P / 260 774 3532 868 E. 800 N. NORTH MANCHESTER, IN 46962 POET.COM/NORTHMANCHESTER

June 25, 2024

095-48001-00127
MAI 45291

Preliminary Application Received by

State of Indiana IDEM-OAQ via Email

6-25-tc-2

Indiana Department of Environmental Management
Office of Air Quality
ATTN: Jenny Acker, Permits Branch Chief
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

RE: Significant Permit Modifications
POET Biorefining – North Manchester, LLC (Title V Permit No. 169-45835-00068)
POET Biorefining – Portland, LLC (Title V Permit No. 075-44657-00032)
POET Biorefining – Alexandria, LLC (Title V Permit No. 095-45994-00127)

Dear Ms. Acker:

Please find attached to this letter applications for Significant Permit Modifications to the existing Title V permits issued to POET's biorefineries in North Manchester, Portland, and Alexandria, IN. As discussed in our meeting with IDEM on June 21, 2024, POET is seeking to modify these permits to account for sulfur dioxide (SO2) emissions associated with a process treatment that POET has developed to mitigate Deoxynivalenol (DON), a mycotoxin found in corn.

As we discussed during our meeting with IDEM, POET developed its DON mitigation treatment in 2017, and deployed the treatment at its North Manchester, Portland, and Alexandria plants intermittently from October 2018 through April 2024. POET's initial engineering review concluded that the processing aid did not substantially change the emissions profile at its Indiana plants.

In April of this year, POET engaged a third party to test emissions at its plant in Caro, Michigan, which was using the same DON mitigation treatment in its operations. Through this testing, POET learned that its DON mitigation treatment results in SO2 emissions. Upon receiving the testing results in Michigan, POET discontinued use of its DON mitigation treatment at its North Manchester plant, which was the only Indiana plant in POET's fleet using the treatment at that time. POET has not resumed DON mitigation treatments at any of its Indiana plants.[1]

Subsequently, POET conducted further testing at its plant in Marion, Ohio for the purpose of determining the SO2 emissions associated with a worst-case scenario of expected operations. This testing studied a process-aid addition rate of 1 gallon per minute, which is the intended maximum rate at all of POET's plants in Indiana, Ohio, and Michigan that deploy the same DON mitigation treatment. Based on this testing, as set forth in the permit modification applications attached hereto, POET understands that use of the processing aid results in sulfur dioxide (SO2) emission levels that exceed the thresholds that require air permit modifications. POET also understands, however, that the SO2 emissions generated by its DON mitigation

[1] As POET informed IDEM by a letter dated June 21, 2024, we are now conducting stack testing at our North Manchester plant to further investigate and understand the SO2 emissions associated with our DON mitigation treatment and for this limited purpose have resumed DON mitigation treatments at that plant.

treatment do not reach levels that would require federal prevention of significant deterioration (PSD) permitting.

POET looks forward to working cooperatively with IDEM to obtain the Title V permit modifications necessary to bring the DON mitigation practices at its Indiana plants into regulatory compliance.

If you have any questions concerning this request, please contact David Westlund at (605) 965-4962 or David.Westlund@poet.com.

Sincerely,

David Westlund
Senior Environmental Engineer
POET Bioprocessing

Title V Air Permit Application
Significant Source Modification
Significant Permit Modification

POET Biorefining – Alexandria, LLC
Alexandria, Indiana
Title V Permit No. 095-45994-00127

June 25, 2024

Modification Description

POET Biorefining – Alexandria, LLC (POET) is submitting the enclosed application for a significant source modification and a significant permit modification for an operational change. POET will introduce a processing aid to mitigate mycotoxins in the dried distiller's grain by-product. The addition of this processing aid will result in SO2 emissions from SV009, SV010, SV011, and SV012.

Regulatory Analysis

The attached Potential to Emit Calculations (PTE) include the potential emissions for each of the above listed stack vents. As indicated on the PTE, the facility wide emissions will remain below PSD major source thresholds.

This operational change may lead to a small amount of additional Hazardous Air Pollutants (HAPs), which are included on the attached PTE. POET will remain an area source of HAPs.

This modification will not impact the applicability of any NSPS or NESHAP to POET.

The existing control devices are not used to reduce SO2 to achieve emission limits, therefore Compliance Assurance Monitoring (CAM) is not impacted by this modification.

This modification does not impact the applicability of 326 IAC 8-5-6 or 326 IAC 8-1-6. POET will continue to comply with these requirements with the existing control requirement and associated air permit requirements.

AIR PERMIT APPLICATION COVER SHEET

State Form 50639 (R4 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this cover sheet is to obtain the core information needed to process the air permit application. This cover sheet is required for all air permit applications submitted to IDEM, OAQ. Place this cover sheet on top of all subsequent forms and attachments that encompass your air permit application packet.
- Submit the completed air permit application packet, including all forms and attachments, to **IDEM Air Permits Administration** using the address in the upper right hand corner of this page.
- IDEM will send a bill to collect the filing fee and any other applicable fees.
- Detailed instructions for this form are available on the Air Permit Application Forms website.

FOR OFFICE USE ONLY
PERMIT NUMBER:
095-48001-00127
DATE APPLICATION WAS RECEIVED:

1. Tax ID Number: [redacted]

PART A: Purpose of Application

Part A identifies the purpose of this air permit application. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

2. Source / Company Name: POET Biorefining - Alexandria, LLC | **3. Plant ID:** 095 – 0127

4. Billing Address: P.O. Box 717

City: Alexandria | **State:** IN | **ZIP Code:** 46001 –

5. Permit Level: ☐ Exemption ☐ Registration ☐ SSOA ☐ MSOP ☐ FESOP ☒ TVOP ☐ PBR

6. Application Summary: *Check all that apply. Multiple permit numbers may be assigned as needed based on the choices selected below.*

☐ Initial Permit
☐ Review Request
☐ Interim Approval
☐ Site Closure
☐ Renewal of Operating Permit
☐ Revocation of Operating Permit
☐ Relocation of Portable Source
☐ Emission Reduction Credit Registry
☐ Asphalt General Permit
☐ Alternate Emission Factor Request
☐ Acid Deposition (Phase II)

☐ Transition (between permit levels) *From:* *To:*

☐ Administrative Amendment:
☐ *Company Name Change*
☐ *Correction to Non-Technical Information*
☐ *Change of Responsible Official*
☐ *Notice Only Change*
☐ *Other (specify):*

☒ Modification:
☐ *New Emission Unit or Control Device*
☐ *Modified Emission Unit or Control Device*
☐ *New Applicable Permit Requirement*
☐ *Change to Applicability of a Permit Requirement*
☐ *Prevention of Significant Deterioration*
☐ *Emission Offset*
☐ *MACT Preconstruction Review*
☐ *Minor Source Modification*
☒ *Significant Source Modification*
☐ *Minor Permit Modification*
☒ *Significant Permit Modification*
☐ *Other (specify):*

7. Is this an application for an initial construction and/or operating permit for a **"Greenfield" Source**? ☐ Yes ☒ No

8. Is this an application for construction of a new emissions unit at an **Existing Source**? ☐ Yes ☒ No

Continued on Next Page

PART B: Pre-Application Meeting

Part B specifies whether a meeting was held or is being requested to discuss the permit application.

9. Was a meeting held between the company and IDEM prior to submitting this application to discuss the details of the project?

☒ No ☐ Yes: *Date:*

10. Would you like to schedule a meeting with IDEM management and your permit writer to discuss the details of this project?

☒ No ☐ Yes: *Proposed Date for Meeting:*

PART C: Confidential Business Information

Part C identifies permit applications that require special care to ensure that confidential business information is kept separate from the public file.

Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in the Indiana Administrative Code (IAC). To ensure that your information remains confidential, refer to the IDEM, OAQ information regarding submittal of confidential business information. For more information on confidentiality for certain types of business information, please review IDEM's Nonrule Policy Document Air-031-NPD regarding Emission Data.

11. Is any of the information contained within this application being claimed as **Confidential Business Information**?

☒ No ☐ Yes

PART D: Certification Of Truth, Accuracy, and Completeness

Part D is the official certification that the information contained within the air permit application packet is truthful, accurate, and complete. Any air permit application packet that we receive without a signed certification will be deemed incomplete and may result in denial of the permit.

For a Part 70 Operating Permit (TVOP) or a Source Specific Operating Agreement (SSOA), a "responsible official" as defined in 326 IAC 2-7-1(34) must certify the air permit application. For all other applicants, this person is an "authorized Individual" as defined in 326 IAC 2-1.1-1(1).

☒ *I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.*

Dan McMahan	General Manager
Name *(typed)*	Title
[signature]	08/25/2024
Signature	Date

OAQ AIR PERMIT APPLICATION – FORMS CHECKLIST

State Form 51607 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this checklist is to help the applicant and IDEM, OAQ ensure that the air permit application packet is administratively complete. This checklist is a required form.
- Check the appropriate box indicating whether each application form is applicable for the current permit application. The source must submit only those forms pertinent to the current permit application.
- Place this checklist between the cover sheet and all subsequent forms and attachments that encompass your air permit application packet.

Part A: General Source Data

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☒ Y ☐ N	COVER	Application Cover Sheet	50639	Include for every application, modification, and renewal, including source specific operating agreements (SSOA).
☒ Y ☐ N	CHECKLIST	Forms Checklist	51607	Include for every application, modification, and renewal, including SSOA.
☒ Y ☐ N	GSD-01	Basic Source Level Information	50640	Include for every application, modification, and renewal, including SSOA.
☒ Y ☐ N	GSD-02	Plant Layout Diagram	51605	Include for every new source application, and modification.
☒ Y ☐ N	GSD-03	Process Flow Diagram	51599	Include one for every process covered by the application.
☒ Y ☐ N	GSD-04	Stack / Vent Information	51606	Include for every new source application, and modification.
☒ Y ☐ N	GSD-05	Emissions Unit Information	51610	Include for every process covered by the application.
☐ Y ☒ N	GSD-06	Particulate Emissions Summary	51612	Include if the process has particulate emissions (PM).
☒ Y ☐ N	GSD-07	Criteria Pollutant Emissions Summary	51602	Include if the process has criteria pollutant emissions.
☒ Y ☐ N	GSD-08	HAP Emissions Summary	51604	Include if the process has hazardous air pollutant emissions (HAP).
☐ Y ☒ N	GSD-09	Summary of Additional Information	51611	Include if the additional information is included.
☐ Y ☒ N	GSD-10	Insignificant Activities	51596	Include if there are unpermitted insignificant activities.
☐ Y ☒ N	GSD-11	Alternative Operating Scenario	51601	Include if an AOS is requested.
☐ Y ☒ N	GSD-12	Affidavit of Nonapplicability	51600	Include if the standard notification requirements do not apply.
☐ Y ☒ N	GSD-13	Affidavit of Applicability	51603	Include if the standard notification requirements apply.
☐ Y ☒ N	GSD-14	Owners and Occupants Notified	51609	Include if the standard notification requirements apply.
☐ Y ☒ N	GSD-15	Government Officials Notified	51608	Include if the standard notification requirements apply.
☐ Y ☒ N	RENEWAL	Renewal Checklist	51755	Include with every operating permit renewal packet.

