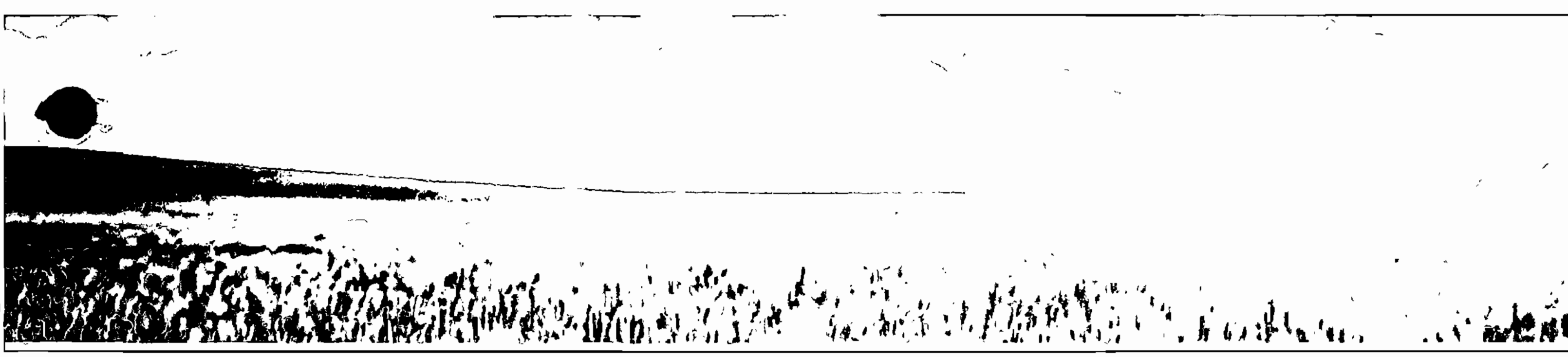
APPLICATION FOR PSD AIR CONSTRUCTION PERMIT

HIGHLANDS ETHANOL, LLC

HIGHLANDS COUNTY, FLORIDA



PREPARED FOR:
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JANUARY 2009

VERENIUM
THE NATURE OF ENERGY™

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February 6, 2009

Mr. Alvero A. Linero, P.E.
Administrator, South Permitting Section
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

Re: PSD Permit Application for Proposed Highlands Ethanol Facility

Dear Mr. Linero:

Highlands Ethanol, LLC, an affiliate of Verenium Biofuels Corporation, is pleased to submit the enclosed Prevention of Significant Deterioration (PSD) permit application and accompanying fee payment of $7,500 for the construction of the Highlands Ethanol facility. As we discussed in our pre-application meeting on October 23, 2008, Highlands Ethanol will be a new cellulosic ethanol production facility located in Highlands County near the intersection of State Route 70 and State Route 721.

We are hereby providing you with the hard copy of the application in quadruplicate, in accordance with 62-4.050(2) F.A.C. In addition, as you requested, we are providing you with a CD-ROM containing an electronic file of the document in portable document format (pdf) for ease of uploading onto the Florida Department of Environmental Protection (FDEP) website.

Because FDEP has not adopted USEPA's PSD rule changes for certain ethanol production facilities, potential emissions from the proposed project will exceed either the major source threshold of 100 tons per year for chemical process plants or the PSD significance threshold for all criteria pollutants. Therefore, PSD review and application of Best Available Control Technology (BACT) is required for all criteria pollutants.

The enclosed permit application contains all of the required information for PSD review under 62-212.400 F.A.C. as follows:

- Description of the proposed facility, processes, and equipment;
- Emissions characterization;

- Regulatory review;
- Control technology review;
- Source impact analysis;
- Air quality analysis;
- Additional impact analyses; and
- Completed permit application form (DEP Form No. 62-210.900(1)).

While Highlands Ethanol has prepared an application that is based on the best available engineering data to date, we ask that FDEP recognize that final engineering design and vendor selection will not occur for a number of months. Therefore, it is possible that some design details and/or supporting information requested on the application form are not yet available or are subject to change. We respectfully request that application review commence and that a condition be included in the permit as is deemed necessary to supply final engineering information.

While the site is not currently supplied with natural gas, Florida Gas Transmission (FGT) is currently in the process of expanding their pipeline system to include the addition of a pipeline along the north side of State Route 70. This pipeline is expected to be completed before the Highlands Ethanol facility completes construction, and consequently we plan to use that resource. Should FGT's plans be postponed for whatever reason, we will need to use either ultra-low sulfur diesel (ULSD) or propane at the facility. Our permit application provides emissions calculations for either scenario.

As we discussed in our pre-application meeting, Highlands Ethanol is requesting that a Class I analysis be waived based on the distance from the proposed site to the Class I areas, modeled impacts at 50 kilometers from the proposed site that are less than the Class I area Significant Impact Levels (SILs), the relatively low emissions from this facility in relation to other permitted sources in the area. We understand that this decision rests with the Federal Land Managers (FLM) and not with FDEP. Highlands Ethanol is concurrently submitting a letter to the FLMs requesting the waiver. We will forward their responses to FDEP upon receipt.

In addition, Highlands Ethanol is seeking the USEPA's exemption from the following New Source Performance Standards (NSPS) for ethanol production facilities because the ethanol is totally produced by biological synthesis:

- 40 CFR 60 Subpart NNN - Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations; and

- 40 CFR 60 Subpart RRR - Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes.

Highlands Ethanol understands that this decision rests with the USEPA and not with FDEP. Highlands Ethanol is concurrently submitting a letter to USEPA Region 4 that formally requests the exemption from these requirements. Prior USEPA applicability determinations are provided in Appendix D for your reference.

This permit application represents a construction permit application only. Highlands Ethanol is not requesting concurrent construction and operating permit review. We understand that a Title V permit application must be submitted 90 days prior to the expiration date of the facility's preconstruction permit but no later than 180 days after commencing operation. We will submit a Title V permit application, including Compliance Assurance Monitoring (CAM) plan, as necessary, at the required time.

We are excited about locating the first ever commercial scale cellulosic ethanol facility within the State of Florida, and we look forward to working with you through the permitting process. Should you have any questions, or require any additional information, please do not hesitate to contact me at (813) 349-4943 or our environmental consultant, Mr. Jeff Harrington of AMEC at (207) 879-4222.

Sincerely,

TR Eves

Tim Eves
Vice President, Business Development

cc: C. Davis – Verenium/Highlands Ethanol
J. Harrington – AMEC
K. Jameson – AMEC

McBee PLEASE ORDER FROM ... EXPRESS 1-800-... 1/14/2009 Ref. No. G 2733009

Check Date: **Check No.** 14708

Invoice No.	Invoice Date	Voucher No.	Description	Gross Amt.	Disc. Amt.	Paid Amount
01082009	1/8/2009	00011265		7,500.00	0.00	7,500.00

Vendor Number	Vendor Name	Total Discounts
0000005897	FLORIDA DEPT OF ENVIRONMENTAL PROTECTION	$0.00

Check Number	Date	Total Amount	Discounts Taken	Total Paid Amount
14708	1/14/2009	$7,500.00	$0.00	$7,500.00

COMERICA BANK-CALIFORNIA
90-3752/1211

14708

VERENIUM CORPORATION
JENNINGS OPERATING ACCOUNT
P.O. BOX 389
JENNINGS, LA 70546

Date January 14, 2009 **Pay Amount** $7,500.00***

Pay ****SEVEN THOUSAND FIVE HUNDRED AND XX / 100 DOLLAR****

To The Order Of

FLORIDA DEPT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR RESOURCE MANAGEMENT
2600 BLAIR STONE ROAD, MS # 5505
TALLAHASSEE, FL 32399-2400

Void After 90 Days

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Appendices

EXECUTIVE SUMMARY

Highlands Ethanol, LLC, an affiliate of Verenium Biofuels Corporation (Verenium), is proposing to construct the Highlands Ethanol facility, a cellulosic ethanol production facility that will be located on 95.7 acres of land in southeastern Highlands County, Florida, near the community of Brighton. This state-of-the-art facility will have a production capacity of 36 million gallons of cellulosic ethanol per year, using feedstocks of dedicated energy crops, such as energy cane and forage sorghum, grown on adjacent farmland.

The demand for fuel grade ethanol has increased ten-fold in the past twenty years in the United States. Fuel grade ethanol is used primarily as an "oxygenate" in gasoline, and has been identified in national strategies as a means to reduce our country's dependence on foreign energy supplies and to reduce ozone air pollution. Historically, ethanol has supplemented the nation's fuel needs during oil embargoes, has been a key ingredient of oxygenated gasolines required by the implementation of clean air programs, and has provided a replacement for banned gasoline additives such as lead and methyl tert-butyl ether (MTBE). Although all ethanol produced in the US has historically been made from corn (1st Generation Ethanol production), this facility represents one of the first commercial scale facilities utilizing 2nd Generation, cellulosic technology. As a result, the energy inputs and carbon footprint associated with this facility's production will be significantly lower than those of 1st Generation production facilities.

The federal Energy Independence and Security (EIS) Act of 2007 requires the production of 36 billion gallons per year of ethanol by the year 2022. The EIS Act incentivizes and requires the production of cellulosic ethanol and other undifferentiated advanced Biofuels. The Act specifically requires cellulosic ethanol production to meet 16 billions gallons of this mandate by the year 2022 and undifferentiated advanced Biofuels, which includes cellulosic ethanol, to meet 5 billion of this mandate. Traditional, first generation, corn ethanol production will provide 15 billion gallons of capacity to meet the mandate of the EIS Act. Considering the proposed capacity of the Highlands Ethanol facility of 36 million gallons per year, the market for cellulosic ethanol is very significant.

There are a number of advantages to using cellulosic biomass as the raw material for Biofuels as compared to food based feedstocks:

- increased yield of ethanol per acre of cropland,
- no impact on food supply,
- relatively low feedstock cost,
- use of marginal lands for feedstock growth,
- beneficial net energy balance, and

- less fertilizer and water usage.

Significant benefits of the proposed project include:

- The creation of an estimated 65 full time jobs at the plant. The job classification will require technical skills. It is expected that existing local residents will be able to fill most of the positions for operations and maintenance of the plant.
- The creation of an estimated 75 full time jobs for the adjacent farming operation. It is expected that existing local residents will be able to fill most of the positions for the farming operations.
- Construction activities, at peak, will employ approximately 500 people during the estimated 18-month construction period. The estimated construction-related cost of the facility is in excess of $250 million including labor benefits, overhead and taxes, and the purchase of local supplies, services, and consumables. The proposed project should not require any additional infrastructure for Highlands County or other local communities, and will have a minimal impact on the municipal services which will be supported by the tax dollars paid by the facility.
- Property values are not expected to be negatively impacted. The proposed project will be located on a 95.7 acre site surrounded by agricultural land. There are no residential properties located within one mile of the site.
- The project will generate tax revenue for the county and state economies.

Project Overview and Schedule

Cellulosic ethanol is produced by converting the abundant cellulose and hemicellulose in biomass to sugars that are then fermented to produce ethanol. The exact composition of cellulose and hemicellulose varies by plant species, although generally biomass is composed of 30-50% cellulose, 20-40% hemicellulose, and 15-30% lignin. Expected ethanol yields from cellulosic biomass crops, based on Verenium's process, are on the order of 1,800 gallons per acre. Verenium's process is based on work conducted University of Florida in the early 1990s and the associated intellectual property is exclusively licensed by the University to Verenium. The ethanol currently produced in the United States is produced from food based feedstock, primarily corn. Ethanol yields from corn crops are on the order of 400 gallons per acre, or less than one-quarter of the yield per acre as compared to cellulosic ethanol.

The proposed ethanol production capacity of 36 million gallons per year is based on an expected operating schedule of 8,000 hours per year. The project will be permitted at an operating capacity of 39.42 million gallons per year to allow for an operating schedule of 8,760 hours per year. The ethanol is required to be denatured with gasoline, with a minimum denaturant content of 5% by volume. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.49 million gallons when accounting for the denaturant.

Selected preliminary milestones for the proposed project are as follows:

- Air permit application submitted — 1st Quarter 2009
- Final air permit issued — 3rd Quarter 2009
- Start construction — 4th Quarter 2009
- Complete construction, start up and commissioning — 4th Quarter 2011
- Commercial operation — 4th Quarter 2011

The schedule for issuance of environmental permits is tied to the schedule of federal loan guarantees that Highlands Ethanol has applied for from the US Department of Energy (DOE). Highlands Ethanol will strive to supply Florida Department of Environmental Protection (FDEP) with any additional requested information to assist the FDEP in maintaining the desired schedule.

Facility Emissions

Emissions of regulated New Source Review (NSR) pollutants and Hazardous Air Pollutants (HAPs) were calculated. Annual and short-term emissions (durations of 24 hours or less) were calculated for comparison to regulatory thresholds and to meet dispersion modeling requirements. Emissions from point sources and fugitive sources were quantified separately. Point sources are emission sources that are vented through a stack or vent. Fugitive sources are emission sources that have no specific emission point.

The facility will include two biomass boilers that will burn stillage cake, a byproduct of the process, as well as biogas generated by anaerobic digesters included in the facility's wastewater treatment plant (WWTP). Natural gas will be used in the biomass boilers for startups and flame stabilization. The backup boiler will operate only when one of the biomass boilers is down. It will burn natural gas, although ultra low sulfur diesel (ULSD) is included in the application in the event a natural gas pipeline being considered for the area is not constructed in a timely manner.

A summary of calculated potential emissions by emission source is provided in Table 1.

Applicable Requirements

The proposed project is required to obtain an air construction permit from the Florida Department of Environmental Protection (FDEP) before it can be constructed. Additionally, the

Table 1. Summary of Calculated Potential Emissions, Highlands Ethanol

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	HAP (tpy)
Liquid/Solid Separation	--	--	--	--	--	2.1	--
Fermentation/Distillation	--	--	--	--	--	18.8	6.4
Product/Denaturant Stg.	--	--	--	--	--	1.7	0.1
Product Loadout	0.0	0.0	0.0	0.4	2.3	5.3	0.4
Misc. Storage Tanks	--	--	--	--	--	0.0	--
Misc. Storage Silos	4.7	4.7	--	--	--	--	--
Wastewater Treatment	0.0	0.0	0.0	0.1	0.3	5.2	--
Cooling Tower	0.7	0.7	--	--	--	4.1	0.2
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7	9.6
Emergency Engines	0.9	0.9	0.0	25.9	15.9	2.9	0.1
Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**	**16.7**
Stillage Loadout	--	--	--	--	--	2.8	--
Equipment Leaks	--	--	--	--	--	19.6	1.0
Roadway Emissions	9.9	1.0	--	--	--	--	--
Subtotal, Fugitive Sources	**9.9**	**1.0**	**--**	**--**	**--**	**22.4**	**1.0**
Total	***33.6***	***24.7***	***104.1***	***156.5***	***192.0***	***71.3***	***17.7***

project is subject to the requirements of the United States Environmental Protection Agency's (USEPA's) Prevention of Significant Deterioration (PSD) rules, which are implemented by 62-212.400, Florida Administrative Code (F.A.C.) of the FDEP's regulations.

These regulations impose Best Available Control Technology (BACT) emission control requirements on the proposed facility. In addition, the Highlands Ethanol project is required to demonstrate compliance with the USEPA's National Ambient Air Quality Standards (NAAQS), and USEPA's and FDEP's ambient allowable increments. This application for the required air construction permit demonstrates that the Highlands Ethanol facility will meet the control technology requirements and will comply with ambient air quality standards and ambient increment standards.

The proposed facility will be subject to the following regulations:

- Prevention of Significant Deterioration (PSD)
- New Source Performance Standards (NSPS) at 40 CFR 60 and 62-204.800(8), F.A.C:
  - Subpart Db *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*

- Subpart Kb *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)*
- Subpart VVa *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*
- Subpart IIII *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*
- National Emission Standards for Hazardous Air Pollutants (NESHAPs) at 40 CFR 63 Subpart ZZZZ *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

The project is not subject to the following provisions:

- Acid Rain Permit Program at 40 CFR 72 and 62-214, F.A.C.
- NO_X Budget Program at 40 CFR 96 and 40 CFR 97
- Clean Air Interstate Rule at 40 CFR 96 and 40 CFR 97, 62-296.470, F.A.C.
- Chemical Accident Prevention at 40 CFR 68 with exception of general duty provisions

It should be noted that Compliance Assurance Monitoring (CAM) requirements will be addressed in the Title V permit application and not in the PSD preconstruction permit application.

Control Technology Assessment

Based on the calculated potential emissions for the Highlands Ethanol project and a review of the regulations that consequently apply to the project, Table 2 provides a listing of the emission sources that will emit the pollutants subject to BACT.

The following paragraphs summarize the proposed emissions control technology and emission limits by pollutant.

Volatile Organic Compounds (VOCs)

Highlands Ethanol proposes to utilize wet scrubbers achieving 98 percent control for the purposes of controlling VOC emissions from the liquid/solid separation process and from the fermentation vent gases. The corresponding proposed VOC BACT emission limits for liquid/solid separation are 0.6 lb/hr and 2.1 tpy. The corresponding proposed VOC BACT emission limits for fermentation/distillation/propagation are 5.1 lb/hr and 18.8 tpy.

Highlands Ethanol plans to install internal floating roofs to control VOC emissions from product storage tanks (ethanol and E95 storage tanks). The denaturant storage tank will be equipped with an internal floating roof and will utilize vapor balancing.

Table 2: Emission Sources Subject to BACT

Sources	Pollutant Emitted Subject to BACT Review					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Point Sources						
Liquid/Solid Separation	•					
Fermentation/Distillation/Propagation	•					
Product/Denaturant Storage	•					
Product Loadout	•					
Miscellaneous Storage Tanks	•					
Miscellaneous Storage Silos					•	•
Wastewater Treatment	•					
Cooling Tower	•				•	•
Steam Production	•	•	•	•	•	•
Emergency Engines	•	•	•	•	•	•
Fugitive Sources						
Stillage Loadout	•					
Equipment Leaks	•					
Roadway Emissions					•	•

Product will be loaded onto tank trucks at a rate of 600 gallons per minute. Vapors displaced from the trucks will be exhausted to a flare. The Product Loadout Flare will have a rated capacity of 9.42 MMBtu/hr and will provide 98% control efficiency for VOC emissions during the loading of product (ethanol) into trucks.

The vertical fixed roof design of the three nutrient storage tanks is sufficient to effectively eliminate VOC emissions.

The WWTP three anaerobic digesters will produce biogas (predominantly methane) that will be combusted in the biomass boilers. During times when the biomass boilers are shut down, the biogas emissions will be controlled with a flare having a rated capacity of 44.03 MMBtu/hr. Highlands Ethanol also plans to construct the WWTP's equalization tank and primary clarifier as vertical fixed roof storage tanks to effectively eliminate VOC emissions.

Highlands Ethanol proposes to utilize good combustion practices to control VOC emissions from the biomass boilers and backup boiler. The proposed VOC BACT emission limit for the biomass boilers is 0.005 lb/MMBtu. The proposed VOC BACT emission limit is 0.0015 lb/MMBtu if the backup boiler is fired with ULSD and 0.0014 lb/MMBtu if the backup boiler is fired with natural gas.

As proposed, the emergency generators and the fire pump will utilize good combustion practices, use ULSD or propane, and limit operation for maintenance and testing purposes to no more than 100 hours per year as well as limit total operation to no more than 500 hours per year. The proposed VOC BACT emission limits for these units are 0.64 g/kW-hr for the emergency generators and 0.3 g/hp-hr for the fire pump.

Handling of the stillage cake as it is transferred from dewatering to the boilers will be performed entirely within a closed system except for the conveyor. VOC emissions will occur from the evaporation of trace organics dissolved in the water fraction and therefore maintenance of the stillage cake at ambient temperature will reduce the potential for fugitive VOC emissions and represents BACT. BACT for equipment leaks is the establishment of a LDAR program in compliance with 40 CFR 60, Subpart VVa. Similarly, VOC emissions from the cooling tower are the result of process fluid leaks from heat exchangers into cooling water. BACT for leaks into cooling water is the establishment of a monitoring program for VOCs in cooling water to allow for maintenance of equipment leaks.

Particulate Matter (PM)

The miscellaneous storage silos include lime storage and handling and miscellaneous chemical storage silos. Highlands Ethanol intends to install fabric filters on miscellaneous chemical storage silos as well as enclosed transfer points. Highlands Ethanol is proposing a $PM_{10}/PM_{2.5}$ BACT emission limit of 0.005 gr/dscf for the miscellaneous storage silos.

Highlands Ethanol proposes to install a cooling tower with a 0.0005% drift eliminator, which represents the top level of control and BACT for $PM_{10}/PM_{2.5}$.

Fabric filters, the top level of BACT control will be installed on the biomass boilers. Highlands Ethanol is proposing a PM_{10} BACT emission limit of 0.01 lb/MMBtu (filterable, based on Method 5).

BACT for particulate matter emissions from the backup boiler will be the use of clean fuels (either natural gas or ULSD) and good combustion practices. The proposed $PM_{10}/PM_{2.5}$ BACT emission limit is 0.0071 lb/MMBtu (filterable based on Method 5) if the backup boiler is fired with ULSD and 0.0022 lb/MMBtu if the backup boiler is fired with natural gas. These proposed emission rates are equivalent to the lowest emission rates.

The emergency generators and the fire pump will utilize good combustion practices, use ULSD or propane, and limit operation for maintenance and testing purposes to no more than 100 hours per year as well as limit total operation to no more than 500 hours per year. The proposed PM_{10} BACT emission limits are 0.2 g/kW-hr for the emergency generators and 0.15 g/hp-hr for the fire pump.

To minimize fugitive dust (PM) emissions from roadways during dry periods, unpaved roads will be wet down with water.

Nitrogen Oxides (NO_X)

The proposed biomass boilers will use fluidized bed combustion technology. Combustion in a fluidized bed unit results in inherently low NO_X emissions compared to other solid-fuel boiler designs resulting in emission levels similar to a traditional boiler design employing combustion controls. In addition, Highlands Ethanol proposes to install selective non-catalytic reduction (SNCR) to further reduce NO_X emissions from the biomass boilers. Highlands Ethanol proposes a NO_X BACT emission limit of 0.075 lb/MMBtu.

Unlike the biomass boilers, which have a unique design, the backup boiler will be a standard package boiler design. Therefore, combustion controls are a technically feasible option. Highlands Ethanol proposes to install a backup boiler with low NO_X burners and flue gas recirculation (FGR), which is the highest level of combustion controls available. Because the backup boiler will utilize clean fuels and only operate when the biomass boilers are not operational, add-on controls would not be cost effective. The proposed NO_x BACT emission limit is 0.072 lb/MMBtu if the backup boiler is fired with ULSD and 0.035 lb/MMBtu if the backup boiler is fired with natural gas.

The emergency generators and the fire pump will meet NSPS Subpart IIII, utilize good combustion practices, use ULSD or propane, and limit operation for maintenance and testing purposes to no more than 100 hours per year as well as limit total operation to no more than 500 hours per year. The proposed NO_X BACT emission limits are 5.76 g/kW-hr for the emergency generators and 2.7 g/hp-hr for the fire pump.

Sulfur Dioxide (SO_2)

Highlands Ethanol proposes to utilize limestone injection to reduce SO_2 in the biomass boilers, which is the top level of control, and represents BACT. For this project, the hydrolysis process results in additional sulfur in the fuel and therefore, slightly higher SO_2 emissions. Taking this into account, Highlands Ethanol proposes a SO_2 BACT emission limit of 0.06 lb/MMBtu based on a 30-day rolling average. Because of the potential for variability in short-term levels of sulfur in the fuel, Highlands Ethanol further proposes SO_2 BACT emission limits of 0.12 lb/MMBtu (24-hour rolling average) and 0.14 lb/MMBtu (3-hour block average).

BACT for SO_2 from the backup boiler is use of clean fuels (either natural gas or ULSD). Highlands Ethanol proposes a SO_2 BACT emission limit of 0.0017 lb/MMBtu for ULSD firing (based on ULSD sulfur content) and 0.0056 lb/MMBtu for natural gas firing (based on FDEP's presumed sulfur content of natural gas of 0.02 gr/scf).

Highlands Ethanol proposes to utilize ULSD or propane in the fire pump engine and emergency generators. These units will be new units and will be required to meet the NSPS for internal combustion engines (40 CFR 60, Subpart IIII) as well. Therefore BACT for SO_2 emissions from these units is good combustion practices, use of ULSD or propane, and limit operation to no more than 100 hours per year for maintenance and testing purposes as well as limit total operation to no more than 500 hours per year.

Carbon Monoxide (CO)

Highlands Ethanol plans to utilize good combustion practices to control CO emissions from the biomass boilers and backup boiler. The proposed CO BACT emission limit for the biomass boilers is 0.1 lb/MMBtu. CO BACT emission limits of 0.035 lb/MMBtu for oil firing and 0.037 lb/MMBtu for natural gas firing are proposed for the backup boiler.

The emergency generators and the fire pump will utilize good combustion practices, use ULSD or propane, and limit operation for maintenance and testing purposes to no more than 100 hours per year as well as limit total operation to no more than 500 hours per year. The proposed CO BACT emission limits are 3.5 g/kW-hr for the emergency generators and 2.6 g/hp-hr for the fire pump.

Ambient Impact Analysis

An ambient air quality impact analysis was conducted for the proposed project. Emission rates, exhaust parameters, and stack parameters were obtained or calculated, and wind-direction specific building dimensions were calculated with USEPA's BPIPPRM computer program. A modeling protocol was prepared that described the selected dispersion model, land use, receptor grids, and meteorological data used.

The significant impact analysis was completed per USEPA guidance. Dispersion modeling was performed to determine the maximum impact operating scenario for the proposed biomass boilers. The "100% load" operating scenario was selected for further analysis for all pollutants and averaging periods. The predicted concentrations for the selected operating scenarios were then compared to Significant Impact Levels (SILs). Predicted concentrations were less than SILs for CO and Pb, demonstrating compliance with NAAQS, FAAQS, and allowable increments. Because predicted concentrations were less than SILs for CO and Pb, interactive source modeling was not required. In contrast, predicted concentrations of SO_2, PM_{10}, and NO_2 were greater than SILs.

Interactive source modeling was performed for SO_2, PM_{10}, and NO_2. Background air quality concentrations were identified based on data collected at monitoring sites in southern Florida. FDEP provided a database of interactive sources located in southern Florida for input to the dispersion model. The interactive source analysis demonstrates that the proposed project will be in compliance with ambient air quality standards and ambient increment standards.

Highlands Ethanol is requesting an exemption from pre-construction monitoring requirements. Predicted concentrations of NO_2, CO, and Pb were less than Significant Monitoring

Concentrations (SMC). In the cases of SO_2 and PM_{10}, existing data from southern Florida were deemed to be conservatively representative of background air quality in Highlands County.

An assessment of the potential impacts on Class I areas by the proposed project was performed. Based on the large distances to the nearest Class I areas, the emissions associated with the project, and predicted concentrations at 50 kilometers (km) being less than Class I area SILs, Highlands Ethanol is requesting in a notification letter being sent to the Federal Land Managers (FLMs) to determine that an analysis of impacts to either Class I area increments or Class I area air quality related values (AQRVs) would not be required. The FDEP will be notified of the FLM's decisions upon Highlands Ethanol's receipt.

Finally, an additional impacts analysis was performed. Growth, visibility impairment, impacts to soils and vegetation, and air toxics were addressed. The analysis demonstrated that resulting impacts are minimal.

Conclusions

The purpose of this air permit application is to demonstrate that the Highlands Ethanol project will include the required air emission controls and will comply with ambient air quality standards and ambient increment standards. This application provides an emissions inventory and other information required to identify applicable requirements, a control technology assessment that identifies BACT emission controls, and a dispersion modeling analysis that demonstrates compliance with ambient air quality standards.

1.0 INTRODUCTION

Highlands Ethanol, LLC, an affiliate of Verenium Biofuels Corporation (Verenium) is proposing to construct the Highlands Ethanol facility, a cellulosic ethanol production facility that will be located on 95.7 acres of land in southeastern Highlands County, Florida, near the community of Brighton. This state-of-the-art facility will have a production capacity of 36 million gallons of cellulosic ethanol per year, using feedstocks of dedicated energy crops, such as energy cane and forage sorghum, grown on adjacent farmland.

The demand for fuel grade ethanol has increased ten-fold in the past twenty years in the United States. Fuel grade ethanol is used primarily as an "oxygenate" in gasoline, and has been identified in national strategies as a means to reduce our country's dependence on foreign energy supplies and to reduce ozone air pollution. Historically, ethanol has supplemented the nation's fuel needs during oil embargoes, has been a key ingredient of oxygenated gasolines required by the implementation of clean air programs, and has provided a replacement for banned gasoline additives such as lead and methyl tert-butyl ether (MTBE). Although all ethanol produced in the US has historically been made from corn (1st Generation Ethanol production), this facility represents one of the first commercial scale facilities utilizing 2nd Generation, cellulosic technology. As a result, the energy inputs and carbon footprint associated with this facility's production will be significantly lower than those of 1st Generation production facilities.

The federal Energy Independence and Security (EIS) Act of 2007 requires the production of 36 billion gallons per year of ethanol by the year 2022. The EIS Act incentivizes and requires the production of cellulosic ethanol and other undifferentiated advanced Biofuels. The Act specifically requires cellulosic ethanol production to meet 16 billions gallons of this mandate by the year 2022 and undifferentiated advanced Biofuels, which includes cellulosic ethanol, to meet 5 billion of this mandate. Traditional, first generation, corn ethanol production will provide 15 billion gallons of capacity to meet the mandate of the EIS Act. Considering the proposed capacity of the Highlands Ethanol facility of 36 million gallons per year, the market for cellulosic ethanol is very significant.

Cellulosic ethanol is produced by converting the abundant cellulose and hemicellulose in biomass to sugars that are then fermented to produce ethanol. The exact composition of cellulose and hemicellulose varies by plant species, although generally biomass is composed of 30-50% cellulose, 20-40% hemicellulose, and 15-30% lignin. Expected ethanol yields from cellulosic biomass crops, based on Verenium's process, are on the order of 1,800 gallons per acre. Verenium's process is based on work conducted at the University of Florida in the early 1990s and the associated intellectual property is exclusively licensed by the University to Verenium. The ethanol currently produced in the United States is produced from food based feedstock, primarily corn. Ethanol yields from corn crops are on the order of 400 gallons per acre, or less than one-quarter of the yield per acre as compared to cellulosic ethanol.

There are a number of advantages to using cellulosic biomass as the raw material for Biofuels as compared to food based feedstocks:

- increased yield of ethanol per acre of cropland,
- no impact on food supply,
- relatively low feedstock cost,
- use of marginal lands for feedstock farming,
- beneficial net energy balance, and
- less fertilizer and water usage.

Significant benefits of the proposed project include:

- The creation of an estimated 65 full time jobs at the plant. The job classification will require technical skills. It is expected that existing local residents will be able to fill most of the positions for operations and maintenance of the plant.
- The creation of an estimated 75 full time jobs for the adjacent farming operation. It is expected that existing local residents will be able to fill most of the positions for the farming operations.
- Construction activities, at peak, will employ approximately 500 people during the estimated 18-month construction period. The estimated construction-related cost of the facility is in excess of $250 million including labor benefits, overhead and taxes, and the purchase of local supplies, services, and consumables. The proposed project should not require any additional infrastructure for Highlands County or other local communities, and will have a minimal impact on the municipal services which will be supported by the tax dollars paid by the facility.
- Property values are not expected to be negatively impacted. The proposed project will be located on a 95.7 acre site surrounded by agricultural land. There are no residential properties located within one mile of the site.
- The project will generate tax revenue for the local, county, and state economies.

The proposed project is required to obtain an air construction permit from the Florida Department of Environmental Protection (FDEP) before it can be constructed. Additionally, the project is subject to the requirements of the United States Environmental Protection Agency's (USEPA's) Prevention of Significant Deterioration (PSD) rules, which are implemented by 62-212.400, Florida Administrative Code (F.A.C.) of the FDEP's regulations.

Selected preliminary milestones for the proposed project are as follows:

- Air permit application submitted — 1st Quarter 2009

- Final air permit issued — 3rd Quarter 2009
- Start construction — 4th Quarter 2009
- Complete construction, start up and commissioning — 4th Quarter 2011
- Commercial operation — 4th Quarter 2011

The schedule for issuance of environmental permits is tied to the schedule of federal loan guarantees that Highlands Ethanol has applied for from the US Department of Energy (DOE). Highlands Ethanol will strive to supply FDEP with any additional requested information to assist the FDEP in maintaining the desired schedule.

The purpose of this air permit application is to provide the technical information required by the FDEP's air permitting program, and demonstrate that the proposed facility will be in compliance with regulations related to ambient air quality. As such, this application provides:

- A description of the proposed project configuration (Section 2);
- An inventory of maximum potential emissions resulting from the project (Section 3);
- An analysis of applicable regulatory requirements (Section 4);
- A Best Available Control Technology (BACT) assessment for the project (Section 5);
- An ambient air quality impact assessment (Section 6);
- Completed air permit application forms (Appendix A);
- Detailed emissions calculations (Appendix B);
- A detailed site plan (Appendix C);
- USEPA Applicability Determinations for New Source Performance Standards (NSPS) Subparts NNN and RRR (Appendix D);
- Data from USEPA's RACT/BACT/LAER Clearinghouse (RBLC) (Appendix E);
- A summary of dispersion model input and output files (Appendix F);
- A tabulation of modeling inputs for interactive sources in the vicinity (Appendix G);
- Copies of notifications to Federal Land Managers (FLMs) (Appendix H); and
- A listing of exempt and insignificant emission units (Appendix I).

2.0 PROJECT DESCRIPTION

Highlands Ethanol is proposing to construct its facility in southeastern Highlands County, Florida, near the community of Brighton. This state-of-the-art facility will have a production capacity of 36 million gallons of ethanol per year, using feedstocks of dedicated energy crops, such as energy cane and forage sorghum, grown on adjacent farmland.

This section provides a description of the project location (Section 2.1), and the proposed equipment to be installed for the project (Section 2.2).

2.1 Site Location

The proposed Highlands Ethanol project will be located on property currently owned by Lykes Bros., Inc., and approximately 2 miles east of the community of Brighton. The 95.7 acre site is surrounded entirely by Lykes Bros. property, with an easement allowing access to the site from State Route 70. The location of the site is presented in Figure 2-1.

The site is exceptionally flat, with terrain elevations ranging from 30 to 32 feet above mean sea level (AMSL). The facility will be constructed on additional fill material with a resulting base elevation of 36 feet AMSL. Terrain surrounding the site is generally flat with the highest elevation within 10 kilometers (km) of the site being 50 feet AMSL. This higher terrain is generally located along US Route 98 between the communities of Fort Basinger and Cornwell.

The proposed facility is located in the USEPA's Southwest Florida Intrastate Air Quality Control Region (AQCR), which is classified as attainment or unclassifiable for all criteria pollutants. The AQCR is classified as a Class II area with regard to available ambient increments.

The closest PSD Class I areas are the Everglades National Park (154 km) and the Chassahowitzka Wilderness Area (216 km). All other Class I areas are located at distances greater than 300 km from the facility with the next closest being the Okefenokee Wilderness Area in Georgia (386 km).

2.2 Summary of Proposed Facility

The proposed Highlands Ethanol project will have an ethanol production capacity of 36 million gallons per year, based on an expected operating schedule of 8,000 hours per year. For permitting purposes, the availability of the plant is assumed to be 8,760 hours per year, resulting in an assumed operating capacity of 39.4 million gallons per year. Fuel ethanol is required to be denatured with gasoline. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.5 million gallons per year when accounting for the denaturant.

A process flow schematic of the proposed facility is provided in Figure 2-2. Facility processes include:

- Feedstock handling;
- Hydrolysis;
- Liquid/solid separation and neutralization;
- Fermentation, distillation, and propagation;
- Product loadout;
- Product and denaturant storage tanks;
- Miscellaneous storage tanks;
- Miscellaneous storage silos;
- Stillage loadout;
- Wastewater treatment;
- Cooling tower;
- Steam production; and
- Emergency engines.

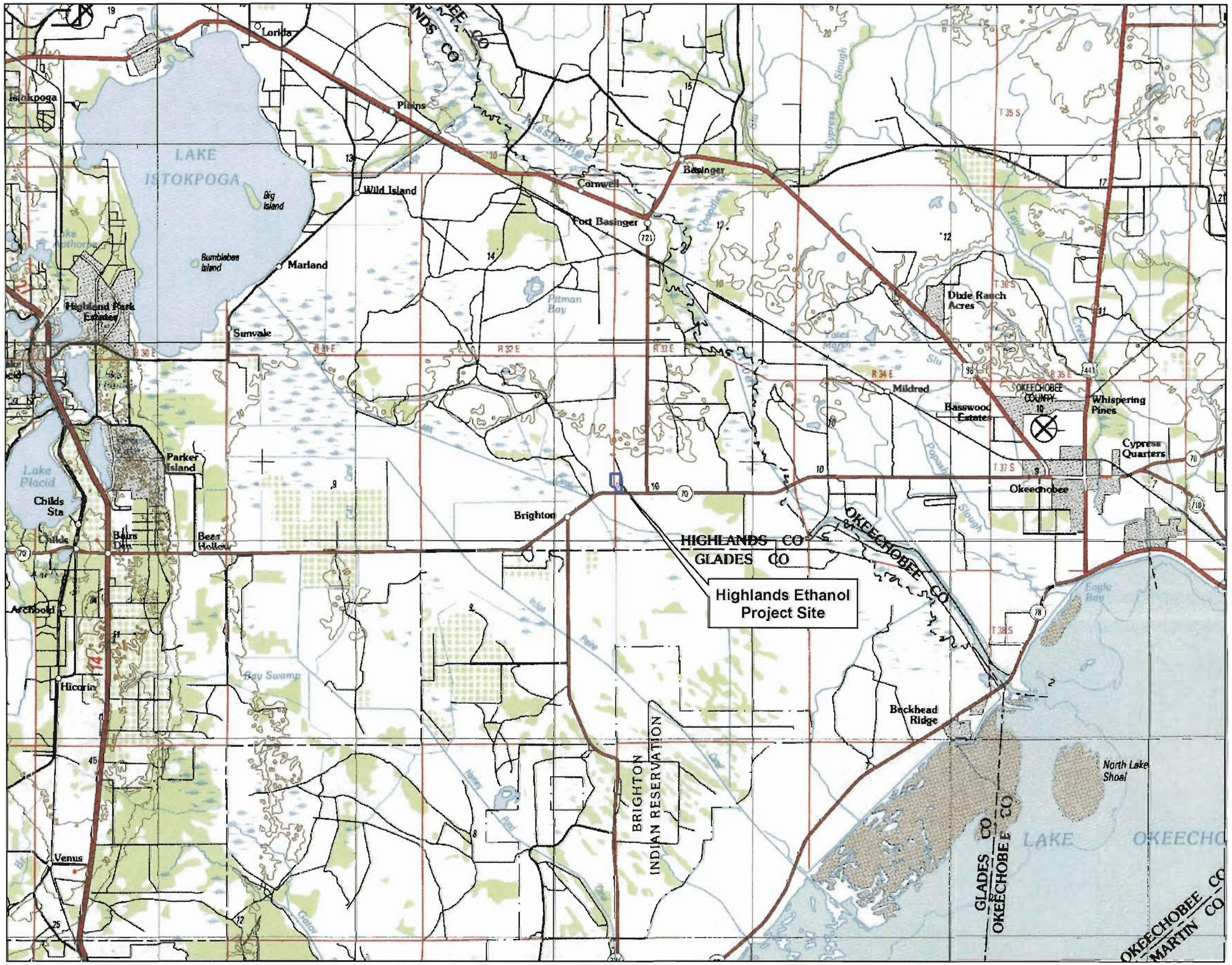
Air emissions will be produced by the proposed equipment. The basis for the calculation of emissions from the various processes is provided in Section 3. Detailed calculations of the emissions are provided in Appendix B. A site plan of the project is included in Appendix C.

2.2.1 Feedstock Handling

Energy cane and forage sorghum feedstocks will be delivered to the facility by truck from the adjacent farmland. Upon receipt, the feedstock will be offloaded and subsequently conveyed through a washing process. The feedstocks will be freshly harvested material with a high moisture content. The site will not include a feedstock storage pile. Rather, feedstock will be brought to the facility via just-in-time deliveries. The facility will be designed to receive 3,600 green tons per day (150 green tons per hour) of feedstock.

2.2.2 Hydrolysis

The hydrolyzer will employ a single-stage dilute acid hydrolysis process to produce sugars from the hemicellulose fraction of the biomass feedstock. The hydrolyzer employs steam and a dilute sulfuric acid solution to produce these sugars. The resulting slurry will consist of cellulose/lignin solids mixed with a liquid fraction containing a variety of pentoses (i.e., xylose, arabinose, and others) and hexoses (i.e., glucose, mannose, galactose, and others). The hydrolyzer is an insignificant source of air emissions.



LEGEND

Property Line

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Basemap data from US Geologic Survey 1°×2° Series
Topographic Map Source: FL Land Boundary Information System

TITLE

Highlands Ethanol Site Location

0 2 Kilometers

amec

AMEC Earth and Environmental, Inc
Portland, Maine

FIGURE 2-1

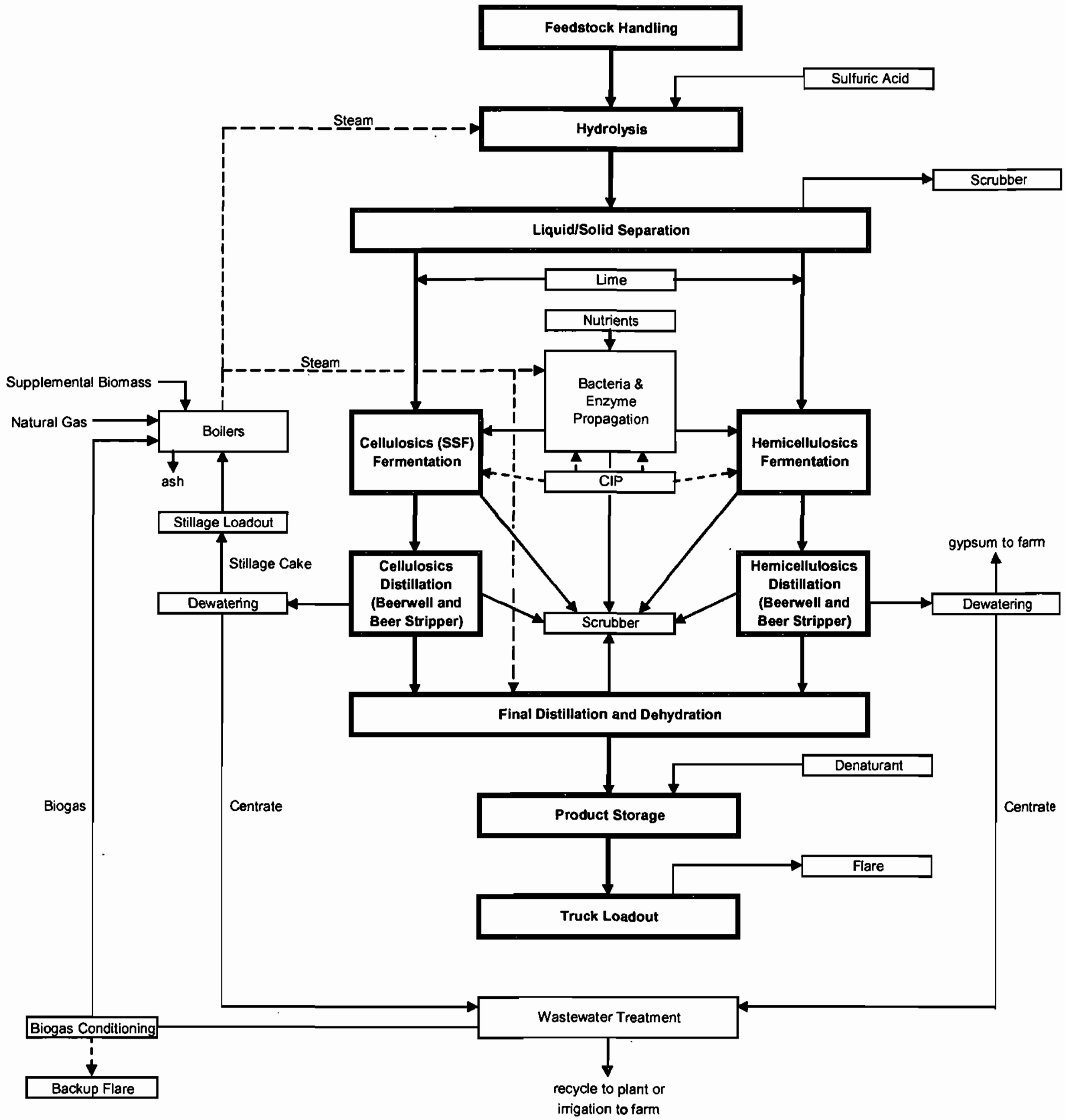


Figure 2-2
Process Flow Schematic, Highlands Ethanol

2.2.3 Liquid/Solid Separation and Neutralization

The slurry is separated into liquid and solid fractions in a 3-stage series of screw presses. An enclosed tank is located at the feed side of each screw press stage (for a total of three feed tanks) and another enclosed tank is located at the filtrate discharge of each screw press stage (for a total of three filtrate tanks). The resulting cellulose/lignin solids stream, which has high water content, will be neutralized with lime in a mixer. The resulting liquid stream, which contains most of the hemicellulosic sugars, will be neutralized with lime in a neutralization tank. A vapor capture system will be used to collect the evaporative emissions from each of the enclosed feed tanks and filtrate tanks. The captured emissions will be exhausted to a wet scrubber dedicated to the process. Scrubbing water will be returned to the neutralization tank as make-up water. Each stream is then stored in a tank until a fermentation vessel becomes available.

2.2.4 Fermentation, Distillation, and Propagation

A set of four cellulosic fermentation vessels will be used to simultaneously saccharify and ferment the cellulose in the solids stream. The cellulose will be saccharified by a proprietary enzyme, producing glucose sugars. These sugars will in turn be fermented with a proprietary bacterium to produce a dilute ethanol beer. The fermentations will occur in batches, and the fermented mash will be passed to a beerwell upon completion of each fermentation batch. The beer will then be transferred to a beer stripper that initiates the distillation process.

Similarly, a separate set of four hemicellulosic fermentation vessels will be used to ferment the hemicellulosic sugars. The sugars will be fermented with a proprietary bacterium to produce a dilute ethanol beer. The fermentations will occur in batches, and the fermented mash will be passed to a beerwell upon completion of each fermentation batch. The beer will then be transferred to a beer stripper that initiates the distillation process. This beerwell and beer stripper will be separate from those used with the cellulosic distillation.

The heads (vapors) from the two beer strippers will be passed to a stripper/rectifier for further distillation and then a molecular sieve system to remove remaining water (dehydration) from the product. The purified ethanol will then be denatured with gasoline, resulting in a product that contains approximately 95 percent ethanol by weight and 5 percent gasoline by weight.

The proprietary enzyme and bacteria will be produced on site in the propagation system. Nutrients required to produce the enzyme and bacteria will be stored adjacent to the propagation system, and are described later in this section.

Equipment to be used for the fermentation, distillation, and propagation processes include four cellulosic fermentation tanks, four hemicellulosic fermentation tanks, two beerwells, three cellulosic enzyme propagators, three cellulosic bacterium propagators, three hemicellulosic bacterium propagators, two beer strippers, a stripper/rectifier, and a molecular sieve system.

The vents associated with this equipment will be connected to a wet scrubber for VOC control. Scrubbing water will be returned to the cellulosic beerwell as make-up water.

The fermentation and propagation vessels will require a clean-in-place (CIP) system to provide sanitary conditions for the enzymes and bacteria. The CIP system will use a disinfectant solution such as caustic soda, sodium hypochlorite, etc.

2.2.5 Product and Denaturant Storage Tanks

The facility will include two product shift tanks, two ethanol product (E95) storage tanks, and one recycle product tank. The facility will also include one gasoline (denaturant) storage tank. Each of these tanks will be designed with an internal floating roof. The materials stored in these tanks will be as follows:

- Product Shift Tank No. 1 - storing ethanol;
- Product Shift Tank No. 2 - storing ethanol;
- Recycle Product Tank - storing ethanol;
- Product Storage Tank No. 1 - storing E95;
- Product Storage Tank No. 2 - storing E95; and
- Denaturant Storage Tank - storing gasoline.

2.2.6 Product Loadout

E95 product will be loaded onto tank trucks at a rate of 600 gallons per minute. Vapors displaced from the trucks will be exhausted to a flare. The Product Loadout Flare will have a rated capacity of 9.42 MMBtu/hr to control vapors displaced from the trucks during the loading of E95. The trucks are assumed to not to be in dedicated E95 service (i.e., some trucks will have returned from delivering gasoline and gasoline vapors will be displaced).

2.2.7 Miscellaneous Storage Tanks

The facility will include several other chemical storage tanks; however, all of these tanks will be insignificant sources of air emissions. These tanks include a number of storage tanks to store sulfuric acid and various fermentation nutrient materials. Sulfuric acid will be used in the hydrolyzer. The sulfuric acid will be delivered and stored as a 98% solution and then blended with water and stored as a 3% solution prior to use in the hydrolyzer. The fermentation nutrients will include corn steep, lactose, glucose, and phosphoric acid (45% solution). All of these tanks will be of a vertical fixed roof design. The fermentation nutrients also include an anhydrous ammonia storage tank, which will be of a horizontal pressurized design. The materials stored in these tanks will be as follows:

- 98% Sulfuric Acid;

- 3% Sulfuric Acid;
- Corn Steep;
- Lactose;
- Glucose;
- 45% Phosphoric Acid; and
- Anhydrous Ammonia.

2.2.8 Miscellaneous Storage Silos

The facility will include equipment and silos for the handling and storage of dry materials. These materials include nutrients for the propagation of the proprietary enzyme and bacteria, lime for the neutralization of hydrolyzate and cake prior to fermentation, and materials associated with the biomass boilers. These materials will be stored in silos, each of which will be equipped with fabric filters to control emissions during material handling. The materials stored in these silos will be as follows:

- Solka-Flok® (powdered cellulose, a propagation nutrient);
- Soy Flour (powdered roasted soy beans, a propagation nutrient);
- Ammonium Sulfate (a propagation nutrient);
- Potassium Phosphate (a propagation nutrient);
- Urea (a propagation nutrient);
- Pebbled Lime (neutralization);
- Ash (biomass boilers);
- Sand (fluidized bed material for the biomass boilers);
- Limestone (fluidized bed material and emissions control for the biomass boilers); and
- Urea (emissions control for the biomass boilers).

2.2.9 Stillage Loadout

Stillage cake will be removed from the bottom of the cellulosic beer stripper, dewatered to remove some of the water fraction, and conveyed to the biomass boilers. The stillage cake will not be otherwise dried and will consist of lignin, unhydrolyzed cellulose, and other material with fuel value. Stillage will be generated at a rate of 25 dry tons per hour and will consist primarily of lignin fibers and secondarily of unhydrolyzed cellulose fibers with a moisture content between 35 and 60 percent. Handling will be performed entirely within a closed system except for the conveyor.

2.2.10 Wastewater Treatment

The facility will include a wastewater treatment plant (WWTP) to treat process wastewaters. The wastewater treatment system will consist of the following equipment:

- Equalization Tank;
- Primary Clarifier;
- Anaerobic Reactors;
- Aeration Basin;
- Secondary Clarifier; and
- Four Sand Filters.

The biogas produced by the anaerobic reactors will be burned in the biomass boilers and the facility will include a flare in the event that biogas cannot be combusted in the boilers. The flow through the system will be approximately 1,640 gallons per minute. The treated water from the WWTP will be reused.

2.2.11 Cooling Tower

An induced draft evaporative cooling tower will provide cooling of process water for the project. The tower will be of rectangular mechanical-draft design with six cells. Each cell will be equipped with its own fan and a high efficiency drift eliminator to minimize water drift losses. The flow rate will be approximately 22,500 gallons per minute. Total dissolved solids in the cooling water are expected to be approximately 2,750 mg/l.

2.2.12 Steam Production

Biomass Boilers. Two biomass boilers, each with a heat input capacity of 198 MMBtu/hr, will be used to combust the stillage cake. The boilers will be based on fluidized bed technology. The boilers will also be equipped to burn the biogas produced by the anaerobic reactors of the facility's WWTP. While the site is not currently supplied with natural gas, Florida Gas Transmission (FGT) is currently in the process of expanding their pipeline system to include the addition of a pipeline along the north side of State Route 70. This pipeline is expected to be completed before the Highlands Ethanol facility completes construction, and consequently the boilers will be equipped to burn natural gas for startups and flame stabilization. For the purposes of permitting, the boilers are assumed to also be equipped to burn Ultra-Low Sulfur Diesel (ULSD) or propane in the event that FGT's plans are postponed.

Backup Boiler. In the event the biomass boilers cannot be operated, the facility will include a 198 MMBtu/hr backup boiler with the ability to burn natural gas. The boiler will also be equipped to combust biogas. As previously discussed, the site is not currently supplied with natural gas, but natural gas is expected to be available to the site before the Highlands Ethanol facility completes construction. For the purposes of permitting, the boilers are assumed to also be equipped to burn ULSD or propane in the event that FGT's plans are postponed.

2.2.13 Emergency Engines

Four emergency generators, each rated at 2,000 kW, will be installed to provide backup electrical power in the event of a power outage at the facility. A backup 360 hp diesel fire pump will also be installed to provide firewater during power outages. All of these units will fire ULSD or propane and will be limited to 500 hours per year of operation. Each unit will be operated no more than 100 hours per year for testing and maintenance purposes. Each engine will be designed to meet USEPA's emission standards listed in 40 CFR Part 60 Subpart IIII for model year 2009 or later.

3.0 EMISSIONS INVENTORY

This section describes how emissions from the proposed Highlands Ethanol project were calculated based upon the results of the Best Available Control Technology (BACT) evaluation (see Section 5) and emission factors obtained from USEPA's AP-42 *Compilation of Air Pollutant Emission Factors* (AP-42). Detailed emissions calculations are provided in Appendix B.

From a practical perspective relevant to the proposed project and its emissions, the list of regulated New Source Review (NSR) pollutants includes the six criteria pollutants for which National Ambient Air Quality Standards (NAAQS) have been established and those pollutants that are subject to the New Source Performance Standards (NSPS) promulgated pursuant to Section 111 of the federal Clean Air Act (CAA).

The six criteria pollutants are: sulfur dioxide (SO_2), particulate matter (PM), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). Volatile organic compounds (VOC) and nitrogen oxides (NO_X) are included by virtue of being established as ozone precursors. For regulatory purposes, PM is further classified by particle size. $PM_{2.5}$ includes all particles with an aerodynamic diameter of less than 2.5 microns. PM_{10} includes all particles with an aerodynamic diameter of less than 10 microns. Total suspended particulate (TSP) includes particles of all sizes.

The list of Hazardous Air Pollutants (HAPs) is defined in Rule 62-210.155, F.A.C. The list is identical to the federal list of HAPs pursuant to Section 112(b) of the Clean Air Act. From a practical perspective, many of the HAPs to be emitted from the proposed project are subsets of regulated NSR pollutants, particularly trace metals (PM) and trace organics (VOC).

Annual emissions were calculated for comparison to regulatory thresholds, and short-term emissions (durations of 24 hours or less) were calculated to meet dispersion modeling requirements. Emissions of regulated NSR pollutants and HAPs were calculated.

Emissions from point sources and fugitive sources were quantified separately. Point sources are emission sources that are vented through a stack or vent. Fugitive sources are emission sources that have no specific emission point.

3.1 Point Sources

3.1.1 Feedstock Handling and Hydrolysis

Feedstock will be conveyed from the receiving area to feedstock washing equipment. The feedstock will be fresh material brought in from the adjacent farm and because of its high moisture content is not expected to produce fugitive PM emissions at the receiving area.

The hydrolyzer system will operate under pressure and will not produce air emissions. The system is equipped with pressure safety valves (PSVs), which in turn are ultimately vented to the fermentation/distillation scrubber described in Section 3.3. VOC emissions from these PSVs are conservatively included in the fugitive VOC emissions calculations described in Section 3.2.2.

3.1.2 Liquid/Solid Separation

Acid hydrolyzed biomass will be separated into liquid and solid fractions in a 3-stage series of screw presses. An enclosed tank is located at the feed side of each screw press stage (for a total of three feed tanks) and another enclosed tank is located at the filtrate discharge of each screw press stage (for a total of three filtrate tanks). The process will operate at a temperature of approximately 85-90°C. The water fraction entering the process will contain trace amounts of dissolved soluble organics that have the potential to volatilize from the water surfaces inside each of the six tanks. The trace VOCs present in the system include furfural and acetic acid.

VOC emissions from the process were calculated using USEPA's WATER9, Version 2 software (USEPA, 2004a), which calculates VOC emissions from aqueous surfaces. Meteorological data required by the software were obtained from USEPA's TANKS (USEPA, 2001a) software for West Palm Beach, Florida. WATER9 was implemented as though the tanks were open to atmosphere, even though they will be enclosed and vented to a wet scrubber dedicated to the process. A summary of the WATER9 inputs and outputs are provided in Appendix B, as are the detailed WATER9 outputs.

The total VOC evaporation rate from the liquid/solid separation process was calculated to be 106 tons per year (tpy) before capture and control. This calculated evaporation rate was only 1.0% of the total VOC entering the liquid/solid separation process from hydrolysis, demonstrating the high water solubility of these VOCs. The captured VOC emissions will be vented to a wet scrubber with a BACT control efficiency of 98%. The total VOC emissions to atmosphere in consideration of the scrubber were calculated to be 2.1 tpy.

3.1.3 Fermentation, Distillation, and Propagation

Emissions were calculated by scaling speciated VOC stack test results from a fermentation scrubber and a distillation scrubber at the ACE Ethanol Facility in Stanley, Wisconsin. Testing was performed by Interpoll Laboratories, Inc. in December 2002. The same emission calculation procedure was used for the permitting of the Pacific Ethanol Facility located in Madera, California (San Joaquin Valley Unified Air Pollution Control District, 2004). Controlled VOC emissions from fermentation were calculated to be 0.8366 pounds per 1000 gallons of ethanol produced. Controlled VOC emissions from distillation were calculated to be 0.1161 pounds per 1000 gallons of ethanol produced.

The fermentation, distillation, and propagation vents will be equipped with a wet scrubber designed to remove >98% of the trace VOCs (ethanol, acetic acid, lactic acid and methanol) evaporated during fermentation, distillation, and propagation. The total VOC emissions to atmosphere in consideration of the scrubber were calculated to be 18.8 tpy. Based on the speciation identified by the stack test, the total HAP emissions to atmosphere in consideration of the scrubber were calculated to be 6.4 tpy. Detailed calculations of emissions from fermentation, distillation, and propagation are provided in Appendix B.

3.1.4 Product and Denaturant Storage Tanks

VOC emissions from the ethanol, E95, and denaturant storage tanks were calculated using USEPA's TANKS 4.0.9d software (USEPA, 2001a). Each of these tanks will be equipped with an internal floating roof. The gasoline was assumed to have a Reid Vapor Pressure (RVP) of 12. Speciation of gasoline vapor emissions was derived from Profile 2490 of USEPA's SPECIATE 3.2 database (USEPA, 2002a). This speciation was used to calculate HAP emissions from the E95 and gasoline storage tanks. A summary of the TANKS inputs and outputs are provided in Appendix B, as are the detailed TANKS outputs.

The total VOC emissions from these storage tanks were calculated to be 1.7 tpy. The total HAP emissions from these storage tanks were calculated to be 0.1 tpy.

3.1.5 Product Loadout

Product will be loaded onto tank trucks at a rate of 600 gallons per minute. Vapors displaced from the trucks will be exhausted to a flare. The trucks are assumed to employ submerged fill techniques, but not be in dedicated E95 service (i.e., some trucks will have returned from delivering gasoline). The gasoline was assumed to have an RVP of 12. Displaced gasoline vapor emissions were calculated using USEPA's AP-42, Section 5.2 (USEPA, 1995a). The flare was then assumed to destroy 98% of the displaced VOC emissions. Combustion emissions of other criteria pollutants were calculated using USEPA's AP-42, Section 13.5 (USEPA, 1995b). PM emissions were calculated by conservatively assuming a lightly smoking flare. The flare will have a combustion capacity of 9.4 MMBtu/hr and a pilot capacity of 0.2 MMBtu/hr. Speciation of gasoline vapor emissions was derived for HAPs from Profile 2490 of USEPA's SPECIATE 3.2 database (USEPA, 2002a). The total emissions calculated for product loadout are presented in Table 3-1. Detailed calculations of emissions from product loadout are provided in Appendix B.

Table 3-1. Calculated Potential Emissions, Product Loadout Flare

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	HAP (tpy)
Product Loadout Flare	0.02	0.02	0.004	0.4	2.3	5.3	0.4

3.1.6 Miscellaneous Storage Tanks

VOC emissions from the corn steep, lactose, and glucose storage tanks were calculated using USEPA's TANKS 4.0.9d software (USEPA, 2001a). Each of these tanks will be of a vertical fixed roof design. All three of these mixtures consist predominantly of water, and the trace hydrocarbons contained in each mixture are highly soluble in water. A summary of the TANKS inputs and outputs are provided in Appendix B, as are the detailed TANKS outputs.

The total VOC emissions from these storage tanks were calculated to be negligible (3.2E-11 tpy). Because of the negligible emissions, these storage tanks will be included in the facility's inventory of insignificant sources.

Emissions of sulfuric acid and phosphoric acid from their respective storage tanks were also calculated using the TANKS software. The emissions from each of these storage tanks were calculated to be negligible, and as such these storage tanks will also be included in the facility's inventory of insignificant sources.

The anhydrous ammonia storage tank will operate under pressure and will not emit ammonia to the atmosphere. Therefore, the anhydrous ammonia storage tank will be included in the facility's inventory of insignificant sources.

3.1.7 Miscellaneous Storage Silos

A number of fabric filter dust collectors will be used to control PM_{10} emissions from storage silos and their respective material handling operations. Per the BACT analysis presented in Section 5, all of these fabric filter dust collectors will be designed with outlet emissions of 0.005 grains per dry standard cubic foot (gr/dscf) of PM_{10}. Emissions from each of these storage silos were calculated from the respective exhaust flow rates and a conservative assumption that each will be in operation 8,760 hours per year. $PM_{2.5}$ emissions were conservatively set equal to the calculated PM_{10} emissions. The calculated potential PM_{10} emissions for the baghouses are summarized in Table 3-2. Detailed emissions calculations are presented in Appendix B.

3.1.8 Wastewater Treatment

Anaerobic Digesters. The biogas generated by the anaerobic digesters will be combusted in the biomass boilers. The facility will include a flare for those occasions when the biomass boilers are shut down. The biogas will be produced at a rate of 44 MMBtu/hr and will be conditioned to remove sulfur. The emission calculations for the biomass boilers include the maximum potential emissions of the biogas for the purposes of comparison to permitting thresholds. Short-term emissions were calculated for the backup flare and are presented in Appendix B.

Table 3-2. Calculated Potential Emissions, Storage Silos

Storage Silo	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Solka-Flok® (propagation)	0.5	0.5
Soy Flour (propagation)	0.5	0.5
Ammonium Sulfate (propagation)	0.5	0.5
Potassium Phosphate (propagation)	0.5	0.5
Urea (propagation)	0.5	0.5
Lime (neutralization)	0.5	0.5
Sand (biomass boilers)	0.5	0.5
Limestone (biomass boilers)	0.5	0.5
Urea (biomass boilers)	0.5	0.5
Ash (biomass boilers)	0.5	0.5
Total	4.7	4.7

Notes: Calculated emissions based on outlet emissions of 0.005 gr/dscf for fabric filter dust collectors, expected exhaust flow rates, and operations of 8,760 hrs/yr.

The backup flare will have a pilot that will combust natural gas. The pilot will have a capacity of 0.2 MMBtu/hr. Combustion emissions of criteria pollutants for the pilot, which was assumed to operate 8,760 hours per year, were calculated using USEPA's AP-42, Section 13.5 (USEPA, 1995b). PM emissions were calculated by conservatively assuming a lightly smoking flare. The calculated emissions for the pilot are included in Table 3-3.

Table 3-3. Calculated Potential Emissions, Anaerobic Digesters Backup Flare

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)
Anaerobic Digesters Backup Flare	0.002	0.002	0.005	0.05	0.3	0.1

Aerobic Treatment. The volatilization of trace dissolved organic constituents in the wastewater will result in VOC emissions from the various components of the WWTP. Based on the estimated speciation of VOCs, volatile organic HAP emissions are expected to be negligible.

VOC emissions from the enclosed equalization tank, and enclosed primary clarifier were calculated using USEPA's TANKS 4.0.9d software (USEPA, 2001a). Each of these tanks will be of a vertical fixed roof design. The wastewater contains trace hydrocarbons that are highly soluble in water. A summary of the TANKS inputs and outputs are provided in Appendix B, as are the detailed TANKS outputs.

VOC emissions from the aeration tank, secondary clarifier, and sand filters were calculated using USEPA's WATER9, Version 2 software (USEPA, 2004a). Meteorological data required by the software were obtained from USEPA's TANKS (USEPA, 2001a) software for West Palm Beach, Florida. A summary of the WATER9 inputs and outputs are provided in Appendix B, as are the detailed WATER9 outputs.

The total VOC emissions from the aerobic treatment system were calculated to be 4.7 tpy.

3.1.9 Cooling Tower

A mechanical draft cooling tower will provide cooling of process water for the project. The maximum design flow rate will be approximately 22,500 gallons per minute (GPM). Total dissolved solids in the cooling water are expected to be approximately 2,750 milligrams per liter (mg/l). Per the BACT analysis presented in Section 5, the cooling tower will be designed with a drift rate of 0.0005 percent or less to minimize PM_{10} emissions. The cooling tower will use a total of six cells.

Emissions were calculated using USEPA's AP-42, Section 13.4 (USEPA, 1995c). The total PM_{10} emissions from the cooling tower were calculated to be 0.7 tpy. The total $PM_{2.5}$ emissions were set equal to the PM_{10} emissions. Detailed emissions calculations are presented in Appendix B.

VOC emissions resulting from heat exchanger process fluid leaks into cooling water were calculated in accordance with the South Coast Air Quality Management District's (SCAQMD) "Guidelines for Calculating Emissions from Cooling Towers" (SCAQMD, 2006). Total VOC emissions from the cooling tower were calculated to be 4.1 tpy. Because Highlands Ethanol is proposing to perform weekly monitoring of VOCs in the cooling water, the emission factor that claims credit for VOC control was used. While volatile organic HAPs are expected to represent a negligible fraction of the VOCs leaking from this equipment, acetaldehyde emissions are conservatively assumed to comprise 5% of the VOC emissions. Detailed emissions calculations are presented in Appendix B. Equipment leaks will be minimized by implementation of a monitoring program that detects VOCs in cooling water.

3.1.10 Steam Production

Biomass Boilers. Combustion emissions were calculated based on the maximum heat input capacity of each boiler (198 MMBtu/hr) and the BACT analyses presented in Section 5. Emissions of HAPs were calculated based on USEPA's AP-42 for bagasse boilers. The boilers will be of fluidized bed design and each will be equipped with a baghouse for PM emissions control, selective non-catalytic reduction (SNCR) for NO_X emissions control, and limestone injection into the fluidized bed for SO_2 emissions control. Each boiler will burn primarily stillage cake, each at a maximum rate of 12.5 tons per hour. The boilers will also be equipped to burn biogas, each at a rate of 22 MMBtu/hr. Natural gas will be used for startups and flame meet steam requirements. Natural gas will be used for startups and flame stabilization as necessary. For the purposes of permitting, the boilers are assumed to be equipped to burn ULSD or propane in the event that FGT's plans are postponed.

The calculated emissions for the biomass boilers are included in Table 3-4. Detailed emissions calculations are presented in Appendix B.

Table 3-4. Calculated Potential Emissions, Biomass Boilers

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	HAP (tpy)
Biomass Boiler No. 1	8.7	8.7	52.0	65.0	86.7	4.3	4.8
Biomass Boiler No. 2	8.7	8.7	52.0	65.0	86.7	4.3	4.8
Total	17.3	17.3	104.1	130.1	173.4	8.7	9.6

Backup Boiler. A backup boiler with a maximum heat input capacity of 198 MMBtu/hr will be used when one of the biomass boilers is down. The backup boiler will use natural gas. For the purposes of permitting, the boilers are assumed to be equipped to burn ULSD or propane in the event that FGT's plans are postponed. Annual emissions for the backup boiler were not calculated because the emission calculations for the biomass boilers include the maximum potential emissions of steam production for the purposes of comparison to permitting thresholds (i.e., the maximum potential emissions from the facility are based on the assumption that the backup boiler will not need to be used). Short-term emissions were calculated for the backup boiler and are presented in Appendix B. The calculated emissions are based on the BACT analyses presented in Section 5. The proposed BACT emission limits account for the potential that the backup boiler will be equipped to burn ULSD or propane.

3.1.11 Emergency Engines

Four emergency generators, each rated at 2,000 kW, will be installed to provide backup electrical power in the event of a power outage at the facility. A backup 360 hp diesel fire pump will also be installed to provide firewater during power outages. All of these units will fire ULSD or propane and will be limited to 500 hours per year of operation. Each unit will be operated no more than 100 hours per year for testing and maintenance purposes. Each engine will be designed to meet USEPA's emission standards listed in 40 CFR Part 60 Subpart IIII for model year 2009 or later. The maximum potential emissions from the emergency engines were calculated using the emission standards, the capacities of each unit, and the annual limit of 500 hours per year.

The calculated emissions for the emergency engines are included in Table 3-5. Detailed emissions calculations are presented in Appendix B.

Table 3-5. Calculated Potential Emissions, Emergency Engines

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	HAP (tpy)
Emerg. Engine No. 1	0.2	0.2	0.005	6.3	3.9	0.7	0.02
Emerg. Engine No. 2	0.2	0.2	0.005	6.3	3.9	0.7	0.02
Emerg. Engine No. 3	0.2	0.2	0.005	6.3	3.9	0.7	0.02
Emerg. Engine No. 4	0.2	0.2	0.005	6.3	3.9	0.7	0.02
Fire Pump	0.02	0.02	0.001	0.5	0.5	0.1	0.004
Total	0.9	0.9	0.02	25.9	15.9	2.9	0.1

3.2 Fugitive Sources

3.2.1 Stillage Loadout

Stillage cake will be removed from the bottom of the cellulosic beer stripper, dewatered to remove some of the water fraction, and conveyed to the biomass boilers. The stillage cake will not be otherwise dried and will consist of lignin, unhydrolyzed cellulose, and other material with fuel value. Based on the consistency and moisture content of the material, PM emissions are expected to be negligible. VOC emissions will occur from the evaporation of organics dissolved in the water fraction.

A VOC emission factor was identified for this process as follows. Three emission calculation procedures were identified for the permitting of the Pacific Ethanol Facility located in Madera, California (San Joaquin Valley Unified Air Pollution Control District, 2004) for distillers grain solids. The procedure that resulted in the greatest VOC emission rate was selected. The emission factor was then doubled for an additional margin of safety, resulting in a VOC emission factor of 0.1421 pounds per 1000 gallons of ethanol produced. Speciation of the VOC emissions was based on data supplied in the San Joaquin Valley Unified Air Pollution Control District's report. Based on the estimated speciation of VOCs, volatile organic HAP emissions are expected to be negligible. Total fugitive VOC emissions from stillage loadout were calculated to be 2.8 tpy. Detailed emissions calculations are presented in Appendix B.

3.2.2 Fugitive VOC Equipment Leaks

Fugitive VOC emissions from equipment leaks were calculated in accordance with USEPA's "Protocol for Equipment Leak Emission Estimates" (USEPA, 1995d). Component counts were estimated from preliminary engineering drawings of the proposed facility. Total fugitive VOC emissions from equipment leaks were calculated to be 19.6 tpy. While volatile organic HAPs are expected to represent a negligible fraction of the VOCs leaking from this equipment, acetaldehyde emissions are conservatively assumed to comprise 5% of the VOC emissions. Detailed emissions calculations are presented in Appendix B. Fugitive equipment leaks will be minimized by implementation of a monthly leak detection and repair (LDAR) monitoring program in accordance with New Source Performance Standard (NSPS) 40 CFR Part 60, Subpart VVa.

3.2.3 Fugitive Roadway Emissions

Approximately 130 trucks per day will be used to deliver feedstock and will use the feedstock roads, and an additional 100 vehicles per day will drive on the plant roads. The feedstock roads will be unpaved, consisting primarily of gravel. The plant roads will be paved with asphalt. To minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water. Because Highlands Ethanol is considering the use of supplemental biomass in its boilers, an additional 120 trucks per day are conservatively assumed for delivering the supplemental fuel. These trucks are conservatively assumed to use the unpaved feedstock roads.

Emissions were calculated using USEPA's AP-42, Sections 13.2.2 (USEPA, 2006a) and 13.2.1 (USEPA, 2006b). Total fugitive PM_{10} and $PM_{2.5}$ emissions from roadways were calculated to be 9.9 tpy and 1.0 tpy, respectively. Detailed emissions calculations are presented in Appendix B.

3.3 Summary of Calculated Potential Emissions

A summary of calculated potential emissions for Highlands Ethanol is provided in Table 3-6. A more detailed summary of pollutant emissions is provided in Appendix B along with detailed emission calculations.

Table 3-6. Summary of Calculated Potential Emissions, Highlands Ethanol

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	HAP (tpy)
Liquid/Solid Separation	--	--	--	--	--	2.1	--
Fermentation/Distillation	--	--	--	--	--	18.8	6.4
Product/Denaturant Stg.	--	--	--	--	--	1.7	0.1
Product Loadout	0.02	0.02	0.004	0.4	2.3	5.3	0.4
Misc. Storage Tanks	--	--	--	--	--	0.0	--
Misc. Storage Silos	4.7	4.7	--	--	--	--	--
Wastewater Treatment	0.002	0.002	0.001	0.1	0.3	5.4	--
Cooling Tower	0.7	0.7	--	--	--	4.1	0.2
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7	9.6
Emergency Engines	0.9	0.9	0.02	25.9	15.9	2.9	0.1
Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**	**16.7**
Stillage Loadout	--	--	--	--	--	2.8	--
Equipment Leaks	--	--	--	--	--	19.6	1.0
Roadway Emissions	9.9	1.0	--	--	--	--	--
Subtotal, Fugitive Sources	**9.9**	**1.0**	**--**	**--**	**--**	**22.4**	**1.0**
Total	***33.6***	***24.7***	***104.1***	***156.5***	***192.0***	***71.3***	***17.7***

4.0 APPLICABLE REQUIREMENTS

A summary of the federal and state air quality requirements and their applicability to emission units included in the proposed facility is provided in the following sections.

4.1 Federal Requirements

Brief explanations of the applicability or nonapplicability of federal requirements and other specific information are included for reference purposes.

4.1.1 Prevention of Significant Deterioration

The PSD regulations specify that any major new stationary source within an air quality attainment area must undergo PSD review and obtain applicable federal and state preconstruction air permits prior to the commencement of construction. Highlands County is designated as attainment or unclassified for all criteria pollutants. Florida has delegated authority to implement the federal Clean Air Act (CAA); therefore, the PSD program in Florida is administered by the FDEP under Rule 62-212.400, F.A.C. – *Stationary Sources – Preconstruction Review, Prevention of Significant Deterioration.* The PSD regulations apply to:

- Any source type listed in any of 28 designated industrial source categories having potential emissions of 100 tons per year or more of any pollutant regulated under the CAA;
- Any other source having potential emissions of 250 tons per year or more of any pollutant regulated under the CAA; and
- Any source having potential lead emissions greater than 5 tons per year.

Ethanol production for fuel use previously fell into one of the 28 designated industrial source categories under PSD, so a major source was defined as having potential emissions of 100 tons per year or more. In April 2007, USEPA promulgated changes to the PSD permitting program, establishing a PSD applicability threshold of 250 tpy for ethanol production facilities. However, in the October 23, 2008 Pre-Application meeting between FDEP and representatives of Highlands Ethanol, the FDEP indicated that Florida has not adopted the PSD rule changes for ethanol production facilities and does not anticipate doing so. Therefore, the PSD applicability threshold for ethanol production facilities in Florida remains 100 tpy.

Potential emissions are defined as the emission of any pollutant at maximum design capacity (or less than maximum design capacity if specified as a permit condition) including the control efficiency of air pollution control equipment. Based on the facility's calculated potential emissions, the project will exceed the 100 tons per year major source thresholds for CO, NO_X, and SO_2. In addition, the project will exceed the PSD significance thresholds of 40 tpy for VOCs, 15 tpy for PM_{10}, and 10 tpy for $PM_{2.5}$. Therefore, the project will be subject to PSD for all criteria pollutants. A summary of potential emissions for the Project are provided in Table 4-1.

Table 4-1 – Potential Emissions compared to PSD Applicability Thresholds

Pollutant	Potential Annual Emissions (tpy)	Major Source Threshold (tpy)	Significant Emissions Threshold (tpy)	PSD/NSR Applies?
NO_X	156.5	100	40	**yes**
CO	192.0	100	100	**yes**
VOC	71.3	100	40	**yes**
PM_{10}	33.6	100	15	**yes**
$PM_{2.5}$	24.7	100	10	**yes**
SO_2	104.1	100	40	**yes**
Pb	0.1	5	N/A	**no**

4.1.2 New Source Performance Standards

New Source Performance Standards (NSPS) apply to specific source categories. These standards are codified in 40 CFR 60, Standards of Performance for New Stationary Sources and adopted by reference in Rule 62-204.800(8), F.A.C. The following NSPS standards will apply to the proposed facility:

40 CFR 60 Subpart A - General Provisions

The general provisions contained in Subpart A will apply to the emission sources that are subject to an NSPS standard [40 CFR §60.1(a)]. These general provisions include notification and recordkeeping requirements (described in 40 CFR §60.7), testing requirements (described in 40 CFR §60.8), and monitoring requirements (described in 40 CFR §60.13).

The general provisions also include requirements for flares (40 CFR §60.18). Flares must be operated with a pilot flame present at all times and the presence of the flare pilot must be monitored using a thermocouple or equivalent device such as an infrared sensor.

Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

This subpart applies to each steam generating unit capable of combusting more than 100 MMBtu/hr heat input of fuels, which is constructed, modified, or reconstructed after June 19, 1984. The provisions of 40 CFR 60 Subpart Db will apply to the two biomass boilers and diesel or natural gas fired backup boiler because each boiler's maximum firing rate will be 198 MMBtu/hr and will be constructed after June 19, 1984.

Subpart Db requirements limit emissions for the biomass boilers and the backup boiler as follows:

- SO_2 emissions are limited to 0.20 pounds per million British thermal units (lb/MMBtu) heat input or 8 percent (0.08) of the potential SO_2 emission rate (92 percent reduction) and 1.2 lb/MMBtu heat input [40 CFR 60.42b(k)(1)] determined on a 30-day rolling average basis [40 CFR 60.42b(e)];
- Filterable PM emissions are limited to 0.030 lb/MMBtu heat input when burning coal, oil, wood, a mixture of these fuels, or a mixture of these fuels with any other fuels [40 CFR 60.43b(h)(1)]; or
- Opacity is limited to 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity [40 CFR 60.43b(f)];
- NO_X emissions (expressed as NO_2) are limited to 0.10 to 0.20 lb/MMBtu for NO_X heat input when firing low and high heat release rate distillate oil [40 CFR 60.44b(a)] and 0.30 lb/MMBtu when combusting biomass [40 CFR 60.44b(c)]
- Where more than 10 percent of total annual output is electrical or mechanical, the unit may comply with an optional NO_X emission limit (expressed as NO_2) of 2.1 lb/MWh gross energy output on a 30-day rolling average basis [40 CFR 60.44b(l)(3)], and units complying with this output-based limit must demonstrate compliance according to the procedures of §60.48Da(i), and must monitor emissions according to §60.49Da(c), (k), through (n).

The proposed BACT emission rates for the biomass and backup boilers will comply with all of the applicable Subpart Db emission limits.

The SO_2 emission standards under §60.42b will apply at all times including periods of startup, shutdown, or malfunction [40 CFR 60.45b(a)]. The PM emission standards and opacity limits under §60.43b will apply at all times except during periods of startup, shutdown, or malfunction [40 CFR 60.46b(a)]. The NO_X emission standards under §60.44b will apply at all times including periods of startup, shutdown, or malfunction [40 CFR 60.46b(a)]. Compliance and performance test methods and procedures will be required as described in §§60.45b and 60.46b.

Continuous Emission Monitoring Systems (CEMS) will be required to be installed, calibrated, maintained, and operated for SO_2 [40 CFR 60.47b], opacity [40 CFR 60.48b(a)], NO_X [40 CFR 60.48b(b)], and either O_2 or CO_2 content in flue gases [40 CFR 60.47b and 40 CFR 60.48b(b)]. CEMS operation and data records will be required during all operating periods for the affected facility, including periods of startup, shutdown, malfunction, or emergency conditions, and except for CEMS breakdowns, repairs, calibration checks, and zero and span adjustments. Reporting and recordkeeping requirements are summarized in §60.49b.

<u>*40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*</u>

Subpart Kb applies to each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) [19,813 gallons] that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984 [40 CFR §60.110b(a)]. This subpart does not apply to [40 CFR §60.110b(b)]:

- Storage vessels with a capacity greater than or equal to 151 m^3 [39,890 gallons] storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) [0.51 pounds per square inch absolute or psia]; and
- Storage vessels with a capacity greater than or equal to 75 m^3 [19,813 gallons] but less than 151 m^3 [39,890 gallons] storing a liquid with a maximum true vapor pressure less than 15.0 kPa [2.18 psia].

Subpart Kb applies to Product Shift Tank 1, Product Shift Tank 2, Recycle Product Tank, Product Storage Tank 1, Product Storage Tank 2 because the tank capacities are greater than 19,813 gallons. Storage vessels with a design capacity greater than or equal to 151 m^3 (39,890 gallons) containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa (0.75 psia) but less than 76.6 kPa (11.1 psia) is required to equip each storage vessel with one of the following:

- A fixed roof in combination with an internal floating roof meeting the specifications of [40 CFR §60.110b(a)(1)]; or
- An external floating roof, where an external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the specifications of [40 CFR §60.110b(a)(2)].

Subpart Kb also applies to the Denaturant Storage Tank because the tank volume is greater than 19,813 gallons [40 CFR §60.110b(b)] and the RVP12 gasoline has a vapor pressure greater than 2.18 psia. The six tanks will be equipped with internal floating roofs as prescribed in 40 CFR §60.112b(a)(1). These tanks will also be subject to the monitoring, recordkeeping, and reporting requirements contained in 40 CFR §60.113b and §60.116b.

Subpart Kb will not apply to the following tanks because VOLs are not stored in the tank: Sulfuric Acid Storage Tanks; Ammonia Storage Tank; and Phosphoric Acid Storage Tank.

Subpart Kb will not apply to the Corn Steep Storage Tank, Lactose Storage Tank, or Glucose Storage Tank because the vapor pressures of the materials are less than 0.51 psia.

For reference, 40 CFR 60 Subpart Kb does not apply to storage vessels used to store beverage alcohol [40 CFR §60.110b(d)(7)]. Because the proposed facility will be manufacturing fuel alcohol, this exemption will not apply.

40 CFR 60 Subpart VVa - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry

Subpart VVa applies to an affected facility in the synthetic organic chemicals manufacturing industry (SOCMI) [40 CFR §60.480a(a)] that commences construction or modification after November 7, 2006 [40 CFR §60.480a(b)]. Further, this subpart applies to equipment components (i.e., each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector) in volatile organic compound (VOC) service, which means that the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight [40 CFR §60.481a]. Any affected facility that has a design capacity to produce less than 1,000 Mg/yr (1,102 ton/yr) is exempt from §60.482a [40 CFR §60.480a(d)(2)]. By definition, the list of chemicals produced by affected facilities, as intermediates or final products, by process units covered under this subpart includes: CAS No. 64-17-5, Ethanol [40 CFR §60.489].

The equipment components proposed for the facility in VOC service will be subject to the standards, including controls, monitoring, repair, recordkeeping, and reporting requirements of 40 CFR 60 Subpart VVa because the facility will have the design capacity to produce 127,725 tons per year (>1,102 tons per year exemption threshold) of ethanol. Emissions from these components are identified as Fugitive Equipment Leaks.

For reference, 40 CFR 60 Subpart VVa does not apply to beverage alcohol facilities. This subpart states that "Any affected facility that produces beverage alcohol is exempt from §60.482a" [40 CFR §60.480a(d)(4)]. However, if an owner or operator applies for one or more of the exemptions in this paragraph, then the owner or operator shall maintain records as required in §60.486a(i) [40 CFR §60.480a(d)(1)]. Because the proposed facility will be manufacturing fuel alcohol, this exemption will not apply.

40 CFR 60 Subpart NNN - Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations

Subpart NNN applies to an affected SOCMI facility [40 CFR §60.660(a)] that commences construction, modification, or reconstruction after December 30, 1983 [40 CFR §60.660(b)]. The affected facility is any of the following [40 CFR §60.660(b)(1), (2), (3)]:

- Each distillation unit not discharging its vent stream into a recovery system;

- Each combination of a distillation unit and the recovery system into which its vent stream is discharged; or
- Each combination of two or more distillation units and the common recovery system into which their vent streams are discharged.

Any affected facility that has the design capacity to produce less than 1,000 megagrams (Mg) per year (1,102 tons per year) is exempt from all provisions of this subpart except for the recordkeeping and reporting requirements in paragraphs (j), (l)(6), and (n) of §60.665 [40 CFR §60.660(c)(5)]. Each affected facility operated with a vent stream flow rate less than 0.008 standard cubic meters per minute (scm/min) [0.28 standard cubic feet per minute (scfm)] is exempt from all provisions of this subpart except for the test method, procedure, recordkeeping, and reporting requirements in §60.664(g) and paragraphs (i), (l)(5), and (o) of §60.665 [40 CFR §60.660(c)(6)]. By definition, the list of chemicals produced by process units as a product, by-product, or intermediate covered under this subpart includes: Ethanol, CAS No. 64-17-5 [40 CFR §60.667].

Emission sources at the facility that are potentially subject to Subpart NNN include:

- Distillation, which includes emissions from various vent sources including the distillation columns and associated molecular sieve system.

For reference, 40 CFR 60 Subpart NNN does not apply to beverage alcohol facilities. This subpart states that "Any distillation unit operating as part of a process unit which produces coal tar or beverage alcohols, or which uses, contains, and produces no VOC is not an affected facility" [40 CFR §60.660(c)(1)]. Because the proposed facility will be manufacturing fuel alcohol, this exemption will not apply.

However, according to a USEPA Federal Register notice (72 FR 41117) and several letters issued by USEPA Region 5 (see USEPA Applicability Determination Index Control Numbers 0100076 and 0100083 and USEPA correspondence dated October 20, 2000), ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart NNN because the NSPS background information document (USEPA, 1983) states that "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart NNN. Therefore, Highlands Ethanol will request in separate correspondence that USEPA Region 4 issue a site-specific exemption from the requirements in 40 CFR 60 Subpart NNN. Copies of USEPA support documentation are included in Appendix D.

40 CFR 60 Subpart RRR - Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes

Subpart RRR applies to an affected SOCMI facility [40 CFR §60.700(a)] that commences construction, modification, or reconstruction after June 29, 1990 [40 CFR §60.700(b)]. The affected facility is any of the following [40 CFR §60.700(b)(1), (2), (3)]:

- Each reactor process not discharging its vent stream into a recovery system;
- Each combination of a reactor process and the recovery system into which its vent stream is discharged; or
- Each combination of two or more reactor processes and the common recovery system into which their vent streams are discharged.

Any affected facility that has the design capacity to produce less than 1,000 Mg/yr (1,102 ton/yr) is exempt from all provisions of this subpart except for the recordkeeping and reporting requirements in paragraphs (i), (l)(5), and (n) of §60.705 [40 CFR §60.700(c)(3)]. Each affected facility operated with a vent stream flow rate less than 0.011 scm/min [0.39 scfm] is exempt from all provisions of this subpart except for the test method, procedure, recordkeeping, and reporting requirements in §60.704(g) and paragraphs (h), (l)(4), and (o) of §60.665 [40 CFR §60.700(c)(4)]. If the vent stream from an affected facility is routed to a distillation unit subject to Subpart NNN and has no other releases to the air except for a pressure relief valve, the facility is exempt from all provisions of this subpart except for §60.705(r) [40 CFR §60.700(c)(5)]. By definition, the list of chemicals produced by process units as a product, by-product, or intermediate covered under this subpart includes: Ethanol, CAS No. 64-17-5 [40 CFR §60.707].

Emission sources at the facility that are potentially subject to Subpart RRR include:

- Fermentation, which includes emissions from various vent sources including the fermentation vessels.

For reference, 40 CFR 60 Subpart RRR does not apply to beverage alcohol facilities. This subpart states that "Any reactor process operating as part of a process unit which produces beverage alcohols, or which uses, contains, and produces no VOC is not an affected facility" [40 CFR §60.700(c)(6)]. Because the proposed facility will be manufacturing fuel alcohol, this exemption will not apply.

However, according to a USEPA Federal Register notice (72 FR 41117) and several letters issued by USEPA Region 5 (see USEPA Applicability Determination Index Control Numbers 0100076 and 0100083 and USEPA correspondence dated October 20, 2000), ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart RRR because the

NSPS background information document (USEPA, 1990) states that "... a total of 173 chemicals produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart RRR. Therefore, Highlands Ethanol will request in separate correspondence that USEPA Region 4 issue a site-specific exemption from the requirements in 40 CFR 60 Subpart RRR. Copies of USEPA support documentation are included in Appendix D.

Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

This subpart applies to owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005, and where the stationary CI ICE are manufactured after April 1, 2006, for non-fire pump engines or manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006 [40 CFR 60.4200(a)(2)(i) and (ii)]. The rule requires manufacturers of these engines to meet emission standards based on engine size, model year, and end use. The rule requires owners and operators to configure, operate, and maintain the engines according to specifications and instructions provided by the engine manufacturer. The provisions of 40 CFR 60 Subpart IIII will apply to the four emergency generators and the diesel fire pump engine because the engines will be manufactured after July 1, 2006. The project must also comply with recordkeeping and reporting requirements.

The fire pump proposed for the project will have a displacement of less than 30 liters per cylinder and maximum engine power in the range of 360 horsepower. Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder are required to comply with the emission standards in Table 4 as specified §60.4202(d). For a maximum engine power of 300 horsepower to 600 horsepower, the model year 2008 (and earlier) applicable emission standard for non-methane hydrocarbons (NMHC) plus NO_X is 10.5 grams per kilowatt-hour (g/kW-hr) (7.8 grams per brake horsepower-hour [g/hp-hr]); for CO is 3.5 g/kW-hr (2.6 g/hp-hr); and for PM is 0.54 g/kW-hr (0.40 g/hp-hr) [40 CFR 60.4205(c)]. For model year 2009 (and later), the emission standard in Table 4 for NMHC plus NO_X is 4.0 g/kW-hr (3.0 g/hp-hr) and for PM is 0.20 g/kW-hr (0.15 g/hp-hr). These emission standards are required to be met for the entire life of the engine [40 CFR 60.4206]. The Project's fire pump will be certified to meet the 2009 standards.

§60.4202(d) of Subpart IIII requires that the proposed emergency generators for the project meets the new non-road compression ignition engine standards promulgated in 40 CFR 89. The engine manufacturer will be required to manufacture and certify that their engines are compliant with this rule.

Beginning on October 1, 2007, owners and operators of stationary compression ignition internal combustion engines subject to this subpart are also required to use diesel fuel that meets the requirements of 40 CFR 80.510(a) for a maximum sulfur content of 500 parts per million by weight (ppmw) (0.05 percent). Beginning on October 1, 2010, owners and operators of stationary compression ignition internal combustion engines subject to this subpart will be required to use diesel fuel that meets the requirements of 40 CFR 80.510(b) for a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel [40 CFR 60.4207(a) and (b)].

For the purposes of NSPS Subpart IIII, the date that construction commences is the date that the engine is ordered. Highlands Ethanol will install a diesel fire pump and emergency generators with certified engines that meet the requirements within this subpart. In addition, Highlands Ethanol will use diesel fuel with a sulfur content of 0.0015 percent (15 ppmw) to meet the requirements in 40 CFR 80.

Monitoring requirements include the following:

- Owners or operators of emergency stationary compression ignition internal combustion engines are required to install a non-resettable hour meter prior to the startup of an engine [40 CFR 60.4209(a)]; and
- Owners or operators of stationary compression ignition internal combustion engines with a diesel particulate filter are required to install a backpressure monitor that indicates when the high backpressure limit of the engine is approached [40 CFR 60.4209(b)].

Compliance requirements for owners or operators are described in 40 CFR 60.4211. Emergency stationary compression ignition internal combustion engines may be operated for recommended maintenance checks and readiness testing, which is limited to 100 hours per year. There is no time limit on the use of emergency stationary compression ignition internal combustion engines in emergency situations [40 CFR 60.4211(e)].

Non-Applicable NSPS Regulations

For reference purposes, the following NSPS standards will not apply to the proposed facility:

40 CFR 60 Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978

40 CFR 60 Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984

The facility storage tanks will not be subject to the requirements of 40 CFR 60 Subpart K and Subpart Ka because construction commenced later than the dates specified by these rules.

40 CFR 60 Subpart DD - Standards of Performance for Grain Elevators

The feedstock handling at the proposed facility will not be subject to the requirements of 40 CFR 60 Subpart DD because the facility will not store any feedstock on-site and therefore, does not meet the definition of a grain terminal elevator or a grain storage elevator [40 CFR §60.301]. As defined in the regulation: *Grain* means corn, wheat, sorghum, rice, rye, oats, barley, and soybeans; *Grain terminal elevator* means any grain elevator, which has a permanent storage capacity of more than 88,100 m^3 (ca. 2.5 million U.S. bushels), except those located at animal food manufacturers, pet food manufacturers, cereal manufacturers, breweries, and livestock feedlots; and *Grain storage elevator* means any grain elevator located at any wheat flour mill, wet corn mill, dry corn mill (human consumption), rice mill, or soybean oil extraction plant which has a permanent grain storage capacity of 35,200 m^3 (ca. 1 million bushels) [40 CFR §60.301(a), (c), and (f)].

40 CFR 60 Subpart VV - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry

The proposed facility will not be subject to the requirements of 40 CFR 60 Subpart VV because construction will commence after November 7, 2006.