Continued on Next Page

Part B: Process Information				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	AEF-01	Alternate Emission Factor Request	51860	Submit if you are requesting to use an emission factor other than AP-42.
☐ Y ☒ N	PI-01	Miscellaneous Processes	52534	Include one form for each process for which there is not a specific PI form.
☐ Y ☒ N	PI-02A	Combustion Unit Summary	52535	Include one form to summarize all combustion units *(unless SSOA).*
☐ Y ☒ N	PI-02B	*Combustion:* Boilers, Process Heaters, & Furnaces	52536	Include one form for each boiler, process heater, or furnace *(unless SSOA).*
☐ Y ☒ N	PI-02C	*Combustion:* Turbines & Internal Combustion Engines	52537	Include one form for each turbine or internal combustion engine *(unless SSOA).*
☐ Y ☒ N	PI-02D	*Combustion:* Incinerators & Combustors	52538	Include one form for each incinerator or combustor *(unless SSOA).*
☐ Y ☒ N	PI-02E	*Combustion:* Kilns	52539	Include one form for each kiln *(unless SSOA).*
☐ Y ☒ N	PI-02F	*Combustion:* Fuel Use	52540	Include one form for each combustion unit *(unless SSOA).*
☐ Y ☒ N	PI-02G	*Combustion:* Emission Factors	52541	Include one form for each combustion unit *(unless SSOA).*
☐ Y ☒ N	PI-02H	*Combustion:* Federal Rule Applicability	52542	Include one form for each combustion unit *(unless SSOA).*
☒ Y ☐ N	PI-03	Storage and Handling of Bulk Material	52543	Include if the process involves the storage and handling of bulk materials.
☐ Y ☒ N	PI-04	Asphalt Plants	52544	Include for each asphalt plant process (*unless general permit*).
☐ Y ☒ N	PI-05	Brick / Clay Products	52545	Include for each brick and/or clay products process.
☐ Y ☒ N	PI-06	Electroplating Operations	52546	Include for each electroplating process.
☐ Y ☒ N	PI-07	Welding Operations	52547	Include for each welding process.
☐ Y ☒ N	PI-08	Concrete Batchers	52548	Include for each concrete batcher *(unless SSOA).*
☐ Y ☒ N	PI-09	Degreasing	52549	Include for each degreasing process *(unless SSOA).*
☐ Y ☒ N	PI-10	Dry Cleaners	52550	Include for each dry cleaning process
☐ Y ☒ N	PI-11	Foundry Operations	52551	Include for each foundry process
☐ Y ☒ N	PI-12	Grain Elevators	52552	Include for each grain elevator *(unless SSOA).*
☐ Y ☒ N	PI-13	Lime Manufacturing	52553	Include for each lime manufacturing process.
☐ Y ☒ N	PI-14	Liquid Organic Compound Storage	52554 (doc)	Include if the process involves the storage of liquid organic compounds.
☐ Y ☒ N	PI-14ALT	Alternate version of Liquid Organic Compound Storage	52555 (xls)	Include if the process involves the storage of liquid organic compounds and there are several storage vessels.
☐ Y ☒ N	PI-15	Portland Cement Manufacturing	52556	Include for each Portland cement manufacturing process.
☐ Y ☒ N	PI-16	Reinforced Plastics & Composites	52557	Include for each reinforced plastics and composites process.

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Part B: Process Information				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	PI-17	Blasting Operations	52558	Include for each blasting process *(unless SSOA).*
☐ Y ☒ N	PI-18	Mineral Processing	52559	Include if the process involves mineral processing *(unless SSOA)*.
☐ Y ☒ N	PI-19	Surface Coating & Printing Operations	52560	Include for each surface coating or printing process *(unless SSOA).*
☐ Y ☒ N	PI-20	Woodworking / Plastic Machining	52561	Include for each woodworking or plastic machining process *(unless SSOA).*
☐ Y ☒ N	PI-21	Site Remediation	52570	Include for each soil remediation process.
☐ Y ☐ N	PI-22	Ethanol Plants ***(Under Development)***	None	Include for each ethanol plant.

Part C: Control Equipment				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	CE-01	Control Equipment Summary	51904	Include if add-on control equipment will be used for the process.
☒ Y ☐ N	CE-02	Particulates – Baghouse / Fabric Filter	51953	Include for each baghouse or fabric filter.
☐ Y ☒ N	CE-03	Particulates – Cyclone	52620	Include for each cyclone.
☐ Y ☒ N	CE-04	Particulates – Electrostatic Precipitator	52621	Include for each electrostatic precipitator.
☐ Y ☒ N	CE-05	Particulates – Wet Collector / Scrubber / Absorber	52622	Include for each wet collector, scrubber, or absorber.
☒ Y ☐ N	CE-06	Organics – Flare / Oxidizer / Incinerator	52623	Include for each flare, oxidizer, or incinerator.
☐ Y ☒ N	CE-07	Organics – Adsorbers	52624	Include for each adsorber.
☐ Y ☒ N	CE-08	Organics – Condenser	52625	Include for each condenser.
☐ Y ☒ N	CE-09	Reduction Technology	52626	Include for each control device using reduction technology (e.g., SCR, SNCR).
☐ Y ☒ N	CE-10	Miscellaneous Control Equipment	52436	Include one form for equipment for which there is not a specific CE form.

Continued on Next Page

Part D: Compliance Determination for Part 70 Sources				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☒ Y ☐ N	CD-01	Emissions Unit Compliance Status	51861	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-02	Compliance Plan by Applicable Requirement	51862	Include for every Title V application, including modifications.
☒ Y ☐ N	CD-03	Compliance Plan by Emissions Unit	51863	Include for every Title V application, including modifications.
☒ Y ☐ N	CD-04	Compliance Schedule and Certification	51864	Include for every Title V application, including modifications and renewal.
☐ Y ☒ N	FED-03	Compliance Assurance Monitoring	53377	Include for every Title V application, including modifications.

Part E: Best Available Control Technology				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	BACT-01	Analysis of Best Available Control Technology	None	Include for every BACT application.
☐ Y ☒ N	BACT-01a	Background Search: Existing BACT Determinations	None	Include for every BACT application.
☐ Y ☒ N	BACT-01b	Cost/Economic Impact Analysis	None	Include for every BACT application.
☐ Y ☒ N	BACT-02	Summary of Best Available Control Technology	None	Include for every BACT application.
☐ Y ☒ N	PSD / EO-01	PSD / Emission Offset Checklist	None	Include for every PSD application and every NSR application that requires emission offsets.

Part F: Emission Credit Registry				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	EC-01	Generation of Emission Credits	51783	Include if the modification results in emission reductions.
☐ Y ☒ N	EC-02	Transfer of Emission Credits	51784	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	EC-03	Use of Emission Credits	51785	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	EC-04	Emission Credit Request	51906	Submit if you are looking for emission credits for offsets.

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Part G: Plantwide Applicability Limits				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	PAL-01	Actuals Plantwide Applicability Limit	52451	Include if the modification results in emission reductions.
☐ Y ☒ N	PAL-02	Revised Plantwide Applicability Limit	52452	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	PAL-03	Plantwide Applicability Limit Renewal	52453	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	PAL-04	Request for Termination of Plantwide Applicability Limit	52454	Submit if you are looking for emission credits for offsets.

Part H: Air Toxics				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	FED-01	Summary of Federal Requirements – NSPS & NESHAP	53512	Include for each 40 CFR Part 60 NSPS, 40 CFR Part 61 NESHAP, and 40 CFR Part 63 NESHAP applicable to the process.
☐ Y ☒ N	FED-02	MACT Pre-Construction Review	51905	Include if constructing or modifying a process subject to a Part 63 NESHAP.
☐ Y ☒ N	No Form ID	MACT Initial Notification	None	This form is available on the U.S. EPA website. Completed notifications should be submitted to the IDEM Compliance Branch.

Part I: Special Permits				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	INTERIM	Interim Approval	None	Submit if you are applying for interim operating approval.
☐ Y ☒ N	ASPHALT	Asphalt General Permit	None	Submit if you are applying for or modifying an asphalt plant general permit.
☐ Y ☒ N	NOXBTP	NO_X Budget Permit	None	Submit if you are a power plant or if you have opted in to the NO_X budget trading program.
☐ Y ☒ N	ACIDRAIN	Phase 2 Acid Rain Permit	None	Submit if you are applying for, modifying, or renewing a Phase 2 Acid Rain permit.

Continued on Next Page

Part J: Source Specific Operating Agreements (SSOA)				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	OA-01	Summary of Application and Existing Agreements	53438	Submit if you are applying for or modifying a Source Specific Operating Agreement.
☐ Y ☒ N	OA-02	Industrial / Commercial Surface Coating Operations -OR- Graphic Arts Operations (326 IAC 2-9-2.5)	53439	Submit if you are applying for or modifying a SSOA for industrial or commercial surface coating operations not subject to 326 IAC 8-2; or graphic arts operations not subject to 326 IAC 8-5-5.
☐ Y ☒ N	OA-03	Surface Coating or Graphic Arts Operations (326 IAC 2-9-3)	53440	Submit if you are applying for or modifying a SSOA for surface coating or graphic arts operations.
☐ Y ☒ N	OA-04	Woodworking Operations (326 IAC 2-9-4)	53441	Submit if you are applying for or modifying a SSOA for woodworking operations.
☐ Y ☒ N	OA-05	Abrasive Cleaning Operations (326 IAC 2-9-5)	53442	Submit if you are applying for or modifying a SSOA for abrasive cleaning operations.
☐ Y ☒ N	OA-06	Grain Elevators (326 IAC 2-9-6)	53443	Submit if you are applying for or modifying a SSOA for grain elevators.
☐ Y ☒ N	OA-07	Sand And Gravel Plants (326 IAC 2-9-7)	53444	Submit if you are applying for or modifying a SSOA for sand and gravel plants.
☐ Y ☒ N	OA-08	Crushed Stone Processing Plants (326 IAC 2-9-8)	53445	Submit if you are applying for or modifying a SSOA for crushed stone processing plants.
☐ Y ☒ N	OA-09	Ready-Mix Concrete Batch Plants (326 IAC 2-9-9)	53446	Submit if you are applying for or modifying a SSOA for ready-mix concrete batch plants.
☐ Y ☒ N	OA-10	Coal Mines And Coal Preparation Plants (326 IAC 2-9-10)	53447	Submit if you are applying for or modifying a SSOA for coal mines and coal preparation plants.
☐ Y ☒ N	OA-11	Automobile Refinishing Operations (326 IAC 2-9-11)	53448	Submit if you are applying for or modifying a SSOA for automobile refinishing operations.
☐ Y ☒ N	OA-12	Degreasing Operations (326 IAC 2-9-12)	53449	Submit if you are applying for or modifying a SSOA for degreasing operations.
☐ Y ☒ N	OA-13	External Combustion Sources (326 IAC 2-9-13)	53450	Submit if you are applying for or modifying a SSOA for external combustion sources.
☐ Y ☒ N	OA-14	Internal Combustion Sources (326 IAC 2-9-14)	53451	Submit if you are applying for or modifying a SSOA for internal combustion sources.

OAQ GENERAL SOURCE DATA APPLICATION
GSD-01: Basic Source Level Information

State Form 50640 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-01 is to provide essential information about the entire source of air pollutant emissions. GSD-01 is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

PART A: Source / Company Location Information

1. **Source / Company Name**: POET Biorefining - Alexandria, LLC
2. **Plant ID**: 095 – 00127
3. **Location Address**: 13179 North 100 East
   - **City**: Alexandria
   - **State**: IN
   - **ZIP Code**: 46001 –
4. **County Name**: Madison
5. **Township Name**: Monroe
6. **Geographic Coordinates**:
   - **Latitude**: 40 17.99' N
   - **Longitude**: 85 39.31' W
7. **Universal Transferal Mercadum Coordinates** *(if known)*:
   - **Zone**:
   - **Horizontal**:
   - **Vertical**:
8. **Adjacent States**: Is the source located within 50 miles of an adjacent state?
   ☐ No ☒ Yes – *Indicate Adjacent State(s):* ☐ Illinois (IL) ☐ Michigan (MI) ☒ Ohio (OH) ☐ Kentucky (KY)
9. **Attainment Area Designation**: Is the source located within a non-attainment area for any of the criteria air pollutants?
   ☒ No ☐ Yes – *Indicate Nonattainment Pollutant(s):* ☐ CO ☐ Pb ☐ NO_x ☐ O_3 ☐ PM ☐ PM_{10} ☐ $PM_{2.5}$ ☐ SO_2
10. **Portable / Stationary**: Is this a portable or stationary source? ☐ Portable ☒ Stationary

PART B: Source Summary

11. **Company Internet Address** *(optional)*:
12. **Company Name History**: Has this source operated under any other name(s)?
    ☐ No ☒ Yes – *Provide information regarding past company names in Part I, Company Name History.*
13. **Portable Source Location History**: Will the location of the portable source be changing in the near future?
    ☒ Not Applicable ☐ No ☐ Yes – *Complete Part J, Portable Source Location History, and Part K, Request to Change Location of Portable Source.*
14. **Existing Approvals**: Have any exemptions, registrations, or permits been issued to this source?
    ☐ No ☒ Yes – *List these permits and their corresponding emissions units in Part M, Existing Approvals.*
15. **Unpermitted Emissions Units**: Does this source have any unpermitted emissions units?
    ☒ No ☐ Yes – *List all unpermitted emissions units in Part N, Unpermitted Emissions Units.*
16. **New Source Review**: Is this source proposing to construct or modify any emissions units?
    ☒ No ☐ Yes – *List all proposed new construction in Part O, New or Modified Emissions Units.*
17. **Risk Management Plan**: Has this source submitted a Risk Management Plan?
    ☒ Not Required ☐ No ☐ Yes → Date submitted: EPA Facility Identifier: – –

Continued on Next Page

PART C: Source Contact Information

IDEM will send the original, signed permit decision to the person identified in this section. This person MUST be an employee of the permitted source.

18. Name of Source Contact Person: Ron Vehikite

19. Title *(optional)*: Plant Manager

20. Mailing Address: P.O. Box 717

City: Alexandria	**State**: IN	**ZIP Code**: 46001 –

21. Electronic Mail Address *(optional)*: ron.vehikite@POET.com

22. Telephone Number: (765) 724 – 0403	**23. Facsimile Number** *(optional)*: ( ) –

PART D: Authorized Individual/Responsible Official Information

IDEM will send a copy of the permit decision to the person indicated in this section, if the Authorized Individual or Responsible Official is different from the Source Contact specified in Part C.

24. Name of Authorized Individual or Responsible Official: Dan McMahan

25. Title: General Manager

26. Mailing Address: P.O. Box 717

City: Alexandria	**State**: IN	**ZIP Code**: 46001 –

27. Telephone Number: (765) 724 – 0401	**28. Facsimile Number** *(optional)*: ( ) –

29. Request to Change the Authorized Individual or Responsible Official: Is the source officially requesting to change the person designated as the Authorized Individual or Responsible Official in the official documents issued by IDEM, OAQ? *The permit may list the title of the Authorized Individual or Responsible Official in lieu of a specific name.*

☐ No ☒ Yes – ***Change Responsible Official to:*** Dan McMahan from Dave Hudak

PART E: Owner Information

30. Company Name of Owner: POET Biorefining - Alexandria, LLC

31. Name of Owner Contact Person: Dan McMahan

32. Mailing Address: P.O. Box 717

City: Alexandria	**State**: IN	**ZIP Code**: 46001 –

33. Telephone Number: (765) 724 – 0401	**34. Facsimile Number** *(optional)*: ( ) –

34. Operator: Does the "Owner" company also operate the source to which this application applies?

☐ No – *Proceed to Part F below.*	☒ Yes – *Enter "SAME AS OWNER" on line 35 and proceed to Part G below.*

PART F: Operator Information

35. Company Name of Operator: Same as owner

36. Name of Operator Contact Person:

37. Mailing Address:

City:	**State**:	**ZIP Code**: –

38. Telephone Number: ( ) –	**39. Facsimile Number** *(optional)*: ( ) –

Continued on Next Page

PART G: Agent Information

40. Company Name of Agent: POET Bioprocessing and Plant Management

41. Type of Agent: ☐ Environmental Consultant ☐ Attorney ☒ Other (specify): Internal

42. Name of Agent Contact Person: David Westlund

43. Mailing Address: 4615 North Lewis Ave

City: Sioux Falls	**State**: SD	**ZIP Code**: 57104 –

44. Electronic Mail Address *(optional)*: David.Westlund@POET.com

45. Telephone Number: (605) 965 – 4962	**46. Facsimile Number** *(optional)*: ( ) –

47. Request for Follow-up: Does the "Agent" wish to receive a copy of the preliminary findings during the public notice period (if applicable) and a copy of the final determination? ☐ No ☒ Yes

PART H: Local Library Information

48. Date application packet was filed with the local library: 6/25/2024

49. Name of Library: Alexandria-Monroe Public Library

50. Name of Librarian *(optional)*:

51. Mailing Address: 117 East Church Street

City: Alexandria	**State**: IN	**ZIP Code**: 46001 – 2005

52. Internet Address *(optional)*:

53. Electronic Mail Address *(optional)*:

54. Telephone Number: ( ) –	**55. Facsimile Number** *(optional)*: ( ) –

PART I: Company Name History *(if applicable)*

Complete this section only if the source has previously operated under a legal name that is different from the name listed above in Section A.

56. Legal Name of Company	**57. Dates of Use**
Ultimate Ethanol, LLC	2007 to 2008
POET Biorefining - Alexandria	2008 to 2016
POET Biorefining - Alexandria, LLC	2016 to Present
	to
	to
	to
	to
	to
	to
	to

58. Company Name Change Request: Is the source officially requesting to change the legal name that will be printed on all official documents issued by IDEM, OAQ?

☒ No ☐ Yes – ***Change Company Name to***:

Continued on Next Page

PART J: Portable Source Location History *(if applicable)*

Complete this section only if the source is portable and the location has changed since the previous permit was issued. The current location of the source should be listed in Section A.

59. Plant ID	60. Location of the Portable Source	61. Dates at this Location
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to
–		to

PART K: Request to Change Location of Portable Source *(if applicable)*

Complete this section to request a change of location for a portable source.

62. Current Location:

Address:

City: **State**: **ZIP Code**: –

County Name:

63. New Location:

Address:

City: **State**: **ZIP Code**: –

County Name:

Continued on Next Page

PART L: Source Process Description

Complete this section to summarize the main processes at the source.

64. Process Description	65. Products	66. SIC Code	67. NAICS Code
Fuel Ethanol & Industrial Alcohol Production	Ethyl Alcohol	2869	325193
Prep Feeds/Feed Ingredients	Other Animal Food Manufacturing	2048	311119

PART M: Existing Approvals *(if applicable)*

Complete this section to summarize the approvals issued to the source since issuance of the main operating permit.

68. Permit ID	69. Emissions Unit IDs	70. Expiration Date
43506	Significant Source Modification	8/31/2021
45994	ADministrativ Amendment	8/31/2026
39730	Significant Source Modification	8/8/2018
35684	Significant Source Modification	1/6/2017
25333	Total Faciltiy	1/29/2012

PART N: Unpermitted Emissions Units *(if applicable)*

Complete this section only if the source has emission units that are not listed in any permit issued by IDEM, OAQ.

71. Emissions Unit ID	72. Type of Emissions Unit	73. Actual Dates		
		Began Construction	Completed Construction	Began Operation

PART O: New or Modified Emissions Units *(if applicable)*

Complete this section only if the source is proposing to add new emission units or modify existing emission units.

74. Emissions Unit ID	75. NEW	76. MOD	77. Type of Emissions Unit	78. Estimated Dates		
				Begin Construction	Complete Construction	Begin Operation

Continued on Next Page

OAQ GENERAL SOURCE DATA APPLICATION
GSD-02: Plant Layout Diagram

State Form 51605 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-02 is to provide a diagram of the entire plant site. This form and a Plant Layout diagram are required for all air permit applications. If you do not provide the necessary information, applicable to your source, the application process may be stopped.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic plant layout diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Basic Plant Layout

Part A provides IDEM, OAQ with the appropriate information about all buildings and access-limiting features in and around the plant site. **Please use this table as a checklist.** You must provide scaled drawings, with the actual scale shown. All dimensions and units must be clearly indicated with a brief explanation of what is being shown. Include the following (*All measurements should be given in feet.*):

1.	☒ Building Location and Dimensions				
2.	☒ Property Lines and Access-Limiting Features				
3.	☒ Surrounding Building Location and Dimensions				
4.	☒ Distances to Property Lines and Access-Limiting Features				
5.	☐ UTM Location Coordinates	**6.**	☒ Compass (pointing North)	**7.**	☒ Scale

Part B: Stack Information

Part B provides IDEM, OAQ with the appropriate information about all stacks, roof monitors, control devices, and process vents at the plant site. **Please use this table as a checklist.** You must show the location of all applicable emission points and include all relevant stack and emissions unit identification numbers for each. In addition, you will need to identify each of these emission points under "Stack Identification" on form GSD-04, Stack/Vent Information. Include the following (*All measurements should be in feet.*):

8.	☒ Exhaust Stacks			
9.	☒ Process Vents			
10.	☐ Roof Monitors	☐ *No Roof Monitors*		
11.	☐ Control Devices	☐ *No Control Devices*		
12.	☐ Interior Vents	☒ *No Interior Vents*	☐ Doors and Windows *(for processes vented inside a building)*	

Part C: Roadway Information

Part C provides IDEM, OAQ with the appropriate information about the roadways in and around the plant site. **Please use this table as a checklist.** Include the following (*All measurements should be in feet.*):

13.	☒ Adjacent Roadways	☒ Interior Roadways
14.	☒ Roadway Surface Description (gravel, dirt, paved, etc.)	
15.	☒ Number of Lanes	

Continued on Next Page

Part D: Source Building Information

This table provides detailed information about each building at the plant site that is part of the source. If additional space is needed, you may make a copy of this table. (*All measurements should be given in feet.*)