40 CFR 60 Subpart XX - Standards of Performance for Bulk Gasoline Terminals

The Denaturant Storage Tank will not be subject to the requirements of 40 CFR 60 Subpart XX because the facility does not meet the definition of a bulk gasoline terminal [40 CFR §60.500(a)]. As defined in the regulation, *Bulk gasoline terminal* means any gasoline facility, which receives gasoline by pipeline, ship or barge, and has a gasoline throughput greater than 75,700 liters per day (20,000 gallons per day) [40 CFR §60.501]. Highlands Ethanol will receive on average 5,700 gallons per day of denaturant, which is less than the applicability threshold of Subpart XX.

40 CFR 60 Subpart III - Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Air Oxidation Unit Processes

Process equipment at the proposed facility will not be subject to the requirements in 40 CFR 60 Subpart III because the facility does not meet the definition of an air oxidation unit process [40

CFR §60.610(a)]. As defined in the regulations, *Air oxidation unit process* means a unit process, including ammoxidation and oxychlorination unit process, that uses air, or a combination of air and oxygen, as an oxygen source in combination with one or more organic reactants to produce one or more organic compounds [40 CFR §60.611].

4.1.3 National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology

National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to specific pollutants, as codified in 40 CFR 61, and to specific source categories, as codified in 40 CFR 63, NESHAPs for Source Categories. None of the regulations in 40 CFR 61 apply to the proposed facility. The regulations in 40 CFR 63 contain standards for maximum achievable control technology (MACT) that apply mainly to major sources of HAP emissions – defined as a stationary source that has the potential to emit 10 tpy of any single HAP or 25 tpy of any combination of HAPs. However, in a few instances, MACT standards have been promulgated for HAP area sources. NESHAPs corresponding to 40 CFR 61 have been adopted by reference in Rule 62-204.800(10), F.A.C. NESHAPs corresponding to 40 CFR 63 have been adopted by reference in Rule 62-204.800(11), F.A.C. Because the facility will not be a major source of HAP emissions (i.e., emissions from the proposed facility do not exceed 10 tpy for any individual HAP and 25 tpy for all HAPs collectively) most the MACT standards will not apply. However, 40 CFR 60 Subpart ZZZZ - *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines will apply to the Project.*

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

In 2004, USEPA promulgated NESHAPS for Stationary Reciprocating Internal Combustion Engines in 40 CFR 63 Subpart ZZZZ. Revisions to Subpart ZZZZ were promulgated on January 18, 2008, and include reciprocating internal combustion engines located at HAP "area sources." The potential HAP emissions from the proposed facility will be less than major source HAP thresholds and the proposed facility would, therefore, not be a major source of HAPs. However, the proposed facility would be subject to NESHAP Subpart ZZZZ. By complying with NSPS Subpart IIII, the Project will also satisfy the requirements of Subpart ZZZZ [40 CFR §63.6590(c)]. No other requirements under Part 63 apply to the engines.

For reference purposes, the following NESHAP standards will not apply to the Highlands Ethanol:

40 CFR 63 Subpart A – General Provisions

The general provisions contained in Subpart A apply only to emission sources that are subject to a NESHAP standard [40 CFR §63.1(b)]. Because the proposed facility will not be a major source of HAPs, the Subpart A requirements will not be relevant.

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40 CFR 63 Subpart B – Case-by-Case MACT

Control technology determinations for major sources of HAPs are described in 40 CFR 63 Subpart B. The requirements of §§63.40 through 63.44 of this subpart apply to any owner or operator who constructs or reconstructs a major source of HAPs after the effective date that the permitting authority adopts a program to implement Section 112(g) of the Clean Air Act and the effective date of a Title V Operating Permit program in the state or local jurisdiction in which the major source will be located unless the major source in question has been specifically regulated or exempted from regulation under a standard issued pursuant to Section 112(d), Section 112(h), or Section 112(j) and incorporated in another subpart of Part 63. The proposed facility will not be a major source of HAPs and therefore these requirements will not apply.

40 CFR 63 Subpart F - National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry

40 CFR 63 Subpart G - National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater

40 CFR 63 Subpart H - National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

Ethanol is not listed in Table 1 or Table 2 of 40 CFR 63 Subpart F [40 CFR §63.100], and the proposed facility will not be a major source of HAPs. Consequently, 40 CFR 63 Subparts F, G, and H will not apply.

40 CFR 63 Subpart I - National Emission Standards for Organic Hazardous Air Pollutants for Certain Processes Subject to the Negotiated Regulation for Equipment Leaks

None of the processes listed in the rule are to be located at the proposed facility [40 CFR §63.190], and the facility will not be a major source of HAPs. As a result, 40 CFR 63 Subpart I will not apply.

40 CFR 63 Subpart Q - National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers

The Cooling Tower will not be subject to the requirements of 40 CFR 63 Subpart Q because chromium-based water treatment chemicals will not be used, and the facility will not be a major source of HAPs [40 CFR §63.400(a)].

40 CFR 63 Subpart R - National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)

As defined in the regulation, *bulk gasoline terminal* means any gasoline facility which receives gasoline by pipeline, ship or barge, and has a gasoline throughput greater than 75,700 liters per day (20,000 gallons per day) [40 CFR §63.421]. Because the proposed facility will not be defined as a bulk gasoline terminal and the proposed facility will not be a major source of HAPs, the rule will not apply.

40 CFR 63 Subpart Y - National Emission Standards for Marine Tank Vessel Loading Operations

The proposed facility will not be subject to the requirements of 40 CFR 63 Subpart Y because the proposed facility will not have the capability for marine tank vessel loading operations [40 CFR 63.560(a)].

40 CFR 63 Subpart OO - National Emission Standards for Tanks - Level 1

40 CFR 63 Subpart PP - National Emission Standards for Containers

40 CFR 63 Subpart WW - National Emission Standards for Storage Vessels (Tanks) - Control Level 2

Subparts OO, PP, and WW apply only when referenced by another regulation in 40 CFR Parts 60, 61, or 63. The regulations that will apply to the proposed facility do not require the air emission controls specified in Subpart OO [40 CFR §63.900], Subpart PP [40 CFR §63.920], or Subpart WW [40 CFR §63.1060].

40 CFR 63 Subpart TT - National Emission Standards for Equipment Leaks - Control Level 1 Standards

40 CFR 63 Subpart UU - National Emission Standards for Equipment Leaks - Control Level 2 Standards

Subparts TT and UU apply only when referenced by another regulation in 40 CFR Parts 60, 61, or 63. The regulations that will apply to the proposed facility do not require the air emission controls specified in Subpart TT [40 CFR §63.1000] or Subpart UU [40 CFR §63.1019].

40 CFR 63 Subpart VV - National Emission Standards for Oil-Water Separators and Organic-Water Separators

Subpart VV applies only when referenced by another regulation in 40 CFR Parts 60, 61, or 63. The regulations that will apply to the proposed facility do not require the air emission controls specified in Subpart VV [40 CFR §63.1040].

40 CFR 63 Subpart YY - National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards

None of the processes listed in the rule are to be located at the proposed facility [40 CFR §63.1103(a)-(h)], so 40 CFR 63 Subpart YY will not apply.

40 CFR 63 Subpart EEEE - National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)

The proposed facility's Product Storage Tanks and Product Loadout will not be subject to the requirements of 40 CFR 63 Subpart EEEE because the facility will not be a major source of HAPs [40 CFR §63.2334(a)].

40 CFR 63 Subpart FFFF - National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Because the proposed facility will not be a major source of HAPs, 40 CFR 63 Subpart FFFF will not apply [40 CFR §63.2435].

40 CFR 63 Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

The Boiler MACT Standards (Subpart DDDDD) were vacated by the Federal Courts (See Natural Resources Defense Counsel v. USEPA, June 8, 2007), and USEPA is in the process of developing a new regulation in response to the court decision. The National Association of Clean Air Agencies (NACAA, formerly STAPPA and ALAPCO) issued guidance for developing Subpart B case-by-case MACT determinations for industrial, commercial, and institutional (ICI) boilers (NACAA, 2008). The report contains a discussion of control strategies for CO, PM, Hg, and acid gases. CO and PM serve as surrogate pollutants for a number of HAPs.

NACAA's limits are more stringent than those contained in USEPA's vacated Boiler MACT rule. NACAA calculated an average for the MACT floor in four fuel categories (coal; wood/biomass; gaseous; and liquid/oil) and then adjusted the average according to a "variability factor" based on an analysis of year-over-year test results from the same emission units. Overall, NACAA believes that sufficient data are available to characterize CO and PM emissions from ICI Boilers, and thus the MACT floor accurately represents the performance of the best-performing units and likely represents MACT. For HCl and Hg, less data were available and NACAA's confidence in the MACT floor is reduced. In these instances, NACAA identifies percent reductions that should lead to MACT levels of emissions.

As previously discussed, the Florida Plant will not be a major source of HAPs and consequently MACT standards will not apply to the boilers. Nevertheless, Highlands Ethanol is proposing

BACT emission limits for CO and PM that are consistent with the MACT emission limits proposed by NACAA (see Table 4-2).

Table 4-2 – Comparison of Vacated USEPA Emission Limits and NACAA Recommended Emission Limits to Proposed Emission Limits for Highlands Ethanol[1]

Pollutant	NACAA Guidance	Vacated USEPA Limit	Highlands Ethanol
CO[2]	0.08-0.12 (100-150 ppm)	400 ppm	0.1 - 0.2
PM	0.01 - 0.02	0.025	0.01 (filterable)

[1]In lb/MMBtu, unless otherwise noted
[2]Based on 80% maximum load

4.1.4 Compliance Assurance Monitoring

The Compliance Assurance Monitoring requirements in 40 CFR 64 apply to pollutant-specific emissions units, located at a major source required to obtain a Part 70 permit, if the units satisfy certain criteria [40 CFR §64.2(a)]. Based on discussions with the FDEP during the October 23, 2008 pre-application meeting, CAM requirements will be addressed in the Title V permit application and not in the PSD preconstruction permit application.

4.1.5 Chemical Accident Prevention Provisions

The Chemical Accident Prevention provisions in 40 CFR 68 apply to facilities that have more than a threshold quantity of a regulated toxic or flammable substance in a process [40 CFR §68.10(a)]. The proposed facility will not conduct any activities involving more than a threshold quantity of a regulated substance, including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. This includes the proposed anhydrous ammonia storage tank. However, the general duty provisions will apply to the proposed facility.

4.1.6 State Operating Permit Programs

The State Operating Permit Programs provisions in 40 CFR 70 are codified in Rule 62-213, F.A.C. *Operation Permit for Major Sources of Air Pollution.* The operating permit requirements are discussed in Section 4.2.4.

4.1.7 Stratospheric Ozone Protection Provisions

The Stratospheric Ozone Protection provisions in 40 CFR 82 Subpart F will apply to the proposed facility. The facility will comply with the materials, recycling, and systems maintenance requirements of this rule.

4.2 Florida State Requirements

The emission sources for the proposed facility will comply with applicable regulations established by the FDEP. A summary of the state air quality requirements and their applicability to the proposed emission units for the proposed facility is discussed below.

4.2.1 Rule 62, Chapter 204, F.A.C. Air Pollution Control – General Provisions

The USEPA has established National Ambient Air Quality Standards (NAAQS) in 40 CFR 50 for the following criteria pollutants: SO_2, PM_{10}, $PM_{2.5}$, CO, O_3, NO_2, and Pb. Primary NAAQS define levels of air quality, which the USEPA judges are necessary with an adequate margin of safety to protect the public health. Secondary NAAQS define levels of air quality which the USEPA judges are necessary to protect the public welfare (i.e., wildlife, national monuments, vegetation, visibility, and property values) from any known or anticipated adverse effects of a pollutant. FDEP has also adopted ambient air quality standards (FAAQS) in Rule 62-204.240, F.A.C. for SO_2, PM_{10}, $PM_{2.5}$, CO, NO_2, and O_3. The 24-hour and annual standards for SO_2 are more stringent than the NAAQS. Table 4-3 lists both the NAAQS and FAAQS.

Chapter 204.340 establishes attainment designations for all pollutants and counties in Florida. Highlands County is designated as attainment or unclassified for all criteria pollutants. Class 1 and Class 2 allowable increments under the PSD program are also codified in Chapter 204. A listing of these allowable increments is also provided in Table 4-3.

Chapter 204.800 incorporates several federal regulations by reference that will apply to this project, including the NAAQS, NSPS, NESHAPS, MACT, CAM, and Operating Permits.

4.2.2 Rule 62, Chapter 210, F.A.C. Stationary Sources – General Provisions

Rule 62-210 establishes the general procedures for stationary sources including permit applicability, public notice requirements, emissions estimation and the use of air quality models. Regulation 62-210.200(191) defines a major source as one having potential emissions greater than 5 tons per year or more of lead, 30 tons per year or more of acrylonitrile, or100 tons per year or more of any regulated pollutant. Regulation 62.210.370(2) identifies the methodologies for determining emissions for preconstruction review and for reporting requirements. Regulation 62.210.370(3) also requires that Title V sources submit an annual operating report to FDEP by April 1 of each year using DEP Form No. 62-210.900(5).

Table 4-3. Ambient Air Quality Standards, Ambient Increment Standards, and SILs

		Ambient Air Quality Standards [a]		FDEP and Federal Allowable Increments		SILs	
Pollutant	**Averaging Period**	**FAAQS ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**	**Class I ($\mu g/m^3$)**	**Class II ($\mu g/m^3$)**	**Class I ($\mu g/m^3$)**	**Class II ($\mu g/m^3$)**
SO_2	3-Hour	1,300 [b,c]	1,300 [b,c]	25 [b]	512 [b]	--	25 [d]
	24-Hour	260 [b]	365 [b]	5 [b]	91 [b]	1	5 [d]
	Annual	60 [d]	80 [d]	2 [d]	20 [d]	--	1 [d]
PM_{10}	24-Hour	150 [e]	150 [e]	8 [b]	30 [b]	1	5 [d]
	Annual	50 [f]	50 [f]	4 [d]	17 [d]	--	1 [d]
$PM_{2.5}$	24-Hour	35 [g]	35 [g]	--	--	--	--
	Annual	15 [g]	15 [g]	--	--	--	--
CO	1-Hour	40,000 [b]	40,000 [b]	--	--	--	2,000 [d]
	8-Hour	10,000 [b]	10,000 [b]	--	--	--	500 [d]
NO_2	Annual	100 [d]	100 [d]	2.5 [d]	25 [d]	--	1 [d]
O_3	1-Hour	235 [e]	--	--	--	--	--
	8-Hour	--	147 [h]	--	--	--	--
Pb	3-Month	0.15 [i]	0.15 [j]	--	--	--	0.1

[a] Primary standard unless otherwise noted.

[b] Arithmetic time-averaged concentration shall not exceed standard, except one exceedance allowed per year.

[c] Secondary standard.

[d] Arithmetic time-averaged concentration shall not exceed standard, no exceedances allowed.

[e] Expected number of days per calendar year with arithmetic time-averaged concentration above standard is equal to or less than one.

[f] Based on 3-year average of the annual concentrations. The annual PM_{10} NAAQS was revoked effective December 18, 2006 (71 Federal Register [FR] 61144).

[g] The 3-year average of the 98th percentile of 24-hour concentrations must not exceed standard. The NAAQS was revised effective December 18, 2006 (71 FR 61144). Note that both the 1997 (65 $\mu g/m^3$) and 2006 (35 $\mu g/m^3$) standards are listed in 40 Code of Federal Regulations [CFR] Part 50 for the purposes of implementing $PM_{2.5}$ control strategies.

[h] The 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations at each location within an area over each year must not exceed standard. On March 12, 2008, USEPA revised the ozone NAAQS to 147 $\mu g/m^3$ (0.075 ppm) for the primary and secondary standards. FLDEP has not yet determined area designations under the new standard.

[i] Quarterly arithmetic average, no exceedances allowed.

[j] Rolling 3-month average, no exceedances allowed. Final rule signed October 15, 2008 (73FR66964).

$\mu g/m^3$ = micrograms per cubic meter

Plantwide Applicability Limits (PALs). As discussed in Section 4.1, the project will be subject to the PSD permitting requirements for all criteria pollutants. For sources subject to PSD permitting requirements, Chapter 212.400 contains applicability provisions, control technology requirements, and procedures and standards for the ambient impact and additional impacts requirements. The project will meet all of the applicable requirements in Chapter 212.

Permitting fees and timelines for all FDEP permits are contained in Regulation 62-4.050 and 62-4.055. Air pollution permit fees for PSD permits are specified in Regulation 62-4.050(4)(a)1 as $7,500. The regulatory permit processing timeline is 120 days if the Department does not request any additional information or clarification of the application. If additional information is requested, the applicant has up to 90 days to submit this information and the Department has an additional 90 days to review.

4.2.4 Rule 62, Chapter 213, F.A.C. Operation Permits for Major Sources of Air Pollution

Chapter 213 provides the operating permit requirements for major sources of air pollution. Chapter 213.205 establishes annual operating fees and specifies the methodology for the fee calculation. Operating fees are required to be paid annually between January 15 and March 1 of each year. Fees that are unpaid by March 1 are subject to an additional penalty of 50 percent of the fee plus interest. Chapter 213.400 specifies that major sources not covered under Chapter 213.300 (General Title V Permits) are required to obtain a Title V permit under this section.

Chapter 213.405 allows for concurrent review of a preconstruction and Title V Operating permit. However, sources that opt for this combined review must waive the preconstruction air permit review processing time requirement to accommodate the additional Title V permit review. Therefore, Highlands Ethanol is not requesting concurrent preconstruction and Title V review.

Chapter 213-420 requires that a major source file a Title V permit application 90 days prior to the expiration date of the facility's preconstruction permit but no later than 180 days after commencing operation. FDEP can also require an earlier submittal date in the preconstruction permit.

4.2.5 Rule 62, Chapter 296, F.A.C. Stationary Sources – Emissions Standards

Chapter 296 of Rule 62 provides emission standards for several pollutants and a variety of emission sources. This chapter includes emission limitations for specific facility categories and also establishes Reasonably Available Control Technology (RACT) for sources of NO_X, VOCs, and PM_{10}. Emission limits and work practice standards codified in 296.320 and 296.401 to 290.480 are applicable to all sources statewide. RACT requirements contained in 296.500, 296.600, and 296.700 are applicable to areas of the state that are designated as a nonattainment or maintenance area for ozone, lead, or particulate matter. The requirements of 296.500, 296.600, and 296.700 will not apply to the project.

Sections of Chapter 296 that will apply to the project are as follows:

- 320 – General Pollutant Emission Limiting Standards;
- 406 – Fossil Fuel Steam Generators with less than 250 MMBtu/hr heat input; and
- 410 – Carbonaceous Fuel Burning Equipment.

Chapter 296.320, General Pollutant Emission Limiting Standards.

This chapter establishes emissions limitations and work practice standards for various process operations and emission units. This regulation is divided in four subparts: (1) volatile organic compounds or organic solvent emissions, (2) odor, (3) open burning, and (4) particulate emission limiting standards. The project will be subject to each of these subparts as follows.

Volatile Organic Compounds or Organic Solvent Emissions [62-296.320(1)]. This regulation prohibits any storage, processing, pumping, loading, unloading or handling of VOCs or organic solvents without the use of known and existing vapor emission control devices or systems that are required by the FDEP. The project will comply with this requirement by establishing and implementing Best Available Control Technology (BACT) for VOC emissions sources at the facility including liquid/solid separation, fermentation, distillation, product and denaturant storage tanks, product loadout, stillage loadout, wastewater treatment operations, biomass boilers, backup boiler, emergency engines, and fugitive equipment leaks.

Objectionable Odor Prohibited [62-296.320(2)]. This regulation prohibits the discharge of air emissions that cause or contribute to an objectionable odor. The project will comply with this requirement by implementing BACT on the VOC emission sources that produce odorous emissions.

Permitted Open Burning [62-296.320(3)]. This regulation allows open burning in accordance with 62.256.700 and when the FDEP determines that open burning is the only available method of disposal available and authorizes the burning by issuing an air permit. Rule 62-256 prohibits open burning of vegetative debris and untreated wood with the exception of yard waste, tree cutting debris, land clearing debris, storm generated debris, insect or disease infested vegetation, and debris for recreational or ceremonial activities. In addition, 62.256.700(7) regulates the open burning of specific agricultural related materials including polyethylene agricultural plastic; damaged, nonsalvageable, untreated wood pallets; and packing material that cannot feasibly be recycled. The project will comply with the open burning requirements of 62-296.320 and 62-256.

General Particulate Emission Limiting Standards [62-296.320(4)]. This regulation limits particulate matter emissions from emission units that are not subject to a particulate matter or opacity emission limit elsewhere in Chapter 296. Processes subject to this regulation include feedstock receiving, the product loadout flare, the lime storage and handling system, the wastewater treatment flare, and the cooling tower. Regulation 296.320(4) limits particulate emissions in pounds per hour based on the process rate in tons per hour.

Chapter 296.406. Fossil Fuel Steam Generators with less than 250 MMBtu/hr Heat Input, New and Existing Emission Units

This chapter establishes emission standards for new and existing units that would be subject to permitting requirements pursuant to Regulation 62-210.300(3), F.A.C. and those units that would meet the criteria for an insignificant activity under Regulation 62-213.430(6)(b). Chapter 296.406 applies to the two biomass boilers when diesel fuel or natural gas is combusted and to the diesel fuel or natural gas backup boiler. Emission limits for PM and SO_2 prescribed by this chapter must meet BACT. A top down BACT analysis for the biomass boilers is provided in Section 5.

Visible emission requirements that will apply to the boilers while firing natural gas are as follows:

- 20 percent opacity, except for one six minute period per hour during which the opacity shall not exceed 27 percent, or one two minute period per hour during which the opacity shall not exceed 40 percent.

The facility will only be allowed one of the two 20 percent exception options in its preconstruction and operating permits.

Chapter 296.410. Carbonaceous Fuel Burning Equipment

This chapter establishes particulate and visible emissions standards for new and existing fuel burning equipment fired with carbonaceous fuel as defined in 62-210.200. Carbonaceous fuel is defined as "solid materials composed primarily of vegetative matter such as tree bark, wood waste, or bagasse". For burners with a heat input capacity greater than 30 MMBtu/hr (i.e., the two biomass boilers), particulate matter emissions are limited to 0.2 lb/MMBtu heat input of carbonaceous fuel and 0.1 lb/MMBtu heat input of fossil fuel. Particulate emissions from the biomass boilers will be well below these limits.

Visible emissions for the biomass boilers are limited to 30 percent opacity, except for one two minute period per hour where visible emissions may have a smoke density of 40 percent. Test methods for particulate matter and visible emissions shall be conducted using FDEP Methods 5 and 9, respectively (62-297).

4.2.6 Rule 62, Chapter 297, F.A.C. Stationary Sources – Emissions Monitoring

This regulation documents the test methods and monitoring procedures to be used to demonstrate compliance with applicable emission limits established in preconstruction permits and Chapter 296 of Rule 62. This regulation also specifies the requirements for stack test ports, test reports, and alternate procedures.

4.3 Non-Applicable Regulations

4.3.1 Nonattainment New Source Review

NNSR permitting requirements will not apply to the construction of the proposed facility because it will be located within Highlands County, which is designated as attainment for all criteria pollutants [62-204.340, 62-212.500, F.A.C.].

4.3.2 Acid Rain, NO_X Budget Program, Clean Air Interstate Rule (CAIR), and Clean Air Mercury Rule (CAMR) Requirements

The proposed project will not be subject to the Acid Rain Permit Program (40 CFR 72 and 62-214, F.A.C.), NO_X Budget Program (40 CFR 96 and 40 CFR 97), Clean Air Interstate Rule (40 CFR 96 and 40 CFR 97, 62-296.470, F.A.C.), or Clean Air Mercury Rule (40 CFR 60 Subpart HHHH and 62-296.480, F.A.C.) requirements because the facility will not produce electricity [62-214, 62-296.470, F.A.C.]. Furthermore, the biomass boilers would qualify as an exempt cogeneration unit because of the biomass fuel to be combusted in the boilers (72 FR 59190).

4.4 Summary of Requirements

Table 4-4 contains a summary of the applicable requirements and the compliance methods for emission sources at the proposed facility.

Table 4-4. Summary of Applicable Requirements and Compliance Methods

Emission Source	Applicable Requirement	Compliance Method (Control)
Facility	62-204, F.A.C.	Apply for preconstruction permit
	62-210, F.A.C.	Submit annual Operating Report
	62-212, F.A.C.	Obtain PSD permit, apply BACT
	62-213, F.A.C.	Apply for Title V Operating Permit 90 days prior to expiration of construction permit and no later than 180 days after commencing operation
	62-296.320(2), F.A.C.	Capture and control odor causing emissions
	62-296.320(3), F.A.C.	Comply with open burning requirements in Chapters 256 and 296
Liquid/Solid Separation	62-296.320(1), F.A.C.	Control VOC emissions as required
Fermentation	62-296.320(1), F.A.C.	Control VOC emissions as required
Distillation	62-296.320(1), F.A.C.	Control VOC emissions as required
Product Shift Tank No. 1	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof
Product Shift Tank No. 2	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof
Recycle Product Tank	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof
Product Storage Tank No. 1	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof

amec

Table 4-4. Summary of Applicable Requirements and Compliance Methods (Continued)

Emission Source	Applicable Requirement	Compliance Method (Control)
Product Storage Tank No. 2	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof
Denaturant Storage Tank	62-296.320(1), F.A.C. 40 CFR 60 Subpart Kb	Control VOC emissions as required Internal floating roof
Product Loadout	62-296.320(1), F.A.C.	Control VOC emissions as required
Storage Silos	62-296.320(4), F.A.C.	Process weight rate limit for PM, fabric filter
Stillage Loadout	62-296.320(1), F.A.C.	Control VOC emissions as required
WWTP Aerobic Digestion	62-296.320(1), F.A.C.	Control VOC emissions as required
Biomass Boilers	40 CFR 60 Db 62-296.406, F.A.C. 62,296.410, F.A.C	Comply with Subpart Db SO_2, NO_x and PM limits 20 percent opacity, except for one six minute period per hour where opacity <= 27%, or one two minute period per hour where opacity <= 40% PM emissions <=0.2 lb/MMBtu for biomass and 0.1 lb/MMBtu for fossil fuel. Opacity ,= 30% except one two minute period per hour where opacity <=40%
Backup Boiler (ULSD)	40 CFR 60 Db 62-296.406, F.A.C.	Comply with Subpart Db SO_2, NO_x and PM limits 20 percent opacity, except for one six minute period per hour where opacity <= 27%, or one two minute period per hour where opacity <= 40%
Emergency Generators	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ	Install certified engines, limit fuel sulfur content
Fire Pump	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ	Install certified engines, limit fuel sulfur content
Fugitive Equipment Leaks	40 CFR 60 Subpart VVa	Leak detection and repair (LDAR) program for VOCs

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

This section documents the top-down BACT analysis for the proposed Highlands Ethanol project in accordance with guidance presented in the draft USEPA Guidance Document New Source Review Workshop Manual - Draft (October 1990) and regulations contained in Title 62, Chapter 212, Section 400 of the Florida Administrative Code (62-212.400 F.A.C.).

The determination of BACT involves assessing the feasibility of applying emission control alternatives to an emission unit taking into account technological, economic, energy, and secondary environmental impacts. The BACT evaluation process starts with the characterization of the "base" level of emission control proposed for the source. That is, establishing the inherent design and operating features of the emission unit and its pollutant emission rates as it is proposed to be installed. Each BACT alternative is then evaluated in terms of additional control provided beyond the existing base case.

Section 5.1 presents the applicability of BACT by pollutant and emission source. Section 5.2 presents an overview of the "top-down" BACT assessment procedure used in this analysis. Section 5.3 presents control technology determinations for all emission sources of each pollutant subject to BACT review. Section 5.4 summarizes the proposed BACT emission limits.

5.1 BACT Applicability

The following presents the pollutants and emission sources subject to BACT review.

5.1.1 Pollutants Subject to BACT

Pollutants that are subject to PSD review are subject to the BACT requirements. BACT is defined as an emission limitation based on the maximum degree of reduction, on a case-by-case basis, taking into account energy, environmental, and economic impacts. As discussed in Section 4, the major source threshold for the Highlands Ethanol facility is 100 tons per year for criteria pollutants. Once a facility is considered a major source for one criteria pollutant, then the lower significance thresholds apply for the other criteria pollutants. Therefore, the facility is subject to PSD review, and hence BACT, for each pollutant with potential to emit (PTE) greater than the major source threshold, or for pollutants with PTE greater than significance thresholds if one pollutant is greater than the major source threshold. The total maximum estimated PTE for each criteria pollutant to be emitted from the proposed facility was compared to the respective PSD major source and significance thresholds for each pollutant to determine PSD applicability. As was discussed in Section 4.1.1 and summarized in Table 4-1, the project will exceed the 100 tons per year major source thresholds for CO, NO_X, and SO_2. In addition, the project will exceed the PSD significance thresholds of 40 tpy for VOCs, 15 tpy for PM_{10}, and 10 tpy for $PM_{2.5}$. Therefore, the project will be subject to PSD and BACT for these criteria pollutants.

5.1.2 Emission Sources Subject to BACT

For a facility subject to PSD and BACT, each emission unit that emits a regulated pollutant for which total facility emissions exceed PSD applicability or significant emission thresholds is subject to the control technology review. Table 5-1 contains a listing of the emission sources that will emit the pollutants subject to BACT. The pollutants emitted, and thus pollutants for which BACT will be required for each source, are indicated in the columns to the right of the emission source description. Point sources are listed first, followed by fugitive sources. Detailed emission calculations by emission source are presented in Section 3.0 and Appendix B. However, for the purposes of this analysis, the many small sources and the few large sources of criteria pollutant emissions have been logically grouped to avoid redundancy in the analysis by addressing numerous similar, related sources as groups.

Table 5-1: Emission Sources Subject to BACT

	Pollutant Emitted Subject to BACT Review					
Sources	**VOC**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Point Sources						
Liquid/Solid Separation	•					
Fermentation/Distillation/Propagation	•					
Product/Denaturant Storage	•					
Product Loadout	•					
Miscellaneous Storage Tanks	•					
Miscellaneous Storage Silos					•	•
Wastewater Treatment	•					
Cooling Tower					•	•
Steam Production	•	•	•	•	•	•
Emergency Engines	•	•	•	•	•	•
Fugitive Sources						
Stillage Loadout	•					
Equipment Leaks	•					
Roadway Emissions					•	•

5.2 BACT Methodology

The following describes the "top-down" BACT evaluation methodology adopted by the USEPA and presented in the USEPA's *Draft New Source Review Workshop Manual* (USEPA Draft, 1990). The method is the standard procedure accepted by the USEPA and state and local regulatory agencies, including the FDEP, for determining BACT for sources subject to PSD permitting.

The "top down" method for determining BACT requires that emission control technologies be ranked in descending order of control effectiveness and that the most effective technology that is achievable, given economic, energy and environmental impacts, be established as BACT. The steps involved in this evaluation are as follows:

- Step 1: Identify available control alternatives;
- Step 2: Eliminate technically infeasible options;
- Step 3: Rank remaining options by control effectiveness;
- Step 4: Evaluate energy, environmental, and economic impacts of remaining options; and
- Step 5: Select BACT and document results.

The first step in determining BACT is the review of available control options. Each option is evaluated from the standpoint of technical feasibility for application to the subject source. All of the technically feasible options are then ranked in descending order of control efficiency. Consistent with USEPA and FDEP policy, the BACT analysis then proceeds in the "top-down" format. In the top-down BACT analysis, the most effective control options that are feasible for implementation are evaluated on the basis of economic, energy, and secondary environmental impacts. If the "top" alternative is economically feasible and does not have detrimental energy or environmental impacts, then the "top" alternative is selected as BACT.

If the most stringent technology is determined to be "not achievable" based on technical considerations, or economic, energy, or environmental impacts, then the next most stringent alternative is evaluated in the same fashion. The analysis proceeds until a technology cannot be eliminated from consideration based on the economic, energy, and secondary environmental impacts. This technology, which could be the inherent equipment design, is then determined to represent BACT for the subject source. If all of the technically feasible control technologies are shown to be economically infeasible, then BACT may be set at no control for the specific source in question.

If there is only a single feasible option, or if the applicant is proposing the most stringent alternative, then no further analysis is required. If two or more technically feasible options are identified, the next three steps are applied to identify and compare the economic, energy, and environmental impacts of the options. Technical considerations and site-specific sensitive issues will often play a role in BACT determinations. Generally, if the most stringent technology is rejected as BACT, the next most stringent technology is evaluated, and so on.

5.2.1 Step 1: Identify Available Control Alternatives

The first step is identification of available technically feasible control technology options, including consideration of transferable and innovative control measures that may not have previously been applied to the source type under analysis. Any control technology that has previously been determined to represent BACT for a similar source type should be included in the BACT analysis. Technologies that are deemed to meet Lowest Achievable Emission Rate (LAER) also need to be considered in the BACT analysis. Technically feasible control alternatives that previously have been determined to be LAER usually represent the top level of control in the BACT analysis. In addition to demonstrated controls for the source being evaluated, available control alternatives identified should also include controls for similar source categories and exhaust gas streams through technology transfer. The minimum requirement for a BACT proposal is an option that meets federal NSPS limits or other minimum state or local requirements that would prevail in the absence of BACT decision-making, such as RACT or other FDEP emission standards. After elimination of technically infeasible control technologies, the remaining options are to be ranked by control effectiveness.

To identify options for each class of equipment, various sources of information were reviewed to determine appropriate emission control technologies to be considered in the BACT analysis. These sources included:

- USEPA's RACT/BACT/LAER Clearinghouse (RBLC), which is available on-line through USEPA's Technology Transfer Network (TTN) website (USEPA, 2008) ;
- Federal, state and local new source review permits and associated inspection and performance test reports;
- Literature provided by control technology vendors;
- Environmental engineers and consultants;
- Technical journals, reports and newsletters;
- USEPA's New Source Review (NSR) bulletin board; and
- Industrial Trade Associations and Organizations.

5.2.2 Step 2: Evaluate Technical Feasibility of Control Alternatives

The second step identifies the technical feasibility of the control alternatives identified in Step 1 with respect to the specific emission unit in question. Control alternatives that have been demonstrated (i.e., installed and successfully operated) on the same source type as the unit under review are generally deemed technically feasible. Stack emissions data from a known reference method or certified CEMS are an acceptable level of quality for confirming the feasibility of meeting a BACT emission limit.

Control alternatives that have not been demonstrated on the same type of emission unit under review must be commercially available to be considered in the BACT analysis. A technical evaluation is then made on the applicability of the alternative to the source in question. The technical feasibility evaluation is based on the following:

- Physical and chemical characteristics of the gas stream;
- Similarities and differences between the proposed source and other sources on which the technique has been demonstrated; and
- Unique technical difficulties associated with applying the technique (e.g., size of the unit, location of the proposed site, expected operating problems, availability of required utilities).

Assessing the technical feasibility of emission control alternatives is discussed in USEPA's draft "New Source Review Workshop Manual" previously referenced. Using terminology from this manual, if a control technology has been "demonstrated" successfully for the type of emission source under review, then it would normally be considered technically feasible. For an undemonstrated technology, technical feasibility is determined by "availability" and "applicability." An available technology is one that is commercially available, meaning that it has advanced through the following steps:

- Concept stage;
- Research and patenting;
- Bench scale or laboratory testing;
- Pilot scale testing;
- Licensing and commercial demonstration; and
- Commercial sales.

The term applicability entails the following concepts (as quoted from USEPA's draft "New Source Review Workshop Manual," pages B.18-B-19):

> *"Technical judgment on the part of the applicant and the review authority is to be exercised in determining whether a control alternative is applicable to the source type under considerations. In general, a commercially available control option will be presumed applicable if it has been or is soon to be deployed (e.g., is specified in a permit) on the same or similar source type. Absent a showing of this type, technical feasibility would be based on examination of the physical and chemical characteristics of the pollutant-bearing gas stream and comparison to the gas stream characteristics of the source types to which the technology had been applied previously. Deployment of the control technology on an existing source with similar gas stream characteristics is generally sufficient basis for concluding technical feasibility barring to demonstration to the contrary."*

If a control alternative is determined to be technically infeasible for application to the subject source, then supporting information demonstrating the technical infeasibility must be presented. The documentation should demonstrate based on physical, chemical, and engineering principles that technical difficulties would preclude the successful application of the control alternative on the specific emission unit. Control alternatives that are demonstrated to be technically infeasible are eliminated from further consideration in the BACT evaluation.

5.2.3 Step 3: Rank Technically Feasible Control Alternatives

In Step 3, technically feasible control alternatives (i.e., those that were deemed technically feasible in Step 2) are ranked in order of overall control effectiveness for the pollutant under review. The most effective control alternative is evaluated first as BACT. If the proposed control technology for the new emission unit is the top level of control and determined to be BACT, then cost data and related energy and environmental impacts for other emission control alternatives do not need to be evaluated. However, if alternative control options are considered that are not top level control options, then the BACT evaluation must review economic, energy and secondary environmental impacts.

5.2.4 Step 4: Evaluate Economic, Energy and Secondary Environmental Impacts

In Step 4, if the BACT proposal is not the top level of control from the technically feasible alternatives, the applicant must demonstrate why the top level technology does not represent BACT for the project. This demonstration is based on the economic, energy, or secondary environmental impacts of that technology and the analysis then considers the next most stringent control technology. The analysis continues until a control alternative cannot be eliminated from consideration based on economic, energy, or secondary environmental impacts. The following describes the procedures for quantifying economic, energy, and secondary environmental impacts.

5.2.4.1 Economic Impacts

Economic impacts are developed when necessary by quantifying the total capital investment, annual operating costs, and pollutant removal cost-effectiveness for each alternative under consideration. In general, the cost data used in this analysis are accurate to within ±30 percent.

The total capital investment is comprised of basic equipment costs and direct and indirect installation costs. Direct installation costs include costs for foundations and supports, erecting and handling the equipment, electrical work, piping, insulation and painting. Indirect installation costs include engineering costs, construction and field expenses, contractor fees, royalty/license fees, process modeling, start-up and performance test costs, and contingencies.

Annual operating costs include direct costs and indirect costs. Direct annual costs include costs for raw materials, utilities (steam, electricity, fuel, water), waste treatment and disposal, maintenance materials, replacement parts and operating, supervisory, and maintenance labor. Indirect annual costs include administrative charges, property taxes, insurance, and capital recovery. The capital recovery cost is the annualized cost of the total capital investment (i.e., capital investment amortized over the expected life of the control equipment to give a uniform annual payment necessary to repay the investment).

The cost effectiveness of the control alternative is calculated by dividing its total annual operating cost by the amount of emissions that that the control alternative removes. Cost effectiveness is the measure by which regulatory agencies judge the economic feasibility of applying the control alternative under review.

The cost/economic impacts analyses provided in this BACT assessment are based primarily on budgetary-level capital and operating cost assessments estimated using the methodology in the USEPA's Office of Air Quality Planning and Standards (OAQPS) *Air Pollution Control Cost Manual, Sixth Edition* (EPA 452/B-02-001) (USEPA, 2002b). Some costs estimated from data in this manual were based on equipment cost data obtained in earlier years. These data were escalated, where necessary, to be representative of current costs by applying the appropriate cost escalation indices from the Marshal & Swift Equipment Cost Index (*Chemical Engineering*, October 2008). In some cases equipment cost data were based on budgetary estimates or quotations obtained directly from a control equipment vendor for a BACT assessment for another facility and scaled to the appropriate size required for the Highlands Ethanol plant using the engineering "Six-Tenth's Rule" for scaling of cost estimates, which accounts for economies of scale realized when increasing equipment size (Peters et al., 2002).

5.2.4.2 Energy Impacts

The energy requirements of the control alternative are quantified when necessary to determine whether the use of that alternative results in any significant or unusual positive or negative energy impacts. Only direct energy impacts are considered. Indirect energy impacts, such as energy to produce raw materials for construction or operation of control equipment, are not considered.

5.2.4.3 Secondary Environmental Impacts

The analysis of secondary environmental impacts is conducted by quantifying the solid, liquid, and gaseous discharges from the control alternative under consideration. Secondary environmental impacts include wastewater streams that could have an impact on water quality and land use, solid and hazardous wastes such as spent catalysts, impacts on visible emissions such as cooling tower vapor, and additional air emissions (including air toxics, greenhouse gases, and pollutants other than the one under review). In addition, significant differences in noise levels, radiant heat or dissipated static electrical energy may also be considered.

5.2.5 Step 5: Determine BACT

The most effective emission control alternative that cannot be eliminated from consideration based on economic, energy or secondary environmental impacts is determined to be BACT.

5.3 BACT Evaluation for the Highlands Ethanol Project

The following sections provide the BACT assessment for the Highlands Ethanol facility for each regulated pollutant subject to BACT review. Within each section, a separate assessment is provided for each emission source that emits the BACT pollutant as detailed in Table 5-1. For each pollutant/process combination, the analysis follows the top down procedure outlined in Section 5.2 above.

It is important to recognize that Highlands Ethanol's cellulosic ethanol production process is a proprietary process and the Highlands Ethanol facility will be the first production-scale facility to use this process in the production of fuel grade ethanol. Most recently permitted ethanol production facilities are corn-based ethanol facilities. As a result, there is not a direct correlation between the specific process operations identified in the RBLC Clearinghouse and existing permits for corn ethanol facilities and the proposed Highlands Ethanol facility. Nevertheless, many of the production processes used in corn-based ethanol production are analogous and emission control determinations for these processes may be transferable. Other supporting project operations such as boilers, engines, cooling towers, etc. are not unique to Highlands Ethanol's process and documentation of prior determinations for these supporting processes is more straightforward.

To identify potential BACT options for each process/pollutant combination, AMEC compiled an extensive database of relevant prior BACT/permit data. BACT data were first obtained through a review of the RBLC Clearinghouse for process types that have direct or transferable applications to the various processes at the proposed Highlands Ethanol facility. The following RBLC processes were reviewed:

- Alcohol production (including alcohol beverage, alcohol fuel, and other alcohol production);
- Biomass boilers with heat input capacities greater than 250 MMBtu/hr;
- Biomass boilers with heat input capacities between 100-250 MMBtu/hr;
- Cooling towers;
- Internal combustion engines;
- Distillate oil boilers with heat input capacities between 100-250 MMBtu/hr;
- Natural gas boilers with heat input capacities between 100-250 MMBtu/hr;
- Lime/limestone handling/kilns/storage/manufacture.

In addition, AMEC identified a promulgated state regulation in Indiana that requires VOC emission controls for ethanol production facilities, which is considered in determining BACT. Fuel ethanol production plants constructed or modified in Indiana after April 1, 2007 are subject to 326 Indiana Administrative Code (IAC) 8-5-6 (Fuel Grade Ethanol Production at Dry Mills) if the plant uses dry milling and has combined potential VOC emissions of 25 tons or more per year from fermentation, distillation, and dehydration; DDGS dryer or dryers; and, ethanol load-out operations. Plants subject to the requirements of 326 IAC 8-5-6 are required to control VOC emissions by installing one of the following control devices:

- A thermal oxidizer with an overall control efficiency not less than 98% or resulting in a VOC concentration of not more than 10 ppm;
- A wet scrubber with an overall control efficiency not less than 98% or resulting in a VOC concentration of not more than 20 ppm; or
- An enclosed flare with an overall control efficiency of not less than 98%.

To augment the information obtained from the RBLC Clearinghouse and state regulations, AMEC also conducted a thorough search of air permits for facilities likely to have analogous processes within the State of Florida and in other states within USEPA Region 4. Our search included recently permitted facilities, or facilities whose permit applications are under review by the regulatory agency. Ethanol production facilities (both fuel alcohol and beverage alcohol), biodiesel production facilities (which have some relevant emission units), and facilities with biomass boilers, cooling towers, or storage tanks/loading racks were included to identify technically feasible technologies. AMEC identified the following permits for inclusion in our analysis in addition to the RBLC Clearinghouse data:

Florida

- U.S. Sugar Corporation – Clewiston Sugar Mill & Refinery (biomass boiler);
- Bartow Ethanol of Florida L.C. (ethanol production);
- United States EnviroFuels, LLC – Port Sutton Ethanol Facility (ethanol production);
- United States EnviroFuels, LLC – Port Manatee Ethanol Facility (ethanol production);
- Progress Energy Florida, Inc. – Anclote Power Plant (cooling tower);
- Progress Energy Florida, Inc. – Crystal River Power Plant (cooling tower); and
- Murphy Oil USA, Inc (biodiesel production).

Georgia

- Greenway Renewable Power, LLC (biomass boiler);
- Earth Resources, Inc. – Plant Carl (biomass boiler);
- The Procter & Gamble Paper Products Company (biomass boiler);
- Southwest Georgia Ethanol, LLC (ethanol production);
- Wind Gap Farms (biomass boiler); and

- Yellow Pine Energy Company, LLC (biomass boiler).

Mississippi

- Three Rivers Biofuels, LLC (biodiesel production);
- Tri States Petroleum Products LLC (biodiesel production);
- North Mississippi Biodiesel, Inc. (biodiesel production);
- Mound Bayou Refiner Inc. (biodiesel production);
- CFC Transportation, Inc. (biodiesel production);
- Southern Ethanol Company, LLC – Rosedale (ethanol production);
- Southern Ethanol Company, LLC – Amory (ethanol production); and
- Delta Ethanol, LLC (ethanol production).

Alabama

- Athens Biodiesel, LLC (biodiesel production);
- Alabama Biodiesel Corporation (biodiesel production); and
- Dunhill Entities, L.P.(loading terminal for biodiesel, gasoline, and ethanol).

Kentucky

- Bluegrass Bioenergy, LLC (ethanol production);
- Buffalo Trace Distillery Inc. (ethanol production);
- Commonwealth Agri-Energy, LLC (ethanol production);
- Constellation Spirits Inc. (ethanol production);
- Countrymark Cooperative, LLP (storage tanks and loading racks);
- The Four Rivers BioEnergy Company, Inc. (biodiesel production);
- Four Roses Distillery, LLC (ethanol production);
- Heaven Hill Distilleries, Inc. (ethanol production); and
- Kentucky 5 Star Energy, LLC (ethanol production).

North Carolina

- Suez Energy BioPower, Inc. – North Cove (biomass boiler).

Finally, based on industry knowledge, AMEC is also aware of two very recently permitted facilities outside of Region 4 that have sources analogous to the proposed facility: the Corn Plus facility in Winnebago, Faribault County, Minnesota, and the Nacogdoches Power facility in Nacogdoches County, Texas. The Corn Plus facility is an ethanol production facility that utilizes a fluidized bed biomass boiler similar to the boiler design proposed for the Highlands Ethanol facility. The primary difference is that Corn Plus combusts corn syrup and Highlands Ethanol will combust stillage cake. The Nacogdoches Power facility also incorporates a fluidized bed biomass boiler fired with wood waste. Given the similarities of these facilities to the proposed Project, AMEC included data from both the Corn Plus and Nacogdoches Power permits in the database as well.

The BACT review database used in this analysis contains 1,078 records of prior permit decisions potentially relevant to the various emission processes at Highlands Ethanol, and for brevity and consistency, is referred to as the "permit database" in the remainder of this analysis. We believe that this database is representative of the level of control that currently exists in the industry for ethanol production facilities such as that proposed by Highlands Ethanol.

For each process identified in the database, AMEC determined which corresponding process, if any, was relevant to the proposed Highlands Ethanol processes. AMEC was then able to sort the database for each Highlands Ethanol process to obtain a subset of prior BACT and permit records relating to that process. This information was used to determine the available control technologies and corresponding levels of control to be considered in the BACT analysis.

5.3.1 Volatile Organic Compounds

As detailed in Table 5-1, the specific sources of VOC emissions at the Highlands Ethanol facility include:

- Liquid/Solid Separation;
- Fermentation/Distillation/Propagation;
- Product/Denaturant Storage;
- Product Loadout;
- Miscellaneous Storage Tanks;
- Wastewater Treatment;
- Cooling Tower;
- Steam Production;
- Emergency Engines;
- Stillage Loadout; and

- Fugitive Equipment Leaks.

The BACT evaluation for each of these sources of VOC emissions is presented in the following sections.

5.3.1.1 Liquid/Solid Separation

Liquid/solid separation is used to separate the liquid hemicellulosic stream from the solid cellulosic stream in preparation for fermentation. The stream entering liquid/solid separation from the hydrolyzer has trace levels of organics that are highly soluble in water. Representative of these organics are acetic acid and furfural. While highly soluble in water, a small fraction of the trace levels of organics are expected to evaporate in the process.

Available Control Alternatives

Liquid/solid separation is unique to Highlands Ethanol's proprietary acid hydrolysis process and there are no currently permitted facilities in the permit database that utilize such a process in ethanol production. However, the VOCs emitted from the process are acetic acid and furfural, both of which are highly soluble in water. These are analogous to the other water soluble compounds emitted in the fermentation and distillation processes. The fermentation process is also used in corn ethanol production, and is included in the permit database compiled for this BACT analysis. Therefore, AMEC used the permit database records for fermentation to represent the currently available control alternatives and the expected BACT level of control for the liquid/solid separation process.

The permit database records relating to fermentation are presented in Appendix E, Table E-1. There are 27 facilities in the database relating to fermentation. Four facilities have no control. Three facilities use a combination of wet scrubbing and regenerative thermal oxidation. Twenty facilities use wet scrubbing. Based on this information, the available control alternatives for this process include wet scrubbing and thermal oxidation.

While one or more of these control options may be technically feasible, given the highly water soluble nature and relatively low concentrations of the VOCs in the waste stream, the most likely option is a wet scrubber, as evidenced by the fact that 74 percent of the identified facilities use a wet scrubber.

Ranking of Technically Feasible Controls

Based on the permit database, the current level of BACT control in the industry for the fermentation process, which has been determined to be analogous to liquid/solid separation, ranges from 95% to 99%. Because the pollutants are highly water soluble, wet scrubbing and thermal oxidation can provide equivalent levels of control. Highlands Ethanol is proposing to use a wet scrubber to control VOC emissions from the liquid/solid separation process, which represents the top level of control. Therefore, an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol proposes to install a wet scrubber on the liquid/solid separation process as BACT. The current level of BACT control in the industry ranges from 95 to 99 percent as shown in Table E-1. In addition, as discussed in Section 5.3, Indiana has mandated a control level of 98 percent for ethanol production facilities constructed after April 1, 2007. Five facilities for which control level data are available are permitted at a level of 95 percent control, two facilities are permitted at 97 percent control, four facilities are permitted at 98 percent control, and only three facilities are permitted at higher than 98 percent control. Specific control efficiencies are not specified for nine of the facilities.

Highlands Ethanol has determined that 98 percent control is achievable. This is equivalent to the control level required for new facilities in Indiana and is as good as or better than all but three (nearly 90 percent) of the identified facilities. Therefore, BACT for VOC emissions from liquid/solid separation is a wet scrubber achieving 98 percent control. The corresponding proposed VOC BACT emission limits for liquid/solid separation are 0.6 lb/hr and 2.1 tpy.

5.3.1.2 Fermentation/Distillation/Propagation

Fermentation is the biological process that occurs when bacteria convert sugars to produce ethanol, carbon dioxide (CO_2), and water. Distillation processes are used to separate and concentrate ethanol from the fermented mixture. Propagation is the biological process used to grow the proprietary enzyme and bacteria for fermentation. Ethanol will be the primary VOC that is emitted from these processes, although trace VOCs such as acetic acid, lactic acid, and methanol will also be emitted.

Available Control Alternatives

The permit database records relating to fermentation are presented in Table E-1, while those relating to distillation are presented in Table E-2. There are 27 facilities in the database relating to fermentation. Four facilities have no control. Three facilities use a combination of wet scrubbing and regenerative thermal oxidation. Twenty facilities use wet scrubbing. Based on this information, the available control alternatives for fermentation include wet scrubbing and thermal oxidation.

Given the highly water soluble nature and relatively low concentrations of the organics in the fermentation vent stream, the most likely BACT option is a wet scrubber, as evidenced by the fact that 74 percent of the identified facilities use this technology.

There are 15 facilities in the database relating to distillation operations. Three facilities have no control. One facility uses a combination of wet scrubbing and thermal oxidation. Two facilities use thermal oxidation, most likely because at these facilities the distillation vent stream is combined with the dry distiller's grain and solubles (DDGS) dryer exhaust, which is a high VOC process exhaust that does not exist in a cellulosic ethanol facility. Three facilities use a combination of wet scrubbing and regenerative thermal oxidation. Nine facilities use wet scrubbing. One of these facilities is marked in the database as "no control," but this is likely an error because a control efficiency of 95 percent is indicated and other processes at the facility are controlled by an "absorption column" (wet scrubber). Based on this information, the available control alternatives for distillation include wet scrubbing and thermal oxidation.

While more than one of these control options are technically feasible, given the highly water soluble nature and relatively low concentrations of the pollutants in the waste stream, the most logical BACT technology is a wet scrubber, as evidenced by the fact that 60 percent of the identified facilities use this technology.

Ranking of Technically Feasible Controls

Based on the permit database, the current level of control in the industry for the fermentation and distillation processes range from 95% to 99% using either technology. Because the pollutants are highly water soluble, wet scrubbing and thermal oxidation can provide equivalent levels of control. Highlands Ethanol is proposing to use a wet scrubber to control VOC emissions from the fermentation vent gases which represents the top level of control. Therefore, an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol proposes to connect the fermentation and distillation vents to a single wet scrubber, which is the top level of control and therefore represents BACT. The current level of BACT control in the industry ranges from 95 to 99 percent as shown in Tables E-1 and E-2. In addition, as discussed in Section 5.3, Indiana has mandated a control level of 98 percent for ethanol production facilities constructed after April 1, 2007. Five facilities for which control level data are available are permitted at a level of 95 percent control, two facilities are permitted at 97 percent control, four facilities are permitted at 98 percent control, and only three facilities are permitted at higher than 98 percent control. Specific control efficiencies are not specified for nine of the facilities.

As stated above, cellulosic ethanol production differs from corn ethanol production in that fermenting organism propagation unit operations are more complex and there is an additional enzyme propagation unit operation. These unit operations require sparging of air into the process and also emit different volatile components than corn ethanol production. For these reasons, Highlands Ethanol has determined that 98 percent control is achievable. This is equivalent to the control level required for new facilities in Indiana and is as good as or better than all but three (nearly 90 percent) of the identified facilities.

Therefore, BACT for VOC emissions from fermentation/distillation/propagation is a wet scrubber achieving 98 percent control. The corresponding proposed VOC BACT emission limits for fermentation/distillation/propagation are 5.1 lb/hr and 18.8 tpy.

5.3.1.3 Product and Denaturant Storage Tanks

The facility includes two product shift tanks, two E95 storage tanks, and one recycle product tank. These tanks, which contain denatured ethanol, will be designed with internal floating roofs to minimize VOC emissions. The facility also includes one gasoline (denaturant) storage tank. Gasoline is used as a denaturant to render the ethanol undrinkable. The denaturant tank will also be designed with an internal floating roof to minimize VOC (gasoline vapor) emissions.

Available Control Alternatives

The permit database records relating to volatile organic storage tanks are presented in Appendix E, Table E-3. There are 22 facilities in the database relating to storage tanks. Four facilities have no control on storage tanks. Three facilities utilize only submerged fill pipes for VOC control. Thirteen facilities use internal floating roofs for VOC control. One facility utilizes submerged fill pipes in conjunction with internal floating roofs, and one facility utilizes submerged fill pipes and vents the tanks to a condenser.

Based on the information in the database, the available control options for storage tanks include internal floating roofs, venting the storage tanks to a control device, and submerged pipe filling. In addition, fixed roof tanks can be equipped with a pressure/vacuum conservation vent, which allows the tanks to operate at a slight internal pressure and prevents the release of vapors to the atmosphere during small changes in temperature, pressure, or liquid level (USEPA, 1997b).

All of these control technologies are technically feasible for application to the storage tanks at Highlands Ethanol.

Ranking of Technically Feasible Controls

The permit database does not contain any information relating to the level of control provided by the control options in use. However, estimates are available from USEPA as follows. An internal floating roof (IFR) and seals installed in a fixed roof tank can be used to minimize evaporation of product from the tank, with a control efficiency from 60 to 99 percent, depending on the type of roof and seals installed and the type of liquid stored (USEPA, 1997b). Vapor recovery systems to collect emissions from storage tanks and vent to a control device can have control efficiencies as high as 90 to 98 percent (USEPA, 1997b). For the top-down approach, internal floating roofs and venting the tanks to a control device are considered to provide an equivalent level of control and are the top control available. While not quantifiable, submerged filling and vapor conservation vents would not provide as high a level of control as internal floating roofs or venting the tanks to a control device.

Highlands Ethanol plans to install internal floating roofs to control VOC emissions from storage tanks, which represents the top level of control. Therefore, an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol plans to install internal floating roofs on the ethanol and E95 storage tanks, which is the top level of control and represents BACT.

For gasoline storage tanks, vapor balancing is also typically used to retrieve the vapors displaced from the tank during gasoline loading. This control measure (called Stage I vapor control) returns the vapors displaced from the storage tank to the tank truck, which then transports the vapors back to the gasoline loading terminal. The denaturant storage tank will be equipped with an internal floating roof and will utilize vapor balancing to further reduce VOC emissions.

5.3.1.4 Product Loadout

Product will be loaded onto tank trucks at a rate of 600 gallons per minute using submerged fill. Vapors displaced from the trucks will be exhausted to a flare. The Product Loadout Flare will have a rated capacity of 9.4 MMBtu/hr and will provide 98% control efficiency for VOC emissions during the loading of product (ethanol) into trucks. The trucks are assumed not to be in dedicated ethanol service (i.e., some trucks will have returned from delivering gasoline).

Available Control Alternatives

The permit database records relating to product loadout are presented in Appendix E, Table E-4. There are 20 facilities in the database relating to product loadout. One facility has no control on product loadout. One facility uses a regenerative thermal oxidizer. The remaining 18 facilities utilize a flare to reduce VOC emissions from product loadout. Based on this information, the available control alternatives for this process include flares and thermal oxidation.

Given the high control level possible and the relatively low cost, the most logical BACT technology is a flare as evidenced by the fact that 90 percent of the identified facilities use this technology.

Ranking of Technically Feasible Controls

Based on the permit database, the current level of control in the industry for product loadout ranges from 97 percent to 99 percent. The technologies in use provide an equivalent level of control and therefore a flare represents the top level of control. Therefore, an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol plans to install a flare on this process, which is the top level of control, and therefore represents BACT. The current level of BACT control in the industry ranges from 97 to 99 percent as shown in Table E-4. One facility for which control level data are available is permitted at a level of 97 percent control, seven facilities are permitted at 98 percent control, and one facility is permitted at 99 percent control. Highlands Ethanol has determined that 98 percent control is achievable. This is equivalent to the control level required for new facilities in Indiana and is as good as or better than all but one of the identified facilities. Therefore, BACT for VOC emissions from product loadout is a flare achieving 98 percent control.

5.3.1.5 Miscellaneous Storage Tanks

The facility includes three nutrient storage tanks that contain aqueous solutions of corn steep, lactose, and glucose. These solutions contain organics that are highly soluble in water and despite the large throughput through these storage tanks, the VOC emissions were calculated to be negligible. The vertical fixed roof design of these tanks is sufficient to effectively eliminate VOC emissions and therefore constitutes BACT for these storage tanks.

5.3.1.6 Wastewater Treatment Plant

The wastewater treatment system consists of aerobic and anaerobic components. Biogas (predominantly methane) generated by the three anaerobic digesters will be combusted in the biomass boilers. During times when the biomass boilers are shut down, the biogas emissions will be controlled with a flare having a rated capacity of 44.0 MMBtu/hr.

The volatilization of trace dissolved organic constituents in the wastewater will result in fugitive VOC emissions from the various components of the aerobic wastewater treatment plant. The aerobic wastewater treatment plant consists of an equalization tank, a primary clarifier, a large aeration basin, a secondary clarifier, and four sand filters.

Available Control Alternatives

The permit database records relating to wastewater treatment are presented in Appendix E, Table E-5. There are four facilities in the database relating to wastewater treatment. Two facilities have no control on wastewater treatment and two facilities control anaerobic digesters with a flare. Based on this information, the available control alternatives for this process include flares. Given the high control level possible and the relatively low cost, the most logical BACT technology is a boiler or a flare as evidenced by the permit data.

Because the equalization tank and primary clarifier will be located upstream of the anaerobic digesters, which have the ability to remove 90% of the organics in the wastewater, these tanks could have significant VOC emissions if left open to the atmosphere. The most logical BACT technology for these tanks is to cover them such that they are vertical fixed roof tanks.

Ranking of Technically Feasible Controls

Based on the permit database, the current level of control in the industry for wastewater treatment is 98 percent. Therefore the biomass boilers and the flare represent the top level of control and an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol plans to combust the biogas in the biomass boilers and install a flare for backup purposes. These are the top level of control, and therefore represent BACT. The current level of BACT control in the industry is 98 percent as shown in Table E-5. Highlands Ethanol has determined that 98 percent control, which is equivalent to the one facility for which control data was available as well as the control level required for new facilities in Indiana, is achievable. Therefore, BACT for VOC emissions from anaerobic wastewater treatment is the biomass boilers with a backup flare achieving 98 percent control.

Highlands Ethanol also plans to construct the equalization tank and primary clarifier as effectively vertical fixed roof storage tanks. The VOC emissions from these tanks are thereby reduced significantly compared to tanks of open top design. Therefore, BACT for VOC emissions from aerobic wastewater treatment is covering the equalization tank and primary clarifier.

5.3.1.7 Cooling Tower

VOC emissions can occur from cooling towers used in chemical plants, where the circulating water is used to cool down hydrocarbon process streams. While the process heat exchangers will be designed to prevent contact of the cooling water with the process streams, leaks in the process heat exchangers can occur. The VOCs that would consequently enter the cooling water would ultimately be stripped out by the cooling tower's air flow.

The most practical method of controlling VOC emissions is to promptly repair any leaking components. Highlands Ethanol proposes to collect a sample of cooling water on a weekly basis and analyze it for VOCs. This will enable the early detection of leaking heat exchangers, thereby minimizing VOC emissions. Therefore, BACT for process heat exchanger leaks is establishment of a weekly monitoring program.

5.3.1.8 Steam Production, Biomass Boilers

The project is proposing two fluidized bed biomass boilers. Each boiler has a rated capacity of 198 MMBtu/hr and will burn stillage cake as fuel. VOCs are formed through incomplete combustion of fuels. The rate of VOC formation is enhanced by low combustion temperatures and near- or sub-stoichiometric quantities of oxygen in the combustion zone. The boilers will implement BACT to minimize VOC emissions.

Available Control Alternatives

The methods for reduction or control VOC emissions from boilers identified include:

- Good combustion practice; and
- VOC oxidation catalysts.

Good combustion practice, also known as burner optimization, is usually the first method used to control formation of VOC (as well as CO and NO_X). Optimization is achieved by modifying boiler-operating conditions, including excess air control, boiler fine tuning and balancing the fuel and air flow to the combustion zone. Unfortunately, the conditions (high excess air) that favor reduced VOC formation also generally result in the increase of NO_X formation. Therefore, it is often not possible to operate a boiler so as to minimize both VOC and NO_X generation simultaneously.

VOC oxidation catalysts can be used to control VOC emissions from boilers. The VOC catalyst promotes the oxidation of VOC to carbon dioxide and water as the emission stream passes through the catalyst bed. These catalysts are similar or identical to the catalysts used to oxidize CO in emissions from combustion sources. The catalyst is usually made of a precious metal such as platinum, palladium, or rhodium. Other formulations, such as metal oxides for emission streams containing chlorinated compounds, are also used. The oxidation process takes place spontaneously, without the requirement for introducing reactants. The performance of these oxidation catalyst systems is a function of several variables, including temperature, pressure drop, incoming VOC concentration and the presence in the flue gas of particulate, condensables and certain elements that may foul or deactivate (poison) the catalysts.

The permit database records relating to VOC emissions from biomass boilers are presented in Appendix E, Table E-6. It is important to recognize that Highlands Ethanol proposes to install a fluidized bed biomass boiler, which is a significantly different design configuration from most biomass boilers. The fluidized bed design has implications for the emission controls which are feasible and/or effective. There are only four identified facilities in the permit database utilizing the fluidized bed biomass boiler design. The Public Service Company of New Hampshire's (PSNH) Schiller Station operates fluidized bed boilers capable of firing biomass (wood) in addition to coal. The Corn Plus facility discussed in Section 5.3 has a fluidized bed biomass boiler combusting corn syrup. The Nacogdoches Power facility proposed a bubbling fluidized bed boiler burning wood chips and sawdust. The proposed Yellow Pine Energy facility in Georgia has proposed fluidized bed biomass boilers burning wood waste. This facility's permit application is currently under review by the Georgia Environmental Protection Department (GAEPD). The Yellow Pine Energy permit application proposes no control for VOCs while PSNH, Corn Plus and Nacogdoches Power utilize good combustion controls for VOCs.

The oxidation catalyst technology has never been applied to a fluidized bed biomass boiler. Particulate matter emissions from a fluidized bed biomass boiler are significantly higher than from a standard natural gas or distillate oil fired boiler, which is the application typical for an oxidation catalyst. Given the high particulate matter loading from the boiler, it is not feasible to install the oxidation catalyst in the location where the temperature is conducive to catalyst operation upstream of the fabric filter. The only way that this technology would be technically feasible would be to install it downstream of the fabric filter. However, due to the cooler flue gas temperature downstream of the fabric filter, this would require installation of a duct burner downstream of the fabric filter and upstream of the oxidation catalyst. A significant amount of fossil fuel would be combusted in the duct burner to reheat the flue gas to the catalyst activation temperature. Good combustion practices are inherent in the design and efficient operation of the fluidized bed boiler.

Ranking of Technically Feasible Controls

Oxidation catalysts are typically considered the top level of control. However, the oxidation catalyst technology has never been applied to a fluidized bed biomass boiler. Particulate matter emissions from a fluidized bed biomass boiler are significantly higher than from a standard natural gas or distillate oil fired boiler, which is the application typical for an oxidation catalyst. Given the high particulate matter loading from the boiler, it is not practical to install the oxidation catalyst in the location where the temperature is conducive to catalyst operation upstream of the fabric filter. Therefore, an oxidation catalyst on a fluidized bed biomass boiler is not technically feasible due to the operating temperature requirements and the need to place the catalyst downstream of the particulate controls to avoid plugging of the catalyst. To reheat the flue gas to the required temperature for an oxidation catalyst, over 72,799,000 cubic feet of natural gas per year would be fired in the duct burner, which is a significant energy impact. Firing natural gas in a duct burner would not only increase VOC emissions, the pollutant intended to be controlled by the oxidation catalyst, but would also increase NO_X, SO_2, CO and PM emissions. In addition, a significant amount of greenhouse gas emissions (CO_2) would be generated. Estimated emissions from firing the required amount of natural gas in a duct burner are calculated using natural gas combustion emission factors from Section 1.4 of USEPA's AP-42 (USEPA, 1998) as follows:

- VOC 0.2 tpy;
- NO_X 3.6 tpy;
- SO_2 0.02 tpy;
- CO 3.1 tpy;
- PM 0.3 tpy; and
- CO_2 4,368 tpy.

In addition to these issues, other constituents in the flue gas would cause fouling and deactivation of the catalyst bed. The VOC control efficiency from good combustion practices is not readily quantifiable, but combustion parameters, such as air to fuel ratio can be monitored to assure optimal combustion conditions for minimizing air emissions. Given these significant energy and environmental impacts, an oxidation catalyst would not be considered BACT for controlling VOCs from the biomass boilers. Therefore, good combustion practices represents the top level of control for the Highlands Ethanol project.

Determination of BACT

The top level of control, an oxidation catalyst, was determined to not represent BACT based on its technical feasibility issues and energy and secondary environmental impacts. Therefore, Highlands Ethanol proposes to utilize good combustion practices to control VOC emissions from the biomass boilers as BACT.

The proposed VOC BACT emission limit is 0.005 lb/MMBtu, which as shown in Appendix E, Table E-6, is equivalent to the lowest permitted VOC emission rate identified for fluidized bed biomass boilers at PSNH's Schiller Station in New Hampshire.

5.3.1.9 Steam Production, Backup Boiler

There will be one backup boiler comparable in size to one of the fluidized bed biomass boilers. Although natural gas is not currently available at the site, there is a plan to extend natural gas service to the site by 2010, which would correspond to the construction phase of the facility. Highlands Ethanol prefers to fire the backup boiler with natural gas. In the event that FGT experiences delays with its project, Highlands Ethanol is considering the flexibility to fire the backup boiler with either natural gas or ULSD. In either case, the backup boiler will only operate when one of the biomass boilers is down.

As discussed in Section 5.3.1.8 above, available VOC control technologies include oxidation catalysts and good combustion practices. The permit database records relating to VOC emissions from natural gas-fired and distillate oil-fired backup and auxiliary boilers are presented in Appendix E, Table E-7. There are 12 facilities in the database relating to such boilers. Three facilities have no control for VOCs, eight facilities utilize good combustion practices to control VOCs, and one facility utilizes an oxidation catalyst for control of VOCs.

However, given the fact that the backup boiler will utilize clean fuels and only operate when the biomass boilers are down, this boiler would be operating a limited number of hours per year and add-on controls would not be cost effective. Therefore, BACT for VOC emissions from the backup boiler is good combustion practices. The proposed VOC BACT emission limit is 0.0015 lb/MMBtu if the backup boiler is fired with ULSD and 0.0014 lb/MMBtu if the backup boiler is fired with natural gas. These proposed emission rates are equivalent to the lowest emission rates shown in Table E-7. In fact, the one facility using an oxidation catalyst has an emission limit higher than this at 0.0044 lb/MMBtu.

5.3.1.10 Emergency Engines

As discussed in Section 4.0, the fire pump engine and emergency generators will be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). As such, the engines will be required to meet specific emission standards based on engine size, model year, and end use. Use of these engines for testing and maintenance will be limited to 100 hours per year. In addition, they will also be required to use diesel fuel that meets the requirements of 40 CFR 80. This means that beginning on October 1, 2010, the fuel used in these engines must have a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel, which is consistent with the characteristics of ULSD.

As with the other combustion sources, good combustion practice and VOC oxidation catalysts are available control alternatives. The permit database records relating to VOC emissions from emergency diesel engines are presented in Appendix E, Table E-8. There are 16 entries in the database relating to emergency engines (fire pumps or emergency generators). Five of the entries list no control for VOCs; the other 11 entries list engine design or good combustion practices, some in conjunction with low sulfur fuel. None of the entries list add-on controls.

While the oxidation catalyst technology is technically feasible for application to internal combustion engines, it would not be cost effective given the high cost of add-on controls coupled with the extremely low emissions and very limited operating hours

Good combustion practices are inherent in the design and efficient operation of the units. In addition, in accordance with 40 CFR 60, Subpart IIII, Highlands Ethanol will be required to utilize ULSD or propane in these units and operate them no more 100 hours per year for maintenance and testing. Therefore BACT for these units is good combustion practices, use of ULSD or propane, and operation for maintenance and testing purposes for no more than 100 hours per year. The proposed VOC BACT emission limits are as follows:

- Emergency Generators – 0.64 g/kW-hr; and

- Fire Pump – 0.3 g/hp-hr.

5.3.1.11 Stillage Loadout

Stillage cake will be removed from the cellulosics beer stripper, dewatered to remove some of the water fraction, and conveyed to the biomass boiler for use as fuel. The stillage will not be otherwise dried. Stillage will be generated at a rate of 25 tons per hour and will consist primarily of lignin fibers and secondarily of unhydrolyzed cellulose fibers with a moisture content between 50 and 60 percent. Handling will be performed entirely within a closed system except for the conveyor. Based on the consistency and moisture content of the material, PM emissions are expected to be negligible. VOC emissions will occur from the evaporation of trace organics dissolved in the water fraction and therefore maintenance of the material at ambient temperature will reduce the potential for fugitive VOC emissions.

The only control options for this process would be to capture the emissions and vent them to an add-on control device such as a wet scrubber or thermal oxidizer. However, the potential uncontrolled VOC emissions from the process are calculated to be only 2.8 tons per year, which is very low compared to the other VOC emitting sources at the facility. Based on this low emission rate, capturing and controlling these emissions with an add-on control device would clearly not be cost effective. Therefore, BACT is proposed to be maintaining the stillage cake at ambient temperature.

5.3.1.12 Fugitive Equipment Leaks

The permit database records relating to VOC emissions from fugitive equipment leaks are presented in Appendix E, Table E-9. There are 22 facilities in the database relating to equipment leaks. Two of the facilities have no control and two employ best management practices. The other 18 facilities have established leak detection and repair (LDAR) programs for control of VOCs from fugitive equipment leaks. Because of the fugitive nature of this emission source and the sheer numbers of components (pumps, valves, flanges, etc.) in VOC service in an ethanol production facility, it would not be practical or cost effective to capture and control these emissions.

The most practical method of controlling VOC emissions is to promptly repair any leaking components, as evidenced by the database records for this emission source. Highlands Ethanol will be subject to 40 CFR 60, Subpart VVa, the NSPS for VOC Equipment Leaks in the Synthetic Organic Chemical Manufacturing Industry (for projects that commence construction or modifications after November 7, 2006), which requires a LDAR program. Therefore, BACT for equipment leaks is establishment of a LDAR program in compliance with 40 CFR 60, Subpart VVa.

5.3.2 Particulate Matter

As detailed in Table 5-1, the specific sources of PM_{10} and $PM_{2.5}$ emissions at the Highlands Ethanol facility include:

- Miscellaneous Storage Silos;
- Cooling Tower;
- Steam Production;
- Emergency engines; and
- Fugitive dust from roads.

At the current time FDEP has not established a separate regulatory framework for $PM_{2.5}$ and is currently using PM_{10} as a surrogate for $PM_{2.5}$. Consequently, the remainder of this analysis is based on emissions of PM_{10}. The evaluation of BACT for each of these sources of PM_{10} emissions is presented in the following sections.

5.3.2.1 Miscellaneous Storage Silos

The miscellaneous storage silos includes lime storage and handling. The permit database records relating to PM_{10} emissions from lime handling are presented in Appendix E, Table E-10. There are 29 entries in the database relating to lime handling operations. Three of these operations are controlled by wet scrubbers, the rest are controlled by baghouses/dust collectors (fabric filters). The control efficiencies range from 91 to 99.9 percent.

In addition to lime storage and handling discussed in Section 5.3.2.1, the facility proposes to install and operate the following miscellaneous chemical storage silos:

- Solka-Flok (propagation nutrient);
- Soy Flour (propagation nutrient);
- Ammonium Sulfate (propagation nutrient);
- Potassium Phosphate (propagation nutrient);
- Urea (propagation nutrient);
- Ash (biomass boilers);
- Sand (fluidized bed for biomass boilers);
- Limestone (fluidized bed for biomass boilers); and
- Urea (SNCR system for biomass boilers).

The permit database records relating to PM_{10} emissions from lime handling presented in Table E-10 are representative of dry chemical storage and handling for other materials as well.

Fabric filters are widely accepted to represent the top level of control for particulate matter emission sources. Highlands Ethanol intends to install fabric filters on miscellaneous chemical storage silos. In addition, transfer points will be enclosed. Because Highlands Ethanol is installing the top level of control, this represents BACT and no further analysis is required.

The emission rates shown in Table E-10 range from 0.0114 gr/dscf to 0.0005 gr/dscf. However, the operation associated with the lowest emission rate (0.0005 gr/dscf) at Nucor Corporation in Arkansas is a pelletized lime handling operation, which has a lower dust generation potential and is therefore not analogous to Highlands Ethanol's operations. The next lowest emission rate shown in Table E-10 is 0.005 gr/dscf, which is met by five of the 29 operations. Therefore, Highlands Ethanol is proposing a PM_{10} BACT emission limit of 0.005 gr/dscf for the miscellaneous storage silos.

5.3.2.2 Cooling Tower

The permit database records relating to PM_{10} emissions from cooling towers are presented in Appendix E, Table E-11. There are 31 cooling tower entries in the database. Six of these cooling towers are either not controlled or the control is not specified. Two are controlled by best management practices. The remaining 23 are controlled by drift eliminators.

Drift eliminators integral to the cooling tower design is the only practical method of control for this source. The permit database shows that the level of drift elimination ranges from 0.001 percent to 0.0005 percent. There are five cooling towers with 0.0005 percent drift eliminators, three in Arizona (at Dome Valley Energy Partners and Allegheny Energy – La Paz) and two in Florida (at Progress Energy – Crystal River and Progress Energy – Anclote). Highlands Ethanol plans to install a cooling tower with a 0.0005% drift eliminator, which is equivalent to the two recently permitted Progress Energy facility cooling towers in Florida, and represents the top level of control.

Because Highlands Ethanol is installing the top level of control, this represents BACT and no further analysis is required. The proposed PM_{10} BACT emission limit is cooling tower drift limited to 0.0005 percent of the water recirculation rate.

5.3.2.3 Steam Production, Biomass Boilers

The biomass boilers will be subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60, Subpart Db) because each boiler's maximum firing rate will be 198 MMBtu/hr, which is greater than the applicability threshold of 100 MMBtu/hr. Therefore filterable PM emissions are limited to 0.030 lb/MMBtu.

The permit database records relating to PM_{10} emissions from biomass boilers are presented in Appendix E, Table E-12. There are 28 biomass boiler entries in the database. Twelve of these biomass boilers are controlled with electrostatic precipitators (ESPs) or a combination of cyclones and ESPs. Ten are controlled with wet scrubbers or a combination of cyclones and wet scrubbers. Six are controlled by fabric filters.

Technically feasible particulate matter control technologies include fabric filters, ESPs, cyclones and wet scrubbers. However, from a top-down perspective, the most effective types of particulate matter control equipment being successfully applied to biomass boilers are fabric filters and ESPs. Fabric filters have surpassed ESPs as the preferred particulate control device because they provide better control for finer particulate matter.

Highlands Ethanol intends to install fabric filters on the biomass boilers, which represents the top level of BACT control and no further analysis is required. The emission rates shown in Table E-12 range from 0.0125 lb/MMBtu to 0.8 lb/MMBtu. Highlands Ethanol is proposing a PM_{10} BACT emission limit of 0.01 lb/MMBtu (filterable, based on Method 5), which is more stringent than any of the units listed in the permit database.

5.3.2.4 Steam Production, Backup Boiler

The backup boiler will be subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60, Subpart Db) because the boiler's maximum firing rate will be 198 MMBtu/hr, which is greater than the applicability threshold of 100 MMBtu/hr. Therefore filterable PM emissions are limited to 0.030 lb/MMBtu.

The permit database records relating to PM_{10} emissions from distillate oil-fired and natural gas-fired backup and auxiliary boilers are presented in Appendix E, Table E-13. In all cases, the control technology is either no control or use of clean fuels combined with good combustion practices. As discussed in Section 5.3.2.3 above, proven add-on particulate matter control technologies include fabric filters, electrostatic precipitators (ESP), cyclones and wet scrubbers. However, given the fact that the backup boiler will utilize clean fuels and only operate when the biomass boilers are down, add-on controls would not be cost effective.

BACT for particulate matter emissions from the backup boiler will be the use of clean fuels (either natural gas or ULSD) and good combustion practices. The proposed PM_{10} BACT emission limit is 0.0071 lb/MMBtu (filterable based on Method 5) if the backup boiler is fired with ULSD and 0.0022 lb/MMBtu if the backup boiler is fired with natural gas. These proposed emission rates are equivalent to the lowest emission rates shown in Table E-13.

5.3.2.5 Emergency Engines

As discussed in Section 4.0, the fire pump engine and emergency generators will be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). As such, the engines will be required to meet specific emission standards based on engine size, model year, and end use. Use of these engines for testing and maintenance will be limited to 100 hours per year. In addition, they will also be required to use diesel fuel that meets the requirements of 40 CFR 80. This means that beginning on October 1, 2010, the fuel used in these engines must have a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel, which is consistent with the characteristics of ULSD.

The permit database records relating to PM_{10} emissions from emergency diesel engines are presented in Appendix E, Table E-14. There are 20 entries in the database relating to emergency engines (fire pumps or emergency generators). Six of the entries list no control for PM_{10}. One entry limits the engine to 200 hours per year. The other 13 entries list engine design or good combustion practices, some in conjunction with low sulfur fuel. None of the entries list add-on controls.

While add-on controls would be technically feasible for application to internal combustion engines, it would not be cost effective given the high cost of add-on controls coupled with the extremely low emissions and very limited operating hours of these engines.

Good combustion practices are inherent in the design and efficient operation of the units. In addition, in accordance with 40 CFR 60, Subpart IIII, Highlands Ethanol will be required to utilize ULSD or propane in these units and operate them no more 100 hours per year for maintenance and testing. Therefore BACT for these units is good combustion practices, use of ULSD or propane, and operation for maintenance and testing purposes for no more than 100 hours per year. The proposed PM_{10} BACT emission limits are as follows:

- Emergency Generator – 0.2 g/kW-hr; and
- Fire Pump – 0.15 g/hp-hr.

5.3.2.6 Fugitive Dust from Roads

Approximately 130 trucks per day will be used to deliver feedstock and will use the unpaved feedstock roads, and an additional 100 vehicles per day will drive on the paved plant roads. The only practical measures to control fugitive dust from roads is paving the roads or employing other dust control measures such as wetting and maintaining low vehicle speeds. Therefore, to minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water. This constitutes BACT for this source.

5.3.3 Nitrogen Oxides

Nitrogen oxides (NO_X) are formed as a result of the combustion process through either the oxidation of nitrogen in the fuel (fuel NO_X) or fixation of atmospheric nitrogen (thermal NO_X). As such, NO_X control is primarily accomplished through either the combustion process or post combustion controls.

As detailed in Table 5-1, the specific sources of NO_X emissions at the Highlands Ethanol facility include:

- Steam Production; and
- Emergency Engines.

5.3.3.1 Steam Production, Biomass Boilers

Available Control Alternatives

The biomass boilers will be subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60, Subpart Db) because each boiler's maximum firing rate will be 198 MMBtu/hr, which is greater than the applicability threshold of 100 MMBtu/hr. Therefore NO_X emissions are limited to 0.30 lb/MMBtu for biomass firing.

Emission reduction techniques for NO_X encompass both combustion controls and post-combustion controls. In standard solid fuel boiler design, combustion controls include low NO_X burners, flue gas recirculation, and staged combustion/low excess air. However, these techniques are not applicable to the fluidized bed boiler design such as that proposed for the Highlands Ethanol project. Combustion in a fluidized bed unit results in inherently low NO_X emissions compared to other solid-fuel boiler designs resulting in emission levels similar to a traditional boiler design employing combustion controls. Therefore, the remainder of this analysis considers possible post-combustion NO_X control for the biomass boilers.

The permit database records relating to NO_X emissions from biomass boilers are presented in Appendix E, Table E-15. There are 29 biomass boiler entries in the database. Two of these biomass boilers are controlled with Selective Catalytic Reduction (SCR). Fourteen of the biomass boilers are controlled with Selective Noncatalytic Reduction (SNCR). The remaining 13 biomass boilers are controlled with good combustion design and operation. Therefore, add-on NO_X control technologies evaluated include SCR and SNCR.

SCR uses a combination of reducing reagent and a catalyst placed in the flue gas stream to promote the NO_X reduction reaction. In a full-scale SCR system, the flue gas is ducted through a separate reactor that contains a catalyst. With SCR, ammonia, which is used as the reducing agent, is injected into the flue gas upstream of a catalyst reactor that is placed in a location where the gas temperature is between 550 and 750°F (USEPA, 2002b). The ammonia reacts with NO_X on the catalyst to form nitrogen gas and water. The catalyst is installed in the reactor in layers. Catalysts can be installed with a specified number of catalyst layers with provisions for adding future layers if necessary. While SCR systems have the potential for high NO_X

removal, there are inherent operating concerns associated with their use such as plugging or poisoning of the catalyst, high dependence on proper flue gas temperature for NO_X reduction, and some emissions of unreacted ammonia ("ammonia slip").

SNCR uses injection of a NO_X reducing reagent, either ammonia (NH_3) or urea ($NH_2C(O)H_2$), into the flue gas downstream from the combustion zone. The reducing reagent is injected into the flue gas where the exhaust temperature is between 1,600°F and 2,100°F. The high gas temperatures support high chemical reaction rates so that a catalyst is not required. The reagent reduces NO_X to nitrogen and water. SNCR systems often have multiple injection levels to account for shifting of the optimal reaction temperature window (1,600 - 2,100°F) as the boiler load changes. This arrangement ensures maximum NO_X reduction over varying boiler loads and as the furnace heat exchange characteristics vary. With SNCR, placement of the reagent injection probes is important. If reagent is injected at a point where the temperature is greater than 2,100°F, ammonia or urea will react with oxygen to form additional NO_X. At gas temperatures below 1,600°F, excessive/unreacted ammonia passes through the ductwork and is discharged out the stack as ammonia slip.

SCR has been successfully applied at biomass, coal, oil and natural gas fired boiler facilities in the United States. In some applications, the SCR system can be located within the heat exchanger section upstream of the other air pollution control systems, termed hot-side application. However, this type of application is not feasible with the fluidized bed biomass boiler because of the high particulate matter loading prior to the fabric filter system. In this location, the catalyst is subject to damage from erosion, thermal sintering and fly ash deposition. Placement of an SCR system after other air pollution control equipment, termed cold side application, is the only feasible method of incorporating SCR into the fluidized bed boiler system. Cold side applications require flue gas reheat (i.e., fossil fuel is burned to reheat the flue gas) to raise the gas temperature from approximately 270°F to 650°F, the optimum temperature range for effective NO_X reduction across the catalyst bed. Reheating the gas stream also involves heat recovery that adds capital and operating expenses. SCR systems also require reagent storage and management systems and a process control system that monitors reagent usage to minimize ammonia slip.

There is also a significant amount of experience with SNCR systems in biomass boilers, including fluidized bed biomass boilers as documented in Table E-15. Therefore, this technology is technically feasible for implementation on the Highlands Ethanol biomass boilers.

Ranking of Technically Feasible Controls

With respect to the expected level of NO_X control using an SCR system, there are a number of variables that affect system performance, including presence of catalyst fouling contaminants in the gas stream, system operating temperature to optimize catalyst effectiveness, flue gas temperature to prevent condensation of acid gases, and formation of undesirable air contaminants such as ammonia bisulfite and ammonia chloride. NO_X emission reductions ranging from 50 to 90 percent are typical. The two SCR systems shown in Table E-15 have NO_X control efficiencies of 80 percent. SCR represents the top level of control.

NO_X emission reductions with SNCR typically range from 40 to 60 percent. As shown in Table E-15, control efficiencies of the SNCR systems installed on biomass boilers as reported in the permit database range from 48 to 65 percent. This represents the next most stringent level of control.

The only other available control option is good combustion control, which would provide the lowest level of control possible. However, the actual NO_X reduction with this control option is not quantifiable.

Economic, Energy, and Environmental Impacts

As discussed above the top level of control is SCR. The following presents the economic, energy, and secondary environmental impacts associated with installing SCR systems on the biomass boilers at the proposed Highlands Ethanol facility.

Economic Impacts

The analysis of applying SCR to the biomass boilers to control NO_X emissions is provided in Tables 5-2 and 5-3. The cost is based on a 2005 cost quotation from Riley Power to provide SCR on a 288 MMBtu/hr municipal solid waste boiler. SCR costs are a function of the exhaust gas flow rate. The exhaust gas flow rate of the boiler from the Riley cost quote is 74,188 scfm. The proposed biomass boilers will have an exhaust gas flow rate of 54,460 scfm. The basic equipment cost was scaled to correspond to the size of the Highlands Ethanol biomass boiler using the engineering "six-tenths" rule of economies of scale (Peters et al., 2002) as follows:

$$\text{Cost 2} = \text{Cost 1} \times (\text{Size 2}/\text{Size 1})^{0.6}$$

Costs were then escalated to 2008 dollars using Marshal & Swift Equipment Cost Indices (*Chemical Engineering*, 2008) from third quarter 2005 and third quarter 2008. The remainder of the cost information was developed using the cost estimation algorithms provided in the USEPA Office Air Quality Planning and Standards (OAQPS) Air Pollution Control Cost Manual (USEPA, 2002b). As described above, to be technically viable an SCR system needs to be placed on the cold side of the air pollution control train. As such, our cost estimates are based on locating the SCR unit downstream of the fabric filter and upstream of the induced draft fan, which would require flue gas reheating with a duct burner. Supporting calculations for the cost estimation are presented in Appendix E.

Table 5-2
Economic Analysis of SCR for Biomass Boilers - Capital Costs

Source Parameters		
Combustion source		Fluidized Bed Biomass Boiler
Heat Input (MMBtu/hr)		198
SCR location		Tail-end after baghouse
Uncontrolled NOx Emission Rate (tpy)		144.5
Uncontrolled NOx concentration (lb/MMBtu)		0.17
SCR NOx Control Efficiency		80%
Heat recovery		60%
Operating schedule (hr/yr)		8,760
Actual flow rate (acfm)		78,905
Standard Flow rate (scfm)		54,460
Standard Flow Rate for Boiler from Riley Power Cost Qote (scfm)		74,188
Inlet temperature (°F)		305
SCR temperature ((°F)		650
Ammonia Slip (assumed) (ppm)		2
Cost escalation factor (3rd Qtr 2005 - 3rd Qtr 2008)		1.165
Item	**Factor**	**Cost**
Equipment Costs		
Complete System SCR Equipment Cost	Based on Cost Quote from Riley Power(1)	$5,400,000
Auxiliary Equipment	All is included in Riler Power quote	$0
Cost Escalation to 2008 Dollars	Reference (2)	$900,000
Purchased Equipment Cost		$6,300,000
Sales Taxes	0.03 x Purchased Equipment Cost (3)	$189,000
Freight	0.05 x Purchased Equipment Cost (3)	$315,000
Total Equipment Cost		$6,804,000
Direct Installation Costs		
Foundation	0.08 x Total Equipment Cost (3)	$544,300
Erection and Handling	0.14 x Total Equipment Cost (3)	$952,600
Electrical	0.04 x Total Equipment Cost (3)	$272,200
Piping	0.02 x Total Equipment Cost (3)	$136,100
Insulation	0.01 x Total Equipment Cost (3)	$68,000
Painting	0.01 x Total Equipment Cost (3)	$68,000
Total Direct Installation Costs		$2,041,200
Direct Capital Cost	Total Equipment Cost + Direct Installation Costs	$8,845,200
Indirect Installation Costs		
General Facilities	0.05 x Direct Capital Cost (3)	$442,300
Engineering and Home Office Fees	0.1 x Direct Capital Cost (3)	$884,500
Process Contingency	0.05 x Direct Capital Cost (3)	$442,300
Total Indirect Installation Costs		$1,769,100
Total Direct Capital and Indirect Installed Costs		$10,614,300
Project Contingencies	0.15 of Total Direct and Indirect (3)	$1,592,100
Total Plant Costs		$12,206,400
Preproduction costs	0.02 of Total Plant Costs (3)	$244,100
Inventory Capital	Initial ammonia charge (assumes 1 week supply) (3)	$3,300
Total Capital Investment (TCI)		$12,453,800

Reference Sources:

(1) 2005 cost quote from Riley Power for a 288 MMBtu/hr boiler with a flow rate of 74,188 scfm scaled to proposed boiler of 198 MMBtu with a flow rate of 54,460 scfm using engineering "Six-Tenth's Rule"
Highlands Ethanol Cost = Quoted Cost ($6,500,000) x (54,460/74,198)^0.6 = $5,600,000

(2) Marshal & Swift Equipment Cost Index: 3rd Qtr 2005 = 1260.9; 3rd Qtr 2008 = 1469.5; ratio = 1469.5/1260.9 = 1.165

(3) U.S. EPA 2002. EPA Air Pollution Control Cost Manual, 6th Ed., Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, EPA/452/B-02-001, January, 2002

Table 5-3
Economic Analysis of SCR for Biomass Boilers - Annual Costs

Source Parameters			
Combustion source			Fluidized Bed Biomass Boiler
Heat Input (MMBtu/hr)			198
SCR location			Tail-end after baghouse
Uncontrolled NOx Emission Rate (tpy)			144.5
Uncontrolled NOx concentration (lb/MMBtu)			0.17
SCR NOx Control Efficiency			80%
Heat recovery			60%
Operating schedule (hr/yr)			8,760
Actual flow rate (acfm)			78,905
Standard Flow rate (scfm)			54,460
Inltet temperature (°F)			305
SCR temperature ((°F)			650
Ammonia Slip (assumed) (ppm)			2
Cost escalation factor (3rd Qtr 2005 - 2nd Qtr 2008)			1.165
Cost Item	**Cost Factor**	**Unit Cost**	**Total Cost**
Direct Annual Costs			
Maintenance	OAQPS Section 4, Chapter 2 SCR Costing (1)	0.015 of TCI	$186,800
Replacement Parts			
Catalyst Volume	OAQPS Section 4, Chapter 2 SCR Costing (1)	891 cu. ft.	
Estimated Catalyst Area	OAQPS Section 4, Chapter 2 SCR Costing (1)	82 sq. ft.	
Estimated Number of Catalyst Layers	OAQPS Section 4, Chapter 2 SCR Costing (1)	3	
Catalyst Life	Two year catalyst life (2)	2 yrs	
Catalyst Cost	Reference (2), escalated to 2008	$154 /cu. ft.	
Catalyst Replacement Cost			$68,600
Reagent Comsumption (19% aqueous ammonia)	OAQPS Section 4, Chapter 2 SCR Costing (1)	67 lb/hr	
Aqueous ammonia costs	19.2% aqueous ammonia delivered (4)	$575.00 /ton	$170,000
Utilities			
BTU Reheat Requirement	Heat Balance	72,799 MMBtu/yr	
Heat Contribution of Waste Stream	Assume zero	0 MMBtu/yr	
Net BTU Reheat Requirement		72,799 MMBtu/yr	
Natural Gas Requirement	1,000 Btu/cu.ft (natural gas)	72,799,000 cu. ft./yr	
Natural Gas Cost	$13.19/1,000 cu. Ft (5)	$13.19 /1000 cu ft	$960,200
Electricity Requirement	OAQPS Section 4, Chapter 2 SCR Costing (1)	571,000 kWhr/yr	
Electricity Cost	$0.10/kWhr (5)	$0.10 /kWhr	$59,700
Indirect Annual Cost			
Administrative Charges	2% TCI (1)	NA	$249,100
Property Taxes	1% TCI (1)	NA	$124,500
Insurance	1% TCI (1)	NA	$124,500
Equipment Life	NA	20 yrs	
Interest Rate	NA	7%	
Capital Recovery Factor	NA	0.094	
Capital Recovery	CRF x TCI		$1,175,600
Total Annual Cost			$3,119,000
Uncontrolled NOx Emission Rate (tpy)			144.5
NOx Controlled (tpy)			115.6
NOx Emitted (tpy)			28.9
Cost Effectiveness ($/ton controlled)			**$27,000**

Reference Sources:

(1) U.S. EPA 2002. EPA Air Pollution Control Cost Manual, 6th Ed., Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, EPA/452/B-02-001, January, 2002
(2) Communication with Rich Abrams of Babcock Power Environmental Inc. on January 11, 2005, supplier of SCR systems.
(3) Communication with John Bowman of Babcock Power Environmental Inc. on August 22, 2008, supplier of SCR systems.
(4) Ammonia pricing information from ICIS.com 11/25/08
(5) Local energy costs for Florida from the U.S. Energy Information Administration 11/14/08

As presented in Table 5-2 the total capital investment cost for an SCR system is estimated to be $12,453,800. Table 5-3 presents the estimated annual operating cost of $3,119,000. Based on these costs the cost effectiveness value associated with using SCR would be $27,000 per ton of NO_X removed. This value is significant and would not be considered cost effective. The high economic impact of applying SCR to the biomass boilers would eliminate the control technology from further consider as BACT.