16. Building ID	17. Building Description	18. Building Dimensions			19. Distance & direction to the nearest property line or access limiting feature (feet & compass coordinate)	20. Distance & direction to the nearest residence (feet & compass coordinate)
		Length (feet)	Width (feet)	Height (feet)		
1	Grains Bldg	136.00	100.00	47.00	759.00 Northwest	3509.00 Northwest
2	Mech. Bldg A	190.00	91.00	44.00	426.00 West	3176.00 Northwest
3	Mech. Bldg B	84.00	42.00	36.00	501.00 Northwest	3251.00 Northwest
4	Process Bldg A	91.00	23.00	50.00	507.00 West	3257.00 Northwest
5	Process Bldg B	91.00	29.00	67.00	461.00 Northwest	3211.00 Northwest
6	Process Bldg C	168.00	104.00	72.00	545.00 Northwest	3295.00 Northwest
7	Process Bldg D	45.00	25.00	95.00	513.00 West	3263.00 Northwest
8	Distillation Bldg	64.00	47.00	95.00	580.00 West	3330.00 Northwest
9	Fermentation Bldg	142.00	46.00	30.00	738.00 West	3488.00 Northwest

Continued on Next Page

Part E: Surrounding Building / Residence Information

This table provides detailed information about each building or residence surrounding the plant site. If additional space is needed, you may make a copy of this table. (*All measurements should be given in feet.*)

21. Surrounding Building / Residence Description	22. Surrounding Building / Residence Property Dimensions			23. Distance & direction to the nearest property line or access limiting feature (feet & compass coordinate)		24. Building ID of nearest building on the plant site	25. Distance & direction to the nearest building on the plant site (feet & compass coordinate)	
	Length (feet)	Width (feet)	Height (feet)					
Home 1	45.00	25.00	15.00	2750.00	Southwest	2	3176.00	Southwest
Home 2	45.00	25.00	15.00	1250.00	Southwest	8	4000.00	Southwest

Continued on Next Page

Part F: Plant Layout Diagram

This space provides a place for a hand drawn plant layout diagram. It is **optional** to use this space to create your plant layout, but you must include the diagram with your application. If you choose to submit the plant layout in a different format, state “plant layout attached” in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic plant layout diagram on the Air Permit Applications Forms website.

GRAVEL
GRAIN STORAGE
GRAIN STORAGE
GRAIN STORAGE
GRAIN STORAGE
GRAIN STORAGE
CONCRETE
ASPHALT
GRAINS BUILDING
DRYER
MECHANICAL
EVAPORATION
DISTILLATION
MILLING AREA PAD
BEER WELL
STILLAGE TANK
FERMENTER
FERMENTATION
COOLING TOWERS
OHP
ETHANOL STORAGE

OAQ GENERAL SOURCE DATA APPLICATION
GSD-03: Process Flow Diagram

State Form 51599 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-03 is to provide a checklist for identifying the information to be included on each Process Flow diagram.
- Complete this form and submit a process flow diagram for each process included in your air permit application.
- IDEM, OAQ has provided detailed instructions for this form and an example of a basic process flow diagram on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Process Flow Diagram

Part A provides basic information to understanding the nature of the process. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

1. ☒ **Process Description:** Fuel Ethanol and Industiral Alcohol Production Facility

2. ☐ Process Equipment	3. ☒ Raw Material Input	4. ☒ Process Throughput

5. ☐ Additions ☐ Deletions ☒ Modifications

Use the space below to briefly explain the impacts of the additional equipment, the reason for removing any equipment, and/or the reason for the proposed modification. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

See cover letter.

Part B: Process Operation Schedule

Part B indicates the actual (or estimated actual) hours of operation for the process.

6. ☒ Process Operation Schedule 24 Hours per Day 7 Days per Week 52 Weeks Per Year

7. **Scheduled Downtime:** Use the space below to include as much information as is known about scheduled periods of downtime for this process. (*If additional space is needed, please attach a separate sheet with the information and indicate in the space below that additional information is attached.*)

NA

Part C: Emissions Point Information

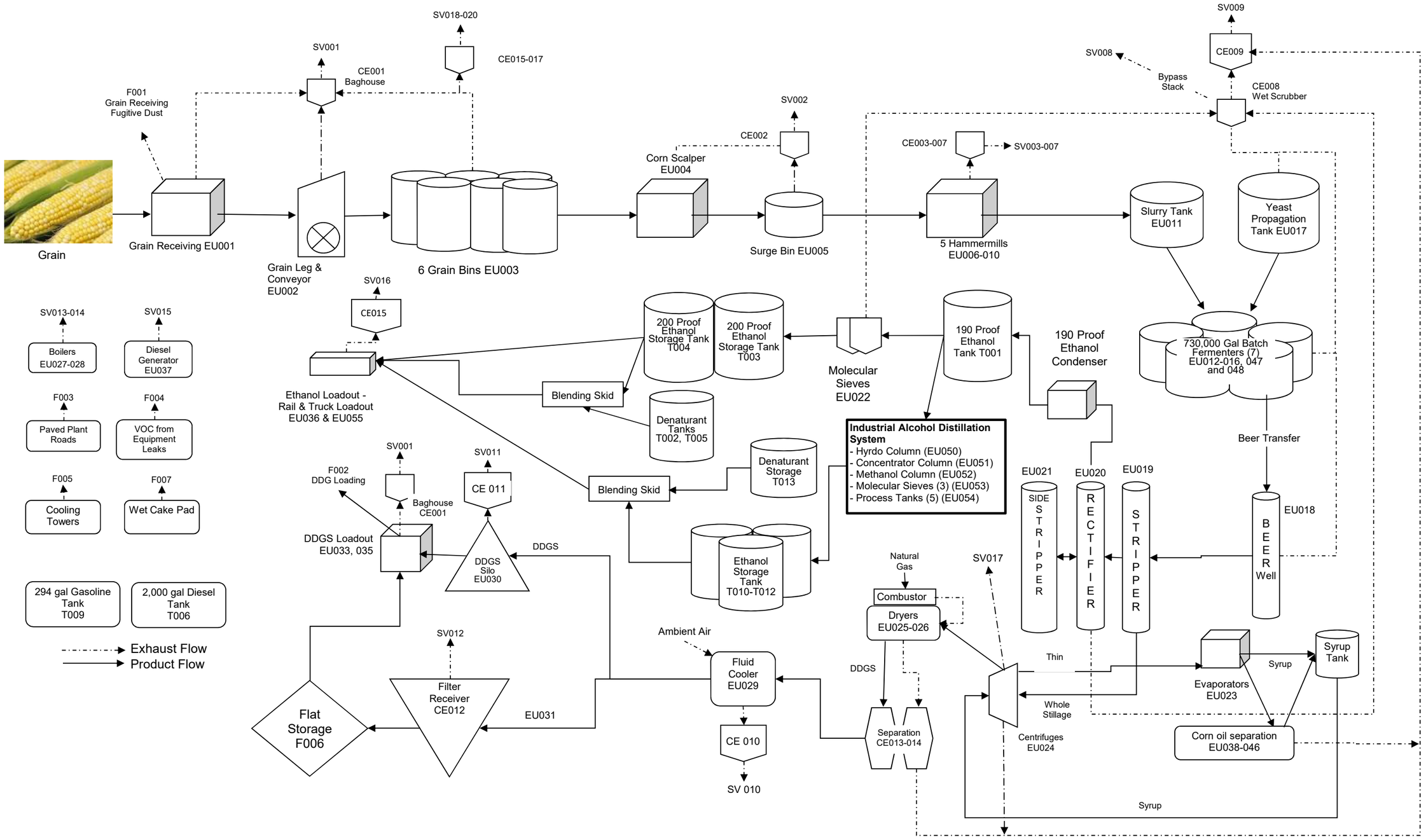
Part C provides information about each potential outlet of air pollutant emissions to the atmosphere. Please use this table as a checklist to indicate that you have included the following items on your process flow diagram (*All throughputs should be given in pounds per hour.*):

8. ☒ Stack / Vent Information
9. ☒ Pollutants Emitted
10. ☒ Air Pollution Control

Continued on Next Page

Part D: Process Flow Diagram

This space provides a place for a hand drawn process flow diagram. It is **optional** to use this space to create your process flow diagram, but you must include the diagram with your application. If you choose to submit the process flow diagram in a different format, state “process flow diagram attached” in the space provided, and submit the information with your completed application. IDEM, OAQ has provided an example of a basic process flow diagram on the Air Permit Applications Forms website.


Grain
F001
Grain Receiving
Fugitive Dust
Grain Receiving EU001
SV001
CE001
Baghouse
SV018-020
CE015-017
Grain Leg &
Conveyor
EU002
6 Grain Bins EU003
Corn Scalper
EU004
CE002
SV002
Surge Bin EU005
CE003-007
SV003-007
5 Hammermills
EU006-010
SV009
CE009
SV008
Bypass
Stack
CE008
Wet Scrubber
Slurry Tank
EU011
Yeast
Propagation
Tank EU017
730,000 Gal Batch
Fermenters (7)
EU012-016, 047
and 048
Beer Transfer
EU018
BEER
Well
190 Proof
Ethanol
Tank T001
190 Proof
Ethanol
Condenser
Molecular
Sieves
EU022
200 Proof
Ethanol
Storage Tank
T004
200 Proof
Ethanol
Storage Tank
T003
SV016
CE015
Ethanol Loadout -
Rail & Truck Loadout
EU036 & EU055
Blending Skid
Denaturant
Tanks
T002, T005
Denaturant
Storage
T013
Industrial Alcohol Distillation
System
- Hyrdo Column (EU050)
- Concentrator Column (EU051)
- Methanol Column (EU052)
- Molecular Sieves (3) (EU053)
- Process Tanks (5) (EU054)
EU021
EU020
EU019
SIDE
STRIPPER
RECTIFIER
STRIPPER
SV013-014
Boilers
EU027-028
SV015
Diesel
Generator
EU037
F003
Paved Plant
Roads
F004
VOC from
Equipment
Leaks
F005
Cooling
Towers
F007
Wet Cake Pad
294 gal Gasoline
Tank
T009
2,000 gal Diesel
Tank
T006
Exhaust Flow
Product Flow
SV001
SV011
F002
DDG Loading
Baghouse
CE001
CE 011
DDGS Loadout
EU033, 035
DDGS
DDGS
Silo
EU030
Ethanol
Storage
Tank
T010-T012
Natural
Gas
Combustor
Dryers
EU025-026
SV017
Thin
Syrup
Syrup
Tank
Evaporators
EU023
Whole
Stillage
Centrifuges
EU024
Corn oil separation
EU038-046
Syrup
SV012
Filter
Receiver
CE012
Flat
Storage
F006
EU031
Ambient Air
Fluid
Cooler
EU029
CE 010
SV 010
DDGS
Separation
CE013-014

OAQ GENERAL SOURCE DATA APPLICATION
GSD-04: Stack / Vent Information

State Form 51606 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each stack or vent that has the potential to emit air pollutants. If you do not provide enough information to adequately describe each process vent and/or stack, the application process may be stopped. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Stack / Vent Information

This table provides detailed information about each stack or vent through which air pollutants could be released into the atmosphere. If an air stream is vented inside a building, the vent does not need to be listed on this form. If additional space is needed, you may make a copy of this form.

1. Stack / Vent ID	2. Type (V H W O)	3. Shape (C R O)	4. Outlet Dimensions (feet)	5. Height (feet)	6. Maximum Outlet Flow Rate (acfm)	7. Outlet Gas Temperature (Degrees F)	8. Related Stacks / Vents (B P O)
SV008	V	C	2.00	68.00	9000.00	75.0	
SV009	V	C	6.30	100.00	145000.00	320.0	
SV010	V	C	3.00	100.00	23400.00	100.0	
SV011	V	C	1.25	112.00	4000.00	70.0	
SV012	V	C	1.25	30.00	4000.00	70.0	

OAQ GENERAL SOURCE DATA APPLICATION
GSD-05: Emissions Unit Information

State Form 51610 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each emissions unit that has the potential to emit air pollutants. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Emissions Unit Information

This table provides detailed information about each emissions unit that has the potential to emit air pollutants to the atmosphere. Accurate information is needed to determine the total potential to emit. If you do not provide enough information to adequately describe each emissions unit, the application process may be stopped. If additional space is needed, you may make a copy of this form.

1. Unit ID	2. Model Number	3. Serial Number	4. Description	5. Manufacturer	6. Installation Date	7. Maximum Capacity	8. Stack / Vent ID
EU012	NA	NA	Fermenter #1	POET	12/1/2006	73000.00 gal/hr	SV008, SV009
EU013	NA	NA	Fermenter #2	POET	12/1/2006	73000.00 gal/hr	SV008, SV009
EU014	NA	NA	Fermenter #3	POET	12/1/2006	73000.00 gal/hr	SV008, SV009
EU015	NA	NA	Fermenter #4	POET	12/1/2006	73000.00 gal/hr	SV008, SV009
EU016	NA	NA	Fermenter #5	POET	12/1/2006	73000.00 gal/hr	SV008, SV009
EU017	NA	NA	YEAST PROPAGATION TANK	POET	12/1/2006	69000.00 gal/hr	SV008 SV009
EU018	NA	NA	BEER WELL	POET	12/1/2006	69000.00 gal/hr	SV008 SV009
EU0019	NA	NA	BEER STRIPPER	SIZER CHEMTECH	12/1/2006	69000.00 gal/hr	SV008 SV009
EU020	NA	NA	RECTIFIER		12/1/2006	69000.00 gal/hr	SV008 SV009
EU021	NA	NA	SIDE STRIPPER	SIZER CHEMTECH	12/1/2006	69000.00 gal/hr	SV008 SV009
EU022	NA	NA	ONE SET OF THREE MOLECULAR SIEVES	SIZER CHEMTECH	12/1/2006	69000.00 gal/hr	SV008 SV009
EU023	NA	NA	ONE SET OF FOUR EVAPORATORS	SIZER CHEMTECH	12/1/2006	69000.00 gal/hr	SV008 SV009
EU024	NA	NA	ONE SET OF FOUR CENTRIFUGES		12/1/2006	69000.00 gal/hr	SV008 SV009

EU025	NA	NA	DDG DRYER #1	BARR-ROSIN	12/1/2006	42.50 ton/hr	SV009
EU026	NA	NA	DDG DRYER #2	BARR-ROSIN	12/1/2006	42.50 ton/hr	SV009
EU047, EU048	NA	NA	Fermenter #6 & #7	POET	12/1/2006	73000.00 gal/hr	SV008, SV009

OAQ GENERAL SOURCE DATA APPLICATION
GSD-05: Emissions Unit Information

State Form 51610 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide basic information about each emissions unit that has the potential to emit air pollutants. This form is required for all air permit applications.
- Detailed instructions for this form are available online on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Emissions Unit Information

This table provides detailed information about each emissions unit that has the potential to emit air pollutants to the atmosphere. Accurate information is needed to determine the total potential to emit. If you do not provide enough information to adequately describe each emissions unit, the application process may be stopped. If additional space is needed, you may make a copy of this form.

1. Unit ID	2. Model Number	3. Serial Number	4. Description	5. Manufacturer	6. Installation Date	7. Maximum Capacity	8. Stack / Vent ID
EU029	NA	NA	DDG FLUID BED COOLER	BARR-ROSIN	12/1/2006	27.00 ton/hr	SV010
EU030	NA	NA	DDG SILO LOADING	LAIDIG/SMI	12/1/2006	27.00 ton/hr	SV011
EU031	NA	NA	DDG SILO BYPASS	MAC	12/1/2006	27.00 ton/hr	SV012

OAQ GENERAL SOURCE DATA APPLICATION
GSD-07: Criteria Pollutant Emissions Summary

State Form 51602 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide the actual and potential emissions of each criteria pollutant emitted from the source. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Unit Emissions Summary

Part A provides the actual and potential emissions of each criteria pollutant emitted from each emissions unit. If you do not provide enough information to adequately describe the emissions from each emissions unit, the application process may be stopped.

1. Unit ID	2. Stack / Vent ID	3. Criteria Pollutant	4. Actual Emissions		5. Potential To Emit	
			Standard Units	Tons Per Year	Standard Units	Tons Per Year
	See attached PTE calculations					

Continued on Next Page

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each criteria pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

6. Criteria Pollutant	7. Actual Emissions		8. Potential To Emit	
	Standard Units	Tons Per Year	Standard Units	Tons Per Year
Carbon Monoxide (CO)	See attached PTE calculations			
Lead (Pb)				
Nitrogen Oxides (NO_X)				
Particulate Matter (PM)				
Particulate Matter less than 10μm (PM_{10})				
Particulate Matter less than 2.5μm ($PM_{2.5}$)				
Sulfur Dioxide (SO_2)				
Volatile Organic Compounds (VOC)				
Other *(specify)*:				

Part C: Fugitive VOC Emissions *(if applicable)*

Part C summarizes the sources of fugitive VOC emissions at the source and estimates VOC emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

9. Fugitive Emissions Source	10. Emission Factor (lb/hr)	11. Number Leaking	12. Uncontrolled Potential To Emit	
			Pounds Per Hour	Tons Per Year
Compressor Seals				
Flanges				
Open-Ended Lines				
Pressure Relief Seals				
Pump Seals				
Sampling Connections				
Valves				
Other *(specify)*:				

OAQ GENERAL SOURCE DATA APPLICATION
GSD-08: Hazardous Air Pollutant Emissions Summary

State Form 51604 (R3 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to provide the actual and potential emissions of each hazardous air pollutant emitted from the source. This form is required for all air permit applications.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

Part A: Unit Emissions Summary

Part A provides the actual and potential emissions of each hazardous air pollutant emitted from each emissions unit. If you do not provide enough information to adequately describe the emissions from each emissions unit, the application process may be stopped.

1. Unit ID	2. Stack / Vent ID	3. Hazardous Air Pollutant	4. CAS Number	5. Actual Emissions		6. Potential To Emit	
				Standard Units	Tons Per Year	Standard Units	Tons Per Year
	See attached PTE calculations						

Continued on Next Page

Part B: Pollutant Emissions Summary

Part B provides the total actual and potential emissions of each hazardous air pollutant emitted from the source (including all emissions units and fugitive emissions at the source). If you do not provide enough information to adequately describe the total source emissions, the application process may be stopped.

7. Hazardous Air Pollutant	8. CAS Number	9. Actual Emissions		10. Potential To Emit	
		Standard Units	Tons Per Year	Standard Units	Tons Per Year
See attached PTE calculations					

Part C: Fugitive HAP Emissions *(if applicable)*

Part C summarizes the sources of fugitive HAP emissions at the source and estimates HAP emissions from these emission points. Complete this table if you are required to provide fugitive emissions data pursuant to 326 IAC 2-2 or 326 IAC 2-3.

11. Fugitive Emissions Source	12. Hazardous Air Pollutant	13. Emission Factor (lb/hr)	14. Number Leaking	15. Uncontrolled Potential To Emit	
				Pounds Per Hour	Tons Per Year
Compressor Seals	See attached PTE calculations				
Flanges					
Open-Ended Lines					
Pressure Relief Seals					
Pump Seals					
Sampling Connections					
Valves					
Other *(specify)*:					

OAQ PROCESS INFORMATION APPLICATION
PI-03: Storage & Handling of Bulk Material

State Form 52543 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this form is to obtain detailed information about the storage and handling of bulk materials. Complete one form for each process (or group of identical processes). Use additional forms if necessary. This is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for anyone to inspect and photocopy.

PART A: Storage & Handing Information

Part A identifies all process units associated with storage and handling process for bulk materials. If there are multiple process units that are identical in nature, capacity, and use, you may use one form to summarize the data.

1. Equipment / Component Type	2. Unit ID	3. Number of Identical Units	4. Installation Date *(see instructions)*	5. Material Handled/ Stored	6. Maximum Materials Throughput Rate *(tons/year)*
DDG Fluid Bed Cooler	EU029		12/1/2006	DDGS	175200.00
DDG Silo Loading	EU030		12/1/2006	DDGS	175200.00
DDG Silo Bypass	EU031		12/1/2006	DDGS	175200.00

7. Add-On Control Technology: *Identify all control technologies used for this unit, and attach completed CE-01 (unless "none").*

☐ None

☒ Baghouse / Fabric Filter – *Attach CE-02.*

☐ Cyclone – *Attach CE-03.*

☐ Electrostatic Precipitator – *Attach CE-04.*

☐ Absorption / Wet Collector / Scrubber – *Attach CE-05.*

☐ Adsorber – *Attach CE-07.*

☐ Other *(specify)*: – *Attach CE-10.*

8. Control Techniques: *Identify any other air emission control options used for the process.*

Conveyors and transfer points will be aspired to a fabric filter baghouse.

9. Process Limitations / Additional Information: *Identify any acceptable process limitations. Attach additional information if necessary.*

Continued on next page

PART B: Process Material Information

Part B summarizes the process material information. Provide the information in the items below for each material stored and/or handled in this process.

10. Material Handled/Stored *(from table above)*	11. Method of Handling	12. Type of Storage	13. Storage Capacity *(tons)*	14. Pile Acreage	15. Silt Content *(% by weight)*	16. Moisture Content *(% by weight)*
DDG	Conveyor	Silo			0.00%	10.00%
DDG	Conveyor	Flat Building			0.00%	10.00%

PART C: Emission Factors

Part C identifies all emission factors used to calculate air emissions from the process units listed on this form.

17. Process Equipment & ID *(complete for all units listed in Part A of this form)*	18. Air Pollutant	19. Emission Factor		20. Source of Emission Factor *(if not using AP-42, include calculations)*	
		value	*units*		
See attached	PM			☐ AP-42	☒ Other
See attached	PM-10			☐ AP-42	☒ Other
See PTE	SO2			☐ AP-42	☒ Other
				☐ AP-42	☐ Other

PART D: Federal Rule Applicability

Part D identifies any federal rules that apply to the process.