Energy Impacts

The annual energy impacts resulting from using an SCR system would be the use of over 72,700,000 additional cubic feet of natural gas to re-heat the flue gas and nearly 571,000 kWh per year of electricity to overcome the increased pressure drop across the catalyst reactor. The energy impact from natural gas consumption would be 629,700 cubic feet of natural gas per ton of NO_X controlled. The impact associated with electricity consumption would be 4,939 kWh per ton of NO_X controlled. These values represent significant energy impacts and would be considered excessive given the level of NO_X emissions controlled. These energy impacts, aside from the high economic impact, eliminate SCR from further consideration as BACT.

Environmental Impacts

The environmental impacts associated with using SCR are not inconsequential. These impacts result primarily from the combustion of additional fossil fuel to reheat the flue gas. Firing natural gas in a duct burner would not only increase NO_X emissions, the pollutant intended to be controlled by the SCR system, but would also increase CO, VOC, SO_2, and PM emissions. In addition, a significant amount of greenhouse gas emissions (CO_2) would be generated. Estimated emissions from firing the required amount of natural gas were calculated using natural gas combustion emission factors from Section 1.4 of USEPA's AP-42 (USEPA, 1998) as follows:

- VOC 0.2 tpy;
- NO_X 3.6 tpy;
- SO_2 0.02 tpy;
- CO 3.1 tpy;
- PM 0.3 tpy; and
- CO_2 4,368 tpy.

The increase in emissions represents a significant environmental impact. Additionally, an SCR system would generate a solid waste stream in the form of spent catalyst that would also have a negative environmental impact.

Determination of BACT

Given the excessive economic, energy, and environmental impacts associated with application of SCR, it was eliminated from consideration as BACT. The next most stringent control technology available is SNCR. Because the top level of control was eliminated as BACT, the next most stringent level of control, SNCR, has been determined to be BACT. Therefore, Highlands Ethanol proposes to install SNCR to control NO_X emissions from the biomass boilers.

The NO_X emission limits associated with the SNCR systems in the permit database shown in Table E-15 range from 0.075 lb/MMBtu to 0.25 lb/MMBtu. With the exception of one system , all have emission rates at 0.1 lb/MMBtu or greater. Highlands Ethanol proposes a NO_X BACT emission limit of 0.075 lb/MMBtu. This is equivalent to the lowest emission rate found in the permit database.

5.3.3.2 Steam Production, Backup Boiler

Available Control Alternatives

The backup boiler will be subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60, Subpart Db) because the boiler's maximum firing rate will be 198 MMBtu/hr, which is greater than the applicability threshold of 100 MMBtu/hr. Therefore NO_X emissions are limited to 0.1 to 0.2 lb/MMBtu when firing low and high heat release rate distillate oil.

As discussed in Section 5.3.3.1, emission reduction techniques for NO_X encompass both combustion controls and post-combustion controls. Unlike the biomass boilers, which have a unique design, the backup boiler will be a standard package boiler design. Consequently, combustion controls are an available option and Highlands Ethanol proposes to install a backup boiler with low NO_X burners and flue gas recirculation (FGR), which is the highest level of combustion controls available.

The permit database records relating to NO_X emissions from backup and auxiliary boilers are presented in Appendix E, Table E-16. There are 12 auxiliary boiler entries in the database that were listed in permit records as "auxiliary boilers." Two of these boilers have no controls. One of the boilers is controlled with Selective Catalytic Reduction (SCR). The remainder are controlled with low NO_X burners, four in conjunction with FGR and three in conjunction with good combustion controls.

Proven add-on NO_X control technologies include SCR and SNCR. However, given the fact that the backup boiler will utilize clean fuels and only operate when the biomass boilers are not operational, add-on controls would not be cost effective. Therefore, the base level of control for the backup boiler, low NO_X burners with FGR, is determined to be BACT.

The emission rates in the permit database for auxiliary boilers controlled with combustion controls, as shown in Table E-16, range from 0.072 lb/MMBtu to 0.169 lb/MMBtu for oil firing and from 0.035 lb/MMBtu to 0.137 lb/MMBtu for natural gas firing. The proposed NO_X BACT emission limit is 0.072 lb/MMBtu if the backup boiler is fired with ULSD and 0.035 lb/MMBtu if the backup boiler is fired with natural gas. These proposed emission rates are equivalent to the lowest emission rates shown in Table E-16.

5.3.3.3 Emergency Engines

As discussed in Section 4.0, the fire pump engine and emergency generators will be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). As such, the engines will be required to meet specific emission standards based on engine size, model year, and end use. Use of these engines for testing and maintenance will be limited to 100 hours per year. In addition, they will also be required to use diesel fuel that meets the requirements of 40 CFR 80. This means that beginning on October 1, 2010, the fuel used in these engines must have a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel, which is consistent with the characteristics of ULSD.

The permit database records relating to NO_X emissions from emergency diesel engines are presented in Appendix E, Table E-17. There are 21 entries in the database relating to NO_X emissions from emergency engines (fire pumps or generators). Five of the entries list no control for NO_X. The others entries list good combustion practices and low sulfur fuel. Three entries list engine ignition timing retard, some in combination with good combustion practices and/or low sulfur fuel. None of the entries list add-on controls.

While add-on controls would be technically feasible for application to internal combustion engines, it would not be cost effective given the high cost of add-on controls coupled with the extremely low emissions and very limited operating hours.

Highlands Ethanol proposes to utilize ULSD or propane in these units. These units will be new units and will be required to meet the NSPS for internal combustion engines (40 CFR 60, Subpart IIII) as well. Therefore BACT for NO_X emissions from these units is good combustion practices, use of ULSD or propane, and operation for no more than 100 hours per year for maintenance and testing. The proposed NO_X BACT emission limits are as follows:

- Emergency Generator – 5.76 g/kW-hr; and
- Fire Pump – 2.7 g/hp-hr.

5.3.4 Sulfur Dioxide

Sulfur dioxide (SO_2) emissions result from the oxidation of sulfur bearing compounds in the fuel. SO_2 emissions can be controlled by pre-combustion, combustion or post-combustion controls.

As detailed in Table 5-1, the specific sources SO_2 emissions at the Highlands Ethanol facility include:

- Steam Production; and
- Emergency Engines.

5.3.4.1 Steam Production, Biomass Boilers

Available Control Alternatives

Control strategies for SO_2 emissions include pre-combustion controls, combustion zone controls, and post-combustion controls. Pre-combustion control strategies involve the use of low sulfur fuels. Combustion zone control is achieved by sorbent (e.g., limestone) injection into the fluidized bed. Post-combustion controls comprise wet or dry flue gas scrubbing processes (e.g., spray dryer absorbers).

The permit database records relating to SO_2 emissions from biomass boilers are presented in Appendix E, Table E-18. There are 15 biomass boiler entries in the database relating to SO_2 emissions. Four of these boilers have no control. Three are controlled with dry scrubbers (spray dryer absorbers) and two are controlled with lime or sodium bicarbonate injection. Two list either spray dryer absorber or sodium bicarbonate injection. One lists inherent scrubbing from calcium in the fuel. The remaining three have fuel sulfur limitations.

With sorbent injection, dry sorbent is injected into the fluidized bed to react with acid gases in the flue gas. The reacted calcium salts and unused dry sorbent is then captured in the downstream particulate matter control device. Dry sorbents used are typically limestone or hydrated lime.

Wet scrubbers for acid gas control use an alkaline liquid, typically either caustic soda solution or lime slurry to scrub the flue gases. In larger systems, the use of lime slurry is common for economic reasons. Lime slurry systems react with SO_2 and other acid gases to form calcium based salts which require clarifying, thickening, and vacuum filtering to avoid a concentration build-up of precipitated salts in the system. Sodium-based systems produce a liquid waste with highly soluble sodium-based salts which may require the use of large, carefully contained, holding pond(s) or wastewater treatment plants.

With spray dryer absorbers (also referred to as dry scrubbers, spray dryers, or semi-dry scrubbers), flue gases from the boiler are introduced into an absorbing chamber where the gases are contacted by atomized lime slurry. To form the lime slurry, lime is hydrated by slaking with water. The slurry and any additional cooling water which may be required are pumped to nozzles or a rotary atomizer inside the scrubber's absorbing chamber. Acid gases are absorbed by the slurry mixture and the alkaline component reacts with the gases to form salts. Evaporation of the water produces a finely divided particle of mixed salt and unreacted alkali and results in the flue gas having a lower temperature. A portion of the dry powder drops to the bottom of the scrubber vessel while the flue gases, containing the remaining powder with reacted acid gas salts and the particulates generated during combustion, are delivered to the particulate collection device (e.g., fabric filter) for removal.

Technically Feasible Controls

The boiler is designed to burn stillage cake from the distillation process as its primary fuel. The sulfur content of the stillage cake will be a function of the raw materials that are input to the process (energy cane and forage sorghum) and the hydrolysis process which uses sulfuric acid. The sulfur content of the fuel may be variable and is not under the direct control of Highlands Ethanol. Therefore, use of low sulfur fuel is not technically feasible. The only SO_2 emissions control methods that are technically feasible are combustion zone controls (limestone injection) and post-combustion controls (wet scrubber or spray dryer absorber).

Spray dryer absorbers or wet scrubbers are typically understood to provide the highest level of SO_2 control possible in boiler applications. With the fluidized bed design, however, limestone injection can provide SO_2 controls equivalent to that of spray dryer absorbers or wet scrubbers. Therefore, all three technologies are considered equivalent in this application and represent the top level of control.

Economic, Energy, and Environmental Impacts

Highlands Ethanol proposes to utilize limestone injection to control SO_2 emissions from the biomass boilers, which represents the top level of control. Therefore, an analysis of economic, energy, and environmental impacts is not required.

Determination of BACT

Highlands Ethanol plans to utilize limestone injection for the biomass boilers, which is the top level of control, and therefore represents BACT. The SO_2 emission rates in the permit database for biomass boilers, as shown in Table E-18, range from 0.02 lb/MMBtu to 1.54 lb/MMBtu. For this project, the hydrolysis process results in additional sulfur in the fuel and therefore, slightly higher SO_2 emissions. Taking this into account, Highlands Ethanol proposes a SO_2 BACT emission limit of 0.06 lb/MMBtu based on a 30-day rolling average. Because of the potential for variability in short-term levels of sulfur in the fuel, Highlands Ethanol further proposes SO_2 BACT emission limits of 0.12 lb/MMBtu (24-hour rolling average) and 0.14 lb/MMBtu (3-hour block average).

5.3.4.2 Steam Production, Backup Boiler

The permit database records relating to SO_2 emissions from distillate oil-fired and natural gas-fired backup and auxiliary boilers are presented in Appendix E, Table E-19. In all cases, the control technology is either no control or use of low sulfur fuels. Given the fact that the backup boiler will utilize clean fuels and only operate when the biomass boilers are not operational, add-on controls would not be cost effective. Therefore, BACT for SO_2 from the backup boiler is use of clean fuels (either natural gas or ULSD.

The SO_2 emission rates in the permit database for auxiliary boilers, as shown in Table E-19, range from 0.051 lb/MMBtu to 0.055 lb/MMBtu for oil firing and from 0.000018 lb/MMBtu to 0.0055 lb/MMBtu for natural gas firing. Highlands Ethanol proposes a SO_2 BACT emission limit of 0.0017 lb/MMBtu for ULSD firing (based on ULSD sulfur content) and 0.0056 lb/MMBtu for natural gas firing, (based on FDEP's presumed sulfur content of natural gas of 0.02 gr/scf). These proposed emission rates are equivalent to the lowest emission rates shown in Table E-19.

5.3.4.3 Emergency Engines

As discussed in Section 4.0, the fire pump engine and emergency generators will be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). As such, the engines will be required to meet specific emission standards based on engine size, model year, and end use. Use of these engines for testing and maintenance will be limited to 100 hours per year. In addition, they will also be required to use diesel fuel that meets the requirements of 40 CFR 80. This means that beginning on October 1, 2010, the fuel used in these engines must have a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel, which is consistent with the characteristics of ULSD.

SO_2 emissions are a function of the sulfur content in the fuel rather than any other combustion variables. The only practical control technique available for emergency engines that will operate no more than 100 hours per year for testing and maintenance is the use of low sulfur fuels. The permit database records relating to SO_2 emissions from emergency engines are presented in Appendix E, Table E-20. In all cases, the control technology is either no control or use of low sulfur fuels.

Highlands Ethanol proposes to utilize ULSD or propane in these units. These units will be new units and will be required to meet the NSPS for internal combustion engines (40 CFR 60, Subpart IIII) as well. Therefore BACT for SO_2 emissions from these units is good combustion practices, use of ULSD or propane, and operation for no more than 100 hours per year for maintenance and testing.

5.3.5 Carbon Monoxide

Carbon monoxide (CO) is produced by the incomplete oxidation of the fuel. CO emissions can be controlled by combustion or post-combustion controls.

As detailed in Table 5-1, the specific sources of CO emissions at the Highlands Ethanol facility include:

- Steam Production; and
- Emergency Engines.

5.3.5.1 Steam Production, Biomass Boilers

Available Control Alternatives

The following methods for reduction or control of CO emissions from boilers were identified:

- Good combustion practice; and
- CO oxidation catalysts.

Good combustion practice, also known as burner optimization, is usually the first method used to control formation of CO (as well as VOC and NO_X) and was discussed in Section 5.3.1.8. CO oxidation catalysts promote the oxidation of CO to carbon dioxide and water as the emission stream passes through the catalyst bed. These catalysts are similar or identical to the catalysts used to oxidize VOC in emissions from stationary sources as discussed in Section 5.3.1.8.

The permit database records relating to CO emissions from biomass boilers are presented in Appendix E, Table E-21. Four of the boilers listed in the database have no controls. Three are controlled by oxidation catalysts, and the remainder are controlled by good combustion practices.

Technically Feasible Controls

Oxidation catalysts are typically considered the top level of control. However, the oxidation catalyst technology has never been applied to a fluidized bed biomass boiler. Particulate matter emissions from a fluidized bed biomass boiler are significantly higher than from a standard natural gas or distillate oil fired boiler, which is the application typical for an oxidation catalyst. Given the high particulate matter loading from the boiler, it is not practical to install the oxidation catalyst in the location where the temperature is conducive to catalyst operation upstream of the fabric filter. Therefore, an oxidation catalyst on a fluidized bed biomass boiler is not technically feasible due to the operating temperature requirements and the need to place the catalyst downstream of the particulate controls to avoid plugging of the catalyst. To reheat the flue gas to the required temperature for an oxidation catalyst, over 72,799,000 cubic feet of natural gas per year would be fired in the duct burner, which is a significant energy impact. Firing natural gas in a duct burner would not only increase CO emissions, the pollutant intended to be controlled by the oxidation catalyst, but would also increase NO_X, SO_2, VOC, and PM emissions. In addition, a significant amount of greenhouse gas emissions (CO_2) would be generated. Estimated emissions from firing the required amount of natural gas are calculated using natural gas combustion emission factors from Section 1.4 of USEPA's AP-42 (USEPA, 1998) as follows:

- VOC 0.2 tpy;
- NO_X 3.6 tpy;
- SO_2 0.02 tpy;
- CO 3.1 tpy;
- PM 0.3 tpy; and
- CO_2 4,368 tpy.

In addition to these issues, other constituents in the flue gas would cause fouling and deactivation of the catalyst bed. The CO control efficiency from good combustion practices is not readily quantifiable, but combustion parameters, such as air to fuel ratio can be monitored to assure optimal combustion conditions for minimizing air emissions. Given these significant energy, and environmental impacts, an oxidation catalyst would not be considered BACT for controlling CO from the biomass boilers. Therefore, good combustion practices represents the top level of control for the Highlands Ethanol Project.

Determination of BACT

The top level of control, an oxidation catalyst, was determined to not represent BACT based on its excessive energy and environmental impacts. Therefore, Highlands Ethanol plans to utilize good combustion practices to control CO emissions from the biomass boilers, which is the next most stringent level of control, and therefore represents BACT.

The proposed CO BACT emission limit is 0.1 lb/MMBtu, which as shown in Table E-21, is equivalent to the lowest permitted CO emission rate identified for fluidized bed biomass boilers and is being achieved by PSNH's Schiller Station in New Hampshire.

5.3.5.2 Steam Production, Backup Boiler

As discussed in Section 5.3.5.1 above, proven CO control technologies include oxidation catalysts or good combustion practices. The permit database records relating to CO emissions from natural gas-fired and No. 2 fuel oil-fired backup and auxiliary boilers are presented in Appendix E, Table E-22. There are 12 facilities in the database relating to auxiliary boilers.

Three facilities have no control for CO, seven facilities utilize good combustion practices to control CO, one facility limits operating hours, and one facility utilizes an oxidation catalyst to control CO.

Given the fact that the backup boiler will utilize clean fuels and only operate when the biomass boilers are not operational, add-on controls would not be cost effective. Therefore, BACT for CO emissions from the backup boiler is good combustion practices.

The CO emission rates in the permit database for auxiliary boilers, as shown in Table E-22, range from 0.035 lb/MMBtu to 0.036 lb/MMBtu for oil firing and from 0.037 lb/MMBtu to 0.0824 lb/MMBtu for natural gas firing. Highlands Ethanol proposes a CO BACT emission limit of 0.035 lb/MMBtu for oil firing and 0.037 lb/MMBtu for natural gas firing. These proposed emission rates are equivalent to the lowest emission rates shown in Table E-22, including the one facility using an oxidation catalyst.

5.3.5.3 Emergency Engines

As discussed in Section 4.0, the fire pump engine and emergency generators will be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). As such, the engines will be required to meet specific emission standards based on engine size, model year, and end use. Use of these engines for testing and maintenance will be limited to 100 hours per year. In addition, they will also be required to use diesel fuel that meets the requirements of 40 CFR 80. This means that beginning on October 1, 2010, the fuel used in these engines must have a maximum sulfur content of 15 ppmw (0.0015 percent) for non-road diesel fuel, which is consistent with the characteristics of ULSD.

As with the other combustion sources, good combustion practice and CO oxidation catalysts are available control alternatives. The permit database records relating to CO emissions from emergency diesel engines are presented in Appendix E, Table E-23. There are 22 entries in the database relating to emergency engines (fire pumps or generators). Six of the entries list no control for CO and the other entries list engine design or good combustion practices, some in conjunction with low sulfur fuel and limiting operating hours. None of the entries list add-on controls.

While the oxidation catalyst technology is technically feasible for application to internal combustion engines, it would not be cost effective given the high cost of add-on controls coupled with the low emissions and very limited operating hours

Good combustion practices are inherent in the design and efficient operation of the unit. In addition, Highlands Ethanol proposes to utilize ULSD or propane in these units. Therefore BACT for these units is good combustion practices, use of ULSD or propane, and operation for no more than 100 hours per year for testing and maintenance. The proposed CO BACT emission limits are as follows:

- Emergency Generator – 3.5 g/kW-hr; and
- Fire Pump – 2.6 g/hp-hr.

5.3.6 Summary of BACT Determinations

A summary of BACT determinations, including the control alternative determined to be BACT and the proposed BACT emission limits for each pollutant and emission source subject to PSD review is presented in Table 5-4.

Table 5-4. Summary of BACT Determinations

Pollutant	Emission Source	BACT Control Alternative	Proposed BACT Emission Limits
VOC	Liquid/Solid Separation	Wet Scrubber	98% control 0.6 lb/hr 2.1 tpy
	Fermentation/Distillation	Wet Scrubber	98% control 5.1 lb/hr 18.8 tpy
	Product/Denaturant Storage	Internal Floating Roof Tanks	
	Product Loadout	Flare	98% control
	Misc. Storage Tanks	Vertical Fixed Roof Tanks	
	WWTP (Aerobic)	Covered Equalization Tank and Primary Clarifier	
	WWTP (Anaerobic)	Flare	98% control
	Cooling Tower	Monitor Cooling Water for VOCs	
	Biomass Boilers	Good Combustion Practices	0.005 lb/MMBtu
	Backup Boiler	Good Combustion Practices	0.0014 lb/MMBtu (gas) 0.0015 lb/MMBtu (if ULSD)
	Fire Pump Engine	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.3 g/hp-hr
	Emergency Generators	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.64 g/kW-hr
	Stillage Loadout	Maintain Ambient Temperature	
	Fugitive Equipment Leaks	LDAR Program	

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Table 5-4. Summary of BACT Determinations (continued)

Pollutant	Emission Source	BACT Control Alternative	Proposed BACT Emission Limits
PM_{10}	Misc. Storage Silos	Fabric Filter	0.005 gr/dscf
	Cooling Tower	Drift Eliminator	0.0005% Drift Loss
	Biomass Boilers	Fabric Filter	0.01 lb/MMBtu (filterable)
	Backup Boiler	Good Combustion Practices Use of Natural Gas or ULSD	0.0022 lb/MMBtu (filterable) (gas) 0.0071 lb/MMBtu (filterable) (if ULSD)
	Fire Pump Engine	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.15 g/hp-hr (filterable)
	Emergency Generators	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.2 g/kW-hr (filterable)
	Fugitive Dust from Roads	Road Wetting During Dry Periods	
NO_X	Biomass Boilers	SNCR	0.075 lb/MMBtu
	Backup Boiler	Low NO_X Burners with FGR	0.035 lb/MMBtu (gas) 0.072 lb/MMBtu (if ULSD)
	Fire Pump Engine	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	2.7 g/hp-hr
	Emergency Generators	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	5.76 g/kW-hr

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Table 5-4. Summary of BACT Determinations (continued)

Pollutant	Emission Source	BACT Control Alternative	Proposed BACT Emission Limits
SO_2	Biomass Boilers	Limestone Injection	0.06 lb/MMBtu (30-day rolling) 0.12 lb/MMBtu (24-hour rolling) 0.14 lb/MMBtu (3-hour block)
	Backup Boiler	Use of Natural Gas or ULSD	0.0056 lb/MMBtu (gas) 0.0017 lb/MMBtu (if ULSD)
	Fire Pump Engine	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.0015% sulfur content
	Emergency Generators	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	0.0015% sulfur content
CO	Fluidized Bed Biomass Boilers	Good Combustion Practices	0.1 lb/MMBtu
	Backup Boiler	Good Combustion Practices	0.037 lb/MMBtu (gas) 0.035 lb/MMBtu (if ULSD)
	Fire Pump Engine	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	2.6 g/hp-hr
	Emergency Generators	Good Combustion Practices Use of ULSD or Propane Limit Operation to 500 hr/yr	3.5 g/hp-hr

6.0 AMBIENT AIR QUALITY IMPACT ANALYSIS

The ambient air quality analysis addresses several PSD requirements. These include:

- a significant impact analysis (SIA) for the project itself,
- an interactive source analysis that demonstrates compliance with NAAQS, FAAQS, and PSD increments and includes emissions from the project as well as other facilities in the vicinity of the significant impact area of the project,
- an assessment of pre-construction monitoring requirements,
- an assessment of Class I area modeling requirements, and
- an additional impacts analysis that addresses community growth impacts on air quality, project impacts on local soils and vegetation, and visibility impairment resulting from the project.

6.1 Significant Impact Analysis

The purpose of the SIA is to assess the need for interactive source modeling. For the SIA, a criteria pollutant emission inventory is prepared and a Good Engineering Practice (GEP) stack height analysis is performed to identify emissions, stack parameters, and building downwash parameters for input to the dispersion model. A receptor grid and meteorological data are also prepared for input to the dispersion model. Ambient concentrations resulting from the proposed facility configuration are then predicted by the dispersion model and compared to SILs prescribed by the USEPA and FDEP. If the predicted concentrations are less than the SILs, then compliance with NAAQS, FAAQS, and ambient increment standards is demonstrated and no additional modeling is required. Conversely, if the predicted concentrations are greater than the SILs, then an interactive source analysis is required to demonstrate compliance with the NAAQS, FAAQS, and ambient increment standards. The SIA is pollutant-specific. For example, if predicted CO concentrations are less than the SILs and predicted SO_2 concentrations are greater than the SILs, then an interactive source analysis is not required for CO but is required for SO_2.

6.1.1 Site Location

The site location is described in Section 2.1 of this application and presented in Figure 2-1. A site plan is presented in Appendix C.

6.1.2 SIA Emission Inventory

Potential emissions for the project are presented in Section 3 of this application. In addition to the potential emissions listed there, USEPA modeling guidelines require evaluation of various operating loads for the proposed boilers. Load conditions are evaluated because model-predicted concentrations from reduced load conditions can be greater than from full load conditions. This results from reduced plume rise due to reduced exhaust flow. The load conditions evaluated are full load, 75% load, and 50% load.

Table 6-1 presents the stack and exhaust parameters modeled for the project's point sources. Included are the three load conditions for the boilers. Coordinates for each stack were identified by mapping the site plan to rectified aerial photographs of the site. Universal Transverse Mercator (UTM) coordinates of each stack are projected to UTM Zone 17 and the 1983 North American Datum (NAD83). Figure 6-1 shows the stack locations on the plot plan.

Table 6-2 presents the emissions modeled for the Project's point sources. Included are the three load conditions for the boilers. Short-term emission rates are modeled for all pollutants even for comparison to annual SILs, which provides for a conservative assessment of annual significant impacts.

6.1.3 Good Engineering Practice Stack Height Analysis

A GEP stack height analysis was conducted to evaluate whether the plumes emitted from the stacks are subjected to building wake effects. If a stack is sufficiently close to a large building, the plume can be entrained in the building's wake. The winds in the wake of the building cause the plume's rise to be diminished, which results in increased ground level ambient concentrations.

There are two definitions of GEP stack height: formula GEP stack height; and regulatory GEP stack height. The USEPA requires building downwash effects to be evaluated when a stack is less than formula GEP stack height (see Equation 6-1 below). Regulatory GEP stack height is either 65 meters or formula GEP stack height, whichever is greater. Sources are not allowed to take credit for ambient air concentrations that result from stacks that are higher than regulatory GEP stack height.

An analysis of the stack heights with respect to GEP was conducted in accordance with the USEPA's guideline for air quality impact modeling. The USEPA's Building Profile Input Program for PRIME (BPIPPRM, version 04274; USEPA, 2004b) was used to compute the formula GEP stack heights and to generate wind direction specific building profiles for sequential modeling. Formula GEP stack height is defined as:

$$H_{GEP} = H_B + 1.5L_B \tag{6-1}$$

where:

H_{GEP} = formula GEP stack height,
H_B = the building's height above stack base, and
L_B = the lesser of the building's height or maximum projected width.

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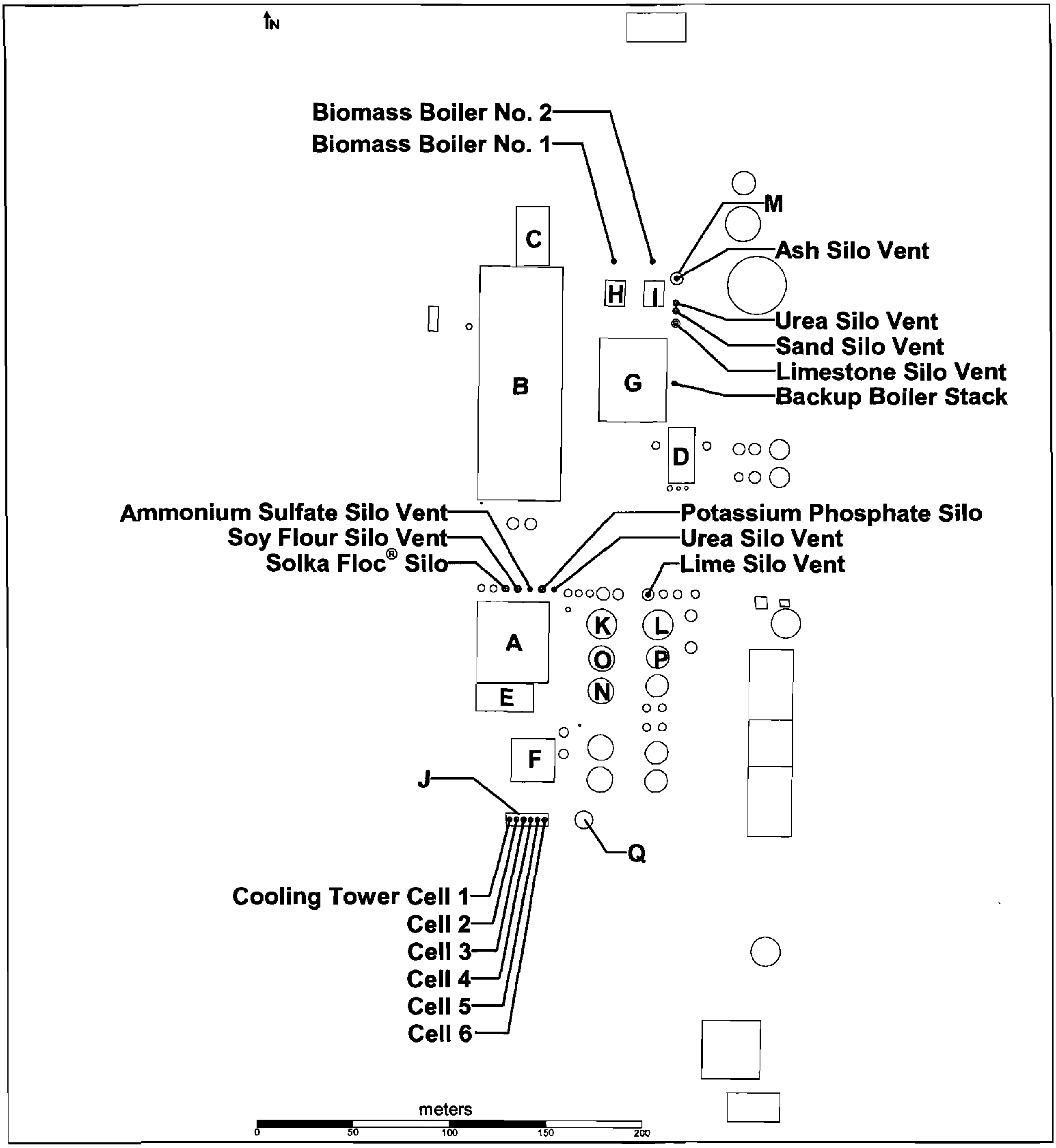
Table 6-1. Stack and Exhaust Parameters

Stack (Load)	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Exit Diameter (m)	Exhaust Flow (acms)	Exhaust Temp. (°K)	Exit Velocity (m/s)
Bio. Boiler No. 1 (100%)	493,273.9	3,013,178.2	11.0	54.9	1.83	37.2	425	14.2
Bio. Boiler No. 1 (75%)	493,273.9	3,013,178.2	11.0	54.9	1.83	27.9	425	10.6
Bio. Boiler No. 1 (50%)	493,273.9	3,013,178.2	11.0	54.9	1.83	18.6	425	7.1
Bio. Boiler No. 2 (100%)	493,294.0	3,013,178.0	11.0	54.9	1.83	37.2	425	14.2
Bio. Boiler No. 2 (75%)	493,294.0	3,013,178.0	11.0	54.9	1.83	27.9	425	10.6
Bio. Boiler No. 2 (50%)	493,294.0	3,013,178.0	11.0	54.9	1.83	18.6	425	7.1
Backup Boiler	493,304.7	3,013,114.0	11.0	45.7	1.52	29.1	450	15.5
CT Cell No. 1	493,218.6	3,012,886.0	11.0	8.5	2.44	35.6	303	7.62
CT Cell No. 2	493,222.2	3,012,886.0	11.0	8.5	2.44	35.6	303	7.62
CT Cell No. 3	493,225.8	3,012,886.0	11.0	8.5	2.44	35.6	303	7.62
CT Cell No. 4	493,229.5	3,012,885.8	11.0	8.5	2.44	35.6	303	7.62
CT Cell No. 5	493,233.1	3,012,885.8	11.0	8.5	2.44	35.6	303	7.62
CT Cell No. 6	493,236.8	3,012,885.8	11.0	8.5	2.44	35.6	303	7.62
Lime Silo	493,291.1	3,013,003.8	11.0	32.0	0.46	1.18	298	7.19
Ash Silo	493,306.3	3,013,168.8	11.0	10.4	0.46	1.18	298	7.19
SNCR Urea Silo	493,306.1	3,013,156.0	11.0	10.4	0.46	1.18	298	7.19
Sand Silo	493,306.1	3,013,151.8	11.0	10.4	0.46	1.18	298	7.19
Limestone Silo	493,306.0	3,013,145.2	11.0	10.4	0.46	1.18	298	7.19
Solka-Floc® Silo	493,217.1	3,013,006.5	11.0	14.5	0.46	1.18	298	7.19
Soy Flour Silo	493,223.4	3,013,006.5	11.0	14.5	0.46	1.18	298	7.19
Ammonium Sulf. Silo	493,229.8	3,013,006.5	11.0	10.8	0.46	1.18	298	7.19
Potassium Phos. Silo	493,236.1	3,013,006.2	11.0	14.5	0.46	1.18	298	7.19
Urea Process Silo	493,242.3	3,013,006.2	11.0	10.8	0.46	1.18	298	7.19



Note: Structures are labeled with blue codes that refer to Table 6-4. Only those structures that contributed to downwash are labeled. All others are listed on the site plan provided in Appendix C. Stacks and vents are marked in black.

Figure 6-1
Site Plan and BPIPPRM Cross-Reference

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Table 6-2. Modeled Emission Rates [a]

Stack (Load)	SO_2 (g/s)	PM_{10} (g/s)	NO_2 (g/s)	CO (g/s)	Pb (g/s)
Bio. Boiler No. 1 (100%)	4.99	1.25	2.49	4.99	0.0012
Bio. Boiler No. 1 (75%)	3.74	0.936	1.87	3.74	0.0009
Bio. Boiler No. 1 (50%)	2.49	0.624	1.25	2.49	0.0006
Bio. Boiler No. 2 (100%)	4.99	1.25	2.49	4.99	0.0012
Bio. Boiler No. 2 (75%)	3.74	0.936	1.87	3.74	0.0009
Bio. Boiler No. 2 (50%)	2.49	0.624	1.25	2.49	0.0006
Backup Boiler	0.140	0.177	1.80	0.923	0.0002
CT Cell No. 1	--	0.00325	--	--	--
CT Cell No. 2	--	0.00325	--	--	--
CT Cell No. 3	--	0.00325	--	--	--
CT Cell No. 4	--	0.00325	--	--	--
CT Cell No. 5	--	0.00325	--	--	--
CT Cell No. 6	--	0.00325	--	--	--
Lime Silo	--	0.0135	--	--	--
Ash Silo	--	0.0135	--	--	--
SNCR Urea Silo	--	0.0135	--	--	--
Sand Silo	--	0.0135	--	--	--
Limestone Silo	--	0.0135	--	--	--
Solka-Floc® Silo	--	0.0135	--	--	--
Soy Flour Silo	--	0.0135	--	--	--
Ammonium Sulfate Silo	--	0.0135	--	--	--
Potassium Phosphate Silo	--	0.0135	--	--	--
Urea Process Silo	--	0.0135	--	--	--

[a] All emission rates based on proposed BACT emission limits. See Appendix C.

BPIPPRM requires a digitized blueprint of the facility's buildings and stacks. The position and height of buildings relative to the stack positions must be evaluated in the GEP analysis. The building positions were obtained from a site plan of the proposed project. Coordinates for each building tier corner were identified by mapping the site plan to rectified aerial photographs of the site. Roof heights for the project were obtained from preliminary designs of the facility structures.

The layout of the facility is displayed in Figure 6-1. The project stack locations are also identified in this figure. The building heights shown in Figure 6-1 are referenced to a base elevation of 11 meters for the project. The associated BPIPPRM building-tier identifications are provided in Table 6-3.

Table 6-4 provides the results of the analysis. Presented for each stack are:

- the structure(s) that defines formula GEP for the stack (controlling structure),
- the height of the controlling structure,
- the projected width of the controlling structure,
- structure shape (i.e., squat or tall),
- formula GEP stack height,
- regulatory GEP stack height, and
- the actual stack height.

The stack heights are less than the calculated formula GEP height. Therefore, building wake effects will be evaluated for all of the stacks in all modeling runs. Because the actual stack heights are less than both formula and regulatory GEP heights, the actual stack heights are modeled. BPIPPRM input and output files are provided on CDROM per the nomenclature described in Appendix F.

6.1.4 Modeling Protocol

This section provides the modeling protocol including model selection, receptor grid design, and meteorological data.

6.1.4.1 Model Selection

AERMOD (version 07026; USEPA, 2004c) was selected to predict ambient concentrations in simple, complex, and intermediate terrain. AERMOD is the recommended sequential model in USEPA's Guideline on Air Quality Models (40 CFR 51, Appendix W). The regulatory default option was used. This option commands AERMOD to:

Table 6-3. BPIPPRM Building-Tier/Site Plan Cross Reference [a]

BPIPPRM Bldg-Tier No.	Site Plan Building Tier(s)	Tier Height (m)	BPIPPRM Bldg-Tier No.	Site Plan Building Tier(s)	Tier Height (m)
1	A	33.27	19	J	8.31
2	B	43.46	20	K	34.72
3	C	23.29	21	L	21.16
4	D	35.20	38	M	8.84
5	E	23.16	44	N	18.29
6	F	21.64	45	O	18.29
7	G	17.53	49	P	12.80
8	H	16.54	80	Q	11.13
9	I	16.54			

[a] Letter codes refer to building tiers shown in blue on Figure 6-1.

Table 6-4. BPIP Results

Stack	Controlling Bldg-Tier	Bldg-Tier Height (m)	Bldg-Tier Projected Width (m)	Bldg-Tier Shape	Formula GEP Stack Height (m)	Regulatory GEP Stack Height (m)	Actual Stack Height (m)
Biomass Boiler No. 1	2	43.46	67.58	Squat	108.65	108.65	54.86
Biomass Boiler No. 2	2	43.46	83.20	Squat	108.65	108.65	54.86
Backup Boiler	2	43.46	115.18	Squat	108.65	108.65	45.72
CT Cell No. 1	2	43.46	43.63	Squat	108.65	108.65	8.49
CT Cell No. 2	2	43.46	43.63	Squat	108.65	108.65	8.49
CT Cell No. 3	2	43.46	43.63	Squat	108.65	108.65	8.49
CT Cell No. 4	2	43.46	43.63	Squat	108.65	108.65	8.49
CT Cell No. 5	2	43.46	43.63	Squat	108.65	108.65	8.49
CT Cell No. 6	2	43.46	43.63	Squat	108.65	108.65	8.49
Lime Silo	2	43.46	74.04	Squat	108.65	108.65	32.00
Ash Silo	2	43.46	93.92	Squat	108.65	108.65	10.36
SNCR Urea Silo	2	43.46	98.10	Squat	108.65	108.65	10.36
Sand Silo	2	43.46	99.56	Squat	108.65	108.65	10.36
Limestone Silo	2	43.46	102.05	Squat	108.65	108.65	10.36
Solka-Floc® Silo	2	43.46	43.63	Squat	108.65	108.65	14.48
Soy Flour Silo	2	43.46	43.63	Squat	108.65	108.65	14.48
Ammonium Sulf. Silo	2	43.46	43.63	Squat	108.65	108.65	10.84
Potassium Phos. Silo	2	43.46	43.63	Squat	108.65	108.65	14.48
Urea Process Silo	2	43.46	43.63	Squat	108.65	108.65	10.84

- use the elevated terrain algorithms requiring input of terrain height data for receptors and emission sources,
- use stack tip downwash (building downwash automatically overrides),
- use the calms processing routines,
- use buoyancy-induced dispersion, and
- use the missing meteorological data processing routines.

Additionally, model options were set to use rural dispersion coefficients.

6.1.4.2 Urban Land Use Assessment

Dispersion coefficients for air quality modeling were selected based on the land use classification technique suggested by Auer (Auer, 1978), which is the preferred method of the USEPA. The classification determination involves assessing land use by Auer's categories within a 3-kilometer radius of the proposed site. Urban dispersion coefficients should be selected if greater than 50 percent of the area consists of urban land use types; otherwise, rural coefficients apply.

Land use categories for areas within the 3-kilometer radius of the facility were identified from US Geological Survey (USGS) maps and observation. Figure 6-2 shows the 3-kilometer radius centered on the CFB boiler stack. The area within 3-kilometers of the facility is primarily rural. Therefore, rural dispersion coefficients were selected for the air quality modeling.

6.1.4.3 Receptors

A total of 2,545 receptors were placed along the facility fenceline and in seven nested cartesian grids. Receptor spacing is as follows for each of the seven grids:

- inner grid = 50 meters (out to 500 meters from the property boundary),
- second grid = 100 meters (out to 1 kilometer),
- third grid = 200 meters (out to 2 kilometer),
- fourth grid = 400 meters (out to 4 kilometers),
- fifth grid = 800 meters (out to 8 kilometers),
- sixth grid = 1,600 meters (out to 16 kilometers), and
- outer grid = 3,200 meters (out to 32 kilometers).

Fence line receptor spacing is no more than 25 meters.

The grid has a total coverage of 64 kilometers by 64 kilometers, covering portions of Highlands, Glades, Okeechobee, Martin, and Palm Beach Counties. Figure 6-3 presents the entire modeling domain on a map of the area. Figure 6-4 presents the receptors within 10 km of the facility. Figure 6-5 presents a detailed view of the receptors within 1 km of the facility.

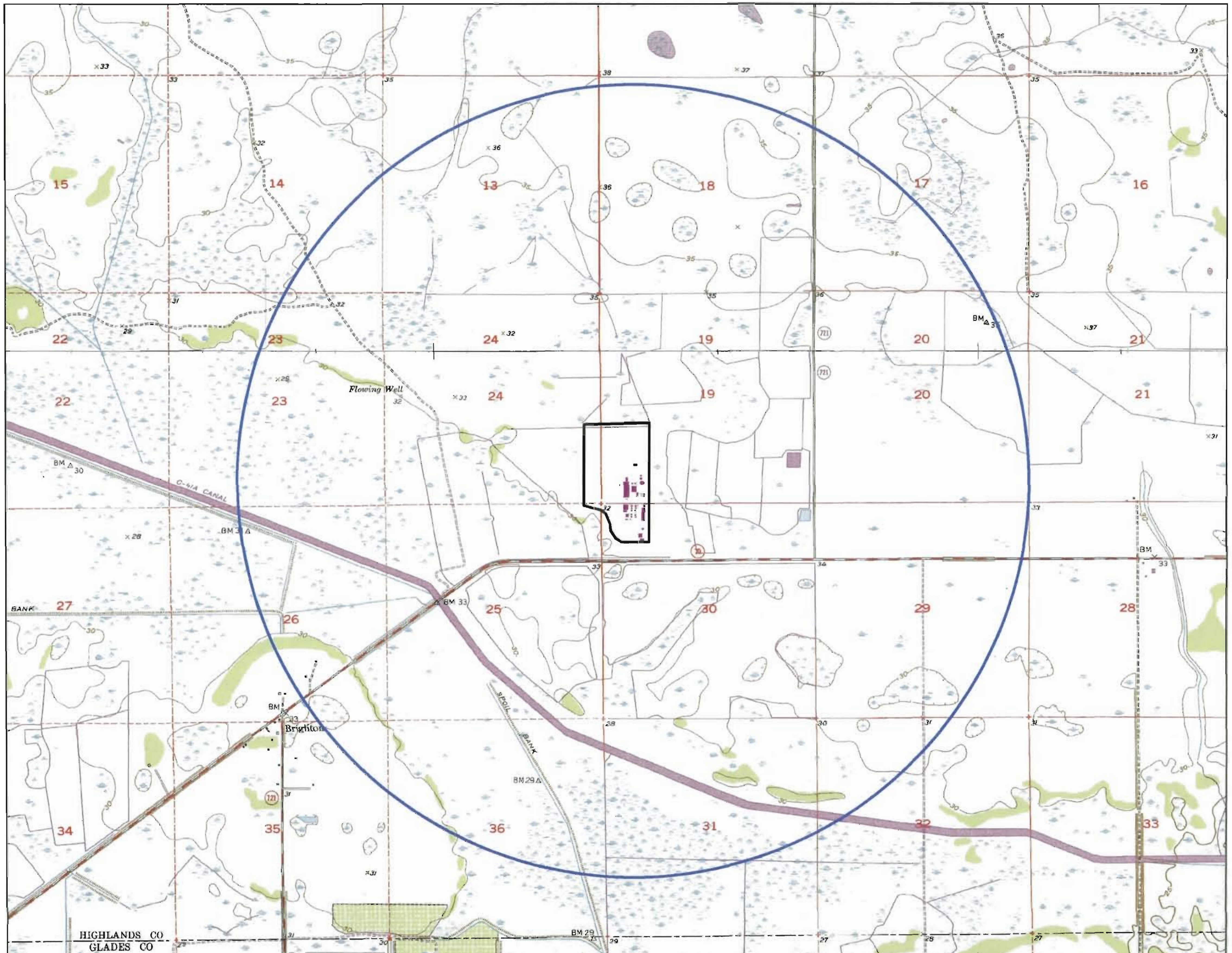
Receptor elevations were assigned by using USEPA's AERMAP (version 06341; USEPA, 2004d) software tool, which is designed to extract elevations from USGS Digital Elevation Model (DEM) files. AERMAP is the terrain preprocessor for AERMOD and uses the following procedure to assign elevations to a receptor:

- For each receptor, the program searches through the DEM data index files to determine the two profiles (longitudes or eastings) that straddle this receptor.
- For each of these two profiles, the program then searches through the nodes in the index file to determine which two rows (latitudes or northings) straddle the receptor.
- The program then calculates the coordinates of these four points and determines the DEM direct access file and the record numbers that correspond to these points.
- It reads the elevations for these four points from the appropriate direct access file.
- A 2-dimensional distance-weighted interpolation is used to determine the elevation at the receptor location based on the elevations at the four nodes determined above.

When 7.5-minute DEM data are used, the receptor or source location may fall outside the range of the profiles in the DEM file. Elevations for these receptors or sources located near the edges of a DEM file are assigned values based on the nodes that are closest to the receptor or source location.

Receptor elevations generated by AERMAP were then visually confirmed with the actual USGS 7.5-minute topographic maps to ensure accurate representation of terrain features.

7.5-minute DEM data were used as inputs to AERMAP. The 7.5-minute DEM data are produced from digitized map contours or from manual or automated scanning of aerial photographs. Each 7.5-minute DEM data file corresponds to a single 1:24,000-scale map quadrangle; 41 such quadrangles were used for this analysis. A 7.5-minute DEM data file consists of a regular array of elevations referenced horizontally in the Universal Transverse Mercator (UTM) coordinate system, with a uniform horizontal spacing of either 10 or 30 meters. The DEM data used for this analysis are based on the 1983 North American Datum (NAD83). The desired accuracy standard for 7.5-minute DEMs is a vertical root-mean-square error (RMSE) of 7 meters (USGS, 1993). AERMAP input and output files are provided on CDROM per the nomenclature described in Appendix F.



LEGEND

Property Boundary

3 km Radius From Boiler Stacks

Urban Land Use

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Basemap data from US Geological Survey 7-1/2 minute
Topographic Map Source: FL Land Boundary Information System

TITLE

Highlands Ethanol
Urban Land Use Evaluation

0 1 Kilometers

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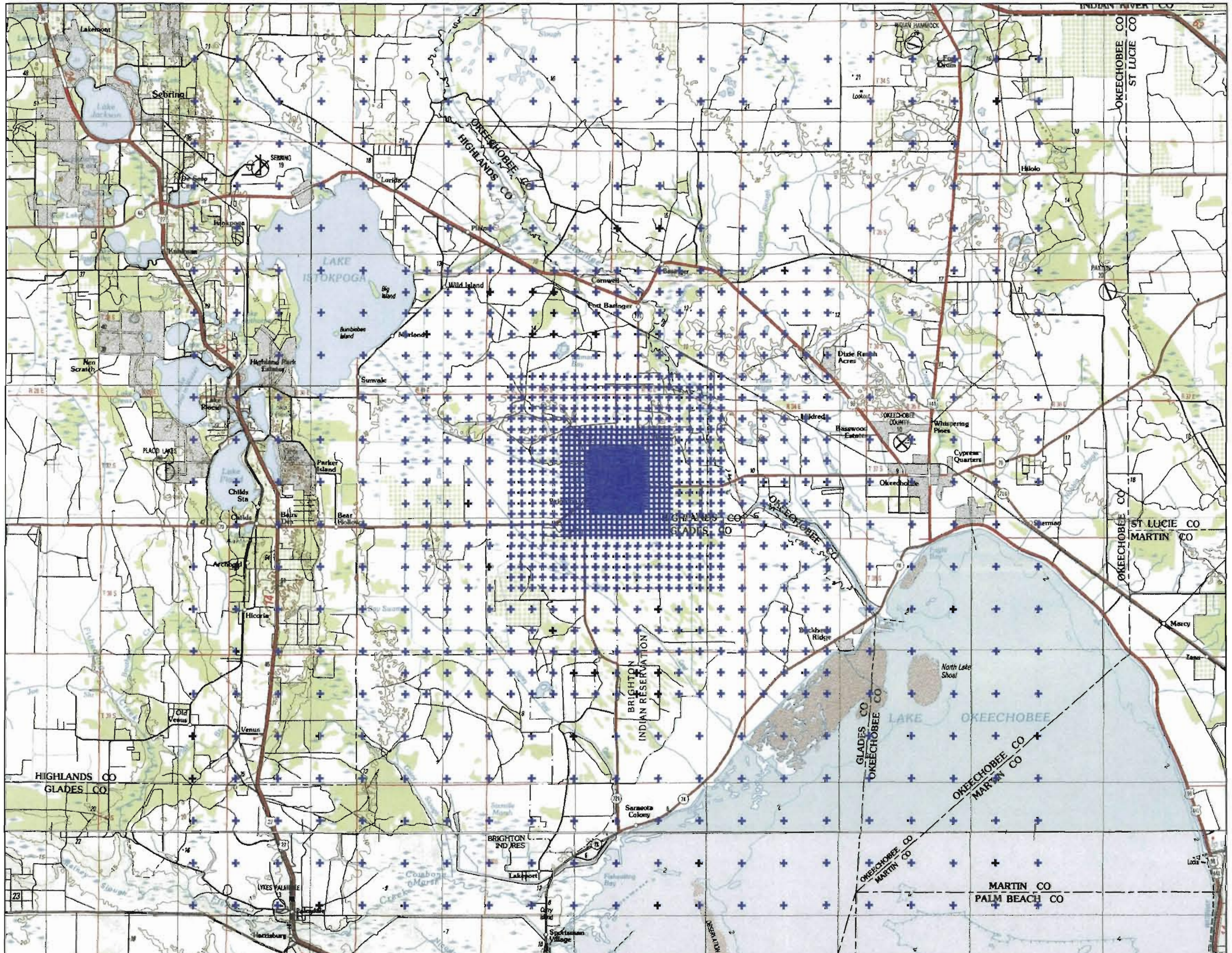
AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE
6-2



LEGEND

Property Boundary

Receptor

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83 UTM Zone 17N, Meters
Basemap data from US Geologic Survey 1°×2° Series
Topographic Map Source: FL Land Boundary Information System

TITLE

Highlands Ethanol
Receptors - Modeling Domain

0 10 Kilometers

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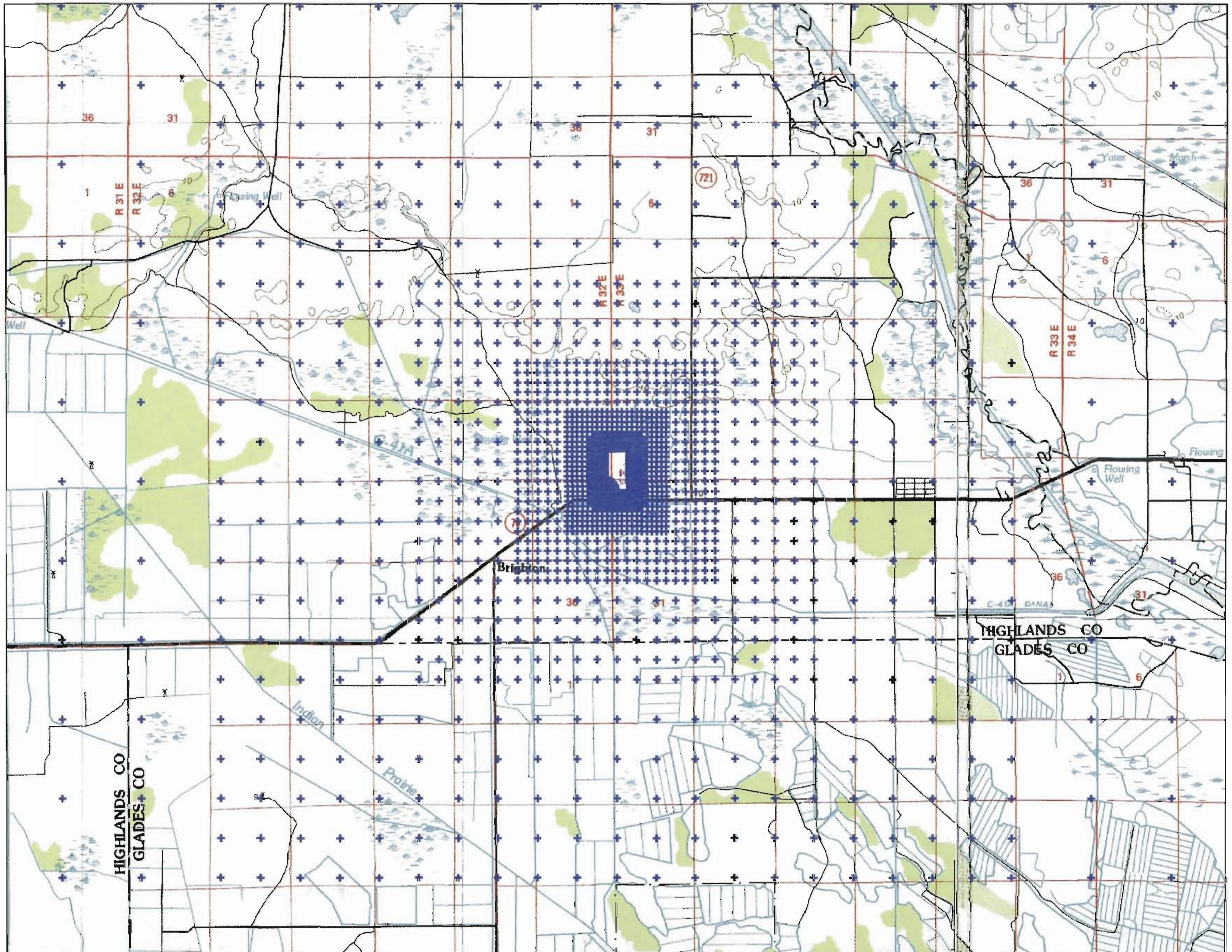
AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE
6-3



LEGEND

Property Boundary

Receptor

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Basemap data from US Geologic Survey 0.5° × 1.0° Series
Topographic Map Source: FL Land Boundary Information System

TITLE

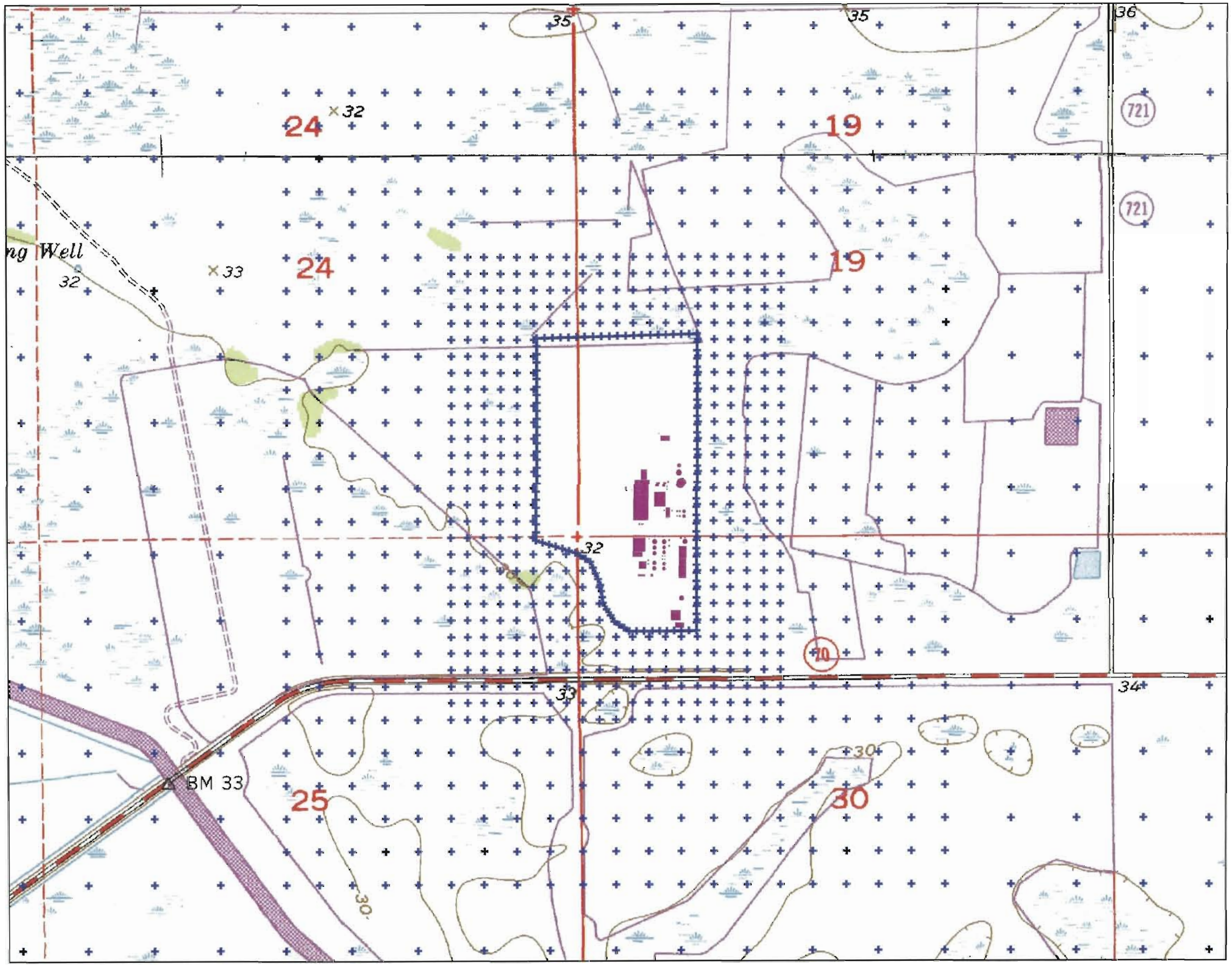
Highlands Ethanol
Receptors Within 10 km of Project

0 2 Kilometers

amec

AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE
6-4



LEGEND

Property Boundary

Receptor

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Basemap data from US Geologic Survey 7-1/2 minute
Topographic Map Source: FL Land Boundary Information System

TITLE

Highlands Ethanol
Receptors Within 1 km of Project

0 0.5 Kilometers

amec

AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE
6-5

6.1.4.4 Meteorological Data

USEPA recommends that AERMOD be run with a minimum of 5 years of NWS data or 1 year of on-site meteorological data. A wind rose for the 2001 to 2005 data are provided in Figure 6-6. The five-year composite wind rose demonstrates that prevailing winds are primarily in easterly and westerly directions.

6.1.5 Load Analysis Modeling Results

The results of the load analysis for the biomass boilers are presented in Table 6-5. The results show that the maximum concentrations are predicted for the "100% load" operating scenario for all pollutants and averaging periods.

The "100% load" operating scenario for the biomass boilers are used in the SIA for all pollutants and averaging periods. AERMOD input and output files are provided on CDROM per the nomenclature described in Appendix F.

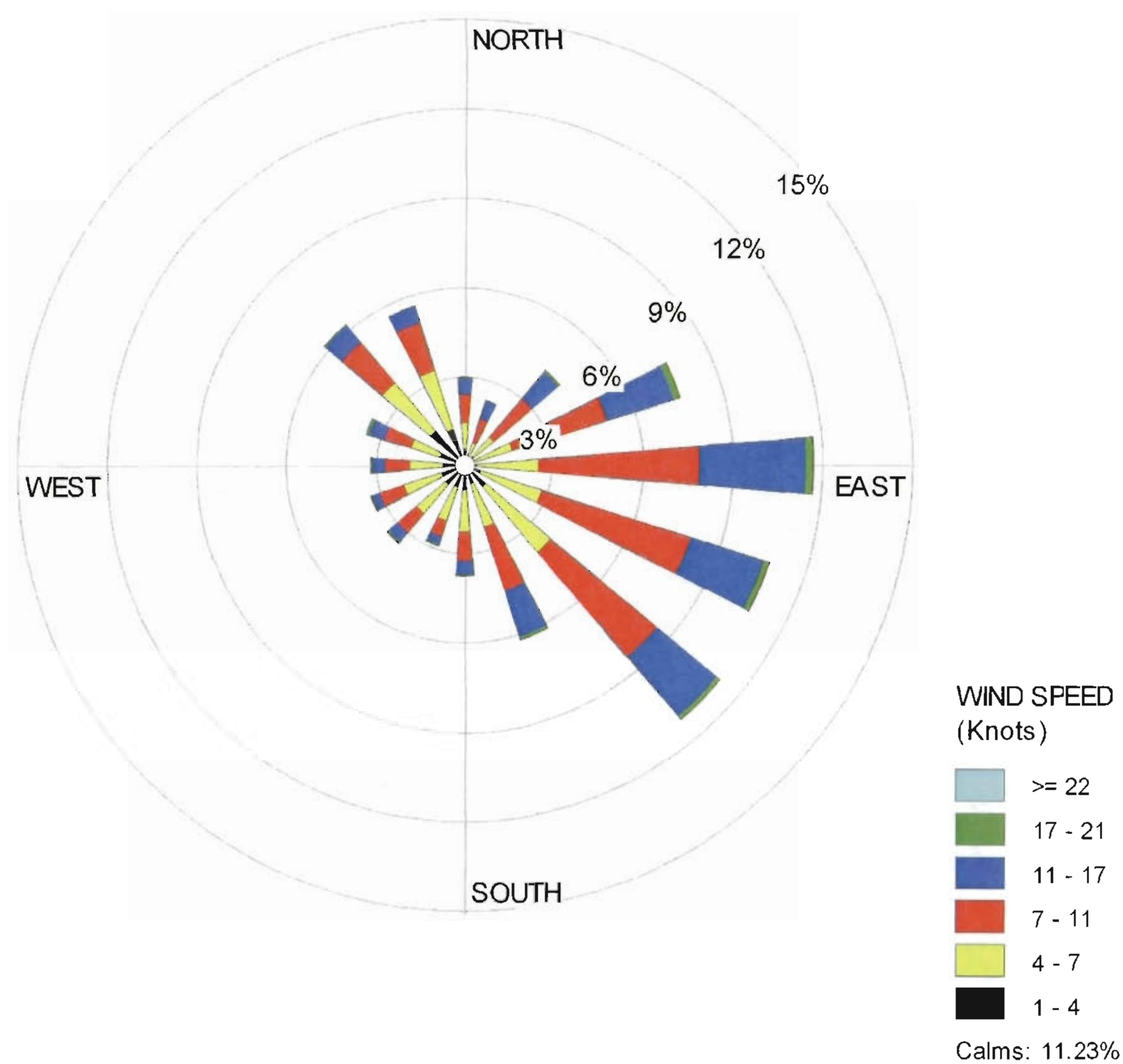
6.1.6 SIA Modeling Results

The predicted concentrations were compared to SILs established by the USEPA and FDEP for SO_2, PM_{10}, NO_2, CO, and Pb. The predicted concentrations include emissions from all proposed project emission sources. The boiler operating loads identified in Table 6-5 that resulted in the highest predicted concentrations were used in the significant impact analysis. The significant impact analysis results are presented in Table 6-6. The highest predicted concentrations are presented rather than the highest second high (HSH) concentrations as is appropriate for comparison to SILs. If the modeling results for a particular pollutant are less than the corresponding SILs, then no further analysis for that pollutant is required.

Predicted maximum concentrations for CO and Pb for all averaging periods are less than SILs. Thus, the Project is predicted to comply with the ambient air quality standards and increments for these pollutants and averaging periods. No interactive source modeling is required.

Predicted maximum concentrations for SO_2, PM_{10}, and NO_2 are greater than SILs. Consequently, interactive modeling is required for these pollutants. The significant impact areas for each were identified and are as follows:

- SO_2 3.7 km,
- PM_{10} 1.1 km, and
- NO_2 1.3 km.



5-Year Composite for 2001-2005

Figure 6-6
Wind Rose for West Palm Beach NWS Meteorological Data

Table 6-5. Biomass Boilers Load Analysis Modeling Results

		Maximum Predicted Concentration (µg/m³) [a]			
Pollutant	Averaging Period	100% Load	75% Load	50% Load	Maximum Load Case
SO_2	3-hour	68.4	57.1	48.3	100%
	24-hour	39.0	31.8	24.2	100%
	Annual	7.46	6.20	4.70	100%
PM_{10}	24-hour	9.74	7.95	6.04	100%
	Annual	1.87	1.55	1.17	100%
NO_2	Annual	3.73	3.10	2.35	100%
CO	1-hour	93.6	81.4	66.0	100%
	8-hour	54.6	44.6	35.7	100%
Pb	3-month	0.0035 [b]	0.0029 [b]	0.0021 [b]	100%

[a] µg/m³ = micrograms per cubic meter

[b] based on a one month average, a conservative assumption

Table 6-6. Significant Impact Analysis Modeling Results

Pollutant (Load)	Averaging Period	Year	Date (Hr)	Receptor UTM Coordinates (km)	AERMOD Predicted Conc. (µg/m³)	Significant Impact Levels (µg/m³)
SO_2	3-hour	2002	10/06(03)	492.65, 3012.85	68.4	25
	24-hour	2005	05/14	492.91, 3013.24	39.0	5
	Annual	2004	--	492.91, 3013.19	7.46	1
PM_{10}	24-hour	2005	10/16	493.07, 3013.93	12.1	5
	Annual	2002	--	492.91, 3013.25	2.30	1
NO_2	Annual	2004	--	492.91, 3013.19	3.73	1
CO	1-hour	2004	07/18(02)	494.15, 3013.25	93.6	2,000
	8-hour	2005	09/24(08)	492.90, 3013.25	54.6	500
Pb	3-month	2003	08/31	492.91, 3013.26	.0035	0.1

[a] based on a one month average, a conservative assumption

Distances are referenced to the centroid of the boiler stacks. FDEP was contacted to obtain interactive source data. The interactive source analysis is presented in Section 6.2.

AERMOD input and output files are provided on CDROM per the nomenclature described in Appendix F.

6.2 Interactive Source Analysis

The purpose of the interactive source analysis is to demonstrate that emissions from the proposed project, combined with other sources in the vicinity while accounting for existing background ambient air quality, will result in ambient air quality that remains in compliance with NAAQS, FAAQS, and ambient increment standards. For the interactive source analysis, background ambient air quality concentrations are identified from measurements collected in the vicinity, and an emissions inventory is obtained from FDEP for other emission sources that have the potential to impact the project's significant impact area. Dispersion modeling is performed with the interactive source inventory and predicted concentrations are compared to NAAQS, FAAQS, and ambient increment standards. Based on the results of the SIA, the interactive source analysis is performed for SO_2, PM_{10}, and NO_2.

6.2.1 Background Air Quality

Based on review of available data and discussions with FDEP, ambient monitors located in Palm Beach, Polk, and Highlands Counties were selected for the determination of background ambient air quality concentrations to be used in the NAAQS assessment. Table 6-7 provides identification and location information for the monitoring sites. The UTM coordinates of each site are projected to UTM Zone 17 and the 1983 North American Datum (NAD83).

Table 6-7. Background Air Quality Monitoring Sites

Monitor	USEPA AIRS ID	Address	UTM Coordinates (m)	Distance (km)	Direction
Archbold Station	12-055-0003	123 Main Drive	466263, 3007402	28	WSW
Belle Glade	12-099-0008	38754 State Rd. 80	533148, 2955958	70	SE
West Palm Beach	12-099-1004	3700 Belvedere Rd.	589596, 2952755	114	ESE
Lakeland	12-105-6006	1015 Sikes Blvd.	404451, 3100847	125	NW
Riviera Beach	12-099-3004	1050 15th St. W	592342, 2916960	138	SE

Table 6-8 summarizes the monitoring data for SO_2, PM_{10}, $PM_{2.5}$, and NO_2 collected in 2005, 2006, and 2007. As shown in Table 6-8, all measured concentrations for these pollutants are less than their respective NAAQS. The short-term concentrations represent the second-highest measurement recorded by the monitor during each year. As such, these data provide a conservative representation of background air quality in the region.

Table 6-8. Regional Ambient Air Quality Data [a]

Monitor Location	Pollutant	Averaging Period	Concentration (μg/m³) 2005	2006	2007	NAAQS (μg/m³)
Riviera Beach	SO_2	3-hour	7.9	5.2	10.5	1,300
		24-hour	7.9	5.2	5.2	365
		Annual	3.1	2.9	2.6	80
Belle Glade	PM_{10}	24-hour	39	42	37	150
		Annual	17.6	20.1	16.5	50 [a]
Lakeland	$PM_{2.5}$	24-hour	21.6 [b]	18.3 [b]	18.8 [b]	35
		Annual	9.6	9.2	9.3	15
West Palm Beach	NO_2	Annual	16.2	18.0	15.0	100

[a] Ambient monitoring data obtained from FDEP.
[b] NAAQS revoked.
[c] 98th percentile

To provide a conservative analysis of the project's compliance with NAAQS, the maximum measured values presented in Table 6-8 were selected to represent background air quality in the modeling analysis. A summary of the selected background air quality concentrations is provided in Table 6-9.

Table 6-9. Background Air Quality for Dispersion Modeling

Pollutant	Averaging Period	Background Air Quality (μg/m³)
SO_2	3-hour	10.5
	24-hour	7.9
	Annual	3.1
PM_{10}	24-hour	42
	Annual	20.1
$PM_{2.5}$	24-hour	19.6 [a]
	Annual	9.6
NO_2	Annual	18.0

[a] 3-year average of 98th percentile

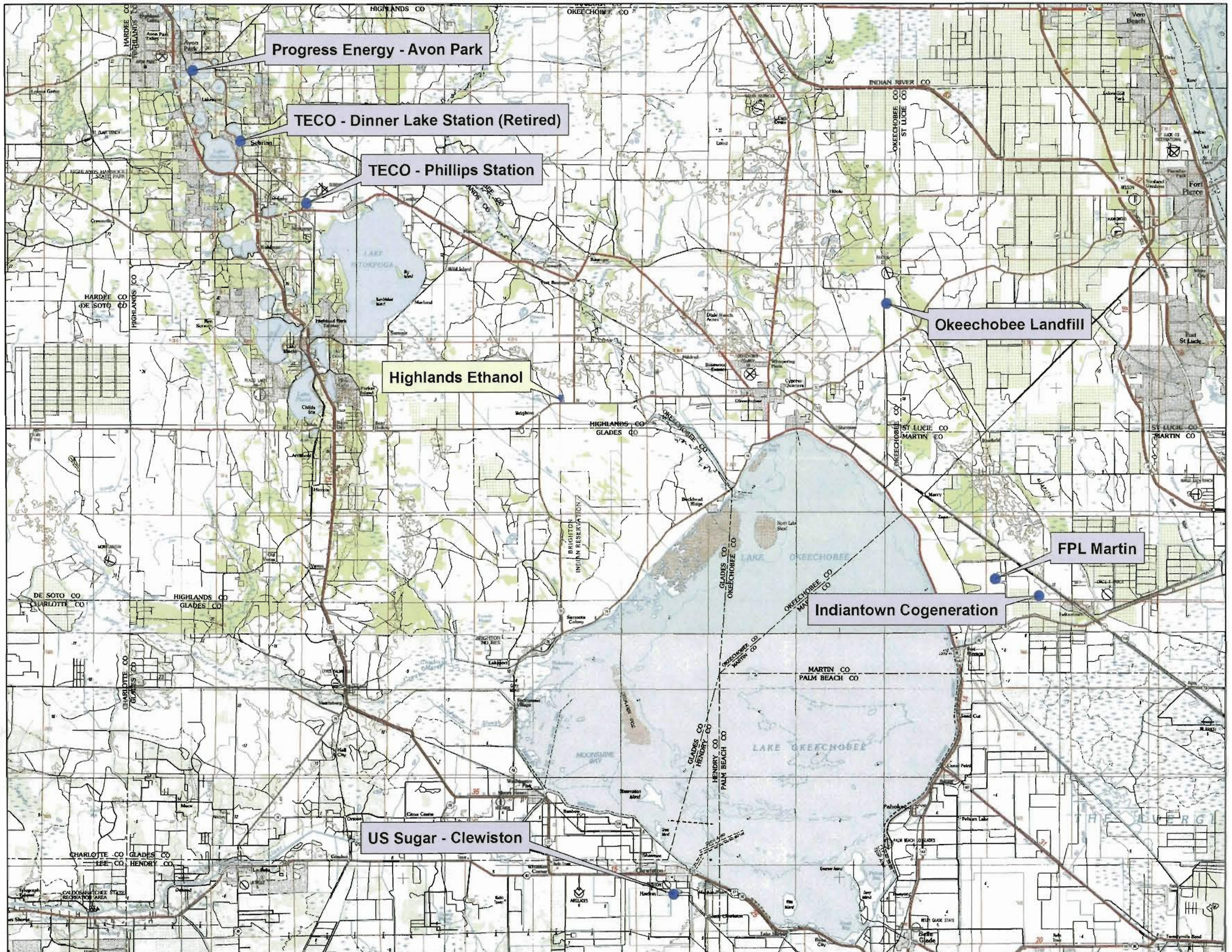
6.2.2 Interactive Source Emissions Inventory and Modeling Results

Highlands Ethanol requested FDEP to supply an inventory of other interactive sources to include in the dispersion modeling analysis. FDEP subsequently identified 53 facilities to potentially be included in the interactive modeling analysis. FDEP allowed the facilities with lower emissions and/or those that are more distant from the project site to be eliminated from the interactive modeling analysis by applying the "20D" rule, a screening method developed by the North Carolina Department of Natural Resources and Community Development (NCDNRCD, 1985). The 20D rule compares a facility's emissions for a given pollutant in terms of tons per year to a second value that is twenty times the distance ("D", in kilometers) between the project site and the facility being considered. A facility whose emissions in tons per year exceed the 20D value is included in the interactive modeling analysis. All other facilities can be removed from the inventory. Applying the 20D rule to the candidate list of other sources provided by FDEP reduced the number of interactive sources to seven. Of the seven sources selected, five are electric generating stations, and the remaining two are US Sugar – Clewiston and the Okeechobee Landfill. The locations of these facilities with respect to the Project site are presented in Figure 6-7. Detailed AERMOD input data are provided in Appendix G.

Table 6-10 presents the results of the interactive modeling analysis. The results demonstrate that the facility will be in compliance with NAAQS, FAAQS, and ambient increments for SO_2, PM_{10}, $PM_{2.5}$, and NO_2, even with interactive sources and background concentrations added to the analysis.

Table 6-10. PSD Class II Increment and NAAQS Analysis

Pollutant	Averaging Period	Project plus Interactive Sources (μg/m³)	PSD Class II Increments (μg/m³)	Background Air Quality (μg/m³)	Modeled Impacts plus Background (μg/m³)	FAAQS/ NAAQS (μg/m³)
SO_2	3-hour	76.5	512	10.5	87.0	1300
	24-hour	42.6	91	7.9	50.5	365
	Annual	8.93	20	3.1	12.1	80
PM_{10}	24-hour	11.4	30	42	53.4	150
	Annual	2.34	17	20.1	22.4	50
$PM_{2.5}$	24-hour	11.4	--	19.6	31.0	35
	Annual	2.34	--	9.6	11.9	15
NO_2	Annual	7.44	25	18	25.4	100



LEGEND

Highlands Ethanol Property

Location of Interactive Source

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Basemap data from US Geologic Survey 1°x2° Series
Topographic Map Source: FL Land Boundary Information System

TITLE

Highlands Ethanol Interactive Source Locations

0 20 Kilometers

amec

AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE 6-7

6.3 Pre-Construction Monitoring

Exemptions from pre-construction monitoring requirements can be requested if predicted ambient concentrations resulting from the proposed project are less than Significant Monitoring Concentrations (SMCs). Table 6-11 presents the concentrations predicted for the Project against the relevant SMCs.

Predicted concentrations for NO_2, CO, and Pb are less than the SMCs. Based on these modeling results, Highlands Ethanol requests an exemption from pre-construction monitoring for these pollutants. AERMOD input and output files are provided on CDROM per the nomenclature described in Appendix F.

Predicted concentrations for SO_2 and PM_{10} are greater than the SMCs. Readily available ambient monitoring data can be used to assess pre-construction air quality if:

- the existing monitoring locations are in areas that are representative of the project area,
- the data are of sufficient quality, and
- the data are current.

Table 6-11. Pre-Construction Monitoring Analysis Results

Parameter	Averaging Period	AERMOD Predicted Conc. ($\mu g/m^3$)	Significant Monitoring Conc. ($\mu g/m^3$)
SO_2	24-hour	39.0	13
PM_{10}	24-hour	12.1	10
NO_2	Annual	3.7	14
CO	8-hour	54.6	575
Pb [a]	3-month	0.0035	0.1

[a] Modeled Pb result is based on a 1-month average, which provides a conservative comparison to the 3-month SMC.

Based on review of available data and discussions with FDEP, ambient monitors located in Palm Beach, Polk, and Highlands Counties were selected for the determination of background ambient air quality concentrations to be used in the NAAQS assessment. Table 6-9 presents a summary of the most recent three years of ambient air monitoring data for SO_2, PM_{10}, $PM_{2.5}$, and NO_2. Table 6-12 presents the most recent three years of ambient monitoring data for ozone collected at the nearby Archbold Biological Station. The locations of these monitors were provided in Table 6-8.

Table 6-12. Ambient Ozone Air Quality Data, Archbold Biological Station

Monitor Location	Pollutant	Averaging Period	Concentration ($\mu g/m^3$) 2005	2006	2007	NAAQS ($\mu g/m^3$)
Archbold Station	O_3	1-hour	155	171	159	235 [a]
		8-hour	145	151	143	147/157 [b]

[a] NAAQS revoked.

[b] 2008 (147) and 1997 (157) NAAQS listed. Implementation of 2008 NAAQS not yet final.

Highlands Ethanol requests that the monitoring data presented in Tables 6-9 and 6-12 satisfy the pre-construction monitoring criteria. The monitors are in areas representative of pre-construction conditions in Highlands County and of sufficient quality to be used to identify background air quality for interactive modeling. All of the data were collected from 2005 through 2007, satisfying the requirement that the data be current. Therefore, the three criteria established for using existing air quality measurements have been satisfied.

6.4 Class I Area Analysis

Class I areas are designated in 40 CFR Part 81, and are areas of special national or regional value from a natural, scenic, recreational, or historic perspective. Mandatory Federal Class I areas include the following areas in existence on August 7, 1977:

- International parks,
- National wilderness areas which exceed 5,000 acres in size,
- National memorial parks which exceed 5,000 acres in size, and
- National parks which exceed 6,000 acres in size.

These areas are administered by the National Park Service (NPS), the US Fish & Wildlife Service (USFWS), or the US Forest Service (USFS). These FLMs are responsible for evaluating a project's air quality impacts in the Class I areas and may make recommendations to the permitting agency to approve or deny permit applications. The FLMs are typically consulted prior to submittal of a permit application, which allows the FLM to assess the need for a Class I area impact analysis.

Class I area impact analyses were historically performed for proposed projects located within 100 kilometers of a Class I area, although this has been extended to 300 kilometers for some large projects. The analysis consists of:

- an increment analysis,

- a visibility impairment analysis, and
- an analysis of impacts on other air quality related values (AQRVs) such as impacts to flora and fauna, water, and cultural resources.

The closest Class I areas are the Everglades National Park (154 km) and Chassahowitzka Wilderness Area (216 km) in Florida. All other Class I areas are located at distances greater than 300 kilometers from the facility with the next closest being the Okefenokee Wilderness Area in Georgia (386 km).

Based on these distances, the emissions associated with the project, and modeled concentrations at 50 km from the Highlands Ethanol facility that are less than Class I area SILs, Highlands Ethanol is requesting in a letter to the FLMs to determine that further analysis of impacts to either Class I area increments or Class I AQRVs will not be required. Copies of these notifications, which include the modeling analysis performed at 50 km, are provided in Appendix H. Both the NPS and the USFWS have been notified. Their respective determinations will be provided to FDEP upon receipt.

6.5 Additional Impacts Analysis

The Additional Impacts Analysis consists of an assessment of impacts resulting from community growth associated with the project, an assessment of visibility impacts resulting from the project, and impacts to local soils and vegetation resulting from the project.

6.5.1 Growth Analysis

Highlands Ethanol anticipates that up to 65 new employees will be hired to operate the proposed facility, which will increase long-term jobs within the community. There will be additional short-term local employment during the 18 month construction phase of the proposed project. Short-term employment has a projected maximum of 500 workers over the 18-month life of the construction project.

6.5.1.1 Work Force

During the anticipated construction period associated with the proposed project, the construction jobs will be filled by local area workers, as well as workers currently located outside Highlands County. While supplemental, short-term labor is likely to relocate into the Highlands County area during the construction phase of the proposed project, Highlands Ethanol anticipates that the influx of temporary workers during the construction phase will have minimal effect on the environment, but will have a positive effect on the local economy.

For daily operation and maintenance of the proposed project, Highlands Ethanol anticipates that the required full time staff will be mostly comprised of current or future Highlands County area residents, and the project could result in a small increase in residential housing demand.

During the construction phase of the project, there will be a temporary increase in truck traffic. Once in operation, it is anticipated that 100 vehicles per day will access the site. These include 60 employee vehicles, 26 delivery trucks, and 14 product trucks.

The resulting increase in indirect employment is not anticipated to significantly impact the air quality of the area because the increase represents a small fraction of the population of Highlands County (97,987 people estimated by the US Census Bureau for 2006). Thus, construction and operation of the proposed Project will have a positive impact on the work force in Highlands County and the surrounding areas, but its net impact on the environment and to residential resource consumption is expected to be minimal.

6.5.1.2 Industry

Because much of the growth from the Project will be filled by a relatively small number of new local labor and resources, Highlands Ethanol does not anticipate any significant corresponding commercial growth. Because the commercial and industrial growth resulting from the project is anticipated to be minimal, air quality impacts resulting from such commercial and industrial growth are expected to be minimal in the immediate area and its adjacent communities.

6.5.2 Visibility Impairment Analysis

The visibility impairment analysis addressed here is distinct from the analysis performed for Class I areas.

NPS guidance does address the need for visibility analysis in "Class II floor areas", although no specific guidance is provided that quantifies visibility impairment for these areas. Class II floor areas include the following areas in existence on August 7, 1977, that exceed 10,000 acres in size:

- National monuments,
- National primitive areas,
- National preserves,
- National recreational areas,
- National wild and scenic rivers,
- National wildlife refuges, and
- National lakeshores and seashores.

These Class II floor areas also include the following areas established after August 7, 1977 that exceed 10,000 acres in size:

- National parks, and

- National wilderness areas.

The only Class II floor area within 100 km of the proposed project is the Loxahatchee National Wildlife Refuge (92.6 km) near West Palm Beach, Florida. All other Class II floor areas are located at distances greater than 100 km from the proposed project with the next closest being the Big Cypress National Preserve in southern Florida (120 km). These distances are well beyond the significant impact area of the project, and as such visibility impacts in these areas are expected to be minimal.

6.5.3 Soils and Vegetation Analysis

Ambient air quality screening levels are provided for soils and vegetation in USEPA guidance (USEPA, 1980). Table 6-13 compares the predicted concentrations for those compounds that have predicted concentrations greater than their respective SILs for which there are relevant screening levels. USEPA has not published screening values for PM_{10}.

Table 6-13. Soils and Vegetation Screening Modeling – Project Only

Parameter	Averaging Period	AERMOD Predicted Conc. (μg/m³)	USEPA Screening Level (μg/m³)
SO_2	1-hour	93.6	917
	3-hour	68.4	786
	Annual	7.46	18
NO_2	4-hour	32.0	3760
	8-hour	27.3	3760
	1-month	7.34	564
	Annual	3.73	94

The predicted concentrations for SO_2 and NO_2 are less than the screening levels, thereby demonstrating that impacts to soils and vegetation will be negligible. AERMOD input and output files are provided on CDROM per the nomenclature described in Appendix F.

6.6 Ambient Air Quality Impact Analysis Conclusion

An ambient air quality impact analysis was conducted for the proposed project. Emission rates, exhaust parameters, and stack parameters were obtained or calculated, and wind-direction specific building dimensions were calculated with USEPA's BPIPPRM computer program. A modeling protocol was prepared that described the selected dispersion model, land use, receptor grids and meteorological data used.

The significant impact analysis was completed per USEPA guidance. Dispersion modeling was performed for simple terrain to determine the maximum impact operating scenario for the proposed boilers. The "100% load" operating scenario was selected for further analysis for all pollutants and averaging periods. The predicted concentrations for the selected operating scenarios were then compared to SILs. Predicted concentrations were less than SILs for CO and Pb, demonstrating compliance with NAAQS, FAAQS, and allowable increments. Because predicted concentrations were less than SILs for CO and Pb, interactive source modeling was not required. In contrast, predicted concentrations of SO_2, PM_{10}, and NO_2 were greater than SILs.

Interactive source modeling was performed for SO_2, PM_{10}, and NO_2. Background air quality concentrations were identified based on data collected at monitoring sites. The interactive source analysis demonstrates that the project, when combined with the existing sources, will be in compliance with ambient air quality standards and ambient increment standards.

Highlands Ethanol is requesting an exemption from pre-construction monitoring requirements. Predicted concentrations of NO_2, CO, and Pb were less than SMCs. In the cases of SO_2 and PM_{10}, existing data from nearby and adjacent counties were deemed to be representative of background air quality in Highlands County.

An assessment of the potential impacts on Class I areas by the proposed Project was performed. Based on these distances, the emissions associated with the project, and modeled concentrations at 50 km from the Highlands Ethanol facility that are less than Class I area SILs, Highlands Ethanol is requesting in a letter to the FLMs to determine that further analysis of impacts to either Class I area increments or Class I AQRVs will not be required. Copies of these notifications, which include the modeling analysis performed at 50 km, are provided in Appendix H. Both the NPS and the USFWS have been notified. Their respective determinations will be provided to FDEP upon receipt.

Finally, an additional impacts analysis was performed. Growth, visibility impairment, impacts to soils and vegetation, and air toxics were addressed. The analysis demonstrated that resulting impacts are minimal.

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APPENDIX A

Air Permit Application Forms

Department of Environmental Protection

Division of Air Resource Management

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BUREAU OF AIR REGULATION

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: Highlands Ethanol, LLC	
2. Site Name: Highlands Ethanol	
3. Facility Identification Number: N/A	
4. Facility Location... Street Address or Other Locator: FL SR 70 and FL SR 721 City: East of Brighton County: Highlands Zip Code: 33857	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☐ Yes ☒ No

Application Contact

1. Application Contact Name: Tim Eves
2. Application Contact Mailing Address. Organization/Firm: Verenium Corporation Street Address: 509 Suwanee Circle City: Tampa State: FL Zip Code: 33606
3. Application Contact Telephone Numbers... Telephone: (813) 349-4943 ext. Fax: ( ) -
4. Application Contact E-mail Address: tim.eves@verenium.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	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

[X] 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

PSD Air Construction Permit Application for a proposed new cellulosic ethanol production facility located in Highlands County, Florida.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
EU001	Liquid/Solid Separation	AC1A	*See Below
EU002	Fermentation/Distillation/Propagation	AC1A	*See Below
EU003	Product and Denaturant Storage Tanks	AC1A	*See Below
EU004	Product Loadout	AC1A	*See Below
EU005	Miscellaneous Storage Silos	AC1A	*See Below
EU006	Wastewater Anaerobic Treatment	AC1A	*See Below
EU007	Wastewater Aerobic Treatment	AC1A	*See Below
EU008	Cooling Tower	AC1A	*See Below
EU009	Two Biomass Boilers	AC1A	*See Below
EU010	Backup Boiler (Natural Gas or No. 2 Oil)	AC1A	*See Below
EU011	Four Emergency Generators	AC1A	*See Below
EU012	Fire Pump Engine	AC1A	*See Below
EU013	Stillage Loadout	AC1A	*See Below
EU014	Fugitive Equipment Leaks	AC1A	*See Below
EU015	Fugitive Dust from Paved and Unpaved Roads	AC1A	*See Below

Application Processing Fee **(*per FDEP, Maximum PSD permit application processing fee is $7,500)**

Check one: [x] Attached - Amount: $ 7,500 [ ] Not Applicable

Owner/Authorized Representative Statement

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

1.	Owner/Authorized Representative Name : Charles F. Davis III, Senior Vice President, Commercial Development
2.	Owner/Authorized Representative Mailing Address... Organization/Firm: Highlands Ethanol LLC Street Address: 55 Cambridge Parkway, 8th Floor City: Cambridge State: MA Zip Code: 02142
3.	Owner/Authorized Representative Telephone Numbers... Telephone: (617) 674-5300 ext. Fax: ( ) -
4.	Owner/Authorized Representative E-mail Address: chuck.davis@verenium.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] — February 6, 2009 Signature — Date

APPLICATION INFORMATION

Application Responsible Official Certification (NOT APPLICABLE—AIR CONSTRUCTION PERMIT APPLICATION ONLY)

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, CAIR source, or Hg Budget 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: Joe Vaccaro
   Registration Number: 57095
2. Professional Engineer Mailing Address...
   Organization/Firm: AMEC
   Street Address: 1979 Lakeside Parkway, Suite 500
   City: Tucker State: GA Zip Code: 30084
3. Professional Engineer Telephone Numbers...
   Telephone: (770) 688-2500 ext. Fax: (770) 688-2501
4. Professional Engineer E-mail Address: joe.vaccaro@amec.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 [X], 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.

Joe Vac — February 4, 2009

Signature — Date

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 493,200 North (km) 3,013,200		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
3. Governmental Facility Code: 0	4. Facility Status Code: C	5. Facility Major Group SIC Code: 28	6. Facility SIC(s): 2869
7. Facility Comment : New facility to be constructed on currently agricultural property for which Highlands County granted a conditional Special Use Permit to Verenium on December 23, 2008.			

Facility Contact

1. Facility Contact Name: Tim Eves
2. Facility Contact Mailing Address... Organization/Firm: Highlands Ethanol, LLC Street Address: 509 Suwanee Circle City: Tampa State: FL Zip Code: 33606
3. Facility Contact Telephone Numbers: Telephone: (813) 349-4943 ext. Fax: ( ) -
4. Facility Contact E-mail Address: tim.eves@verenium.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: Tim Eves
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Highlands Ethanol, LLC Street Address: 509 Suwanee Circle City: Tampa State: FL Zip Code: 33606
3. Facility Primary Responsible Official Telephone Numbers... Telephone: (813) 349-4943 ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address: tim.eves@verenium.com

FACILITY INFORMATION

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. [x] Title V Source	
4. [x] 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. [x] 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. [x] 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: No synthetic restrictions on operations are being requested other than for the backup boiler, which will meet BACT requirements, and emergency engines, which will be limited by 40 CFR 60, Subpart IIII.	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
CO	A	
NO_X	A	
PM_{10}	A	
$PM_{2.5}$	A	
SO_2	A	
VOC	A	
NH_3	B	
Pb	B	
Total HAPs	B	
H001 - Acetaldehyde	B	
H006 - Acrolein	B	
H017 - Benzene	B	
H053 - Cumene	B	
H085 - Ethylbenzene	B	
H095 - Formaldehyde	B	
H104 - Hexane	B	

List of Pollutants Emitted by Facility (Continued)

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
H106 - Hydrochloric Acid	B	
H114 - Mercury	B	
H115 - Methanol	B	
H132 - Naphthalene	B	
H151 - Polycyclic Organic Matter	B	
H169 - Toluene	B	
H181 - 2,2,4-Trimethylpentane	B	
H186 - Xylene	B	

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:
No facility-wide or multi-unit emissions caps are being requested.

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) [x] Attached, Document ID: Appendix C [ ] 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) [x] Attached, Document ID: Figure 2-2 [ ] 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) [x] Attached, Document ID: Section 5.3.2.7 [ ] Previously Submitted, Date:______

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: [x] Attached, Document ID: Figure 2-1 [ ] Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): [x] Attached, Document ID: Section 2.0
3.	Rule Applicability Analysis: [x] Attached, Document ID: Section 4.0
4.	List of Exempt Emissions Units: [x] Attached, Document ID: Appendix I [ ] Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: [x] Attached, Document ID: Section 3.2 [ ] Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): [x] Attached, Document ID: Section 6.5 [ ] Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): [ ] Attached, Document ID:__________ [x] Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications (NOT APPLICABLE)

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 (NOT APPLICABLE)

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)
3. Hg Budget Part (DEP Form No. 62-210.900(1)(c)): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☒ Not Applicable (not a Hg Budget unit)

Additional Requirements Comment

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.

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.)

   [x] 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)

   [x] 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: Liquid/Solid Separation. Acid hydrolyzed biomass is separated into liquid and solid fractions in a 3-stage series of screw presses.

3. Emissions Unit Identification Number: EU001

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Wet Scrubber
2. Control Device or Method Code: 141

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: 3,247 gal/min of acid hydrolyzed biomass		
2. Maximum Production Rate: 39,420,000 gal/yr of ethanol		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: Maximum throughput of 3,247 gal/min of hydrolyzed biomass is for the third stage feed tank. Other feed tanks and filtrate tanks have lower throughputs.		