21. Is a **New Source Performance Standard (NSPS)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.* ☐ Yes ☒ No

- ☐ 40 CFR Part 60, Subpart CC — Glass Manufacturing Plants
- ☐ 40 CFR Part 60, Subpart DD — Grain Elevators
- ☐ 40 CFR Part 60, Subpart HH — Lime Manufacturing Plants
- ☐ 40 CFR Part 60, Subpart LL — Metallic Mineral Processing Plants
- ☐ 40 CFR Part 60, Subpart UU — Asphalt Processing and Asphalt Roofing Manufacture
- ☐ 40 CFR Part 60, Subpart OOO — Non-Metallic Mineral Processing Plants
- ☐ 40 CFR Part 60, Subpart UUU — Calciners and Dryers in Mineral Industries

22. Is a **National Emission Standard for Hazardous Air Pollutants (NESHAP)** applicable to this source? *If yes, attach a completed FED-01 for each rule that applies.* ☐ Yes ☒ No

- ☐ 40 CFR Part 61, Subpart _____ *(Specify)*:
- ☐ 40 CFR Part 63, Subpart _____ *(Specify)*:

23. Non-Applicability Determination: Provide an explanation if the process unit appears subject to a rule (based on the rule title or the source category), but the rule will not apply.

Grain storage less than 2.5 million bu.

OAQ CONTROL EQUIPMENT APPLICATION
CE-02: Particulate Control – Baghouse / Fabric Filter

State Form 51953 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-02 is to identify all the parameters that describe the baghouse or fabric filter. This is a required form.
- Complete this form once for each baghouse or fabric filter (or once for each set of identical baghouses or fabric filters).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the particulate control device and describes its physical properties.

1. Control Equipment ID:	CE010
2. Installation Date:	12/1/2006
3. Bags or Cartridges?	☒ Bags ☐ Cartridges
4. Filter Material:	Fabric
5. Number of Bags/Cartridges per Compartment:	
6. Number of Compartments:	
7. Mode of Operation:	☐ Intermittent ☐ Periodic ☒ Continuous
8. Cleaning Method:	☐ Shaking ☐ Reverse Pulse ☐ Reverse Air ☒ Jet Pulse
9. Cleaning Cycle / Frequency *(specify units)*:	
10. Is a bag leak detector installed on this device?	☐ Yes ☒ No
11. Type / Description of Bag Leak Detector:	☐ Positive Pressure ☐ Negative Pressure
12. Air to Cloth Ratio *(Ex: 1.3 : 1.0)*:	3.4 : 1.0
13. Is **Lime Injection** used on this device?	☐ Yes ☒ No
14. Is **Carbon Injection** used on this device?	☐ Yes ☒ No

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream. Appropriate units must be included if the standard units are not used. For each applicable parameter, provide the inlet and outlet values or provide the differential value.

	A. Units	B. Inlet	C. Outlet	D. Differential
15. Gas Stream Flow Rate	ACFM	23800.00	23800.00	0.00
16. Gas Stream Temperature	°F	70.00	70.00	0.00
17. Gas Stream Pressure	inches of water			to
18. Moisture Content	%			
19. Particle Size Range	micrometers			to
20. Lime Injection Rate *(if applicable)*	lb/hr			
21. Carbon Injection Rate *(if applicable)*	lb/hr			
22. Other *(specify)*:				

Continued on Next Page

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	23. Units	24. Inlet	25. Outlet	26. Efficiency *(%)*:	
				Capture	Control
☐ **a.** Lead (Pb)					
☐ **b.** Hazardous Air Pollutant (HAP) *(specify)*:					
☐ **c.** Particulate Matter (PM)					
☐ **d.** Particulate Matter less than 10μm (PM_{10})					
☐ **e.** Particulate Matter less than 2.5μm ($PM_{2.5}$)					
☒ **f.** Other Pollutant *(specify)*: SO2	lb/hr		1.00	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

27. Item(s) Monitored:		Visible Emissions		
28. Monitoring Frequency:		Daily		
29. Item(s) Recorded:		Visible Emissions		
30. Record Keeping Frequency:		Daily		
31. Pollutant(s) Tested:		Visible Emissions		
32. Test Method(s):		NA		
33. Testing Frequency:		NA		

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

34. Do you have a Preventive Maintenance Plan (PMP)?

☒ No PMP is needed. ☐ Yes – the following items are identified on the PMP:

- ☐ **A.** Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- ☐ **B.** Description of the items or conditions that will be inspected.
- ☐ **C.** Schedule for inspection of items or conditions described above.
- ☐ **D.** Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

PART F: Determination of Integral Control

Part F provides explanation to determine whether the control device should be considered integral to the process.

35. Has IDEM already made an integral control determination for this device? ☒ No ☐ Yes
If "Yes", provide the following:

Permit Number: | **Issuance Date:** | **Determination:** ☐ Integral ☐ Not Integral

36. Is this device integral to the process? ☐ No ☐ Yes
If "Yes", provide the reason(s) why the device is integral.

OAQ CONTROL EQUIPMENT APPLICATION
CE-02: Particulate Control – Baghouse / Fabric Filter

State Form 51953 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-02 is to identify all the parameters that describe the baghouse or fabric filter. This is a required form.
- Complete this form once for each baghouse or fabric filter (or once for each set of identical baghouses or fabric filters).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the particulate control device and describes its physical properties.

1. Control Equipment ID:	CE011, CE012
2. Installation Date:	12/1/2006
3. Bags or Cartridges?	☒ Bags ☐ Cartridges
4. Filter Material:	Fabric
5. Number of Bags/Cartridges per Compartment:	
6. Number of Compartments:	
7. Mode of Operation:	☐ Intermittent ☐ Periodic ☒ Continuous
8. Cleaning Method:	☐ Shaking ☐ Reverse Pulse ☐ Reverse Air ☒ Jet Pulse
9. Cleaning Cycle / Frequency *(specify units)*:	
10. Is a bag leak detector installed on this device?	☐ Yes ☒ No
11. Type / Description of Bag Leak Detector:	☐ Positive Pressure ☐ Negative Pressure
12. Air to Cloth Ratio *(Ex: 1.3 : 1.0)*:	3.4 : 1.0
13. Is **Lime Injection** used on this device?	☐ Yes ☒ No
14. Is **Carbon Injection** used on this device?	☐ Yes ☒ No

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream. Appropriate units must be included if the standard units are not used. For each applicable parameter, provide the inlet and outlet values or provide the differential value.

	A. Units	B. Inlet	C. Outlet	D. Differential
15. Gas Stream Flow Rate	ACFM	4000.00	4000.00	0.00
16. Gas Stream Temperature	°F	70.00	70.00	0.00
17. Gas Stream Pressure	inches of water			to
18. Moisture Content	%			
19. Particle Size Range	micrometers			to
20. Lime Injection Rate *(if applicable)*	lb/hr			
21. Carbon Injection Rate *(if applicable)*	lb/hr			
22. Other *(specify)*:				

Continued on Next Page

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	23. Units	24. Inlet	25. Outlet	26. Efficiency (%):	
				Capture	Control
☐ **a.** Lead (Pb)					
☐ **b.** Hazardous Air Pollutant (HAP) *(specify)*:					
☐ **c.** Particulate Matter (PM)					
☐ **d.** Particulate Matter less than 10μm (PM_{10})					
☐ **e.** Particulate Matter less than 2.5μm ($PM_{2.5}$)					
☒ **f.** Other Pollutant *(specify)*: SO2	lb/hr		0.50	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

27. Item(s) Monitored:		Visible Emissions		
28. Monitoring Frequency:		Daily		
29. Item(s) Recorded:		Visible Emissions		
30. Record Keeping Frequency:		Daily		
31. Pollutant(s) Tested:		Visible Emissions		
32. Test Method(s):		NA		
33. Testing Frequency:		NA		

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

34. Do you have a Preventive Maintenance Plan (PMP)?

☒ No PMP is needed. ☐ Yes – the following items are identified on the PMP:

- ☐ **A.** Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- ☐ **B.** Description of the items or conditions that will be inspected.
- ☐ **C.** Schedule for inspection of items or conditions described above.
- ☐ **D.** Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

PART F: Determination of Integral Control

Part F provides explanation to determine whether the control device should be considered integral to the process.

35. Has IDEM already made an integral control determination for this device? ☒ No ☐ Yes
If "Yes", provide the following:

Permit Number: **Issuance Date:** **Determination:** ☐ Integral ☐ Not Integral

36. Is this device integral to the process? ☐ No ☐ Yes
If "Yes", provide the reason(s) why the device is integral.

Reset Form

OAQ CONTROL EQUIPMENT APPLICATION
CE-06: Organics – Flare / Oxidizer / Incinerator

State Form 52623 (R / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CE-06 is to identify all the parameters that describe the oxidizer or incinerator. This is a required form.
- Complete this form once for each oxidizer or incinerator (or once for each set of identical oxidizers or incinerators).
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification and Description of Control Equipment

Part A identifies the control device and describes its physical properties.

1. Control Equipment ID:	CE009
2. Installation Date:	12/1/2006
3. Incineration Method:	☐ Flare ☐ Thermal Oxidizer ☐ Catalytic Oxidizer ☑ Other *(specify)*: RTO
4. Residence Time *(specify units)*:	
5. Hood Static Pressure *(specify units)*:	*Negative Pressure?* ☐ Yes ☐ No
6. Bed Temperature at the Flame Zone:	°F
7. Fuel Used:	☐ Not Applicable ☑ Natural Gas Only ☐ Other – *Attach completed PI-02F form.*
8. Is the **Gas Stream used as Overfire Air**?	☑ No ☐ Yes: *Combustion Unit ID:*
9. Location of Flame *(flares only)*:	☐ Ground Level ☐ Other *(specify elevation and units of measure)*:
10. Are **Flame Arrestors** used? *(flares only)*	☐ No ☐ Yes
11. Are **Steam Jets** used? *(flares only)*	☐ No ☐ Yes
12. How is the flare used? *(flares only)*	☐ Emergency only ☐ Normal Operation ☐ Other *(specify)*:
13. Catalyst Material:	☑ None ☐ Specify:
14. Number of Catalyst Beds:	☑ *Not Applicable*
15. Is the **Catalyst Cleaned** and reused on-site?	☐ Yes ☐ No ☑ *Not Applicable*
16. Is a **Heat Exchanger** used to recover heat on this device?	☑ Yes ☐ No
17. Heat Exchanger Type:	☐ Recuperator ☑ Regenerator ☐ Other *(specify)*: ☐ *Not Applicable*

PART B: Operational Parameters

Part B provides the operational parameters of the control device and the pollutant laden gas stream.

	A. Units	B. Inlet	C. Outlet	D. Differential
18. Organic Vapor Concentration *(by volume)*	ppmv			
19. Gas Stream Flow Rate	ACFM	145000.00	145000.00	
20. Moisture Content	%	43.00%	43.00%	
21. Heat Content *(for Flares)*	%			
22. Excess Oxygen *(for Oxidizers)*	%			
23. Particle Size Range	micrometers			to
24. Other *(specify)*:				

Continued on Next Page

PART C: Pollutant Concentrations

Part C provides the pollutant concentrations of the pollutant laden gas stream.

	25. Units	26. Inlet	27. Outlet	28. Efficiency (%): Capture	28. Efficiency (%): Control
☐ **a.** Carbon Monoxide (CO)					
☐ **b.** Hazardous Air Pollutant (HAP) *(specify)*:					
☐ **c.** Particulate Matter (PM)					
☐ **d.** Particulate Matter less than 10μm (PM_{10})					
☐ **e.** Particulate Matter less than 2.5μm ($PM_{2.5}$)					
☐ **f.** Volatile Organic Compounds (VOC)					
☑ **g.** Other Pollutant *(specify)*: ~~Total HAPs~~	lb/hr	SO2	TBD	0.00%	0.00%

PART D: Monitoring, Record Keeping, & Testing Procedures

Part D identifies any existing or proposed monitoring, record keeping, & testing procedures that may need to be included in the permit.

29. Item(s) Monitored:	Bed temperature	Visible emissions	Duct Pressure	
30. Monitoring Frequency:	Continuous	Daily	Continuous	
31. Item(s) Recorded:	Temperature	Opacity	Pressure	
32. Record Keeping Frequency:	3 hr average	Daily	3 hr average	
33. Pollutant(s) Tested:	NA	NA	NA	
34. Test Method(s):	NA	NA	NA	
35. Testing Frequency:	NA	NA	NA	

PART E: Preventive Maintenance Plan

Part E verifies that a complete Preventive Maintenance Plan (PMP) has been prepared for the control device, if applicable. Use this table as a checklist to ensure that the PMP is complete.

36. Do you have a Preventive Maintenance Plan (PMP)?

☐ No PMP is needed. ☑ Yes – the following items are identified on the PMP:

- ☑ **A.** Identification of the individual(s) responsible for inspecting, maintaining and repairing emission control devices.
- ☑ **B.** Description of the items or conditions that will be inspected.
- ☑ **C.** Schedule for inspection of items or conditions described above.
- ☑ **D.** Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

This space is intentionally left blank.

OAQ COMPLIANCE DETERMINATION APPLICATION
CD-01: Emissions Unit Compliance Status

State Form 51861 (R / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CD-01 is to identify the requirements that apply to each emissions unit at the permitted source and to determine the compliance status of these emissions units.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification of Source and Emissions Unit

Part A identifies the source and the emissions unit. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

1. Source Name:	POET Biorefining - Alexandria	**2. Source ID:**	095 – 0127
3. Emissions Unit Description:	Regenerative Thermal Oxidizer	**4. Unit ID:**	EU011-026, EU038-048

PART B: Regulatory Compliance Status

Part B identifies the regulatory requirements that apply to the emissions unit and to determine the compliance status of the emissions unit. These "regulatory requirements" are those required by federal, state, or local law.

5. Rule Cite	6. Description	7. State / Local Only	8. Limitation	9. Test Method	10. In Compliance (y/n)
326 IAC 2-8-4	VOC		33.10 lb/hr	1,2,3,4,25/25A	Y
326 IAC 2-8-4	Acetaldehyde		1.00 lb/hr	1,2,3,4,18	Y
326 IAC 2-8-4	CO		28.10 lb/hr	1,2,3,4, and 10	Y
326 IAC 2-8-4	PM		28.70 lb/hr	1,2,3,4,5 and 202	Y
326 IAC 2-8-4	PM10		33.10 lb/hr	1,2,3,4,5 and 202	Y
326 IAC 2-8-4	PM2.5		33.10 lb/hr	1,2,3,4,5 and 202	Y
326 IAC 2-8-4	SO2		35.63 lb/hr		

PART C: Compliance Status – Other Requirements

Part C identifies any other requirements that apply to the emissions unit and to determine the compliance status of the emissions unit. These "other requirements" would not be required by federal, state, or local law.

11. Other Requirements	12. State / Local Only	13. In Compliance (y/n)

OAQ COMPLIANCE DETERMINATION APPLICATION
CD-03: Compliance Plan Requirements Per Emissions Unit

State Form 51863 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CD-03 is to identify existing compliance monitoring activities (monitoring, testing, record keeping and/or reporting) required in an applicable requirement or to provide compliance monitoring activities for applicable requirements where there is no or inadequate compliance monitoring requirements.
- CD-03 focuses on specific applicable requirements that may apply to a single emission unit or group of emission units.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Identification of Source and Applicable Requirement

Part A identifies the source and the emissions unit. Use one form for each emissions unit. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

1. Source Name:	POET Biorefining - Alexandria	**2. Source ID:**	095 – 00127
3. Emissions Unit Description:	Regenerative Thermal Oxidizer	**4. Unit ID:**	EU011-026, EU038-048

5. Limitations: List each operational and/or emission limit for this emissions unit.

PM emission limt - 28.70 lb/hr

PM10 emisison limit - 33.10 lb/hr

PM2.5 emission limit - 33.10 lb/hr

VOC emission limit - 33.10 lb/hr

CO emission limit - 28.10 lb/hr

Acetaldehyde emission limit - 1.00 lb/hr

Proposed SO2 emission limit - 35.63 lb/hr

6. Reporting Schedule: Provide a description of the reporting schedule to be used. The schedule should include what will be reported and how often the reports will be submitted.

None

Continued on Next Page

PART B: Compliance Plan Components

Part B identifies the main components of each required compliance plan.

7. Rule Cite	8. Control Equipment	9. Parameters Monitored	10. Monitoring Frequency	11. Item Recorded	12. Record Keeping Frequency	13. Pollutants tested	14. Test Method	15. Testing Frequency
326 IAC 2-7-5	RTO	Visible emissions	Daily	Visible emissions	Daily	Visible emissions	N/A	N/A
326 IAC 8-5-6	RTO	Temperature	Continuous (every 15-minutes)	Temperature	Continuous (every 15-minutes)	N/A	N/A	N/A

OAQ COMPLIANCE DETERMINATION APPLICATION
CD-04: Compliance Schedule and Certification

State Form 51864 (R2 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of CD-04 is to provide a schedule of for compliance certification submittals, a certification of the source's compliance status with all applicable requirements, and a compliance schedule that details the measures a source will use to address non-compliance.
- Complete this form once per application (not once for each emissions unit) with respect to all applicable requirements at the source.
- This is required form for each initial Title V permit application as well as each modification and every renewal.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for any one to inspect and photocopy.

PART A: Source Identification and Compliance Schedule

Part A identifies the permitted source and the permit term compliance certification schedule.

1. **Source Name:** POET Biorefining - Alexandria, LLC	2. **Source ID:** 095 – 0127
3. **Permit Term Compliance Certification Schedule**	
Date of first certification submittal:	**Frequency of future submittals:**

PART B: Risk Management Plan

Part B indicates whether sources subject to section 112(r), Accidental Release Prevention, are complying with the requirement to submit a Risk Management Plan (RMP).

4. **Statement of Applicability / Non-Applicability:** Indicate whether the source is subject to Section 112(r) and the requirement to submit and RMP.

☐ Source is subject to Section 112(r) and a Risk Management Plan (RMP) is required.

☒ Source is not subject to Section 112(r) and a Risk Management Plan (RMP) is not required.

RMP Submittal Information: Indicate when the RMP was submitted to each of the following agencies. If the RMP has not yet been submitted to any of the listed agencies, indicate the date when the RMP will be mailed to that agency. If the RMP for IDEM is attached to this application, please write "attached" in the Date Submitted column.

5. Agency Name	6. Date Submitted	7. Expected Submittal Date
Chemical Safety and Hazard Investigation Board (CSHIB)		
United States Environmental Protection Agency (U.S. EPA)		
Indiana Department of Environmental Management (IDEM)		
Local Agency responsible for permitting:		

8. **EPA Facility Identifier:** — —

Continued on Next Page

PART C: Certification of Source Compliance Status

Part C states whether the source is or is not in full compliance with all applicable requirements and to identify corrective actions to be taken in cases of noncompliance.

9. Check the Most Accurate Statement.

- ☐ The source described in this air pollution control permit application is fully in compliance with all applicable requirements and will continue to comply with those requirements.
- ☒ FORM CD-01 includes new requirements that apply or will apply to the emissions unit during the term of the permit. The source will meet such requirements on a timely basis.
- ☐ The source described in this air pollution control permit application is fully in compliance with all applicable requirements, except for the emissions unit(s) listed below. Compliance will be achieved according to the schedule identified below.

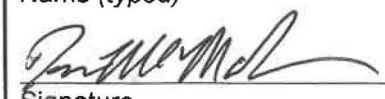
10. Unit ID	11. Applicable Requirement	12. Corrective Action	13. Deadline	14. Progress Reports	
				Start Date	Frequency

15. Signature of Responsible Official

☒ I certify that, based on information and belief formed after reasonable inquiry, the statements and information presented are true, accurate and complete.

Dan McMahan
Name *(typed)*

General Manager
Title


Signature

6/25/2024
Date

Appendix A: Emission Calculations
Facility Parameters

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Receiving	**Current**	**Proposed**	**Difference**	
Annual Grain Receiving [1]	37,453,184	37,453,184	-	bu/yr
Annual Grain Receiving [1]	1,048,689	1,048,689	-	ton/yr
Grain Receiving Capacity:	30,000	30,000	-	bu/hr
Grain Receiving Capacity:	840.00	840.00	-	ton/hr
Grain Density:	56	56	-	lb/bushel
Gallons Ethanol Produced per Bushel of grain:	2.67	2.67	-	gal/bu

Production	**Current**	**Proposed**	**Difference**	
Gallons Anhydrous Ethanol Produced per Year:	100,000,000	100,000,000	-	gallons/yr
Denaturant Throughput w/ 10.4 Mgal E85	7,242,105	7,242,105	-	gallon/yr
Denaturant Delivery w/ loadout of all denatured ethanol at 5%	5,000,000	5,000,000	-	gal/yr
E-85 Operations (assume 10.4 Mgal of Anhydrous Ethanol Production is loaded out at E70):				
Gallons E-85 Produced:	11,428,571	11,428,571	-	gallons/year
Denaturant Throughput [2]:	2,400,000	2,400,000	-	gallons/year
Gallons Anhydrous Ethanol Loaded out in E-85 Service	8,000,000	8,000,000	-	gallons/year
Normal Denatured Ethanol Operation:				
Gallons Denatured Ethanol Produced:	96,842,105	96,842,105	-	gallons/year
Denaturant Throughput [3]:	4,842,105	4,842,105	-	gallons/year
Gallons Anhydrous Ethanol Loaded out in Denatured Service:	92,000,000	92,000,000		
Combined Maximum Undenatured, Denatured Ethanol and E85 Loadout Rate	**108,270,677**	**108,270,677**		**gal/yr**
Non-fuel Grade Ethanol Operation:				
Non-fuel Grade Ethanol		40,000,000		
Storage		4,000,000		gallons/year

DDGS Production	**Current**	**Proposed**	**Difference**	
Hourly DDGS Production:	33.52	33.52	-	ton/hour
Annual DDGS Produced:	293,633	293,633	-	ton/year
Percent Grain Throughput that becomes DDGS	28.0%	28.0%		

Modified Wetcake Production			
Hourly Modified Wetcake Production	97	97	ton/hr
Annual Modified Wetcake Production	849,720	849,720	ton/yr