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: EU001	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 20 feet	7. Exit Diameter: TBD feet
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: Unknown %
11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493204.67 North (km): 3013051.28	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Ethanol production by fermentation.		
2. Source Classification Code (SCC): 30125010	3. SCC Units: Tons	
4. Maximum Hourly Rate: 14.8 tons	5. Maximum Annual Rate: 129,298 tons	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: In the liquid/solid separation process, acid hydrolyzed biomass is separated into liquid and solid fractions in a 3-stage series of screw presses. An enclosed tank is located at the feed side of each screw press (for a total of three feed tanks) and another enclosed tank is located at the filtrate discharge of each screw press (for a total of three filtrate tanks).		

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	141	N/A	EL

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: 98%
3. Potential Emissions: 0.6 lb/hour 2.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: Refer to the WATER9 emissions calculations in Appendix B. Reference: USEPA WATER9 Software	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Maximum short-term emissions are assumed to be 120% of average emissions.	

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: Upon Permit Issuance
3. Allowable Emissions and Units: 98% control	4. Equivalent Allowable Emissions: 0.6 lb/hour 2.1 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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. N/A

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:	

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. N/A

<u>Continuous Monitoring System:</u> 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:	

<u>Continuous Monitoring System:</u> 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:	

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)
   [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [x] Attached, Document ID: Section 5 [ ] 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 __________
   [x] 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)
   [x] Attached, Document ID: Section 5 [ ] 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: __________

   [x] To be Submitted, Date (if known): : ________
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: __________ [x] 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)): [X] Attached, Document ID: Section 5 [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [X] Attached, Document ID: Section 6 [ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [X] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

[x] 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)

[x] 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:
Fermentation/Distillation/Propagation. These processes are vented to a single point and treated with a wet scrubber designed to remove >98% of the trace contaminants (ethanol, ethyl acetate, acetaldehyde and others) from the vent stream.

3. Emissions Unit Identification Number: EU002

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

[ ] Acid Rain Unit

[ ] CAIR Unit

[ ] Hg Budget Unit

9. Package Unit:
Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: Equipment includes 4 hemicellulosic fermentation tanks, 4 cellulosic fermentation tanks, two beerwells, 3 hemicellulosic seed propagators, 3 cellulosic enzyme propagators, 3 cellulosic seed propagators, 2 beer strippers, 1 stripper/rectifier, and the molecular sieve dehydration system.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Wet Scrubber
2. Control Device or Method Code: 141

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: 39,420,000 gal/yr of ethanol		
2. Maximum Production Rate: 39,420,000 gal/yr of ethanol		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU002	2. Emission Point Type Code: 2
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: V	6. Stack Height: 24.5 feet	7. Exit Diameter: TBD feet
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: Unknown %

11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493255.04 North (km): 3012935.12	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Fermentation and propagation associated with the production of ethanol.		
2. Source Classification Code (SCC): 30125001	3. SCC Units: Tons	
4. Maximum Hourly Rate: 14.8 tons	5. Maximum Annual Rate: 129,298 tons	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: The fermentation and propagation vents exhaust to a wet scrubber designed to remove >98% trace VOC contaminants (ethanol, acetic acid, lactic acid and methanol) from the CO_2 vent stream generated during fermentation and propagation. Equipment in this segment include 4 hemicellulosic fermentation tanks, 4 cellulosic fermentation tanks, 3 hemicellulosic seed propagators, 3 cellulosic enzyme propagators, and 3 cellulosic seed propagators. Scrubbing water is returned to the cellulosics beerwell as make-up water.		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Distillation associated with the production of ethanol.		
2. Source Classification Code (SCC): 30125003	3. SCC Units: Tons	
4. Maximum Hourly Rate: 14.8 tons	5. Maximum Annual Rate: 129,298 tons	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: The distillation operation vents exhaust to a wet scrubber designed to remove >98% of the trace contaminants (ethanol, acetic acid, lactic acid and methanol) from the vent stream. Equipment in this segment include 2 beer strippers, 1 stripper/rectifier, and the molecular sieve dehydration system.		

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	141	N/A	EL
HAPS*	141	N/A	NS
H001	141	N/A	NS
H006	141	N/A	NS
H095	141	N/A	NS
H115	141	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

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: 98%
3. Potential Emissions: Fermentation/Propagation 4.5 lb/hour 16.5 tons/year Distillation 0.6 lb/hour 2.3 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.8366 lb VOC per 1000 gallons of ethanol produced for fermentation. 0.1161 lb VOC per 1000 gallons of ethanol produced for distillation. Reference: Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Maximum short-term emissions are assumed to be 120% of average emissions.	

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: 98%
3. Potential Emissions: Fermentation/Propagation 1.4 lb/hour 5.6 tons/year Distillation 0.2 lb/hour 0.8 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission calculations in Appendix B for speciated HAP emission factors. Reference: Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Maximum short-term emissions are assumed to be 120% of average emissions.	

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: Upon Permit Issuance
3. Allowable Emissions and Units: 98% control	4. Equivalent Allowable Emissions: 5.1 lb/hour 18.8 tons/year
5. Method of Compliance: Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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. N/A

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:	

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. N/A

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:	

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) [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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) [X] Attached, Document ID: Section 5 [ ] 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 ______ [X] 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) [X] Attached, Document ID: Section 5 [ ] 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: ______ [X] To be Submitted, Date (if known): : ______ Test Date(s)/Pollutant(s) Tested: After Start-Up [ ] 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: ______ [X] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [X] 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)

   [X] 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: Product and Denaturant Storage Tanks. The facility includes 2 product shift tanks, 2 E95 storage tanks, 1 recycle product tank, and 1 gasoline storage tank (used as a denaturant).

3. Emissions Unit Identification Number: EU003

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Internal Floating Roofs in each tank.
2. Control Device or Method Code: 091

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:	39,420,000 gal/yr of ethanol 2,074,737 gal/yr gasoline (denaturant) 41,494,737 gal/yr E95
2. Maximum Production Rate: N/A	
3. Maximum Heat Input Rate: N/A million Btu/hr	
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A	

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: EU003	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: P	6. Stack Height: 45 feet	7. Exit Diameter: 0.25 feet
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: N/A acfm	10. Water Vapor: N/A %
11. Maximum Dry Standard Flow Rate: N/A dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493359.47 North (km): 3013079.12	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Emission point data provided correspond to Product Storage Tanks 1 and 2, which are the largest tanks.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 4

1. Segment Description (Process/Fuel Type): Standing Losses from E95 Storage, Product Shift, and Product Recycle Tanks		
2. Source Classification Code (SCC): 40799997	3. SCC Units: 1000 Gallons Throughput	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 41,495	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Two 295,317-gallon ethanol product storage tanks, two 61,215-gallon product shift tanks, and one 61,215-gallon recycle product tank.		

Segment Description and Rate: Segment 2 of 4

1. Segment Description (Process/Fuel Type): Working Losses from E95 Storage, Product Shift, and Product Recycle Tanks		
2. Source Classification Code (SCC): 40799998	3. SCC Units: 1000 Gallons Throughput	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 41,495	6. Estimated Annual Activity Factor: N/A
8. Maximum % Sulfur N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Two 295,317-gallon ethanol product storage tanks, two 61,215-gallon product shift tanks, and one 61,215-gallon recycle product tank.		

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 3 of 4

1. Segment Description (Process/Fuel Type): Gasoline RVP 13: Standing Loss (67000 Bbl Cap.) - Floating Roof Tank		
2. Source Classification Code (SCC): 40400207	3. SCC Units: 1000 Gallons Throughput	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 2,074.7	6. Estimated Annual Activity Factor: N/A
8. Maximum % Sulfur N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: One 28,467-gallon gasoline (denaturant) storage tank.		

Segment Description and Rate: Segment 4 of 4

1. Segment Description (Process/Fuel Type): Gasoline RVP 13: Working Loss (67000 Bbl Cap.) - Floating Roof Tank		
2. Source Classification Code (SCC): 40400204	3. SCC Units: 1000 Gallons Throughput	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 2,074.7	6. Estimated Annual Activity Factor: N/A
8. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: One 28,467-gallon gasoline (denaturant) storage tank.		

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	091	N/A	EL
HAPS*	091	N/A	NS
H017	091	N/A	NS
H085	091	N/A	NS
H104	091	N/A	NS
H053	091	N/A	NS
H169	091	N/A	NS
H181	091	N/A	NS
H186	091	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

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: N/A
3. Potential Emissions: 0.5 lb/hour 1.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: Refer to the TANKS 4.09d emissions calculations in Appendix B. Reference: USEPA TANKS 4.09d Program.	7. Emissions Method Code: 3 (TANKS is based on AP-42)
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Maximum short-term emissions are based on July TANKS calculations.	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: HAPS	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.02 lb/hour 0.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: Refer to the TANKS 4.09d emissions calculations in Appendix B. Reference: USEPA TANKS 4.09d Program.	7. Emissions Method Code: 3 (TANKS is based on AP-42)
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Maximum short-term emissions are based on July TANKS calculations.	

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: Upon Permit Issuance
3. Allowable Emissions and Units: Use of internal floating roof tanks	4. Equivalent Allowable Emissions: 0.5 lb/hour 1.7 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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. N/A

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:	

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. N/A

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:	

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) [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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) [x] Attached, Document ID: Section 5 [ ] 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 ______ [x] 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) [x] Attached, Document ID: Section 5 [ ] 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: ______ [x] To be Submitted, Date (if known): : ______ Test Date(s)/Pollutant(s) Tested: After Start-Up [ ] 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: ______ [x] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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)

   [x] 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: Product Loadout. Product (E95) is loaded into trucks.

3. Emissions Unit Identification Number: EU004

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: N/A   Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

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

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description: Submerged Filling	
2. Control Device or Method Code: 093	

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: 41,494,737 gallons/yr of E95	
2. Maximum Production Rate: 41,494,737 gallons/yr of E95	
3. Maximum Heat Input Rate: Pilot = 0.18 MMBtu/hr; Flare = 9.42 MMBtu/hr	
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: Operating Schedule for Pilot = 8,760 hrs/yr Operating Schedule for Flare = 1,153 hrs/yr	

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: EU004	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): TBD North (km): TBD	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Cars/Trucks: Loading Rack - ethanol		
2. Source Classification Code (SCC): 40899995	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 36	5. Maximum Annual Rate: 41,495	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: VOC emissions during product loadout into trucks		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): < 10 Million Btu/hr of Natural Gas		
2. Source Classification Code (SCC): 10200603	3. SCC Units: Million Cubic Feet	
4. Maximum Hourly Rate: 0.0092	5. Maximum Annual Rate: 10.6	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 1,020
10. Segment Comment: Emissions from the natural gas and gasoline vapors combusted with the 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
VOC	023	093	EL
PM_{10}	023	N/A	NS
$PM_{2.5}$	023	N/A	NS
SO_2	023	N/A	NS
NO_X	023	N/A	NS
CO	023	N/A	NS
HAPS*	023	093	NS
H017	023	093	NS
H085	023	093	NS
H104	023	093	NS
H053	023	093	NS
H169	023	093	NS
H181	023	093	NS
H186	023	093	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: 98%
3. Potential Emissions: 9.3 lb/hour 5.3 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids, January 1995	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.02 lb/hour 0.02 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.02 lb/hour 0.02 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.01 lb/hour 0.004 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.6 lb/hour 0.4 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: N/A
3. Potential Emissions: 3.5 lb/hour 2.3 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: HAPS	2. Total Percent Efficiency of Control: 98%
3. Potential Emissions: 0.6 lb/hour 0.4 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B Reference: EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids, January 1995	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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: Upon Permit Issuance
3. Allowable Emissions and Units: 98% control	4. Equivalent Allowable Emissions: 9.3 lb/hour 5.3 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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)
   [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [X] Attached, Document ID: Section 5 [ ] 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 ___________
   [X] 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)
   [X] Attached, Document ID: Section 5 [ ] 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: ______________________________

   [X] To be Submitted, Date (if known): : ________
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: __________ [X] 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)): [x] Attached, Document ID: Section 5	[ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6	[ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4	[ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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)

   [x] 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: Miscellaneous Storage Silos: Propagation Nutrients (Solka-Flok®, Soy Flour, Ammonium Sulfate, Potassium Phosphate, Urea); Neutralization (Lime), Biomass Boilers (Ash, Sand, Limestone, and Urea).

3. Emissions Unit Identification Number: EU005

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: Various   Model Number: Various

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Low Temperature Fabric Filter (Baghouse)
2. Control Device or Method Code: 018

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: Varies, See Appendix B.		
2. Maximum Production Rate: Varies, See Appendix B.		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU005	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Fabric filter exhaust on each silo.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 47.5 feet	7. Exit Diameter: 1.5 feet
8. Exit Temperature: 77 °F	9. Actual Volumetric Flow Rate: 2,500 acfm	10. Water Vapor: Unknown %
11. Maximum Dry Standard Flow Rate: 2,458 dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates...N/A Zone: 17 East (km): 493217.11 North (km): 3013006.62	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack parameters correspond to the Solka Flock storage silo, which is representative.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Storage of materials associated with chemical manufacturing		
2. Source Classification Code (SCC): 30183001	3. SCC Units: Tons	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: Varies	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: N/A		

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
PM_{10}	018	N/A	EL
$PM_{2.5}$	018	N/A	EL

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_{10}	2. Total Percent Efficiency of Control: 99+%
3. Potential Emissions: 1.1 lb/hour 4.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.005 gr/dscf Reference: Emission factor is equal to proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: 99+%
3. Potential Emissions: 1.1 lb/hour 4.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.005 gr/dscf Reference: Emission factor is equal to proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.005 gr/dscf	4. Equivalent Allowable Emissions: 1.1 lb/hour 4.7 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.005 gr/dscf	4. Equivalent Allowable Emissions: 1.1 lb/hour 4.7 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

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: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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) [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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) [X] Attached, Document ID: Section 5 [ ] 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 ____ [X] 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) [X] Attached, Document ID: Section 5 [ ] 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: ____ [X] To be Submitted, Date (if known): : ____ Test Date(s)/Pollutant(s) Tested: After Start-Up [ ] 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: ____ [X] 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)): [x] Attached, Document ID: Section 5	[ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6	[ ] Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4	[ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

EMISSIONS UNIT INFORMATION
Section [6] of [15]

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.)

   [x] 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)

   [x] 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: Wastewater Anaerobic Treatment. Gases from the wastewater treated by anaerobic digestion will be controlled by venting them to the biomass boilers. A back up flare with a rated capacity of 44.03 MMBtu/hr will be used when the biomass boilers are not in operation.

3. Emissions Unit Identification Number: EU006

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 2

1. Control Equipment/Method Description: Combustion in the biomass boilers	
2. Control Device or Method Code: 024	

Emissions Unit Control Equipment/Method: Control 2 of 2

1. Control Equipment/Method Description: Flare	
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:	

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

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 4,434 lb/hr		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: Pilot = 0.18 MMBtu/hr; Flare = 44.03 MMBtu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: Flare will be used as back-up when the biomass boilers are not operational.		

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: EU006	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates. Zone: 17 East (km): TBD North (km): TBD	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack parameters provided are for the flare. Biomass boiler stack information is provided in Section 10 of 15.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): 10-100 Million Btu/hr of Natural Gas		
2. Source Classification Code (SCC): 10200602	3. SCC Units: Million Cubic Feet	
4. Maximum Hourly Rate: 0.043	5. Maximum Annual Rate: 378	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	7. Maximum % Sulfur: N/A	9. Million Btu per SCC Unit: 1,020
10. Segment Comment: Emissions from the natural gas associated with the flare. VOC emissions from treatment of biogas are accounted for in the biomass boiler emission rate in Section 10 of 15.		

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*	024	N/A	NS
PM_{10}	024	N/A	NS
$PM_{2.5}$	024	N/A	NS
SO_2	024	N/A	NS
NO_X	024	N/A	NS
CO	024	N/A	NS

* VOC emissions are for combustion of natural gas in the flare. VOC emissions from treatment of biogas are accounted for in the biomass boiler emission rate in Section 10 of 15.

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: 98%
3. Potential Emissions: 6.2 lb/hour 0.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.14 lb THC per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.002 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0024 lb PM per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.002 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0024 lb PM per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.03 lb/hour 0.0005 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.00059 lb SO_2 per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 3.0 lb/hour 0.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.068 lb NO_X per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 16.3 lb/hour 0.3 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.37 lb CO per MMBtu Reference: EPA AP-42, Section 13.5, Industrial Flares, January 1995.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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: Upon Permit Issuance
3. Allowable Emissions and Units: 98% Control (for flare)	4. Equivalent Allowable Emissions: N/A lb/hour N/A tons/year (VOC emissions from biogas combustion are included in biomass boiler emissions in Section 10 of 15)
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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)
   [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [X] Attached, Document ID: Section 5 [ ] 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 ______
   [X] 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)
   [X] Attached, Document ID: Section 5 [ ] 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: ______

   [X] To be Submitted, Date (if known): : ______
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ______ [X] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

EMISSIONS UNIT INFORMATION
Section [7] of [15]

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.)

[x] 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).

[x] 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: Wastewater Aerobic Treatment. The wastewater treatment plant consists of a covered equalization tank, a covered primary clarifier, three anaerobic reactors, an aeration basin, a secondary clarifier, and four sand filters.

3. Emissions Unit Identification Number: EU007

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

[ ] Acid Rain Unit

[ ] CAIR Unit

[ ] Hg Budget Unit

9. Package Unit:
Manufacturer: N/A   Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Covered equalization tank and clarifier
2. Control Device or Method Code: 054

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: 1,642 gallons of wastewater/min
2.	Maximum Production Rate: N/A
3.	Maximum Heat Input Rate: N/A million Btu/hr
4.	Maximum Incineration Rate: N/A pounds/hr N/A tons/day
5.	Requested Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year 8760 hours/year
6.	Operating Capacity/Schedule Comment: N/A

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: EU007	2. Emission Point Type Code: 3
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A	

5. Discharge Type Code: P	6. Stack Height: N/A feet	7. Exit Diameter: N/A feet
8. Exit Temperature: N/A °F	9. Actual Volumetric Flow Rate: N/A acfm	10. Water Vapor: N/A %

11. Maximum Dry Standard Flow Rate: N/A dscfm	12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): N/A North (km): N/A	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Wastewater treatment		
2. Source Classification Code (SCC): 30182002	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 98.5	5. Maximum Annual Rate: 863,035	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: The wastewater treatment plant consists of a covered equalization tank, a covered primary clarifier, three anaerobic reactors, an aeration basin, a secondary clarifier, and four sand filters. The flow through the system will be 1,642 gallons per minute.		

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	054	N/A	EL

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: N/A
3. Potential Emissions: 1.2 lb/hour 5.2 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: The USEPA models WATER9 and TANKS 4.09d were used to calculate emissions from the wastewater treatment plant. Reference: USEPA WATER9 and TANKS 4.09d Calculations in Appendix B.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: Covered equalization tank and primary clarifier	4. Equivalent Allowable Emissions: 1.2 lb/hour 5.2 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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. N/A

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:	

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. N/A

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:	

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)
   [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [X] Attached, Document ID: Section 5 [ ] 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 ______
   [X] 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)
   [X] Attached, Document ID: Section 5 [ ] 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: ______

   [X] To be Submitted, Date (if known): : ______
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ______ [X] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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)

   [x] 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: Cooling Tower. Process cooling will be provided by an induced draft cooling tower.

3. Emissions Unit Identification Number: EU008

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Mist Eliminator - High Velocity	
2. Control Device or Method Code: 014	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description: Cooling Water Leak Monitoring and Repair	
2. Control Device or Method Code: 099	

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: 22,500 gal/min of water		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU008	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: P	6. Stack Height: 27.86 feet	7. Exit Diameter: 8 feet
8. Exit Temperature: 85 °F	9. Actual Volumetric Flow Rate: 75,398 acfm	10. Water Vapor: Unknown %
11. Maximum Dry Standard Flow Rate: 73,046 dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493225.85 North (km): 3012885.90	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Stack data provided for cooling tower cell No. 3, which is representative.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Process Cooling Mechanical Draft		
2. Source Classification Code (SCC): 38500101	3. SCC Units: Million Gallons	
4. Maximum Hourly Rate: 1.35	5. Maximum Annual Rate: 11,826	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Flow rate of 22,500 gallons/minute (GPM) cooling water		

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
PM_{10}	014	N/A	EL
$PM_{2.5}$	014	N/A	EL
VOC	099	N/A	EL

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control: Control to 0.0005% drift loss
3. Potential Emissions: 0.2 lb/hour 0.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: Assume a TDS of 2,750 mg/L and drift loss of 0.0005% Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: Control to 0.0005% drift loss
3. Potential Emissions: 0.2 lb/hour 0.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: Assume a TDS of 2,750 mg/L and drift loss of 0.0005% Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: PM_{10} is a surrogate for $PM_{2.5}$	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.9 lb/hour 4.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.7 lb VOC / MGD Reference: SCAQMD, 2006. "Guidelines for Calculating Emissions from Cooling Towers." June 2006.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: HAPS	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.05 lb/hour 0.2 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 5% of VOC Reference: Assumed.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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 4

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0005% Drift	4. Equivalent Allowable Emissions: 0.2 lb/hour 0.7 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 4

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0005% Drift	4. Equivalent Allowable Emissions: 0.2 lb/hour 0.7 tons/year
5. Method of Compliance: Equipment design	
6. Allowable Emissions Comment (Description of Operating Method): Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 4

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: Leak Monitoring	4. Equivalent Allowable Emissions: 0.9 lb/hour 4.1 tons/year
5. Method of Compliance: Leak Monitoring and Repair	
6. Allowable Emissions Comment (Description of Operating Method):	

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 4 of 4

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: Leak Monitoring	4. Equivalent Allowable Emissions: 0.05 lb/hour 0.2 tons/year
5. Method of Compliance: Leak Monitoring and Repair	
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 Limitation1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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)
   [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [x] Attached, Document ID: Section 5 [ ] 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 ______
   [x] 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)
   [x] Attached, Document ID: Section 5 [ ] 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: ______

   [x] To be Submitted, Date (if known): : ______
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ______ [x] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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)

   [x] 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: Two Biomass Boilers. The fluidized bed units will burn biomass (stillage cake, biogas, and supplemental biomass) as fuel with natural gas for startups and flame stabilization. Each boiler will be equipped with a baghouse to control PM emissions, selective non-catalytic reduction (SNCR) to control NO_X emissions, and limestone injection to control SO_2 emissions. Good combustion practices will be used to minimize CO and VOC emissions.

3. Emissions Unit Identification Number: EU009

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: To Be Determined (TBD) Model Number: TBD

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 3

1. Control Equipment/Method Description: Fabric Filter – High Temperature (>250 °F)	
2. Control Device or Method Code: 016	

Emissions Unit Control Equipment/Method: Control 2 of 3

1. Control Equipment/Method Description: Selective Noncatalytic Reduction for NO_X	
2. Control Device or Method Code: 107	

Emissions Unit Control Equipment/Method: Control 3 of 3

1. Control Equipment/Method Description: Dry Limestone Injection	
2. Control Device or Method Code: 041	

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: N/A		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: 198 MMBtu/hr each or 396 MMBtu/hr total		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU009	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Stack of each boiler.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 180 feet	7. Exit Diameter: 6 feet
8. Exit Temperature: 305 °F	9. Actual Volumetric Flow Rate: 78,905 acfm	10. Water Vapor: Unknown %
11. Maximum Dry Standard Flow Rate: 54,460 dscfm	12. Nonstack Emission Point Height: N/A feet	
13. Emission Point UTM Coordinates Zone: 17 East (km): 493273.90 North (km): 3013178.20	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Parameters provided on this form are for one stack (Biomass Boiler No. 1). There will be two identical stacks; one for each boiler.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Fluidized bed combustion boiler		
2. Source Classification Code (SCC): 10200912	3. SCC Units: Tons (of biomass)	
4. Maximum Hourly Rate: 47.1	5. Maximum Annual Rate: 412,971	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 4.4%, Variable	8. Maximum % Ash: 7%, Variable	9. Million Btu per SCC Unit: 8.4
10. Segment Comment: N/A		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Natural Gas >100 MMBtu/hr		
2. Source Classification Code (SCC): 10200601	3. SCC Units: Million Cubic Feet	
4. Maximum Hourly Rate: 0.388	5. Maximum Annual Rate: 3,399	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 1,020
10. Segment Comment: N/A		

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
PM_{10}	016	N/A	EL
$PM_{2.5}$	016	N/A	EL
SO_2	041	N/A	EL
NO_X	107	N/A	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
NH_3	N/A	N/A	EL
PB	N/A	N/A	NS
HAPS*	N/A	N/A	NS
H106	N/A	N/A	NS
H114	N/A	N/A	NS
H151	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total and individual HAPs are provided in Section F1 for informational purposes. Mercury is included specifically at the request of FDEP.**

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_{10}	2. Total Percent Efficiency of Control: 99+%
3. Potential Emissions: 19.8 lb/hour 86.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.05 lb PM_{10} per MMBtu (total PM_{10}) 0.01 lb PM_{10} per MMBtu (filterable PM_{10}) Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: 99+%
3. Potential Emissions: 19.8 lb/hour 86.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.05 lb $PM_{2.5}$ per MMBtu (total $PM_{2.5}$) 0.01 lb $PM_{2.5}$ per MMBtu (filterable $PM_{2.5}$) Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: SO_2	2. Total Percent Efficiency of Control: 85-95%
3. Potential Emissions: 55.4 lb/hour 104.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.06 lb SO_2 per MMBtu (30-day rolling average) 0.12 lb SO_2 per MMBtu (24-hour rolling average) 0.14 lb SO_2 per MMBtu (3-hour block average) Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: NO_X	2. Total Percent Efficiency of Control: 45-65%
3. Potential Emissions: 39.6 lb/hour 130.1 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.075 lb NO_X per MMBtu (30-day rolling average) 0.10 lb NO_X per MMBtu (24-hour rolling average) Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 79.2 lb/hour 173.4 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.1 lb CO per MMBtu (30-day rolling average) 0.2 lb CO per MMBtu (8-hour rolling average) Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: N/A
3. Potential Emissions: 2.0 lb/hour 8.7 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.005 lb VOC per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: NH_3	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 2.9 lb/hour 12.8 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 10 ppmv Reference: Emission factor based on proposed ammonia slip for SNCR to meet NO_X BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: Pb (Lead)	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.02 lb/hour 0.08 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.000048 lb per MMBtu Reference: Pb emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate.	7. Emissions Method Code: 4
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: N/A
3. Potential Emissions: 2.2 lb/hour 9.6 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: HAP emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate except for HCl and Hg, which were based on testing of feedstock.	7. Emissions Method Code: 4
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: H106 (Hydrochloric Acid)	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 2.1 lb/hour 9.4 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0054 lb per MMBtu Reference: HCl emission factor is based on testing of feedstock.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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 (Mercury)	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.004 lb/hour 0.02 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 1E-05 lb per MMBtu Reference: Hg emission factor is based on testing of feedstock.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: H151 (Polycyclic Organic Matter)	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.2 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.000143 lb per MMBtu Reference: HAP emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate.	7. Emissions Method Code: 4
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.01 lb/MMBtu	4. Equivalent Allowable Emissions: 4.0 lb/hour 17.3 tons/year
5. Method of Compliance: EPA Method 5 compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.01 lb/MMBtu	4. Equivalent Allowable Emissions: 4.0 lb/hour 17.3 tons/year
5. Method of Compliance: EPA Method 5 compliance test (PM_{10} is a surrogate for $PM_{2.5}$ per FDEP)	
6. Allowable Emissions Comment (Description of Operating Method): Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.06 lb/MMBtu	4. Equivalent Allowable Emissions: 23.8 lb/hour 104.1 tons/year
5. Method of Compliance: CEMS	
6. Allowable Emissions Comment (Description of Operating Method): Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

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 4 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.075 lb/MMBtu	4. Equivalent Allowable Emissions: 29.7 lb/hour 130.1 tons/year
5. Method of Compliance: CEMS	
6. Allowable Emissions Comment (Description of Operating Method): Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.1 lb/MMBtu	4. Equivalent Allowable Emissions: 39.6 lb/hour 173.4 tons/year
5. Method of Compliance: CEMS	
6. Allowable Emissions Comment (Description of Operating Method): Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.005 lb/MMBtu	4. Equivalent Allowable Emissions: 2.0 lb/hour 8.7 tons/year
5. Method of Compliance: EPA Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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 7 of 7

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 10 ppmv	4. Equivalent Allowable Emissions: 2.9 lb/hour 12.8 tons/year
5. Method of Compliance: TBD	
6. Allowable Emissions Comment (Description of Operating Method): Proposed NH_3 slip for SNCR to meet proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

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 3

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other

3. Allowable Opacity:
Normal Conditions: 20 % Exceptional Conditions: 27 %
Maximum Period of Excess Opacity Allowed: 6 min/hour
OR
Normal Conditions: 20 % Exceptional Conditions: 40 %
Maximum Period of Excess Opacity Allowed: 2 min/hour

4. Method of Compliance: COMS

5. Visible Emissions Comment: VE limitation required by 62-296.406 F.A.C. (Fossil Fuel Steam Generators with less than 250 MMBtu/hr Heat Input, New and Existing Emission Units) when boilers are combusting natural gas.

Visible Emissions Limitation: Visible Emissions Limitation 2 of 3

1. Visible Emissions Subtype: VE30	2. Basis for Allowable Opacity: [x] Rule [ ] Other

3. Allowable Opacity:
Normal Conditions: 30 % Exceptional Conditions: 40 %
Maximum Period of Excess Opacity Allowed: 2 min/hour

4. Method of Compliance: COMS

5. Visible Emissions Comment: VE limitation required by 62-296.410 F.A.C. (Carbonaceous Fuel Burning Equipment) when boilers are combusting biomass.

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 3 of 3

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: COMS	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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: 40 % Maximum Period of Excess Opacity Allowed: 2 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 1 of 5

1. Parameter Code: EM	2. Pollutant(s): NO_X
3. CMS Requirement:	[x] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: After Permit Issuance	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: CEMS is required by 40 CFR 60.48b (Subpart Db) and proposed for 62-212.400(10) F.A.C (BACT)	

Continuous Monitoring System: Continuous Monitor 2 of 5

1. Parameter Code: EM	2. Pollutant(s): SO_2
3. CMS Requirement:	[x] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: After Permit Issuance	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: CEMS required by 40 CFR 60.47b (Subpart Db) and proposed for 62-212.400(10) F.A.C (BACT)	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 3 of 5

1. Parameter Code: EM	2. Pollutant(s): CO
3. CMS Requirement:	[x] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: After Permit Issuance	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: CEMS proposed for 62-212.400(10) F.A.C (BACT)	

Continuous Monitoring System: Continuous Monitor 4 of 5

1. Parameter Code: O_2	2. Pollutant(s): N/A
3. CMS Requirement:	[x] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: After Permit Issuance	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: CEMS is required by 40 CFR 60.47b and 60.48b (Subpart Db)	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 5 of 5

1. Parameter Code: VE	2. Pollutant(s): N/A
3. CMS Requirement:	[x] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: After Permit Issuance	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: COMS is required by 40 CFR 60.48b (Subpart Db)	

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:	

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)
[X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
[X] Attached, Document ID: Section 5 [ ] 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 ______
[X] 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)
[X] Attached, Document ID: Section 5 [ ] 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: ______
[X] To be Submitted, Date (if known): : ______
Test Date(s)/Pollutant(s) Tested: After Start-Up
[ ] 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: ______ [X] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [X] 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)

   [X] 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: Backup Boiler. The backup boiler will be fired with natural gas, if natural gas becomes available to the site as expected. Otherwise, it will be fired with No. 2 fuel oil. The backup boiler will operate only when one of the biomass boilers is not operational.

3. Emissions Unit Identification Number: EU010

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: TBD Model Number: TBD

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 2

1. Control Equipment/Method Description: Low NO_X Burners
2. Control Device or Method Code: 205

Emissions Unit Control Equipment/Method: Control 2 of 2

1. Control Equipment/Method Description: Flue Gas Recirculation
2. Control Device or Method Code: 026

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: N/A		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: 198 million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU010		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 150 feet	7. Exit Diameter: 5.5 feet
8. Exit Temperature: 350 °F	9. Actual Volumetric Flow Rate: 61,671 acfm	10. Water Vapor: Unknown %
11. Maximum Dry Standard Flow Rate: 40,200 dscfm		12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 493304.72 North (km): 3013114.02		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Natural Gas >100 MMBtu/hr		
2. Source Classification Code (SCC): 10200601	3. SCC Units: Million Cubic Feet	
4. Maximum Hourly Rate: 0.194	5. Maximum Annual Rate: N/A	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 1,020
10. Segment Comment: N/A The backup boiler will operate only when one of the biomass boilers is not operational.		

Segment Description and Rate: Segment of 2 of 2

1. Segment Description (Process/Fuel Type): Grades 1 and 2 oil		
2. Source Classification Code (SCC): 10200501	3. SCC Units: 1000 gallons	
4. Maximum Hourly Rate: 1.414	5. Maximum Annual Rate: N/A	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.0015	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 140
10. Segment Comment: The backup boiler will only be fired with No. 2 oil if natural gas is not available at the site.		

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
PM_{10}	N/A	N/A	EL
$PM_{2.5}$	N/A	N/A	EL
SO_2	N/A	N/A	EL
NO_X	205	026	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
*HAPS	N/A	N/A	NS
H015	N/A	N/A	NS
H017	N/A	N/A	NS
H020	N/A	N/A	NS
H027	N/A	N/A	NS
H046	N/A	N/A	NS
H047	N/A	N/A	NS
H061	N/A	N/A	NS
H095	N/A	N/A	NS
H104	N/A	N/A	NS
H113	N/A	N/A	NS
H114	N/A	N/A	NS
H132	N/A	N/A	NS
H133	N/A	N/A	NS
H153	N/A	N/A	NS
H162	N/A	N/A	NS
H169	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted based on natural gas combustion are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: PM_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 1.4 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0071 lb of PM_{10} per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 1.4 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0071 lb of $PM_{2.5}$ per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: PM_{10} is a surrogate for $PM_{2.5}$	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 1.1 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0056 lb of SO_2 per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: NO_X	2. Total Percent Efficiency of Control: Not Quantifiable
3. Potential Emissions: 14.3 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.072 lb of NO_X per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: N/A
3. Potential Emissions: 7.3 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.037 lb of CO per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: N/A
3. Potential Emissions: 0.3 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0015 lb of VOC per MMBtu Reference: Emission factor based on proposed BACT emission limit.	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: N/A	

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: N/A
3. Potential Emissions: 0.4 lb/hour N/A tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: Emission factors based on EPA AP-42, Section 14 "Natural Gas Combustion", July 1998.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: HAP emissions based on natural gas combustion.	

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 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0071 lb/MMBtu	4. Equivalent Allowable Emissions: 1.4 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 5 compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0071 lb/MMBtu	4. Equivalent Allowable Emissions: 1.4 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 5 compliance test (PM_{10} is a surrogate for $PM_{2.5}$)	
6. Allowable Emissions Comment (Description of Operating Method): Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0056 lb/MMBtu	4. Equivalent Allowable Emissions: 1.1 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 6C compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

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 4 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.072 lb/MMBtu	4. Equivalent Allowable Emissions: 14.3 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 7E compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.037 lb/MMBtu	4. Equivalent Allowable Emissions: 7.3 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 10B compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0015 lb/MMBtu	4. Equivalent Allowable Emissions: 0.3 lb/hour N/A tons/year
5. Method of Compliance: EPA Method 25 or 25A compliance test	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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 2

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 27 % Maximum Period of Excess Opacity Allowed: 6 min/hour OR Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.406 F.A.C. (Fossil Fuel Steam Generators with less than 250 MMBtu/hr Heat Input, New and Existing Emission Units).	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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: N/A	2. Pollutant(s): N/A
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:	

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)
   [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [x] Attached, Document ID: Section 5 [ ] 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 ________
   [x] 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)
   [x] Attached, Document ID: Section 5 [ ] 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: ________

   [x] To be Submitted, Date (if known): : ________
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ________ [x] 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)): [X] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [X] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [X] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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)

   [x] 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 Generators. The four emergency generators will be used in the event of power supply disruptions.

3. Emissions Unit Identification Number: EU011

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: TBD Model Number: TBD

10. Generator Nameplate Rating: 2 MW

11. Emissions Unit Comment: Emergency Generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions assume maximum operations of 500 hours per year.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: None
2. Control Device or Method Code: N/A

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: N/A		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: 19.45 million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week up to 500 hours/year
6. Operating Capacity/Schedule Comment: N/A The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.		

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: EU011		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm		12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates.. Zone: 17 East (km): TBD North (km): TBD		14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Distillate (Diesel Oil) Reciprocating Internal Combustion Engine		
2. Source Classification Code (SCC): 20200102	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 0.139 each	5. Maximum Annual Rate: 69.45 each	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.0015	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 140
10. Segment Comment: The emergency generators will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. The maximum annual rate is based on an assumed maximum operating time of 500 hr/yr.		

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
PM_{10}	N/A	N/A	EL
$PM_{2.5}$	N/A	N/A	EL
SO_2	N/A	N/A	EL
NO_X	N/A	N/A	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
HAPS*	N/A	N/A	NS
H001	N/A	N/A	NS
H006	N/A	N/A	NS
H017	N/A	N/A	NS
H095	N/A	N/A	NS
H169	N/A	N/A	NS
H187	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

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_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 3.5 lb/hour 0.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.2 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 3.5 lb/hour 0.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.2 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: PM_{10} is a surrogate for $PM_{2.5}$. The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.02 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0041 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 101.6 lb/hour 25.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 5.76 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 61.7 lb/hour 15.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 3.5 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 11.3 lb/hour 2.8 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.64 g/kW-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 0.3 lb/hour 0.1 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: EPA AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The emergency generator will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.2 g/kW-hr	4. Equivalent Allowable Emissions: 3.5 lb/hour 0.9 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.2 g/kW-hr	4. Equivalent Allowable Emissions: 3.5 lb/hour 0.9 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0041 g/kW-hr	4. Equivalent Allowable Emissions: 0.1 lb/hour 0.02 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

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 4 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 5.76 g/kW-hr	4. Equivalent Allowable Emissions: 101.6 lb/hour 25.40 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 3.5 g/kW-hr	4. Equivalent Allowable Emissions: 61.7 lb/hour 15.4 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.64 g/kW-hr	4. Equivalent Allowable Emissions: 11.3 lb/hour 2.8 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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)
   [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [X] Attached, Document ID: Section 5 [ ] 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 ______
   [X] 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)
   [X] Attached, Document ID: Section 5 [ ] 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: ______

   [X] To be Submitted, Date (if known): : ______
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ______ [X] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

EMISSIONS UNIT INFORMATION
Section [12] of [15]

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.)

   [x] 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)

   [x] 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: Fire Pump. The diesel pump will be used to provide water in the event of a fire.

3. Emissions Unit Identification Number: EU012

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit:
   Manufacturer: TBD Model Number: TBD

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: The pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: None
2. Control Device or Method Code: N/A

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: N/A		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: 2.52 million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week up to 500 hours/year
6. Operating Capacity/Schedule Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.		

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: EU012		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: TBD feet	7. Exit Diameter: TBD feet
8. Exit Temperature: TBD °F	9. Actual Volumetric Flow Rate: TBD acfm	10. Water Vapor: TBD %
11. Maximum Dry Standard Flow Rate: TBD dscfm		12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates.. Zone: 17 East (km): TBD North (km): TBD		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Distillate (Diesel Oil) Reciprocating Internal Combustion Engine		
2. Source Classification Code (SCC): 20200102	3. SCC Units: 1000 Gallons	
4. Maximum Hourly Rate: 0.018	5. Maximum Annual Rate: 9.14	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: 0.0015	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: 140
10. Segment Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. The maximum annual rate is based on an assumed maximum operating time of 500 hr/yr.		

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
PM_{10}	N/A	N/A	EL
$PM_{2.5}$	N/A	N/A	EL
SO_2	N/A	N/A	EL
NO_X	N/A	N/A	EL
CO	N/A	N/A	EL
VOC	N/A	N/A	EL
HAPS*	N/A	N/A	NS
H001	N/A	N/A	NS
H006	N/A	N/A	NS
H017	N/A	N/A	NS
H095	N/A	N/A	NS
H169	N/A	N/A	NS
H187	N/A	N/A	NS
H132	N/A	N/A	NS
H151	N/A	N/A	NS

*** Although the facility is not major for HAPs, the HAPs emitted are provided in Section E and emissions of total HAPs are provided in Section F1 for informational purposes.**

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_{10}	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.03 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.15 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.1 lb/hour 0.03 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.15 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: PM10 is a surrogate for PM2.5. The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: SO_2	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 0.004 lb/hour 0.001 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0055 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: NO_X	2. Total Percent Efficiency of Control: N/A
3. Potential Emissions: 2.1 lb/hour 0.5 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 2.7 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 2.1 lb/hour 0.5 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 2.6 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 0.2 lb/hour 0.1 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.3 g/hp-hr Reference: 40 CFR 60, Subpart IIII	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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: N/A
3. Potential Emissions: 0.02 lb/hour 0.004 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: See emissions inventory calculations in Appendix B for pollutant-specific emission factors. Reference: EPA AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A [ ] 5 years [ ] 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: The fire pump will be tested weekly for approximately 1 hour or less, and will be limited to less than 100 hours per year for testing and maintenance per 40 CFR 60, Subpart IIII. Emissions are based on an assumed maximum operating time of 500 hr/yr.	

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 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.15 g/hp-hr	4. Equivalent Allowable Emissions: 0.1 lb/hour 0.03 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed PM_{10} BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.15 g/hp-hr	4. Equivalent Allowable Emissions: 0.1 lb/hour 0.03 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed $PM_{2.5}$ BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 3 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.0055 g/hp-hr	4. Equivalent Allowable Emissions: 0.004 lb/hour 0.001 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed SO_2 BACT Emission Limit per 62-212.400(10) F.A.C.	

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 4 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 2.7 g/hp-hr	4. Equivalent Allowable Emissions: 2.1 lb/hour 0.5 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed NO_X BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 5 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 2.6 g/hp-hr	4. Equivalent Allowable Emissions: 2.1 lb/hour 0.5 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed CO BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 6 of 6

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: 0.3 g/hp-hr	4. Equivalent Allowable Emissions: 0.2 lb/hour 0.06 tons/year
5. Method of Compliance: as specified in 40 CFR 60, Subpart IIII	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart IIII and Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: N/A % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: VE limitation required by 62-296.320(4)(b) F.A.C. (General Visible Emission Standard)	

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. N/A

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:	

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)
   [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [x] Attached, Document ID: Section 5 [ ] 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 ______
   [x] 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)
   [x] Attached, Document ID: Section 5 [ ] 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: ______

   [x] To be Submitted, Date (if known): : ______
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ______ [x] 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)): [X] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [X] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [X] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

[x] 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.

[x] 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: Stillage Loadout. Stillage cake is removed from the celluosic beer stripper distillation column, dewatered to remove some of the water fraction, and conveyed to the biomass boiler for use as a fuel.

3. Emissions Unit Identification Number: EU013

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

[ ] Acid Rain Unit

[ ] CAIR Unit

[ ] Hg Budget Unit

9. Package Unit:
Manufacturer: N/A   Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: None
2. Control Device or Method Code: N/A

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: 25 dry tons per hour of stillage		
2. Maximum Production Rate: 39,420,000 gal/yr of ethanol		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU013		2. Emission Point Type Code: 4
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: P	6. Stack Height: N/A feet	7. Exit Diameter: N/A feet
8. Exit Temperature: N/A °F	9. Actual Volumetric Flow Rate: N/A acfm	10. Water Vapor: N/A %
11. Maximum Dry Standard Flow Rate: N/A dscfm		12. Nonstack Emission Point Height: N/A feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): N/A North (km): N/A		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): General Processes – Storage and Transfer		
2. Source Classification Code (SCC): 30183001	3. SCC Units: Tons	
4. Maximum Hourly Rate: 25	5. Maximum Annual Rate: 219,000	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Stillage cake will be removed from the beer stripper distillation column, dewatered to remove some of the water fraction, and conveyed to the biomass boiler for use as fuel.		

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	N/A	N/A	EL

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: N/A
3. Potential Emissions: 0.6 lb/hour 2.8 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A to tons/year	
6. Emission Factor: 0.0001421 lb VOC per gallon of ethanol produced. Reference: Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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: Upon Permit Issuance
3. Allowable Emissions and Units: 0.6 lb/hr; 2.8 tons/yr	4. Equivalent Allowable Emissions: 0.6 lb/hour 2.8 tons/year
5. Method of Compliance: Material throughput records and emission calculations	
6. Allowable Emissions Comment (Description of Operating Method): Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

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. N/A

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:	

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. N/A

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:	

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)
   [x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [x] Attached, Document ID: Section 5 [ ] 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 ____
   [x] 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)
   [x] Attached, Document ID: Section 5 [ ] 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: ____

   [x] To be Submitted, Date (if known): : ____
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ____ [x] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

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.)

   [x] 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.

   [x] 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: Fugitive Equipment Leaks. Equipment components in VOC service are subject to 40 CFR Part 60 Subpart VVa; therefore components are monitored monthly.

3. Emissions Unit Identification Number: EU014

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit: N/A
   Manufacturer: N/A Model Number: N/A

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Components will be monitored monthly per Subpart VVa. Refer to: Table 5-2, Control Effectiveness for an LDAR Program at a SOCMI Process Unit, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.
2. Control Device or Method Code: N/A

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description: LDAR
2. Control Device or Method Code: 099

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: N/A		
2. Maximum Production Rate: 39,420,000 gallons/yr ethanol		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU014		2. Emission Point Type Code: 4
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: F	6. Stack Height: N/A feet	7. Exit Diameter: N/A feet
8. Exit Temperature: N/A °F	9. Actual Volumetric Flow Rate: N/A acfm	10. Water Vapor: N/A %
11. Maximum Dry Standard Flow Rate: N/A dscfm		12. Nonstack Emission Point Height: 0 - 20 feet
13. Emission Point UTM Coordinates... Zone: N/A East (km): N/A North (km): N/A		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Fugitive Emissions from methanol/alcohol production		
2. Source Classification Code (SCC): 30125004	3. SCC Units: EACH-YEAR	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 4,070 components	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Equipment components in VOC service are subject to 40 CFR Part 60 Subpart VVa; therefore components are monitored monthly.		

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	N/A	N/A	EL
HAPS	N/A	N/A	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: 0 to 87% (depending on component monitored)
3. Potential Emissions: 4.5 lb/hour 19.6 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A tons/year	
6. Emission Factor: See emission factors in emissions inventory calculations in Appendix B. Reference: Table 2-1, SOCMI Average Emission Factors; or Table 2-11, Default-Zero Values: SOCMI Process Units; or Table 5-1, Summary of Equipment Modifications; Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment:	

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: 0 to 87% (depending on component monitored)
3. Potential Emissions: 0.2 lb/hour 1.0 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A tons/year	
6. Emission Factor: Conservatively assumed equal to 5% of VOC emissions. Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
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 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issuance
3. Allowable Emissions and Units: LDAR in compliance with NSPS	4. Equivalent Allowable Emissions: 4.5 lb/hour 19.6 tons/year
5. Method of Compliance: LDAR as specified in 40 CFR 60, Subpart VVa	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart VVa and Proposed VOC BACT Emission Limit per 62-212.400(10) F.A.C.	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions: Upon Permit Issu
3. Allowable Emissions and Units: LDAR in compliance with NSPS	4. Equivalent Allowable Emissions: 0.2 lb/hour 1.0 tons/year
5. Method of Compliance: LDAR as specified in 40 CFR 60, Subpart VVa	
6. Allowable Emissions Comment (Description of Operating Method): 40 CFR 60, Subpart VVa	

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. N/A

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:	

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. N/A

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:	

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)
   [X] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
   [X] Attached, Document ID: Section 5 [ ] 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 ____
   [X] 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)
   [X] Attached, Document ID: Section 5 [ ] 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: ____

   [X] To be Submitted, Date (if known): : ____
   Test Date(s)/Pollutant(s) Tested: After Start-Up

   [ ] 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: ____ [X] 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)): [x] Attached, Document ID: Section 5 ☐ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 ☐ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

EMISSIONS UNIT INFORMATION
Section [15] of [15]

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.)

   [x] 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.

   [x] 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: Fugitive Dust from Paved and Unpaved Roads. Approximately 130 trucks per day will deliver feedstock using the feedstock roads, and an additional 100 vehicles per day will drive on the plant roads. The feedstock roads will be unpaved, consisting primarily of gravel. The plant roads will be paved with asphalt. To minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water.

3. Emissions Unit Identification Number: EU015

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	N/A	N/A	28

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

   [ ] Acid Rain Unit

   [ ] CAIR Unit

   [ ] Hg Budget Unit

9. Package Unit: N/A
   Manufacturer: Model Number:

10. Generator Nameplate Rating: N/A MW

11. Emissions Unit Comment: N/A

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: Dust Suppression by Water Sprays (on unpaved roads)
2. Control Device or Method Code: 061

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: 21,256 vehicle miles/yr on paved roads 57,294 vehicle miles/yr on unpaved roads		
2. Maximum Production Rate: N/A		
3. Maximum Heat Input Rate: N/A million Btu/hr		
4. Maximum Incineration Rate: N/A pounds/hr N/A 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: N/A		

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: EU015	2. Emission Point Type Code: 4	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: N/A		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: F	6. Stack Height: N/A feet	7. Exit Diameter: N/A feet
8. Exit Temperature: N/A °F	9. Actual Volumetric Flow Rate: N/A acfm	10. Water Vapor: N/A %
11. Maximum Dry Standard Flow Rate: N/A dscfm	12. Nonstack Emission Point Height: 0 feet	
13. Emission Point UTM Coordinates... Zone: N/A East (km): N/A North (km): N/A	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: N/A		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Unpaved roads – heavy duty vehicles		
2. Source Classification Code (SCC): 30300833	3. SCC Units: Miles	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 57,294	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Approximately 130 trucks per day will be used to deliver feedstock and will use the feedstock roads. The feedstock roads will be unpaved, consisting primarily of gravel. To minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water. Because Highlands Ethanol is considering the use of supplemental biomass in its boilers, an additional 120 trucks per day are conservatively assumed for delivering the supplemental fuel. These trucks are conservatively assumed to use the unpaved feedstock roads.		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Paved roads – all vehicle types		
2. Source Classification Code (SCC): 30300834	3. SCC Units: Miles	
4. Maximum Hourly Rate: N/A	5. Maximum Annual Rate: 21,256	6. Estimated Annual Activity Factor: N/A
7. Maximum % Sulfur: N/A	8. Maximum % Ash: N/A	9. Million Btu per SCC Unit: N/A
10. Segment Comment: Approximately 100 vehicles per day will drive on the plant roads. The plant roads will be paved with asphalt.		

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
PM_{10}	061	N/A	EL
$PM_{2.5}$	061	N/A	EL

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_{10}	2. Total Percent Efficiency of Control: 75% (for water spray on unpaved roads)
3. Potential Emissions: 2.3 lb/hour 9.9 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A tons/year	
6. Emission Factor: Paved: 0.063 lbs PM_{10}/VMT (adjusted for estimated rainfall) Unpaved: 1.29 lbs PM_{10}/VMT (adjusted for estimated rainfall) Reference: EPA, AP-42, Section 13.2.2, Unpaved Roads, November 2006. EPA, AP-42, Section 13.2.1, Paved Roads, November 2006.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Emissions from unpaved roads are controlled during dry periods by water spray (75% control on unpaved road emissions).	

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: $PM_{2.5}$	2. Total Percent Efficiency of Control: 75% (for water spray on unpaved roads)
3. Potential Emissions: 0.2 lb/hour 1.0 tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): N/A tons/year	
6. Emission Factor: Paved: 0.009 lbs $PM_{2.5}$/VMT (adjusted for estimated rainfall) Unpaved: 0.13 lbs $PM_{2.5}$/VMT (adjusted for estimated rainfall) Reference: EPA, AP-42, Section 13.2.2, Unpaved Roads, November 2006. EPA, AP-42, Section 13.2.1, Paved Roads, November 2006.	7. Emissions Method Code: 3
8.a. Baseline Actual Emissions (if required): N/A tons/year	8.b. Baseline 24-month Period: N/A From: To:
9.a. Projected Actual Emissions (if required): N/A tons/year	9.b. Projected Monitoring Period: N/A ☐ 5 years ☐ 10 years
10. Calculation of Emissions: See emissions inventory calculations in Appendix B.	
11. Potential, Fugitive, and Actual Emissions Comment: Emissions from unpaved roads are controlled during dry periods by water spray (75% control on unpaved road emissions).	

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. N/A

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. N/A

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

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: N/A	

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. N/A

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:	

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)
[x] Attached, Document ID: Figure 2-2 [ ] 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: NA [ ] 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)
[x] Attached, Document ID: Section 5 [ ] 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 ______
[x] 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)
[x] Attached, Document ID: Section 5 [ ] 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: ______

[x] To be Submitted, Date (if known): : ______
Test Date(s)/Pollutant(s) Tested: After Start-Up

[ ] 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: ______ [x] 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)): [x] Attached, Document ID: Section 5 [ ] Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): [x] Attached, Document ID: Section 6 [ ] Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) [x] Attached, Document ID: Section 4 [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications (N/A)

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

N/A

APPENDIX B

Emissions Calculations

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
SUMMARY OF EMISSIONS

Pollutant / CAS No.	PM10 (tpy)	PM2.5 (tpy)	SO2 7446-09-5 (tpy)	NOx (tpy)	CO 630-08-0 (tpy)	VOC (tpy)	HAP (tpy)	Acetaldehyde 75-07-0 (tpy)	Acrolein 107-02-8 (tpy)	Benzene 71-43-2 (tpy)	Cumene 98-82-8 (tpy)	Ethylbenzene 100-41-4 (tpy)
POINT EMISSION SOURCES												
LIQUID/SOLID SEPARATION SCRUBBER	---	---	---	---	---	2.1	---	---	---	---	---	---
FERMENTATION/DISTILLATION SCRUBBER	---	---	---	---	---	18.8	6.4	6.1	0.1	---	---	---
FERMENTATION	---	---	---	---	---	*16.5*	*5.6*	*5.4*	*0.1*	---	---	---
DISTILLATION	---	---	---	---	---	*2.3*	*0.8*	*0.7*	*0.01*	---	---	---
PRODUCT STORAGE TANKS	---	---	---	---	---	0.7	0.003	---	---	0.001	0.00001	0.0001
PRODUCT SHIFT TANK NO. 1	---	---	---	---	---	*0.2*	---	---	---	---	---	---
PRODUCT SHIFT TANK NO. 2	---	---	---	---	---	*0.2*	---	---	---	---	---	---
RECYCLE PRODUCT TANK	---	---	---	---	---	*0.1*	---	---	---	---	---	---
PRODUCT STORAGE TANK NO. 1	---	---	---	---	---	*0.2*	*0.002*	---	---	*0.001*	*0.000005*	*0.00003*
PRODUCT STORAGE TANK NO. 2	---	---	---	---	---	*0.2*	*0.002*	---	---	*0.001*	*0.000005*	*0.00003*
PRODUCT LOADOUT FLARE	0.02	0.02	0.004	0.4	2.3	5.3	0.4	---	---	0.1	0.001	0.003
DENATURANT STORAGE TANK	---	---	---	---	---	0.9	0.1	---	---	0.01	0.0001	0.001
MISCELLANEOUS CHEMICAL STORAGE TANKS	---	---	---	---	---	0.0	---	---	---	---	---	---
SULFURIC ACID (98% SOLUTION)	---	---	---	---	---	---	---	---	---	---	---	---
SULFURIC ACID (3% SOLUTION)	---	---	---	---	---	---	---	---	---	---	---	---
CORN STEEP LIQUOR (NUTRIENT)	---	---	---	---	---	*0.0*	---	---	---	---	---	---
LACTOSE (NUTRIENT)	---	---	---	---	---	*0.0*	---	---	---	---	---	---
GLUCOSE (NUTRIENT)	---	---	---	---	---	*0.0*	---	---	---	---	---	---
PHOSPHORIC ACID (NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---	---
MISCELLANEOUS STORAGE SILOS	4.7	4.7	---	---	---	---	---	---	---	---	---	---
PEBBLED LIME (NEUTRALIZATION)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
SOY FLOUR (PROPAGATION NUTRIENT)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
UREA (PROPAGATION NUTRIENT)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILERS)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILERS)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILERS)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
UREA (SNCR FOR BIOMASS BOILERS)	*0.5*	*0.5*	---	---	---	---	---	---	---	---	---	---
WASTEWATER TREATMENT	0.002	0.002	0.0005	0.1	0.3	5.4	---	---	---	---	---	---
ANAEROBIC DIGESTION FLARE	*0.002*	*0.002*	*0.0005*	*0.1*	*0.3*	*0.1*	---	---	---	---	---	---
AEROBIC DIGESTION	---	---	---	---	---	*5.2*	---	---	---	---	---	---
COOLING TOWER	0.7	0.7	---	---	---	4.1	0.2	0.2	---	---	---	---
STEAM PRODUCTION	17.3	17.3	104.1	130.1	173.4	8.7	9.6	---	---	---	---	---
BIOMASS BOILER NO. 1	*8.7*	*8.7*	*52.0*	*65.0*	*86.7*	*4.3*	*4.8*	---	---	---	---	---
BIOMASS BOILER NO. 2	*8.7*	*8.7*	*52.0*	*65.0*	*86.7*	*4.3*	*4.8*	---	---	---	---	---
BACKUP BOILER (NOT INCLUDED IN PTE DUE TO PROPOSED LIMITS)	---	---	---	---	---	---	---	---	---	---	---	---
STATIONARY ENGINES	0.9	0.9	0.02	25.9	15.9	2.9	0.1	0.001	0.0002	0.02	---	---
FIRE PUMP	*0.03*	*0.03*	*0.001*	*0.5*	*0.5*	*0.1*	*0.004*	*0.0005*	*0.00006*	*0.001*	---	---
EMERGENCY GENERATOR NO. 1	*0.2*	*0.2*	*0.005*	*6.3*	*3.9*	*0.7*	*0.02*	*0.0001*	*0.00004*	*0.004*	---	---
EMERGENCY GENERATOR NO. 2	*0.2*	*0.2*	*0.005*	*6.3*	*3.9*	*0.7*	*0.02*	*0.0001*	*0.00004*	*0.004*	---	---
EMERGENCY GENERATOR NO. 3	*0.2*	*0.2*	*0.005*	*6.3*	*3.9*	*0.7*	*0.02*	*0.0001*	*0.00004*	*0.004*	---	---
EMERGENCY GENERATOR NO. 4	*0.2*	*0.2*	*0.005*	*6.3*	*3.9*	*0.7*	*0.02*	*0.0001*	*0.00004*	*0.004*	---	---
FUGITIVE EMISSION SOURCES												
STILLAGE LOADOUT	---	---	---	---	---	2.8	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	19.6	1.0	1.0	---	---	---	---
ROADWAY FUGITIVES	9.9	1.0	---	---	---	---	---	---	---	---	---	---
UNPAVED ROADS	*9.3*	*0.9*	---	---	---	---	---	---	---	---	---	---
PAVED ROADS	*0.7*	*0.1*	---	---	---	---	---	---	---	---	---	---
Point Source Total	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**	**16.7**	**6.3**	**0.1**	**0.1**	**0.0006**	**0.004**
Fugitive Source Total	**9.9**	**1.0**	**0.0**	**0.0**	**0.0**	**22.4**	**1.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**33.6**	**24.7**	**104.1**	**156.5**	**192.0**	**71.3**	**17.7**	**7.3**	**0.1**	**0.1**	**0.0006**	**0.004**
Major Source Threshold	**100**	**100**	**100**	**100**	**100**	**100**	**25**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	**15**	**10**	**40**	**40**	**100**	**40**	---	---	---	---	---	---

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
SUMMARY OF EMISSIONS

Pollutant CAS No.	Formaldehyde 50-00-0 (tpy)	n-Hexane 110-54-3 (tpy)	HCl 7647-01-0 (tpy)	Lead 7439-92-1 (tpy)	Mercury 7439-97-6 (tpy)	Methanol 67-56-1 (tpy)	Naphthalene 91-20-3 (tpy)	Total POM --- (tpy)	Toluene 108-88-3 (tpy)	2,2,4-Trimethylpentane 540-84-1 (tpy)	Xylenes 1330-20-7 (tpy)
POINT EMISSION SOURCES											
LIQUID/SOLID SEPARATION SCRUBBER	---	---	---	---	---	---	---	---	---	---	---
FERMENTATION/DISTILLATION SCRUBBER	0.1	---	---	---	---	0.1	---	---	---	---	---
FERMENTATION	*0.1*	---	---	---	---	*0.1*	---	---	---	---	---
DISTILLATION	*0.01*	---	---	---	---	*0.01*	---	---	---	---	---
PRODUCT STORAGE TANKS	---	0.004	---	---	---	---	---	---	0.001	0.0004	0.00004
PRODUCT SHIFT TANK NO. 1	---	---	---	---	---	---	---	---	---	---	---
PRODUCT SHIFT TANK NO. 2	---	---	---	---	---	---	---	---	---	---	---
RECYCLE PRODUCT TANK	---	---	---	---	---	---	---	---	---	---	---
PRODUCT STORAGE TANK NO. 1	---	*0.002*	---	---	---	---	---	---	*0.001*	*0.0002*	*0.00002*
PRODUCT STORAGE TANK NO. 2	---	*0.002*	---	---	---	---	---	---	*0.001*	*0.0002*	*0.00002*
PRODUCT LOADOUT FLARE	---	0.2	---	---	---	---	---	---	0.1	0.02	0.002
DENATURANT STORAGE TANK	---	0.03	---	---	---	---	---	---	0.01	0.004	0.0004
MISCELLANEOUS CHEMICAL STORAGE TANKS	---	---	---	---	---	---	---	---	---	---	---
SULFURIC ACID (98% SOLUTION)	---	---	---	---	---	---	---	---	---	---	---
SULFURIC ACID (3% SOLUTION)	---	---	---	---	---	---	---	---	---	---	---
CORN STEEP LIQUOR (NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
LACTOSE (NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
GLUCOSE (NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
PHOSPHORIC ACID (NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
MISCELLANEOUS STORAGE SILOS	---	---	---	---	---	---	---	---	---	---	---
PEBBLED LIME (NEUTRALIZATION)	---	---	---	---	---	---	---	---	---	---	---
SOLKA-FLOC® (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
SOY FLOUR (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
AMMONIUM SULFATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
POTASSIUM PHOSPHATE (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
UREA (PROPAGATION NUTRIENT)	---	---	---	---	---	---	---	---	---	---	---
ASH (BIOMASS BOILERS)	---	---	---	---	---	---	---	---	---	---	---
SAND (FLUIDIZED BED FOR BIOMASS BOILERS)	---	---	---	---	---	---	---	---	---	---	---
LIMESTONE (FLUIDIZED BED FOR BIOMASS BOILERS)	---	---	---	---	---	---	---	---	---	---	---
UREA (SNCR FOR BIOMASS BOILERS)	---	---	---	---	---	---	---	---	---	---	---
WASTEWATER TREATMENT	---	---	---	---	---	---	---	---	---	---	---
ANAEROBIC DIGESTION FLARE	---	---	---	---	---	---	---	---	---	---	---
AEROBIC DIGESTION	---	---	---	---	---	---	---	---	---	---	---
COOLING TOWER	---	---	---	---	---	---	---	---	---	---	---
STEAM PRODUCTION	---	---	9.4	0.1	0.02	---	---	0.2	---	---	---
BIOMASS BOILER NO. 1	---	---	*4.7*	*0.04*	*0.01*	---	---	*0.1*	---	---	---
BIOMASS BOILER NO. 2	---	---	*4.7*	*0.04*	*0.01*	---	---	*0.1*	---	---	---
BACKUP BOILER (NOT INCLUDED IN PTE DUE TO PROPOSED LIMITS)	---	---	---	---	---	---	---	---	---	---	---
STATIONARY ENGINES	0.002	---	---	---	---	---	0.0001	0.0001	0.1	---	0.01
FIRE PUMP	*0.0007*	---	---	---	---	---	*0.0001*	*0.0001*	*0.002*	---	*0.0003*
EMERGENCY GENERATOR NO. 1	*0.0004*	---	---	---	---	---	---	---	*0.01*	---	*0.001*
EMERGENCY GENERATOR NO. 2	*0.0004*	---	---	---	---	---	---	---	*0.01*	---	*0.001*
EMERGENCY GENERATOR NO. 3	*0.0004*	---	---	---	---	---	---	---	*0.01*	---	*0.001*
EMERGENCY GENERATOR NO. 4	*0.0004*	---	---	---	---	---	---	---	*0.01*	---	*0.001*
FUGITIVE EMISSION SOURCES											
STILLAGE LOADOUT	---	---	---	---	---	---	---	---	---	---	---
FUGITIVE EQUIPMENT LEAKS	---	---	---	---	---	---	---	---	---	---	---
ROADWAY FUGITIVES	---	---	---	---	---	---	---	---	---	---	---
UNPAVED ROADS	---	---	---	---	---	---	---	---	---	---	---
PAVED ROADS	---	---	---	---	---	---	---	---	---	---	---
Point Source Total	**0.1**	**0.2**	**9.4**	**0.1**	**0.02**	**0.1**	**0.0001**	**0.2**	**0.1**	**0.03**	**0.01**
Fugitive Source Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Facility Total	**0.1**	**0.2**	**9.4**	**0.1**	**0.02**	**0.1**	**0.0001**	**0.2**	**0.1**	**0.03**	**0.01**
Major Source Threshold	**10**	**10**	**10**	**5**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Significant Emissions Threshold	---	---	---	---	---	---	---	---	---	---	---

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
LIQUID/SOLID SEPARATION

SOURCE DESCRIPTION

Acid hydrolyzed biomass is separated into liquid and solid fractions in a 3-stage series of screw presses. A feed tank is located at the feed side of each screw press (for a total of three feed tanks) and a filtrate tank is located at the filtrate discharge of each screw press (for a total of three filtrate tanks). The entire system was modeled using USEPA's WATER9 software for the purpose of calculating emissions from the system. Non-default input assumptions are presented below for the components with evaporative emissions, along with the WATER9 predicted emission rates. Detailed WATER9 reports are provided elsewhere in the application. A vapor capture system will be used to collect the evaporative emissions from each tank. The captured emissions will be exhasuted to a scrubber dedicated to the process.

OPERATING PARAMETERS[1]

	1st Stage Feed Tank	1st Stage Filtrate Tank	2nd Stage Feed Tank	2nd Stage Filtrate Tank	3rd Stage Feed Tank	3rd Stage Filtrate Tank
throughput (gal/min)	3149.8	2798.8	3212.5	196.9	3246.8	199.7
throughput (liters/sec)	198.72	176.58	202.68	12.42	204.84	12.60
met. data location	West Palm	West Palm	West Palm	West Palm	West Palm	West Palm
inlet air humidity (%)	71.5	71.5	71.5	71.5	71.5	71.5
air temp (F)	74.72	74.72	74.72	74.72	74.72	74.72
air temp (C)	23.73	23.73	23.73	23.73	23.73	23.73
wind speed (mph)	9.61	9.61	9.61	9.61	9.61	9.61
wind speed (cm/s)	429.5	429.5	429.5	429.5	429.5	429.5
wastewater temp (F)	150.8	150.8	150.8	150.8	150.8	150.8
wastewater temp (C)	66.00	66.00	66.00	66.00	66.00	66.00
diameter (ft)	19.10	19.10	19.10	19.10	19.10	19.10
length (m)	5.159	5.159	5.159	5.159	5.159	5.159
width (m)	5.159	5.159	5.159	5.159	5.159	5.159
surface area (m2)	26.619	26.619	26.619	26.619	26.619	26.619
depth (ft)	25.000	25.000	25.000	25.000	25.000	25.000
depth (m)	7.620	7.620	7.620	7.620	7.620	7.620
volume (gal)	53,583	53,583	53,583	53,583	53,583	53,583
volume (m3)	203	203	203	203	203	203
agitators	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
agitator power, each (hp)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
residence time (hr)	0.283	0.284	0.278	0.297	0.275	0.293
concentration in unit						
acetic acid (ppm)	8145	7978	5343	5341	2705	2704
furfural (ppm)	3077	3013	2011	2010	1016	1016
biodegradation removal						
acetic acid (%)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
furfural (%)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
evaporation removal						
acetic acid (%)	0.236%	0.231%	0.155%	0.155%	0.078%	0.078%
furfural (%)	0.342%	0.335%	0.223%	0.223%	0.113%	0.113%

EMISSION CALCULATIONS[2]

	1st Stage Feed Tank	1st Stage Filtrate Tank	2nd Stage Feed Tank	2nd Stage Filtrate Tank	3rd Stage Feed Tank	3rd Stage Filtrate Tank
Acetic Acid (g/s)	0.496	0.486	0.326	0.325	0.165	0.165
Furfural (g/s)	0.272	0.267	0.178	0.178	0.090	0.090
VOC (g/s)	0.768	0.753	0.503	0.503	0.255	0.255

Emission Control

capture efficiency	100%
control device	wet scrubber
control efficiency	98%

Emissions Summary - Before Capture and Control

Pollutant	*Average (lbs/hr)*	*Maximum[3] (lbs/hr)*	*Annual (TPY)*
VOC	24.1	28.9	105.6
Acetic Acid	15.6	18.7	68.2
Furfural	8.5	10.2	37.3

Emissions Summary - Controlled

Pollutant	*Average (lbs/hr)*	*Maximum[3] (lbs/hr)*	*Annual (TPY)*
VOC	0.5	0.6	2.1
Acetic Acid	0.3	0.4	1.4
Furfural	0.2	0.2	0.7

1 Only non-default input parameters are shown. Detailed WATER9 inputs are provided elsewhere in the documentation.
2 Emissions were calculated using EPA's WATER9 software.
3 Maximum emissions are assumed to be 120% of average emissions.

SOURCE DESCRIPTION

The fermentation vents are equipped with a random polypropylene packed scrubber designed to remove >98% of the trace VOC contaminants (ethanol, ethyl acetate, acetaldehyde and others) from the CO_2 vent stream generated during fermentation. Equipment exhausted to the scrubber include 4 hemicellulosic fermentation tanks, 4 cellulosic fermentation tanks, the beerwell, 3 hemicellulosic seed propagators, 3 cellulosic enzyme propagators, 3 cellulosic seed propagators, and the heads vent. Scrubbing water is returned to the beerwell as make-up water. Note that the fermentation emissions are vented to the same scrubber that is used to control distillation emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Ethanol Production	39,420,000	gal/yr
Control Device		Wet Scrubber
Control Efficiency	98.0	%

EMISSION CALCULATIONS [1]

VOC Emission Factor	0.0008366	lb/gal

VOC Emissions

*Average Emissions = VOC Emission Factor (0.00084 lb/gal) * Ethanol Production (39,420,000 gal/yr) / Operating Hours (8,760 hrs/yr)*

Average VOC Emission Rate	3.76	lbs/hr

*Maximum Emissions = Average VOC Emission Rate (3.76 lbs/hr) * 120%*

Maximum VOC Emission Rate	4.52	lbs/hr

*Annual Emissions = Average VOC Emission Rate (3.76 lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Annual VOC Emission Rate	16.49	tons/yr

Speciated Emissions

*Average Emissions = VOC Emissions (3.76 lbs/hr) * Avg % concentration*

*Max Emissions = VOC Emissions (3.76 lbs/hr) * Max % concentration*

*Annual Emissions = Avg Speciated Emissions (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Pollutant	% of total VOC	% for Avg	% for Max
Acetic Acid	5-10	7.5%	10.0%
Ethanol	20-25	22.5%	25.0%
Ethyl Acetate	25-30	27.5%	30.0%
Lactic Acid	3-5	4.0%	5.0%
2-Furaldehyde	< 1	0.5%	1.0%
Acetaldehyde*	30-35	32.5%	35.0%
Acrolein*	< 1	0.5%	1.0%
Formaldehyde*	< 1	0.5%	1.0%
Methanol*	< 1	0.5%	1.0%

Emissions Summary

Pollutant	Average (lbs./hr)	Maximum (lbs./hr)	Annual (TPY)
Acetic Acid	0.3	0.4	1.2
Ethanol	0.8	0.9	3.7
Ethyl Acetate	1.0	1.1	4.5
Lactic Acid	0.2	0.2	0.7
2-Furaldehyde	0.02	0.04	0.1
Acetaldehyde*	1.2	1.3	5.4
Acrolein*	0.02	0.04	0.1
Formaldehyde*	0.02	0.04	0.1
Methanol*	0.02	0.04	0.1
Total VOC	3.8	4.5	16.5
Total TAP/HAP*	1.3	1.4	5.6

REFERENCES/NOTES

1 Emissions data scaled from speciated VOCs of Air Emission Compliance Testing at the ACE Ethanol Facility in Stanley, Wisconsin. Testing performed by Interpoll Laboratories, Inc. in December 2002. This is the same procedure used for the permitting of the Pacific Ethanol Facility located in Madera, California. Controlled VOC emissions from fermentation were calculated to be 0.8366 lb VOC per 1000 gallons of ethanol produced. See Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.

SOURCE DESCRIPTION

The distillation operation vents are equipped with a random packed polypropylene column designed to remove >98% of the trace contaminants (ethanol, ethyl acetate, acetaldehyde and others) from the vent stream. Vent sources to this vessel will include the distillation system, evaporator system, molecular sieve system, centrifuges and process fluid tanks. Note that the distillation emissions are vented to the same scrubber that is used to control fermentation emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Ethanol Production	39,420,000	gal/yr
Control Device		Wet Scrubber
Control Efficiency	98.0	%

EMISSION CALCULATIONS [1]

VOC Emission Factor 0.0001161 lb/gal

VOC Emissions

*Average Emissions = VOC Emission Factor (0.00012 lb/gal) * Ethanol Production (39,420,000 gal/yr) / Operating Hours (8,760 hrs/yr)*

Average VOC Emission Rate 0.522 lbs/hr

*Maximum Emissions = Average VOC Emission Rate (0.52 lbs/hr) * 120%*

Maximum VOC Emission Rate 0.627 lbs/hr

*Annual Emissions = Average VOC Emission Rate (0.52 lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Annual VOC Emission Rate 2.29 tons/yr

Speciated Emissions

*Average Emissions = VOC Emissions (0.522 lbs/hr) * Avg % concentration*

*Max Emissions = VOC Emissions (0.522 lbs/hr) * Max % concentration*

*Annual Emissions = Avg Speciated Emissions (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Pollutant	% of total VOC	% for Avg	% for Avg
Acetic Acid	5-10	7.5%	10.0%
Ethanol	20-25	22.5%	25.0%
Ethyl Acetate	25-30	27.5%	30.0%
Lactic Acid	3-5	4.0%	5.0%
2-Furaldehyde	< 1	0.5%	1.0%
Acetaldehyde*	30-35	32.5%	35.0%
Acrolein*	< 1	0.5%	1.0%
Formaldehyde*	< 1	0.5%	1.0%
Methanol*	< 1	0.5%	1.0%

Emissions Summary

Pollutant	*Average (lbs./hr)*	*Maximum (lbs./hr)*	*Annual (TPY)*
Acetic Acid	0.04	0.1	0.2
Ethanol	0.1	0.1	0.5
Ethyl Acetate	0.1	0.2	0.6
Lactic Acid	0.02	0.03	0.1
2-Furaldehyde	0.003	0.01	0.01
Acetaldehyde*	0.2	0.2	0.7
Acrolein*	0.003	0.01	0.01
Formaldehyde*	0.003	0.01	0.01
Methanol*	0.003	0.01	0.01
Total VOC	0.5	0.6	2.3
Total TAP/HAP*	0.2	0.2	0.8

REFERENCES/NOTES

1 Emissions data scaled from speciated VOCs of Air Emission Compliance Testing at the ACE Ethanol Facility in Stanley, Wisconsin. Testing performed by Interpoll Laboratories, Inc. in December 2002. This is the same procedure used for the permitting of the Pacific Ethanol Facility located in Madera, California. Controlled VOC emissions from distillation were calculated to be 0.1161 lb VOC per 1000 gallons of ethanol produced. See Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
ETHANOL STORAGE TANKS

SOURCE DESCRIPTION

The facility includes 2 product shift tanks, 2 ethanol product storage tanks, and 1 recycle product tank. The tanks will be designed with an internal floating roof. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Recycle Product Tank	Product Storage Tank No. 1	Product Storage Tank No. 2
Tank Contents	Ethanol	Ethanol	Ethanol	E95	E95
Tank Type	Internal Floating Roof	Internal Floating Roof	Internal Floating Roof	Internal Floating Roof	Internal Floating Roof
Tank Diameter (ft)	20	20	20	34	34
Tank Height (ft)	27	27	27	44	44
Tank Capacity (gal)	61,215	61,215	61,215	295,317	295,317
Throughput (gal/yr)	19,710,000	19,710,000	1,971,000	20,747,368	20,747,368
Turnovers per Year	322	322	32	70	70
Max Liquid Height (ft)	#N/A	#N/A	#N/A	#N/A	#N/A
Avg Liquid Height (ft)	#N/A	#N/A	#N/A	#N/A	#N/A
Heated Tank	No	No	No	No	No
Underground Tank	No	No	No	No	No
Self-Supporting Roof	Yes	Yes	Yes	Yes	Yes
Columns	#N/A	#N/A	#N/A	#N/A	#N/A
Effective Column Diameter	#N/A	#N/A	#N/A	#N/A	#N/A
Internal Shell Condition	Light Rust	Light Rust	Light Rust	Light Rust	Light Rust
External Shell Color	White	White	White	White	White
External Shell Shade	White	White	White	White	White
External Shell Condition	Good	Good	Good	Good	Good
Roof Color	White	White	White	White	White
Roof Shade	White	White	White	White	White
Roof Paint Condition	Good	Good	Good	Good	Good
Fixed Roof Type	#N/A	#N/A	#N/A	#N/A	#N/A
Roof Height (ft)	#N/A	#N/A	#N/A	#N/A	#N/A
Roof Slope (ft/ft)	#N/A	#N/A	#N/A	#N/A	#N/A
Breather Vent Vacuum (psig)	#N/A	#N/A	#N/A	#N/A	#N/A
Breather Vent Pressure (psig)	#N/A	#N/A	#N/A	#N/A	#N/A
Primary Seal	Liquid Mounted	Liquid Mounted	Liquid Mounted	Liquid Mounted	Liquid Mounted
Secondary Seal	Rim Mounted	Rim Mounted	Rim Mounted	Rim Mounted	Rim Mounted
Deck Type	Welded	Welded	Welded	Welded	Welded
Deck Fittings	Typical	Typical	Typical	Typical	Typical
Vent Height above grade (ft)	28	28	28	45	45
Vent Diameter (ft)	0.25	0.25	0.25	0.25	0.25
Exit Velocity (ft/s)	10	10	10	10	10

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
ETHANOL STORAGE TANKS

Nearest Major City	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL
Daily Avg Temp (F)	74.72	74.72	74.72	74.72	74.72
Annual Avg Max Temp (F)	82.86	82.86	82.86	82.86	82.86
Annual Avg Min Temp (F)	66.58	66.58	66.58	66.58	66.58
Avg Wind Speed (mph)	9.61	9.61	9.61	9.61	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505	1,505	1,505	1,505	1,505
Atmospheric Pressure (psia)	14.747	14.747	14.747	14.747	14.747
Liquid Molecular Weight	46.07	46.07	46.07	47.25	47.25
Vapor Molecular Weight	46.07	46.07	46.07	49.04	49.04
Liquid Density @ 60F (lb/gal)	6.61	6.61	6.61	6.55	6.55
Avg Bulk Temp (F)	74.74	74.74	74.74	74.74	74.74
Avg Surface Temp (F)	76.75	76.75	76.75	76.75	76.75
Vapor Pressure (psia)	1.145	1.145	1.145	1.337	1.337

VOC EMISSION CALCULATIONS[1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Recycle Product Tank	Product Storage Tank No. 1	Product Storage Tank No. 2
EIQ No.					
Standing Loss (lbs/yr)	—	—	—	—	—
Working Loss (lbs/yr)	—	—	—	—	—
Rim Seal Loss (lbs/yr)	5.59	5.59	5.59	11.89	11.89
Withdrawal Losses (lbs/yr)	219.39	219.39	21.94	134.63	134.63
Deck Fitting Losses (lbs/yr)	122.31	122.31	122.31	180.76	180.76
Deck Seam Losses (lbs/yr)	0.00	0.00	0.00	0.00	0.00
Total Losses (tons/yr)	0.17	0.17	0.07	0.16	0.16

ETHANOL EMISSION CALCULATIONS[1]

Tank ID. No.	Product Shift Tank No.1	Product Shift Tank No.2	Recycle Product Tank	Product Storage Tank No. 1	Product Storage Tank No. 2
Standing Loss (lbs/yr)	—	—	—	—	—
Working Loss (lbs/yr)	—	—	—	—	—
Rim Seal Loss (lbs/yr)	5.59	5.59	5.59	9.32	9.32
Withdrawal Losses (lbs/yr)	219.39	219.39	21.94	127.90	127.90
Deck Fitting Losses (lbs/yr)	122.31	122.31	122.31	141.65	141.65
Deck Seam Losses (lbs/yr)	0.00	0.00	0.00	0.00	0.00
Total Losses (tons/yr)	0.17	0.17	0.07	0.14	0.14

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
ETHANOL STORAGE TANKS

Emissions Summary (Total Emissions from all tanks)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.2	0.2	0.7
HAP	0.001	0.001	0.003
Ethanol	0.2	0.2	0.7

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**1.56E-04**	**1.66E-04**	**6.82E-04**
BUTANE N-	3.15E-03	3.36E-03	1.38E-02
BUTENE CIS-2-	9.17E-05	9.77E-05	4.02E-04
BUTENE TRANS-2-	1.13E-04	1.20E-04	4.94E-04
CIS-2-PENTENE	7.40E-05	7.88E-05	3.24E-04
CYCLOHEXANE	4.75E-05	5.06E-05	2.08E-04
CYCLOPENTANE	6.74E-05	7.18E-05	2.95E-04
DIMETHYLBUTANE 2,2-	1.15E-04	1.22E-04	5.03E-04
DIMETHYLPENTANE 2,4-	4.75E-05	5.06E-05	2.08E-04
ETHANE	7.74E-06	8.24E-06	3.39E-05
ETHYLBENZENE	**6.63E-06**	**7.06E-06**	**2.90E-05**
HEPTANE N-	4.42E-05	4.71E-05	1.94E-04
HEXANE N-	**4.14E-04**	**4.41E-04**	**1.82E-03**
ISOBUTANE	9.22E-04	9.81E-04	4.04E-03
ISOPROPYL BENZENE	**1.11E-06**	**1.18E-06**	**4.84E-06**
METHYLCYCLOHEXANE	1.33E-05	1.41E-05	5.81E-05
METHYLCYCLOPENTANE	1.56E-04	1.66E-04	6.82E-04
METHYLHEPTANE 3-	6.63E-06	7.06E-06	2.90E-05
METHYLHEXANE 3-	4.64E-05	4.94E-05	2.03E-04
METHYLPENTANE 3-	2.20E-04	2.34E-04	9.63E-04
OCTANE N-	3.32E-06	3.53E-06	1.45E-05
PENTANE N-	8.01E-04	8.53E-04	3.51E-03
PENTENE 1-	9.50E-05	1.01E-04	4.16E-04
PROPANE	1.17E-04	1.25E-04	5.13E-04
TOLUENE	**1.38E-04**	**1.47E-04**	**6.05E-04**
TRANS-2-PENTENE	1.51E-04	1.61E-04	6.63E-04
TRIMETHYLBENZENE 1,2,4-	5.53E-06	5.88E-06	2.42E-05
TRIMETHYLBENZENE 1,3,5-	2.21E-06	2.35E-06	9.68E-06
TRIMETHYLPENTANE 2,2,4-	**4.64E-05**	**4.94E-05**	**2.03E-04**
TRIMETHYLPENTANE 2,3,4-	7.74E-06	8.24E-06	3.39E-05
XYLENE O-	**4.42E-06**	**4.71E-06**	**1.94E-05**
UNIDENTIFIED VOC	3.98E-03	4.23E-03	1.74E-02

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.
2 Maximum emissions are based on emissions during the month of July.
3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

SOURCE DESCRIPTION

The truck loadout flare has a rated capacity of 9.42 MMBtu/hr and provides 98% control efficiency for VOC emissions during loading product (ethanol) into trucks, which will not be in dedicated service.

OPERATING PARAMETERS

Operating Schedule (Pilot)	8,760	hrs/yr	
Operating Schedule (Flare)	1,153	hrs/yr	
Average Thruput	36	Mgallons/hr	assume 600 gpm truck filling rate
Annual Thruput	41,495	Mgallons/Yr	E95 (ethanol plus denaturant)
Gasoline Heat Content	20,300	Btu/lb	assumes gasoline vapors displaced from trucks
Heat Rate (Pilot)	0.184	MMBtu/hr	3 scfm natural gas
Heat Rate (Flare)	9.42	MMBtu/hr	calculated
Control Device		Flare	
Control Efficiency	98	%	BACT

EMISSION CALCULATIONS

VOC Loading Emissions [1]

L (lbs/Mgal) = (12.46 x S x P x M)/T

where:
- L = Loading Loss, lb VOC/Mgal of liquid loaded
- S = Saturation Factor (AP-42 Table 5.2-1)
- P = True Vapor Pressure of Liquid Loaded, psia
- M = Molecular Weight of Vapors, lb/lb-mole
- T = Temperature of Bulk Liquid Loaded, °R

The values for P, T, and M were obtained from EPA's TANKS 4.09c emissions calculation software, which calculates the annual average bulk product temperature based on the annual average temperatures for the city of West Palm Beach, Florida. The saturation factor is based on submerged loading, dedicated vapor balance service for gasoline. This should be conservative because the vapor pressure of ethanol is less than that for gasoline and because the trucks will not be in dedicated gasoline service.

Saturation Factor(s)	1	
Annual Thruput	41,495	Mgal/yr
Vapor Molecular Weight (MW)	64.00	lb/lb-mole
Product Temperature (T)	534.33	°R
True Vapor Pressure (P)	8.63	psia *(based on RVP 12 gasoline)*

VOC Emission Factor

*L = (12.46 * 1 * 8.6339 psia * 64 lb/lb-mole) / 534.33 R*

12.89 lb VOC/Mgal

Uncontrolled Emissions

*VOC = 12.89 lb VOC/Mgal * 36 Mgal /hr*

463.87 lb/hr VOC — gasoline vapors displaced

9.42 MMBtu/hr VOC — heat rate of gasoline vapors displaced

Controlled VOC Emissions

*Avg = 463.87 lbs/hr * (1-98/100) DRE*

9.28 lb/hr VOC — 1.0 lb/MMBtu, calculated VOC emission factor

*Max = 9.28 lbs/hr * 120%*
11.13 lb/hr VOC

*Ann = 12.89 lbs/Mgal * 41,495 Mgal/yr * (1-98/100)/ 2,000 lbs/ton*
5.35 TPY VOC

Combustion Emissions[2]

Emission Factor	lb/MMBtu	µg/l	
SOx	0.00059		
NOx	0.068		
CO	0.370		
PM	0.0024	40	lightly smoking

Average Emissions During Flare Operation

*Avg = Heat Input (9.41659757350851 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*SOx = 9.42 MMBtu/hr * 0.00059 lb/MMBtu*
0.0055 lb/hr SOx

*NOx = 9.42 MMBtu/hr * 0.068 lb/MMBtu*
0.64 lb/hr NOx

*CO = 9.42 MMBtu/hr * 0.370 lb/MMBtu*
3.5 lb/hr CO

*PM = 9.42 MMBtu/hr * 0.0024 lb/MMBtu*
0.0231 lb/hr PM

Annual Emissions

*Annual = {[Average (lbs/hr) * 1,153 hrs/yr] + [Pilot Input (0.184 MMBtu/hr) * EF (lbs/MMBtu)]} / 2,000 lbs/ton*

*SOx = {[0.0055 lbs/hr * 1,153 hrs/yr] + [0.184 MMBtu/hr * 0.00059 lb/MMBtu * 8,760 hr/yr]} / 2,000 lbs/ton*
0.00367 TPY SOx

*NOx = {[0.64 lbs/hr * 1,153 hrs/yr] + [0.184 MMBtu/hr * 0.068 lb/MMBtu * 8,760 hr/yr]} / 2,000 lbs/ton*
0.424 TPY NOx

*CO = {[3.5 lbs/hr * 1,153 hrs/yr] + [0.184 MMBtu/hr * 0.37 lb/MMBtu * 8,760 hr/yr]} / 2,000 lbs/ton*
2.306 TPY CO

*PM = {[0.0231 lbs/hr * 1,153 hrs/yr] + [0.184 MMBtu/hr * 0.0024 lb/MMBtu * 8,760 hr/yr]} / 2,000 lbs/ton*
0.01525 TPY PM

Emissions Summary

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
PM	0.02	0.02
SOx	0.01	0.004
NOx	0.6	0.4
CO	3.5	2.3
VOC	9.3	5.3
HAP	0.6	0.4

HAP Emissions[4]		
benzene	0.1	0.1
ethylbenzene	0.01	0.003
n-hexane	0.3	0.2
isopropyl benzene	0.001	0.001
toluene	0.1	0.1
2,2,4-trimethylpentane	0.04	0.02
o-xylene	0.004	0.002

REFERENCES/NOTES

1 Based on EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids, January 1995.
2 Based on EPA AP-42, Section 13.5, Industrial Flares, January 1995.
3 Maximum emissions are assumed to be 120% of average emissions.
4 HAP emissions based on speciation shown for denaturant storage, conservatively assuming gasoline vapors.

SOURCE DESCRIPTION

The facility includes 1 gasoline storage tank. Gasoline is used as a denaturant to render the ethanol undrinkable. The tank is designed with an internal floating roof to minimize VOC (gasoline) emissions. Emissions are calculated using EPA's TANKS 4.09d software.

OPERATING PARAMETERS

Tank ID. No.	Denaturant Tank
Tank Contents	Gasoline (RVP12)
Tank Type	Internal Floating Roof
Tank Diameter (ft)	15
Tank Height (ft)	22
Tank Capacity (gal)	28,467
Throughput (gal/yr)	2,074,737
Turnovers per Year	73
Max Liquid Height (ft)	#N/A
Avg Liquid Height (ft)	#N/A
Heated Tank	No
Underground Tank	No
Self-Supporting Roof	Yes
Columns	#N/A
Effective Column Diameter	#N/A
Internal Shell Condition	Light Rust
External Shell Color	White
External Shell Shade	White
External Shell Condition	Good
Roof Color	White
Roof Shade	White
Roof Paint Condition	Good
Fixed Roof Type	#N/A
Roof Height (ft)	#N/A
Roof Slope (ft/ft)	#N/A
Breather Vent Vacuum (psig)	#N/A
Breather Vent Pressure (psig)	#N/A
Primary Seal	Liquid Mounted
Secondary Seal	Rim Mounted
Deck Type	Welded
Deck Fittings	Typical
Vent Height above grade (ft)	23
Vent Diameter (ft)	0.25
Exit Velocity (ft/s)	10
Nearest Major City	West Palm Beach, FL
Daily Avg Temp (F)	74.72
Annual Avg Max Temp (F)	82.86
Annual Avg Min Temp (F)	66.58
Avg Wind Speed (mph)	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505
Atmospheric Pressure (psia)	14.747
Liquid Molecular Weight	92.00
Vapor Molecular Weight	64.00
Liquid Density @ 60F (lb/gal)	5.60
Avg Bulk Temp (F)	74.74
Avg Surface Temp (F)	76.75
Vapor Pressure (psia)	8.63

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

DENATURANT STORAGE TANK

EMISSION CALCULATIONS [1]

Tank ID. No.	Denaturant Tank
Standing Loss (lbs/yr)	---
Working Loss (lbs/yr)	---
Rim Seal Loss (lbs/yr)	62.40
Withdrawal Losses (lbs/yr)	26.09
Deck Fitting Losses (lbs/yr)	1712.59
Deck Seam Losses (lbs/yr)	0.00
Total Losses (tons/yr)	0.90

Emissions Summary (Total VOC Emissions from all tanks)

Pollutant	*Average (lbs./hr)*	*Maximum [2] (lbs./hr)*	*Annual (TPY)*
VOC	0.2	0.2	0.9
Total HAP	0.01	0.02	0.1

Emissions Speciation [3]

Pollutant	CAS No.	Percent	HAP
BENZENE	71-43-2	1.41	Yes
BUTANE N-	106-97-8	28.53	No
BUTENE CIS-2-	590-18-1	0.83	No
BUTENE TRANS-2-	624-64-6	1.02	No
CIS-2-PENTENE	627-20-3	0.67	No
CYCLOHEXANE	110-82-7	0.43	No
CYCLOPENTANE	287-92-3	0.61	No
DIMETHYLBUTANE 2,2-	75-83-2	1.04	No
DIMETHYLPENTANE 2,4-	108-08-7	0.43	No
ETHANE	74-84-0	0.07	No
ETHYLBENZENE	100-41-4	0.06	Yes
HEPTANE N-	142-82-5	0.40	No
HEXANE N-	110-54-3	3.75	Yes
ISOBUTANE	75-28-5	8.34	No
ISOPROPYL BENZENE	98-82-8	0.01	Yes
METHYLCYCLOHEXANE	108-87-2	0.12	No
METHYLCYCLOPENTANE	96-37-7	1.41	No
METHYLHEPTANE 3-	589-81-1	0.06	No
METHYLHEXANE 3-	589-34-4	0.42	No
METHYLPENTANE 3-	96-14-0	1.99	No
OCTANE N-	111-65-9	0.03	No
PENTANE N-	109-66-0	7.25	No
PENTENE 1-	109-67-1	0.86	No
PROPANE	74-98-6	1.06	No
TOLUENE	108-88-3	1.25	Yes
TRANS-2-PENTENE	646-04-8	1.37	No
TRIMETHYLBENZENE 1,2,4-	95-63-6	0.05	No
TRIMETHYLBENZENE 1,3,5-	108-67-8	0.02	No
TRIMETHYLPENTANE 2,2,4-	540-84-1	0.42	Yes
TRIMETHYLPENTANE 2,3,4-	565-75-3	0.07	No
XYLENE O-	95-47-6	0.04	Yes
UNIDENTIFIED VOC		35.98	No

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

DENATURANT STORAGE TANK

Speciated Emissions

Pollutant	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
BENZENE	**2.90E-03**	**3.22E-03**	**1.27E-02**
BUTANE N-	5.87E-02	6.51E-02	2.57E-01
BUTENE CIS-2-	1.71E-03	1.89E-03	7.47E-03
BUTENE TRANS-2-	2.10E-03	2.33E-03	9.19E-03
CIS-2-PENTENE	1.38E-03	1.53E-03	6.03E-03
CYCLOHEXANE	8.84E-04	9.82E-04	3.87E-03
CYCLOPENTANE	1.25E-03	1.39E-03	5.49E-03
DIMETHYLBUTANE 2,2-	2.14E-03	2.37E-03	9.37E-03
DIMETHYLPENTANE 2,4-	8.84E-04	9.82E-04	3.87E-03
ETHANE	1.44E-04	1.60E-04	6.30E-04
ETHYLBENZENE	**1.23E-04**	**1.37E-04**	**5.40E-04**
HEPTANE N-	8.22E-04	9.13E-04	3.60E-03
HEXANE N-	**7.71E-03**	**8.56E-03**	**3.38E-02**
ISOBUTANE	1.71E-02	1.90E-02	7.51E-02
ISOPROPYL BENZENE	**2.06E-05**	**2.28E-05**	**9.01E-05**
METHYLCYCLOHEXANE	2.47E-04	2.74E-04	1.08E-03
METHYLCYCLOPENTANE	2.90E-03	3.22E-03	1.27E-02
METHYLHEPTANE 3-	1.23E-04	1.37E-04	5.40E-04
METHYLHEXANE 3-	8.64E-04	9.59E-04	3.78E-03
METHYLPENTANE 3-	4.09E-03	4.54E-03	1.79E-02
OCTANE N-	6.17E-05	6.85E-05	2.70E-04
PENTANE N-	1.49E-02	1.65E-02	6.53E-02
PENTENE 1-	1.77E-03	1.96E-03	7.74E-03
PROPANE	2.18E-03	2.42E-03	9.55E-03
TOLUENE	**2.57E-03**	**2.85E-03**	**1.13E-02**
TRANS-2-PENTENE	2.82E-03	3.13E-03	1.23E-02
TRIMETHYLBENZENE 1,2,4-	1.03E-04	1.14E-04	4.50E-04
TRIMETHYLBENZENE 1,3,5-	4.11E-05	4.57E-05	1.80E-04
TRIMETHYLPENTANE 2,2,4-	**8.64E-04**	**9.59E-04**	**3.78E-03**
TRIMETHYLPENTANE 2,3,4-	1.44E-04	1.60E-04	6.30E-04
XYLENE O-	**8.22E-05**	**9.13E-05**	**3.60E-04**
UNIDENTIFIED VOC	7.40E-02	8.21E-02	3.24E-01

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.

2 Maximum emissions are based on emissions during the month of July.

3 Speciation derived from EPA's SPECIATE 3.2 Program, Profile 2490.

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
MISCELLANEOUS STORAGE TANKS

SOURCE DESCRIPTION

The facility includes several miscellaneous chemical storage tanks. Tank emissions are calculated individually using EPA's TANKS 4.0.9d software.

OPERATING PARAMETERS

Tank ID. No.	Sulfuric Acid (98%)	Sulfuric Acid (3%)	Corn Steep	Lactose	Glucose	Phosphoric Acid
Tank Contents	Sulfuric Acid, 98%	Sulfuric Acid, 3%	Corn Steep	Lactose	Glucose	Phosphoric Acid, 45%
Tank Type	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof	Vertical Fixed Roof
Tank Diameter (ft)	18	14	22	12	12	14
Tank Height (ft)	29	29	33	53	21	19
Tank Capacity (gal)	53,907	32,610	92,370	44,000	16,982	21,101
Throughput (gal/yr)	2,068,906	67,584,259	23,652,000	11,266,515	4,348,363	236,520
Turnovers per Year	38.4	2,072.5	256	256	256	11
Max Liquid Height (ft)	27.55	27.55	31.35	50.35	19.95	18.05
Avg Liquid Height (ft)	19.33	19.33	22.00	35.33	14.00	12.67
Heated Tank	No	No	Yes	No	No	No
Underground Tank	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Self-Supporting Roof	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Columns	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Effective Column Diameter	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Internal Shell Condition	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
External Shell Color	White	White	White	White	White	White
External Shell Shade	White	White	White	White	White	White
External Shell Condition	Good	Good	Good	Good	Good	Good
Roof Color	White	White	White	White	White	White
Roof Shade	White	White	White	White	White	White
Roof Paint Condition	Good	Good	Good	Good	Good	Good
Fixed Roof Type	Cone	Cone	Cone	Cone	Cone	Cone
Roof Height (ft)	0.5625	0.4375	0.6875	0.3750	0.3750	0.4375
Roof Slope (ft/ft)	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Breather Vent Vacuum (psig)	-0.03	-0.03	0.00	-0.03	-0.03	-0.03
Breather Vent Pressure (psig)	0.03	0.03	0.00	0.03	0.03	0.03
Primary Seal	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Secondary Seal	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Deck Type	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Deck Fittings	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

MISCELLANEOUS STORAGE TANKS

Vent Height above grade (ft)	30	30	34	54	22	20
Vent Diameter (ft)	0.25	0.25	0.50	0.25	0.25	0.25
Exit Velocity (ft/s)	10	10	10	10	10	10
Nearest Major City	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL	West Palm Beach, FL
Daily Avg Temp (F)	74.72	74.72	74.72	74.72	74.72	74.72
Annual Avg Max Temp (F)	82.86	82.86	82.86	82.86	82.86	82.86
Annual Avg Min Temp (F)	66.58	66.58	66.58	66.58	66.58	66.58
Avg Wind Speed (mph)	9.61	9.61	9.61	9.61	9.61	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505	1,505	1,505	1,505	1,505	1,505
Atmospheric Pressure (psia)	14.75	14.75	14.75	14.75	14.75	14.75
Liquid Molecular Weight	98.07	98.07	18.17	19.90	19.80	98.00
Vapor Molecular Weight	98.07	98.07	18.02	18.02	18.02	98.00
Liquid Density @ 60F (lb/gal)	15.30	8.93	8.35	8.76	8.76	6.61
Avg Surface Temp (F)	76.75	76.75	76.75	76.75	76.75	76.75
Vapor Pressure (psia)	6.46E-07	1.93E-16	0.46	0.46	0.46	2.74E-04

EMISSION CALCULATIONS [1]

Tank ID. No.	Sulfuric Acid (98%)	Sulfuric Acid (3%)	Corn Steep	Lactose	Glucose	Phosphoric Acid
			VOC Fraction	VOC Fraction	VOC Fraction	
Standing Loss (lbs/yr)	0.0003	5.66E-14	3.33E-09	2.12E-15	1.01E-07	0.07
Working Loss (lbs/yr)	0.003	5.53E-12	6.11E-08	4.07E-14	1.86E-06	0.20
Rim Seal Loss (lbs/yr)	—	—	—	—	—	—
Withdrawal Losses (lbs/yr)	—	—	—	—	—	—
Deck Fitting Losses (lbs/yr)	—	—	—	—	—	—
Deck Seam Losses (lbs/yr)	—	—	—	—	—	—
Total Losses (tons/yr)	0.000002	0.00	0.00	0.00	0.00	0.0001

Emissions Summary

Pollutant	*Average (lbs./hr)*	*Annual (TPY)*
VOC	0.00000000001	0.00000000003
Sulfuric Acid	0.0000004	0.000002
Phosphoric Acid	0.00003	0.0001

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
MISCELLANEOUS STORAGE SILOS

SOURCE DESCRIPTION

A number of silos are used to handle dry materials. These materials include a number of nutrients for the propagation area and a number of materials associated with the biomass boilers. The vents for each of these silos will be controlled by a baghouse that meets BACT emission requirements.

OPERATING PARAMETERS

Emission Source	Stack Height (feet)	Exit Diameter (feet)	Exhaust Flow (acfm)	Exit Velocity (ft/s)	Exhaust Temperature (°F)	BACT Emission Rate (gr/scf)	BACT Emission Rate (lb/hr)	BACT Emission Rate (tpy)
Lime (neutralization)	105	1.5	2,500	23.58	77	0.005	0.1	0.5
Solka-Floc® (propagation nutrient)	47.5	1.5	2,500	23.58	77	0.005	0.1	0.5
Soy Flour (propagation nutrient)	47.5	1.5	2,500	23.58	77	0.005	0.1	0.5
Ammonium Sulfate (propagation nutrient)	35.58	1.5	2,500	23.58	77	0.005	0.1	0.5
Potassium Phosphate (propagation nutrient)	47.5	1.5	2,500	23.58	77	0.005	0.1	0.5
Urea (propagation nutrient)	35.58	1.5	2,500	23.58	77	0.005	0.1	0.5
Ash (biomass boilers)	34	1.5	2,500	23.58	77	0.005	0.1	0.5
Sand (fluidized bed for biomass boilers)	34	1.5	2,500	23.58	77	0.005	0.1	0.5
Limestone (fluidized bed for biomass boilers)	34	1.5	2,500	23.58	77	0.005	0.1	0.5
Urea (for biomass boilers, SNCR)	34	1.5	2,500	23.58	77	0.005	0.1	0.5
						total	1.1	4.7

Notes:
Stack heights referenced as above ground level (AGL).
Stack locations assumed at center of silo.
PM emission rates from dust collector baghouses are based on gr/dscf BACT and exhaust flow.

SOURCE DESCRIPTION

The wastewater treatment flare is used for combusting methane generated by anaerobic digestion and has a rated capacity of 44.03 MMBtu/hr. The flare will use natural gas for the pilot and will be limited to combust biogas only when both of the biomass boilers are shut down. Hence, annual potential emissions include only the pilot because emissions for biogas combustion are accounted for by the biomass boilers.

OPERATING PARAMETERS

Operating Schedule (Pilot)	8,760	hrs/yr	
Operating Schedule (Flare)	#N/A	hrs/yr	operates only when biomass boilers down
Thruput	4,343	lb/hr	anaerobic digester production
Heat Rate (Pilot)	0.18	MMBtu/hr	3 scfm gas
Heat Rate (Flare)	44.03	MMBtu/hr	assumes 10,139 Btu/lb

EMISSION CALCULATIONS

Combustion Emissions[1]

Emission Factor	lb/MMBtu	μg/l	
SOx	0.00059		
NOx	0.068		
CO	0.37		
THC	0.14		
PM	0.0024	40	lightly smoking

Emissions During Flare Operation

*Avg = Heat Input (44.03 MMBtu/hr) * Emission Factor (lbs/MMBtu)*

*SO2 = 44.03 MMBtu/hr * 0.00059 lb/MMBtu*
0.026 lb/hr SO2

*NOx = 44.03 MMBtu/hr * 0.068 lb/MMBtu*
2.99 lb/hr NOx

*CO = 44.03 MMBtu/hr * 0.370 lb/MMBtu*
16.3 lb/hr CO

*PM = 44.03 MMBtu/hr * 0.0024 lb/MMBtu*
0.11 lb/hr PM

*THC = 44.03 MMBtu/hr * 0.14 lb/MMBtu*
6.16 lb/hr THC

Annual Emissions

*Annual = [Pilot Input (0.184 MMBtu/hr) * EF (lbs/MMBtu)] / 2,000 lbs/ton*

*SOx = [0.184 MMBtu/hr * 0.00059 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.00047 TPY SOx

*NOx = [0.184 MMBtu/hr * 0.068 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.055 TPY NOx

*CO = [0.184 MMBtu/hr * 0.37 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.298 TPY CO

*PM = [0.184 MMBtu/hr * 0.0024 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.0020 TPY PM

*THC = [0.184 MMBtu/hr * 0.14 lb/MMBtu * 8,760 hr/yr] / 2,000 lbs/ton*
0.11 TPY THC

Emissions Summary

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
PM	0.1	0.002
SOx	0.03	0.0005
NOx	3.0	0.1
CO	16.3	0.3
VOC[3]	6.2	0.1

REFERENCES/NOTES

1 Based on EPA AP-42, Section 13.5, Industrial Flares, January 1995.

SOURCE DESCRIPTION

The wastewater treatment plant consists of an equalization basin, a primary clarifier, a neutralization tank, an aeration basin, a secondary clarifier, and a pair of sand filters. The flow through the system will be 1,642 gallons per minute. The Equalization Tank and Primary Clarifier will be covered to minimize VOC emissions. The USEPA model TANKS 4.09d was used to calculate emissions from the Equalization Tank and Primary Clarifier. The USEPA model WATER9 was used to calculate emissions from the balance of the wastewater treatment plant. Non-default input assumptions are presented below along with the WATER9 predicted emission rates. Detailed TANKS and WATER9 reports are provided elsewhere in the application.

TANKS Modeling

OPERATING PARAMETERS[1]

Tank ID. No.	Equalization	Primary
	Tank	Clarifier
Tank Contents	Wastewater	Wastewater
Tank Type	Vertical Fixed Roof	Vertical Fixed Roof
Tank Diameter (ft)	60	85
Tank Height (ft)	33	20
Working Tank Capacity (gal)	634,520	679,172
Throughput (gal/yr)	863,035,200	863,035,200
Turnovers per Year	1,360	1,271
Max Liquid Height (ft)	30	16
Avg Liquid Height (ft)	30	16
Heated Tank	Yes	Yes
Underground Tank	#N/A	#N/A
Self-Supporting Roof	#N/A	#N/A
Columns	#N/A	#N/A
Effective Column Diameter	#N/A	#N/A
Internal Shell Condition	#N/A	#N/A
External Shell Color	White	White
External Shell Shade	White	White
External Shell Condition	Good	Good
Roof Color	White	White
Roof Shade	White	White
Roof Paint Condition	Good	Good
Fixed Roof Type	Cone	Cone
Roof Height (ft)	1.8750	2.6563
Roof Slope (ft/ft)	0.0625	0.0625
Breather Vent Vacuum (psig)	0	0
Breather Vent Pressure (psig)	0	0
Primary Seal	#N/A	#N/A
Secondary Seal	#N/A	#N/A
Deck Type	#N/A	#N/A
Deck Fittings	#N/A	#N/A
Vent Height above grade (ft)	34	21
Vent Diameter (ft)	0.25	0.25
Exit Velocity (ft/s)	10	10
Nearest Major City	West Palm Beach, FL	West Palm Beach, FL
Daily Avg Temp (F)	74.72	74.72
Annual Avg Max Temp (F)	82.86	82.86
Annual Avg Min Temp (F)	66.58	66.58
Avg Wind Speed (mph)	9.61	9.61
Annual Avg Insolation (Btu/ft2-day)	1,505	1,505
Atmospheric Pressure (psia)	14.75	14.75
Liquid Molecular Weight	18.03	18.03
Vapor Molecular Weight	18.04	18.04
Liquid Density @ 60F (lb/gal)	8.35	8.35
Avg Surface Temp (F)	100.00	86.00
Vapor Pressure (psia)	0.95	0.62

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
WASTEWATER AEROBIC DIGESTION

EMISSION CALCULATIONS [1]

Tank ID. No.	Equalization Tank	Primary Clarifier
Standing Loss (lbs/yr)	126.40	83.85
Working Loss (lbs/yr)	0.00	0.00
Rim Seal Loss (lbs/yr)	---	---
Withdrawal Losses (lbs/yr)	---	---
Deck Fitting Losses (lbs/yr)	---	---
Deck Seam Losses (lbs/yr)	---	---
Total Losses (tons/yr)	0.06	0.04

WATER9 Modeling

OPERATING PARAMETERS [2]

	Aeration Basin	Secondary Clarifier	Sand Filters
throughput (gal/min)	1642	1642	1642
throughput (liters/sec)	103.6	103.6	103.6
met. data location	West Palm Beach	West Palm Beach	West Palm Beach
inlet air humidity (%)	71.5	71.5	71.5
air temp (F)	74.72	74.72	74.72
air temp (C)	23.73	23.73	23.73
wind speed (mph)	9.61	9.61	9.61
wind speed (cm/s)	429.5	429.5	429.5
wastewater temp (F)	86	86	86
wastewater temp (C)	30	30	30
diameter (ft)	100	98	
length (ft)			20.00
width (ft)			32.00
diameter (m)	30.48	29.87	8.701
length (m)	27.01	26.47	6.096
width (m)	27.01	26.47	9.754
surface area (m2)	729.7	700.8	59.46
depth (ft)	20	20	10.0
depth (m)	6.096	6.096	3.048
aeration air flow (cfm)	3200	---	---
aeration air flow (m3/s)	1.510	---	---
residence time (hr)	11.9	11.4	0.5
influent conc.			
furfural (ppm)	13.9	5.4	5.4
acetic acid (ppm)	51.7	20.7	20.7
ethanol (ppm)	64.0	37.2	36.8
biodegradation removal			
furfural (%)	60.54%	0.00%	0.00%
acetic acid (%)	59.86%	0.00%	0.00%
ethanol (%)	40.62%	0.00%	0.00%
evaporation removal			
furfural (%)	0.39%	0.18%	0.021%
acetic acid (%)	0.0004%	0.0002%	0.00%
ethanol (%)	1.4%	0.65%	0.071%

EMISSION CALCULATIONS [3]

	Aeration Basin	Secondary Clarifier	Sand Filters
Furfural (g/s)	5.62E-03	2.52E-03	3.06E-04
Acetic Acid (g/s)	2.40E-05	1.07E-05	1.47E-06
Ethanol (g/s)	9.16E-02	4.29E-02	4.73E-03
Total VOC (g/s)	0.10	0.05	0.005

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
VOC	1.2	5.2

REFERENCES/NOTES

1 Emissions were calculated using EPA TANKS 4.09d Program.

2 Only non-default input parameters are shown. Detailed WATER9 inputs are provided elsewhere in the documentation.

3 Emissions were calculated using EPA's WATER9 software.

SOURCE DESCRIPTION

Cooling for equipment within the facility will be provided by an induced draft cooling tower.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Cells	6	
Water Flow (total)	11,267,100	lb/hr cooling water
Water Density	8.346	lb/gal
Water Flow (total)	22,500	gallons/minute (GPM) cooling water
Drift Losses	0.0005	%
TDS [1]	2,750	mg/L
Air Flow (total)	1,977,930	lb/hr air flow
Air Exit Temperature	85	°F
Air Density	0.07287	lb/ft3
Air Flow (total)	452,389	acfm
Air Flow (each cell)	75,398	acfm

EMISSION CALCULATIONS [1]

PM Emissions

*Drift Loss (gal/hr) = 22,500 GPM * 60 mins/hr * 0.0005 %drift*
6.75 gals/hr Drift Loss

Average Emissions

*Average = 6.8 gal/hr loss * 2,750 mg/L * 3.7854 L/gal / 453,600 mg/lb*
0.15 lb PM10/hr

Annual Emissions

*Total = 0.15 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*
0.68 TPY PM10

VOC Emissions

SCAQMD Guidance (2006)

Average Emissions

*Average = 22,500 GPM * 0.00144 MGD/GPM * 0.7 lb VOC/MGD / 24 hr/day*
0.95 lb VOC/hr

Annual Emissions

*Total = 0.95 lbs/hr * 8,760 hrs/yr / 2,000 lbs/ton*
4.14 TPY VOC

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*	
PM10	0.2	0.7	
PM2.5	0.2	0.7	assume equal to PM10
VOC	0.9	4.1	
HAP[2]	0.05	0.2	

Dispersion Modeling Emissions Summary, Each Cooling Tower Cell

Pollutant	*Averaging Period*	*Emissions (lb/hr)*
PM_{10}	24-Hour	0.03
PM_{10}	Annual	0.03

REFERENCES/NOTES

1 Based on facility supplied information.
2 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

SOURCE DESCRIPTION

Each fluidized bed biomass boiler has a rated capacity of 198 MMBtu/hr. The units will burn stillage cake, biogas, and supplemental biomass as fuel with natural gas for startups and flame stabilization, and will utilize best available control technology (BACT) to minimize emissions. Specifically, each boiler will be equipped with a baghouse to control PM emissions, selective non-catalytic reduction (SNCR) to control NOx emissions, and limestone injection to control SO2 emissions. Good combustion practices will be used to minimize CO and VOC emissions.

OPERATING PARAMETERS, EACH BOILER

Operating Schedule	8,760	Hrs/yr
Capacity	198	MMBtu/hr
F-Factor (approximate)	16,500	wscf/MMBtu
Exhaust Flow	78,905	acfm
Exit Temperature	305	°F
Exit Diameter	6	ft
Exit Velocity	46.5	ft/s

EMISSION CALCULATIONS, EACH BOILER

Emission Factors[1]	lbs/MMBtu	
PM10 (filterable)	0.01	
PM10 (total)	0.05	
PM2.5 (filterable)	0.01	
PM2.5 (total)	0.05	
SO_2	0.06	30-day rolling average
SO_2	0.12	short-term average (24-hour)
SO_2	0.14	short-term average (3-hour)
NOx	0.075	30-day rolling average
NOx	0.1	short-term average (24-hour)
CO	0.1	30-day rolling average
CO	0.2	short-term average (8-hour)
VOC	0.005	
HCl	0.0054	
Pb	0.000048	
Hg	0.00001	

Typical Emissions

Typical = Boiler Capacity (198 MMBtu/hr) x Emission Factor (lb/MMBtu)

Filterable PM10 = 198 MMBtu/hr x 0.01 lb/MMBtu

1.98 lb Filterable PM10/hr

Total PM10 = *198 MMBtu/hr x 0.05 lb/MMBtu*
9.90 lb Total PM10/hr

Filterable PM2.5 = *198 MMBtu/hr x 0.01 lb/MMBtu*
1.98 lb Filterable PM2.5/hr

Total PM2.5 = *198 MMBtu/hr x 0.05 lb/MMBtu*
9.90 lb Total PM2.5/hr

SO2 = *198 MMBtu/hr x 0.06 lbs/MMBtu*
11.88 lb SO2/hr

NOx = *198 MMBtu/hr x 0.075 lbs/MMBtu*
14.85 lb NOx/hr

CO = *198 MMBtu/hr x 0.1 lbs/MMBtu*
19.80 lb CO/hr

VOC = *198 MMBtu/hr x 0.005 lbs/MMBtu*
0.99 lb VOC/hr

HCl = *198 MMBtu/hr x 0.0054 lbs/MMBtu*
1.07 lb HCl/hr

Pb = *198 MMBtu/hr x 0.000048 lbs/MMBtu*
9.50E-03 lb Pb/hr

Hg = *198 MMBtu/hr x 0.00001 lbs/MMBtu*
1.98E-03 lb Hg/hr

Annual Emissions

*Annual = Average (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Filterable PM10 = *(1.98 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
8.67 TPY Filterable PM10

Total PM10 = *(9.90 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
43.36 TPY Total PM10

Filterbale PM2.5 = *(1.98 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
8.67 TPY Filterable PM2.5

Total PM2.5 = *(9.90 lbs/hr) * (78,905 hrs/yr) / (2,000 lbs/ton)*
43.36 TPY Total PM2.5

SO2 = *(11.88 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
52.03 TPY SO2

NOx = *(14.85 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
65.04 TPY NOx

*CO = (19.80 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
86.72 TPY CO

*VOC = (0.99 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
4.34 TPY VOC

*HCl = (1.07 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
4.68 TPY HCl

*Pb = (0.009504 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
4.16E-02 TPY Pb

*Hg = (0.00198 lbs/hr) * (8,760 hrs/yr) / (2,000 lbs/ton)*
8.67E-03 TPY Hg

Emissions Summary, Each Boiler

Pollutant	***Typical***	***Annual***
	(lbs/hr)	***(TPY)***
Filt. PM10	2.0	8.7
Total PM10	9.9	43.4
Filt. PM2.5	2.0	8.7
Total PM2.5	9.9	43.4
SO_2	11.9	52.0
NOx	14.9	65.0
CO	19.8	86.7
VOC	1.0	4.3
HCl	1.1	4.7
Pb	0.01	0.04
Hg	0.002	0.01
total HAPs	1.1	4.8

Dispersion Modeling Emissions Summary, Each Boiler

Pollutant	***Averaging Period***	***Emissions (lb/hr)***
PM_{10}	24-Hour	9.9
PM_{10}	Annual	9.9
$PM_{2.5}$	24-Hour	9.9
$PM_{2.5}$	Annual	9.9
SO_2	3-Hour	27.7
SO_2	24-Hour	23.8
SO_2	Annual	11.9
NO_2	Annual	19.8
CO	1-Hour	39.6
CO	8-Hour	39.6

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[2]

	lb/MMBtu	lb/hr	tpy
HCl	5.40E-03	1.07E+00	4.68E+00
Hg	1.00E-05	1.98E-03	8.67E-03
POM	1.43E-04	2.83E-02	1.24E-01
Total HAPs	5.55E-03	1.10E+00	4.82E+00

REFERENCES/NOTES

1 Emission factors based on proposed BACT emission limits.

2 HAP emission factors are not available for stillage cake. Emission factors from AP-42 Section 1.8, Bagasse Combustion In Sugar Mills (Oct. 1996), were used as a surrogate except for HCl and Hg.

SOURCE DESCRIPTION

The backup boiler is fired with natural gas and will be limited to operate only when one of the biomass boilers is shut down. Hence, potential emissions are calculated for dispersion modeling purposes only and are not included in the annual PTE of the facility.

OPERATING PARAMETERS

Boiler

Operating Schedule	8,760	hrs/yr	
Fuels		Natural Gas	
Capacity	198	MMBtu/hr	
Natural Gas HHV	1,020	Btu/scf	from AP42
Capacity	194,118	scf/hr	
Sulfur Content	0.02	gr/scf	from FDEP
F-Factor	10,610	scf/MMBtu	from 40 CFR 60 Method 19
Exhaust Flow	61,671	acfm	
Exit Temperature	350	°F	
Exit Diameter	5	ft	
Exit Velocity	52.35	ft/s	

EMISSION CALCULATIONS

Criteria Pollutant Emission Factors for Natural Gas

Pollutant	lb/MMBtu	Emission Factor Source
PM10	0.0022	BACT
PM2.5	0.0022	BACT
SO2	0.0056	BACT
NOx	0.035	BACT
CO	0.037	BACT
VOC	0.0014	BACT

Typical Emissions

Typical = *Boiler Capacity (198 MMBtu/hr) x Emission Factor (lb/MMBtu)*

PM10 = *198 MMBtu/hr * 0.0022 lbs/MMBtu*
0.44 lbs PM/hr

PM2.5 = *198 MMBtu/hr * 0.0022 lbs/MMBtu*
0.44 lbs PM/hr

SO2 = *198 MMBtu/hr * 0.0055964 lbs/MMBtu*
1.11 lbs SO2/hr

NOx = *198 MMBtu/hr * 0.035 lbs/MMBtu*
6.93 lbs NOx/hr

CO = *198 MMBtu/hr * 0.037 lbs/MMBtu*
7.33 lbs CO/hr

VOC = *198 MMBtu/hr * 0.0014 lbs/MMBtu*
0.28 lbs VOC/hr

TOTAL CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	0.4	#N/A
PM2.5	0.4	#N/A
SO2	1.1	#N/A
NOx	6.9	#N/A
CO	7.3	#N/A
VOC	0.3	#N/A
total HAP	0.4	#N/A

Dispersion Modeling Emissions Summary, Each Boiler

Pollutant		*Averaging Period*	*Emissions (lb/hr)*
PM_{10}		24-Hour	0.4
$PM_{2.5}$		24-Hour	0.4
SO_2		3-Hour	1.1
SO_2		24-Hour	1.1
SO_2		Annual	1.1
NO_2		Annual	6.9
CO		1-Hour	7.3
CO		8-Hour	7.3

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

BACKUP BOILER - NATURAL GAS FIRING

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/MMscf	lb/MMBtu	lb/hr
HAP	1.89E+00	1.85E-03	3.66E-01
Organic HAP Speciation			
n-hexane	1.80E+00	1.76E-03	3.49E-01
formaldehyde	7.50E-02	7.35E-05	1.46E-02
toluene	3.40E-03	3.33E-06	6.60E-04
benzene	2.10E-03	2.06E-06	4.08E-04
dichlorobenzene	1.20E-03	1.18E-06	2.33E-04
naphthalene	6.10E-04	5.98E-07	1.18E-04
POM Speciation			
total POM	8.82E-05	8.65E-08	1.71E-05
2-methylnaphthalene	2.40E-05	2.35E-08	4.66E-06
phenanthrene	1.70E-05	1.67E-08	3.30E-06
7,12-dimethylbenz(a)anthracene	1.60E-05	1.57E-08	3.11E-06
pyrene	5.00E-06	4.90E-09	9.71E-07
benzo(b,k)fluoranthene	3.60E-06	3.53E-09	6.99E-07
fluoranthene	3.00E-06	2.94E-09	5.82E-07
fluorene	2.80E-06	2.75E-09	5.44E-07
anthracene	2.40E-06	2.35E-09	4.66E-07
acenaphthene	1.80E-06	1.76E-09	3.49E-07
acenaphthylene	1.80E-06	1.76E-09	3.49E-07
benz(a)anthracene	1.80E-06	1.76E-09	3.49E-07
chrysene	1.80E-06	1.76E-09	3.49E-07
indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09	3.49E-07
3-methylchloranthene	1.80E-06	1.76E-09	3.49E-07
benzo(a)pyrene	1.20E-06	1.18E-09	2.33E-07
benzo(g,h,i)perylene	1.20E-06	1.18E-09	2.33E-07
dibenzo(a,h)anthracene	1.20E-06	1.18E-09	2.33E-07
Inorganic HAP Speciation			
nickel	2.10E-03	2.06E-06	4.08E-04
chromium	1.40E-03	1.37E-06	2.72E-04
cadmium	1.10E-03	1.08E-06	2.14E-04
manganese	3.80E-04	3.73E-07	7.38E-05
mercury	2.60E-04	2.55E-07	5.05E-05
arsenic	2.00E-04	1.96E-07	3.88E-05
cobalt	8.40E-05	8.24E-08	1.63E-05
selenium	2.40E-05	2.35E-08	4.66E-06
beryllium	1.20E-05	1.18E-08	2.33E-06

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.4 *"Natural Gas Combustion"*, July 1998.

SOURCE DESCRIPTION

The backup boiler may be fired with ULSD in the event gas is not available and will be limited to operate only when one of the biomass boilers is shut down. Hence, potential emissions are calculated for dispersion modeling purposes only and are not included in the annual PTE of the facility.

OPERATING PARAMETERS

Boiler

Operating Schedule	8,760	hrs/yr	
Fuels		ULSD	
Capacity	198	MMBtu/hr	
Diesel HHV	140,000	Btu/gal	from AP42
Diesel Density	7.86	lb/gal	from AP42
Capacity	1,414	gal/hr	
Sulfur Content	0.0015	%	
F-Factor	10,320	scf/MMBtu	from 40 CFR 60 Method 19
Exhaust Flow	59,986	acfm	
Exit Temperature	350	°F	
Exit Diameter	5	ft	
Exit Velocity	50.92	ft/s	

EMISSION CALCULATIONS

Criteria Pollutant Emission Factors for ULSD

Pollutant	lb/MMBtu	Emission Factor Source
PM10	0.0071	BACT
PM2.5	0.0071	BACT
SO2	0.0017	BACT
NOx	0.072	BACT
CO	0.035	BACT
VOC	0.0015	BACT
Pb	0.000009	AP-42, Table 1.3-10

Typical Emissions

Typical = *Boiler Capacity (198 MMBtu/hr) x Emission Factor (lb/MMBtu)*

PM10 = *198 MMBtu/hr * 0.0071 lbs/MMBtu*
1.41 lbs PM/hr

PM2.5 = *198 MMBtu/hr * 0.0071 lbs/MMBtu*
1.41 lbs PM/hr

SO2 = *198 MMBtu/hr * 0.0017 lbs/MMBtu*
0.33 lbs SO2/hr

NOx = *198 MMBtu/hr * 0.072 lbs/MMBtu*
14.26 lbs NOx/hr

CO = *198 MMBtu/hr * 0.035 lbs/MMBtu*
6.93 lbs CO/hr

VOC = *198 MMBtu/hr * 0.0015 lbs/MMBtu*
0.30 lbs VOC/hr

Pb = *198 MMBtu/hr * 0.000009 lbs/MMBtu*
0.002 lbs Pb/hr

TOTAL CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	*Typical (lbs/hr)*	*Annual (TPY)*
PM10	1.4	#N/A
PM2.5	1.4	#N/A
SO2	0.3	#N/A
NOx	14.3	#N/A
CO	6.9	#N/A
VOC	0.3	#N/A
Pb	0.002	#N/A
total HAP	0.1	#N/A

Dispersion Modeling Emissions Summary, Each Boiler

Pollutant		*Averaging Period*	*Emissions (lb/hr)*
PM_{10}		24-Hour	1.4
$PM_{2.5}$		24-Hour	1.4
SO_2		3-Hour	0.3
SO_2		24-Hour	0.3
SO_2		Annual	0.3
NO_2		Annual	14.3
CO		1-Hour	6.9
CO		8-Hour	6.9

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

BACKUP BOILER - ULSD FIRING

TOTAL SPECIATED POLLUTANT EMISSIONS SUMMARY[1]

	lb/gal	lb/MMBtu	lb/hr
HAP	4.33E-05	3.10E-04	6.13E-02
Organic HAP Speciation			
formaldehyde	3.30E-05	2.36E-04	4.67E-02
toluene	6.20E-06	4.43E-05	8.77E-03
naphthalene	1.13E-06	8.07E-06	1.60E-03
1,1,1-trichloroethane	2.36E-07	1.69E-06	3.34E-04
benzene	2.14E-07	1.53E-06	3.03E-04
o-xylene	1.09E-07	7.79E-07	1.54E-04
ethylbenzene	6.36E-08	4.54E-07	8.99E-05
POM Speciation			
total POM	6.06E-08	4.33E-07	8.57E-05
acenaphthene	2.11E-08	1.51E-07	2.98E-05
phenanthrene	1.05E-08	7.50E-08	1.49E-05
fluoranthene	4.84E-09	3.46E-08	6.85E-06
fluorene	4.47E-09	3.19E-08	6.32E-06
pyrene	4.25E-09	3.04E-08	6.01E-06
benz(a)anthracene	4.01E-09	2.86E-08	5.67E-06
chrysene	2.38E-09	1.70E-08	3.37E-06
benzo(g,h,i)perylene	2.26E-09	1.61E-08	3.20E-06
indeno(1,2,3-cd)pyrene	2.14E-09	1.53E-08	3.03E-06
dibenzo(a,h)anthracene	1.67E-09	1.19E-08	2.36E-06
benzo(b,k)fluoranthene	1.48E-09	1.06E-08	2.09E-06
anthracene	1.22E-09	8.71E-09	1.73E-06
acenaphthylene	2.53E-10	1.81E-09	3.58E-07
Inorganic HAP Speciation			
selenium	2.10E-06	1.50E-05	2.97E-03
manganese	4.71E-11	6.00E-06	1.19E-03
arsenic	5.66E-09	4.00E-06	7.92E-04
beryllium	4.50E-15	3.00E-06	5.94E-04
cadmium	3.10E-08	3.00E-06	5.94E-04
chromium	1.80E-07	3.00E-06	5.94E-04
mercury	1.05E-09	3.00E-06	5.94E-04
nickel	1.50E-11	3.00E-06	5.94E-04

REFERENCES/NOTES

1 Emission factors based on EPA AP-42, Section 1.3 *"Fuel Oil Combustion"*, September 1998.

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

EMERGENCY GENERATORS

SOURCE DESCRIPTION

The four emergency generators will be used in the event of power supply disruptions. The engines will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 500 hours per year. Emissions listed here are per each engine.

OPERATING PARAMETERS

Operating Schedule	500	hrs/yr	
Capacity	2,682	hp	2000 ekW
	19.45	MMBtu/hr	138.9 gal/hr
Primary Fuel	#2 Diesel		

EMISSION CALCULATIONS

Pollutant	g/kW-hr [1]	Pollutant	lb/MMBtu [2]
PM10	0.2	Acetaldehyde	0.0000252
SOx	0.0041	Acrolein	0.00000788
NOx	5.76	Benzene	0.000776
CO	3.5	Formaldehyde	0.0000789
VOC	0.64	Propylene	0.00279
		Toluene	0.000281
		Xylene	0.000193

Average Emissions - Criteria Pollutants

*Average = Capacity (kW) * Emission Factor (g/kW-hr) * (1 lb/453.5924 g)*

*PM = 2,000 kW * 0.2 g/hp-hr * (1 lb/453.5924 g)*

0.88 lb PM10/hr

*SO2 = 2,000 kW * 0.0041 g/hp-hr * (1 lb/453.5924 g)*

0.02 lb SO2/hr

*NOx = 2,000 kW * 5.76 g/hp-hr * (1 lb/453.5924 g)*

25.40 lb NOx/hr

*CO = 2,000 kW * 3.5 g/hp-hr * (1 lb/453.5924 g)*

15.43 lb CO/hr

*VOC = 2,000 kW * 0.64 g/hp-hr * (1 lb/453.5924 g)*

2.82 lb VOC/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (19.45) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 19.45 MMBtu/hr * 0.0000252 lb/MMBtu*

0.0005 lb Acetaldehyde/hr

*Acrolein = 19.45 MMBtu/hr * 0.0000079 lb/MMBtu*

0.0002 lb Acrolein/hr

*Benzene = 19.45MMBtu/hr * 0.000776 lb/MMBtu*
0.02 lb Benzene/hr

*Formaldehyde = 19.45 MMBtu/hr * 0.0000789 lb/MMBtu*
0.002 lb Formaldehyde/hr

*Propylene = 19.45 MMBtu/hr * 0.002790 lb/MMBtu*
0.05 lb Propylene/hr

*Toluene = 19.45 MMBtu/hr * 0.000281 lb/MMBTu*
0.005 lb Toluene/hr

*Xylene = 19.45 MMBtu/hr * 0.000193 lb/MMBtu*
0.004 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 500 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.88 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.22 TPY PM10

*SO2 = 0.02 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.005 TPY SO2

*NOx = 25.40 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
6.35 TPY NOx

*CO = 15.43 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
3.86 TPY CO

*VOC = 2.82 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.71 TPY VOC

*Acetaldehyde = 0.00049 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.0001 TPY Acetaldehyde

*Acrolein = 0.00015 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00004 TPY Acrolein

*Benzene = 0.015 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.004 TPY Benzene

*Formaldehyde = 0.0015 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.0004 TPY Formaldehyde

*Propylene = 0.0038 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.0009 TPY Propylene

*Toluene = 0.054 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.01 TPY Toluene

*Xylene = 0.0055 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.001 TPY Xylene

Emissions Summary - Each Generator

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
PM10	0.9	0.2
PM2.5	0.9	0.2
SOx	0.02	0.005
NOx	25.4	6.3
CO	15.4	3.9
Total VOC	2.8	0.7
HAPs	0.1	0.02
Acetaldehyde	0.0005	0.0001
Acrolein	0.0002	0.00004
Benzene	0.02	0.004
Formaldehyde	0.002	0.0004
Propylene	0.004	0.001
Toluene	0.1	0.01
Xylene	0.01	0.001

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII
2 Emission factor based on AP-42, Table 3.4-3: Speciated Organic Compound Emission Factors for Large Uncontrolled Stationary Diesel Engines, October 1996.

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
FIRE PUMP

SOURCE DESCRIPTION

The diesel pump will be used in the event of a fire. The pump will be tested weekly for approximately 1 hour or less, and will be operationally limited to less than 500 hours per year.

OPERATING PARAMETERS

Operating Schedule	500	hrs/yr
Capacity	360	hp
	2.52	MMBtu/hr
Primary Fuel	#2 Diesel	

EMISSION CALCULATIONS

Pollutant	g/hp-hr [1]	Pollutant	lb/MMBtu [2]
PM10	0.15	Acetaldehyde	0.000767
SOx	0.0055	Acrolein	0.0000925
NOx	2.7	Benzene	0.000933
CO	2.6	Formaldehyde	0.00118
VOC	0.3	Propylene	0.00258
		Toluene	0.000409
		Xylene	0.000285
		Naphthalene	0.0000848
		POM	0.0000832

Average Emissions - Criteria Pollutants

*Average = Capacity (hp) * Emission Factor (g/hp-hr) * (1 lb/453.5924 g)*

*PM = 360 hp * 0.15 g/hp-hr * (1 lb/453.5924 g)*
0.119 lb PM10/hr

*SO2 = 360 hp * 0.0055 g/hp-hr * (1 lb/453.5924 g)*
0.0044 lb SO2/hr

*NOx = 360 hp * 2.7 g/hp-hr * (1 lb/453.5924 g)*
2.14 lb NOx/hr

*CO = 360 hp * 2.6 g/hp-hr * (1 lb/453.5924 g)*
2.06 lb CO/hr

*VOC = 360 hp * 0.3 g/hp-hr * (1 lb/453.5924 g)*
0.24 lb VOC/hr

Average Emissions - Speciated Pollutants

*Average = Capacity (2.52) * Emission Factor (lb/MMBtu)*

*Acetaldehyde = 2.52 MMBtu/hr * 0.0007670 lb/MMBtu*
0.001933 lb Acetaldehyde/hr

*Acrolein = 2.52 MMBtu/hr * 0.0000925 lb/MMBtu*
0.000233 lb Acrolein/hr

*Benzene = 2.52MMBtu/hr * 0.000933 lb/MMBtu*
0.0024 lb Benzene/hr

*Formaldehyde = 2.52 MMBtu/hr * 0.0011800 lb/MMBtu*
0.00297 lb Formaldehyde/hr

*Propylene = 2.52 MMBtu/hr * 0.002580 lb/MMBtu*
0.0065 lb Propylene/hr

*Toluene = 2.52 MMBtu/hr * 0.000409 lb/MMBTu*
0.00103 lb Toluene/hr

*Xylene = 2.52 MMBtu/hr * 0.000285 lb/MMBtu*
0.00072 lb Xylene/hr

Annual Emissions

*Total = Average lbs/hr * 500 hrs/yr / 2,000 lbs/ton*

*PM10 = 0.119 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.030 TPY PM10

*SO2 = 0.0044 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00109 TPY SO2

*NOx = 2.14 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.54 TPY NOx

*CO = 2.06 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.52 TPY CO

*VOC = 0.24 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.060 TPY VOC

*Acetaldehyde = 0.00193 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00048 TPY Acetaldehyde

*Acrolein = 0.00023 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.000058 TPY Acrolein

*Benzene = 0.0024 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00059 TPY Benzene

*Formaldehyde = 0.0030 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00074 TPY Formaldehyde

*Propylene = 0.00072 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.000180 TPY Propylene

*Toluene = 0.0065 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00163 TPY Toluene

*Xylene = 0.00103 lbs/hr * 500 hrs/yr / 2,000 lbs/ton*
0.00026 TPY Xylene

Emissions Summary

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
PM10	0.1	0.03
PM2.5	0.1	0.03
SO2	0.004	0.001
NOx	2.1	0.5
CO	2.1	0.5
Total VOC	0.2	0.1
HAPs	0.02	0.004
Acetaldehyde	0.002	0.0005
Acrolein	0.0002	0.0001
Benzene	0.002	0.001
Formaldehyde	0.003	0.001
Propylene	0.0007	0.0002
Toluene	0.007	0.002
Xylene	0.001	0.0003
Naphthalene	0.0002	0.0001
POM	0.0002	0.0001

REFERENCES/NOTES

1 40 CFR 60 Subpart IIII
2 EPA AP-42, Table 3.3-2: Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, October 1996.

VERENIUM BIOFUELS CORP.

HIGHLANDS ETHANOL

STILLAGE LOADOUT (FUGITIVE VOC)

SOURCE DESCRIPTION

Stillage is removed from the beer stripper distillation column, centrifuged to remove some of the water fraction, and conveyed to the biomass boiler. The stillage will not be dried. Stillage will be generated at a rate of 25 dry tons per hour and will consist primarily of lignin fibers and secondarily of unhydrolyzed cellulose fibers with a moisture content between 50 and 60 percent. Handling will be performed entirely within a closed system except for the conveyor. Based on the consistency and moisture content of the material, PM emissions are expected to be negligible. VOC emissions will occur from the evaporation of organics dissolved in the water fraction and escaping the conveyor as fugitive emissions.

OPERATING PARAMETERS

Operating Schedule	8,760	hrs/yr
Ethanol Production	39,420,000	gal/yr

EMISSION CALCULATIONS [1]

VOC Emission Factor	0.0001421	lb/gal

VOC Emissions

*Average Emissions = VOC Emission Factor (0.00014 lb/gal) * Ethanol Production (39,420,000 gal/yr) / Operating Hours (8,760 hrs/yr)*

Average VOC Emission Rate	0.639	lbs/hr

*Annual Emissions = Average VOC Emission Rate (0.64 lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Annual VOC Emission Rate	2.80	tons/yr

Emissions Speciation [2]

Pollutant	CAS No.	Percent	HAP
Propionic Acid	79-09-4	52.0%	No
Acetic Acid	64-19-7	32.0%	No
Ethanol	64-17-5	16.0%	No

Speciated Emissions

Pollutant	Average (lb/hr)	Annual (tpy)
Propionic Acid	0.332	1.456
Acetic Acid	0.205	0.896
Ethanol	0.102	0.448

Emissions Summary

Pollutant	***Average (lbs./hr)***	***Annual (TPY)***
Total VOC	0.6	2.8
Propionic Acid	0.3	1.5
Acetic Acid	0.2	0.9
Ethanol	0.1	0.4

REFERENCES/NOTES

1 Emission factor based on the procedure used for the permitting of the Pacific Ethanol Facility located in Madera, California. Three emission calculation procedures were identified and the one that resulted in the greatest VOC emission rate was selected. The emission factor was then doubled for an additional margin of safety. See Initial Study/Environmental Checklist for the Pacific Ethanol Facility, San Joaquin Valley Unified Air Pollution Control District, January 29, 2004.

2 The Pacific Ethanol Study referenced above indicates that only acetic acid, propionic acid, and ethanol are available to evaporate from the wet stillage. Speciation is based on the proportions identified in that report.

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
FUGITIVE VOC EQUIPMENT LEAKS

SOURCE DESCRIPTION

Equipment components in VOC service are subject to 40 CFR Part 60 Subpart VV; therefore components are monitored monthly. Control effectiveness is allowed for components subject to an LDAR program.

OPERATING PARAMETERS

Operating Schedule 8,760 hrs/yr

EMISSION CALCULATIONS [1]

*Average (Lbs/hr) = Component Count x Emission Factor (lb/hr/source) * (1 - Control Effectiveness/100)*

*Annual (TPY) = Average (lbs VOC/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

Component Type	Service	Component Count	Emission Factors (kg/hr/source) [1]	Weighted Average VOC Content [2]	Subpart VV Control Effectiveness [3]	Emissions		
						Avg (lbs/hr)	Max (lbs/hr) [4]	Tons/Yr
Valves	Gas/Vapor	50	0.00597	100%	87%	8.56E-02	1.03E-01	3.75E-01
Valves	Light Liquid	400	0.00403	96%	84%	5.46E-01	6.55E-01	2.39E+00
Valves	Heavy Liquid	200	0.00023	5%	0%	5.07E-03	6.08E-03	2.22E-02
Sealless Valves	Light Liquid	400	4.90E-07	96%	84%	6.64E-05	7.96E-05	2.91E-04
Sealless Valves	Heavy Liquid	200	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Light Liquid	0	0.0199	96%	69%	0.00E+00	0.00E+00	0.00E+00
Pump Seals	Heavy Liquid	0	0.00862	5%	0%	0.00E+00	0.00E+00	0.00E+00
Pump Seals, Dual Mech.	Light Liquid	100	7.50E-06	96%	69%	4.92E-04	5.90E-04	2.16E-03
Pump Seals, Dual Mech.	Heavy Liquid	20	0	5%	0%	0.00E+00	0.00E+00	0.00E+00
Agitator Seals	Light Liquid	20	0.0199	96%	69%	2.61E-01	3.13E-01	1.14E+00
Agitator Seals	Heavy Liquid	20	0.00862	5%	0%	1.90E-02	2.28E-02	8.32E-02
Compressor Seals	Gas/Vapor	0	0.228	100%	0%	0.00E+00	0.00E+00	0.00E+00
Pressure Relief Valves	Gas/Vapor	0	0.104	100%	0%	0.00E+00	0.00E+00	0.00E+00
Connectors	All	2500	0.00183	30%	0%	3.03E+00	3.63E+00	1.33E+01
Open-Ended Lines	All	120	0.0017	30%	0%	1.35E-01	1.62E-01	5.91E-01
Sampling Connections	All	40	0.015	30%	0%	3.97E-01	4.76E-01	1.74E+00
					TOTAL	**4.5**	**5.4**	**19.6**

VERENIUM BIOFUELS CORP.
HIGHLANDS ETHANOL
FUGITIVE VOC EQUIPMENT LEAKS

Emissions Summary

Pollutant	*Average (lbs/hr)*	*Annual (TPY)*
VOC	4.5	19.6
HAP[4]	0.2	1.0

REFERENCES/NOTES:

1 Table 2-1, SOCMI Average Emission Factors; or Table 2-11, Default-Zero Values: SOCMI Process Units; or Table 5-1, Summary of Equipment Modifications; Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

2 For components in liquid service, approximately 75% are associated with liquids containing less than 5% VOC, 20% are associated with liquids containing less than 95% VOC, and 5% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 30%. For components in light liquid service, approximately 80% are associated with liquids containing less than 95% VOC, and 20% are associated with liquids containing greater than 95% VOC. The resulting weighted average VOC content is approximately 96%.

3 Table 5-2, Control Effectiveness for an LDAR Program at a SOCMI Process Unit, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995.

4 HAP emissions are conservatively assumed to represent 5% of the VOC emissions, and are conservatively assigned to acetaldehyde.

SOURCE DESCRIPTION

Approximately 130 trucks per day will be used to deliver feedstock and will use the feedstock roads, and an additional 100 vehicles per day will drive on the plant roads. The feedstock roads will be unpaved, consisting primarily of gravel. The plant roads will be paved with asphalt. To minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water. Because Highlands Ethanol is considering the use of supplemental biomass in its boilers, an additional 120 trucks per day are conservatively assumed for delivering the supplemental fuel. These trucks are conservatively assumed to use the unpaved feedstock roads.

OPERATING PARAMETERS

Operating Schedule 8,760 hr/yr

Vehicle Traffic	Vehicles/Day	Miles/Vehicle	VMT/Day	VMT/Year
Feedstock Delivery	130	0.63	81.62	29,793
Employee Vehicles	0	0.00	0.00	0
Product Tankers	0	0.00	0.00	0
Denaturant Tankers	0	0.00	0.00	0
Fuel Delivery Trucks	120	0.63	75.35	27,501
Chemical Delivery Trucks	0	0.00	0.00	0
Ash Disposal Trucks	0	0.00	0.00	0
Process Waste Trucks	0	0.00	0.00	0
Vendors/Deliveries	0	0.00	0.00	0
Miscellaneous	0	0.00	0.00	0
TOTAL			**156.97**	**57,294**

EMISSION CALCULATIONS [1]

$$E = k\,(s/12)^{a} * (W/3)^{b}$$

$$E_{est} = E\,(lbs/VMT) * [(365-P)/365]$$

where:

E = particulate emission factor (lb/VMT)

	PM10	PM2.5	
k =	1.5	0.15	particle size multiplier (Table 13.2.2-2)
a =	0.9	0.9	constant (Table 13.2.2-2)
b =	0.45	0.45	constant (Table 13.2.2-2)
s =	5.1	5.1	surface material silt content (%)
W =	29	29	average weight of the vehicles traveling the road (tons)
P =	120	120	Days rainfall > 0.01" (Figure 13.2.2-1)

Emission Factor

*E = 1.5 * (5.1/12)^0.9 * (29/3)^0.45*
1.93 lbs PM10/VMT
*E = 0.15 * (5.1/12)^0.9 * (29/3)^0.45*
0.19 lbs PM2.5/VMT

Adjusted for Rainfall
E_{est} = *1.93 lbs/VMT * [(365 -120)/365]*
1.29 lbs PM10/VMT
E_{est} = *0.19 lbs/VMT * [(365 -120)/365]*
0.13 lbs PM2.5/VMT

Emission Calculations

*Average PM10 (Lbs/Hr) = 1.29 lbs PM10/VMT * 57,294 VMT/yr / 8,760 hrs/yr*
8.46 lb/hr PM10
*Annual PM10 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*
37.07 tpy PM10
*Average PM2.5 (Lbs/Hr) = 0.13 lbs PM10/VMT * 57,294 VMT/yr / 8,760 hrs/yr*
0.85 lb/hr PM2.5
*Annual PM2.5 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*
3.71 tpy PM2.5

Emissions Summary

Pollutant	Control Efficiency	Average (lbs/hr)	Annual (TPY)	
PM10	none	8.5	37.1	
	0.75	2.1	9.3	dust suppression using water
PM2.5	none	0.8	3.7	
	0.75	0.2	0.9	dust suppression using water

REFERENCES/NOTES:

1 EPA, AP-42, Section 13.2.2, Unpaved Roads, November 2006.

SOURCE DESCRIPTION

Approximately 130 trucks per day will be used to deliver feedstock and will use the feedstock roads, and an additional 100 vehicles per day will drive on the plant roads. The feedstock roads will be unpaved, consisting primarily of gravel. The plant roads will be paved with asphalt. To minimize fugitive dust (PM) emissions during dry periods, unpaved roads will be wet down with water. Because Highlands Ethanol is considering the use of supplemental biomass in its boilers, an additional 120 trucks per day are conservatively assumed for delivering the supplemental fuel. These trucks are conservatively assumed to use the unpaved feedstock roads.

OPERATING PARAMETERS

Operating Schedule 8,760 hr/yr

Vehicle Traffic	Vehicles/Day	Miles/Vehicle	VMT/Day	VMT/Year
Feedstock Delivery	0	0.00	0.00	0
Employee Vehicles	60	0.38	22.75	8,303
Product Tankers	14	0.89	12.42	4,534
Denaturant Tankers	1	0.89	0.89	324
Fuel Delivery Trucks	2	0.89	1.77	648
Chemical Delivery Trucks	6	0.89	5.32	1,943
Ash Disposal Trucks	2	0.89	1.77	648
Process Waste Trucks	3	0.89	2.66	971
Vendors/Deliveries	5	0.89	4.44	1,619
Miscellaneous	7	0.89	6.21	2,267
TOTAL			**58.23**	**21,256**

EMISSION CALCULATIONS [1]

$$E = k\,(sL/2)^{0.65} * (W/3)^{1.5}$$
$$E_{est} = E\,(lbs/VMT) * [1-(P/4N)]$$

where:

E = particulate emission factor (lb/VMT)

	PM10	PM2.5	
k =	0.016	0.0024	particle size multiplier (Table 13.2.1-1)
sL =	0.6	0.6	road surface silt loading (g/m2, Table 13.2.1-3)
W =	29	29	average weight of the vehicles traveling the road (tons)
P =	120	120	Days rainfall > 0.01" (Figure 13.2.1-2)
N =	365	365	days in averaging period

Emission Factor

*E = 0.016 * (0.6/2)^0.65 * (29/3)^1.5*

0.069 lbs PM10/VMT

*E = 0.0024 * (0.6/2)^0.65 * (29/3)^1.5*

0.010 lbs PM2.5/VMT

Adjusted for Rainfall

E_{est} = *0.07 lbs/VMT * {1-[120/(4*365)]}*

0.063 lbs PM10/VMT

E_{est} = *0.01 lbs/VMT * {1-[120/(4*365)]}*

0.009 lbs PM2.5/VMT

Emission Calculations

*Average PM10 (Lbs/Hr) = 0.06 lbs PM10/VMT * 21,256 VMT/yr / 8,760 hrs/yr*

0.15 lb/hr PM10

*Annual PM10 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.67 tpy PM10

*Average PM2.5 (Lbs/Hr) = 0.01 lbs PM10/VMT * 21,256 VMT/yr / 8,760 hrs/yr*

0.02 lb/hr PM2.5

*Annual PM2.5 (TPY) = Avg (lbs/hr) * 8,760 hrs/yr / 2,000 lbs/ton*

0.10 tpy PM2.5

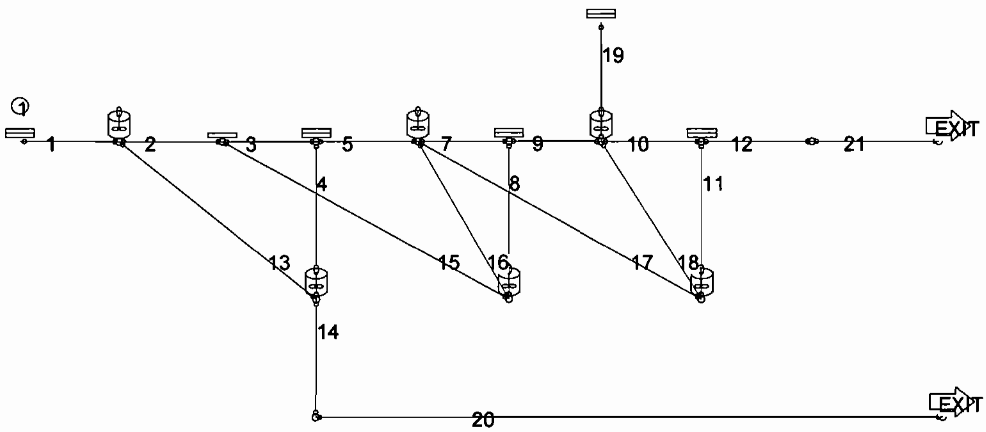
Emissions Summary

Pollutant	Average (lbs/hr)	Annual (TPY)
PM10	0.2	0.7
PM2.5	0.02	0.1

REFERENCES/NOTES:

1 EPA, AP-42, Section 13.2.1, Paved Roads, November 2006.

16:31:25 01-14-2009



No.	Name Type	flow (l/s)
1	TK-206 headspace sealed	22.14
2	TK-205 mix tank	198.75
3	P-209 hard piped, no headspace	211.15
4	PW-211 to TK-220 divert flow	198.3
5	PW-211 headspace sealed	12.85
7	TK-222 mix tank	202.95
8	PW-212 to TK-223 divert flow	189.9
9	PW-212 headspace sealed	13.05
10	TK-224 mix tank	205.06
11	PW-213 to TK-225 divert flow	192.
12	PW-213 headspace sealed	13.06
13	TK-220 mix tank	176.61
14	TK-220 to TK-221 divert flow	21.69
15	TK-223 mix tank	12.4
16	TK-223 to TK-222 divert flow	177.5
17	TK-225 mix tank	12.6
18	TK-225 to TK-224 divert flow	179.4
19	P-205 & P-206 headspace sealed	12.61
20	TK-221 system exit stream	21.69
21	MX-233 system exit stream	13.06

WASTEWATER TREATMENT SUMMARY I 01-14-2009 16:32:10

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COMPOUND	RATE	Fraction					
	(g/s)	Air	Removal	Exit	Adsorb	error	emissions
ACETIC ACID	1.96E+00	.00	.	.9906	0.0000	0.0000	(6.19E+01 Mg/yr)
FURFURAL	1.07E+00	.01	.	.9865	0.0000	0.0000	(3.39E+01 Mg/yr)

TOTAL ALL COMPOUNDS 3.04E+00 g/s air emissions
TOTAL ALL COMPOUNDS 9.58E+01 Mg/yr air emissions

WASTEWATER TREATMENT SUMMARY II 01-14-2009 16:33:37

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COMPOUND	RATE	Fraction	RATE	loading
	(g/s)	Air	(lb/day)	ppmw
ACETIC ACID	1.96E+00	.00933	373.487	9500.
FURFURAL	1.07E+00	.01348	204.473	3600.

TOTAL EMISSIONS ALL COMPOUNDS 3.04E+00 g/s air emissions
TOTAL EMISSIONS ALL COMPOUNDS 95.77 Mg/yr air emissions
TOTAL LOADING 9146.51 Mg/yr in waste
TOTAL WATER FLOW 22.14 L/s

WASTEWATER TREATMENT SUMMARY III 01-14-2009 16:33:58

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COMPOUND	Air loss	Fractions based on inlet waste		
	total	fe	fe	fbio
	(Mg/yr)	collection	treatment	removal
ACETIC ACID	61.89057	.	.0093	.
FURFURAL	33.88326	.	.0135	.

ALL COMPOUND TOTAL SUMMARY
COLLECTION SYSTEM EMISSIONS . Mg/yr collection system air emissions
TREATMENT EMISSIONS 95.77 Mg/yr treatment air emissions
TOTAL AIR EMISSIONS 95.77 Mg/yr total air emissions
TOTAL LOADING 9146.51 Mg/yr
TOTAL WATER FLOW 22.14 L/s

WASTEWATER TREATMENT MATERIAL BALANCE 01-14-2009
ACETIC ACID

No.	Name	load (g/s)	air (g/s)	exit (g/s)	removal (g/s)	
1: 12	TK-206	2.1 E+02	0. E+00	0. E+00	0. E+00	
2: 24	TK-205	0. E+00	4.96 E-01	0. E+00	0. E+00	15.658 Mg emis/yr.
3: 14	P-209	0. E+00	0. E+00	0. E+00	.0. E+00	
4: 47	PW-211 to TK-220	0. E+00	0. E+00	0. E+00	0. E+00	
5: 12	PW-211	0. E+00	0. E+00	0. E+00	0. E+00	
6: 0	def.	0. E+00	0. E+00	0. E+00	0. E+00	
7: 24	TK-222	0. E+00	3.25 E-01	0. E+00	0. E+00	10.272 Mg emis/yr.
8: 47	PW-212 to TK-223	0. E+00	0. E+00	0. E+00	0. E+00	
9: 12	PW-212	0. E+00	0. E+00	0. E+00	0. E+00	
10: 24	TK-224	0. E+00	1.65 E-01	0. E+00	0. E+00	5.2 Mg emis/yr.
11: 47	PW-213 to TK-225	0. E+00	0. E+00	0. E+00	0. E+00	
12: 12	PW-213	0. E+00	0. E+00	0. E+00	0. E+00	
13: 24	TK-220	0. E+00	4.86 E-01	0. E+00	0. E+00	15.337 Mg emis/yr.
14: 47	TK-220 to TK-221	0. E+00	0. E+00	0. E+00	0. E+00	
15: 24	TK-223	0. E+00	3.25 E-01	0. E+00	0. E+00	10.269 Mg emis/yr.
16: 47	TK-223 to TK-222	0. E+00	0. E+00	0. E+00	0. E+00	
17: 24	TK-225	0. E+00	1.65 E-01	0. E+00	0. E+00	5.198 Mg emis/yr.
18: 47	TK-225 to TK-224	0. E+00	0. E+00	0. E+00	0. E+00	
19: 12	P-205 & P-206	0. E+00	0. E+00	0. E+00	0. E+00	
20: 46	TK-221	0. E+00	0. E+00	1.73 E+02	0. E+00	
21: 46	MX-233	0. E+00	0. E+00	3.53 E+01	0. E+00	
TOTALS FOR ALL UNITS		2.1 E+02	1.96 E+00	2.08 E+02	0. E+00	

Total emissions for all units 61.933 Mg/yr (1.365e+05 lb/yr)
Total emissions per total flow 0.088642 g/L (739.662 lb/million gal.)
Total loading of compound 210.33 g/s. (6637.51 Mg/yr.)(14632958.571 lb/yr.)
Total fraction air emissions .0093
MATERIAL BALANCE 6.17981E-03 PERCENT DIFFERENCE = 2.938149E-03

Loading is the compound added to or generated in the system.
exit is from entire project system, not the unit.
removal is compound conversion in the system.

No.	Name	air (fe)	exit (fo)	removal (fbio+fcon)
1: 12	TK-206	.	.	.
2: 24	TK-205	.0024	.	.
3: 14	P-209	.	.	.
4: 47	PW-211 to TK-220	.	.	.
5: 12	PW-211	.	.	.
6: 0	def.	.	.	.
7: 24	TK-222	.0015	.	.
8: 47	PW-212 to TK-223	.	.	.
9: 12	PW-212	.	.	.
10: 24	TK-224	.0008	.	.
11: 47	PW-213 to TK-225	.	.	.
12: 12	PW-213	.	.	.
13: 24	TK-220	.0023	.	.
14: 47	TK-220 to TK-221	.	.	.
15: 24	TK-223	.0015	.	.
16: 47	TK-223 to TK-222	.	.	.
17: 24	TK-225	.0008	.	.
18: 47	TK-225 to TK-224	.	.	.
19: 12	P-205 & P-206	.	.	.
20: 46	TK-221	.	.8227	.
21: 46	MX-233	.	.168	.
TOTALS FOR ALL UNITS		.0093	.9906	.

Totals .9999706
Loading is the compound added to or generated in the system.
fe is the fraction of the loading that is emitted to the air.
fo is the fraction of the loading that remains in the project.
removal is the fraction of the losding that is converted to another compound.

WASTEWATER TREATMENT MATERIAL BALANCE 01-14-2009
FURFURAL

No.	Name	load (g/s)	air (g/s)	exit (g/s)	removal (g/s)	
1: 12	TK-206	7.97 E+01	0. E+00	0. E+00	0. E+00	
2: 24	TK-205	0. E+00	2.72 E-01	0. E+00	0. E+00	8.592 Mg emis/yr.
3: 14	P-209	0. E+00	0. E+00	0. E+00	0. E+00	
4: 47	PW-211 to TK-220	0. E+00	0. E+00	0. E+00	0. E+00	
5: 12	PW-211	0. E+00	0. E+00	0. E+00	0. E+00	
6: 0	def.	0. E+00	0. E+00	0. E+00	0. E+00	
7: 24	TK-222	0. E+00	1.78 E-01	0. E+00	0. E+00	5.616 Mg emis/yr.
8: 47	PW-212 to TK-223	0. E+00	0. E+00	0. E+00	0. E+00	
9: 12	PW-212	0. E+00	0. E+00	0. E+00	0. E+00	
10: 24	TK-224	0. E+00	8.99 E-02	0. E+00	0. E+00	2.837 Mg emis/yr.
11: 47	PW-213 to TK-225	0. E+00	0. E+00	0. E+00	0. E+00	
12: 12	PW-213	0. E+00	0. E+00	0. E+00	0. E+00	
13: 24	TK-220	0. E+00	2.67 E-01	0. E+00	0. E+00	8.413 Mg emis/yr.
14: 47	TK-220 to TK-221	0. E+00	0. E+00	0. E+00	0. E+00	
15: 24	TK-223	0. E+00	1.78 E-01	0. E+00	0. E+00	5.613 Mg emis/yr.
16: 47	TK-223 to TK-222	0. E+00	0. E+00	0. E+00	0. E+00	
17: 24	TK-225	0. E+00	8.99 E-02	0. E+00	0. E+00	2.836 Mg emis/yr.
18: 47	TK-225 to TK-224	0. E+00	0. E+00	0. E+00	0. E+00	
19: 12	P-205 & P-206	0. E+00	0. E+00	0. E+00	0. E+00	
20: 46	TK-221	0. E+00	0. E+00	6.54 E+01	0. E+00	
21: 46	MX-233	0. E+00	0. E+00	1.33 E+01	0. E+00	
TOTALS FOR ALL UNITS		7.97 E+01	1.07 E+00	7.86 E+01	0. E+00	

Total emissions for all units 33.906 Mg/yr (7.475e+04 lb/yr)
Total emissions per total flow 0.048529 g/L (404.943 lb/million gal.)
Total loading of compound 79.704 g/s. (2515.267 Mg/yr.)(5545121.465 lb/yr.)
Total fraction air emissions .0135
MATERIAL BALANCE 2.258301E-03 PERCENT DIFFERENCE = 2.833359E-03

Loading is the compound added to or generated in the system.
exit is from entire project system, not the unit.
removal is compound conversion in the system.

No.	Name	air (fe)	exit (fo)	removal (fbio+fcon)
1: 12	TK-206	.	.	.
2: 24	TK-205	.0034	.	.
3: 14	P-209	.	.	.
4: 47	PW-211 to TK-220	.	.	.
5: 12	PW-211	.	.	.
6: 0	def.	.	.	.
7: 24	TK-222	.0022	.	.
8: 47	PW-212 to TK-223	.	.	.
9: 12	PW-212	.	.	.
10: 24	TK-224	.0011	.	.
11: 47	PW-213 to TK-225	.	.	.
12: 12	PW-213	.	.	.
13: 24	TK-220	.0033	.	.
14: 47	TK-220 to TK-221	.	.	.
15: 24	TK-223	.0022	.	.
16: 47	TK-223 to TK-222	.	.	.
17: 24	TK-225	.0011	.	.
18: 47	TK-225 to TK-224	.	.	.
19: 12	P-205 & P-206	.	.	.
20: 46	TK-221	.	.82	.
21: 46	MX-233	.	.1665	.
TOTALS FOR ALL UNITS		.0135	.9865	.

Totals .9999716

Loading is the compound added to or generated in the system.
fe is the fraction of the loading that is emitted to the air.
fo is the fraction of the loading that remains in the project.
removal is the fraction of the losding that is converted to another compound.

WASTEWATER UNIT LOADING 01-14-2009

ACETIC ACID

No.	Name	load (g/s)	air fract	removal fract	exit fract
1: 12	TK-206	2.1 E+02	.	.	.
2: 24	TK-205	0. E+00	.002359	.	.
3: 14	P-209	0. E+00	.	.	.
4: 47	PW-211 to TK-220	0. E+00	.	.	.
5: 12	PW-211	0. E+00	.	.	.
7: 24	TK-222	0. E+00	.001548	.	.
8: 47	PW-212 to TK-223	0. E+00	.	.	.
9: 12	PW-212	0. E+00	.	.	.
10: 24	TK-224	0. E+00	.000783	.	.
11: 47	PW-213 to TK-225	0. E+00	.	.	.
12: 12	PW-213	0. E+00	.	.	.
13: 24	TK-220	0. E+00	.002311	.	.
14: 47	TK-220 to TK-221	0. E+00	.	.	.
15: 24	TK-223	0. E+00	.001547	.	.
16: 47	TK-223 to TK-222	0. E+00	.	.	.
17: 24	TK-225	0. E+00	.000783	.	.
18: 47	TK-225 to TK-224	0. E+00	.	.	.
19: 12	P-205 & P-206	0. E+00	.	.	.
20: 46	TK-221	0. E+00	.	.	.822687
21: 46	MX-233	0. E+00	.	.	.167953
TOTALS FOR ALL UNITS		2.1 E+02	.009331	.	.99064

MATERIAL BALANCE 2.938509E-05

WASTEWATER UNIT LOADING 01-14-2009

FURFURAL

No.	Name	load (g/s)	air fract	removal fract	exit fract
1: 12	TK-206	7.97 E+01	.	.	.
2: 24	TK-205	0. E+00	.003416	.	.
3: 14	P-209	0. E+00	.	.	.
4: 47	PW-211 to TK-220	0. E+00	.	.	.
5: 12	PW-211	0. E+00	.	.	.
7: 24	TK-222	0. E+00	.002233	.	.
8: 47	PW-212 to TK-223	0. E+00	.	.	.
9: 12	PW-212	0. E+00	.	.	.
10: 24	TK-224	0. E+00	.001128	.	.
11: 47	PW-213 to TK-225	0. E+00	.	.	.
12: 12	PW-213	0. E+00	.	.	.
13: 24	TK-220	0. E+00	.003345	.	.
14: 47	TK-220 to TK-221	0. E+00	.	.	.
15: 24	TK-223	0. E+00	.002232	.	.
16: 47	TK-223 to TK-222	0. E+00	.	.	.
17: 24	TK-225	0. E+00	.001127	.	.
18: 47	TK-225 to TK-224	0. E+00	.	.	.
19: 12	P-205 & P-206	0. E+00	.	.	.
20: 46	TK-221	0. E+00	.	.	.819994
21: 46	MX-233	0. E+00	.	.	.166498
TOTALS FOR ALL UNITS		7.97 E+01	.01348	.	.986491

MATERIAL BALANCE 2.837181E-05

DETAILED CALCULATIONS Defaults
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: ACETIC ACID

1 Total water added at the unit (l/s)	50	0
2 Area of openings at unit (cm2)		0
3 Radius of drop pipe (cm)		0
4 Drop length to conduit (cm)		0
5 Humidity of inlet air (%)		63
6 Temperature of air (C)		19.86
7 Drain air velocity (ft/min)		0
8 manhole air velocity (ft/min)		0
9 Conduit air velocity (ft/min)		0
10 Wind speed (cm/s at 10 m)		383.7
11 distance to next unit (cm)		0
12 slope of underflow conduit		0
13 friction factor liquid		0
14 friction factor gas		0
15 radius of underflow conduit (cm)		0
16 Underflow T (C)		66
17 oscillation cycle time (min)		0
18 design collection velocities (ft/s)		0
19 design branch line fraction full		0

Type of unit is

8 HL partition flag=1, adjust for sorption	0
9 unit recycle convergence number	200
10 oil molecular weight	0
11 oil density (g/cc)	0
12 NaUT 1=municipal 2=industrial 3=turb.	0
13 NaUT 1=mass tr. 2=equil	0
14 parts biomass per 1000 parts COD	
15 Reserved for default integer	

DETAILED CALCULATIONS at Unit 1 TK-206
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is headspace sealed

1 Description of unit	1	TK-206
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 1

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	0.
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	210.33
total component into unit, g/s	210.33
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	3.376e-07
UNIT EXIT CONCENTRATION (ppmw)	9500.

```
DETAILED CALCULATIONS at Unit 2 TK-205
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank
1 Description of unit                          2     TK-205
2 Wastewater temperature    (C)                      66
3 length of unit (m)                                 5.159
4 width of unit (m)                                  5.159
5 depth  of unit (m)                                 7.62
6 Area of agitation (each aerator,m2)                0
7 Total number of agitators in the unit              0
8 Power of agitation (each aerator,HP)               0
9 Impeller diameter (cm)                             0
10 Impeller rotation (RPM)                           0
13 if there is plug flow, enter 1                    0
15 Aeration air flow (m3/s)                          0
16 vent air emission control factor                  0
17 If covered, then enter 1                          0
19 pH                                                0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
   hl= 9.059e-06 atm-m3/mol      vp= 117.276 mmHg (2.26837 psia)
       0.5033 y/x
       3.257e-04 g/L gas per g/L liquid


   kl= 0. L/g-hr          dl= 1.365e-05 cm2/s  dv= 0.14158 cm2/s
Compound flow rate from inlet water is 1619.266 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.28345 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                          0.
   KL aerated (m/s)                          0.
   KL OVERALL AERATED (m/s)                  0.
   KG quiescent (m/s)                        0.010864
   KL quiescent (m/s)                        5.306e-06


   KL OVERALL QUIESCENT (m/s)                2.289e-06
   KL OVERALL (m/s)                          2.289e-06
   FRACTION SURFACE VOLATILIZED              3.064e-04
   FRACTION SUBMERGED VOLATILIZED            0.
   TOTAL FRACTION VOLATILIZED                3.064e-04
   FRACTION BIOLOGICALLY REMOVED             0.
   FRACTION ABSORBED                         0.
   TOTAL AIR EMISSIONS  (g/s)                0.49616
                  (Mg/year)                  15.647
   EMISSION FACTOR  (g/cm2-s)                1.864e-06
   UNIT EXIT CONCENTRATION (ppmw)            8144.755
```

DETAILED CALCULATIONS at Unit 5 PW-211
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is headspace sealed

1 Description of unit	5	PW-211
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 5

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	1685.004
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	0.
total component into unit, g/s	1685.004
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	1.864e-06
UNIT EXIT CONCENTRATION (ppmw)	7980.129

```
DETAILED CALCULATIONS at Unit 7 TK-222
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank
1 Description of unit                        7     TK-222
2 Wastewater temperature    (C)                    66
3 length of unit (m)                               5.159
4 width of unit (m)                                5.159
5 depth  of unit (m)                               7.62
6 Area of agitation (each aerator,m2)              0
7 Total number of agitators in the unit            0
8 Power of agitation (each aerator,HP)             0
9 Impeller diameter (cm)                           0
10 Impeller rotation (RPM)                         0
13 if there is plug flow, enter 1                  0
15 Aeration air flow (m3/s)                        0
16 vent air emission control factor                0
17 If covered, then enter 1                        0
19 pH                                              0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
   hl= 9.059e-06 atm-m3/mol      vp= 117.276 mmHg (2.26837 psia)
       0.5033 y/x
       3.257e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.365e-05 cm2/s  dv= 0.14158 cm2/s
Compound flow rate from inlet water is 1084.719 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.27758 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                         0.
   KL aerated (m/s)                         0.
   KL OVERALL AERATED (m/s)                 0.
   KG quiescent (m/s)                       0.010864
   KL quiescent (m/s)                       5.306e-06
   KL OVERALL QUIESCENT (m/s)               2.289e-06
   KL OVERALL (m/s)                         2.289e-06
   FRACTION SURFACE VOLATILIZED             3.001e-04
   FRACTION SUBMERGED VOLATILIZED           0.
   TOTAL FRACTION VOLATILIZED               3.001e-04
   FRACTION BIOLOGICALLY REMOVED            0.
   FRACTION ABSORBED                        0.
   TOTAL AIR EMISSIONS  (g/s)               0.3255
                 (Mg/year)                  10.265
   EMISSION FACTOR  (g/cm2-s)               1.223e-06
   UNIT EXIT CONCENTRATION (ppmw)           5343.155
```

DETAILED CALCULATIONS at Unit 9 PW-212
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is headspace sealed

1 Description of unit	9	PW-212
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 9

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	1084.394
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	0.
total component into unit, g/s	1084.394
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	1.223e-06
UNIT EXIT CONCENTRATION (ppmw)	5343.152

```
DETAILED CALCULATIONS at Unit 10 TK-224
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank
1 Description of unit                    10    TK-224
2 Wastewater temperature   (C)                 66
3 length of unit (m)                           5.159
4 width of unit (m)                            5.159
5 depth  of unit (m)                           7.62
6 Area of agitation (each aerator,m2)          0
7 Total number of agitators in the unit        0
8 Power of agitation (each aerator,HP)         0
9 Impeller diameter (cm)                       0
10 Impeller rotation (RPM)                     0
13 if there is plug flow, enter 1              0
15 Aeration air flow (m3/s)                    0
16 vent air emission control factor            0
17 If covered, then enter 1                    0
19 pH                                          0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
   hl= 9.059e-06 atm-m3/mol      vp= 117.276 mmHg (2.26837 psia)
       0.5033 y/x
       3.257e-04 g/L gas per g/L liquid
   k1= 0. L/g-hr          dl= 1.365e-05 cm2/s  dv= 0.14158 cm2/s
Compound flow rate from inlet water is 554.828 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.27473 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                       0.
   KL aerated (m/s)                       0.
   KL OVERALL AERATED (m/s)               0.
   KG quiescent (m/s)                     0.010864
   KL quiescent (m/s)                     5.306e-06
   KL OVERALL QUIESCENT (m/s)             2.289e-06
   KL OVERALL (m/s)                       2.289e-06
   FRACTION SURFACE VOLATILIZED           2.97e-04
   FRACTION SUBMERGED VOLATILIZED         0.
   TOTAL FRACTION VOLATILIZED             2.97e-04
   FRACTION BIOLOGICALLY REMOVED          0.
   FRACTION ABSORBED                      0.
   TOTAL AIR EMISSIONS  (g/s)             0.16478
                 (Mg/year)                5.1964
   EMISSION FACTOR  (g/cm2-s)             6.191e-07
   UNIT EXIT CONCENTRATION (ppmw)         2704.883
```

```
DETAILED CALCULATIONS at Unit 12 PW-213
Type: headspace sealed
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:41:12
COMPOUND: ACETIC ACID

Type of unit is headspace sealed
1 Description of unit                      12     PW-213
2 Underflow T (C)                                 66
3 Total water added at the unit (l/s)             0
4 opening on sealed line  (cm2)                   0
5 Radius of drop pipe (cm)                        5
6 Drop length to conduit (cm)                     61
7 Open surface=1                                  0
8 Subsurface entrance=1                           1
9 subsurface exit =1                              1
10 radius of underflow conduit (cm)               12
11 distance to next unit (cm)                     500
12 slope of underflow conduit                     0.015
17 municipal waste in conduit =1                  0
18 Assume equilibrium in unit, =1                 1
19 pH                                             0

 sealed headspace unit.  UNIT:  12
   fraction loss in waste1 drop to hub      0.
   fraction loss in waste2 drop to hub      0.
   fraction loss in waste3 drop to hub      0.
   fraction loss in collection hub drop     0.
   fraction loss in unit                    0.
   fraction loss in line run                0.
   component upstream of unit, g/s          554.663
   mol fract. headspace upstream (y)        0.
   headspace at conduit discharge, y        0.
   headspace end of conduit (y)             0.
   mol fract. headspace vent base           0.
   headspace flow out vent (cc/s)           0.
   headspace flow down line (cc/s)          0.
   KG surface (m/s)                         0.
   KL surface (m/s)                         0.
   flow of waste down hub (l/s)             0.
   component flow in waste into unit (g/s)  0.
   total component into unit, g/s           554.663
   TOTAL AIR EMISSIONS  (g/s)               0.
                    (Mg/year)               0.
   EMISSION FACTOR  (g/cm2-s)               6.191e-07
   UNIT EXIT CONCENTRATION (ppmw)           2704.885
```

```
DETAILED CALCULATIONS at Unit 13 TK-220
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank
1 Description of unit                       13    TK-220
2 Wastewater temperature   (C)                    66
3 length of unit (m)                              5.159
4 width of unit (m)                               5.159
5 depth  of unit (m)                              7.62
6 Area of agitation (each aerator,m2)             0
7 Total number of agitators in the unit           0
8 Power of agitation (each aerator,HP)            0
9 Impeller diameter (cm)                          0
10 Impeller rotation (RPM)                        0
13 if there is plug flow, enter 1                 0
15 Aeration air flow (m3/s)                       0
16 vent air emission control factor               0
17 If covered, then enter 1                       0
19 pH                                             0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
   hl= 9.059e-06 atm-m3/mol      vp= 117.276 mmHg (2.26837 psia)
       0.5033 y/x
       3.257e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.365e-05 cm2/s  dv= 0.14158 cm2/s
Compound flow rate from inlet water is 1582.458 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.28409 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                          0.
   KL aerated (m/s)                          0.
   KL OVERALL AERATED (m/s)                  0.
   KG quiescent (m/s)                        0.010864
   KL quiescent (m/s)                        5.306e-06
   KL OVERALL QUIESCENT (m/s)                2.289e-06
   KL OVERALL (m/s)                          2.289e-06
   FRACTION SURFACE VOLATILIZED              3.071e-04
   FRACTION SUBMERGED VOLATILIZED            0.
   TOTAL FRACTION VOLATILIZED                3.071e-04
   FRACTION BIOLOGICALLY REMOVED             0.
   FRACTION ABSORBED                         0.
   TOTAL AIR EMISSIONS  (g/s)                0.48599
                    (Mg/year)                15.326
   EMISSION FACTOR  (g/cm2-s)                1.826e-06
   UNIT EXIT CONCENTRATION (ppmw)            7977.67
```

DETALED CALCULATIONS at Unit 15 TK-223
Type: mix tank
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank

1 Description of unit	15	TK-223
2 Wastewater temperature (C)		66
3 length of unit (m)		5.159
4 width of unit (m)		5.159
5 depth of unit (m)		7.62
6 Area of agitation (each aerator,m2)		0
7 Total number of agitators in the unit		0
8 Power of agitation (each aerator,HP)		0
9 Impeller diameter (cm)		0
10 Impeller rotation (RPM)		0
13 if there is plug flow, enter 1		0
15 Aeration air flow (m3/s)		0
16 vent air emission control factor		0
17 If covered, then enter 1		0
19 pH		0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
hl= 9.059e-06 atm-m3/mol vp= 117.276 mmHg (2.26837 psia)
0.5033 y/x
3.257e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.365e-05 cm2/s dv= 0.14158 cm2/s
Compound flow rate from inlet water is 1014.663 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.29666 hr.
____Biomass production________________
The biomass production rate is 0.mg/hr. (0. mg/L)
The fraction dissolved solids converted is 0. .
The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.

KG aerated (m/s)	0.
KL aerated (m/s)	0.
KL OVERALL AERATED (m/s)	0.
KG quiescent (m/s)	0.010864
KL quiescent (m/s)	5.306e-06
KL OVERALL QUIESCENT (m/s)	2.289e-06
KL OVERALL (m/s)	2.289e-06
FRACTION SURFACE VOLATILIZED	3.207e-04
FRACTION SUBMERGED VOLATILIZED	0.
TOTAL FRACTION VOLATILIZED	3.207e-04
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.32539
(Mg/year)	10.262
EMISSION FACTOR (g/cm2-s)	1.223e-06
UNIT EXIT CONCENTRATION (ppmw)	5341.435

DETAILED CALCULATIONS at Unit 17 TK-225
Type: mix tank
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is mix tank

1 Description of unit	17	TK-225
2 Wastewater temperature (C)		66
3 length of unit (m)		5.159
4 width of unit (m)		5.159
5 depth of unit (m)		7.62
6 Area of agitation (each aerator,m2)		0
7 Total number of agitators in the unit		0
8 Power of agitation (each aerator,HP)		0
9 Impeller diameter (cm)		0
10 Impeller rotation (RPM)		0
13 if there is plug flow, enter 1		0
15 Aeration air flow (m3/s)		0
16 vent air emission control factor		0
17 If covered, then enter 1		0
19 pH		0

Properties of ACETIC ACID at 66. deg.C (150.8 deg.F)
hl= 9.059e-06 atm-m3/mol vp= 117.276 mmHg (2.26837 psia)
0.5033 y/x
3.257e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.365e-05 cm2/s dv= 0.14158 cm2/s
Compound flow rate from inlet water is 519.337 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.29342 hr.
____Biomass production________________
The biomass production rate is 0.mg/hr. (0. mg/L)
The fraction dissolved solids converted is 0. .
The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 732.594.
kl is estimated as 5.306e-06 m/s.
kg is estimated as 0.010664 m/s.
****There is no area specified.
****There is no agitator specified.

KG aerated (m/s)	0.
KL aerated (m/s)	0.
KL OVERALL AERATED (m/s)	0.
KG quiescent (m/s)	0.010864
KL quiescent (m/s)	5.306e-06
KL OVERALL QUIESCENT (m/s)	2.289e-06
KL OVERALL (m/s)	2.289e-06
FRACTION SURFACE VOLATILIZED	3.172e-04
FRACTION SUBMERGED VOLATILIZED	0.
TOTAL FRACTION VOLATILIZED	3.172e-04
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.16472
(Mg/year)	5.19474
EMISSION FACTOR (g/cm2-s)	6.189e-07
UNIT EXIT CONCENTRATION (ppmw)	2704.033

DETAILED CALCULATIONS at Unit 19 P-205 & P-206
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is headspace sealed

1 Description of unit	19	P-205 & P-206
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		12.61
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 19

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	0.
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	12.61
component flow in waste into unit (g/s)	0.
total component into unit, g/s	0.
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	6.189e-07
UNIT EXIT CONCENTRATION (ppmw)	0.

DETAILED CALCULATIONS at Unit 20 TK-221
Type: system exit stream
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is system exit stream

1 Description of unit	20	TK-221
TOTAL AIR EMISSIONS (g/s)	0.	
(Mg/year)	0.	
EMISSION FACTOR (g/cm2-s)	6.189e-07	
UNIT EXIT CONCENTRATION (ppmw)	7977.673	

DETAILED CALCULATIONS at Unit 21 MX-233
Type: system exit stream
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:41:12
COMPOUND: ACETIC ACID

Type of unit is system exit stream

1 Description of unit	21	MX-233
TOTAL AIR EMISSIONS (g/s)	0.	
(Mg/year)	0.	
EMISSION FACTOR (g/cm2-s)	6.189e-07	
UNIT EXIT CONCENTRATION (ppmw)	2704.885	

DETAILED CALCULATIONS Defaults
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

1 Total water added at the unit (l/s)	50	0
2 Area of openings at unit (cm2)		0
3 Radius of drop pipe (cm)		0
4 Drop length to conduit (cm)		0
5 Humidity of inlet air (%)		63
6 Temperature of air (C)		19.86
7 Drain air velocity (ft/min)		0
8 manhole air velocity (ft/min)		0
9 Conduit air velocity (ft/min)		0
10 Wind speed (cm/s at 10 m)		383.7
11 distance to next unit (cm)		0
12 slope of underflow conduit		0
13 friction factor liquid		0
14 friction factor gas		0
15 radius of underflow conduit (cm)		0
16 Underflow T (C)		66
17 oscillation cycle time (min)		0
18 design collection velocities (ft/s)		0
19 design branch line fraction full		0

Type of unit is	
8 HL partition flag=1, adjust for sorption	0
9 unit recycle convergence number	200
10 oil molecular weight	0
11 oil density (g/cc)	0
12 NaUT 1=municipal 2=industrial 3=turb.	0
13 NaUT 1=mass tr. 2=equil	0
14 parts biomass per 1000 parts COD	
15 Reserved for default integer	

DETAILED CALCULATIONS at Unit 1 TK-206
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is headspace sealed

1 Description of unit	1	TK-206
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 1

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	0.
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	79.704
total component into unit, g/s	79.704
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	0.
UNIT EXIT CONCENTRATION (ppmw)	3600.

```
DETAILED CALCULATIONS at Unit 2 TK-205
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank
1 Description of unit                     2     TK-205
2 Wastewater temperature   (C)                  66
3 length of unit (m)                            5.159
4 width of unit (m)                             5.159
5 depth  of unit (m)                            7.62
6 Area of agitation (each aerator,m2)           0
7 Total number of agitators in the unit         0
8 Power of agitation (each aerator,HP)          0
9 Impeller diameter (cm)                        0
10 Impeller rotation (RPM)                      0
13 if there is plug flow, enter 1               0
15 Aeration air flow (m3/s)                     0
16 vent air emission control factor             0
17 If covered, then enter 1                     0
19 pH                                           0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
   hl= 2.647e-05 atm-m3/mol      vp= 23.889 mmHg (0.46207 psia)
       1.47038 y/x
       9.515e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.183e-05 cm2/s  dv= 0.10925 cm2/s
Compound flow rate from inlet water is 611.869 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.28345 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                        0.
   KL aerated (m/s)                        0.
   KL OVERALL AERATED (m/s)                0.
   KG quiescent (m/s)                      0.009132
   KL quiescent (m/s)                      5.008e-06
   KL OVERALL QUIESCENT (m/s)              3.324e-06
   KL OVERALL (m/s)                        3.324e-06
   FRACTION SURFACE VOLATILIZED            4.45e-04
   FRACTION SUBMERGED VOLATILIZED          0.
   TOTAL FRACTION VOLATILIZED              4.45e-04
   FRACTION BIOLOGICALLY REMOVED           0.
   FRACTION ABSORBED                       0.
   TOTAL AIR EMISSIONS  (g/s)              0.27225
                   (Mg/year)               8.5858
   EMISSION FACTOR  (g/cm2-s)              1.023e-06
   UNIT EXIT CONCENTRATION (ppmw)          3077.218
```

DETAILED CALCULATIONS at Unit 5 PW-211
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is headspace sealed

1 Description of unit	5	PW-211
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 5

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	636.526
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	0.
total component into unit, g/s	636.526
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	1.023e-06
UNIT EXIT CONCENTRATION (ppmw)	3014.566

```
DETAILED CALCULATIONS at Unit 7 TK-222
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank
1 Description of unit                      7     TK-222
2 Wastewater temperature   (C)                   66
3 length of unit (m)                             5.159
4 width of unit (m)                              5.159
5 depth  of unit (m)                             7.62
6 Area of agitation (each aerator,m2)            0
7 Total number of agitators in the unit          0
8 Power of agitation (each aerator,HP)           0
9 Impeller diameter (cm)                         0
10 Impeller rotation (RPM)                       0
13 if there is plug flow, enter 1                0
15 Aeration air flow (m3/s)                      0
16 vent air emission control factor              0
17 If covered, then enter 1                      0
19 pH                                            0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
   hl= 2.647e-05 atm-m3/mol      vp= 23.889 mmHg (0.46207 psia)
       1.47038 y/x
       9.515e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.183e-05 cm2/s  dv= 0.10925 cm2/s
Compound flow rate from inlet water is 408.386 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.27758 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                         0.
   KL aerated (m/s)                         0.
   KL OVERALL AERATED (m/s)                 0.
   KG quiescent (m/s)                       0.009132
   KL quiescent (m/s)                       5.008e-06
   KL OVERALL QUIESCENT (m/s)               3.324e-06
   KL OVERALL (m/s)                         3.324e-06
   FRACTION SURFACE VOLATILIZED             4.358e-04
   FRACTION SUBMERGED VOLATILIZED           0.
   TOTAL FRACTION VOLATILIZED               4.358e-04
   FRACTION BIOLOGICALLY REMOVED            0.
   FRACTION ABSORBED                        0.
   TOTAL AIR EMISSIONS  (g/s)               0.17795
                     (Mg/year)              5.61196
   EMISSION FACTOR  (g/cm2-s)               6.686e-07
   UNIT EXIT CONCENTRATION (ppmw)           2011.37
```

DETAILED CALCULATIONS at Unit 9 PW-212
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is headspace sealed

1 Description of unit	9	PW-212
2 Underflow T (C)		66
3 Total water added at the unit (l/s)		0
4 opening on sealed line (cm2)		0
5 Radius of drop pipe (cm)		5
6 Drop length to conduit (cm)		61
7 Open surface=1		0
8 Subsurface entrance=1		1
9 subsurface exit =1		1
10 radius of underflow conduit (cm)		12
11 distance to next unit (cm)		500
12 slope of underflow conduit		0.015
17 municipal waste in conduit =1		0
18 Assume equilibrium in unit, =1		1
19 pH		0

sealed headspace unit. UNIT: 9

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	408.208
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	0.
total component into unit, g/s	408.208
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	6.686e-07
UNIT EXIT CONCENTRATION (ppmw)	2011.37

```
DETAILED CALCULATIONS at Unit 10 TK-224
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank
1 Description of unit                     10    TK-224
2 Wastewater temperature   (C)                  66
3 length of unit (m)                            5.159
4 width of unit (m)                             5.159
5 depth  of unit (m)                            7.62
6 Area of agitation (each aerator,m2)           0
7 Total number of agitators in the unit         0
8 Power of agitation (each aerator,HP)          0
9 Impeller diameter (cm)                        0
10 Impeller rotation (RPM)                      0
13 if there is plug flow, enter 1               0
15 Aeration air flow (m3/s)                     0
16 vent air emission control factor             0
17 If covered, then enter 1                     0
19 pH                                           0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
   hl= 2.647e-05 atm-m3/mol      vp= 23.889 mmHg (0.46207 psia)
       1.47038 y/x
       9.515e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.183e-05 cm2/s  dv= 0.10925 cm2/s
Compound flow rate from inlet water is 208.457 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.27473 hr.
____Biomass production_______________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                       0.
   KL aerated (m/s)                       0.
   KL OVERALL AERATED (m/s)               0.
   KG quiescent (m/s)                     0.009132
   KL quiescent (m/s)                     5.008e-06
   KL OVERALL QUIESCENT (m/s)             3.324e-06
   KL OVERALL (m/s)                       3.324e-06
   FRACTION SURFACE VOLATILIZED           4.313e-04
   FRACTION SUBMERGED VOLATILIZED         0.
   TOTAL FRACTION VOLATILIZED             4.313e-04
   FRACTION BIOLOGICALLY REMOVED          0.
   FRACTION ABSORBED                      0.
   TOTAL AIR EMISSIONS  (g/s)             0.089901
                   (Mg/year)              2.83511
   EMISSION FACTOR  (g/cm2-s)             3.378e-07
   UNIT EXIT CONCENTRATION (ppmw)         1016.126
```

DETAILED CALCULATIONS at Unit 12 PW-213
Type: headspace sealed
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is headspace sealed

1 Description of unit	12 PW-213
2 Underflow T (C)	66
3 Total water added at the unit (l/s)	0
4 opening on sealed line (cm2)	0
5 Radius of drop pipe (cm)	5
6 Drop length to conduit (cm)	61
7 Open surface=1	0
8 Subsurface entrance=1	1
9 subsurface exit =1	1
10 radius of underflow conduit (cm)	12
11 distance to next unit (cm)	500
12 slope of underflow conduit	0.015
17 municipal waste in conduit =1	0
18 Assume equilibrium in unit, =1	1
19 pH	0

sealed headspace unit. UNIT: 12

fraction loss in waste1 drop to hub	0.
fraction loss in waste2 drop to hub	0.
fraction loss in waste3 drop to hub	0.
fraction loss in collection hub drop	0.
fraction loss in unit	0.
fraction loss in line run	0.
component upstream of unit, g/s	208.367
mol fract. headspace upstream (y)	0.
headspace at conduit discharge, y	0.
headspace end of conduit (y)	0.
mol fract. headspace vent base	0.
headspace flow out vent (cc/s)	0.
headspace flow down line (cc/s)	0.
KG surface (m/s)	0.
KL surface (m/s)	0.
flow of waste down hub (l/s)	0.
component flow in waste into unit (g/s)	0.
total component into unit, g/s	208.367
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	3.378e-07
UNIT EXIT CONCENTRATION (ppmw)	1016.126

```
DETAILED CALCULATIONS at Unit 13 TK-220
Type: mix tank
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank
1 Description of unit                        13    TK-220
2 Wastewater temperature   (C)                     66
3 length of unit (m)                               5.159
4 width of unit (m)                                5.159
5 depth  of unit (m)                               7.62
6 Area of agitation (each aerator,m2)              0
7 Total number of agitators in the unit            0
8 Power of agitation (each aerator,HP)             0
9 Impeller diameter (cm)                           0
10 Impeller rotation (RPM)                         0
13 if there is plug flow, enter 1                  0
15 Aeration air flow (m3/s)                        0
16 vent air emission control factor                0
17 If covered, then enter 1                        0
19 pH                                              0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
   hl= 2.647e-05 atm-m3/mol      vp= 23.889 mmHg (0.46207 psia)
       1.47038 y/x
       9.515e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.183e-05 cm2/s  dv= 0.10925 cm2/s
Compound flow rate from inlet water is 597.789 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.28409 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.
   KG aerated (m/s)                         0.
   KL aerated (m/s)                         0.
   KL OVERALL AERATED (m/s)                 0.
   KG quiescent (m/s)                       0.009132
   KL quiescent (m/s)                       5.008e-06
   KL OVERALL QUIESCENT (m/s)               3.324e-06
   KL OVERALL (m/s)                         3.324e-06
   FRACTION SURFACE VOLATILIZED             4.46e-04
   FRACTION SUBMERGED VOLATILIZED           0.
   TOTAL FRACTION VOLATILIZED               4.46e-04
   FRACTION BIOLOGICALLY REMOVED            0.
   FRACTION ABSORBED                        0.
   TOTAL AIR EMISSIONS  (g/s)               0.26659


                    (Mg/year)               8.40725
   EMISSION FACTOR  (g/cm2-s)               1.002e-06
   UNIT EXIT CONCENTRATION (ppmw)           3013.224
```

DETAILED CALCULATIONS at Unit 15 TK-223
Type: mix tank
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank

1 Description of unit	15	TK-223
2 Wastewater temperature (C)		66
3 length of unit (m)		5.159
4 width of unit (m)		5.159
5 depth of unit (m)		7.62
6 Area of agitation (each aerator,m2)		0
7 Total number of agitators in the unit		0
8 Power of agitation (each aerator,HP)		0
9 Impeller diameter (cm)		0
10 Impeller rotation (RPM)		0
13 if there is plug flow, enter 1		0
15 Aeration air flow (m3/s)		0
16 vent air emission control factor		0
17 If covered, then enter 1		0
19 pH		0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
hl= 2.647e-05 atm-m3/mol vp= 23.889 mmHg (0.46207 psia)
1.47038 y/x
9.515e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.183e-05 cm2/s dv= 0.10925 cm2/s
Compound flow rate from inlet water is 381.959 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.29666 hr.
____Biomass production________________
The biomass production rate is 0.mg/hr. (0. mg/L)
The fraction dissolved solids converted is 0. .
The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.

KG aerated (m/s)	0.
KL aerated (m/s)	0.
KL OVERALL AERATED (m/s)	0.
KG quiescent (m/s)	0.009132
KL quiescent (m/s)	5.008e-06
KL OVERALL QUIESCENT (m/s)	3.324e-06
KL OVERALL (m/s)	3.324e-06
FRACTION SURFACE VOLATILIZED	4.657e-04
FRACTION SUBMERGED VOLATILIZED	0.
TOTAL FRACTION VOLATILIZED	4.657e-04
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.17787
(Mg/year)	5.60934
EMISSION FACTOR (g/cm2-s)	6.683e-07
UNIT EXIT CONCENTRATION (ppmw)	2010.425

DETAILED CALCULATIONS at Unit 17 TK-225
Type: mix tank
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM 16:39:40
COMPOUND: FURFURAL

Type of unit is mix tank

1 Description of unit	17	TK-225
2 Wastewater temperature (C)		66
3 length of unit (m)		5.159
4 width of unit (m)		5.159
5 depth of unit (m)		7.62
6 Area of agitation (each aerator,m2)		0
7 Total number of agitators in the unit		0
8 Power of agitation (each aerator,HP)		0
9 Impeller diameter (cm)		0
10 Impeller rotation (RPM)		0
13 if there is plug flow, enter 1		0
15 Aeration air flow (m3/s)		0
16 vent air emission control factor		0
17 If covered, then enter 1		0
19 pH		0

Properties of FURFURAL at 66. deg.C (150.8 deg.F)
hl= 2.647e-05 atm-m3/mol vp= 23.889 mmHg (0.46207 psia)
1.47038 y/x
9.515e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.183e-05 cm2/s dv= 0.10925 cm2/s
Compound flow rate from inlet water is 195.096 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 0. m3/s.
The residence time in the unit is 0.29342 hr.
____Biomass production________________
The biomass production rate is 0.mg/hr. (0. mg/L)
The fraction dissolved solids converted is 0. .
The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 11.198cm/s.
The Schmidt number is 845.301.
kl is estimated as 5.008e-06 m/s.
kg is estimated as 0.008964 m/s.
****There is no area specified.
****There is no agitator specified.

KG aerated (m/s)	0.
KL aerated (m/s)	0.
KL OVERALL AERATED (m/s)	0.
KG quiescent (m/s)	0.009132
KL quiescent (m/s)	5.008e-06
KL OVERALL QUIESCENT (m/s)	3.324e-06
KL OVERALL (m/s)	3.324e-06
FRACTION SURFACE VOLATILIZED	4.606e-04
FRACTION SUBMERGED VOLATILIZED	0.
TOTAL FRACTION VOLATILIZED	4.606e-04
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.089859
(Mg/year)	2.8338
EMISSION FACTOR (g/cm2-s)	3.376e-07
UNIT EXIT CONCENTRATION (ppmw)	1015.655

```
DETAILED CALCULATIONS at Unit 19 P-205 & P-206
Type: headspace sealed
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is headspace sealed
1 Description of unit                         19    P-205 & P-206
2 Underflow T (C)                                   66
3 Total water added at the unit (l/s)               12.61
4 opening on sealed line  (cm2)                     0
5 Radius of drop pipe (cm)                          5
6 Drop length to conduit (cm)                       61
7 Open surface=1                                    0
8 Subsurface entrance=1                             1
9 subsurface exit =1                                1
10 radius of underflow conduit (cm)                 12
11 distance to next unit (cm)                       500
12 slope of underflow conduit                       0.015
17 municipal waste in conduit =1                    0
18 Assume equilibrium in unit, =1                   1
19 pH                                               0

 sealed headspace unit.  UNIT:  19
   fraction loss in waste1 drop to hub      0.
   fraction loss in waste2 drop to hub      0.
   fraction loss in waste3 drop to hub      0.
   fraction loss in collection hub drop     0.
   fraction loss in unit                    0.
   fraction loss in line run                0.
   component upstream of unit, g/s          0.
   mol fract. headspace upstream (y)        0.
   headspace at conduit discharge, y        0.
   headspace end of conduit (y)             0.
   mol fract. headspace vent base           0.
   headspace flow out vent (cc/s)           0.
   headspace flow down line (cc/s)          0.
   KG surface (m/s)                         0.
   KL surface (m/s)                         0.
   flow of waste down hub (l/s)             12.61
   component flow in waste into unit (g/s)  0.
   total component into unit, g/s           0.
   TOTAL AIR EMISSIONS  (g/s)               0.
                   (Mg/year)                0.
   EMISSION FACTOR  (g/cm2-s)               3.376e-07
   UNIT EXIT CONCENTRATION (ppmw)           0.
```

```
DETAILED CALCULATIONS at Unit 20 TK-221
Type: system exit stream
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is system exit stream
1 Description of unit                    20    TK-221

   TOTAL AIR EMISSIONS  (g/s)             0.
                   (Mg/year)              0.
   EMISSION FACTOR  (g/cm2-s)             3.376e-07
   UNIT EXIT CONCENTRATION (ppmw)         3013.222



DETAILED CALCULATIONS at Unit 21 MX-233
Type: system exit stream
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\LiqSolSp 10/19/2008 8:42:21 PM  16:39:40
COMPOUND: FURFURAL

Type of unit is system exit stream
1 Description of unit                    21    MX-233

   TOTAL AIR EMISSIONS  (g/s)             0.
                   (Mg/year)              0.
   EMISSION FACTOR  (g/cm2-s)             3.376e-07
   UNIT EXIT CONCENTRATION (ppmw)         1016.126
```

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Product Shift Tanks, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Product Shift Tanks for Verenium CP-1

Tank Dimensions

Diameter (ft):		20.00
Volume (gallons):		61,215.00
Turnovers:		321.98
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	76.75	72.03	81.47	74.74	1.1451	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Annual Emission Calcaulations	
Rim Seal Losses (lb):	5.5851
Seal Factor A (lb-mole/ft-yr):	0.3000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.6000
Value of Vapor Pressure Function:	0.0202
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.1451
Tank Diameter (ft):	20.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Withdrawal Losses (lb):	219.3874
Number of Columns:	0.0000
Effective Column Diameter (ft):	0.0000
Annual Net Throughput (gal/yr.):	19,710,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.6100
Tank Diameter (ft):	20.0000
Deck Fitting Losses (lb):	122.3140
Value of Vapor Pressure Function:	0.0202
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	131.4000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000
Tank Diameter (ft):	20.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Total Losses (lb):	347.2866

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	33.5107
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	13.0319
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00	0.00	58.8299
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	11.1702
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	5.7713

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Ethyl alcohol	5.59	219.39	122.31	0.00	347.29

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Product Shift Tanks, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Product Shift Tanks for Verenium CP-1

Tank Dimensions

Diameter (ft):	20.00
Volume (gallons):	61,215.00
Turnovers:	321.98
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jul	80.53	75.53	85.52	74.74	1.2907	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):							0.5274					
Seal Factor A (lb-mole/ft-yr):							0.3000					
Seal Factor B (lb-mole/ft-yr (mph)^n):							0.6000					
Value of Vapor Pressure Function:							0.0229					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							1.2907					
Tank Diameter (ft):							20.0000					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Withdrawal Losses (lb):							18.2823					
Number of Columns:							0.0000					
Effective Column Diameter (ft):							0.0000					
Net Throughput (gal/mo.):							1,642,500.0000					
Shell Clingage Factor (bbl/1000 sqft):							0.0015					
Average Organic Liquid Density (lb/gal):							6.6100					
Tank Diameter (ft):							20.0000					
Deck Fitting Losses (lb):							11.5501					
Value of Vapor Pressure Function:							0.0229					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Tot. Roof Fitting Loss Fact.(lb-mole/yr):							131.4000					
Deck Seam Losses (lb):							0.0000					
Deck Seam Length (ft):							0.0000					
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):							0.0000					
Deck Seam Length Factor(ft/sqft):							0.0000					
Tank Diameter (ft):							20.0000					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Total Losses (lb):							30.3598					

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	3.2251
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	1.2542
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00	0.00	5.6618
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	1.0750
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.5554

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

Product Shift Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Ethyl alcohol	0.53	18.28	11.55	0.00	30.36

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Recycle Product Tank, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Recycle Product Tank for Verenium CP-1

Tank Dimensions

Diameter (ft):	20.00
Volume (gallons):	61,215.00
Turnovers:	32.20
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	All	76.75	72.03	81.47	74.74	1.1451	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Annual Emission Calcaulations	
Rim Seal Losses (lb):	5.5851
Seal Factor A (lb-mole/ft-yr):	0.3000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.6000
Value of Vapor Pressure Function:	0.0202
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.1451
Tank Diameter (ft):	20.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Withdrawal Losses (lb):	21.9387
Number of Columns:	0.0000
Effective Column Diameter (ft):	0.0000
Annual Net Throughput (gal/yr.):	1,971,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.6100
Tank Diameter (ft):	20.0000
Deck Fitting Losses (lb):	122.3140
Value of Vapor Pressure Function:	0.0202
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	131.4000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000
Tank Diameter (ft):	20.0000
Vapor Molecular Weight (lb/lb-mole):	46.0700
Product Factor:	1.0000
Total Losses (lb):	149.8379

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	33.5107
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	13.0319
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00	0.00	58.8299
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	11.1702
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	5.7713

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Ethyl alcohol	5.59	21.94	122.31	0.00	149.84

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Recycle Product Tank, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Recycle Product Tank for Verenium CP-1

Tank Dimensions

Diameter (ft):	20.00
Volume (gallons):	61,215.00
Turnovers:	32.20
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	8
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Ethyl alcohol	Jul	80.53	75.53	85.52	74.74	1.2907	N/A	N/A	46.0700			46.07	Option 2: A=8.321, B=1718.21, C=237.52

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):							0.5274					
Seal Factor A (lb-mole/ft-yr):							0.3000					
Seal Factor B (lb-mole/ft-yr (mph)^n):							0.6000					
Value of Vapor Pressure Function:							0.0229					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							1.2907					
Tank Diameter (ft):							20.0000					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Withdrawal Losses (lb):							1.8282					
Number of Columns:							0.0000					
Effective Column Diameter (ft):							0.0000					
Net Throughput (gal/mo.):							164,250.0000					
Shell Clingage Factor (bbl/1000 sqft):							0.0015					
Average Organic Liquid Density (lb/gal):							6.6100					
Tank Diameter (ft):							20.0000					
Deck Fitting Losses (lb):							11.5501					
Value of Vapor Pressure Function:							0.0229					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Tot. Roof Fitting Loss Fact.(lb-mole/yr):							131.4000					
Deck Seam Losses (lb):							0.0000					
Deck Seam Length (ft):							0.0000					
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):							0.0000					
Deck Seam Length Factor(ft/sqft):							0.0000					
Tank Diameter (ft):							20.0000					
Vapor Molecular Weight (lb/lb-mole):							46.0700					
Product Factor:							1.0000					
Total Losses (lb):							13.9057					

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	3.2251
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	1.2542
Roof Leg or Hanger Well/Adjustable	8	7.90	0.00	0.00	5.6618
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	1.0750
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.5554

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

Recycle Product Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Ethyl alcohol	0.53	1.83	11.55	0.00	13.91

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Product Storage Tanks, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Product Storage Tanks for Verenium CP-1

Tank Dimensions

Diameter (ft):	34.00
Volume (gallons):	295,317.00
Turnovers:	70.25
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	11
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
E95	All	76.75	72.03	81.47	74.74	1.3374	N/A	N/A	49.0424			47.25	
Ethyl alcohol						1.1451	N/A	N/A	46.0700	0.9500	0.7837	46.07	Option 2: A=8.321, B=1718.21, C=237.52
Gasoline (RVP 12)						8.6339	N/A	N/A	64.0000	0.0500	0.2163	92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Annual Emission Calcaulations	
Rim Seal Losses (lb):	11.8872
Seal Factor A (lb-mole/ft-yr):	0.3000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.6000
Value of Vapor Pressure Function:	0.0238
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.3374
Tank Diameter (ft):	34.0000
Vapor Molecular Weight (lb/lb-mole):	49.0424
Product Factor:	1.0000
Withdrawal Losses (lb):	134.6295
Number of Columns:	0.0000
Effective Column Diameter (ft):	0.0000
Annual Net Throughput (gal/yr.):	20,747,368.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	6.5509
Tank Diameter (ft):	34.0000
Deck Fitting Losses (lb):	180.7554
Value of Vapor Pressure Function:	0.0238
Vapor Molecular Weight (lb/lb-mole):	49.0424
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	155.1000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000
Tank Diameter (ft):	34.0000
Vapor Molecular Weight (lb/lb-mole):	49.0424
Product Factor:	1.0000
Total Losses (lb):	327.2721

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	41.9548
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	16.3158
Roof Leg or Hanger Well/Adjustable	11	7.90	0.00	0.00	101.2743
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	13.9849
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	7.2256

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
E95	11.89	134.63	180.76	0.00	327.27
Ethyl alcohol	9.32	127.90	141.65	0.00	278.86
Gasoline (RVP 12)	2.57	6.73	39.10	0.00	48.41

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Product Storage Tanks, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Product Storage Tanks for Verenium CP-1

Tank Dimensions

Diameter (ft):		34.00
Volume (gallons):		295,317.00
Turnovers:		70.25
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	11
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
E95	Jul	80.53	75.53	85.52	74.74	1.4946	N/A	N/A	48.9129			47.25	
Ethyl alcohol						1.2907	N/A	N/A	46.0700	0.9500	0.7925	46.07	Option 2: A=8.321, B=1718.21, C=237.52
Gasoline (RVP 12)						9.2282	N/A	N/A	64.0000	0.0500	0.2075	92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):							1.1105					
Seal Factor A (lb-mole/ft-yr):							0.3000					
Seal Factor B (lb-mole/ft-yr (mph)^n):							0.6000					
Value of Vapor Pressure Function:							0.0267					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							1.4946					
Tank Diameter (ft):							34.0000					
Vapor Molecular Weight (lb/lb-mole):							48.9129					
Product Factor:							1.0000					
Withdrawal Losses (lb):							11.2191					
Number of Columns:							0.0000					
Effective Column Diameter (ft):							0.0000					
Net Throughput (gal/mo.):							1,728,947.3330					
Shell Clingage Factor (bbl/1000 sqft):							0.0015					
Average Organic Liquid Density (lb/gal):							6.5509					
Tank Diameter (ft):							34.0000					
Deck Fitting Losses (lb):							16.8856					
Value of Vapor Pressure Function:							0.0267					
Vapor Molecular Weight (lb/lb-mole):							48.9129					
Product Factor:							1.0000					
Tot. Roof Fitting Loss Fact.(lb-mole/yr):							155.1000					
Deck Seam Losses (lb):							0.0000					
Deck Seam Length (ft):							0.0000					
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):							0.0000					
Deck Seam Length Factor(ft/sqft):							0.0000					
Tank Diameter (ft):							34.0000					
Vapor Molecular Weight (lb/lb-mole):							48.9129					
Product Factor:							1.0000					
Total Losses (lb):							29.2152					

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	3.9944
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	1.5534
Roof Leg or Hanger Well/Adjustable	11	7.90	0.00	0.00	9.6422
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	1.3315
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.6879

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

Product Storage Tanks, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
E95	1.11	11.22	16.89	0.00	29.22
Ethyl alcohol	0.88	10.66	13.38	0.00	24.92
Gasoline (RVP 12)	0.23	0.56	3.50	0.00	4.29

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Denaturant Storage Tank, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Denaturant Storage Tank for Verenium CP-1

Tank Dimensions

Diameter (ft):	15.00
Volume (gallons):	28,467.00
Turnovers:	72.88
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	7
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 12)	All	76.75	72.03	81.47	74.74	8.6339	N/A	N/A	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Rim Seal Losses (lb):	62.4022
Seal Factor A (lb-mole/ft-yr):	0.3000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.6000
Value of Vapor Pressure Function:	0.2167
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	8.6339
Tank Diameter (ft):	15.0000
Vapor Molecular Weight (lb/lb-mole):	64.0000
Product Factor:	1.0000
Withdrawal Losses (lb):	26.0864
Number of Columns:	0.0000
Effective Column Diameter (ft):	0.0000
Annual Net Throughput (gal/yr.):	2,074,737.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	5.6000
Tank Diameter (ft):	15.0000
Deck Fitting Losses (lb):	1,712.5936
Value of Vapor Pressure Function:	0.2167
Vapor Molecular Weight (lb/lb-mole):	64.0000
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	123.5000
Deck Seam Losses (lb):	0.0000
Deck Seam Length (ft):	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000
Tank Diameter (ft):	15.0000
Vapor Molecular Weight (lb/lb-mole):	64.0000
Product Factor:	1.0000
Total Losses (lb):	1,801.0822

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	499.2176
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	194.1402
Roof Leg or Hanger Well/Adjustable	7	7.90	0.00	0.00	766.8537
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	166.4059
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	85.9764

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Gasoline (RVP 12)	62.40	26.09	1,712.59	0.00	1,801.08

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Denaturant Storage Tank, CP-1, IFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Internal Floating Roof Tank
Description:	Denaturant Storage Tank for Verenium CP-1

Tank Dimensions

Diameter (ft):		15.00
Volume (gallons):		28,467.00
Turnovers:		72.88
Self Supp. Roof? (y/n):	Y	
No. of Columns:		0.00
Eff. Col. Diam. (ft):		0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	7
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 12)	Jul	80.53	75.53	85.52	74.74	9.2282	N/A	N/A	64.0000			92.00	Option 4: RVP=12, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):							5.7818					
Seal Factor A (lb-mole/ft-yr):							0.3000					
Seal Factor B (lb-mole/ft-yr (mph)^n):							0.6000					
Value of Vapor Pressure Function:							0.2409					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							9.2282					
Tank Diameter (ft):							15.0000					
Vapor Molecular Weight (lb/lb-mole):							64.0000					
Product Factor:							1.0000					
Withdrawal Losses (lb):							2.1739					
Number of Columns:							0.0000					
Effective Column Diameter (ft):							0.0000					
Net Throughput (gal/mo.):							172,894.7500					
Shell Clingage Factor (bbl/1000 sqft):							0.0015					
Average Organic Liquid Density (lb/gal):							5.6000					
Tank Diameter (ft):							15.0000					
Deck Fitting Losses (lb):							158.6770					
Value of Vapor Pressure Function:							0.2409					
Vapor Molecular Weight (lb/lb-mole):							64.0000					
Product Factor:							1.0000					
Tot. Roof Fitting Loss Fact.(lb-mole/yr):							123.5000					
Deck Seam Losses (lb):							0.0000					
Deck Seam Length (ft):							0.0000					
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):							0.0000					
Deck Seam Length Factor(ft/sqft):							0.0000					
Tank Diameter (ft):							15.0000					
Vapor Molecular Weight (lb/lb-mole):							64.0000					
Product Factor:							1.0000					
Total Losses (lb):							166.6326					

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	47.1411
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	18.3326
Roof Leg or Hanger Well/Adjustable	7	7.90	0.00	0.00	72.4139
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	15.7137
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	8.1187

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

Denaturant Storage Tank, CP-1, IFRT - Internal Floating Roof Tank
Brighton, Florida

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Gasoline (RVP 12)	5.78	2.17	158.68	0.00	166.63

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Sulfuric Acid 98% Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Sulfuric Acid 98% Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):	29.00
Diameter (ft):	18.00
Liquid Height (ft) :	27.55
Avg. Liquid Height (ft):	19.33
Volume (gallons):	53,907.00
Turnovers:	38.38
Net Throughput(gal/yr):	2,068,906.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.56
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Sulfuric Acid 98% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Sulfuric Acid, 98% Solution	All	76.75	72.03	81.47	74.74	0.0000	0.0000	0.0000	98.0734			98.07	Option 1: VP70 = .000000398 VP80 = .000000766

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Sulfuric Acid 98% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	0.0003
Vapor Space Volume (cu ft):	2,508.4282
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0311
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,508.4282
Tank Diameter (ft):	18.0000
Vapor Space Outage (ft):	9.8575
Tank Shell Height (ft):	29.0000
Average Liquid Height (ft):	19.3300
Roof Outage (ft):	0.1875
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1875
Roof Height (ft):	0.5625
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	9.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	98.0734
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0311
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0000
Vapor Space Outage (ft):	9.8575
Working Losses (lb):	0.0030
Vapor Molecular Weight (lb/lb-mole):	98.0734
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Annual Net Throughput (gal/yr.):	2,068,906.0000
Annual Turnovers:	38.3792
Turnover Factor:	0.9483
Maximum Liquid Volume (gal):	53,907.0000

Maximum Liquid Height (ft):	27.5500
Tank Diameter (ft):	18.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0033

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Sulfuric Acid 98% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Sulfuric Acid, 98% Solution	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Sulfuric Acid 3% Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Sulfuric Acid 3% Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):		29.00
Diameter (ft):		14.00
Liquid Height (ft) :		27.55
Avg. Liquid Height (ft):		19.33
Volume (gallons):		32,610.00
Turnovers:		2,072.50
Net Throughput(gal/yr):		67,584,259.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.44
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Sulfuric Acid 3% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Sulfuric Acid, 10% Solution	All	76.75	72.03	81.47	74.74	0.0000	0.0000	0.0000	98.0734			98.07	Option 1: VP70 = 7.82E-17 VP80 = 2.49E-16

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Sulfuric Acid 3% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	1,511.0301
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0311
Vented Vapor Saturation Factor:	1.0000
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,511.0301
Tank Diameter (ft):	14.0000
Vapor Space Outage (ft):	9.8158
Tank Shell Height (ft):	29.0000
Average Liquid Height (ft):	19.3300
Roof Outage (ft):	0.1458
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1458
Roof Height (ft):	0.4375
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	7.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	98.0734
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0311
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0000
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	1.0000
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0000
Vapor Space Outage (ft):	9.8158
Working Losses (lb):	0.0000
Vapor Molecular Weight (lb/lb-mole):	98.0734
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0000
Annual Net Throughput (gal/yr.):	67,584,259.0000
Annual Turnovers:	2,072.5010
Turnover Factor:	0.1811
Maximum Liquid Volume (gal):	32,610.0000

Maximum Liquid Height (ft):	27.5500
Tank Diameter (ft):	14.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0000

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Sulfuric Acid 3% Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Sulfuric Acid, 10% Solution	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Corn Steep Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Corn Steep Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):		33.00
Diameter (ft):		22.00
Liquid Height (ft) :		31.35
Avg. Liquid Height (ft):		22.00
Volume (gallons):		92,370.00
Turnovers:		256.06
Net Throughput(gal/yr):		23,652,000.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.69
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Corn Steep Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Corn Steep	All	76.75	72.03	81.47	74.74	0.4599	0.3919	0.5348	18.0152			18.17	
Lysine						0.0000	0.0000	0.0000	146.1900	0.0080	0.0000	146.19	Option 1: VP70 = .000000000102 VP80 = .000000000102
Methionine						0.0000	0.0000	0.0000	149.2100	0.0020	0.0000	149.21	Option 1: VP70 = .0000000101 VP80 = .0000000101
Water						0.4604	0.3924	0.5354	18.0152	0.9900	1.0000	18.02	Option 1: VP70 = .3632 VP80 = .5073

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Corn Steep Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations	
Standing Losses (lb):	72.1942
Vapor Space Volume (cu ft):	4,268.5736
Vapor Density (lb/cu ft):	0.0014
Vapor Space Expansion Factor:	0.0410
Vented Vapor Saturation Factor:	0.7851
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	4,268.5736
Tank Diameter (ft):	22.0000
Vapor Space Outage (ft):	11.2292
Tank Shell Height (ft):	33.0000
Average Liquid Height (ft):	22.0000
Roof Outage (ft):	0.2292
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.2292
Roof Height (ft):	0.6875
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	11.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0014
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4599
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0410
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.1429
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4599
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.3919
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5348
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.7851
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.4599
Vapor Space Outage (ft):	11.2292
Working Losses (lb):	1,324.1985
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4599
Annual Net Throughput (gal/yr.):	23,652,000.0000
Annual Turnovers:	256.0572
Turnover Factor:	0.2838
Maximum Liquid Volume (gal):	92,370.0000

Maximum Liquid Height (ft):	31.3500
Tank Diameter (ft):	22.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1,396.3927

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Corn Steep Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Corn Steep	1,324.20	72.19	1,396.39
Water	1,324.20	72.19	1,396.39
Lysine	0.00	0.00	0.00
Methionine	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Lactose Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lactose Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):	53.00
Diameter (ft):	12.00
Liquid Height (ft) :	50.35
Avg. Liquid Height (ft):	35.33
Volume (gallons):	44,000.00
Turnovers:	256.06
Net Throughput(gal/yr):	11,266,515.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.38
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Lactose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Lactose, 10%	All	76.75	72.03	81.47	74.74	0.4578	0.3901	0.5323	18.0152			19.90	
Lactose						0.0000	0.0000	0.0000	342.3000	0.1000	0.0000	342.30	Option 1: VP70 = 1.56E-18 VP80 = 1.56E-18
Water						0.4604	0.3924	0.5354	18.0152	0.9000	1.0000	18.02	Option 1: VP70 = .3632 VP80 = .5073

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Lactose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	30.1081
Vapor Space Volume (cu ft):	2,012.5671
Vapor Density (lb/cu ft):	0.0014
Vapor Space Expansion Factor:	0.0410
Vented Vapor Saturation Factor:	0.6985
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	2,012.5671
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	17.7950
Tank Shell Height (ft):	53.0000
Average Liquid Height (ft):	35.3300
Roof Outage (ft):	0.1250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1250
Roof Height (ft):	0.3750
Roof Slope (ft/ft):	0.0600
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0014
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4578
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0410
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.1422
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4578
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.3901
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5323
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.6985
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.4578
Vapor Space Outage (ft):	17.7950
Working Losses (lb):	627.6858
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4578
Annual Net Throughput (gal/yr.):	11,266,515.0000
Annual Turnovers:	256.0572
Turnover Factor:	0.2838
Maximum Liquid Volume (gal):	44,000.0000

Maximum Liquid Height (ft):	50.3500
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000

Total Losses (lb):	657.9938

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Lactose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Lactose, 10%	627.89	30.11	657.99
Water	627.89	30.11	657.99
Lactose	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Glucose Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Glucose Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):		21.00
Diameter (ft):		12.00
Liquid Height (ft) :		19.95
Avg. Liquid Height (ft):		14.00
Volume (gallons):		16,982.00
Turnovers:		256.06
Net Throughput(gal/yr):		4,348,363.00
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.38
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Glucose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Glucose, 10%	All	76.75	72.03	81.47	74.74	0.4554	0.3881	0.5296	18.0152			19.80	
Glucose						0.0000	0.0000	0.0000	180.1600	0.1000	0.0000	180.16	Option 1: VP70 = .000000000352 VP80 = .000000000352
Water						0.4604	0.3924	0.5354	18.0152	0.9000	1.0000	18.02	Option 1: VP70 = .3632 VP80 = .5073

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Glucose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations	
Standing Losses (lb):	14.6316
Vapor Space Volume (cu ft):	805.8185
Vapor Density (lb/cu ft):	0.0014
Vapor Space Expansion Factor:	0.0409
Vented Vapor Saturation Factor:	0.8533
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	805.8185
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	7.1250
Tank Shell Height (ft):	21.0000
Average Liquid Height (ft):	14.0000
Roof Outage (ft):	0.1250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1250
Roof Height (ft):	0.3750
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0014
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4554
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0409
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.1415
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4554
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.3881
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.5296
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8533
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.4554
Vapor Space Outage (ft):	7.1250
Working Losses (lb):	241.0740
Vapor Molecular Weight (lb/lb-mole):	18.0152
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4554
Annual Net Throughput (gal/yr.):	4,348,363.0000
Annual Turnovers:	256.0572
Turnover Factor:	0.2838
Maximum Liquid Volume (gal):	16,982.0000

Maximum Liquid Height (ft):	19.9500
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000

Total Losses (lb):	255.7056

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Glucose Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Glucose, 10%	241.07	14.63	255.71
Water	241.07	14.63	255.71
Glucose	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Phosphoric Acid Storage Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Phosphoric Acid Storage Tank for Verenium CP-1

Tank Dimensions

Shell Height (ft):	19.00
Diameter (ft):	14.00
Liquid Height (ft) :	18.05
Avg. Liquid Height (ft):	12.67
Volume (gallons):	21,101.00
Turnovers:	11.21
Net Throughput(gal/yr):	236,520.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.44
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Phosphoric Acid Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Phosphoric Acid, 45% Solution	All	76.75	72.03	81.47	74.74	0.0004	0.0003	0.0004	97.9951			98.00	Option 3: A=55198.69, B=7.940335

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Phosphoric Acid Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	0.0688
Vapor Space Volume (cu ft):	996.8771
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0311
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	996.8771
Tank Diameter (ft):	14.0000
Vapor Space Outage (ft):	6.4758
Tank Shell Height (ft):	19.0000
Average Liquid Height (ft):	12.6700
Roof Outage (ft):	0.1458
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1458
Roof Height (ft):	0.4375
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	7.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	97.9951
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0004
Daily Avg. Liquid Surface Temp. (deg. R):	536.4185
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	534.4067
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0311
Daily Vapor Temperature Range (deg. R):	18.8856
Daily Vapor Pressure Range (psia):	0.0001
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0004
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0003
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0004
Daily Avg. Liquid Surface Temp. (deg R):	536.4185
Daily Min. Liquid Surface Temp. (deg R):	531.6971
Daily Max. Liquid Surface Temp. (deg R):	541.1399
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0004
Vapor Space Outage (ft):	6.4758
Working Losses (lb):	0.1969
Vapor Molecular Weight (lb/lb-mole):	97.9951
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0004
Annual Net Throughput (gal/yr.):	236,520.0000
Annual Turnovers:	11.2089
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	21,101.0000

Maximum Liquid Height (ft):	18.0500
Tank Diameter (ft):	14.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.2658

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Phosphoric Acid Storage Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Phosphoric Acid, 45% Solution	0.20	0.07	0.27

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Equalization Tank, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	WWTP Equalization Tank, CP-1

Tank Dimensions

Shell Height (ft):		33.00
Diameter (ft):		60.00
Liquid Height (ft) :		30.00
Avg. Liquid Height (ft):		30.00
Volume (gallons):		634,522.22
Turnovers:		1,360.13
Net Throughput(gal/yr):		863,035,200.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		1.88
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Equalization Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Wastewater	All	100.00	100.00	100.00	100.00	0.9506	0.9506	0.9506	18.0367			18.03	
Acetic acid						0.5998	0.5998	0.5998	60.0500	0.0005	0.0003	60.05	Option 2: A=7.387, B=1533.313, C=222.309
Ethyl alcohol						2.3233	2.3233	2.3233	46.0700	0.0006	0.0016	46.07	Option 2: A=8.321, B=1718.21, C=237.52
Furfural						0.0768	0.0768	0.0768	96.0900	0.0001	0.0000	96.09	Option 2: A=6.575, B=1198.7, C=162.8
Water						0.9503	0.9503	0.9503	18.0152	0.9987	0.9981	18.02	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Equalization Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	10,249.4460
Vapor Density (lb/cu ft):	0.0029
Vapor Space Expansion Factor:	0.0000
Vented Vapor Saturation Factor:	0.8456
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	10,249.4460
Tank Diameter (ft):	60.0000
Vapor Space Outage (ft):	3.6250
Tank Shell Height (ft):	33.0000
Average Liquid Height (ft):	30.0000
Roof Outage (ft):	0.6250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.6250
Roof Height (ft):	1.8750
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	30.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0029
Vapor Molecular Weight (lb/lb-mole):	18.0367
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9506
Daily Avg. Liquid Surface Temp. (deg. R):	559.6700
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	559.6700
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9506
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.9506
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.9506
Daily Avg. Liquid Surface Temp. (deg R):	559.6700
Daily Min. Liquid Surface Temp. (deg R):	559.6700
Daily Max. Liquid Surface Temp. (deg R):	559.6700
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8456
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.9506
Vapor Space Outage (ft):	3.6250
Working Losses (lb):	66,488.0259
Vapor Molecular Weight (lb/lb-mole):	18.0367
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.9506
Annual Net Throughput (gal/yr.):	863,035,200.0000
Annual Turnovers:	1,360.1339
Turnover Factor:	0.1887
Maximum Liquid Volume (gal):	634,522.2172

Maximum Liquid Height (ft):	30.0000
Tank Diameter (ft):	60.0000
Working Loss Product Factor:	1.0000

Total Losses (lb):	66,488.0259

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Equalization Tank, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Wastewater	66,488.03	0.00	66,488.03
Water	66,361.63	0.00	66,361.63
Ethyl alcohol	103.97	0.00	103.97
Furfural	0.75	0.00	0.75
Acetic acid	21.68	0.00	21.68

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	WWTP Primary Clarifier, CP-1, VFRT
City:	Brighton
State:	Florida
Company:	Verenium Corp.
Type of Tank:	Vertical Fixed Roof Tank
Description:	WWTP Primary Clarifier for Verenium CP-1

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	85.00
Liquid Height (ft) :	16.00
Avg. Liquid Height (ft):	16.00
Volume (gallons):	679,173.78
Turnovers:	1,270.71
Net Throughput(gal/yr):	863,035,200.00
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.66
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: West Palm Beach, Florida (Avg Atmospheric Pressure = 14.75 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

WWTP Primary Clarifier, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Wastewater	All	86.00	86.00	86.00	86.00	0.6224	0.6224	0.6224	18.0368			18.03	
Acetic acid						0.3947	0.3947	0.3947	60.0500	0.0005	0.0003	60.05	Option 2: A=7.387, B=1533.313, C=222.309
Ethyl alcohol						1.5299	1.5299	1.5299	46.0700	0.0006	0.0016	46.07	Option 2: A=8.321, B=1718.21, C=237.52
Furfural						0.0441	0.0441	0.0441	96.0900	0.0001	0.0000	96.09	Option 2: A=6.575, B=1198.7, C=162.8
Water						0.6222	0.6222	0.6222	18.0152	0.9987	0.9981	18.02	Option 1: VP70 = .3632 VP80 = .5073

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

WWTP Primary Clarifier, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

Annual Emission Calcaulations

Standing Losses (lb):	0.0000
Vapor Space Volume (cu ft):	27,722.3999
Vapor Density (lb/cu ft):	0.0019
Vapor Space Expansion Factor:	0.0000
Vented Vapor Saturation Factor:	0.8612
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	27,722.3999
Tank Diameter (ft):	85.0000
Vapor Space Outage (ft):	4.8854
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	16.0000
Roof Outage (ft):	0.8854
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.8854
Roof Height (ft):	2.6563
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	42.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0019
Vapor Molecular Weight (lb/lb-mole):	18.0368
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6224
Daily Avg. Liquid Surface Temp. (deg. R):	545.6700
Daily Average Ambient Temp. (deg. F):	74.7167
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	545.6700
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,504.5472
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0000
Daily Vapor Temperature Range (deg. R):	0.0000
Daily Vapor Pressure Range (psia):	0.0000
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6224
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.6224
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.6224
Daily Avg. Liquid Surface Temp. (deg R):	545.6700
Daily Min. Liquid Surface Temp. (deg R):	545.6700
Daily Max. Liquid Surface Temp. (deg R):	545.6700
Daily Ambient Temp. Range (deg. R):	16.2833
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8612
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.6224
Vapor Space Outage (ft):	4.8854
Working Losses (lb):	43,890.8422
Vapor Molecular Weight (lb/lb-mole):	18.0368
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.6224
Annual Net Throughput (gal/yr.):	863,035,200.0000
Annual Turnovers:	1,270.7134
Turnover Factor:	0.1903
Maximum Liquid Volume (gal):	679,173.7807

Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	85.0000
Working Loss Product Factor:	1.0000

Total Losses (lb):	43,890.8422

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

WWTP Primary Clarifier, CP-1, VFRT - Vertical Fixed Roof Tank
Brighton, Florida

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Wastewater	43,890.84	0.00	43,890.84
Water	43,807.00	0.00	43,807.00
Ethyl alcohol	69.03	0.00	69.03
Furfural	0.43	0.00	0.43
Acetic acid	14.39	0.00	14.39

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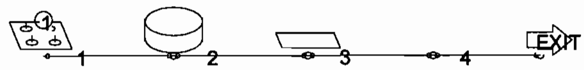


No.	Name	Type	flow (l/s)
1	Aeration Basin	aerated biotreatment	103.6
2	Secondary Clarifie	circular clarifier	103.6
3	Sand Filters	lagoon	103.6
4	Effluent	system exit stream	103.6

WASTEWATER TREATMENT SUMMARY I 01-31-2009 12:30:10

Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP

COMPOUND	RATE (g/s)	Air	Fraction Removal	Exit	Adsorb	error	emissions
FURFURAL	8.45E-03	.00	.6054	.3888	0.0000	0.0000	(2.66E-01 Mg/yr)
ETHANOL	1.39E-01	.02	.4062	.5728	0.0000	0.0000	(4.39E+00 Mg/yr)
ACETIC ACID	3.61E-05	.00	.5986	.4013	0.0000	0.0000	(1.14E-03 Mg/yr)

TOTAL ALL COMPOUNDS 1.48E-01 g/s air emissions
TOTAL ALL COMPOUNDS 4.66E+00 Mg/yr air emissions

WASTEWATER TREATMENT SUMMARY II 01-31-2009 12:30:30

Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP

COMPOUND	RATE (g/s)	Fraction Air	RATE (lb/day)	loading ppmw
FURFURAL	8.45E-03	.00587	1.60812	13.9
ETHANOL	1.39E-01	.02099	26.4817	64.
ACETIC ACID	3.61E-05	.00001	.00688	51.7

TOTAL EMISSIONS ALL COMPOUNDS 1.48E-01 g/s air emissions
TOTAL EMISSIONS ALL COMPOUNDS 4.66 Mg/yr air emissions
TOTAL LOADING 423.42 Mg/yr in waste
TOTAL WATER FLOW 103.6 L/s

WASTEWATER TREATMENT SUMMARY III 01-31-2009 12:30:39

Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP

COMPOUND	Air loss total (Mg/yr)	Fractions based on inlet waste fe collection	fe treatment	fbio removal
FURFURAL	.26648	.	.0059	.6054
ETHANOL	4.38829	.	.021	.4062
ACETIC ACID	.00114	.	.	.5986

ALL COMPOUND TOTAL SUMMARY
COLLECTION SYSTEM EMISSIONS . Mg/yr collection system air emissions
TREATMENT EMISSIONS 4.66 Mg/yr treatment air emissions
TOTAL AIR EMISSIONS 4.66 Mg/yr total air emissions
TOTAL LOADING 423.42 Mg/yr
TOTAL WATER FLOW 103.6 L/s

WASTEWATER TREATMENT MATERIAL BALANCE 01-31-2009
FURFURAL

No.	Name	load (g/s)	air (g/s)	exit (g/s)	removal (g/s)	
1: 28	Aeration Basin	1.44 E+00	5.62 E-03	0. E+00	8.72 E-01	0.177 Mg emis/yr.
2: 32	Secondary Clarifie	0. E+00	2.52 E-03	0. E+00	0. E+00	0.08 Mg emis/yr.
3: 36	Sand Filters	0. E+00	3.06 E-04	0. E+00	0. E+00	0.01 Mg emis/yr.
4: 46	Effluent	0. E+00	0. E+00	5.6 E-01	0. E+00	
TOTALS FOR ALL UNITS		1.44 E+00	8.45 E-03	5.6 E-01	8.72 E-01	

Total emissions for all units 0.26666 Mg/yr (587.884 lb/yr)
Total emissions per total flow 8.156e-05 g/L (0.6806 lb/million gal.)
Total loading of compound 1.44 g/s. (45.444 Mg/yr.)(100185.631 lb/yr.)
Total fraction air emissions .0059
MATERIAL BALANCE 0 PERCENT DIFFERENCE = 0

Loading is the compound added to or generated in the system.
exit is from entire project system, not the unit.
removal is compound conversion in the system.

No.	Name	air (fe)	exit (fo)	removal (fbio+fcon)
1: 28	Aeration Basin	.0039	.	.6054
2: 32	Secondary Clarifie	.0018	.	.
3: 36	Sand Filters	.0002	.	.
4: 46	Effluent	.	.3888	.
TOTALS FOR ALL UNITS		.0059	.3888	.6054

Totals 1
Loading is the compound added to or generated in the system.
fe is the fraction of the loading that is emitted to the air.
fo is the fraction of the loading that remains in the project.
removal is the fraction of the losding that is converted to another compound.

WASTEWATER TREATMENT MATERIAL BALANCE 01-31-2009
ETHANOL

No.	Name	load (g/s)	air (g/s)	exit (g/s)	removal (g/s)	
1: 28	Aeration Basin	6.63 E+00	9.16 E-02	0. E+00	2.69 E+00	2.889 Mg emis/yr.
2: 32	Secondary Clarifie	0. E+00	4.29 E-02	0. E+00	0. E+00	1.353 Mg emis/yr.
3: 36	Sand Filters	0. E+00	4.73 E-03	0. E+00	0. E+00	0.149 Mg emis/yr.
4: 46	Effluent	0. E+00	0. E+00	3.8 E+00	0. E+00	
TOTALS FOR ALL UNITS		6.63 E+00	1.39 E-01	3.8 E+00	2.69 E+00	

Total emissions for all units 4.3913 Mg/yr (9680.987 lb/yr)
Total emissions per total flow 0.001343 g/L (11.208 lb/million gal.)
Total loading of compound 6.6304 g/s. (209.24 Mg/yr.)(461286.402 lb/yr.)
Total fraction air emissions .021
MATERIAL BALANCE 0 PERCENT DIFFERENCE = 0

Loading is the compound added to or generated in the system.
exit is from entire project system, not the unit.
removal is compound conversion in the system.

No.	Name	air (fe)	exit (fo)	removal (fbio+fcon)
1: 28	Aeration Basin	.0138	.	.4062
2: 32	Secondary Clarifie	.0065	.	.
3: 36	Sand Filters	.0007	.	.
4: 46	Effluent	.	.5728	.
TOTALS FOR ALL UNITS		.021	.5728	.4062

Totals 1

Loading is the compound added to or generated in the system.
fe is the fraction of the loading that is emitted to the air.
fo is the fraction of the loading that remains in the project.
removal is the fraction of the losding that is converted to another compound.

WASTEWATER TREATMENT MATERIAL BALANCE 01-31-2009
ACETIC ACID

No.	Name	load (g/s)	air (g/s)	exit (g/s)	removal (g/s)	
1: 28	Aeration Basin	5.36 E+00	2.4 E-05	0. E+00	3.21 E+00	0.001 Mg emis/yr.
2: 32	Secondary Clarifie	0. E+00	1.07 E-05	0. E+00	0. E+00	0. Mg emis/yr.
3: 36	Sand Filters	0. E+00	1.47 E-06	0. E+00	0. E+00	0. Mg emis/yr.
4: 46	Effluent	0. E+00	0. E+00	2.15 E+00	0. E+00	
TOTALS FOR ALL UNITS		5.36 E+00	3.61 E-05	2.15 E+00	3.21 E+00	

Total emissions for all units 0.00114 Mg/yr (2.51377 lb/yr)
Total emissions per total flow 3.488e-07 g/L (0.00291 lb/million gal.)
Total loading of compound 5.3561 g/s. (169.026 Mg/yr.)(372632.956 lb/yr.)
Total fraction air emissions .
MATERIAL BALANCE 0 PERCENT DIFFERENCE = 0

Loading is the compound added to or generated in the system.
exit is from entire project system, not the unit.
removal is compound conversion in the system.

No.	Name	air (fe)	exit (fo)	removal (fbio+fcon)
1: 28	Aeration Basin	.	.	.5986
2: 32	Secondary Clarifie	.	.	.
3: 36	Sand Filters	.	.	.
4: 46	Effluent	.	.4013	.
TOTALS FOR ALL UNITS		.	.4013	.5986

Totals .9999999
Loading is the compound added to or generated in the system.
fe is the fraction of the loading that is emitted to the air.
fo is the fraction of the loading that remains in the project.
removal is the fraction of the losding that is converted to another compound.

WASTEWATER UNIT LOADING 01-31-2009

FURFURAL

No.	Name	load (g/s)	air fract	removal fract	exit fract
1: 28	Aeration Basin	1.44 E+00	.003903	.6053521	.
2: 32	Secondary Clarifie	0. E+00	.001753	.	.
3: 36	Sand Filters	0. E+00	.000212	.	.
4: 46	Effluent	0. E+00	.	.	.38878
TOTALS FOR ALL UNITS		1.44 E+00	.005868	.605352	.38878

MATERIAL BALANCE -5.960464E-08

WASTEWATER UNIT LOADING 01-31-2009

ETHANOL

No.	Name	load (g/s)	air fract	removal fract	exit fract
1: 28	Aeration Basin	6.63 E+00	.013808	.4062389	.
2: 32	Secondary Clarifie	0. E+00	.006466	.	.
3: 36	Sand Filters	0. E+00	.000713	.	.
4: 46	Effluent	0. E+00	.	.	.572774
TOTALS FOR ALL UNITS		6.63 E+00	.020987	.406239	.572774

MATERIAL BALANCE 0

WASTEWATER UNIT LOADING 01-31-2009

ACETIC ACID

No.	Name	load (g/s)	air fract	removal fract	exit fract
1: 28	Aeration Basin	5.36 E+00	.000004	.5986485	.
2: 32	Secondary Clarifie	0. E+00	.000002	.	.
3: 36	Sand Filters	0. E+00	.	.	.
4: 46	Effluent	0. E+00	.	.	.401345
TOTALS FOR ALL UNITS		5.36 E+00	.000007	.598649	.401345

MATERIAL BALANCE 5.960464E-08

```
DETAILED CALCULATIONS Defaults
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:14
COMPOUND: FURFURAL

Type of unit is
1 Total water added at the unit (l/s)      50     0
2 Area of openings at unit (cm2)                  50
3 Radius of drop pipe (cm)                        5
4 Drop length to conduit (cm)                     61
5 Humidity of inlet air (%)                       40
6 Temperature of air (C)                          25
7 Drain air velocity (ft/min)                     84
8 manhole air velocity (ft/min)                   128
9 Conduit air velocity (ft/min)                   66
10 Wind speed (cm/s at 10 m)                      447
11 distance to next unit (cm)                     500
12 slope of underflow conduit                     .015
13 friction factor liquid                         .016
14 friction factor gas                            .006
15 radius of underflow conduit (cm)               12
16 Underflow T (C)                                25
17 oscillation cycle time (min)                   5
18 design collection velocities  (ft/s)           2
19 design branch line fraction full               .4

Type of unit is
8 HL partition flag=1, adjust for sorption        0
9 unit recycle convergence number                 200
10 oil molecular weight                           0
11 oil density  (g/cc)                            0
12 NaUT 1=municipal 2=industrial  3=turb.         0
13 NaUT 1=mass tr. 2=equil                        0
14 parts biomass per 1000 parts COD
15 Reserved for default integer


DETAILED CALCULATIONS at Unit 1 Aeration Basin
Type: aerated biotreatment
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:14
COMPOUND: FURFURAL

Type of unit is aerated biotreatment
1 Description of unit                      1     Aeration Basin
2 Wastewater temperature   (C)                   30
3 length of aeration unit (m)                    27.01
4 width of aeration unit (m)                     27.01
5 depth of aeration unit (m)                     6.096
6 Area of agitation (each aerator,m2)            47
7 Total number of agitators in the unit          1
8 Power of agitation (each aerator,HP)           7.5
9 Impeller diameter (cm)                         60
10 Impeller rotation (RPM)                       1200
11 Agitator mechanical efficiency                0.83
12 aerator effectiveness, alpha                  0.83
13 if there is plug flow, enter 1                0
14 Overall biorate (mg/g bio-hr)                 2
15 Aeration air flow (m3/s)                      1.51
16 active biomass, aeration (g/l)                0.25
17 If covered, then enter 1                      0
19 pH                                            7.5

Properties of FURFURAL at 30. deg.C (86. deg.F)
   hl= 3.152e-06 atm-m3/mol      vp= 2.84456 mmHg (0.05502 psia)
       0.17508 y/x
       1.268e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.057e-05 cm2/s  dv= 0.089775 cm2/s
Compound flow rate from inlet water is 1.44004 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 1.51 m3/s.
The residence time in the unit is 11.924 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
________Quiescent wind shear surface___Springer_
```

Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 945.68.
kl is estimated as 6.576e-06 m/s.
kg is estimated as 0.007379 m/s.
________Agitated surface_________________
The rotation speed is 125.654 radians per second.
The rotation factor NRW is 3.011e+06.
The power number NPR is 3.021e-05.
The rotation factor NFR is 965.508.
kg (agitated)is estimated as 0.04331 m/s.
kl (agitated)is estimated as 0.004596 m/s.
kdiff (/hr) = air * hl * airdens / vol
The air rate is 5.436e+06 L per hr.
The Henry's law constant for air stripping is 3.152e-06 atm-m3/gm mol.
The air density is 40.223 g-m/m3.
The volume of the system is 4.447e+06 L.
The rate constant for submerged bubbles is 1.549e-04 per hr.
The maximum removal rates 50% yield.....
Submerged air supplied rate is 46.755 mg(CH2)/L-hr.
The maximum removal rate for CH2- due to air limited biodegradation is 557.525 ppm.
This compound stripping rate is 0.002154 mg/L-hr.
The total power of surface aeration is 7.5 Hp.
The volume of the system is 4.447e+06 L. (4447.276 M3.)(1174.974 gal.)
The power per volume is 0.006383 Hp per 1000 gal.
The fraction of surface that is agitated is 0.064424.

KG aerated (m/s)	0.044122
KL aerated (m/s)	0.004596
KL OVERALL AERATED (m/s)	5.68e-06
KG quiescent (m/s)	0.007517
KL quiescent (m/s)	6.576e-06
KL OVERALL QUIESCENT (m/s)	8.445e-07
KL OVERALL (m/s)	1.156e-06
air stripping time constant (min)	7.163e+04
FRACTION SURFACE VOLATILIZED	0.003181
FRACTION SUBMERGED VOLATILIZED	7.219e-04
TOTAL FRACTION VOLATILIZED	0.003903
FRACTION BIOLOGICALLY REMOVED	0.60535
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.00562
(Mg/year)	0.17724
EMISSION FACTOR (g/cm2-s)	7.704e-10
UNIT EXIT CONCENTRATION (ppmw)	5.43135

DETAILED CALCULATIONS at Unit 2 Secondary Clarifie
Type: circular clarifier
Project Q:\Projects\VereniumCPl\Air\Emissions\WATER9\WWTP 12:33:14
COMPOUND: FURFURAL

Type of unit is circular clarifier

1 Description of unit	2	Secondary Clarifie
2 Wastewater temperature (C)		30
3 secondary clarifier diameter (m)		29.86
4 secondary clarifier depth (m)		6.096
5 clarifier solids removal efficiency		0.98
6 waterfall drop height (cm)		20
7 clarifier weir/circumference		0.5
8 Center well present, =1		0
10 number of identical units in parallel		1
19 pH		7.5

Properties of FURFURAL at 30. deg.C (86. deg.F)
hl= 3.152e-06 atm-m3/mol vp= 2.84456 mmHg (0.05502 psia)
0.17508 y/x
1.268e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.057e-05 cm2/s dv= 0.089775 cm2/s
Clarifier surface_____________
The residence time in the clarifier is 11.446 hrs.
The Henry's law constant of 3.152e-06 atm-m3/mol is multiplied by
a adsorption factor of 1..
The adsorption corrected aqueous HL is 1.751e-01 (y/x)
The gas phase mass transfer is estimated using correlation 3, MacKay (1983).
The Schmidt number is 1.67084.
The friction velocity is 13.347 m/s
kg is estimated as 0.005306 m/s.
Gas phase mass transfer 2.211e-05 g mol/ cm2-s.

```
  The flow of water is 103.6 cm3/s.
  The effective flow depth in the clarifier is 60.96 cm.
Clarifier model liquid phase mass transfer 6.207e-05 g mol/ cm2-s.
Overall mass transfer 3.643e-06 g mol/cm2-s.
Clarifier weir emissions_____________
The Schmidt number is 1.67084.
The friction velocity is 13.347 m/s
kg is estimated as 0.005306 m/s.
Weir mass transfer is estimated from the Pincince 11/7/89 secondary model
 The water drop was 0.2 m.
 The water flow rate was 0.1036 m3/s. (7.95157 m3/hr-m)
 R = Exp(0.* drop ^ 0.* (q * 3600 / cir) ^ 0.* 0. ^ 0.31
 R = 1.06435
The diffusion constant correction is (1.057e-05/.000024)^.677
The unadjusted fraction O2 lost from the model is 0.060463.
The overall O2 mass transfer coefficient from the model is 6.677e-04 m/s.
The overall compound mass transfer coefficient from the model is 3.856e-04 m/s.
   residence time (hours)                   11.446
   KG surface (m/s)                         0.005405
   KL surface (m/s)                         1.117e-05
   KL OVERALL SURFACE (m/s)                 6.558e-07
   Fraction lost from clarifier surface     0.004423
   KG waterfall (m/s)                       0.005405
   KL waterfall (m/s)                       3.856e-04
   KL OVERALL WATERFALL (m/s)               6.954e-07
   Fraction lost from weir waterfall        6.269e-05
   Fraction absorbed in underflow           0.
   TOTAL FRACTION LOST TO THE AIR           0.004486
   TOTAL AIR EMISSIONS  (g/s)               0.002524
                  (Mg/year)                 0.079597
   EMISSION FACTOR  (g/cm2-s)               3.604e-10
   UNIT EXIT CONCENTRATION (ppmw)           5.40699


DETAILED CALCULATIONS at Unit 3 Sand Filters
Type: lagoon
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:14
COMPOUND: FURFURAL

Type of unit is lagoon
1 Description of unit                      3     Sand Filters
2 Wastewater temperature    (C)                  30
3 Length of impoundment (m)                      6.096
4 Depth of impoundment (m)                       3.048
5 Width of impoundment (m)                       9.754
6 active biomass, impoundment (g/l)              0
7 if there is plug flow, enter 1                 0
8 time for emissions in lagoon (months)          0
9 Overall biorate (mg/g bio-hr)                  0
10 sorption flag for solids settling =1          0
19 pH                                            7.5

Properties of FURFURAL at 30. deg.C (86. deg.F)
   hl= 3.152e-06 atm-m3/mol      vp= 2.84456 mmHg (0.05502 psia)
       0.17508 y/x
       1.268e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.057e-05 cm2/s  dv= 0.089775 cm2/s
The residence time in the unit is 0.48594 hr. (0.020247 days.)
The fetch to depth ratio (effective width/depth) is 2.85538.
__Sorption partitioning of component_______
    The fraction sorbed on solids and oil is 0..
   solids fraction sorbed   0.
   biomass fraction sorbed  0.
   oil fraction sorbed      0.
kg is estimated as 0.00847 m/s.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 945.68.
kl is estimated as 6.576e-06 m/s.
ISC estimation of downwind concentrations
  stability class 4.
  area rate (ug/s-m2)= 5.14093
  windspeed (m/s)= 4.
  concentration (ug/m3)= 33.036
  concentration (ppb)= 7.7013
  the vertical sigmaz is 0.5748 at 6.096 m.
```

Emission factor 3084.559 ug/m2-min.

KG surface (m/s)	0.008629
KL surface (m/s)	6.576e-06
KL OVERALL SURFACE (m/s)	9.513e-07
TOTAL FRACTION VOLATILIZED	5.457e-04
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION SUBMERGED VOLATILIZED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	3.057e-04
(Mg/year)	0.00964
EMISSION FACTOR (g/cm2-s)	5.141e-10
UNIT EXIT CONCENTRATION (ppmw)	5.40404

DETAILED CALCULATIONS at Unit 4 Effluent
Type: system exit stream
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP 12:33:14
COMPOUND: FURFURAL

Type of unit is system exit stream
1 Description of unit 4 Effluent

TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	5.141e-10
UNIT EXIT CONCENTRATION (ppmw)	5.40404

```
DETAILED CALCULATIONS Defaults
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:29
COMPOUND: ETHANOL

Type of unit is
1 Total water added at the unit (l/s)      50.     0
2 Area of openings at unit (cm2)                   50
3 Radius of drop pipe (cm)                         5
4 Drop length to conduit (cm)                      61
5 Humidity of inlet air (%)                        40
6 Temperature of air (C)                           25
7 Drain air velocity (ft/min)                      84
8 manhole air velocity (ft/min)                    128
9 Conduit air velocity (ft/min)                    66
10 Wind speed (cm/s at 10 m)                       447
11 distance to next unit (cm)                      500
12 slope of underflow conduit                      .015
13 friction factor liquid                          .016
14 friction factor gas                             .006
15 radius of underflow conduit (cm)                12
16 Underflow T (C)                                 25
17 oscillation cycle time (min)                    5
18 design collection velocities  (ft/s)            2
19 design branch line fraction full                .4

Type of unit is
8 HL partition flag=1, adjust for sorption         0
9 unit recycle convergence number                  200
10 oil molecular weight                            0
11 oil density  (g/cc)                             0
12 NaUT 1=municipal 2=industrial  3=turb.          0
13 NaUT 1=mass tr. 2=equil                         0
14 parts biomass per 1000 parts COD
15 Reserved for default integer
```

```
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:29
COMPOUND: ETHANOL

Type of unit is aerated biotreatment
1 Description of unit                      1     Aeration Basin
2 Wastewater temperature   (C)                   30
3 length of aeration unit (m)                    27.01
4 width of aeration unit (m)                     27.01
5 depth of aeration unit (m)                     6.096
6 Area of agitation (each aerator,m2)            47
7 Total number of agitators in the unit          1
8 Power of agitation (each aerator,HP)           7.5
9 Impeller diameter (cm)                         60
10 Impeller rotation (RPM)                       1200
11 Agitator mechanical efficiency                0.83
12 aerator effectiveness, alpha                  0.83
13 if there is plug flow, enter 1                0
14 Overall biorate (mg/g bio-hr)                 2
15 Aeration air flow (m3/s)                      1.51
16 active biomass, aeration (g/l)                0.25
17 If covered, then enter 1                      0
19 pH                                            7.5

Properties of ETHANOL at 30. deg.C (86. deg.F)
   pH = 7.5
   Ka = 1.31e-14
   The pH adjusted active fraction is 1.
   hl= 6.976e-06 atm-m3/mol      vp= 78.195 mmHg (1.51246 psia)
       0.38753 y/x
       2.806e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.322e-05 cm2/s  dv= 0.12663 cm2/s
Compound flow rate from inlet water is 6.6304 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 1.51 m3/s.
The residence time in the unit is 11.924 hr.
____Biomass production________________
    The biomass production rate is 0.mg/hr. (0. mg/L)
    The fraction dissolved solids converted is 0. .
    The estimated biomass exit concentration is 0. mg/L.
```

________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 756.544.
kl is estimated as 7.235e-06 m/s.
kg is estimated as 0.009292 m/s.
________Agitated surface________________
The rotation speed is 125.654 radians per second.
The rotation factor NRW is 3.011e+06.
The power number NPR is 3.021e-05.
The rotation factor NFR is 965.508.
kg (agitated)is estimated as 0.051437 m/s.
kl (agitated)is estimated as 0.005138 m/s.
kdiff (/hr) = air * hl * airdens / vol
The air rate is 5.436e+06 L per hr.
The Henry's law constant for air stripping is 6.976e-06 atm-m3/gm mol.
The air density is 40.223 g-m/m3.
The volume of the system is 4.447e+06 L.
The rate constant for submerged bubbles is 3.43e-04 per hr.
The maximum removal rates 50% yield.....
Submerged air supplied rate is 46.755 mg(CH2)/L-hr.
The maximum removal rate for CH2- due to air limited biodegradation is 557.525 ppm.
This compound stripping rate is 0.021949 mg/L-hr.
The total power of surface aeration is 7.5 Hp.
The volume of the system is 4.447e+06 L. (4447.276 M3.)(1174.974 gal.)
The power per volume is 0.006383 Hp per 1000 gal.
The fraction of surface that is agitated is 0.064424.

KG aerated (m/s)	0.052402
KL aerated (m/s)	0.005138
KL OVERALL AERATED (m/s)	1.491e-05
KG quiescent (m/s)	0.009466
KL quiescent (m/s)	7.235e-06
KL OVERALL QUIESCENT (m/s)	1.967e-06
KL OVERALL (m/s)	2.8e-06
air stripping time constant (min)	3.005e+04
FRACTION SURFACE VOLATILIZED	0.011436
FRACTION SUBMERGED VOLATILIZED	0.002372
TOTAL FRACTION VOLATILIZED	0.013808
FRACTION BIOLOGICALLY REMOVED	0.40624
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	0.09155
(Mg/year)	2.88712
EMISSION FACTOR (g/cm2-s)	1.255e-08
UNIT EXIT CONCENTRATION (ppmw)	37.117

DETAILED CALCULATIONS at Unit 2 Secondary Clarifie
Type: circular clarifier
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP 12:33:29
COMPOUND: ETHANOL

Type of unit is circular clarifier

1 Description of unit	2	Secondary Clarifie
2 Wastewater temperature (C)		30
3 secondary clarifier diameter (m)		29.86
4 secondary clarifier depth (m)		6.096
5 clarifier solids removal efficiency		0.98
6 waterfall drop height (cm)		20
7 clarifier weir/circumference		0.5
8 Center well present, =1		0
10 number of identical units in parallel		1
19 pH		7.5

Properties of ETHANOL at 30. deg.C (86. deg.F)
pH = 7.5
Ka = 1.31e-14
The pH adjusted active fraction is 1.
hl= 6.976e-06 atm-m3/mol vp= 78.195 mmHg (1.51246 psia)
0.38753 y/x
2.806e-04 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.322e-05 cm2/s dv= 0.12663 cm2/s
Clarifier surface____________
The residence time in the clarifier is 11.446 hrs.
The Henry's law constant of 6.976e-06 atm-m3/mol is multiplied by
a adsorption factor of 1..
The adsorption corrected aqueous HL is 3.875e-01 (y/x)
The gas phase mass transfer is estimated using correlation 3, MacKay (1983).

```
The Schmidt number is 1.18453.
The friction velocity is 13.347 m/s
kg is estimated as 0.006425 m/s.
Gas phase mass transfer 2.677e-05 g mol/ cm2-s.
  The flow of water is 103.6 cm3/s.
  The effective flow depth in the clarifier is 60.96 cm.
Clarifier model liquid phase mass transfer 7.256e-05 g mol/ cm2-s.
Overall mass transfer 9.076e-06 g mol/cm2-s.
Clarifier weir emissions_____________
The Schmidt number is 1.18453.
The friction velocity is 13.347 m/s
kg is estimated as 0.006425 m/s.
Weir mass transfer is estimated from the Pincince 11/7/89 secondary model
 The water drop was 0.2 m.
 The water flow rate was 0.1036 m3/s. (7.95157 m3/hr-m)
 R = Exp(0.* drop ^ 0.* (q * 3600 / cir) ^ 0.* 0. ^ 0.31
 R = 1.07511
The diffusion constant correction is (1.322e-05/.000024)^.677
The unadjusted fraction O2 lost from the model is 0.069865.
The overall O2 mass transfer coefficient from the model is 7.716e-04 m/s.
The overall compound mass transfer coefficient from the model is 5.174e-04 m/s.
   residence time (hours)                     11.446
   KG surface (m/s)                           0.006545
   KL surface (m/s)                           1.306e-05
   KL OVERALL SURFACE (m/s)                   1.634e-06
   Fraction lost from clarifier surface       0.010982
   KG waterfall (m/s)                         0.006545
   KL waterfall (m/s)                         5.174e-04
   KL OVERALL WATERFALL (m/s)                 1.861e-06
   Fraction lost from weir waterfall          1.666e-04
   Fraction absorbed in underflow             0.
   TOTAL FRACTION LOST TO THE AIR             0.011149
   TOTAL AIR EMISSIONS  (g/s)                 0.042872
                    (Mg/year)                 1.352
   EMISSION FACTOR  (g/cm2-s)                 6.122e-09
   UNIT EXIT CONCENTRATION (ppmw)             36.703
```

```
DETAILED CALCULATIONS at Unit 3 Sand Filters
Type: lagoon
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:29
COMPOUND: ETHANOL

Type of unit is lagoon
1 Description of unit                       3     Sand Filters
2 Wastewater temperature    (C)                   30
3 Length of impoundment (m)                       6.096
4 Depth of impoundment (m)                        3.048
5 Width of impoundment (m)                        9.754
6 active biomass, impoundment (g/l)               0
7 if there is plug flow, enter 1                  0
8 time for emissions in lagoon (months)           0
9 Overall biorate (mg/g bio-hr)                   0
10 sorption flag for solids settling =1           0
19 pH                                             7.5

Properties of ETHANOL at 30. deg.C (86. deg.F)
   pH = 7.5
   Ka = 1.31e-14
   The pH adjusted active fraction is 1.
   hl= 6.976e-06 atm-m3/mol      vp= 78.195 mmHg (1.51246 psia)
       0.38753 y/x
       2.806e-04 g/L gas per g/L liquid
   kl= 0. L/g-hr          dl= 1.322e-05 cm2/s  dv= 0.12663 cm2/s
The residence time in the unit is 0.48594 hr. (0.020247 days.)
The fetch to depth ratio (effective width/depth) is 2.85538.
__Sorption partitioning of component_______
    The fraction sorbed on solids and oil is 0..
   solids fraction sorbed    0.
   biomass fraction sorbed  0.
   oil fraction sorbed      0.
kg is estimated as 0.010665 m/s.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 756.544.
kl is estimated as 7.235e-06 m/s.
```

```
ISC estimation of downwind concentrations
  stability class 4.
  area rate (ug/s-m2)= 79.548
  windspeed (m/s)= 4.
  concentration (ug/m3)= 511.187
  concentration (ppb)= 248.386
  the vertical sigmaz is 0.5748 at 6.096 m.
Emission factor 4.773e+04 ug/m2-min.
   KG surface (m/s)                         0.010865
   KL surface (m/s)                         7.235e-06
   KL OVERALL SURFACE (m/s)                 2.17e-06
   TOTAL FRACTION VOLATILIZED               0.001244
   FRACTION BIOLOGICALLY REMOVED            0.
   FRACTION SUBMERGED VOLATILIZED           0.
   FRACTION ABSORBED                        0.
   TOTAL AIR EMISSIONS  (g/s)               0.00473
                     (Mg/year)              0.14916
   EMISSION FACTOR  (g/cm2-s)               7.955e-09
   UNIT EXIT CONCENTRATION (ppmw)           36.658


DETAILED CALCULATIONS at Unit 4 Effluent
Type: system exit stream
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:29
COMPOUND: ETHANOL

Type of unit is system exit stream
1 Description of unit                      4     Effluent

   TOTAL AIR EMISSIONS  (g/s)               0.
                     (Mg/year)              0.
   EMISSION FACTOR  (g/cm2-s)               7.955e-09
   UNIT EXIT CONCENTRATION (ppmw)           36.658
```

DETAILED CALCULATIONS Defaults
Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP 1/14/2009 12:04:53 PM 17:35:34
COMPOUND: ACETIC ACID

Type of unit is

1	Total water added at the unit (l/s)	50	0
2	Area of openings at unit (cm2)		50
3	Radius of drop pipe (cm)		5
4	Drop length to conduit (cm)		61
5	Humidity of inlet air (%)		40
6	Temperature of air (C)		25
7	Drain air velocity (ft/min)		84
8	manhole air velocity (ft/min)		128
9	Conduit air velocity (ft/min)		66
10	Wind speed (cm/s at 10 m)		447
11	distance to next unit (cm)		500
12	slope of underflow conduit		.015
13	friction factor liquid		.016
14	friction factor gas		.006
15	radius of underflow conduit (cm)		12
16	Underflow T (C)		25
17	oscillation cycle time (min)		5
18	design collection velocities (ft/s)		2
19	design branch line fraction full		.4

Type of unit is

8	HL partition flag=1, adjust for sorption	0
9	unit recycle convergence number	200
10	oil molecular weight	0
11	oil density (g/cc)	0
12	NaUT 1=municipal 2=industrial 3=turb.	0
13	NaUT 1=mass tr. 2=equil	0
14	parts biomass per 1000 parts COD	
15	Reserved for default integer	

Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP 12:33:46
COMPOUND: ACETIC ACID

Type of unit is aerated biotreatment

1	Description of unit	1	Aeration Basin
2	Wastewater temperature (C)		30
3	length of aeration unit (m)		27.01
4	width of aeration unit (m)		27.01
5	depth of aeration unit (m)		6.096
6	Area of agitation (each aerator,m2)		47
7	Total number of agitators in the unit		1
8	Power of agitation (each aerator,HP)		7.5
9	Impeller diameter (cm)		60
10	Impeller rotation (RPM)		1200
11	Agitator mechanical efficiency		0.83
12	aerator effectiveness, alpha		0.83
13	if there is plug flow, enter 1		0
14	Overall biorate (mg/g bio-hr)		2
15	Aeration air flow (m3/s)		1.51
16	active biomass, aeration (g/l)		0.25
17	If covered, then enter 1		0
19	pH		7.5

Properties of ACETIC ACID at 30. deg.C (86. deg.F)
pH = 7.5
Ka = 1.754e-05
The pH adjusted active fraction is 0.0018
hl= 2.841e-09 atm-m3/mol vp= 20.436 mmHg (0.39527 psia)
1.578e-04 y/x
1.143e-07 g/L gas per g/L liquid
kl= 0. L/g-hr dl= 1.22e-05 cm2/s dv= 0.11634 cm2/s
Compound flow rate from inlet water is 5.35612 g/s.
Compound flow rate from inlet vent is 0. g/s.
Compound flow rate from inlet duct is 0. g/s.
Submerged aeration rate from inlet vent is 0. m3/s.
Total submerged aeration is 1.51 m3/s.
The residence time in the unit is 11.924 hr.

____Biomass production________________

The biomass production rate is 0.mg/hr. (0. mg/L)
The fraction dissolved solids converted is 0. .
The estimated biomass exit concentration is 0. mg/L.

```
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 819.589.
kl is estimated as 6.99e-06 m/s.
kg is estimated as 0.008779 m/s.
________Agitated surface__________________
The rotation speed is 125.654 radians per second.
The rotation factor NRW is 3.011e+06.
The power number NPR is 3.021e-05.
The rotation factor NFR is 965.508.
kg (agitated)is estimated as 0.049302 m/s.
kl (agitated)is estimated as 0.004937 m/s.
kdiff (/hr) = air * hl * airdens / vol
    The air rate is 5.436e+06 L per hr.
    The Henry's law constant for air stripping is 2.841e-09 atm-m3/gm mol.
    The air density is 40.223 g-m/m3.
    The volume of the system is 4.447e+06 L.
    The rate constant for submerged bubbles is 1.397e-07 per hr.
    The maximum removal rates 50% yield.....
      Submerged air supplied rate is 46.755 mg(CH2)/L-hr.
      The maximum removal rate for CH2- due to air limited biodegradation is 557.525 ppm.
      This compound stripping rate is 7.221e-06 mg/L-hr.
    The total power of surface aeration is 7.5 Hp.
    The volume of the system is 4.447e+06 L. (4447.276 M3.)(1174.974 gal.)
    The power per volume is 0.006383 Hp per 1000 gal.
    The fraction of surface that is agitated is 0.064424.
   KG aerated (m/s)                        0.050226
   KL aerated (m/s)                        0.004937
   KL OVERALL AERATED (m/s)                5.836e-09
   KG quiescent (m/s)                      0.008943
   KL quiescent (m/s)                      6.99e-06
   KL OVERALL QUIESCENT (m/s)              1.039e-09
   KL OVERALL (m/s)                        1.348e-09
   air stripping time constant (min)       6.412e+07
   FRACTION SURFACE VOLATILIZED            3.81e-06
   FRACTION SUBMERGED VOLATILIZED          6.685e-07
   TOTAL FRACTION VOLATILIZED              4.478e-06
   FRACTION BIOLOGICALLY REMOVED           0.59865
   FRACTION ABSORBED                       0.
   TOTAL AIR EMISSIONS  (g/s)              2.399e-05
                     (Mg/year)             7.564e-04
   EMISSION FACTOR  (g/cm2-s)              3.288e-12
   UNIT EXIT CONCENTRATION (ppmw)          20.75



DETAILED CALCULATIONS at Unit 2 Secondary Clarifie
Type: circular clarifier
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:46
COMPOUND: ACETIC ACID

Type of unit is circular clarifier
1 Description of unit                     2     Secondary Clarifie
2 Wastewater temperature   (C)                  30
3 secondary clarifier diameter (m)              29.86
4 secondary clarifier depth  (m)                6.096
5 clarifier solids removal efficiency           0.98
6 waterfall drop height (cm)                    20
7 clarifier weir/circumference                  0.5
8 Center well present, =1                       0
10 number of identical units in parallel        1
19 pH                                           7.5

Properties of ACETIC ACID at 30. deg.C (86. deg.F)
   pH = 7.5
   Ka = 1.754e-05
   The pH adjusted active fraction is 0.0018
   hl= 2.841e-09 atm-m3/mol      vp= 20.436 mmHg (0.39527 psia)
       1.578e-04 y/x
       1.143e-07 g/L gas per g/L liquid
   kl= 0. L/g-hr           dl= 1.22e-05 cm2/s  dv= 0.11634 cm2/s
Clarifier surface_____________
The residence time in the clarifier is 11.446 hrs.
The Henry's law constant of 2.841e-09 atm-m3/mol is multiplied by
 a adsorption factor of 1..
The adsorption corrected aqueous HL is 1.578e-04 (y/x)
The gas phase mass transfer is estimated using correlation 3, MacKay (1983).
```

```
The Schmidt number is 1.28936.
The friction velocity is 13.347 m/s
kg is estimated as 0.006124 m/s.
Gas phase mass transfer 2.552e-05 g mol/ cm2-s.
  The flow of water is 103.6 cm3/s.
  The effective flow depth in the clarifier is 60.96 cm.
Clarifier model liquid phase mass transfer 6.86e-05 g mol/ cm2-s.
Overall mass transfer 4.027e-09 g mol/cm2-s.
Clarifier weir emissions_____________
The Schmidt number is 1.28936.
The friction velocity is 13.347 m/s
kg is estimated as 0.006124 m/s.
Weir mass transfer is estimated from the Pincince 11/7/89 secondary model
 The water drop was 0.2 m.
 The water flow rate was 0.1036 m3/s. (7.95157 m3/hr-m)
 R = Exp(0.* drop ^ 0.* (q * 3600 / cir) ^ 0.* 0. ^ 0.31
 R = 1.07105
The diffusion constant correction is (1.22e-05/.000024)^.677
The unadjusted fraction O2 lost from the model is 0.066341.
The overall O2 mass transfer coefficient from the model is 7.327e-04 m/s.
The overall compound mass transfer coefficient from the model is 4.656e-04 m/s.
   residence time (hours)                    11.446
   KG surface (m/s)                          0.006239
   KL surface (m/s)                          1.235e-05
   KL OVERALL SURFACE (m/s)                  7.249e-10
   Fraction lost from clarifier surface      4.9e-06
   KG waterfall (m/s)                        0.006239
   KL waterfall (m/s)                        4.656e-04
   KL OVERALL WATERFALL (m/s)                7.25e-10
   Fraction lost from weir waterfall         6.564e-08
   Fraction absorbed in underflow            0.
   TOTAL FRACTION LOST TO THE AIR            4.966e-06
   TOTAL AIR EMISSIONS  (g/s)                1.067e-05
                     (Mg/year)               3.366e-04
   EMISSION FACTOR  (g/cm2-s)                1.524e-12
   UNIT EXIT CONCENTRATION (ppmw)            20.75


DETAILED CALCULATIONS at Unit 3 Sand Filters
Type: lagoon
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP  12:33:46
COMPOUND: ACETIC ACID

Type of unit is lagoon
1 Description of unit                       3     Sand Filters
2 Wastewater temperature    (C)                   30
3 Length of impoundment (m)                       6.096
4 Depth of impoundment (m)                        3.048
5 Width of impoundment (m)                        9.754
6 active biomass, impoundment (g/l)               0
7 if there is plug flow, enter 1                  0
8 time for emissions in lagoon (months)           0
9 Overall biorate (mg/g bio-hr)                   0
10 sorption flag for solids settling =1           0
19 pH                                             7.5

Properties of ACETIC ACID at 30. deg.C (86. deg.F)
   pH = 7.5
   Ka = 1.754e-05
   The pH adjusted active fraction is 0.0018
   hl= 2.841e-09 atm-m3/mol       vp= 20.436 mmHg (0.39527 psia)
       1.578e-04 y/x
       1.143e-07 g/L gas per g/L liquid
   kl= 0. L/g-hr            dl= 1.22e-05 cm2/s  dv= 0.11634 cm2/s
The residence time in the unit is 0.48594 hr. (0.020247 days.)
The fetch to depth ratio (effective width/depth) is 2.85538.
__Sorption partitioning of component_______
    The fraction sorbed on solids and oil is 0..
   solids fraction sorbed   0.
   biomass fraction sorbed  0.
   oil fraction sorbed      0.
kg is estimated as 0.010076 m/s.
________Quiescent wind shear surface___Springer_
Springer correlation does not apply, use Mackay and Yeun (1983).
The friction velocity is 13.347cm/s.
The Schmidt number is 819.589.
kl is estimated as 6.99e-06 m/s.
```

ISC estimation of downwind concentrations
  stability class 4.
  area rate (ug/s-m2)= 0.024744
  windspeed (m/s)= 4.
  concentration (ug/m3)= 0.15901
  concentration (ppb)= 0.059315
  the vertical sigmaz is 0.5748 at 6.096 m.
Emission factor 14.847 ug/m2-min.

KG surface (m/s)	0.010265
KL surface (m/s)	6.99e-06
KL OVERALL SURFACE (m/s)	1.193e-09
TOTAL FRACTION VOLATILIZED	6.844e-07
FRACTION BIOLOGICALLY REMOVED	0.
FRACTION SUBMERGED VOLATILIZED	0.
FRACTION ABSORBED	0.
TOTAL AIR EMISSIONS (g/s)	1.471e-06
(Mg/year)	4.64e-05
EMISSION FACTOR (g/cm2-s)	2.474e-12
UNIT EXIT CONCENTRATION (ppmw)	20.75

DETAILED CALCULATIONS at Unit 4 Effluent
Type: system exit stream
  Project Q:\Projects\VereniumCP1\Air\Emissions\WATER9\WWTP 12:33:46
COMPOUND: ACETIC ACID

Type of unit is system exit stream
1 Description of unit 4 Effluent

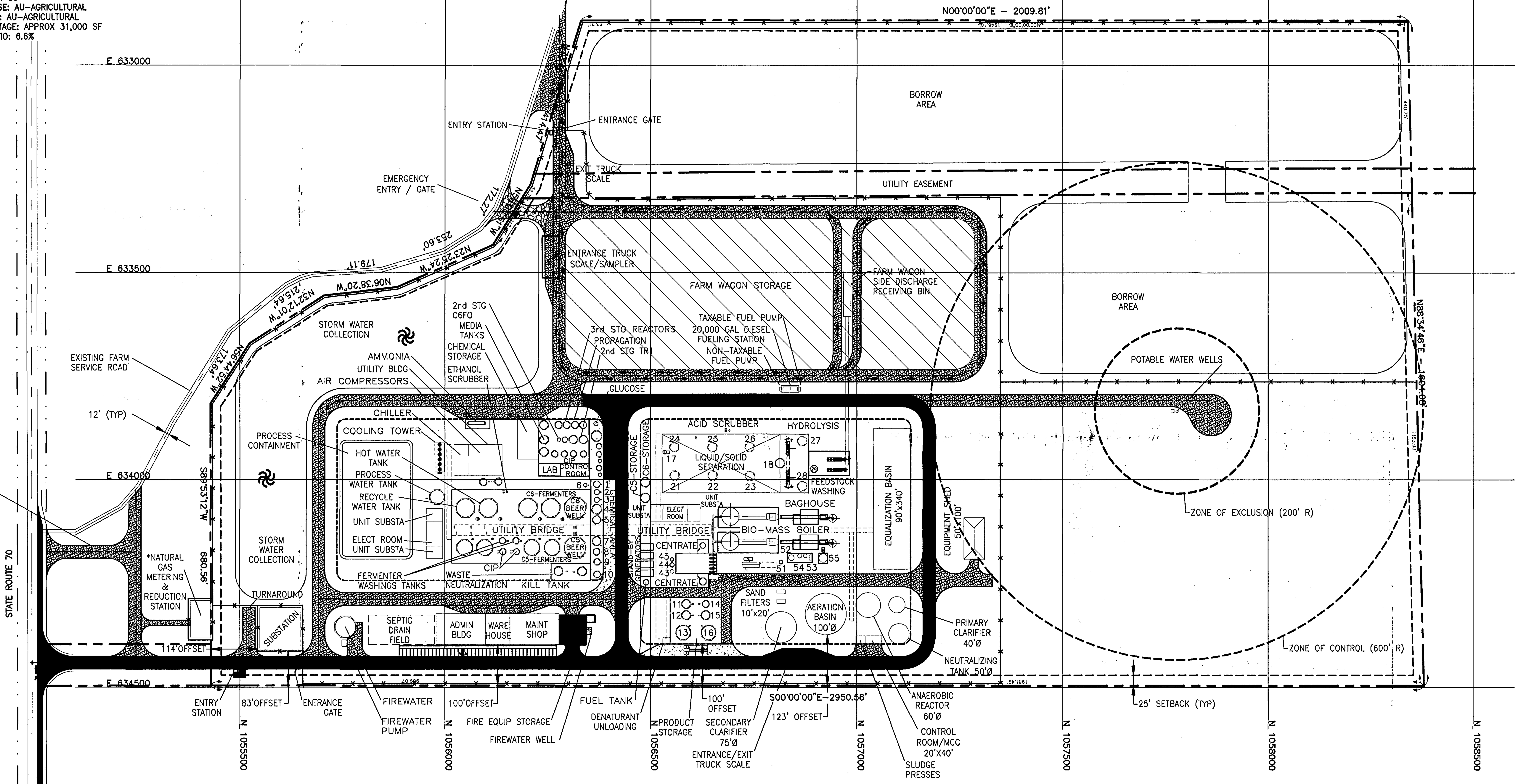
TOTAL AIR EMISSIONS (g/s)	0.
(Mg/year)	0.
EMISSION FACTOR (g/cm2-s)	2.474e-12
UNIT EXIT CONCENTRATION (ppmw)	20.75

APPENDIX C

Site Plan

HIGHLANDS COUNTY
(SPECIAL USE PERMIT 08-1)
PRELIMINARY SITE ARRANGEMENT INFORMATION

1. TOTAL SITE AREA (ACRES): 95.71
2. IMPERVIOUS AREA (%): MAX 25%
3. WATER SUPPLY: POTABLE WATER WELL AND NON-POTABLE WATER WELL
4. SETBACKS: 25 FEET PER HIGHLANDS COUNTY LAND DEVELOPMENT REGULATIONS (SECTION 12.05.200 AU AGRICULTURAL: I. MINIMUM YARD REQUIREMENTS)
5. BASE FLOOD ELEVATION: 33.08 NAVD 88 AS DETERMINED BY AMEC E&E (HIGHLANDS COUNTY APPROVAL PENDING)
6. MINIMUM FINISHED FLOOR ELEVATION: 35.50 NAVD 88
7. PARKING SPACES: 50
8. FUTURE LAND USE: AU-AGRICULTURAL
9. ZONING DISTRICT: AU-AGRICULTURAL
10. OFFICE SQ. FOOTAGE: APPROX 31,000 SF
11. FLOOR AREA RATIO: 6.6%



NOTE:

* PROPERTY OUTSIDE PARCEL LIMITS, NOT UNDER OWNERSHIP CONTROL OF VERENIUM

LEGEND

- FENCE
- PROPERTY LINE
- ASPHALT PAVEMENT
- GRAVEL SURFACE
- CONCRETE SURFACE

CP-1 Tank List

1	20% Caustic Tank
2	Sodium Thiosulfate
3	Sodium Hypochlorite Storage Tank
4	Corn Steep Storage Tank
5	50% Caustic Soda Tank
6	Clean Caustic Tank
7	Slaked Lime System
8	3% Sulfuric Acid Tank
9	Phosphoric Acid Tank
10	98% Sulfuric Acid Tank
11	Shift Product Tank 1
12	Shift Product Tank 2
13	Product Storage Tank 1
14	Denaturant Storage Tank
15	Recycle Tank
16	Product Storage Tank 2
17	C5 Neutralization Tank
18	Blow Tank
19	Lactose Storage Tank
20	Expansion Tank
21	Washer Feed Tank 1
22	Washer Feed Tank 2
23	Washer Feed Tank 3
24	Washer Filtrate Tank 1
25	Washer Filtrate Tank 2
26	Washer Filtrate Tank 3
27	Pressed Bagass Storage Tank 1
28	Pressed Bagass Storage Tank 2
	ITEMS 29-42 RESERVED
43	Stripper Rectifier
44	C5 Beer Stripper
45	C6 Beer Stripper
46	Solka Floc
47	Soy Flour
48	Ammonia Sulfate
49	Potassium Phosphate
50	Urea
51	Urea
52	Limestone
53	Sand
54	Sodium Bicarbonate
55	Ash Silo

BAR SCALE 0 75 150 300 450

SCALE: 1"=150'-0" (UNLESS NOTED OTHERWISE)

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP
B	05NOV08	REVISED	DRD	PWM	PWM
A	29OCT08	ISSUED FOR INFORMATION	DRD	JFD	JFD

STAMP/SEAL

PRELIMINARY

FLORIDA COA NO.: 8379

APPROVED FOR

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
		DSN		
SCALE: AS NOTED	PACKAGE CODE	DRN	DRD	27OCT08
		CHK		
		APP	JFD	27OCT08

amec

AREA

SUBJECT: PRELIMINARY SITE GENERAL ARRANGEMENT

VERENIUM THE NATURE OF ENERGY™

CLIENT DWG. NO.

DRAWING NO.: D-000-C-SK-0004 REV.: B

22x34 – ANSI D

CAD FILE: P:\10-CAD\03-CIV\D-000-C-SK-0004.DWG

APPENDIX D

USEPA Applicability Determinations for NSPS Subparts NNN and RRR

VERENIUM
THE NATURE OF ENERGY™

www.verenium.com

55 Cambridge Parkway, Cambridge, MA 02142
617.674.5300

February 6, 2009

Mr. Gregg Worley
Air Permits Section Chief
United States Environmental Protection Agency
Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Re: New Source Performance Standard Exemptions for Cellulosic Ethanol Facilities

Dear Mr. Worley:

Highlands Ethanol, LLC, an affiliate of Verenium Biofuels Corporation, is submitting a Prevention of Significant Deterioration (PSD) permit application to the Florida Department of Environmental Protection (FDEP) for construction of the Highlands Ethanol facility. This proposed facility will be a new fuel-grade cellulosic ethanol production facility to be constructed in Highlands County, Florida.

As part of the regulatory applicability review for the proposed new facility, Highlands Ethanol identified New Source Performance Standards (NSPS) that are potentially applicable to the facility. Two of these standards are as follows:

- 40 CFR 60 Subpart NNN - Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations; and
- 40 CFR 60 Subpart RRR - Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes.

According to a United States Environmental Protection Agency (USEPA) Federal Register notice (72 FR 41117) and several letters issued by USEPA Region 5 (see USEPA Applicability Determination Index Control Numbers 0100076 and 0100083 and USEPA correspondence dated October 20, 2000), ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart NNN because the NSPS background information document (USEPA, 1983) states that, "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart NNN.

Likewise, these same reference documents state that ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart RRR because the NSPS background information document (USEPA, 1990) states that "... a total of 173 chemicals produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart RRR.

In our pre-application meeting with FDEP on October 23, 2008, Mr. Alvaro Linero indicated that regulatory interpretation of NSPS falls under the jurisdiction of USEPA rather than FDEP, and he indicated that we would need to obtain approval for these exemptions from USEPA Region 4. Therefore, Highlands Ethanol respectfully requests that USEPA Region 4 issue site-specific exemptions from the 40 CFR 60 Subpart NNN and 40 CFR 60 Subpart RRR requirements for the proposed Highlands Ethanol facility based on the supporting documentation cited. The supporting documentation is enclosed for your reference.

To facilitate compliance, Highlands Ethanol desires to have the USEPA's exemption from these NSPS requirements written into the PSD Permit that will be developed by FDEP for the proposed source. Consequently, we request that USEPA provide permit language to FDEP for incorporation into the permit that confirms the site-specific exemptions from the 40 CFR 60 Subpart NNN and 40 CFR 60 Subpart RRR requirements. We understand that FDEP will be making our PSD permit application available for your review, and that package should assist you in preparing your determination.

We thank you for your assistance in the permitting process for our proposed new facility. Should you have any questions, or require any additional information, please do not hesitate to contact me at (813) 349-4943 or our environmental consultant, Mr. Jeff Harrington of AMEC at (207) 879-4222.

Sincerely,

TREves

Tim Eves
Vice President, Business Development

cc: C. Davis – Verenium/Highlands Ethanol
J. Harrington – AMEC
K. Jameson – AMEC

Federal Register

Thursday,
July 26, 2007

Part II

Environmental Protection Agency

Recent Posting to the Applicability Determination Index (ADI) Database System of Agency Applicability Determinations, Alternative Monitoring Decisions, and Regulatory Interpretations Pertaining to Standards of Performance for New Stationary Sources, National Emission Standards for Hazardous Air Pollutants, and the Stratospheric Ozone Protection Program; Notices

Search Applicability Determination Index

Determination Detail

Control Number: 0100076

Category: NSPS
EPA Office: Region 5
Date: 12/06/2000
Title: Applicability of NSPS to Ethanol Manufacturing Plants
Recipient: Don Smith
Author: George Czerniak
Comments:

Subparts:	Part 60, NNN	SOCMI Distillation Operations
	Part 60, RRR	VOC Emissions from SOCMI Reactor Processes

References: 60.667
60.707

Abstract:

Q: Are ethanol manufacturing facilities exempt from the requirements of NSPS Subparts RRR and NNN?

A: Yes. EPA has previously determined that ethanol manufacturing facilities may be exempt from NSPS Subparts RRR and NNN on a cases-by-case basis. In this instance, the ethanol facilities in question use a biological process to ferment the converted starches in corn into ethanol. These NSPS Subparts did not envision unit operations for biological processes.

Letter:

12/6/2000
(AE-17J)

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Don Smith, P.E., Supervisor
Major Facilities
Minnesota pollution Control Agency - South District 520 Lafayette Road North St. Paul, Minnesota 55155

[redacted]

Re: Applicability of NSPS to Ethanol Manufacturing Plants

Dear Mr. Smith:
I am writing in response to your letter dated October 13, 2000, requesting that the United States Environmental Protection Agency (U.S. EPA) determine whether the Ethanol 2000 facility in Bingham Lake, Minnesota, the Pro-Corn facility in Preston, and the Agra Resources facility in Albert Lea are subject to the Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 40 C.F.R. Sec. 60, subpart NNN and the Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. Sec. 60, subpart RRR. This letter responds to that request. The U.S. EPA's Region 5, Air Enforcement and Compliance Assurance Branch and the Office of Enforcement and Compliance Assurance have coordinated this response to your request.

Facility Background
Ethanol 2000 is a new facility constructed in Bingham Lake, MN. Pro-Corn is a new facility constructed in Preston, MN. Agra Resources is a new facility constructed in Albert Lea, MN. These facilities manufacture ethanol by biological processes (fermentation) using corn as a feedstock.

Regulatory Background
The Standards of Performance for VOC Emissions From SOCMI Distillation Operations, 40 C.F.R. Sec. 60, Subpart NNN define applicability as a distillation unit constructed, reconstructed, or modified after December 30, 1983 that "produces any of the chemicals listed in Sec. 69.667 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.667 lists ethanol as one of the chemicals affected by subpart NNN. The Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. Sec. 60, Subpart RRR define applicability as a reactor unit constructed, reconstructed, or modified after June 29, 1990 that "produces any of the chemicals listed in Sec. 69.707 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.707 lists ethanol as one of the chemicals affected by subpart RRR.

Discussion
U.S. EPA document 450/3-83-005b, entitled Distillation Operations in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published December 1983 discusses the scope of 40 C.F.R. Sec. 60, Subpart NNN on page 8-23. "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis" U.S. EPA document 450/3/90-016a, entitled Reactor Processes in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published as draft June 1990 discusses the scope of 40 C.F.R. Sec. 60, Subpart RRR on page 3-2. "... a total of 173 chemical produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis."

Conclusion
Ethanol is listed as a chemical affected by both NSPS Subparts RRR and NNN. However, background documentation created during the development of both standards indicates creation of ethanol by fermentation (biological synthesis) was excluded from the scope of both NSPS. U.S. EPA finds that NSPS RRR and NSPS NNN are not applicable to the facilities in question. If you have any questions regarding this applicability determination, please call Greg Chomycia, of my staff, at (312) 353-8217.

Sincerely yours,

George T. Czerniak, Chief
Air Enforcement and Compliance Assurance Branch

cc: Marcia Mia, OECA
Richard Tripp, Region 7

Search Applicability Determination Index

Determination Detail

Control Number: 0100083

Category: NSPS
EPA Office: Region 5
Date: 04/19/2001
Title: Biological Processes for Ethanol Manufacturing
Recipient: Don Smith
Author: George Czerniak
Comments:

Subparts:	Part 60, NNN	SOCMI Distillation Operations
	Part 60, RRR	VOC Emissions from SOCMI Reactor Processes

Abstract:

Q: Are ethanol manufacturing facilities exempt from the requirements of NSPS RRR and NNN?

A: Yes. EPA has previously determined that ethanol manufacturing facilities may be exempted from NSPS RRR and NNN on a case-by-case basis. The ethanol facility in question here uses a biological process to ferment the converted starches in corn into ethanol. These NSPS did not envision unit operations for biological processes.

Letter:

(AE-17J)

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Don Smith, P.E., Supervisor
Major Facilities
Minnesota Pollution Control Agency - South District 520 Lafayette Road North St. Paul, Minnesota 55155

Re: Applicability of NSPS to Ethanol Manufacturing Plants

Dear Mr. Smith:

I am writing in response to your letter dated March 16, 2001, requesting that the United States Environmental Protection Agency (U.S. EPA) determine whether the Al-Corn Clean Fuel facility in Claremont, Minnesota is subject to the New Source Performance Standards (NSPS) for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 40 C.F.R. part 60, subpart NNN and the NSPS for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. part 60, subpart RRR. The U.S. EPA's Region 5, Air Enforcement and Compliance Assurance Branch and the Office of Enforcement and Compliance Assurance have coordinated this response to your request.

Facility Background
Al-Corn is a facility constructed in Claremont, MN. This facility manufactures ethanol by biological processes (fermentation) using corn as a feedstock.

Regulatory Background
The Standards of Performance for VOC Emissions From SOCMI Distillation Operations, 40 C.F.R. part 60, Subpart NNN define applicability as a distillation unit constructed, reconstructed, or modified after December 30, 1983 that "produces any of the chemicals listed in Sec. 69.667 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.667 lists ethanol as one of the chemicals affected by subpart NNN.

The Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. part 60, Subpart RRR define applicability as a reactor unit constructed, reconstructed, or modified after June 29, 1990 that "produces any of the chemicals listed in Sec. 69.707 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.707 lists ethanol as one of the chemicals affected by subpart RRR.

Discussion
U.S. EPA document 450/3-83-005b, entitled Distillation Operations in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published December 1983 discusses the scope of 40 C.F.R. part 60, Subpart NNN on page 8-23. "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis." U.S. EPA document 450/3/90-016a, entitled Reactor Processes in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published as draft June 1990 discusses the scope of 40 C.F.R. Sec. 60, Subpart RRR on page 3-2. "... a total of 173 chemicals produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis."

Conclusion
Ethanol is listed as a chemical affected by both NSPS Subparts RRR and VVV. However, background documentation created during the development of both standards indicates creation of ethanol by fermentation (biological synthesis) was excluded from the scope of both NSPS. U.S. EPA finds that NSPS RRR and NSPS VVV are not applicable to the facility in question.

If you have any questions regarding this applicability determination, please call Greg Chomycia, of my staff, at (312) 353-8217.

Sincerely yours,

George T. Czerniak, Chief
Air Enforcement and Compliance Assurance Branch

[redacted]

URL: http://cfpub.epa.gov/adi/index.cfm?CFID=1082016&CFTOKEN=57007055&requesttimeout=180

EPA
Environmental Protection Agency
Region 5 - Air and Radiation Division

Correspondence

October 20, 2000

(AR-18J)

Don Smith, Supervisor
North/South District-Major Facilities
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

Dear Mr. Smith:

The United States Environmental Protection Agency (EPA) has reviewed Air Emission Permit Nos. 04500049-003 and 03300025-005 for Pro-Corn LLC in Preston, Minnesota and Ethanol 2000 LLP in Bingham Lake, Minnesota. Both permits are state permits which amend Title I conditions applicable to each facility.

Pro-Corn and Ethanol 2000 produce fuel ethanol through biological fermentation. These plants appear to be subject to New Source Performance Standards (NSPS) for subparts NNN (distillation processes), RRR (reactor processes), and VV (equipment leaks) as they relate to the production of fuel ethanol, which are not included in the proposed permits for these sources. The EPA issued a number of memorandums to clarify the applicability of NSPS subparts NNN, RRR, and VV to sources using biological fermentation to produce organic chemicals and sources using petroleum feedstocks for synthesis of organic chemicals.

In a October 7, 1996, letter from Reggie Cheatham to George Czerniak, EPA issued a formal determination for Don Dame of Dame Engineering Incorporated regarding clarification of "beverage alcohol" as it relates to manufacturing processes that produce ethyl alcohol (ethanol) through refining petroleum products and ethyl alcohol produced through biological fermentation. The EPA's specific response to this request stated that biological fermentation processes are not covered under subparts NNN, RRR, and VV. The EPA further clarified this determination as it related to subpart VV in a letter dated September 8, 1998, entitled "Clarification of Applicability Determination for Biomass Ethanol Production". This clarification stated that process units producing fermented beverages solely for human consumption are exempt from the subpart VV, while process units used to produce industrial grade alcohols from fermentation products are subject to subpart VV.

Furthermore, according to a July 7, 1997, letter entitled "Case-by-Case Applicability Determinations for Biomass Ethanol Production", EPA explains that the intent of the October 7, 1996, letter was that it would be used by EPA to form the basis for site specific, case-by-case determinations of other similar sources. Therefore, the October 1996 letter is not a blanket determination to exempt facilities from the regulations. In order for any specific source to be exempted from any standard or regulation, it must obtain a site specific determination from the EPA.

It appears that subparts NNN, RRR, and VV currently apply to Pro-Corn and Ethanol 2000. Minnesota's State Implemetation Plan (SIP) requires a stationary source to obtain a permit if it is subject to a standard under 40 CFR part 60 or any NSPS. Our office recently received a letter from the Minnesota Pollution Control Agency (MPCA) requesting a site specific exemption for these facilities for subparts NNN and RRR, including another facility called Agra Resources Coop in Albert Lea, Minnesota. The MPCA also notified us of that the subpart VV requirements will be included in these permits. Ultimately, Pro-Corn and Ethanol 2000 must be permitted to include the appropriate NSPS requirements that apply to these sources. We also recommend that these NSPS requirements be appropriately applied to other similar sources in the State that subsequently undergo permitting, such as the state permit for Agra Resources Coop currently proposed for 30-day public comment.

We hope that the information outlined in this letter is useful to you, and will work with you to effectively resolve any concerns regarding these permits. If you have any questions on this letter, please contact Shaheerah Fateen, of my staff, at (312) 353-4779.

Sincerely yours,

/s/

Robert Miller, Chief
Permits and Grants Section

Enclosures

cc: Jenny Reinertsen, Minnesota Pollution Control Agency

AIR AND RADIATION DIVISION
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ethanol.pdf

APPENDIX E

USEPA's RACT/BACT/LAER Clearinghouse Data

Table E-1
Recent BACT/Permit Decisions - VOC from Fermentation

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Basis	Source
IA-0092	06-A-571P - 06-A-590P	04/19/2007	IA	Southwest Iowa Renewable Energy	Fermentation	Wet Scrubber	95%	BACT-PSD	RBLC Clearinghouse
IA-0082	03-A-600P-S2	04/19/2006	IA	Golden Grain Energy	Fermentation	Water Scrubber	95%	BACT-PSD	RBLC Clearinghouse
MN-0062	14300014-005	12/22/2005	MN	Heartland Corn Products	Fermentation	Absorption Column	95%	BACT-PSD	RBLC Clearinghouse
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Degasser, Beer Well, Fermenters	CO2 Scrubber	95%	Conditional Major Permit	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Fermentation and Beer Well	Scrubber	95%	BACT-PSD	State Permit Files
IA-0089	07-A-955P - 07-A-982P	08/08/2007	IA	Homeland Energy Solutions LLC, PN 06-672	Fermenters/Beerwell	Scrubber	97%	BACT-PSD	RBLC Clearinghouse
ND-0020	4004	08/04/2004	ND	Red Trail Energy, LLC - Richardton Plant	Fermentation	Wet Scrubber	97%	BACT-PSD	RBLC Clearinghouse
IA-0095	Project 08-126	09/19/2008	IA	Tate & Lyle Ingredients Americas, Inc.	Ethanol Fermentation Area	CO2 Scrubber, Distillation Scrubber & RTO	98%	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Fermentation	Packed Bed Counterflow Scrubber	98%	Other	RBLC Clearinghouse
IL-0102	5010062	11/01/2005	IL	Aventine Renewable Energy	Fermentation	CO2 Scrubber, Purge Scrubber	98%	BACT-PSD	RBLC Clearinghouse
IA-0088	57-01-080	06/29/2007	IA	Archer Daniels Midland ADM Corn Processing - Cedar Rapids	Fermentation Distillation and Dehydration	Scrubber and RTO	98%	BACT-PSD	RBLC Clearinghouse
OH-0303	01-01306	08/10/2006	OH	Asalliance Biofuels, LLC; Asa Bloominburg, LLC	Fermenting Units	CO2 Wet Scrubber; Leak Detection & Repair	98.5%	State BAT; NSPS VV	RBLC Clearinghouse
WI-0204	03-DCF-048	08/14/2003	WI	United Wisconsin Grain Producers - Fuel Grade Ethanol Plant	Fermentation Process	Wet Scrubber Packed Tower	98.7%	Other	RBLC Clearinghouse
NE-0046	CP06-0048	09/27/2007	NE	Aventine Renewable Energy - Aurora West, LLC	Fermentation Operations	CO2 Scrubber	99%	BACT-PSD	RBLC Clearinghouse
NA	2869-205-0047-S-02-0	12/28/2007	GA	Southwest Georgia Ethanol, LLC	Fermentation	Wet Scrubber	Not Specified	PSD Avoidance	State Permit Files
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Fermentation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Fermentation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	1560-00075	08/03/2004	MS	Delta Ethanol, LLC	Fermentation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Fermentation Process	CO2 Scrubber	Not Specified	Minor Construction	State Permit Files
NA	0810213-001-AC	11/15/2005	FL	United States EnviroFuels, LLC -Port Manatee Ethanol Facility	Fermentation Process	CO2 Scrubber	Not Specified	Minor Construction	State Permit Files
NA	S-06-021	02/27/2006	KY	Commonwealth Agri-Energy, LLC	Fermentation	CO2 Scrubber	Not Specified	Minor Construction/Operating	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Fermenting Operations	Scrubber & Regenerative Thermal Oxidizer	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	F-07-025	09/06/2007	KY	Kentucky 5 Star Energy, LLC	Fermentation	CO2 Scrubber	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	1050145-003-AF	03/08/2007	FL	Bartow Ethanol of Florida L.C.	Fermentation Unit	No Control	No Control	FESOP	State Permit Files
NA	V-07-024 R1	10/31/2007	KY	Constellation Spirits Inc.	Fermentation	No Control	No Control	Conditional Major Operating	State Permit Files
NA	V-0-7-0038	10/15/2007	KY	Buffalo Trace Distillery Inc.	Fermentation (includes distilling process)	No Control	No Control	Title V	State Permit Files
NA	F-06-037	12/22/2006	KY	Four Roses Distillery, LLC	Fermentation, Distillation, Beer Wells, Spent Grain Processing	No Control	No Control	Conditional Major/FESOP	State Permit Files

Table E-2
Recent BACT/Permit Decisions - VOC from Distillation

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Basis	Source
MN-0062	14300014-005	12/22/2005	MN	Heartland Corn Products	Distillation	No Control (should be Absorption Column?)	95%	BACT-PSD	RBLC Clearinghouse
NA	0430041-009	05/09/2008	MN	Corn Plus	Distillation Process	Scrubber	95%	BACT-PSD	State Permit Files
IA-0092	06-A-571P - 06-A-590P	04/19/2007	IA	Southwest Iowa Renewable Energy	DDGS Dryers & Distillation	Thermal Oxidizer	98%	BACT-PSD; NSPS	RBLC Clearinghouse
IA-0088	57-01-080	06/29/2007	IA	Archer Daniels Midland ADM Corn Processing - Cedar Rapids	Fermentation Distillation and Dehydration	Scrubber and RTO	98%	BACT-PSD	RBLC Clearinghouse
NE-0046	CP06-0048	09/27/2007	NE	Aventine Renewable Energy - Aurora West, LLC	Pre-Fermentation, Distillation and DGS Drying Operations	Regenerative Thermal Oxidizer	99%	BACT-PSD	RBLC Clearinghouse
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Distillation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Distillation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	1560-00075	08/03/2004	MS	Delta Ethanol, LLC	Distillation	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Distillation Process	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	0810213-001-AC	11/15/2005	FL	United States EnviroFuels, LLC -Port Manatee Ethanol Facility	Distillation Process	Scrubber	Not Specified	Minor Construction	State Permit Files
NA	S-06-021	02/27/2006	KY	Commonwealth Agri-Energy, LLC	Distillation	Process Blower	Not Specified	Minor Construction/Operating	State Permit Files
NA	F-07-025	09/06/2007	KY	Kentucky 5 Star Energy, LLC	Distillation	Vent Gas Scrubber	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	1050145-003-AF	03/08/2007	FL	Bartow Ethanol of Florida L.C.	Distillation	No Control	No Control	FESOP	State Permit Files
NA	V-0-7-0038	10/15/2007	KY	Buffalo Trace Distillery Inc.	Fermentation (includes distilling process)	No Control	No Control	Title V	State Permit Files
NA	F-06-037	12/22/2006	KY	Four Roses Distillery, LLC	Fermentation, Distillation, Beer Wells, Spent Grain Processing	No Control	No Control	Conditional Major/FESOP	State Permit Files

Table E-3
Recent BACT/Permit Decisions - VOC from Storage Tanks

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Basis	Source
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Storage Tanks	Floating Roof Tanks	Not Specified	Other	RBLC Clearinghouse
NA	2869-205-0047-S-02-0	12/28/2007	GA	Southwest Georgia Ethanol, LLC	Storage Tanks	Internal Floating Roof	Not Specified	PSD Avoidance	State Permit Files
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Storage Tanks	Internal Floating Roof	Not Specified	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Storage Tanks	Internal Floating Roof	Not Specified	Minor Construction	State Permit Files
NA	1560-00075	08/03/2004	MS	Delta Ethanol, LLC	Storage Tanks	Internal Floating Roof	Not Specified	Minor Construction	State Permit Files
NA	707-0022-X001	09/18/2007	AL	Dixie Biodiesel, LLC	Storage Tanks	Submerged Fill Pipe	Not Specified	Minor Construction	State Permit Files
NA	708-0029-X001, X002, X003	11/09/2007	AL	Athens Biodiesel, LLC	Storage Tanks	Submerged Fill Pipe	Not Specified	Minor Construction	State Permit Files
NA	413-0107-X001, X002	02/20/2008	AL	Alabama Biodiesel Corporation	Storage Tanks	Submerged Fill Pipe, vented to condensers	Not Specified	Synthetic Minor Operating	State Permit Files
NA	503-077-X017 - X023	?	AL	Dunhill Entities, L.P.(loading terminal for biodiesel, gasoline, ethanol)	Storage Tanks	Internal Floating Roofs	Not Specified	Minor Construction	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Storage Tanks	Submerged Fill, Internal Floating Roof	Not Specified	Minor Construction	State Permit Files
NA	0810213-001-AC	11/15/2005	FL	United States EnviroFuels, LLC -Port Manatee Ethanol Facility	Storage Tanks	Submerged Fill	Not Specified	Minor Construction	State Permit Files
NA	1310023-005-AC	01/31/2008	FL	Murphy Oil USA, Inc.	Ethanol Storage	Internal Floating Roof	Not Specified	Minor Construction	State Permit Files
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Storage Tanks	Internal Floating Roof	Not Specified	Conditional Major Permit	State Permit Files
NA	S-06-021	02/27/2006	KY	Commonwealth Agri-Energy, LLC	Storage Tanks	Internal Floating Roof	Not Specified	Minor Construction/Operating	State Permit Files
NA	S-07-037-R1	06/04/2007	KY	Countrymark Cooperative, LLP	Storage Tanks	Internal Floating Roof	Not Specified	Minor Source Operating	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Storage Tanks	Internal Floating Roof	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	F-07-025	09/06/2007	KY	Kentucky 5 Star Energy, LLC	Tanks	Internal Floating Roof	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Floating Roof Tanks	Internal Floating Roof	Not Specified	BACT-PSD	State Permit Files
OH-0303	01-01306	08/10/2006	OH	Asalliance Biofuels, LLC; Asa Bloominburg, LLC	Ethanol Storage Tanks	No Control	No Control	State BAT; NSPS	RBLC Clearinghouse
NA	0380-00055	07/31/2006	MS	Tri States Petroleum Products LLC	Ethanol, Biodiesel, and Glycerine Storage Tanks	No Control	No Control	Minor Construction	State Permit Files
NA	1050145-003-AF	03/08/2007	FL	Bartow Ethanol of Florida L.C.	Process and Storage Tanks	No Control	No Control	FESOP	State Permit Files
NA	F-03-024	12/22/2003	KY	Heaven Hill Distilleries, Inc.	Outside Ethanol Storage Tanks	No Control	No Control	Conditional Major Operating	State Permit Files

Table E-4
Recent BACT/Permit Decisions - VOC from Product Loadout

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Basis	Source
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Truck and Rail Loadout	Flare	97%	Conditional Major Permit	State Permit Files
IA-0095	Project 08-126	09/19/2008	IA	Tate & Lyle Ingredients Americas, Inc.	Ethanol Truck Loadout	Flare	98%	BACT-PSD	RBLC Clearinghouse
IA-0095	Project 08-126	09/19/2008	IA	Tate & Lyle Ingredients Americas, Inc.	Ethanol Rail Loadout	Flare	98%	BACT-PSD	RBLC Clearinghouse
IA-0089	07-A-955P - 07-A-982P	08/08/2007	IA	Homeland Energy Solutions LLC, PN 06-672	Product Loadout	Flare	98%	BACT-PSD	RBLC Clearinghouse
IA-0088	57-01-080	06/29/2007	IA	Archer Daniels Midland ADM Corn Processing - Cedar Rapids	Alcohol Rail Loadout	Flare	98%	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Ethanol Loadout	Flare	98%	Other	RBLC Clearinghouse
IA-0092	06-A-571P - 06-A-590P	04/19/2007	IA	Southwest Iowa Renewable Energy	Ethanol Loadout	Flare	98%	BACT-PSD; NSPS VV	RBLC Clearinghouse
NA	S-07-037-R1	06/04/2007	KY	Countrymark Cooperative, LLP	Loading Rack	Flare	98%	Minor Source Operating	State Permit Files
IA-0082	03-A-600P-S2	04/19/2006	IA	Golden Grain Energy	Ethanol Loadout	Flare	99%	BACT-PSD; NSPS	RBLC Clearinghouse
NA	2869-205-0047-S-02-0	12/28/2007	GA	Southwest Georgia Ethanol, LLC	Product Loadout	Flare	Not Specified	PSD Avoidance	State Permit Files
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Ethanol and Industrial Grade Alcohol Loadout	Flare	Not Specified	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Ethanol and Industrial Grade Alcohol Loadout	Flare	Not Specified	Minor Construction	State Permit Files
NA	1560-00075	08/03/2004	MS	Delta Ethanol, LLC	Ethanol Loadout	Afterburner (Flare)	Not Specified	Minor Construction	State Permit Files
NA	503-077-X017 - X023	?	AL	Dunhill Entities, L.P.(loading terminal for biodiesel, gasoline, ethanol)	Loading Operations	Vapor Combustion Unit (Flare)	Not Specified	Minor Construction	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Ethanol Loadout	Flare	Not Specified	Minor Construction	State Permit Files
NA	0810213-001-AC	11/15/2005	FL	United States EnviroFuels, LLC -Port Manatee Ethanol Facility	Ethanol Loadout	Flare	Not Specified	Minor Construction	State Permit Files
NA	1310023-005-AC	01/31/2008	FL	Murphy Oil USA, Inc.	Loading Rack	Vapor Combustion Unit (Flare)	Not Specified	Minor Construction	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Ethanol Loadout	Flare	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	F-07-025	09/06/2007	KY	Kentucky 5 Star Energy, LLC	Ethanol Loadout	Regenerative Thermal Oxidizer	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	1050145-003-AF	03/08/2007	FL	Bartow Ethanol of Florida L.C.	Loadout	No Control	No Control	FESOP	State Permit Files

Table E-5
Recent BACT/Permit Decisions - VOC from Wastewater Treatment

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Corresponding Highlands Ethanol Process	Control Technology	Control Efficiency	Basis	Source
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Anaerobic Wastewater Treatment Module	Wastewater Treatment	Flare	98%	Conditional Major Permit	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Anaerobic Wastewater Treatment Module	Wastewater Treatment	Flare	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	V-0-7-0038	10/15/2007	KY	Buffalo Trace Distillery Inc.	Wastewater Treatment Process	Wastewater Treatment	No Control	No Control	Title V	State Permit Files
NA	V-07-024 R1	10/31/2007	KY	Constellation Spirits Inc.	Wastewater Treatment Process	Wastewater Treatment	No Control	No Control	Conditional Major Operating	State Permit Files

Table E-6
Recent BACT/Permit Decisions - VOC from Biomass Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OH-0269	07-00534	01/05/2004	OH	Biomass Energy, LLC - South Point Power	7 Wood Fired Boilers	Catalytic Oxidation	25%	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0307	07-00534	04/04/2006	OH	Biomass Energy - South Point Biomass Generation	7 Wood Fired Boilers	Good Combustion Practices and Oxidation Catalyst	Not Specified	0.013 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0083	0117-AOP-R4	07/26/2005	AR	Potlatch Corporation - Ozan Unit	Wood Fired Boiler	Good Combustion Practices	Not Specified	0.034 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0084	0117-AOP-R4	07/26/2005	AR	Potlatch Corporation - Ozan Unit	Wood Fired Boiler	Good Combustion Practices	Not Specified	0.034 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NH-0013	TP-B-0501	10/25/2004	NH	Public Service of New Hampshire - Schiller Station	Circulating Fluidized Bed Wood Fired Boiler No. 5	Good Combustion Practices	Not Specified	0.005 lb/MMBtu (24-hr)	Other	RBLC Clearinghouse
GA-0114	2631-115-0021-V-01-4	10/13/2004	GA	Inland Paperboard and Packaging - Rome Linerboard Mill	Solid Fuel Boiler (Bark)	Staged Combustion and Good Combustion Practices	Not Specified	0.05 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
FL-0257	PSD-FL-333	11/18/2003	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse External Combustion	Good Combustion and Operating Practices	Not Specified	0.05 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0178	PSD-LA-77(M-2)	11/14/2003	LA	Boise Cascade Corp - Deridder Paper Mill	Wood Fired Boiler (Bark)	Good Equipment Design and Proper Combustion Techniques	Not Specified	0.034 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0218	PSD-LA-718	07/18/2007	LA	Boise Building Solutions Manufacturing, LLC - Florien Plywood Plant	Hogged Fuel Fired Boiler (wood)	High Pressure Overfire Air, Good Combustion	Not Specified	0.017 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	1,529 MMBtu/hr Fluidized Bed Biomass Boilers	Combustion Controls	Not Specified	0.020 lb/MMBtu	PSD Application	State Permit Files
NA	PSD-FL-333A	11/03/2004	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 8 - Bagasse	Good Combustion Practices	Not Specified	0.05 lb/MMBtu	PSD Construction	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	Good combustion	Not Specified	0.02 lb/MMBtu	BACT-PSD	State Permit Files
WA-0327	PSD-05-04	01/25/2006	WA	Sierra Pacific Industries - Skagit County Lumber Mill	Bark/Wood Waste Fired Cogeneration Boiler	No Control	No Control	0.019 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	2676-095-0071-V-01-8	10/24/2007	GA	The Procter & Gamble Paper Products Company	216 MMBtu/hr Biomass Boiler	No Control	No Control	0.03 lb/MMBtu (biomass); 0.0015 lb/MMBtu (oil)	Title V	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Fluidized Bed Boiler	No Control	No Control	10 ppmdv or 95% destruction	BACT-PSD	State Permit Files

Table E-7
Recent BACT/Permit Decisions - VOC from Back-up Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OR-0046	24-0047	01/06/2005	OR	Calpine - Turner Energy Center LLC	Auxiliary Boiler - Natural Gas	Oxidation Catalyst	90%	0.0044 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethenol, LLC	Auxiliary Boiler - Natural Gas and No. 2 Oil	Good Combustion Practices	Not Specified	0.0014 lb/MMBtu (gas); 0.0054 lb/MMBtu (#2 oil)	Other	RBLC Clearinghouse
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler, No. 2 oil	Combustion Controls	Not Specified	0.0015 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0079	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler, No. 2 oil	Combustion Controls	Not Specified	0.0015 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GeEPD	2008	GA	Yellow Pine Energy Company, LLC	25 MMBtu/hr Oil Fired Auxiliary Boiler	Combustion Controls	Not Specified	0.0024 lb/MMBtu	PSD Application	State Permit Files
MN-0066	05300015-004	05/16/2006	MN	Northern States Power Company/XCEL Energy - Riverside Plant	Auxiliary Boiler-Natural Gas	Good Combustion	Not Specified	0.005 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Auxiliary Boiler-Natural Gas	Good Combustion Control, and Clean Burning Low Sulfur Fuel	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Auxiliary Nat Gas Fired Boiler	Natural Gas, Good Combustion Practices	Not Specified	0.0054 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Auxiliary Boiler-Natural Gas	Good Combustion Practices, Use of Natural Gas	Not Specified	0.0054 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0310	06-08138	02/07/2008	OH	American Municipal Power Generating Station	Auxiliary Boiler - Natural Gas	No Control	No Control	5.5 lb/MMCF	BACT-PSD	RBLC Clearinghouse
GA-0127	4911-067-0003-V-02-2	01/07/2008	GA	Southern Company/Georgia Power - Plant McDonough	Auxiliary Boiler - Natural Gas	No Control	No Control	0.0051 lb/MMBtu	LAER	RBLC Clearinghouse
TX-0499	PSD-TX 1039 AND 70861	07/24/2006	TX	Sandy Creek Energy Station	Auxiliary Boiler - Natural Gas	No Control	No Control	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse

Table E-8
Recent BACT/Permit Decisions - VOC from Emergency Engines

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
LA-0224	PSD-LA-726	03/20/2008	LA	Southwest Electric Power Company - Arsenal Hill Power Plant	Diesel Fire Pump	Low Sulfur Fuel, Limit Operating Hours, Proper Engine Maintenance	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0084	Project Number 06-203	11/30/2006	IA	ADM Corn Processing - Clinton ADM Polymers	Fire Pump Engine	Good Combustion Practices	Not Specified	3 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OK-0100	2004-198-TV	10/21/2005	IA	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	0.0025 lb/hp-hr	Other	RBLC Clearinghouse
OK-0111	2004-198-C (M-1)	10/14/2005	OK	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	0.0025 lb/hp-hr	BACT-PSD	RBLC Clearinghouse
LA-0192	PSD-LA-704	06/06/2005	LA	Crescent City Power	Diesel Fire Water Pump	Good Engine Design and Proper Operating Practices	Not Specified	0.05 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
LA-0194	PSD-LA-703	11/24/2004	LA	Sabine Pass LNG Import Terminal	Firewater Booster Pump Diesel Engines	Good Engine Design, Proper Operating Practices	Not Specified	0.15 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Diesel Booster Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Main Fire Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Fire Water Pump	Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0067	Project 02-528	06/17/2003	IA	Midamerican Energy Company	Diesel Fire Pump	Good Combustion Practices	Not Specified	0.35 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OK-0090	2001-157-C M-1 PSD	03/21/2003	OK	Duke Energy Stephens, LLC	Fire Water Pump	Engine Design	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Generator	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Firewater Pump	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Fire Water Pump	No Control	No Control	1.1 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Back-up Generators	No Control	No Control	0.75 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0275	14-04682	08/24/2004	OH	Cinergy - PSI Energy - Madison Station	Emergency Diesel Fire Pump	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse

Table E-9
Recent BACT/Permit Decisions - VOC from Equipment Leaks

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Basis	Source
IA-0089	07-A-955P - 07-A-982P	08/08/2007	IA	Homeland Energy Solutions LLC, PN 06-672	Equipment Leaks	Best Practices	Not Specified	BACT-PSD	RBLC Clearinghouse
OH-0303	01-01306	08/10/2006	OH	Asaliance Biofuels, LLC; Asa Bloominburg, LLC	Fugitive VOC Emission Leaks from Process Units	Leak Detection and Repair Program	Not Specified	BACT-PSD; NSPS VV	RBLC Clearinghouse
IA-0082	03-A-600P-S2	04/19/2006	IA	Golden Grain Energy	Fugitive Leaks	Leak Detection and Repair Program	Not Specified	BACT-PSD; NSPS VV	RBLC Clearinghouse
IL-0102	5010062	11/01/2005	IL	Aventine Renewable Energy	Leaking Components	Leak Detection and Repair Program	Not Specified	BACT-PSD; NSPS	RBLC Clearinghouse
NA	2869-205-0047-S-02-0	12/28/2007	GA	Southwest Georgia Ethanol, LLC	Equipment Leaks	Leak Detection and Repair Program	Not Specified	PSD Avoidance	State Permit Files
NA	2640-00054	05/03/2006	MS	Three Rivers Biofuels, LLC	Fugitive Methanol Emissions from Equipment	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Fugitive Components	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Fugitive Components	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	1560-00075	08/03/2004	MS	Delta Ethanol, LLC	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	707-0022-X001	09/18/2007	AL	Dixie Biodiesel, LLC	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	708-0029-X001, X002, X003	11/09/2007	AL	Athens Biodiesel, LLC	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	413-0107-X001, X002	02/20/2008	AL	Alabama Biodiesel Corporation	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Synthetic Minor Operating	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	0810213-001-AC	11/15/2005	FL	United States EnviroFuels, LLC -Port Manatee Ethanol Facility	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Minor Construction	State Permit Files
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Fugitives	Leak Detection and Repair Program	Not Specified	Conditional Major Permit	State Permit Files
NA	S-06-021	02/27/2006	KY	Commonwealth Agri-Energy, LLC	Fugitives	Leak Detection and Repair Program	Not Specified	Minor Construction/Operating	State Permit Files
NA	S-07-037-R1	06/04/2007	KY	Countrymark Cooperative, LLP	Pipeline Equipment	Best Management Practices	Not Specified	Minor Source Operating	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	F-07-025	09/06/2007	KY	Kentucky 5 Star Energy, LLC	Equipment Leaks	Leak Detection and Repair Program	Not Specified	Conditional Major/Synthetic Minor	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Valves, Flanges, Etc.	Leak Detection and Repair Program	Not Specified	BACT-PSD	State Permit Files
NA	1050145-003-AF	03/08/2007	FL	Bartow Ethanol of Florida L.C.	Equipment Leaks	No Control (Recordkeeping only)	No Control	FESOP	State Permit Files
NA	F-03-024	12/22/2003	KY	Heaven Hill Distilleries, Inc.	Equipment Leaks	No Control	No Control	Conditional Major Operating	State Permit Files

Table E-10
Recent BACT/Permit Decisions - PM/PM-10 from Lime Handling

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Material Handling - Lime Handling Transfer Points	Baghouse	91%	0.01 gr/dscf	BACT-PSD	RBLC Clearinghouse
AR-0082	0045-AOP-R3	08/30/2005	AR	Arkansas Lime Company	Lime Storage Silo Dust Collectors	Dust Collector	99%	0.015 gr/dscf	BACT-PSD	RBLC Clearinghouse
AR-0082	0045-AOP-R3	08/30/2005	AR	Arkansas Lime Company	Lime Loadout Dust Collector	Dust Collector	99%	0.015 gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0202	PSD-LA-711	02/23/2006	LA	CLECO Power, LLC - Rodemacher Brownfield Unit	Lime Silo	Baghouse	99%	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
SC-0104	0420-0030-CI	02/05/2004	SC	Santee Cooper - Cross Generating Station	Limestone Handling	Baghouse	99%	0.022 gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0122	PSD-LA-93 (M-6)	08/14/2001	LA	International Paper Company - Mansfield Mill	Lime Slaker	Wet Scrubber	99.5%	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
CO-0055	05PR0027	02/03/2006	CO	Lamar Light & Power Power Plant	Limestone Handling/Processing/Storage	Baghouse	99.5%	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
ND-0024	PTC07026	09/14/2007	ND	Great River Energy - Spiritwood Station	Lime, Limestone, and Ash Handling	Baghouse	99.9%	0.005 gr/dscf	BACT-PSD	RBLC Clearinghouse
ND-0021	PTC 05005	06/03/2005	ND	Montana Dakota Utilities/Westmoreland Power - Gascoyne Gen. Sta.	Lime, Limestone, and Ash Handling	Baghouse	99.9%	0.005 gr/dscf	BACT-PSD	RBLC Clearinghouse
OH-0270	03-13527	10/14/2003	OH	Carmeuse Lime Inc. - Maple Grove Facility	Lime Material Handling #2	Baghouse	Not Specified	0.01 gr/dscf	BACT-PSD	RBLC Clearinghouse
AL-0220	411-0039-X026 – X032	03/23/2005	AL	Chemical Lime Company - O'Neal Plant	Lime Product Handling and Storage	Baghouse	Not Specified	0.005 gr/dscf and 0.009 gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0202	PSD-LA-711	02/23/2006	LA	CLECO Power, LLC - Rodemacher Brownfield Unit	Limestone Rock Silo	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
WI-0233	05-DCF-412	08/16/2006	WI	Cutler Magner Company - Superior	Lime Storage and Handling	Baghouse	Not Specified	0.0114 gr/dscm	BACT-PSD	RBLC Clearinghouse
LA-0221	PSD-LA-720	11/30/2007	LA	Entergy Louisiana LLC - Little Gypsy Generating Plant	Activated Carbon & Lime Silos	Baghouse	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
TX-0485	PSD-TX-684M1 /9654A/833M1	10/05/2004	TX	Inland Paperboard and Packaging - Orange Mill	Lime Silo	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0207	PSD-LA-93(M-7)	07/22/2004	LA	International Paper Company - Mansfield Mill	Lime Slaker	Wet Scrubber	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0223	PSD-LA-660(M-1)	01/08/2008	LA	Louisiana Generating, LLC - Big Cajun I Power Plant	Lime Silo	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0223	PSD-LA-660(M-1)	01/08/2008	LA	Louisiana Generating, LLC - Big Cajun I Power Plant	Limestone Storage Dome	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0223	PSD-LA-660(M-1)	01/08/2008	LA	Louisiana Generating, LLC - Big Cajun I Power Plant	Limestone Silo and Crusher	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
WI-0225	02-RV-147	12/03/2003	WI	Manitowoc Public Utilities	Lime Storage Silo	Baghouse	Not Specified	No numerical limit	Other	RBLC Clearinghouse
AR-0078	1139-AOP-R5	06/09/2003	AR	Nucor Corporation	Lime Silo	Baghouse	Not Specified	0.0005 gr/dscf	BACT-PSD	RBLC Clearinghouse
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Material Handling - Lime	Baghouse	Not Specified	Not specified in gr/dscf	BACT-PSD	RBLC Clearinghouse
CO-0057	04UNITPB1015	07/05/2005	CO	Public Service Company of Colorado - Comanche Station	Lime Slaker	Scrubber	Not Specified	0.015 gr/dscf	BACT-PSD	RBLC Clearinghouse
CO-0057	04UNITPB1015	07/05/2005	CO	Public Service Company of Colorado - Comanche Station	Lime Silo	Baghouse	Not Specified	0.01 gr/dscf	BACT-PSD	RBLC Clearinghouse
IA-0095	PROJECT 08-126	09/19/2008	IA	Tate & Lyle Ingredients Americas, Inc.	Lime Silo	Dust Collector	Not Specified	0.005 gr/dscf	BACT-PSD	RBLC Clearinghouse
IA-0086	02-111	05/03/2007	IA	University of Northern Iowa	#4 Limestone System - Silo	Baghouse	Not Specified	0.005 gr/dscf	BACT-PSD	RBLC Clearinghouse
WV-0024	R14-0028	04/26/2006	WV	Western Greenbriar Cogeneration LLC	Limestone Handling	Baghouse	Not Specified	0.01 gr/dscf	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Lime Day Bin Vent	Baghouse	Not Specified	0.01 gr/dsc	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Lime Storage Silo Bin Vent	Baghouse	Not Specified	0.01 gr/dscf	BACT-PSD	RBLC Clearinghouse

Table E-11
Recent BACT/Permit Decisions - PM/PM-10 from Cooling Towers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Basis	Source
FL-0299	PSD-FL-392	10/12/2007	FL	Progress Energy Florida - Crystal River Power Plant	Cooling Towers	0.0005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
FL-0294	1010017-008-AC	12/22/2006	FL	Progress Energy Florida - Anclote Power Plant	Cooling Towers	0.0005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
AZ-0047	1001653	12/01/2004	AZ	Dome Valley Energy Partners - Wellton Mohawk Generating Station	Mechanical Draft Cooling Towers	0.0005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
AZ-0049	1001743	09/04/2003	AZ	Allegheny Energy Supply, LLC - La Paz Generating Facility	Mechanical Draft Cooling Towers for GE Turbines	0.0005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
AZ-0049	1001743	09/04/2003	AZ	Allegheny Energy Supply, LLC - La Paz Generating Facility	Mechanical Draft Cooling Towers for Siemens Turbines	0.0005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
LA-0191	PSD-LA-700	10/12/2004	LA	Entergy New Orleans, Inc. - Michoud Electric Generating Plant	Cooling Towers	0.001% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	Cooling Tower	0.001% Drift Eliminator	PSD Application	State Permit Files
LA-0206	PSD-LA-667(M-1)	02/18/2004	LA	ExxonMobil Refining and Supply Co - Baton Rouge Refinery	Cooling Towers	0.003% Drift Eliminators	BACT-PSD	RBLC Clearinghouse
IA-0092	06-A-571P - 06-A-590P	04/19/2007	IA	Southwest Iowa Renewable Energy	Cooling Towers	0.005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
WY-0064	CT-4631	10/15/2007	WY	Basin Electric Power Cooperative - Dry Fork Station	Cooling Towers	0.005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
OH-0303	01-01306	08/10/2006	OH	Asaliance Biofuels, LLC; Asa Bloominburg, LLC	Cooling Tower	0.005% Drift Eliminator	State BAT	RBLC Clearinghouse
IL-0102	5010062	11/01/2005	IL	Aventine Renewable Energy	Cooling Tower	0.005% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
WI-0204	03-DCF-048	08/14/2003	WI	United Wisconsin Grain Producers - Fuel Grade Ethanol Plant	Cooling Towers	0.005% Drift Eliminator	Other	RBLC Clearinghouse
NV-0047	114	02/26/2008	NV	99 Civil Engineer Squadron of USAF - Nellis AFB	Cooling Towers	0.005% Drift Eliminator, Limits on Water Flow Rate and Solids Content	Other	RBLC Clearinghouse
WI-0207	03-DCF-184	01/21/2004	WI	Ace Ethanol - Stanley	Cooling Towers	0.005% Drift Eliminators	BACT-PSD	RBLC Clearinghouse
NC-0112	08680T09	11/23/2004	NC	Nucor Steel	Cooling Towers	0.008% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
NC-0113	08680T09	11/23/2004	NC	Nucor Steel	Cooling Towers	0.008% Drift Eliminator	BACT-PSD	RBLC Clearinghouse
NA	V-0-7-0038	10/15/2007	KY	Buffalo Trace Distillery Inc.	Cooling Tower	Best Management Practices	Title V	State Permit Files
NA	F-03-024	12/22/2003	KY	Heaven Hill Distilleries, Inc.	Bottling House Cooling Tower	Best Management Practices	Conditional Major Operating	State Permit Files
LA-0148	PSD-LA-727	05/28/2008	LA	Red River Enviromental Products, LLC - Activated Carbon Facility	Cooling Towers	Drift Elimination System	BACT-PSD	RBLC Clearinghouse
LA-0213	PSD-LA-619(M-2)	02/08/2007	LA	Valero Refining - New Orleans, LLC - SL Charles Refinery	Cooling Towers	Drift Eliminators	BACT-PSD	RBLC Clearinghouse
AR-0077	2062-AOP-R0	07/22/2004	AR	Steelcorr, Inc. - Bluewater Project	Cooling Towers	Drift Eliminators	BACT-PSD	RBLC Clearinghouse
ID-0015	T1-9507-114-1	04/05/2004	ID	J.R. Simplot Company - Don Siding Plant	Cooling Towers, Reclaim	Drift Eliminators	RACT	RBLC Clearinghouse
IN-0108	107-16823-00038	11/21/2003	IN	Nucor Steel	Cooling Towers	Drift Eliminators	BACT-PSD	RBLC Clearinghouse
LA-0204	PSD-LA-709	07/27/2005	LA	Shintech Louisiana, LLC - Plaquemine PVC Plant	VCM Cooling Towers	Good Design, Maintenance, Integrated Drift Eliminators	BACT-PSD	RBLC Clearinghouse
SC-0104	0420-0030-CI	02/05/2004	SC	Santee Cooper - Cross Generating Station	Cooling Towers	No Control	Other	RBLC Clearinghouse
NA	2640-00054	05/03/2006	MS	Three Rivers Biofuels, LLC	Cooling Tower	No Control	Minor Construction	State Permit Files
NA	0240-00092	05/01/2006	MS	Southern Ethanol Company, LLC - Rosedale	Cooling Tower	No Control	Minor Construction	State Permit Files
NA	1840-00078	09/22/2006	MS	Southern Ethanol Company, LLC - Amory	Cooling Tower	No Control	Minor Construction	State Permit Files
NA	F-07-047	11/27/2007	KY	The Four Rivers BioEnergy Company, Inc.	Cooling Tower	No Control	Conditional Major/Synthetic Minor	State Permit Files
NA	F-06-033	08/31/2006	KY	Bluegrass Bioenergy, LLC	Cooling Tower	Not Specified	Conditional Major Permit	State Permit Files

Table E-12
Recent BACT/Permit Decisions - PM/PM-10 from Biomass Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Pollutant	Control Technology	Control Efficiency	Emission Limit	Basis	Source
LA-0188	PSD-LA-698	11/23/2004	LA	Inland Paperboard and Packaging - Bogalusa Mill	No. 12 Hogged Fuel Boiler (Bark)	PM-10	Wet Scrubber	80%	0.15 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0059	13700027-003	06/30/2005	MN	Hibbing Public Utilities	Wood Fired Boiler	PM-10	ESP	90%	0.025 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
ND-0022	PTC06004	05/01/2006	ND	Archer Daniels Midland Company - Northern Su n	Wood/Hull Fired Boiler	PM	ESP	95%	0.08 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0269	07-00534	01/05/2004	OH	Biomass Energy, LLC - South Point Power	7 Wood Fired Boilers	PM-10	Baghouse	98%	0.0125 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0056	13700028-005	06/30/2005	MN	City of Virginia Department of Public Utilities	Wood Fired Boiler	PM-10	ESP	98%	0.025 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	0430041-009	05/09/2008	MN	Corn Plus	Fluidized Bed Boiler	PM-10	Baghouse	99%	0.8 lb/MMBtu	BACT-PSD	State Permit Files
NH-0013	TP-B-0501	10/25/2004	NH	Public Service of New Hampshire - Schiller Station	Circulating Fluidized Bed Wood Fired Boiler No. 5	PM-10	Baghouse	99%	0.025 lb/MMBtu (no avg); 0.03 lb/MMBtu (30 day); 0.01 lb/hr (24hr)	MACT	RBLC Clearinghouse
WA-0327	PSD-05-04	01/25/2006	WA	Sierra Pacific Industries - Skagit County Lumber Mill	Bark/Wood Waste Fired Cogeneration Boiler	PM-10	ESP	99%	0.02 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0335	PSD-06-02	05/22/2007	WA	Simpson Paper Company - Simpson Tacoma Kraft Company, LLC	Wood Waste Boiler	PM-10	ESP	99%	0.02 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
FL-0257	PSD-FL-333	11/18/2003	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse External Combustion	PM	Wet Cyclone and ESP	99%	0.026 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	1,529 MMBtu/hr Fluidized Bed Biomass Boilers	PM-10	Baghouse	99%	0.033 lb/MMBtu	PSD Application	State Permit Files
OH-0307	07-00534	04/04/2006	OH	Biomass Energy - South Point Biomass Generation	7 Wood Fired Boilers	PM-10	Baghouse	Not Specified	0.0064 gr/dscf	BACT-PSD	RBLC Clearinghouse
LA-0218	PSD-LA-716	07/18/2007	LA	Boise Building Solutions Manufacturing, LLC - Florien Plywood Plant	Hogged Fuel Fired Boiler (wood)	PM-10	Multiclones, Venturi Scrubber, Good Combustion Practices	Not Specified	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0329	PSD-03-04	02/11/2005	WA	Darrington Energy Cogeneration Power Plant	Wood Waste Fired Boiler	PM-10	ESP	Not Specified	0.02 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4911-119-0025-E-03-0	07/29/2008	GA	Earth Resources, Inc. - Plant Carl	400 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	PM	ESP	Not Specified	0.03 lb/MMBtu	Title V; PSD Avoidance	State Permit Files
NA	4991-119-0025-E-02-0	10/31/2006	GA	Earth Resources, Inc. - Plant Carl	335 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	PM	ESP	Not Specified	0.03 lb/MMBtu	Title V; PSD Avoidance	State Permit Files
WA-0336	PSD-06-01	11/17/2006	WA	Grays Harbor Paper, LP	Wood Waste Boiler	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0336	PSD-06-01	11/17/2006	WA	Grays Harbor Paper, LP	Industrial Sized Boiler (wood waste)	PM-10	Primary and Secondary Multiclones, Packed Bed Wet Venturi Scrubber	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4911-149-0008-E-01-0	06/10/2008	GA	Greenway Renewable Power, LLC	719 MMBtu/hr Wood Biomass Boiler	PM	Baghouse	Not Specified	0.03 lb/MMBtu	Title V; PSD Avoidance	State Permit Files
GA-0114	2631-115-0021-V-01-4	10/13/2004	GA	Inland Paperboard and Packaging - Rome Linerboard Mill	Solid Fuel Boiler (Bark)	PM-10	ESP	Not Specified	0.025 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0074	13900114	08/23/2007	MN	Koda Energy	Biomass Boiler 3	PM	Cyclone and ESP	Not Specified	0.037 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0074	13900114	08/23/2007	MN	Koda Energy	Biomass Boiler 1	PM	Cyclone and ESP	Not Specified	0.03 lb/MMBtu on biomass	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 1-2 Case 1 - Bagasse	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 1-2 Case 2 - Bagasse	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 3-4 Case 1 - Bagasse	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 3-4 Case 2 - Bagasse	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 6 - Bagasse	PM-10	Multiclones and Wet Scrubbers	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	05600T10	11/15/2006	NC	Suez Energy BioPower, Inc. - North Cove	Wood/Carpet Waste-Fired Boiler	PM	Multiclone and Variable Throat Venturi	Not Specified	0.38 lb/MMBtu (wood)	Title V; PSD Avoidance	State Permit Files
NA	2676-095-0071-V-01-8	10/24/2007	GA	The Procter & Gamble Paper Products Company	216 MMBtu/hr Biomass Boiler	PM	Wet ESP	Not Specified	0.03 lb/MMBtu (biomass); 0.024lb/MMBtu (oil)	Title V	State Permit Files
NA	PSD-FL-389	12/06/2007	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 7 - Permitting of Wood Chips	PM	Wet sand separator and ESP	Not Specified	0.03 lb/MMBtu; 22 lb/hr	PSD Construction	State Permit Files
NA	PSD-FL-333A	11/03/2004	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 8 - Bagasse	PM-10	Wet Cyclone and ESP	Not Specified	0.026 lb/MMBtu	PSD Construction	State Permit Files
NA	2048-205-0037-V-03-0	12/03/2002	GA	Wind Gap Farms	87.5 MMBtu/hr Wood Fired Boiler	PM	Scrubber	Not Specified	Not specified in lb/MMBtu	Title V	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	PM-10	Baghouse	Not Specified	0.015 lb/MMBtu front half; 0.032 lb/MMBtu total	BACT-PSD	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	PM	Baghouse	Not Specified	0.015 lb/MMBtu front half; 0.032 lb/MMBtu total	BACT-PSD	State Permit Files

Table E-13
Recent BACT/Permit Decisions - PM/PM-10 from Auxiliary Distillate and Natural Gas Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	RBLC Process Type	Process	Pollutant	Control Technology	Control Efficiency	Emission Limit	Basis	Source
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Distillate Oil Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Distillate Oil	PM-10	Low Ash Fuel	Not Specified	0.0071 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0079	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Distillate Oil Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Distillate Oil	PM-10	Low Ash Fuel	Not Specified	0.0071 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	NA	Auxiliary Boiler - Distillate Oil	PM-10	Low Ash Fuel	Not Specified	0.017 lb/MMBtu	PSD Application	State Permit Files
OR-0046	24-0047	01/06/2005	OR	Calpine - Turner Energy Center LLC	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM-10	Use of Natural Gas	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM-10	Low NOx Burners, Good Combustion Control, and Clean Burning Low Sulfur Fuel	Not Specified	0.007 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM-10	Clean Fuels and Good Combustion Practices	Not Specified	0.0022 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM-10	Natural Gas Only, Good Combustion Practices	Not Specified	0.0075 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0310	06-08138	02/07/2008	OH	American Municipal Power Generating Station	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM-10	No Control	No Control	7.6 lb/MMCF	BACT-PSD	RBLC Clearinghouse
TX-0499	PSD-TX 1039 AND 70861	07/24/2006	TX	Sandy Creek Energy Station	Natural Gas Boilers 100-250 MMBtu/hr	Auxiliary Boiler - Natural Gas	PM	No Control	No Control	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Alcohol Production	Auxiliary Boiler-Natural Gas and Distillate Oil	PM-10	Limited Operating House & Good Combustion Practices	Not Specified	0.0075 lb/MMBtu (gas); 0.017 lb/MMBtu (#2 oil)	BACT-PSD	RBLC Clearinghouse

Table E-14
Recent BACT/Permit Decisions - PM/PM-10 from Emergency Engines

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
CA-1144	SE 02-01	04/25/2007	CA	Caithness Blythe II, LLC - Blythe Energy Project II	Fire Pump	0.05% Sulfur Fuel	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
LA-0192	PSD-LA-704	06/06/2005	LA	Crescent City Power	Diesel Fire Water Pump	Good Engine Design and Proper Operating Practices	Not Specified	0.15 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OK-0100	2004-198-TV	10/21/2005	OK	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	0.0022 lb/hp-hr	Other	RBLC Clearinghouse
OK-0111	2004-198-C (M-1)	10/14/2005	OK	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	0.0022 lb/hp-hr	BACT-PSD	RBLC Clearinghouse
OK-0090	2001-157-C M-1 PSD	03/21/2003	OK	Duke Energy Stephens, LLC	Fire Water Pump	Combustion Control and Good Engine Design	Not Specified	0.31 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0254	06-06792	08/14/2003	OH	Duke Energy Washington County LLC	Emergency Diesel Fire Pump Engine	Low Sulfur Fuel, Combustion Control	Not Specified	1 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NA	4911-149-0008-E-01-0	06/10/2008	GA	Greenway Renewable Power, LLC	1500 kW Biodiesel Emergency Generator	200 hr/yr (100 hr/yr non-emergency time); 0.05% Sulfur Fuel (0.0015% after 10/1/10)	Not Specified	0.15 g/hp-hr	Title V; PSD Avoidance	State Permit Files
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Fire Water Pump	Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
CA-1073	418342	08/14/2003	CA	Los Angeles County Probation/FAC Planning/ISD	Fire Pump, Compression Ignition	Operation Limited to 200 hr/yr	Not Specified	0.14 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0067	Project 02-528	06/17/2003	IA	Midamerican Energy Company	Diesel Fire Pump	Good Combustion Practices	Not Specified	0.31 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0194	PSD-LA-703	11/24/2004	LA	Sabine Pass LNG Import Terminal	Firewater Booster Pump Diesel Engines	Low Sulfur Fuel, Good Engine Design, Proper Operating Practices	Not Specified	0.09 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
LA-0224	PSD-LA-726	03/20/2008	LA	Southwest Electric Power Company - Arsenal Hill Power Plant	Diesel Fire Pump	Low Sulfur Fuel, Limit Operating Hours, Proper Engine Maintenance	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Diesel Booster Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Main Fire Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0275	14-04682	08/24/2004	OH	Cinergy - PSI Energy - Madison Station	Emergency Diesel Fire Pump	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Fire Water Pump	No Control	No Control	1.1 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Back-up Generators	No Control	No Control	0.4 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Generator	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Firewater Pump	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NE-0031	58343C01	03/09/2005	NE	Omaha Public Power District - Nebraska City Station	Emergency Generator	No Control	No Control	Not specified in lb/hp-hr or g/bhp-hr	Other	RBLC Clearinghouse

Table E-15
Recent BACT/Permit Decisions - NOx from Biomass Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
WA-0327	PSD-05-04	01/25/2006	WA	Sierra Pacific Industries - Skagit County Lumber Mill	Bark/Wood Waste Fired Cogeneration Boi	SNCR	48%	0.13 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
FL-0257	PSD-FL-333	11/18/2003	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse External Combustion	SNCR with Good Combustion and Operating Practices	50%	0.14 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0058	13700028-005	06/30/2005	MN	City of Virginia Department of Public Utilities	Wood Fired Boiler	SNCR	50%	0.15 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0059	13700027-003	06/30/2005	MN	Hibbing Public Utilities	Wood Fired Boiler	SNCR	50%	0.15 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	1,529 MMBtu/hr Fluidized Bed Biomass Boilers	Low NOx Burner and SNCR	55%	0.10 lb/MMBtu	PSD Application	State Permit Files
NH-0013	TP-B-0501	10/25/2004	NH	Public Service of New Hampshire - Schiller Station	Circulating Fluidized Bed Wood Fired Boiler No. 5	SNCR	65%	0.075 lb/MMBtu (24-hr); 0.6 lb/MMBtu (30 day); 1.6 lb/MW (30 day)	Other	RBLC Clearinghouse
OH-0307	07-00534	04/04/2006	OH	Biomass Energy - South Point Biomass Generation	7 Wood Fired Boilers	SCR	80%	0.44 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0269	07-00534	01/05/2004	OH	Biomass Energy, LLC - South Point Power	7 Wood Fired Boilers	SCR	80%	0.44 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
FL-0301	PSD-FL-389	12/06/2007	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse & Woodchip Fired Boiler	Boiler Design and Operation	Not Specified	0.31 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0074	13900114	08/23/2007	MN	Koda Energy	Biomass Boiler 3	SNCR	Not Specified	0.25 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0074	13900114	08/23/2007	MN	Koda Energy	Biomass Boiler 4	SNCR	Not Specified	0.18 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0335	PSD-06-02	05/22/2007	WA	Simpson Paper Company - Simpson Tacoma Kraft Company, LLC	Wood Waste Boiler	Proper Combustion Controls with Overfire Air	Not Specified	0.2 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
ND-0022	PTC06004	05/01/2006	ND	Archer Daniels Midland Company - Northern Su n	Wood/Hull Fired Boiler	Combustion Controls	Not Specified	0.2 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0337	PSD-01-07 Amendment 1	02/01/2006	WA	Boise Cascade Corp - Boise White Paper, LLC	Wood/Bark Boilers	Overfire Air	Not Specified	0.3 lb/MMBtu	Other	RBLC Clearinghouse
WA-0329	PSD-03-04	02/11/2005	WA	Darrington Energy Cogeneration Power Plant	Wood Waste Fired Boiler	SNCR	Not Specified	0.12 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0188	PSD-LA-698	11/23/2004	LA	Inland Paperboard and Packaging - Bogalusa Mill	No. 12 Hogged Fuel Boiler (Bark)	Low NOx Burners, Overfire Air, Good Combustion Practices	Not Specified	0.45 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 1-2 Case 1 - Bagasse	Good Combustion Practices	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 1-2 Case 2 - Bagasse	Good Combustion Practices	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 3-4 Case 1 - Bagasse	Good Combustion Practices	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 3-4 Case 2 - Bagasse	Good Combustion Practices	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0461	P1024	10/10/2003	TX	Rio Grand Valley Sugar Growers, Inc. - WR Crowley Sugar House	Boiler 6 - Bagasse	Good Combustion Practices	Not Specified	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0218	PSD-LA-716	07/18/2007	LA	Boise Building Solutions Manufacturing, LLC - Florien Plywood Plant	Hogged Fuel Fired Boiler (wood)	Good Combustion Practices, Boiler Design and Operation	Not Specified	0.22 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4911-149-0008-E-01-0	06/10/2008	GA	Greenway Renewable Power, LLC	719 MMBtu/hr Wood Biomass Boiler	SNCR	Not Specified	Meet Db Standards	Title V; PSD Avoidance	State Permit Files
NA	4911-119-0025-E-03-0	07/29/2008	GA	Earth Resources, Inc. - Plant Carl	400 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	SNCR	Not Specified	Meet Db Standards	Title V; PSD Avoidance	State Permit Files
NA	2676-095-0071-V-01-8	10/24/2007	GA	The Procter & Gamble Paper Products Company	216 MMBtu/hr Biomass Boiler	Overfire Air, Good Combustion Practices	Not Specified	0.28 lb/MMBtu	BACT-PSD; Title V	State Permit Files
NA	PSD-FL-333A	11/03/2004	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 8 - Bagasse	SNCR	Not Specified	0.14 lb/MMBtu	PSD Construction	State Permit Files
NA	PSD-FL-389	12/06/2007	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 7 - Permitting of Wood Chips	Good Combustion Practices, Overfire Air, Low Nitrogen Content Fuel	Not Specified	0.31 lb/MMBtu	PSD Construction	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Fluidized Bed Boiler	Ammonia Injection (SNCR)	Not Specified	0.17 lb/MMBtu	BACT-PSD	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	Low NOx fluidized bed combustion and SNCR	Not Specified	0.1 lb/MMBtu	BACT-PSD	State Permit Files

Table E-16
Recent BACT/Permit Decisions - NOx from Back-up Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OR-0046	24-0047	01/06/2005	OR	Calpine - Turner Energy Center LLC	Auxiliary Boiler - Natural Gas	SCR	92%	0.011 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	*Under Review by GaEPD*	*2008*	GA	*Yellow Pine Energy Company, LLC*	*25 MMBtu/hr Oil Fired Auxiliary Boiler*	*Low NOx Burner and FGR*	50-60%	0.14 lb/MMBtu	PSD Application	State Permit Files
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Auxiliary Boiler-Natural Gas and Distillate Oil	Low NOx Burners & FGR	Not Specified	0.035 lb/MMBtu (gas); 0.072 lb/MMBtu (#2 oil)	LAER	RBLC Clearinghouse
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	Low NOx Burners and FGR	Not Specified	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0079	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	Low NOx Burners and FGR	Not Specified	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Boiler, Auxiliary #1 & #2 - Fuel Oil	Low NOx Burners, Limit on Hours of Operation	Not Specified	0.169 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Auxiliary Boiler - Natural Gas	Low NOx Burners, *Good Combustion Control, and* Clean Burning Low Sulfur Fuel	*Not Specified*	*0.1370 lb/MMBtu*	BACT-PSD	*RBLC Clearinghouse*
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Auxiliary Nat Gas Fired Boiler	Natural Gas, *Good* Combustion Practices, Low NOx Burners	Not Specified	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Auxiliary Boiler - Natural Gas	Low NOx Burners, Good Combustion Practices	Not Specified	0.098 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	0430041-009	06/09/2008	MN	Corn Plus	Auxiliary Boilers (2 @ 67 MMBtu/hr Natural Gas/Propane)	Low NOx Burners	Not Specified	0.04 lb/MMBtu (Natural Gas); 0.08 lb/MMBtu (Propane)	BACT-PSD	State Permit Files
OH-0310	06-08138	02/07/2008	OH	American Municipal Power Generating Station	Auxiliary Boiler - Natural Gas	No Control	No Control	140 lb/MMCF	BACT-PSD	RBLC Clearinghouse
TX-0499	PSD-TX 1039 AND 70861	07/24/2006	TX	Sandy Creek Energy Station	Auxiliary Boiler - Natural Gas	No Control	No Control	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse

Table E-17
Recent BACT/Permit Decisions - NOx from Emergency Engines

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Emergency Generator	Limited to 200 hr/yr	97.7%	97.7% reduction based on hourly operational limit	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Emergency Generators	Ignition Retard and 300 hr/yr limit	Not Specified	5.39 g/Bhp-hr	LAER	RBLC Clearinghouse
LA-0224	PSD-LA-726	03/20/2008	LA	Southwest Electric Power Company - Arsenal Hill Power Plant	Diesel Fire Pump	Low Sulfur Fuel, Limit Operating Hours, Proper Engine Maintenance	Not Specified	Not specified in g/bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
CA-1144	SE 02-01	04/25/2007	CA	Caithness Blythe II, LLC - Blythe Energy Project II	Fire Pump	0.05% Sulfur Fuel	Not Specified	Not specified in g/bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
LA-0192	PSD-LA-704	06/06/2005	LA	Crescent City Power	Diesel Fire Water Pump	Good Engine Design and Proper Operating Practices	Not Specified	9.5 g/bph-hr	BACT-PSD	RBLC Clearinghouse
MO-0067	122004-017	12/29/2004	MO	Aquila, Inc - South Harper Peaking Facility	Emergency Diesel Fire Pump	Ignition Timing Retard	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
LA-0194	PSD-LA-703	11/24/2004	LA	Sabine Pass LNG Import Terminal	Firewater Booster Pump Diesel Engines	Good Engine Design, Proper Operating Practices	Not Specified	5.2 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Diesel Booster Pump	0.003% Sulfur Fuel, Good Combustion Practices, Ignition Timing Retard	Not Specified	Not specified in g/bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Main Fire Pump	0.003% Sulfur Fuel, Good Combustion Practices, Ignition Timing Retard	Not Specified	Not specified in g/bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Fire Water Pump	Combustion Controls with Operational Limitations	Not Specified	56 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
AK-0059	307CP01	09/29/2003	AK	USAF Eareckson Air Station	Fire Water Pump	Good Combustion Practices	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
CA-1073	418342	08/14/2003	CA	Los Angeles County Probation/FAC Planning/ISD	Fire Pump, Compression Ignition	5.5 Degrees Fuel Injection Timing Retard-After Cooler by Raw Water	Not Specified	4.2 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0254	06-06792	08/14/2003	OH	Duke Energy Washington County LLC	Emergency Diesel Fire Pump Engine	Low Sulfur Fuel, Combustion Control	Not Specified	14.5 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0067	Project 02-528	06/17/2003	IA	Midamerican Energy Company	Diesel Fire Pump	Good Combustion Practices	Not Specified	4.41 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OK-0090	2001-157-C M-1 PSD	03/21/2003	OK	Duke Energy Stephens, LLC	Fire Water Pump	Engine Design and Hours Limit (<100 hr/yr)	Not Specified	4.97 g/bhp-hr; 4.41 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0291	EFSEC/2001-03	01/03/2003	WA	Wallula Generation, LLC - Wallula Power Plant	Emergency Diesel Generator	Limited to 200 hr/yr	Not Specified	568 ppmdv	Other	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Generator	No Control	No Control	7.7 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Firewater Pump	No Control	No Control	7.7 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Fire Water Pump	No Control	No Control	14 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Back-up Generators	No Control	No Control	6.9 g/bhp	BACT-PSD	RBLC Clearinghouse
OH-0275	14-04682	08/24/2004	OH	Cinergy - PSI Energy - Madison Station	Emergency Diesel Fire Pump	No Control	No Control	Not specified in g/bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse

Table E-18
Recent BACT/Permit Decisions - SO2 from Biomass Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OH-0307	07-00534	04/04/2006	OH	Biomass Energy - South Point Biomass Generation	7 Wood Fired Boilers	Spray Dryer Absorber or Sodium Bicarbonate Injection System	20%	0.087 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0269	07-00534	01/05/2004	OH	Biomass Energy, LLC - South Point Power	7 Wood Fired Boilers	Dry Sodium Bicarbonate Injection or Spray Dryer Absorber	20%	0.087 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NH-0013	TP-B-0501	10/25/2004	NH	Public Service of New Hampshire - Schiller Station	Circulating Fluidized Bed Wood Fired Boiler No. 5	Lime Injection	70%	0.02 lb/MMBtu	Other	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	1,529 MMBtu/hr Fluidized Bed Biomass Boilers	Dry Scrubber	88.9%	0.19 lb/MMBtu (3 hr); 0.13 lb/MMBtu (24-hr); 0.10 lb/MMBtu (30-day)	PSD Application	State Permit Files
LA-0188	PSD-LA-698	11/23/2004	LA	Inland Paperboard and Packaging - Bogalusa Mill	No. 12 Hogged Fuel Boiler (Bark)	Limit Fuel Oil Capacity Factor to <=10%	Not Specified	1.54 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
FL-0257	PSD-FL-333	11/18/2003	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse External Combustion	Bagasse and Distillate Oil <0.05% S	Not Specified	0.06 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4911-149-0008-E-01-0	06/10/2008	GA	Greenway Renewable Power, LLC	719 MMBtu/hr Wood Biomass Boiler	Spray Dry Scrubber, 3% Sulfur Fuel	Not Specified	Meet Db Standards	Title V; PSD Avoidance	State Permit Files
NA	4911-119-0025-E-03-0	07/29/2008	GA	Earth Resources, Inc. - Plant Carl	400 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	Dry Scrubber, 3% Sulfur Fuel	Not Specified	Meet Db Standards	Title V; PSD Avoidance	State Permit Files
NA	2048-205-0037-V-03-0	12/03/2002	GA	Wind Gap Farms	87.5 MMBtu/hr Wood Fired Boiler	2.5% Sulfur Fuel	Not Specified	No numerical limit	Title V	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Fluidized Bed Boiler	Lime Injection and Sodium Bicarbonate Injection	Not Specified	0.16 lb/MMBtu	BACT-PSD	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	Inherent scrubbing from calcium in the fuel	Not Specified	0.046 lb/MMBtu	BACT-PSD	State Permit Files
AL-0223	*705-0014-X015*	*07/14/2006*	AL	*Smurfit Stone Container Corp - Stevenson Mill*	*No. 2 Wood Fired Boiler*	*No Control*	*No Control*	*Not specified in lb/MMBtu*	BACT-PSD	RBLC Clearinghouse
ND-0022	PTC06004	05/01/2006	ND	Archer Daniels Midland Company - Northern Su n	Wood/Hull Fired Boiler	No Control	No Control	0.47 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0327	PSD-05-04	01/25/2006	WA	Sierra Pacific Industries - Skagit County Lumber Mill	Bark/Wood Waste Fired Cogeneration Boiler	No Control	No Control	0.025 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	2676-095-0071-V-01-8	10/24/2007	GA	The Procter & Gamble Paper Products Company	216 MMBtu/hr Biomass Boiler	No Control	No Control	0.025 lb/MMBtu (biomass)	Title V	State Permit Files

Table E-19
Recent BACT/Permit Decisions - SO2 from Back-Up Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Auxiliary Boiler - Natural Gas & Distillate Oil	Fuel Sulfur Limit of 0.05%	Not Specified	0.0006 lb/MMBtu (gas); 0.052 lb/MMBtu (#2 oil)	BACT-PSD	RBLC Clearinghouse
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	Low Sulfur Fuel	Not Specified	0.0510 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0079	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	0.05% Sulfur Fuel	Not Specified	0.0510 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Auxiliary Boiler-Fuel Oil	0.05% Sulfur Fuel; Limit on Hours of Operation	Not Specified	0.055 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	25 MMBtu/hr Oil Fired Auxiliary Boiler	0.05% Sulfur Fuel, Good Combustion Practices	Not Specified	0.051 lb/MMBtu	PSD Application	State Permit Files
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Auxiliary Boiler - Natural Gas	Low NOx Burners, Good Combustion Control, and Clean Burning Low Sulfur Fuel	Not Specified	0.0055 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Auxiliary Nat Gas Fired Boiler	Natural Gas	Not Specified	0.0006 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Auxiliary Boiler - Natural Gas	Low Sulfur Natural Gas Fuel	Not Specified	1.8E-05 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0310	06-08138	02/07/2008	OH	American Municipal Power Generating Station	Auxiliary Boiler - Natural Gas	No Control	No Control	0.6 lb/MMCF	BACT-PSD	RBLC Clearinghouse
TX-0499	PSD-TX 1039 AND 70861	07/24/2006	TX	Sandy Creek Energy Station	Auxiliary Boiler - Natural Gas	No Control	No Control	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse

Table E-20
Recent BACT/Permit Decisions - SO2 from Emergency Engines

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Emergency Generator	0.05% Sulfur Fuel, Limited to 200 hr/yr	97.7%	97.7% reduction based on hourly operational limit	BACT-PSD	RBLC Clearinghouse
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Emergency Generators	Fuel Sulfur Limit of 0.05%	Not Specified	0.166 g/Bhp-hr	BACT-PSD	RBLC Clearinghouse
LA-0224	PSD-LA-726	03/20/2008	LA	Southwest Electric Power Company - Arsenal Hill Power Plant	Diesel Fire Pump	Low Sulfur Fuel, Limit Operating Hours, Proper Engine Maintenance	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
MN-0070	06100067-001	09/07/2007	MN	Minnesota Steel Industries, LLC	Diesel Fire Water Pump	0.05% Sulfur Fuel; 500 hr/yr	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
LA-0192	PSD-LA-704	06/06/2005	LA	Crescent City Power	Diesel Fire Water Pump	Good Engine Design and Proper Operating Practices	Not Specified	0.65 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Fire Water Pump	Low Sulfur Fuel	Not Specified	0.16 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Back-up Generators	Low Sulfur Fuel	Not Specified	0.18 g/bhb-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Diesel Booster Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Main Fire Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
OH-0275	14-04682	08/24/2004	OH	Cinergy - PSI Energy - Madison Station	Emergency Diesel Fire Pump	0.05% Sulfur Fuel; 499 hr/hr operation	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Fire Water Pump	0.05% Sulfur Fuel	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
CA-1073	418342	08/14/2003	CA	Los Angeles County Probation/FAC Planning/ISD	Fire Pump, Compression Ignition	0.0015% Sulfur Fuel, Limited to 200 hr/yr	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
OH-0254	06-06792	08/14/2003	OH	Duke Energy Washington County LLC	Emergency Diesel Fire Pump Engine	Low Sulfur Fuel, Combustion Control	Not Specified	0.95 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0067	Project 02-528	06/17/2003	IA	Midamerican Energy Company	Diesel Fire Pump	0.05% Sulfur Fuel, Good Combustion Practices	Not Specified	0.052 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OK-0090	2001-157-C M-1 PSD	03/21/2003	OK	Duke Energy Stephens, LLC	Fire Water Pump	0.05% Sulfur Fuel	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
VA-0279	VA-21388	01/08/2003	VA	Cinergy Capital and Trading - Martinsville	Fire Water Pump	0.05% Sulfur Fuel	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
WA-0291	EFSEC/2001-03	01/03/2003	WA	Wallula Generation, LLC - Wallula Power Plant	Diesel Fire Pump	0.05% Sulfur Fuel, Limited to 100 hr/yr	Not Specified	No numerical limit	Other	RBLC Clearinghouse
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Emergency Generator	0.5% Sulfur Fuel	Not Specified	No numerical limit	Minor Construction	State Permit Files
NA	0571321-001-AC	04/05/2006	FL	United States EnviroFuels, LLC - Port Sutton Ethanol Facility	Emergency Water Pump	0.5% Sulfur Fuel	Not Specified	No numerical limit	Minor Construction	State Permit Files
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Generator	No Control	No Control	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Firewater Pump	No Control	No Control	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse

Table E-21
Recent BACT/Permit Decisions - CO from Biomass Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OH-0307	07-00534	04/04/2006	OH	Biomass Energy - South Point Biomass Generation	7 Wood Fired Boilers	Oxidation Catalyst	50%	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0269	07-00534	01/05/2004	OH	Biomass Energy, LLC - South Point Power	7 Wood Fired Boilers	Catalytic Oxidation	50%	0.1 lb/MMBtu	Other	RBLC Clearinghouse
MN-0074	13900114	08/23/2007	MN	Koda Energy	Biomass Boiler 4	Good Combustion Practices	Not Specified	0.43 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0335	PSD-06-02	05/22/2007	WA	Simpson Paper Company - Simpson Tacoma Kraft Company, LLC	Wood Waste Boiler	Overfire Air	Not Specified	0.35 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
ND-0022	PTC06004	05/01/2006	ND	Archer Daniels Midland Company - Northern Su n	Wood/Hull Fired Boiler	Good Combustion Practices	Not Specified	0.63 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WA-0337	PSD-01-07 Amendment 1	02/01/2006	WA	Boise Cascade Corp - Boise White Paper, LLC	Wood/Bark Boilers	Overfire Air	Not Specified	500 ppm	Other	RBLC Clearinghouse
WA-0329	PSD-03-04	02/11/2005	WA	Darrington Energy Cogeneration Power Plant	Wood Waste Fired Boiler	Good Combustion Practices	Not Specified	0.35 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0188	PSD-LA-698	11/23/2004	LA	Inland Paperboard and Packaging - Bogalusa Mill	No. 12 Hogged Fuel Boiler (Bark)	Overfire Air, Good Combustion Practices	Not Specified	0.6 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NH-0013	TP-B-0501	10/25/2004	NH	Public Service of New Hampshire - Schiller Station	Circulating Fluidized Bed Wood Fired Boiler No. 5	Good Combustion Practices with Fluidized Bed Design	Not Specified	0.1 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
GA-0114	2631-115-0021-V-01-4	10/13/2004	GA	Inland Paperboard and Packaging - Rome Linerboard Mill	Solid Fuel Boiler (Bark)	Staged Combustion and Good Combustion Practices	Not Specified	368 ppm @ 3% O2	BACT-PSD	RBLC Clearinghouse
FL-0257	PSD-FL-333	11/18/2003	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Bagasse External Combustion	Good Combustion and Operating Practices	Not Specified	0.38 lb/MMBtu	Other	RBLC Clearinghouse
LA-0178	PSD-LA-77(M-2)	11/14/2003	LA	Boise Cascade Corp - Deridder Paper Mill	Wood Fired Boiler (Bark)	Good Equipment Design and Proper Combustion Techniques	Not Specified	0.33 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0072	1714-AOP-R3	02/28/2003	AR	Del-Tin Fiber, LLC	Heat Energy System - Wood Waste	Good Combustion Practices	Not Specified	0.78 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
LA-0218	PSD-LA-716	07/18/2007	LA	Boise Building Solutions Manufacturing, LLC - Florien Plywood Plant	Hogged Fuel Fired Boiler (wood)	High Pressure Overfire Air, Good Combustion	Not Specified	0.6 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0058	13700028-005	06/30/2005	MN	City of Virginia Department of Public Utilities	Wood Fired Boiler	Good Combustion	Not Specified	0.3 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MN-0059	13700027-003	06/30/2005	MN	Hibbing Public Utilities	Wood Fired Boiler	Good Combustion	Not Specified	0.3 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4911-119-0025-E-03-0	07/29/2008	GA	Earth Resources, Inc. - Plant Carl	400 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	Oxidation Catalyst	Not Specified	0.149 lb/MMBtu	Title V; PSD Avoidance	State Permit Files
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	1,529 MMBtu/hr Fluidized Bed Biomass Boilers	Combustion Controls	Not Specified	0.30 lb/MMBtu	PSD Application	State Permit Files
NA	PSD-FL-333A	11/03/2004	FL	U.S. Sugar Corporation - Clewiston Sugar Mill & Refinery	Boiler No. 8 - Bagasse	Good Combustion Practices	Not Specified	No numerical limit	PSD Construction	State Permit Files
NA	PSD-TX-1061	2007	TX	Nacogdoches Power Electric Generating Plant	Fluidized Bed Biomass Boiler	Good combustion	Not Specified	0.15 lb/MMBtu	BACT-PSD	State Permit Files
WA-0327	PSD-05-04	01/25/2006	WA	Sierra Pacific Industries - Skagit County Lumber Mill	Bark/Wood Waste Fired Cogeneration Boiler	No Control	No Control	0.35 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	4991-119-0025-E-02-0	10/31/2006	GA	Earth Resources, Inc. - Plant Carl	335 MMBtu/hr Bubbling Fluidized Bed Biomass Boiler	No Control	No Control	400 ppmdv7	Title V; PSD Avoidance	State Permit Files
NA	2676-095-0071-V-01-8	10/24/2007	GA	The Procter & Gamble Paper Products Company	216 MMBtu/hr Biomass Boiler	No Control	No Control	0.5 lb/MMBtu (biomass); 0.0363 lb/MMBtu (oil)	Title V	State Permit Files
NA	0430041-009	05/09/2008	MN	Corn Plus	Fluidized Bed Boiler	No Control	No Control	100 ppmdv or 90% destruction	BACT-PSD	State Permit Files

Table E-22
Recent BACT/Permit Decisions - CO from Back-Up Boilers

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
OR-0046	24-0047	01/06/2005	OR	Calpine - Turner Energy Center LLC	Auxiliary Boiler - Natural Gas	Oxidation Catalyst	92%	0.038 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0074	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	Combustion Controls	Not Specified	0.036 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
AR-0079	1995-AOP-R0	08/20/2003	AR	Plum Point Associates, LLC - Plum Point Energy	Auxiliary Boiler - Distillate Oil	Combustion Controls	Not Specified	0.036 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Boiler, Auxiliary #1 & #2- Fuel Oil	Limit on Hours of Operation	Not Specified	0.035 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NA	Under Review by GaEPD	2008	GA	Yellow Pine Energy Company, LLC	25 MMBtu/hr Oil Fired Auxiliary Boiler	Combustion Controls	Not Specified	0.036 lb/MMBtu	PSD Application	State Permit Files
MN-0066	05300015-004	05/16/2006	MN	Northern States Power Company/XCEL Energy - Riverside Plant	Auxiliary Boiler - Natural Gas	Good Combustion	Not Specified	0.08 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Auxiliary Boiler - Natural Gas	Low NOx Burners, Good Combustion Control, and Clean Burning Low Sulfur Fuel	Not Specified	0.0824 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Auxiliary Nat Gas Fired Boiler	Natural Gas, Good Combustion Practices, Low NOx Burners	Not Specified	0.08 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Auxiliary Boiler - Natural Gas	Good Combustion Practices, Use of Natural Gas	Not Specified	0.04 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OH-0310	06-08138	02/07/2008	OH	American Municipal Power Generating Station	Auxiliary Boiler - Natural Gas	No Control	No Control	400 ppmdv3	BACT-PSD	RBLC Clearinghouse
GA-0127	4911-067-0003-V-02-2	01/07/2008	GA	Southern Company/Georgia Power - Plant McDonough	Auxiliary Boiler - Natural Gas	No Control	No Control	0.037 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
TX-0499	PSD-TX 1039 AND 70861	07/24/2006	TX	Sandy Creek Energy Station	Auxiliary Boiler - Natural Gas	No Control	No Control	Not specified in lb/MMBtu	BACT-PSD	RBLC Clearinghouse

Table E-23
Recent BACT/Permit Decisions - CO from Emergency Engines

RBLC ID	Permit No.	Date	State	Owner/Facility	Process	Control Technology	Control Efficiency	Emission Limit	Basis	Source
MT-0022	3182-00	07/21/2003	MT	Bull Mountain Dev Company - Roundup Power Project	Emergency Generator	Limited to 200 hr/yr	97.7%	97.7% reduction based on hourly operational limit	BACT-PSD	RBLC Clearinghouse
LA-0224	PSD-LA-726	03/20/2008	LA	Southwest Electric Power Company - Arsenal Hill Power Plant	Diesel Fire Pump	Low Sulfur Fuel, Limit Operating Hours, Proper Engine Maintenance	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
CA-1144	SE 02-01	04/25/2007	CA	Caithness Blythe II, LLC - Blythe Energy Project II	Fire Pump	0.05% Sulfur Fuel	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
OK-0100	2004-198-TV	10/21/2005	IA	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	35.6 g/bhp-hr	Other	RBLC Clearinghouse
OK-0111	2004-198-C (M-1)	10/14/2005	OK	Dalitalia, LLC - Muskogee Porcelain Floor Tile Pit	Emergency Generators	Good Combustion	Not Specified	0.0067 lb/hp-hr	BACT-PSD	RBLC Clearinghouse
LA-0192	PSD-LA-704	06/06/2005	LA	Crescent City Power	Diesel Fire Water Pump	Good Engine Design and Proper Operating Practices	Not Specified	2.01 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
LA-0194	PSD-LA-703	11/24/2004	LA	Sabine Pass LNG Import Terminal	Firewater Booster Pump Diesel Engines	Good Engine Design, Proper Operating Practices	Not Specified	0.27 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Diesel Booster Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WI-0228	04-RV-248	10/19/2004	WI	Wisconsin Public Service - Weston Plant	Main Fire Pump	0.003% Sulfur Fuel, Good Combustion Practices	Not Specified	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse
WV-0023	R14-0024	03/02/2004	WV	Longview Power, LLC - Maidsville	Fire Water Pump	Good Combustion Practices	Not Specified	23.6 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
AK-0059	307CP01	09/29/2003	AK	USAF Eareckson Air Station	Fire Water Pump	Good Combustion Practices	Not Specified	No numerical limit	BACT-PSD	RBLC Clearinghouse
CA-1073	418342	08/14/2003	CA	Los Angeles County Probation/FAC Planning/ISD	Fire Pump, Compression Ignition	Operation Limited to 200 hr/yr	Not Specified	0.44 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0254	06-06792	08/14/2003	OH	Duke Energy Washington County LLC	Emergency Diesel Fire Pump Engine	Low Sulfur Fuel, Combustion Control	Not Specified	1 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
IA-0067	Project 02-528	06/17/2003	IA	Midamerican Energy Company	Diesel Fire Pump	Good Combustion Practices	Not Specified	0.95 lb/MMBtu	BACT-PSD	RBLC Clearinghouse
OK-0090	2001-157-C M-1 PSD	03/21/2003	OK	Duke Energy Stephens, LLC	Fire Water Pump	Engine Design and Good Combustion Practices	Not Specified	1.09 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NA	4911-149-0008-E-01-0	06/10/2008	GA	Greenway Renewable Power, LLC	1500 kW Biodiesel Emergency Generator	200 hr/yr (100 hr/yr non-emergency time); 0.05% Sulfur Fuel (0.0015% after 10/1/10)	Not Specified	2.6 g/np-hr	Title V; PSD Avoidance	State Permit Files
PA-0257	17-313-001	05/07/2007	PA	Sunnyside Ethanol, LLC	Emergency Generators	No Control	No Control	0.29 g/BHp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Generator	No Control	No Control	2.05 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
NC-0101	00986R1	09/29/2005	NC	Forsyth Energy Projects, LLC - Forsyth Energy Plant	Emergency Firewater Pump	No Control	No Control	2.05 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Fire Water Pump	No Control	No Control	3 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0252	07-00503	12/28/2004	OH	Duke Energy Hanging Rock	Back-up Generators	No Control	No Control	8.5 g/bhp-hr	BACT-PSD	RBLC Clearinghouse
OH-0275	14-04682	08/24/2004	OH	Cinergy - PSI Energy - Madison Station	Emergency Diesel Fire Pump	No Control	No Control	Not specified in g/Bhp-hr or lb/hp-hr	BACT-PSD	RBLC Clearinghouse

APPENDIX F

Dispersion Modeling Files

BPIPPRM Files

AERMAP Files

AERMOD Files

Dispersion modeling inputs and results have been provided on CD-ROM formatted for IBM-compatible personal computers. The directory structure on the CD-ROM is self-explanatory, with inputs and outputs organized by the program used. An index of the files provided follows.

BPIPPRM (04274)

The BPIPPRM files are provided in the BPIPPRM folder as follows:

filename	Contents
Run20090206.PIP	Input file
Run20090206.SUM	Summary output file
Run20090206.TAB	Detailed output file

AERMAP (06341)

The AERMAP files are provided in the AERMAP folder. The filenames use extensions that are common to all files. These are as follows:

filename	Contents
Run20081222.MAP	Input file – Full Receptor Grid
Run20081222.MOT	Detailed output file – Full Receptor Grid
Run20081222.RCF	Summary output file – Full Receptor Grid
Interactives.MAP	Input file – Interactive Sources
Interactives.MOT	Detailed output file – Interactive Sources
Interactives.RCF	Summary output file – Interactive Sources
Class1.MAP	Input file – Class I Analysis Receptors
Class1.MOT	Detailed output file – Class I Analysis Receptors
Class1.RCF	Summary output file – Class I Analysis Receptors

AERMOD (07026)

The AERMOD files are provided in the AERMOD folder. The filenames use extensions that are common to all files. These are as follows:

filename	Contents
Run20090206_YYYY_PP.DTA	SIA Input File (YYYY = met data, PP = pollutant)
Run20090206_YYYY_PP.LST	SIA Output File (YYYY = met data, PP = pollutant)
Run20090207_YYYY_PP.DTA	Interactive Analysis Input File (YYYY = met data, PP = pollutant)
Run20090207_YYYY_PP.LST	Interactive Analysis Output File (YYYY = met data, PP = pollutant)
Run20090208_YYYY_PP.DTA	Class I Analysis Input File (YYYY = met data, PP = pollutant)
Run20090208_YYYY_PP.LST	Class I Analysis Output File (YYYY = met data, PP = pollutant)

APPENDIX G

Interactive Source Data

20D Screening Method for Identifying Interactive Sources

Facility	UTME	UTMN	distance (D) from project (km)	SO2 facility total (tpy)	PM facility total (tpy)	NOx facility total (tpy)	$Q_{SO2}/20D$	$Q_{PM10}/20D$	$Q_{NO2}/20D$
85000118 FLORIDA POWER & LIGHT (PMR)	542680	2992650	53.5	78,480	2,616	40,757	**73.3**	**2.44**	**38.09**
5500184 TAMPA ELECTRIC COMPANY	464300	3035400	36.5	4,046	17	5,016	**5.54**	0.02	**6.87**
51000331 U.S. SUGAR CORP. CLEWISTON MILL	506100	2956900	57.7	3,194	344	3,215	**2.77**	0.30	**2.8**
8501027 INDIANTOWN COGENERATION, L.P.	547650	2990700	58.8	2,633	340	2,882	**2.20**	0.29	**2.45**
5500034 FLORIDA POWER CORPORATION D/B/A PROGRESS	451400	3050500	56.1	5,055	0	54	**4.51**	0.00	0.05
5500041 TAMPA ELECTRIC COMPANY	456800	3042500	46.8	1,461	0	2,618	**1.56**	0.00	**2.80**
9301046 OKEECHOBEE LANDFILL, INC.	530280	3023960	38.5	1,393	20	160	**1.81**	0.03	0.21
5500143 BETTER ROADS, INC.	465600	3008700	28.0	167	46	146	0.30	0.08	0.26
51001526 SOUTHERN GARDENS CITRUS PROCESSING CORP.	487500	2957600	55.9	186	116	199	0.17	0.10	0.18
5500052 GEORGIA PACIFIC CORRUGATED LLC	466980	3009230	26.6	193	18	16	0.36	0.03	0.03
8501476 FLORIDIAN NATURAL GAS STORAGE CO., INC.	545930	2996330	55.3	4	0	271	0.00	0.00	0.24
9300011 OKEECHOBEE ASPHALT & READY-MIX CONCRETE,	516090	3014210	22.8	105	0	1	0.23	0.00	0.00
4300031 STANDARD SAND AND SILICA CO.	470600	2965300	53.0	88	134	18	0.08	0.13	0.02
5100222 FIBERSTAR, INC.	487690	2957660	55.8	0	249	0	0.00	0.22	0.00
4300081 ATLAS-TRANSOIL INC	489200	2966600	46.8	85	19	63	0.09	0.02	0.07
5100271 AMERIMIX INDUSTRIES, INC.	495410	2957290	55.9	164	0	11	0.15	0.00	0.01
4300183 OLDCASTLE LAWN AND GARDEN, INC.	492040	2961340	51.9	18	1	132	0.02	0.00	0.13
5500462 HIGHLANDS COUNTY DEPT.OF SOLID WASTE	469330	3042850	38.1	10	34	63	0.01	0.04	0.08
55003211 TURF CARE SUPPLY CORP.	469500	3038400	34.7	0	20	57	0.00	0.03	0.08
77751721 BETTER ROADS, INC.	491967	2966190	47.0	20	0	74	0.02	0.00	0.08
9301092 BP TECHNOLOGY INC	525180	3017400	32.2	16	0	48	0.02	0.00	0.07
5500123 APAC-SOUTHEAST INC., CENTRAL FL DIVISION	451130	3050000	56.0	6	27	64	0.01	0.02	0.06
8500025 LOUIS DREYFUS CITRUS, INC.	547980	2991470	58.9	0	52	47	0.00	0.04	0.04
85001214 BAY STATE MILLING CO	547400	2991680	58.2	0	84	0	0.00	0.07	0.00
10502554 AVON PARK CORRECTIONAL INSTITUTE	464600	3059300	54.3	32	0	24	0.03	0.00	0.02
5500581 GULFSTREAM NATURAL GAS SYSTEM, L.L.C.	472570	3041740	35.3	0	0	29	0.00	0.00	0.04
11101071 TREASURE COAST LAND CLEARING	545570	3035410	56.8	15	0	26	0.01	0.00	0.02
11101091 PORT ST. LUCIE TRACTOR SERVICES, INC.	532010	3037290	45.6	6	0	23	0.01	0.00	0.02
77700733 APAC-SOUTHEAST INC., CENTRAL FL DIVISION	334300	3085600	174.7	5	26	73	0.00	0.01	0.02
11100723 FLORIDA ROCK INDUSTRIES, INC.	547460	3013460	54.2	0	2	14	0.00	0.00	0.01
8501412 GULFSTREAM NATURAL GAS SYSTEM, L.L.C.	543830	2993140	54.4	0	1	9	0.00	0.00	0.01
8501361 PERKINS TRUCKING, INC.	534900	3002000	43.1	2	0	6	0.00	0.00	0.01
5500222 FOUNTAIN FUNERAL HOME	449000	3052800	59.4	1	0	1	0.00	0.00	0.00
5500491 E-STONE USA CORPORATION	455500	3042170	47.6	0	0	1	0.00	0.00	0.00
55000613 GENPAK LLC	464790	3036830	37	0	1	0	0.00	0.00	0.00
5500171 CEMEX CONSTRUCTION MATERIALS FLORIDA LLC	458000	3035000	41.5	0	1	0	0.00	0.00	0.00
5500331 CEMEX CONSTRUCTION MATERIALS FLORIDA LLC	450350	3054660	59.7	0	1	0	0.00	0.00	0.00
4300071 CEMEX CONSTRUCTION MATERIALS FLORIDA LLC	489180	2966740	46.6	0	1	0	0.00	0.00	0.00
5500261 SEBRING SEPTIC TANK & PRECAST CO	463300	3034200	36.6	0	0	0	0.00	0.00	0.00

20D Screening Method for Identifying Interactive Sources

Facility	UTME	UTMN	distance (D) from project (km)	SO2 facility total (tpy)	PM facility total (tpy)	NOx facility total (tpy)	Q_{SO2}/20D	Q_{PM10}/20D	Q_{NO2}/20D
5500161 JAHNA CONCRETE, INC.	450100	3054300	59.6	0	0	0	0.00	0.00	0.00
9301004 OKEECHOBEE ASPHALT& READY MIX CONCRETE	515950	3014210	22.8	0	0	0	0.00	0.00	0.00
5500211 JAHNA CONCRETE, INC.	462500	3034400	37.4	0	0	0	0.00	0.00	0.00
5500081 JAHNA CONCRETE INC	463500	3019200	30.4	0	0	0	0.00	0.00	0.00
5500241 HIGHLANDS CREMATORY, INC.	450700	3052800	58.2	0	0	0	0.00	0.00	0.00
5500271 WELLCRAFT MARINE CORP	448800	3052300	59.2	0	0	0	0.00	0.00	0.00
9300071 TARMAC FLORIDA	516990	3014060	23.7	0	0	0	0.00	0.00	0.00
5100071 HARE LUMBER & READY-MIX INC	506620	2958270	56.5	0	0	0	0.00	0.00	0.00
9301021 BUXTON FUNERAL HOME, INC.	516770	3013720	23.5	0	0	0	0.00	0.00	0.00
9301121 OKEECHOBEE CREMATORY, LLC	516810	3013430	23.5	0	0	0	0.00	0.00	0.00
9301083 TWIN OAKS PET CEMETARY	517270	3043720	38.8	0	0	0	0.00	0.00	0.00
11101101 TREASURE COAST TRACTOR SERVICE, INC.	545120	3035240	56.3	0	0	0	0.00	0.00	0.00
8501051 TAMPA FARM SERVICE, INC.	547160	2992020	57.9	0	0	0	0.00	0.00	0.00

Note: bold values - facility to be included in interactive modeling per the "20D" screening results exceeding 1.0

FPL Martin Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM	Lat SS	Long DD
850001	1	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	2	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	3	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	4	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	5	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	6	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	7	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	9	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	11	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	12	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	17	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	18	NOX	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	3	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	4	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	5	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	6	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	11	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	12	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	17	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	18	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	19	PM10	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	1	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	2	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	3	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	4	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	5	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	6	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	7	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	9	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	11	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	12	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	17	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80
850001	18	SO2	FLORIDA POWER & LIGHT (PMR)	MARTIN POWER PLANT	A	17	542.68	2992.65	27	3	25	80

FPL Martin Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Long MM	Long SS	Facility Type Code	Description	EU Description	EU Status
850001	1	NOX	33	55	1	STEAM ELECTRIC PLANT	Fossil Fuel Fired Steam Generator #1(Acid Rain, Phase II)	A
850001	2	NOX	33	55	1	STEAM ELECTRIC PLANT	Fossil Fuel Fired Steam Generator #2(Acid Rain, Phase II)	A
850001	3	NOX	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3A)(Acid Rain, Phase II)	A
850001	4	NOX	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3B)(Acid Rain, Phase II)	A
850001	5	NOX	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4A)(Acid Rain, Phase II)	A
850001	6	NOX	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4B)(Acid Rain, Phase II)	A
850001	7	NOX	33	55	1	STEAM ELECTRIC PLANT	Auxiliary Boiler	A
850001	9	NOX	33	55	1	STEAM ELECTRIC PLANT	Diesel Generator(0.718 MW for Units 003-006)	A
850001	11	NOX	33	55	1	STEAM ELECTRIC PLANT	Unit 8A - 170 MW gas turbine with gas-fired HRSG	A
850001	12	NOX	33	55	1	STEAM ELECTRIC PLANT	Unit 8B - 170 MW gas turbine with gas-fired HRSG	A
850001	17	NOX	33	55	1	STEAM ELECTRIC PLANT	Unit 8C - 170 MW gas turbine with gas-fired HRSG	A
850001	18	NOX	33	55	1	STEAM ELECTRIC PLANT	Unit 8D - 170 MW gas turbine with gas-fired HRSG	A
850001	3	PM10	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3A)(Acid Rain, Phase II)	A
850001	4	PM10	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3B)(Acid Rain, Phase II)	A
850001	5	PM10	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4A)(Acid Rain, Phase II)	A
850001	6	PM10	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4B)(Acid Rain, Phase II)	A
850001	11	PM10	33	55	1	STEAM ELECTRIC PLANT	Unit 8A - 170 MW gas turbine with gas-fired HRSG	A
850001	12	PM10	33	55	1	STEAM ELECTRIC PLANT	Unit 8B - 170 MW gas turbine with gas-fired HRSG	A
850001	17	PM10	33	55	1	STEAM ELECTRIC PLANT	Unit 8C - 170 MW gas turbine with gas-fired HRSG	A
850001	18	PM10	33	55	1	STEAM ELECTRIC PLANT	Unit 8D - 170 MW gas turbine with gas-fired HRSG	A
850001	19	PM10	33	55	1	STEAM ELECTRIC PLANT	Cooling tower	A
850001	1	SO2	33	55	1	STEAM ELECTRIC PLANT	Fossil Fuel Fired Steam Generator #1(Acid Rain, Phase II)	A
850001	2	SO2	33	55	1	STEAM ELECTRIC PLANT	Fossil Fuel Fired Steam Generator #2(Acid Rain, Phase II)	A
850001	3	SO2	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3A)(Acid Rain, Phase II)	A
850001	4	SO2	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 3B)(Acid Rain, Phase II)	A
850001	5	SO2	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4A)(Acid Rain, Phase II)	A
850001	6	SO2	33	55	1	STEAM ELECTRIC PLANT	Combustion Turbine with HRSG (CT 4B)(Acid Rain, Phase II)	A
850001	7	SO2	33	55	1	STEAM ELECTRIC PLANT	Auxiliary Boiler	A
850001	9	SO2	33	55	1	STEAM ELECTRIC PLANT	Diesel Generator(0.718 MW for Units 003-006)	A
850001	11	SO2	33	55	1	STEAM ELECTRIC PLANT	Unit 8A - 170 MW gas turbine with gas-fired HRSG	A
850001	12	SO2	33	55	1	STEAM ELECTRIC PLANT	Unit 8B - 170 MW gas turbine with gas-fired HRSG	A
850001	17	SO2	33	55	1	STEAM ELECTRIC PLANT	Unit 8C - 170 MW gas turbine with gas-fired HRSG	A
850001	18	SO2	33	55	1	STEAM ELECTRIC PLANT	Unit 8D - 170 MW gas turbine with gas-fired HRSG	A

FPL Martin Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)
850001	1	NOX	499	36	338	2634519		43.1	2595	11366.1	1808	7919
850001	2	NOX	499	36	338	2634519		43.1	2595	11366.1	2595	11366
850001	3	NOX	213	20	280	2420307		128.4	461	3108	461	3108
850001	4	NOX	213	20	280	2420307		128.4	461	3108	177	3108
850001	5	NOX	213	20	280	2420307		128.4	461	3108	461	3108
850001	6	NOX	213	20	280	2420307		128.4	461	3108	461	3108
850001	7	NOX	60	3.6	490	30536		50	4.88	21.37	4.88	21.37
850001	9	NOX	13	0.5	810	4750		403.2	72.07	316	72.07	316
850001	11	NOX	120	19	202	1004200	800000	59	23.6	103	66	111.87
850001	12	NOX	120	19	202	1004200	800000	59	23.6	103	66	111.87
850001	17	NOX	120	19	202	1004200	800000	59	23.6	103	95.3	3
850001	18	NOX	120	19	202	1004200	800000	59	23.6	103	23.6	34
850001	3	PM10	213	20	280	2420307		128.4	60.6	100	18	100
850001	4	PM10	213	20	280	2420307		128.4	60.6	100	60.6	100
850001	5	PM10	213	20	280	2420307		128.4	60.6	100	18	100
850001	6	PM10	213	20	280	2420307		128.4	60.6	100	60.6	100
850001	11	PM10	120	19	202	1004200	800000	59	37	63		
850001	12	PM10	120	19	202	1004200	800000	59	37	63		
850001	17	PM10	120	19	202	1004200	800000	59	37	63		
850001	18	PM10	120	19	202	1004200	800000	59	37	63		
850001	19	PM10	45	38	90	1386055		20.4	4.65	20.4		
850001	1	SO2	499	36	338	2634519		43.1	6920	30309.6	6920	30309
850001	2	SO2	499	36	338	2634519		43.1	6920	30309.6	6920	30309
850001	3	SO2	213	20	280	2420307		128.4	920	568	920	568
850001	4	SO2	213	20	280	2420307		128.4	920	568	920	568
850001	5	SO2	213	20	280	2420307		128.4	920	568	91.5	568
850001	6	SO2	213	20	280	2420307		128.4	920	568	91.5	568
850001	7	SO2	60	3.6	490	30536		50	0.0098	0.043		
850001	9	SO2	13	0.5	810	4750		403.2	1.72	7.5		
850001	11	SO2	120	19	202	1004200	800000	59	99	70	99	25
850001	12	SO2	120	19	202	1004200	800000	59	99	70	4.9	8.31
850001	17	SO2	120	19	202	1004200	800000	59	99	70	99	25
850001	18	SO2	120	19	202	1004200	800000	59	99	70	9.8	47

Facility ID	EU ID	Pollutant	Comments	Actual(tpy)
850001	1	NOX	While burning natural gas	1579.94896
850001	2	NOX	While burning fuel oil. Co-firing of NG and FO shall be prorated see permit ccondition QA10.	1901.536955
850001	3	NOX	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146.	187.704
850001	4	NOX	While burning natural gas. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	219.609
850001	5	NOX	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	181.459
850001	6	NOX	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	167.013
850001	7	NOX	While burning natural gas and fuel oil. Basis for allowable: PSD-FL-146	0.015037
850001	9	NOX	Basis for allowable: PSD-FL-146. Equivalent emission is from the permit application calculation data.	1.23216
850001	11	NOX	Not Active - Replaced. Gas Firing (Normal). Annual emissions based on compressor inlet temperature of 59deg F and 3390 hr/yr	42.93278
850001	12	NOX	Not Active - Replaced. Gas Firing (Normal). Annual emissions based on compressor inlet temperature of 59deg F and 3390 hr/yr	52.25662
850001	17	NOX	Gas firing, simple cycle (1000 hr/yr) w/peaking (60 hr/yr)	46.929425
850001	18	NOX	Gas firing, combined cycle w/duct burning (2880 hr/yr)	39.0379
850001	3	PM10	While burning natural gas. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	10.7784
850001	4	PM10	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	10.6704
850001	5	PM10	While burning natural gas. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	10.8446
850001	6	PM10	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	9.9819
850001	11	PM10		9.71259
850001	12	PM10		7.55424
850001	17	PM10		11.1945
850001	18	PM10		11.4075
850001	19	PM10		10
850001	1	SO2	Lbs/hr is for 100% oil firing.	4726.845404
850001	2	SO2	Lbs/hr is for 100% oil firing.	5300.221267
850001	3	SO2	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	3.4
850001	4	SO2	While burning fuel oil. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	3.5
850001	5	SO2	While burning natural gas. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	3.5
850001	6	SO2	While burning natural gas. TYP represent the total allowed for fuel oil and natural gas. Basis for allowable: PSD-FL-146	3.3
850001	7	SO2	Basis for allowable: PSD-FL-146. Compliance testing for firing fuel oil shall be conducted once per day.	0.000031
850001	9	SO2	Basis for allowable: PSD-FL-164	0.080988
850001	11	SO2	Oil firing (500 hr/yr)	3.432652
850001	12	SO2	Gas Firing (1 gr/100 SCF of NG). Equivalent emissions based on compressor inlet temperature of 59¿ F and 3390 hr/yr of gas firing	3.913694
850001	17	SO2	Oil firing (500 hr/yr)	3.573414
850001	18	SO2	Gas firing (2 gr/100 SCF of NG)	3.650683

FPL Martin Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Year	ICE_PM	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)	Baseline NO2(ton/yr)
850001	1	NOX	2007	C	C	E	865	3788.7	6920	30309.6	11366.1
850001	2	NOX	2007	C	C	E	865	3788.7	6920	30309.6	11366.1
850001	3	NOX	2007	C	C	C					
850001	4	NOX	2007	C	C	C					
850001	5	NOX	2007	C	C	C					
850001	6	NOX	2007	C	C	C					
850001	7	NOX	2007	C	C	C					
850001	9	NOX	2007								
850001	11	NOX	2007	C	C	C					
850001	12	NOX	2007	C	C	C					
850001	17	NOX	2007								
850001	18	NOX	2007								
850001	3	PM10	2007	C	C	C					
850001	4	PM10	2007	C	C	C					
850001	5	PM10	2007	C	C	C					
850001	6	PM10	2007	C	C	C					
850001	11	PM10	2007	C	C	C					
850001	12	PM10	2007	C	C	C					
850001	17	PM10	2007								
850001	18	PM10	2007								
850001	19	PM10	2007								
850001	1	SO2	2007	C	C	E	865	3788.7	6920	30309.6	11366.1
850001	2	SO2	2007	C	C	E	865	3788.7	6920	30309.6	11366.1
850001	3	SO2	2007	C	C	C					
850001	4	SO2	2007	C	C	C					
850001	5	SO2	2007	C	C	C					
850001	6	SO2	2007	C	C	C					
850001	7	SO2	2007	C	C	C					
850001	9	SO2	2007								
850001	11	SO2	2007	C	C	C					
850001	12	SO2	2007	C	C	C					
850001	17	SO2	2007								
850001	18	SO2	2007								

US Sugar - Clewiston Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD
510003	1	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	2	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	3	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	4	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	5	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	9	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	12	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	13	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	14	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	17	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	28	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	35	NOX	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	1	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	2	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	3	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	9	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	12	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	13	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	14	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	17	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	28	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26
510003	35	SO2	U.S. SUGAR CORP. CLEWISTON MILL	U.S. SUGAR CLEWISTON MILL AND REFINERY	A	17	506.1	2956.9	26

Facility ID	EU ID	Pollutant	Lat MM	Lat SS	Long DD	Long MM	Long SS	Facility Type Code	Description
510003	1	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	2	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	3	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	4	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	5	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	9	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	12	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	13	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	14	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	17	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	28	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	35	NOX	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	1	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	2	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	3	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	9	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	12	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	13	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	14	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	17	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	28	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT
510003	35	SO2	44	6	80	56	19	12	SUGAR PROCESSING PLANT

Facility ID	EU ID	Pollutant	EU Description	EU Status	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM
510003	1	NOX	Boiler 1 - 255,000 lb/hr steam rate (1-hr max.)	A	213	6.1	160	140135	
510003	2	NOX	Boiler 2 - 230,000 lb/hr steam rate (1-hr max.)	A	213	6.1	160	153937	
510003	3	NOX	Boiler 3 - 130,000 lb/hr steam rate (1-hr max.)	I	213	7.5	155	122393	
510003	4	NOX	BOILER #5 WITH SCRUBBER.	I	65	6	146	59500	
510003	5	NOX	BOILER #6 WITH SCRUBBER.	I	65	6	154	57503	
510003	9	NOX	Boiler 4 - 300,000 lb/hr steam rate (1-hr max.)	A	150	8.2	160	281000	
510003	12	NOX	DIESEL ELECTRIC GENERATOR #1. GENERAL MOTORS MODEL 16-567-CE	I	37	1.2	475	2721	1383
510003	13	NOX	DIESEL GENERATOR #2. GENERAL MOTORS MODEL #16-567-B	I	37	1.2	475	2721	1383
510003	14	NOX	Boiler 7 - 385,000 lb/hr steam rate (1-hr max.)	A	225	5		254587	
510003	17	NOX	Granular carbon regeneration furnace	A	30	2	160	4300	2746
510003	28	NOX	Boiler 8 - Bagasse boiler rated at 500,000 lb/hour steam	A	199	13	330	400000	225000
510003	35	NOX	Refinery package boiler, 12 MMBtu/hour, 300 hp	C	20	1	350	3770	
510003	1	SO2	Boiler 1 - 255,000 lb/hr steam rate (1-hr max.)	A	213	6.1	160	140135	
510003	2	SO2	Boiler 2 - 230,000 lb/hr steam rate (1-hr max.)	A	213	6.1	160	153937	
510003	3	SO2	Boiler 3 - 130,000 lb/hr steam rate (1-hr max.)	I	213	7.5	155	122393	
510003	9	SO2	Boiler 4 - 300,000 lb/hr steam rate (1-hr max.)	A	150	8.2	160	281000	
510003	12	SO2	DIESEL ELECTRIC GENERATOR #1. GENERAL MOTORS MODEL 16-567-CE	I	37	1.2	475	2721	1383
510003	13	SO2	DIESEL GENERATOR #2. GENERAL MOTORS MODEL #16-567-B	I	37	1.2	475	2721	1383
510003	14	SO2	Boiler 7 - 385,000 lb/hr steam rate (1-hr max.)	A	225	5		254587	
510003	17	SO2	Granular carbon regeneration furnace	A	30	2	160	4300	2746
510003	28	SO2	Boiler 8 - Bagasse boiler rated at 500,000 lb/hour steam	A	199	13	330	400000	225000
510003	35	SO2	Refinery package boiler, 12 MMBtu/hour, 300 hp	C	20	1	350	3770	

US Sugar - Clewiston Interactive Source Data

Facility ID	EU ID	Pollutant	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)	Comments	Actual(tpy)	Year
510003	1	NOX	79		222				19.9	2007
510003	2	NOX	87		222				21.47	2007
510003	3	NOX	46		144.2				11.16	2005
510003	4	NOX	35	21	37.8				7.4	1997
510003	5	NOX	33		75.6				13.5	1997
510003	9	NOX	88.7	126.6	288	126.6	288	Annual test concurrently with CO test	57.39	2007
510003	12	NOX	40	34.9	152.9				2	2004
510003	13	NOX	40	34.9	152.9				4.02	2003
510003	14	NOX	216.1	185	809	185	809		214.59	2007
510003	17	NOX	22.8	3	13.14				12.1	2007
510003	28	NOX	50.2	131	473.7	131	473.7	Limit is 0.14 lb/MMBtu, 30 day rolling average	294	2007
510003	35	NOX	80	1.71	0.64					
510003	1	SO2	79	164.8	296	164.8	296		0.16	2007
510003	2	SO2	87	164.8	296	164.8	296		0.12	2007
510003	3	SO2	46	143	257	143	257		3.59	2005
510003	9	SO2	88.7	38	86.2	38	86.4	Limit is for bagasse firing only	0.31	2007
510003	12	SO2	40	5.8	25.4	5.8	25.4		0.33	2004
510003	13	SO2	40	5.8	25.4	5.8	25.4		0.33	2004
510003	14	SO2	216.1	125	550	125	550		69.63	2007
510003	17	SO2	22.8	0.7	3.07	0.7	3.07	Each fuel purchase must comply with 0.05% sulfur limit	1.02	2007
510003	28	SO2	50.2	56.2	203	56.2	203	Test within 90-100% of 24-hour steam production limit	75.36	2007
510003	35	SO2	80	0.61	0.23					

US Sugar - Clewiston Interactive Source Data

Facility ID	EU ID	Pollutant	ICE_PM	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)	Baseline NO2(ton/yr)
510003	1	NOX								
510003	2	NOX								
510003	3	NOX								
510003	4	NOX								
510003	5	NOX								
510003	9	NOX	C	C	C					
510003	12	NOX								
510003	13	NOX								
510003	14	NOX								
510003	17	NOX								
510003	28	NOX								
510003	35	NOX								
510003	1	SO2								
510003	2	SO2								
510003	3	SO2								
510003	9	SO2	C	C	C					
510003	12	SO2								
510003	13	SO2								
510003	14	SO2								
510003	17	SO2								
510003	28	SO2								
510003	35	SO2								

Progress Energy - Avon Park Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM	Lat SS
550003	3	SO2	FLORIDA POWER CORPORATION D/B/A PROGRESS	AVON PARK	A	17	451.4	3050.5	27	34	45
550003	4	SO2	FLORIDA POWER CORPORATION D/B/A PROGRESS	AVON PARK	A	17	451.4	3050.5	27	34	45

Progress Energy - Avon Park Interactive Source Data

Facility ID	EU ID	Pollutant	Long DD	Long MM	Long SS	Facility Type Code	Description	EU Description	EU Status	Stack Height(ft)	Diam(ft)
550003	3	SO2	81	29	33	1	STEAM ELECTRIC PLANT	Gas Turbine Peaking Unit No. 1	A	55	10
550003	4	SO2	81	29	33	1	STEAM ELECTRIC PLANT	Gas Turbine Peaking Unit No. 2	A	55	10

Progress Energy - Avon Park Interactive Source Data

Facility ID	EU ID	Pollutant	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)
550003	3	SO2	850	2000000		424	577	2527	577	2527
550003	4	SO2	850	2000000		424.4	577	2527	577	2527

Progress Energy - Avon Park Interactive Source Data

Facility ID	EU ID	Pollutant	Comments	Actual(tpy)	Year	ICE_PM	ICE_SO2	ICE_NO2
550003	3	SO2	Basis for allowable emission is AO 28-202500. Sulfur content limit is not federally enforceable.	1.076	2007			
550003	4	SO2	Basis for allowable emission is AO 28-202500. Sulfur content limit is not federally enforceable.	6.361	2007			

Progress Energy - Avon Park Interactive Source Data

Facility ID	EU ID	Pollutant	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)	Baseline NO2(ton/yr)
550003	3	SO2					
550003	4	SO2					

TECO Dinner Lake Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM	Lat SS	Long DD
550004	1	NOX	TAMPA ELECTRIC COMPANY	DINNER LAKE STATION	I	17	456.8	3042.5	27	30	28	81
550004	2	NOX	TAMPA ELECTRIC COMPANY	DINNER LAKE STATION	I	17	456.8	3042.5	27	30	28	81
550004	1	SO2	TAMPA ELECTRIC COMPANY	DINNER LAKE STATION	I	17	456.8	3042.5	27	30	28	81
550004	2	SO2	TAMPA ELECTRIC COMPANY	DINNER LAKE STATION	I	17	456.8	3042.5	27	30	28	81

TECO Dinner Lake Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Long MM	Long SS	Facility Type Code	Description	EU Description
550004	1	NOX	26	14	1	STEAM ELECTRIC PLANT	STEAM BOILER FOR POWER PRODUCTION GAS/OIL FIRED 130000LBS/HR
550004	2	NOX	26	14	1	STEAM ELECTRIC PLANT	(2) DIESEL GENERATING UNITS,(SEE PLANT 0028)
550004	1	SO2	26	14	1	STEAM ELECTRIC PLANT	STEAM BOILER FOR POWER PRODUCTION GAS/OIL FIRED 130000LBS/HR
550004	2	SO2	26	14	1	STEAM ELECTRIC PLANT	(2) DIESEL GENERATING UNITS,(SEE PLANT 0028)

TECO Dinner Lake Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	EU Status	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)	Comments
550004	1	NOX	I	75	6	250	32400		19	91.3				
550004	2	NOX	I	20	3	600				506.5	2036	506.5	2036	
550004	1	SO2	I	75	6	250	32400		19	299.9	1313.4	299.9	1313.4	
550004	2	SO2	I	20	3	600				33.7	136	33.7	136	

TECO Dinner Lake Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Actual(tpy)	Year	ICE_PM	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)
550004	1	NOX	1	1994							
550004	2	NOX	87	1987							
550004	1	SO2	5	1994							
550004	2	SO2	5.788	1987							

TECO Dinner Lake Power Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Baseline NO2(ton/yr)
550004	1	NOX	
550004	2	NOX	
550004	1	SO2	
550004	2	SO2	

TECO Phillips Station Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM	Lat SS	Long DD	Long MM
550018	1	NOX	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21
550018	2	NOX	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21
550018	4	NOX	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21
550018	1	SO2	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21
550018	2	SO2	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21
550018	4	SO2	TAMPA ELECTRIC COMPANY	PHILLIPS STATION	A	17	464.3	3035.4	27	26	35	81	21

TECO Phillips Station Interactive Source Data

Facility ID	EU ID	Pollutant	Long SS	Facility Type Code	Description	EU Description	EU Status
550018	1	NOX	54	2	OTHER ELECTRIC PRODUCTION	19.535 MW SLOW SPEED DIESEL GENERATING UNIT 1	A
550018	2	NOX	54	2	OTHER ELECTRIC PRODUCTION	19.535 MW SLOW SPEED DIESEL GENERATING UNIT 2	A
550018	4	NOX	54	2	OTHER ELECTRIC PRODUCTION	AUXILIARY STEAM BOILER	A
550018	1	SO2	54	2	OTHER ELECTRIC PRODUCTION	19.535 MW SLOW SPEED DIESEL GENERATING UNIT 1	A
550018	2	SO2	54	2	OTHER ELECTRIC PRODUCTION	19.535 MW SLOW SPEED DIESEL GENERATING UNIT 2	A
550018	4	SO2	54	2	OTHER ELECTRIC PRODUCTION	AUXILIARY STEAM BOILER	A

TECO Phillips Station Interactive Source Data

Facility ID	EU ID	Pollutant	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)	Comments
550018	1	NOX	150	6	335	134500		79	571.8	2504.5	571.8	2504.5	
550018	2	NOX	150	6	350	135500		79	571.82	2504.5	571.82	2504.5	
550018	4	NOX	62	2.2					1.49	6.526			
550018	1	SO2	150	6	335	134500		79	459.29	2011.5	459.29	2011.5	
550018	2	SO2	150	6	350	135500		79	459.29	2011.5	459.29	2011.5	
550018	4	SO2	62	2.2					5.26	22.8	5.26	22.8	

TECO Phillips Station Interactive Source Data

Facility ID	EU ID	Pollutant	Actual(tpy)	Year	ICE_PM	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)
550018	1	NOX	309.2669	2007							
550018	2	NOX	303.6832	2007							
550018	4	NOX	0.50364	2007							
550018	1	SO2	198.662715	2007							
550018	2	SO2	202.547492	2007							
550018	4	SO2	0.091906	2007							

TECO Phillips Station Interactive Source Data

Facility ID	EU ID	Pollutant	Baseline NO2(ton/yr)
550018	1	NOX	
550018	2	NOX	
550018	4	NOX	
550018	1	SO2	
550018	2	SO2	
550018	4	SO2	

Indiantown Cogeneration Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM
850102	1	NOX	INDIANTOWN COGENERATION, L.P.	INDIANTOWN COGENERATION PLANT	A	17	547.65	2990.7	27	2
850102	3	NOX	INDIANTOWN COGENERATION, L.P.	INDIANTOWN COGENERATION PLANT	A	17	547.65	2990.7	27	2
850102	1	SO2	INDIANTOWN COGENERATION, L.P.	INDIANTOWN COGENERATION PLANT	A	17	547.65	2990.7	27	2
850102	3	SO2	INDIANTOWN COGENERATION, L.P.	INDIANTOWN COGENERATION PLANT	A	17	547.65	2990.7	27	2

Indiantown Cogeneration Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Lat SS	Long DD	Long MM	Long SS	Facility Type Code	Description	EU Description	EU Status
850102	1	NOX	21	80	30	53	1	STEAM ELECTRIC PLANT	Pulverized Coal Main Boiler	A
850102	3	NOX	21	80	30	53	1	STEAM ELECTRIC PLANT	(2) Auxiliary Boilers and Temporary Auxiliary Boiler	I
850102	1	SO2	21	80	30	53	1	STEAM ELECTRIC PLANT	Pulverized Coal Main Boiler	A
850102	3	SO2	21	80	30	53	1	STEAM ELECTRIC PLANT	(2) Auxiliary Boilers and Temporary Auxiliary Boiler	I

Indiantown Cogeneration Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)
850102	1	NOX	495	16	140	1123700		93.2	582	2549	582	2549
850102	3	NOX	210	5	350	103200		87.6	71.6	177	68	34
850102	1	SO2	495	16	140	1123700		93.2	582	2549		
850102	3	SO2	210	5	350	103200		87.6	18	16.91	18	9

Indiantown Cogeneration Plant Interactive Source Data

Facility ID	EU ID	Pollutant	Comments	Actual(tpy)	Year	ICE_PM
850102	1	NOX	Basis for allowable emission: PSD-FL-168. Emission limit based on 24 hr daily block average (midnight to midnight).	1949.967	2007	C
850102	3	NOX	0.2 lb/mmBtu applies all the time. Basis for allowable emissions: PSD-FL-168	2.22	2006	C
850102	1	SO2	70 percent reduction; 30-day rolling average basis.	2068.78	2007	C
850102	3	SO2	While firing fuel oil. Basis for allowable emissions: PSD-FL-168	0.013	2006	C

Indiantown Cogeneration Plant Interactive Source Data

Facility ID	EU ID	Pollutant	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)	Baseline NO2(ton/yr)
850102	1	NOX	C	C	0	0	0	0	0
850102	3	NOX	C	C	0	0	0	0	0
850102	1	SO2	C	C	0	0	0	0	0
850102	3	SO2	C	C	0	0	0	0	0

Okeechobee Landfill Interactive Source Data

Facility ID	EU ID	Pollutant	Owner	Site Name	Status	UTM Zone	UTM East(km)	UTM North(km)	Lat DD	Lat MM	Lat SS	Long DD
930104	3	SO2	OKEECHOBEE LANDFILL, INC.	BERMAN ROAD LANDFILL	A	17	530.28	3023.96	27	20	24	80

Okeechobee Landfill Interactive Source Data

Facility ID	EU ID	Pollutant	Long MM	Long SS	Facility Type Code	Description	EU Description
930104	3	SO2	41	27	39	MUNICIPAL SOLID WASTE LANDFILL	3000 SCFM ENC FLARE, MODEL 1776 EVAP 3016

Okeechobee Landfill Interactive Source Data

Facility ID	EU ID	Pollutant	EU Status	Stack Height(ft)	Diam(ft)	Exit Temp(F)	ACFM	DSCFM	VEL(ft/s)	Potential(lb/hr)	Potential(tpy)	Allowable(lb/hr)	Allowable(tpy)	Comments
930104	3	SO2	A	50	11	1500	185060	46714	32.5	1.51	6.6			

Okeechobee Landfill Interactive Source Data

Facility ID	EU ID	Pollutant	Actual(tpy)	Year	ICE_PM	ICE_SO2	ICE_NO2	Baseline PM(lb/hr)	Baseline PM(ton/yr)	Baseline SO2(lb/hr)	Baseline SO2(ton/yr)
930104	3	SO2	379	2007							

Okeechobee Landfill Interactive Source Data

Facility ID	EU ID	Pollutant	Baseline NO2(ton/yr)
930104	3	SO2	

APPENDIX H

FLM Notification Letters

February 9, 2009 via email and US mail

Mr. Don Shepherd
National Park Service
Air Resources Division
12795 West Alameda Parkway
Lakewood, Colorado 80228

Re: Federal Land Manager Notification of the Proposed Highlands Ethanol LLC Project

Dear Mr. Shepherd:

The purpose of this letter is to provide formal notification of the intent of Highlands Ethanol LLC (Highlands Ethanol) to permit and construct a cellulosic ethanol production facility at a site in southeastern Highlands County, Florida. The site is located approximately 154 kilometers (km) from Everglades National Park.

The proposed ethanol production capacity of 36 million gallons per year is based on an expected operating schedule of 8,000 hours per year. The project will be permitted at an operating capacity of 39.42 million gallons per year to allow for an operating schedule of 8,760 hours per year. The ethanol is required to be denatured with gasoline, with a minimum denaturant content of 5% by volume. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.49 million gallons when accounting for the denaturant.

The proposed emission rates for nitrogen oxides (NO_X), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC) will be consistent with the US Environmental Protection Agency's (USEPA) Best Available Control Technology (BACT) requirements. A summary of calculated potential emissions by emission source is provided in Table 1. Ethanol production for fuel use previously fell into one of the 28 designated industrial source categories under USEPA's Prevention of Significant Deterioration (PSD) permitting requirements, so a major source was defined as having potential emissions of 100 tons per year or more. In April 2007, USEPA promulgated changes to the PSD permitting program, establishing a PSD applicability threshold of 250 tpy for ethanol production facilities. However, the Florida Department of Environmental Protection (FDEP) has not adopted the PSD rule changes for ethanol production facilities and does not anticipate doing so. Therefore, the PSD applicability threshold for ethanol production facilities in Florida remains 100 tpy and the proposed facility is subject to the PSD construction permit requirements.

AMEC Earth & Environmental, Inc.
15 Franklin Street
Portland, ME 04101
Tel (207) 879-4222
Fax (207) 879-4223 www.amec.com

amec

Table 1. Summary of Calculated Potential Emissions, Highlands Ethanol

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)
Liquid/Solid Separation	--	--	--	--	--	2.1
Fermentation/Distillation	--	--	--	--	--	18.8
Product/Denaturant Storage	--	--	--	--	--	1.7
Product Loadout	0.02	0.02	0.004	0.4	2.3	5.3
Misc. Storage Tanks	--	--	--	--	--	0.0
Misc. Storage Silos	4.7	4.7	--	--	--	--
Wastewater Treatment	0.002	0.002	0.001	0.1	0.3	5.4
Cooling Tower	0.7	0.7	--	--	--	4.1
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7
Emergency Engines	0.9	0.9	0.02	25.9	15.9	2.9
Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**
Stillage Loadout	--	--	--	--	--	2.8
Equipment Leaks	--	--	--	--	--	19.6
Roadway Emissions	9.9	1.0	--	--	--	--
Subtotal, Fugitive Sources	**9.9**	**1.0**	**--**	**--**	**--**	**22.4**
Total	***33.6***	***24.7***	***104.1***	***156.5***	***192.0***	***71.3***

The facility will include two biomass boilers that will burn stillage cake, a byproduct of the process, as well as biogas generated by anaerobic digesters included in the facility's wastewater treatment plant (WWTP). Natural gas will be used in the biomass boilers for startups and flame stabilization. The backup boiler will operate only when one of the biomass boilers is down. It will burn natural gas, although ultra low sulfur diesel (ULSD) is included in the application in the event a natural gas pipeline being considered for the area is not constructed in a timely manner. The proposed biomass boilers will be equipped with selective non-catalytic reduction (SNCR) for nitrogen oxides (NO_X) emissions control, baghouses for particulate matter (PM) emissions control, and limestone injection for sulfur dioxide (SO_2) emissions control.

Highlands Ethanol performed screening modeling to predict the impact on Everglades National Park. The analysis was performed by placing a ring of 360 receptors in 1° increments at a distance of 50 kilometers (km) from the facility. Figure 1 presents a map showing the locations of the facility site and the ring of receptors relative to the park. Included on the map are arcs showing the 100 km and 300 km distances from the proposed project.

The AERMOD dispersion model was used for the analysis. AERMOD is the recommended sequential model in USEPA's Guideline on Air Quality Models (40 CFR 51, Appendix W). The regulatory default option was used. Receptor elevations were assigned by using USEPA's AERMAP software tool, which is designed to extract elevations from USGS Digital Elevation Model (DEM) files. AERMAP is the terrain preprocessor for AERMOD.

The meteorological data used in the sequential modeling consists of National Weather Service (NWS) data collected at West Palm Beach International Airport (WBAN 12844) from 2001 through 2005. Upper air radiosonde data concurrent with the collection of surface meteorological data were used for Miami, Florida (WBAN 92803). AERMOD-ready meteorological data files were provided by FDEP.

The maximum predicted concentrations are presented in Table 2 and compared to Class I area significant impact levels (SILs) promulgated by FDEP and proposed by USEPA.

Table 2. Significant Impact Analysis Modeling Results

Pollutant (Load)	Averaging Period	Year	Date (Hr)	Receptor UTM Coordinates (km)	AERMOD Predicted Conc. ($\mu g/m^3$)	Significant Impact Levels [a] ($\mu g/m^3$)
SO_2	3-hour	2003	12/20 (06)	543.22, 3015.79	0.967	1.0
	24-hour	2002	12/16	528.64, 2977.82	0.171	0.2 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00470	0.1
PM_{10}	24-hour	2002	12/16	528.64, 2977.82	0.0766	0.3 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00433	0.2
NO_2	Annual	2002	--	525.42, 2974.88	0.00587	0.1

[a] SILs proposed by USEPA (61 FR 38338) in 1996. Final SILs have not been promulgated.

[b] SILs promulgated by FDEP [Rule 62-204.200(29) F.A.C.]

In all cases, maximum predicted concentrations are less than the promulgated FDEP and proposed USEPA Class I area SILs at a distance of 50 km from the proposed site. Given the distance to Everglades National Park of 154 km, the impacts in the Class I area will also be less than the SILs. The modeling files are included on the enclosed CDROM.

Because the modeling demonstrates insignificant impacts in the Class I area, Highlands Ethanol concludes that the proposed facility will not adversely impact the Class I area. Highlands Ethanol requests that the FLM consider this analysis and confirm that no additional

modeling (such as a cumulative increment or visibility analysis) needs to be conducted. Highlands Ethanol requests that the confirmation be provided in writing to me and to Mr. Al Linero of the FDEP at the following address:

Mr. Alvaro A. Linero, P.E.
Administrator, South Permitting Section
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

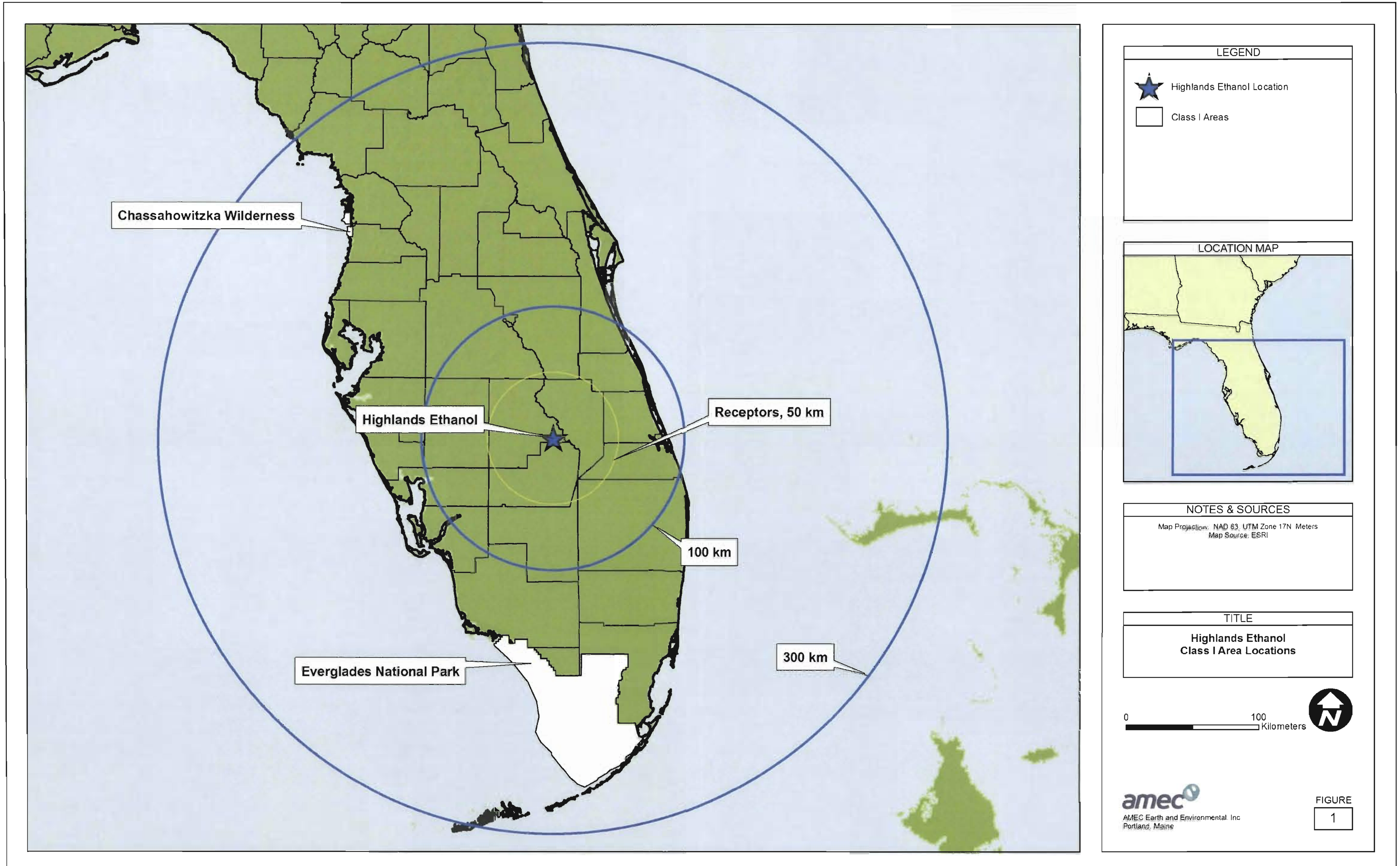
If you have any questions regarding this notification, please call me at (207) 879-4222, ext. 37.

Very truly yours,
AMEC Earth & Environmental

Jeffrey R. Harrington

Jeffrey R. Harrington, P.E.
Senior Project Engineer

cc: T. Eves – Highlands Ethanol
A. Linero – FDEP
D. Nelson – FDEP
K. Jameson – AMEC



TITLE

Highlands Ethanol
Class I Area Locations

FIGURE 1

February 9, 2009 via email and US mail

Ms. Catherine Collins
U.S. Fish and Wildlife Service
Branch of Air Quality
7333 W Jefferson Ave., Suite 375
Lakewood, Colorado 80235

Re: Federal Land Manager Notification of the Proposed Highlands Ethanol LLC Project

Dear Ms. Collins:

The purpose of this letter is to provide formal notification of the intent of Highlands Ethanol LLC (Highlands Ethanol) to permit and construct a cellulosic ethanol production facility at a site in southeastern Highlands County, Florida. The site is located approximately 216 kilometers (km) from the Chassahowitzka Wilderness Area.

The proposed ethanol production capacity of 36 million gallons per year is based on an expected operating schedule of 8,000 hours per year. The project will be permitted at an operating capacity of 39.42 million gallons per year to allow for an operating schedule of 8,760 hours per year. The ethanol is required to be denatured with gasoline, with a minimum denaturant content of 5% by volume. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.49 million gallons when accounting for the denaturant.

The proposed emission rates for nitrogen oxides (NO_X), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC) will be consistent with the US Environmental Protection Agency's (USEPA) Best Available Control Technology (BACT) requirements. A summary of calculated potential emissions by emission source is provided in Table 1. Ethanol production for fuel use previously fell into one of the 28 designated industrial source categories under USEPA's Prevention of Significant Deterioration (PSD) permitting requirements, so a major source was defined as having potential emissions of 100 tons per year or more. In April 2007, USEPA promulgated changes to the PSD permitting program, establishing a PSD applicability threshold of 250 tpy for ethanol production facilities. However, the Florida Department of Environmental Protection (FDEP) has not adopted the PSD rule changes for ethanol production facilities and does not anticipate doing so. Therefore, the PSD applicability threshold for ethanol production facilities in Florida remains 100 tpy and the proposed facility is subject to the PSD construction permit requirements.

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15 Franklin Street
Portland, ME 04101
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Liquid/Solid Separation	--	--	--	--	--	2.1
Fermentation/Distillation	--	--	--	--	--	18.8
Product/Denaturant Storage	--	--	--	--	--	1.7
Product Loadout	0.02	0.02	0.004	0.4	2.3	5.3
Misc. Storage Tanks	--	--	--	--	--	0.0
Misc. Storage Silos	4.7	4.7	--	--	--	--
Wastewater Treatment	0.002	0.002	0.001	0.1	0.3	5.4
Cooling Tower	0.7	0.7	--	--	--	4.1
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7
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Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**
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Equipment Leaks	--	--	--	--	--	19.6
Roadway Emissions	9.9	1.0	--	--	--	--
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The facility will include two biomass boilers that will burn stillage cake, a byproduct of the process, as well as biogas generated by anaerobic digesters included in the facility's wastewater treatment plant (WWTP). Natural gas will be used in the biomass boilers for startups and flame stabilization. The backup boiler will operate only when one of the biomass boilers is down. It will burn natural gas, although ultra low sulfur diesel (ULSD) is included in the application in the event a natural gas pipeline being considered for the area is not constructed in a timely manner. The proposed biomass boilers will be equipped with selective non-catalytic reduction (SNCR) for nitrogen oxides (NO_X) emissions control, baghouses for particulate matter (PM) emissions control, and limestone injection for sulfur dioxide (SO_2) emissions control.

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PM_{10}	24-hour	2002	12/16	528.64, 2977.82	0.0766	0.3 / 1.0[b]
	Annual	2002	--	525.42, 2974.88	0.00433	0.2
NO_2	Annual	2002	--	525.42, 2974.88	0.00587	0.1

[a] SILs proposed by USEPA (61 FR 38338) in 1996. Final SILs have not been promulgated.

[b] SILs promulgated by FDEP [Rule 62-204.200(29) F.A.C.]

In all cases, maximum predicted concentrations are less than the promulgated FDEP and proposed USEPA Class I area SILs at a distance of 50 km from the proposed site. Given the distance to the Chassahowitzka Wilderness Area of 216 km, the impacts in the Class I area will also be less than the SILs. The modeling files are included on the enclosed CDROM.

Because the modeling demonstrates insignificant impacts in the Class I area, Highlands Ethanol concludes that the proposed facility will not adversely impact the Class I area. Highlands Ethanol requests that the FLM consider this analysis and confirm that no additional

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modeling (such as a cumulative increment or visibility analysis) needs to be conducted. Highlands Ethanol requests that the confirmation be provided in writing to me and to Mr. Al Linero of the FDEP at the following address:

Mr. Alvaro A. Linero, P.E.
Administrator, South Permitting Section
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

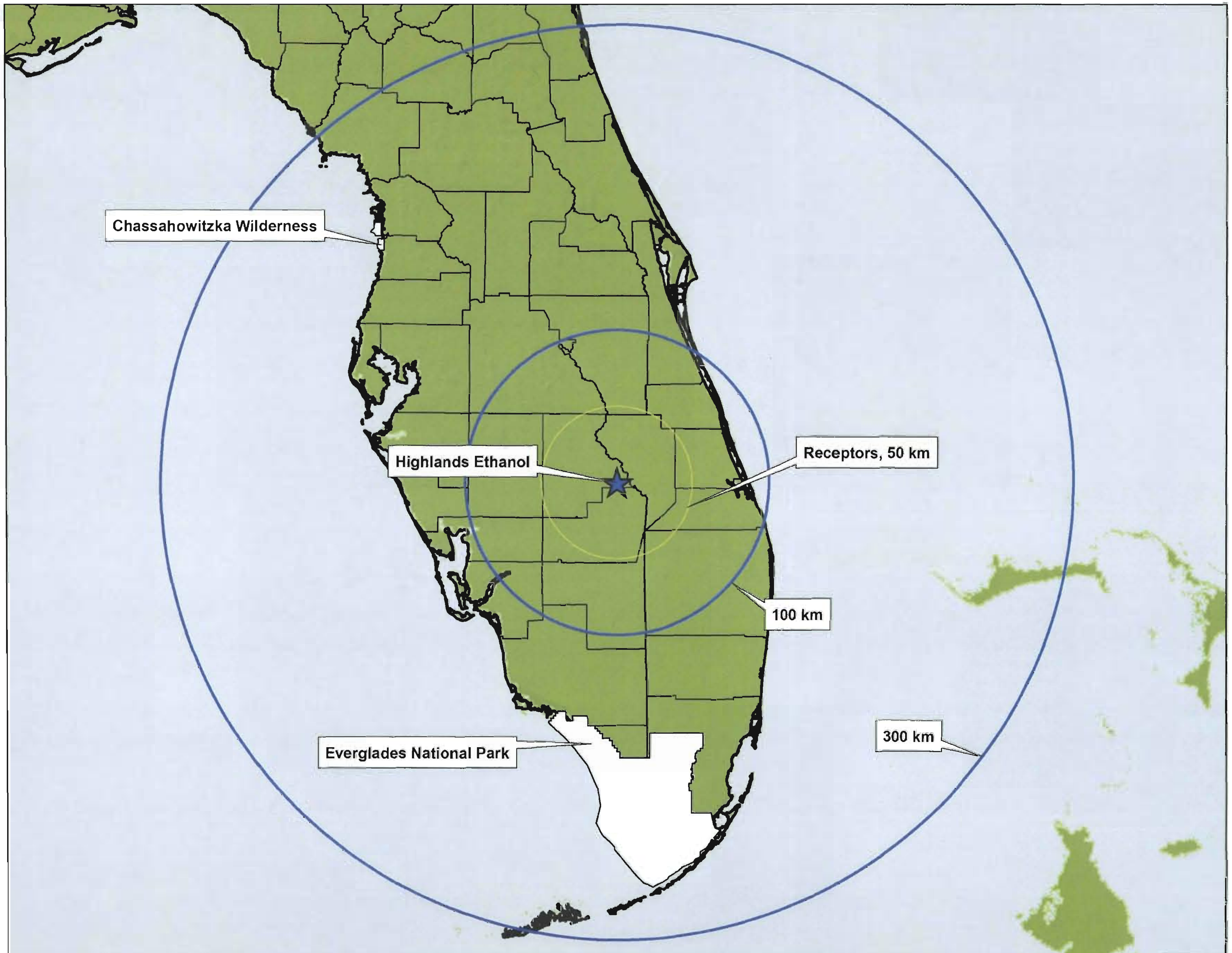
If you have any questions regarding this notification, please call me at (207) 879-4222, ext. 37.

Very truly yours,
AMEC Earth & Environmental

Jeffrey R. Harrington

Jeffrey R. Harrington, P.E.
Senior Project Engineer

cc: T. Eves – Highlands Ethanol
A. Linero – FDEP
D. Nelson – FDEP
K. Jameson – AMEC



LEGEND

Highlands Ethanol Location

Class I Areas

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Map Source: ESRI

TITLE

Highlands Ethanol
Class I Area Locations

0 100 Kilometers

N

AMEC Earth and Environmental, Inc.
Portland, Maine

FIGURE
1

APPENDIX I

Exempt and Insignificant Emission Units

APPENDIX I
Exempt Emission Units Pursuant to FDEP Form No. 62-210.900(1), Section II.C.

Final design of the facility and equipment is not yet complete. Therefore, a specific list of exempt equipment is not available at this time. However, the following types of exempt equipment may be included in the final facility design.

- Space Heaters – Exempt per 62-210.300(3)(a)(9) F.A.C.: Equipment used exclusively for space heating, other than boilers;
- Laboratory Equipment – Exempt per 62-210.300(3)(a)(12) F.A.C.: Laboratory equipment used exclusively for chemical or physical analyses.
- Maintenance Soldering and Welding – Exempt per 62-210.300(3)(a)(13) F.A.C.: Brazing, soldering or welding equipment.
- Fire suppression systems and fire extinguishers – Exempt per 62-210.300(3)(a)(15) F.A.C.: Fire and safety equipment.
- Lubrication of miscellaneous equipment – Exempt per 62-210.300(3)(a)(16) F.A.C.: Petroleum lubrication systems.
- Use of pesticides, herbicides and/or fungicides inside or outside of the facility – Exempt per 62-210.300(3)(a)(17) F.A.C.: Application of fungicide, herbicide, or pesticide.
- Maintenance cold cleaners – Exempt per 62-210.300(3)(a)(23) F.A.C.: Degreasing units using heavier-than-air vapors exclusively, provided that such units shall not use any substance containing any hazardous air pollutant; or 62-210.300(3)(a)(24) F.A.C.: Non-halogenated solvent storage and cleaning operations, provided that such operations shall not use any solvent containing any hazardous air pollutant.
- Small boilers and hot water heaters – Exempt per 62-210.300(3)(a)(33) F.A.C.: Fossil fuel steam generators, hot water generators, and other external combustion heating units with collective heat input capacity equal to or less than 10 million Btu per hour, fired by natural gas or propane, and not subject to Acid Rain, CAIR, or unit-specific requirements.

Additional equipment are expected to qualify as insignificant emission units. These include the miscellaneous storage tanks described in Section 3.1.6, and for which emissions calculations are provided in Appendix B.

Correspondence

VERENIUM
THE NATURE OF ENERGY™

www.verenium.com

55 Cambridge Parkway, Cambridge, MA 02142

617.674.5300

February 6, 2009

Mr. Gregg Worley
Air Permits Section Chief
United States Environmental Protection Agency
Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Re: New Source Performance Standard Exemptions for Cellulosic Ethanol Facilities

Dear Mr. Worley:

Highlands Ethanol, LLC, an affiliate of Verenium Biofuels Corporation, is submitting a Prevention of Significant Deterioration (PSD) permit application to the Florida Department of Environmental Protection (FDEP) for construction of the Highlands Ethanol facility. This proposed facility will be a new fuel-grade cellulosic ethanol production facility to be constructed in Highlands County, Florida.

As part of the regulatory applicability review for the proposed new facility, Highlands Ethanol identified New Source Performance Standards (NSPS) that are potentially applicable to the facility. Two of these standards are as follows:

- 40 CFR 60 Subpart NNN - Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations; and
- 40 CFR 60 Subpart RRR - Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes.

According to a United States Environmental Protection Agency (USEPA) Federal Register notice (72 FR 41117) and several letters issued by USEPA Region 5 (see USEPA Applicability Determination Index Control Numbers 0100076 and 0100083 and USEPA correspondence dated October 20, 2000), ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart NNN because the NSPS background information document (USEPA, 1983) states that, "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart NNN.

Likewise, these same reference documents state that ethanol manufacturing facilities are exempt from the requirements of NSPS Subpart RRR because the NSPS background information document (USEPA, 1990) states that "... a total of 173 chemicals produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis." The ethanol produced by the proposed facility will be created by fermentation (biological synthesis), which is excluded from the scope of Subpart RRR.

In our pre-application meeting with FDEP on October 23, 2008, Mr. Alvaro Linero indicated that regulatory interpretation of NSPS falls under the jurisdiction of USEPA rather than FDEP, and he indicated that we would need to obtain approval for these exemptions from USEPA Region 4. Therefore, Highlands Ethanol respectfully requests that USEPA Region 4 issue site-specific exemptions from the 40 CFR 60 Subpart NNN and 40 CFR 60 Subpart RRR requirements for the proposed Highlands Ethanol facility based on the supporting documentation cited. The supporting documentation is enclosed for your reference.

To facilitate compliance, Highlands Ethanol desires to have the USEPA's exemption from these NSPS requirements written into the PSD Permit that will be developed by FDEP for the proposed source. Consequently, we request that USEPA provide permit language to FDEP for incorporation into the permit that confirms the site-specific exemptions from the 40 CFR 60 Subpart NNN and 40 CFR 60 Subpart RRR requirements. We understand that FDEP will be making our PSD permit application available for your review, and that package should assist you in preparing your determination.

We thank you for your assistance in the permitting process for our proposed new facility. Should you have any questions, or require any additional information, please do not hesitate to contact me at (813) 349-4943 or our environmental consultant, Mr. Jeff Harrington of AMEC at (207) 879-4222.

Sincerely,

TR Eves

Tim Eves
Vice President, Business Development

cc: C. Davis – Verenium/Highlands Ethanol
J. Harrington – AMEC
K. Jameson – AMEC

Federal Register

Thursday,
July 26, 2007

Part II

Environmental Protection Agency

Recent Posting to the Applicability Determination Index (ADI) Database System of Agency Applicability Determinations, Alternative Monitoring Decisions, and Regulatory Interpretations Pertaining to Standards of Performance for New Stationary Sources, National Emission Standards for Hazardous Air Pollutants, and the Stratospheric Ozone Protection Program; Notices

subject to 40 CFR part 60, subpart Y? Conveyor numbers 1 and 2 were built prior to the AEPCO screening and crushing facility.

A: Yes. EPA finds that AEPCO conveyor numbers 1 and 2 are part of the affected facility subject to NSPS subpart Y because these are used to convey coal or coal refuse from the machinery and the exemption in 40 CFR 60.14(c) would therefore, not apply. 40 CFR 60.14(c) exempts existing facilities from becoming affected facilities by the addition of a new affected facility. However, this case involves changes to an existing affected facility.

Abstract for [0600033]

Q: Could EPA clarify the applicability of 40 CFR part 60, subparts NNN, RRR, and VV to the production of ethyl alcohol through biological fermentation processes?

A: These regulations and their background documents state that these subparts apply only to specific processes involving synthesis of organic chemicals using petroleum-based feedstocks (in this case ethylene to ethanol) and not biological fermentation processes where emissions characteristics and industry economics differ. EPA clarified that these regulations do not apply to chemicals extracted from natural sources or totally produced by biological process in the following **Federal Register** notices: the notice proposing the NSPS for volatile organic compound (VOC) emissions from synthetic organic chemical manufacturing industry (SOCMI) distillation operations (40 CFR part 60, subpart NNN) (48 FR 57541); the notice promulgating the NSPS for equipment leaks of VOC in SOCMI (40 CFR part 60, subpart VV) (48 FR 48335); and the notice promulgating the NSPS for VOC emissions from SOCMI reactor processes (40 CFR part 60, subpart RRR) (58 FR 45962).

Abstract for [0600034]

Q: Could EPA clarify the applicability of 40 CFR part 60, subparts NNN, RRR, and III to biomass ethanol production?

A: EPA finds that NSPS subparts NNN, RRR, and III do not contain a blanket exemption for biomass ethanol production facilities from applicability of these subparts. Inherent difficulties in determining emissions characteristics and processes make it necessary to provide exemptions on a case-by-case basis, beyond those provided for explicitly in the rule. This case-by case applicability exemption determination is consistent with the approaches used in implementing other rules, such as the Hazardous Organic NESHAP (HON) rule, and this memorandum further clarifies an earlier EPA response dated October 7, 1996, regarding the applicability of these standards to biomass ethanol production.

Abstract for [0600035]

Q: Could EPA clarify the 30-day reporting requirement for sources which were constructed or reconstructed between proposal and promulgation, under 40 CFR part 60, subpart III?

A: Although 40 CFR part 60, subpart III does not specifically address the issue of notification deadlines for sources for which the 30-day deadline has already or nearly passed, EPA believes that it is only reasonable under NSPS subpart III to allow owners and operators the full 30 days after promulgation to provide the necessary notifications.

Abstract for [0600036]

Q: Could EPA clarify whether heaters F–501 and F–510 at the Chevron USA refinery in Perth Amboy, New Jersey, are subject to 40 CFR part 60, subpart J either because their construction commenced after June 11, 1973, or because the heaters were modified in 1982?

A: EPA finds that heaters F–501 and F–510 are subject to NSPS subpart J because they commenced construction after the applicability date of June 11, 1973. The terms "commenced" and "construction" are defined in 40 CFR 60.2. The terms were also discussed in EPA's earlier response to Chevron on May 2, 1976 (see ADI Control Number CO08). Based on these definitions, EPA finds that the construction of heaters F–501 and F–510 commenced on January 31, 1974, the date the contract for the construction of heaters F–501 and F–510 was signed and became legally binding. Because the construction of these heaters commenced after the applicability date of June 11, 1973, these heaters are subject to NSPS subpart J.

Abstract for [0600037]

Q: Is a fuel oil storage tank (Tank 19) at the Chevron Products Company, New Jersey facility subject to 40 CFR part 60, subpart Kb, if the tank is converted to an internal floating roof tank with a mechanical shoe seal for storing crude oil?

A: Yes. EPA finds that the storage tank is subject to NSPS subpart Kb because the conversions constitute "reconstruction" as defined in 40 CFR 60.14 and 40 CFR 60.15. The fixed capital costs of the new components exceed 50 percent of the initial fixed capital cost, which subjects the storage tank to NSPS subpart Kb requirements. The cost of the new foundation for the storage tank, or other costs not directly related in containerization cannot be included in calculating the fixed capital cost of the new components.

Abstract for [0600038]

Q1: Does EPA approve a custom fuel monitoring schedule for sulfur for a gas turbine, under 40 CFR part 60, subpart GG, at Conoco's Acadia Gas Processing Plant?

A1: Yes. Given that the sulfur levels continue to be low and consistent as demonstrated, EPA approves a custom schedule for sulfur, with a one week composite for each of the first six months and a one week composite for each of the following quarters. Conoco must re-evaluate the fuel composition if there is a change in the feedstock.

Q2: Does EPA approve a custom fuel monitoring schedule for nitrogen for a gas turbine, under 40 CFR part 60, subpart GG, at Conoco's Acadia Gas Processing Plant?

A2: No. EPA does not approve a custom schedule for nitrogen for a gas turbine at this facility. If Conoco would like to reapply for a custom schedule, it should provide sufficient data to demonstrate the consistency of the fuel quality on a daily basis, rather than on an average basis.

Abstract for [0600039]

Q1: Does EPA approve an alternative monitoring schedule for analyzing fuel sulfur content, under 40 CFR part 60, subpart GG, which would allow the use of weekly instead of daily composites to determine sulfur content, for the combined cycle gas turbines at Dow Chemical USA (Dow)? In addition, Dow would like these weekly composites to be conducted on a quarterly basis and believes that this alternative schedule is consistent with 40 CFR 60.334(b)(2).

A1: Yes. EPA approves the use of a weekly composite for analyzing fuel sulfur content. However, EPA does not approve the proposed quarterly sampling at this time. Weekly composites should be analyzed and checked for accuracy and consistency for six months. If after the first six months the sulfur levels remain consistent with the data provided in this review, quarterly monitoring may be requested.

Q2: Does EPA approve the microcoulometric titration technique for determining the sulfur content of fuel under 40 CFR part 60, subpart GG?

A2: No. EPA does not approve Dow's microcoulometric titration technique for determining sulfur content. The method is not a previously approved equivalent method under NSPS subpart GG, and

Search Applicability Determination Index

Determination Detail

Control Number: 0100076

Category: NSPS
EPA Office: Region 5
Date: 12/06/2000
Title: Applicability of NSPS to Ethanol Manufacturing Plants
Recipient: Don Smith
Author: George Czerniak
Comments:

Subparts:	Part 60, NNN	SOCMI Distillation Operations
	Part 60, RRR	VOC Emissions from SOCMI Reactor Processes

References: 60.667
60.707

Abstract:

Q: Are ethanol manufacturing facilities exempt from the requirements of NSPS Subparts RRR and NNN?

A: Yes. EPA has previously determined that ethanol manufacturing facilities may be exempt from NSPS Subparts RRR and NNN on a cases-by-case basis. In this instance, the ethanol facilities in question use a biological process to ferment the converted starches in corn into ethanol. These NSPS Subparts did not envision unit operations for biological processes.

Letter:

12/6/2000
(AE-17J)

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Don Smith, P.E., Supervisor
Major Facilities
Minnesota pollution Control Agency - South District 520 Lafayette Road North St. Paul, Minnesota 55155

Re: Applicability of NSPS to Ethanol Manufacturing Plants

Dear Mr. Smith:
I am writing in response to your letter dated October 13, 2000, requesting that the United States Environmental Protection Agency (U.S. EPA) determine whether the Ethanol 2000 facility in Bingham Lake, Minnesota, the Pro-Corn facility in Preston, and the Agra Resources facility in Albert Lea are subject to the Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 40 C.F.R. Sec. 60, subpart NNN and the Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. Sec. 60, subpart RRR. This letter responds to that request. The U.S. EPA's Region 5, Air Enforcement and Compliance Assurance Branch and the Office of Enforcement and Compliance Assurance have coordinated this response to your request.

Facility Background
Ethanol 2000 is a new facility constructed in Bingham Lake, MN. Pro-Corn is a new facility constructed in Preston, MN. Agra Resources is a new facility constructed in Albert Lea, MN. These facilities manufacture ethanol by biological processes (fermentation) using corn as a feedstock.

Regulatory Background
The Standards of Performance for VOC Emissions From SOCMI Distillation Operations, 40 C.F.R. Sec. 60, Subpart NNN define applicability as a distillation unit constructed, reconstructed, or modified after December 30, 1983 that "produces any of the chemicals listed in Sec. 69.667 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.667 lists ethanol as one of the chemicals affected by subpart NNN. The Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. Sec. 60, Subpart RRR define applicability as a reactor unit constructed, reconstructed, or modified after June 29, 1990 that "produces any of the chemicals listed in Sec. 69.707 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.707 lists ethanol as one of the chemicals affected by subpart RRR.

Discussion
U.S. EPA document 450/3-83-005b, entitled Distillation Operations in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published December 1983 discusses the scope of 40 C.F.R. Sec. 60, Subpart NNN on page 8-23. "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis" U.S. EPA document 450/3/90-016a, entitled Reactor Processes in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published as draft June 1990 discusses the scope of 40 C.F.R. Sec. 60, Subpart RRR on page 3-2. "... a total of 173 chemical produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis."

Conclusion
Ethanol is listed as a chemical affected by both NSPS Subparts RRR and NNN. However, background documentation created during the development of both standards indicates creation of ethanol by fermentation (biological synthesis) was excluded from the scope of both NSPS. U.S. EPA finds that NSPS RRR and NSPS NNN are not applicable to the facilities in question. If you have any questions regarding this applicability determination, please call Greg Chomycia, of my staff, at (312) 353-8217.

Sincerely yours,

George T. Czerniak, Chief
Air Enforcement and Compliance Assurance Branch

cc: Marcia Mia, OECA
Richard Tripp, Region 7

Last updated on Friday, February 24th, 2006
URL: http://cfpub.epa.gov/adi/index.cfm?CFID=1082016&CFTOKEN=57007055&requesttimeout=180

Search Applicability Determination Index

Determination Detail

Control Number: 0100083

Category: NSPS
EPA Office: Region 5
Date: 04/19/2001
Title: Biological Processes for Ethanol Manufacturing
Recipient: Don Smith
Author: George Czerniak
Comments:

Subparts:	Part 60, NNN	SOCMI Distillation Operations
	Part 60, RRR	VOC Emissions from SOCMI Reactor Processes

Abstract:

Q: Are ethanol manufacturing facilities exempt from the requirements of NSPS RRR and NNN?

A: Yes. EPA has previously determined that ethanol manufacturing facilities may be exempted from NSPS RRR and NNN on a case-by-case basis. The ethanol facility in question here uses a biological process to ferment the converted starches in corn into ethanol. These NSPS did not envision unit operations for biological processes.

Letter:

(AE-17J)

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Don Smith, P.E., Supervisor
Major Facilities
Minnesota Pollution Control Agency - South District 520 Lafayette Road North St. Paul, Minnesota 55155

Re: Applicability of NSPS to Ethanol Manufacturing Plants

Dear Mr. Smith:

I am writing in response to your letter dated March 16, 2001, requesting that the United States Environmental Protection Agency (U.S. EPA) determine whether the Al-Corn Clean Fuel facility in Claremont, Minnesota is subject to the New Source Performance Standards (NSPS) for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 40 C.F.R. part 60, subpart NNN and the NSPS for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. part 60, subpart RRR. The U.S. EPA's Region 5, Air Enforcement and Compliance Assurance Branch and the Office of Enforcement and Compliance Assurance have coordinated this response to your request.

Facility Background
Al-Corn is a facility constructed in Claremont, MN. This facility manufactures ethanol by biological processes (fermentation) using corn as a feedstock.

Regulatory Background
The Standards of Performance for VOC Emissions From SOCMI Distillation Operations, 40 C.F.R. part 60, Subpart NNN define applicability as a distillation unit constructed, reconstructed, or modified after December 30, 1983 that "produces any of the chemicals listed in Sec. 69.667 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.667 lists ethanol as one of the chemicals affected by subpart NNN.

The Standards of Performance for VOC Emissions From SOCMI Reactor Processes, 40 C.F.R. part 60, Subpart RRR define applicability as a reactor unit constructed, reconstructed, or modified after June 29, 1990 that "produces any of the chemicals listed in Sec. 69.707 as a product, co-product, by-product, or intermediate...." 40 C.F.R. Sec. 69.707 lists ethanol as one of the chemicals affected by subpart RRR.

Discussion
U.S. EPA document 450/3-83-005b, entitled Distillation Operations in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published December 1983 discusses the scope of 40 C.F.R. part 60, Subpart NNN on page 8-23. "The scope of the distillation NSPS does not include polymers, coal tar distillation products, chemicals extracted from natural sources, or chemicals totally produced by biological synthesis." U.S. EPA document 450/3/90-016a, entitled Reactor Processes in Synthetic Organic Chemical Manufacturing Industry - Background Information for Proposed Standards, published as draft June 1990 discusses the scope of 40 C.F.R. Sec. 60, Subpart RRR on page 3-2. "... a total of 173 chemicals produced ... are included in the scope of reactor processes. The list of 173 chemicals ... does not include polymers or chemicals produced exclusively by biological synthesis."

Conclusion
Ethanol is listed as a chemical affected by both NSPS Subparts RRR and VVV. However, background documentation created during the development of both standards indicates creation of ethanol by fermentation (biological synthesis) was excluded from the scope of both NSPS. U.S. EPA finds that NSPS RRR and NSPS VVV are not applicable to the facility in question.

If you have any questions regarding this applicability determination, please call Greg Chomycia, of my staff, at (312) 353-8217.

Sincerely yours,

George T. Czerniak, Chief
Air Enforcement and Compliance Assurance Branch

[redacted]

URL: http://cfpub.epa.gov/adi/index.cfm?CFID=1082016&CFTOKEN=57007055&requesttimeout=180

EPA
U.S. Environmental Protection Agency
Region 5 - Air and Radiation Division

Correspondence

October 20, 2000

(AR-18J)

Don Smith, Supervisor
North/South District-Major Facilities
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

Dear Mr. Smith:

The United States Environmental Protection Agency (EPA) has reviewed Air Emission Permit Nos. 04500049-003 and 03300025-005 for Pro-Corn LLC in Preston, Minnesota and Ethanol 2000 LLP in Bingham Lake, Minnesota. Both permits are state permits which amend Title I conditions applicable to each facility.

Pro-Corn and Ethanol 2000 produce fuel ethanol through biological fermentation. These plants appear to be subject to New Source Performance Standards (NSPS) for subparts NNN (distillation processes), RRR (reactor processes), and VV (equipment leaks) as they relate to the production of fuel ethanol, which are not included in the proposed permits for these sources. The EPA issued a number of memorandums to clarify the applicability of NSPS subparts NNN, RRR, and VV to sources using biological fermentation to produce organic chemicals and sources using petroleum feedstocks for synthesis of organic chemicals.

In a October 7, 1996, letter from Reggie Cheatham to George Czerniak, EPA issued a formal determination for Don Dame of Dame Engineering Incorporated regarding clarification of "beverage alcohol" as it relates to manufacturing processes that produce ethyl alcohol (ethanol) through refining petroleum products and ethyl alcohol produced through biological fermentation. The EPA's specific response to this request stated that biological fermentation processes are not covered under subparts NNN, RRR, and VV. The EPA further clarified this determination as it related to subpart VV in a letter dated September 8, 1998, entitled "Clarification of Applicability Determination for Biomass Ethanol Production". This clarification stated that process units producing fermented beverages solely for human consumption are exempt from the subpart VV, while process units used to produce industrial grade alcohols from fermentation products are subject to subpart VV.

Furthermore, according to a July 7, 1997, letter entitled "Case-by-Case Applicability Determinations for Biomass Ethanol Production", EPA explains that the intent of the October 7, 1996, letter was that it would be used by EPA to form the basis for site specific, case-by-case determinations of other similar sources. Therefore, the October 1996 letter is not a blanket determination to exempt facilities from the regulations. In order for any specific source to be exempted from any standard or regulation, it must obtain a site specific determination from the EPA.

It appears that subparts NNN, RRR, and VV currently apply to Pro-Corn and Ethanol 2000. Minnesota's State Implemetation Plan (SIP) requires a stationary source to obtain a permit if it is subject to a standard under 40 CFR part 60 or any NSPS. Our office recently received a letter from the Minnesota Pollution Control Agency (MPCA) requesting a site specific exemption for these facilities for subparts NNN and RRR, including another facility called Agra Resources Coop in Albert Lea, Minnesota. The MPCA also notified us of that the subpart VV requirements will be included in these permits. Ultimately, Pro-Corn and Ethanol 2000 must be permitted to include the appropriate NSPS requirements that apply to these sources. We also recommend that these NSPS requirements be appropriately applied to other similar sources in the State that subsequently undergo permitting, such as the state permit for Agra Resources Coop currently proposed for 30-day public comment.

We hope that the information outlined in this letter is useful to you, and will work with you to effectively resolve any concerns regarding these permits. If you have any questions on this letter, please contact Shaheerah Fateen, of my staff, at (312) 353-4779.

Sincerely yours,

/s/

Robert Miller, Chief
Permits and Grants Section

Enclosures

cc: Jenny Reinertsen, Minnesota Pollution Control Agency

AIR AND RADIATION DIVISION
77 WEST JACKSON BOULEVARD (A-18J)
CHICAGO, ILLINOIS 60604
(800) 621-8431 OR (312) 353-2212

ethanol.pdf

amec

February 9, 2009 via email and US mail

Ms. Catherine Collins
U.S. Fish and Wildlife Service
Branch of Air Quality
7333 W Jefferson Ave., Suite 375
Lakewood, Colorado 80235

Re: Federal Land Manager Notification of the Proposed Highlands Ethanol LLC Project

Dear Ms. Collins:

The purpose of this letter is to provide formal notification of the intent of Highlands Ethanol LLC (Highlands Ethanol) to permit and construct a cellulosic ethanol production facility at a site in southeastern Highlands County, Florida. The site is located approximately 216 kilometers (km) from the Chassahowitzka Wilderness Area.

The proposed ethanol production capacity of 36 million gallons per year is based on an expected operating schedule of 8,000 hours per year. The project will be permitted at an operating capacity of 39.42 million gallons per year to allow for an operating schedule of 8,760 hours per year. The ethanol is required to be denatured with gasoline, with a minimum denaturant content of 5% by volume. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.49 million gallons when accounting for the denaturant.

The proposed emission rates for nitrogen oxides (NO_X), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC) will be consistent with the US Environmental Protection Agency's (USEPA) Best Available Control Technology (BACT) requirements. A summary of calculated potential emissions by emission source is provided in Table 1. Ethanol production for fuel use previously fell into one of the 28 designated industrial source categories under USEPA's Prevention of Significant Deterioration (PSD) permitting requirements, so a major source was defined as having potential emissions of 100 tons per year or more. In April 2007, USEPA promulgated changes to the PSD permitting program, establishing a PSD applicability threshold of 250 tpy for ethanol production facilities. However, the Florida Department of Environmental Protection (FDEP) has not adopted the PSD rule changes for ethanol production facilities and does not anticipate doing so. Therefore, the PSD applicability threshold for ethanol production facilities in Florida remains 100 tpy and the proposed facility is subject to the PSD construction permit requirements.

Table 1. Summary of Calculated Potential Emissions, Highlands Ethanol

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)
Liquid/Solid Separation	--	--	--	--	--	2.1
Fermentation/Distillation	--	--	--	--	--	18.8
Product/Denaturant Storage	--	--	--	--	--	1.7
Product Loadout	0.02	0.02	0.004	0.4	2.3	5.3
Misc. Storage Tanks	--	--	--	--	--	0.0
Misc. Storage Silos	4.7	4.7	--	--	--	--
Wastewater Treatment	0.002	0.002	0.001	0.1	0.3	5.4
Cooling Tower	0.7	0.7	--	--	--	4.1
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7
Emergency Engines	0.9	0.9	0.02	25.9	15.9	2.9
Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**
Stillage Loadout	--	--	--	--	--	2.8
Equipment Leaks	--	--	--	--	--	19.6
Roadway Emissions	9.9	1.0	--	--	--	--
Subtotal, Fugitive Sources	**9.9**	**1.0**	**--**	**--**	**--**	**22.4**
Total	***33.6***	***24.7***	***104.1***	***156.5***	***192.0***	***71.3***

The facility will include two biomass boilers that will burn stillage cake, a byproduct of the process, as well as biogas generated by anaerobic digesters included in the facility's wastewater treatment plant (WWTP). Natural gas will be used in the biomass boilers for startups and flame stabilization. The backup boiler will operate only when one of the biomass boilers is down. It will burn natural gas, although ultra low sulfur diesel (ULSD) is included in the application in the event a natural gas pipeline being considered for the area is not constructed in a timely manner. The proposed biomass boilers will be equipped with selective non-catalytic reduction (SNCR) for nitrogen oxides (NO_X) emissions control, baghouses for particulate matter (PM) emissions control, and limestone injection for sulfur dioxide (SO_2) emissions control.

Highlands Ethanol performed screening modeling to predict the impact on the Chassahowitzka Wilderness Area. The analysis was performed by placing a ring of 360 receptors in 1° increments at a distance of 50 kilometers (km) from the facility. Figure 1 presents a map showing the locations of the facility site and the ring of receptors relative to the park. Included on the map are arcs showing the 100 km and 300 km distances from the proposed project.

The AERMOD dispersion model was used for the analysis. AERMOD is the recommended sequential model in USEPA's Guideline on Air Quality Models (40 CFR 51, Appendix W). The regulatory default option was used. Receptor elevations were assigned by using USEPA's AERMAP software tool, which is designed to extract elevations from USGS Digital Elevation Model (DEM) files. AERMAP is the terrain preprocessor for AERMOD.

The meteorological data used in the sequential modeling consists of National Weather Service (NWS) data collected at West Palm Beach International Airport (WBAN 12844) from 2001 through 2005. Upper air radiosonde data concurrent with the collection of surface meteorological data were used for Miami, Florida (WBAN 92803). AERMOD-ready meteorological data files were provided by FDEP.

The maximum predicted concentrations are presented in Table 2 and compared to Class I area significant impact levels (SILs) promulgated by FDEP and proposed by USEPA.

Table 2. Significant Impact Analysis Modeling Results

Pollutant (Load)	Averaging Period	Year	Date (Hr)	Receptor UTM Coordinates (km)	AERMOD Predicted Conc. (μg/m^3)	Significant Impact Levels [a] (μg/m^3)
SO_2	3-hour	2003	12/29 (06)	543.22, 3015.79	0.967	1.0
	24-hour	2002	12/16	528.64, 2977.82	0.171	0.2 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00470	0.1
PM_{10}	24-hour	2002	12/16	528.64, 2977.82	0.0766	0.3 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00433	0.2
NO_2	Annual	2002	--	525.42, 2974.88	0.00587	0.1

[a] SILs proposed by USEPA (61 FR 38338) in 1996. Final SILs have not been promulgated.

[b] SILs promulgated by FDEP [Rule 62-204.200(29) F.A.C.]

In all cases, maximum predicted concentrations are less than the promulgated FDEP and proposed USEPA Class I area SILs at a distance of 50 km from the proposed site. Given the distance to the Chassahowitzka Wilderness Area of 216 km, the impacts in the Class I area will also be less than the SILs. The modeling files are included on the enclosed CDROM.

Because the modeling demonstrates insignificant impacts in the Class I area, Highlands Ethanol concludes that the proposed facility will not adversely impact the Class I area. Highlands Ethanol requests that the FLM consider this analysis and confirm that no additional

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modeling (such as a cumulative increment or visibility analysis) needs to be conducted. Highlands Ethanol requests that the confirmation be provided in writing to me and to Mr. Al Linero of the FDEP at the following address:

Mr. Alvaro A. Linero, P.E.
Administrator, South Permitting Section
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

If you have any questions regarding this notification, please call me at (207) 879-4222, ext. 37.

Very truly yours,
AMEC Earth & Environmental

Jeffrey R. Harrington

Jeffrey R. Harrington, P.E.
Senior Project Engineer

cc: T. Eves – Highlands Ethanol
A. Linero – FDEP
D. Nelson – FDEP
K. Jameson – AMEC

amec

February 9, 2009 via email and US mail

Mr. Don Shepherd
National Park Service
Air Resources Division
12795 West Alameda Parkway
Lakewood, Colorado 80228

Re: Federal Land Manager Notification of the Proposed Highlands Ethanol LLC Project

Dear Mr. Shepherd:

The purpose of this letter is to provide formal notification of the intent of Highlands Ethanol LLC (Highlands Ethanol) to permit and construct a cellulosic ethanol production facility at a site in southeastern Highlands County, Florida. The site is located approximately 154 kilometers (km) from Everglades National Park.

The proposed ethanol production capacity of 36 million gallons per year is based on an expected operating schedule of 8,000 hours per year. The project will be permitted at an operating capacity of 39.42 million gallons per year to allow for an operating schedule of 8,760 hours per year. The ethanol is required to be denatured with gasoline, with a minimum denaturant content of 5% by volume. The capacity of the facility to produce this ethanol-gasoline blend, referred to as E95, will amount to 41.49 million gallons when accounting for the denaturant.

The proposed emission rates for nitrogen oxides (NO_X), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds (VOC) will be consistent with the US Environmental Protection Agency's (USEPA) Best Available Control Technology (BACT) requirements. A summary of calculated potential emissions by emission source is provided in Table 1. Ethanol production for fuel use previously fell into one of the 28 designated industrial source categories under USEPA's Prevention of Significant Deterioration (PSD) permitting requirements, so a major source was defined as having potential emissions of 100 tons per year or more. In April 2007, USEPA promulgated changes to the PSD permitting program, establishing a PSD applicability threshold of 250 tpy for ethanol production facilities. However, the Florida Department of Environmental Protection (FDEP) has not adopted the PSD rule changes for ethanol production facilities and does not anticipate doing so. Therefore, the PSD applicability threshold for ethanol production facilities in Florida remains 100 tpy and the proposed facility is subject to the PSD construction permit requirements.

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Table 1. Summary of Calculated Potential Emissions, Highlands Ethanol

Process	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)
Liquid/Solid Separation	--	--	--	--	--	2.1
Fermentation/Distillation	--	--	--	--	--	18.8
Product/Denaturant Storage	--	--	--	--	--	1.7
Product Loadout	0.02	0.02	0.004	0.4	2.3	5.3
Misc. Storage Tanks	--	--	--	--	--	0.0
Misc. Storage Silos	4.7	4.7	--	--	--	--
Wastewater Treatment	0.002	0.002	0.001	0.1	0.3	5.4
Cooling Tower	0.7	0.7	--	--	--	4.1
Steam Production	17.3	17.3	104.1	130.1	173.4	8.7
Emergency Engines	0.9	0.9	0.02	25.9	15.9	2.9
Subtotal, Point Sources	**23.6**	**23.6**	**104.1**	**156.5**	**192.0**	**48.9**
Stillage Loadout	--	--	--	--	--	2.8
Equipment Leaks	--	--	--	--	--	19.6
Roadway Emissions	9.9	1.0	--	--	--	--
Subtotal, Fugitive Sources	**9.9**	**1.0**	**--**	**--**	**--**	**22.4**
Total	***33.6***	***24.7***	***104.1***	***156.5***	***192.0***	***71.3***

The facility will include two biomass boilers that will burn stillage cake, a byproduct of the process, as well as biogas generated by anaerobic digesters included in the facility's wastewater treatment plant (WWTP). Natural gas will be used in the biomass boilers for startups and flame stabilization. The backup boiler will operate only when one of the biomass boilers is down. It will burn natural gas, although ultra low sulfur diesel (ULSD) is included in the application in the event a natural gas pipeline being considered for the area is not constructed in a timely manner. The proposed biomass boilers will be equipped with selective non-catalytic reduction (SNCR) for nitrogen oxides (NO_X) emissions control, baghouses for particulate matter (PM) emissions control, and limestone injection for sulfur dioxide (SO_2) emissions control.

Highlands Ethanol performed screening modeling to predict the impact on Everglades National Park. The analysis was performed by placing a ring of 360 receptors in 1° increments at a distance of 50 kilometers (km) from the facility. Figure 1 presents a map showing the locations of the facility site and the ring of receptors relative to the park. Included on the map are arcs showing the 100 km and 300 km distances from the proposed project.

The AERMOD dispersion model was used for the analysis. AERMOD is the recommended sequential model in USEPA's Guideline on Air Quality Models (40 CFR 51, Appendix W). The regulatory default option was used. Receptor elevations were assigned by using USEPA's AERMAP software tool, which is designed to extract elevations from USGS Digital Elevation Model (DEM) files. AERMAP is the terrain preprocessor for AERMOD.

The meteorological data used in the sequential modeling consists of National Weather Service (NWS) data collected at West Palm Beach International Airport (WBAN 12844) from 2001 through 2005. Upper air radiosonde data concurrent with the collection of surface meteorological data were used for Miami, Florida (WBAN 92803). AERMOD-ready meteorological data files were provided by FDEP.

The maximum predicted concentrations are presented in Table 2 and compared to Class I area significant impact levels (SILs) promulgated by FDEP and proposed by USEPA.

Table 2. Significant Impact Analysis Modeling Results

Pollutant (Load)	Averaging Period	Year	Date (Hr)	Receptor UTM Coordinates (km)	AERMOD Predicted Conc. ($\mu g/m^3$)	Significant Impact Levels [a] ($\mu g/m^3$)
SO_2	3-hour	2003	12/20 (06)	543.22, 3015.79	0.967	1.0
	24-hour	2002	12/16	528.64, 2977.82	0.171	0.2 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00470	0.1
PM_{10}	24-hour	2002	12/16	528.64, 2977.82	0.0766	0.3 / 1.0 [b]
	Annual	2002	--	525.42, 2974.88	0.00433	0.2
NO_2	Annual	2002	--	525.42, 2974.88	0.00587	0.1

[a] SILs proposed by USEPA (61 FR 38338) in 1996. Final SILs have not been promulgated.

[b] SILs promulgated by FDEP [Rule 62-204.200(29) F.A.C.]

In all cases, maximum predicted concentrations are less than the promulgated FDEP and proposed USEPA Class I area SILs at a distance of 50 km from the proposed site. Given the distance to Everglades National Park of 154 km, the impacts in the Class I area will also be less than the SILs. The modeling files are included on the enclosed CDROM.

Because the modeling demonstrates insignificant impacts in the Class I area, Highlands Ethanol concludes that the proposed facility will not adversely impact the Class I area. Highlands Ethanol requests that the FLM consider this analysis and confirm that no additional

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modeling (such as a cumulative increment or visibility analysis) needs to be conducted. Highlands Ethanol requests that the confirmation be provided in writing to me and to Mr. Al Linero of the FDEP at the following address:

Mr. Alvaro A. Linero, P.E.
Administrator, South Permitting Section
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Road, MS #5505
Tallahassee, Florida 32399-2400

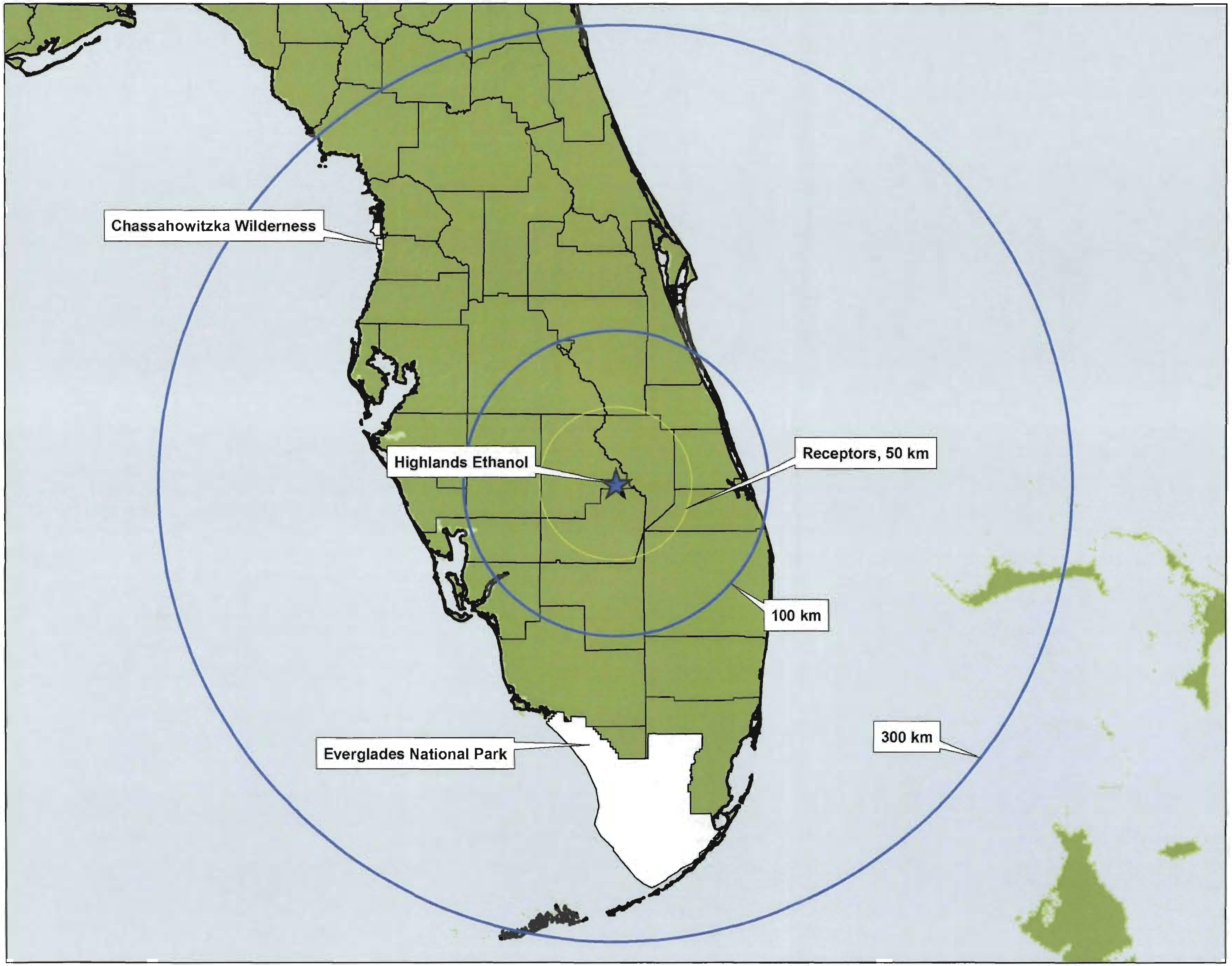
If you have any questions regarding this notification, please call me at (207) 879-4222, ext. 37.

Very truly yours,
AMEC Earth & Environmental

Jeffrey R. Harrington

Jeffrey R. Harrington, P.E.
Senior Project Engineer

cc: T. Eves – Highlands Ethanol
A. Linero – FDEP
D. Nelson – FDEP
K. Jameson – AMEC



LEGEND

Highlands Ethanol Location

Class I Areas

LOCATION MAP

NOTES & SOURCES

Map Projection: NAD 83, UTM Zone 17N, Meters
Map Source: ESRI

TITLE

Highlands Ethanol
Class I Area Locations

0 100 Kilometers

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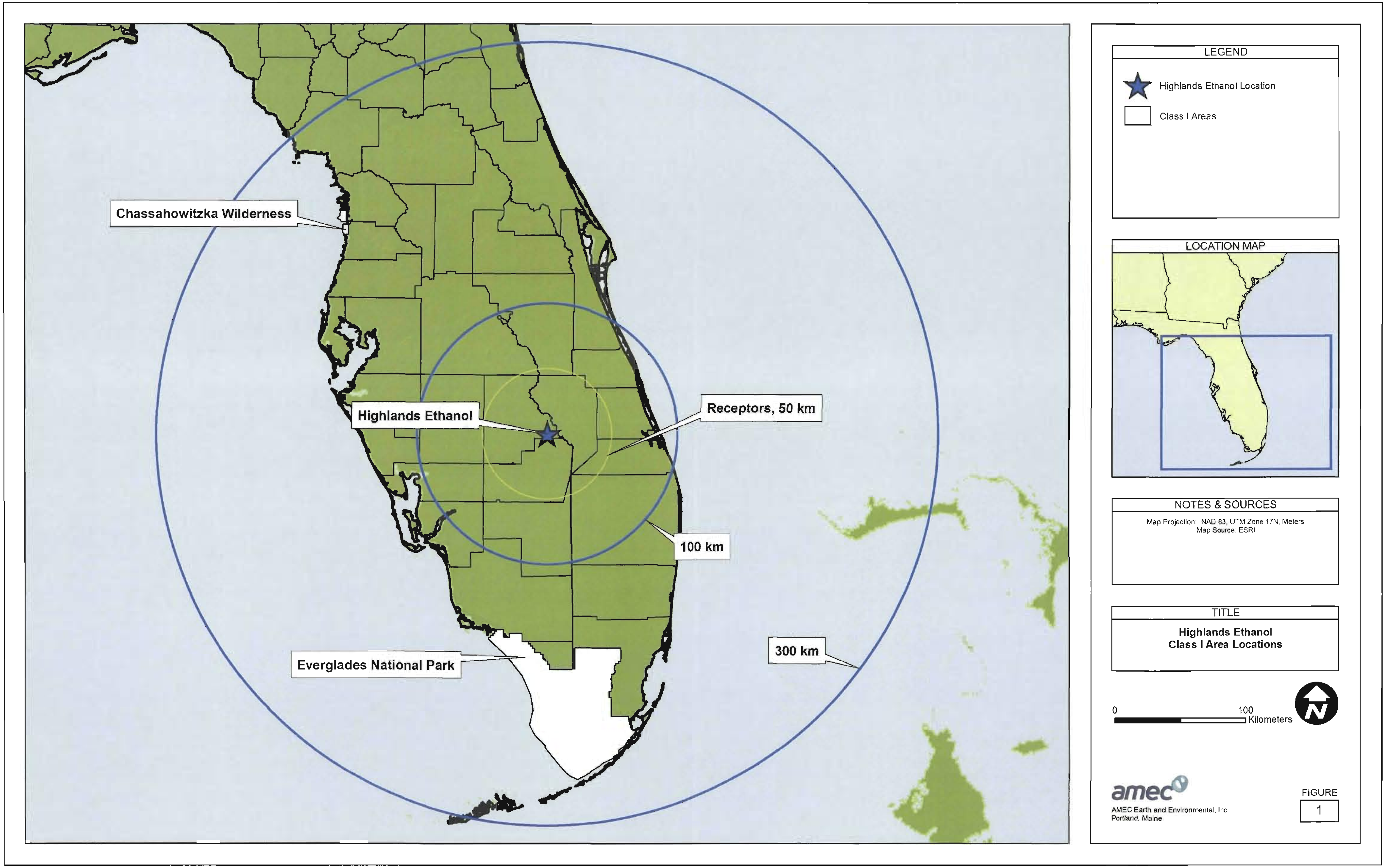
Portland, Maine

FIGURE 1



Chassahowitzka Wilderness
Highlands Ethanol
Receptors, 50 km
100 km
300 km
Everglades National Park
LEGEND
Highlands Ethanol Location
Class I Areas
LOCATION MAP
NOTES & SOURCES
Map Projection: NAD 83, UTM Zone 17N, Meters
Map Source: ESRI
TITLE
Highlands Ethanol
Class I Area Locations
0
100
Kilometers
N
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FIGURE
1

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