Wetcake Production			
Hourly Wetcake Production	98	98	ton/hr
Annual Wetcake Production	858,480	854,100	ton/yr

Other Production Data	**Current**	**Proposed**	**Difference**	
Pounds of Grain Oil Produced per Bushel of Grain	1.0	1.0	-	lb/bushel
Annual Corn Oil Production	18,727	18,727	-	tons/year
Liquid Carbon Dioxide	35,000	35,000	-	tons/year
CO2 Max trucks calc. based on 800 kg/m3 being the minimum density of liquid CO2 shipped by truck	0.0033	0.0033	-	ton/gallon CO2
Number of Hammermills	5	5		

Appendix A: Emission Calculations
Facility Parameters

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Truck Data	Current	Proposed	Difference		Average Weight of Truck (tons)	Quantity Transported per Truck		Maximum Number of Trucks Hourly	Maximum Daily Number of Trucks Daily	Paved miles traveled per truck	Unpaved miles traveled per truck	Maximum Number of Trucks per day (current)	Maximum Number of Trucks per day (proposed)
DDGS Haul Out	11,745	11,745	-	truck/yr	27.5	25	tons	8	50	1.25	0.5	59	59
Ethanol Haul Out	12,500	12,500	-	truck/yr	27.5	8,000	gallons	5	72	1.25	0.5	54	54
Denaturant Delivery	905	905	-	truck/yr	27.5	8,000	gallons	5	5	1.25	0.5	9	9
Grain Delivery	41,948	41,948	-	truck/yr	27.5	25	tons	30	270	1.25	0.5	300	300
Corn Oil Haul Out	814	814	-	truck/yr	27.5	23	tons	2	6	1.25		4	4
Wetcake Haul Out	3125	3109.056122	(16)	truck/yr	NA	25	tons	1	-			19	19
Chemical delivery	365	365	-	truck/yr	27.5			1	2			6	6
Liquid CO2 Haul Out	936	936	-	truck/yr	27.5	20	tons	3	15	1.25			
Syrup Haul Out	600	600	-	truck/yr	NA	8,000	gallons	1	-				

Cooling Tower Data

Drift Loss	0.005%	
Total Dissolved Solids	2500	milligrams/liter

[1]Assumes all ethanol loaded out is undenatured for worst case grain receiving

[2]E-85 can be blended anywhere between 70% to 83% undenatured ethanol, depending on atmospheric conditions. Assume denaturant is 30% of E-85 product.

[3]Assume denaturant is 5% of denatured alcohol product. Denaturant is typically between 1.8 and 2.2%.

Appendix A: Emission Calculations
List Of Sources

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

									Control Equipment		
Emission Point/ Stack Vent	**Emission Unit**	**Control Equipment ID**	**Description**	**Current Capacity**	**Units**	**Proposed Capacity**	**Units**	**Pollutants**	**Description**	**Capacity**	**Units**
SV001	EU001	CE001	Grain Receiving	840	tons/hr	840	tons/hr	TSP/PM10	Fabric Filter	23,450	scfm
	EU002a		Grain Leg and Conveyor	840	tons/hr	840	tons/hr				
	EU002c		Grain Leg and Conveyor	140	tons/hr	140	tons/hr				
	EU003a		4 Grain Storage Bins	1,341,276	bushels	1,341,276	bushels				
	EU033		DDGS Conveyor	220	ton/hr (DDGS)	220	ton/hr (DDGS)				
	EU035		DDGS Rail Loadout	220	ton/hr (DDGS)	220	ton/hr (DDGS)				
SV002	EU004	CE002	Corn Scalper	140	ton/hr	140	ton/hr	TSP/PM10	Fabric Filter	2,500	scfm
	EU005		Surge Bin	140	ton/hr	140	ton/hr				
SV003	EU006	CE003	Hammermill #1	20	ton/hr	45	ton/hr	TSP/PM10	Fabric Filter	12,000	scfm
SV004	EU007	CE004	Hammermill #2	20	ton/hr	45	ton/hr	TSP/PM10	Fabric Filter	12,000	scfm
SV005	EU008	CE005	Hammermill #3	20	ton/hr	45	ton/hr	TSP/PM10	Fabric Filter	12,000	scfm
SV006	EU009	CE006	Hammermill #4	20	ton/hr	45	ton/hr	TSP/PM10	Fabric Filter	12,000	scfm
SV007	EU010	CE007	Hammermill #5	20	ton/hr	45	ton/hr	TSP/PM10	Fabric Filter	12,000	scfm
SV008	--	CE008	RTO By-pass Stack/Scrubber (AOS2):					VOC	Wet Scrubber		
	EU011		Slurry Tank	60,000	gal/hr	69,000	gal/hr				
	EU012-EU016, EU047, EU048		Fermenters (7)	730,000	gal each	730,000	gal each				
	EU017		Yeast Propagation Tank	60,000	gal/hr	69,000	gal/hr				
	EU018		Beer Well	60,000	gal/hr	69,000	gal/hr				
	EU019		Beer Stripper	60,000	gal/hr	69,000	gal/hr				
	EU020		Rectifier	60,000	gal/hr	69,000	gal/hr				
	EU021		Side Stripper	60,000	gal/hr	69,000	gal/hr				
	EU022		Molecular Sieves (3)	60,000	gal/hr	69,000	gal/hr				
	EU023		Evaporators	60,000	gal/hr	69,000	gal/hr				
SV008	EU057	CE008	Hydro Column	130	gal/min (190 Proof Rate)	130	gal/min (190 Proof Rate)	VOC, HAPs	Wet Scrubber		
	EU051		Concentrator Column								
	EU052		Methanol Column								
	EU053		One (1) Set of Three (3) Molecular Sieves								
	EU054		Various Process Tanks (5 tanks)								

Appendix A: Emission Calculations
List Of Sources

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

SV009	--	CE009	RTO:						RTO	30	MMBtu/hr
	EU011		Slurry Tank	60,000	gal/hr	69,000	gal/hr	VOC, HAPs			
	EU012-EU016, EU047, EU048		Fermenters (7)	60,000	gal/hr	69,000	gal/hr				
	EU017		Yeast Propagation Tank	60,000	gal/hr	69,000	gal/hr				
	EU018		Beer Well	60,000	gal/hr	69,000	gal/hr				
	EU019		Beer Stripper	60,000	gal/hr	69,000	gal/hr				
	EU020		Rectifier	60,000	gal/hr	69,000	gal/hr				
	EU021		Side Stripper	60,000	gal/hr	69,000	gal/hr				
	EU022		Molecular Sieves (3)	60,000	gal/hr	69,000	gal/hr				
	EU023		Evaporators	60,000	gal/hr	69,000	gal/hr				
	EU057		Hydro Column	130	gal/min (190 Proof Rate)	130	gal/min (190 Proof Rate)				
	EU051		Concentrator Column								
	EU052		Methanol Column								
	EU053		One (1) Set of Three (3) Molecular Sieves								
	EU054		Various Process Tanks (5 tanks)								
	EU024		Centrifuges (4)	1,000	gpm	1,000	gpm				
	EU025		DDGS Dryer #1	60	MMBtu/hr	60	MMBtu/hr	TSP, PM10, NOx, SOx, VOC			
				31	ton/hr (DDGS)	33.5	ton/hr (DDGS)				
	EU026		DDGS Dryer #2	60	MMBtu/hr	60	MMBtu/hr				
				31	ton/hr (DDGS)	33.5	ton/hr (DDGS)				
	EU038		Corn oil centrifuge	70,956,000	gal/yr	70,956,000	gal/yr	VOC			
	EU039		Corn oil centrifuge	42,048,000	gal/yr	42,048,000	gal/yr				
	EU040		Defatted Syrup Tank	70,956,000	gal/yr	70,956,000	gal/yr				
	EU041		Emulsion Tank	42,048,000	gal/yr	42,048,000	gal/yr				
	EU042		Defatted Emulsion Tank	26,280,000	gal/yr	26,280,000	gal/yr				
	EU043		Oil Seperation Tank	15,768,500	gal/yr	15,768,500	gal/yr				
	EU044		Oil Rundown Tank	7,884,000	gal/yr	7,884,000	gal/yr				
	EU045		Oil Storage Tank #1 (30,000 gal)	7,890,000	gal/yr	7,890,000	gal/yr				
	EU046		Oil Storage Tank #2 (30,000 gal)	7,890,000	gal/yr	7,890,000	gal/yr				
SV010	EU029	CE010	DDG Fluid Bed Cooler	27	ton/hr (DDGS)	33.52	ton/hr (DDGS)	TSP/PM10, VOC, HAP	Fabric Filter	23,800	scfm
SV011	EU030	CE011	DDGS Storage Silo	27	ton/hr (DDGS)	33.52	ton/hr (DDGS)	TSP/PM10, VOC, HAP	Fabric Filter	4,000	scfm
SV012	EU031	CE012	DDGS Silo Bypass	27	ton/hr (DDGS)	33.52	ton/hr (DDGS)	TSP/PM10, VOC, HAP	Fabric Filter	4,000	scfm
SV013	EU027		Boiler #1	143	MMBtu/hr	143	MMBtu/hr	TSP, PM10, NOx, SOx, VOC	Low NOx Burner		
SV014	EU028		Boiler #2	143	MMBtu/hr	143	MMBtu/hr	TSP, PM10, NOx, SOx, VOC	Low NOx Burner		
SV015	EU037		Diesel Generator	3,017	HP	3,017	HP	TSP, PM10, NOx, SOx, VOC	None		

Appendix A: Emission Calculations
List Of Sources

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

SV016	EU036	CE015	Ethanol Loadout- Rail and Truck Loadout	80	MMgal/yr (undenatured)	100	MMgal/yr (undenatured)	TSP, PM10, NOx, SOx, VOC	Flare	0.55	MMBtu/hr
				39,000	gal/hr (trucks)	39,000	gal/hr (trucks)				
				144,000	gal/hr (rail)	144,000	gal/hr (rail)				
	EU055	CE015	Non-Fuel Ethanol Loadout - Rail and Truck Loadout	40	MMgal/yr	40	MMgal/yr	TSP, PM10, NOx, SOx, VOC	Flare	0.55	MMBtu/hr
				600	gal/min (trucks)	600	gal/min (trucks)				
				1,200	gal/min (rail)	1,200	gal/min (rail)				
SV017	EU024		Centrifuges (4) during RTO Bypass	1,000	gpm	1,000	gpm	VOC, HAP	None		
SV018	EU002b	CE016	Enclosed belt conveyor	840	tons/hr	840	tons/hr	TSP/PM10	Fabric Filter	1,200	scfm
	EU003b		2 Grain Storage Bins	683,855	bushels	683,855	bushels				
SV019	EU002b	CE017	Enclosed belt conveyor	840	tons/hr	840	tons/hr	TSP/PM10	Fabric Filter	1,200	scfm
	EU003b		2 Grain Storage Bins	683,855	bushels	683,855	bushels				
SV020	EU002b	CE018	Enclosed belt conveyor	840	tons/hr	840	tons/hr	TSP/PM10	Fabric Filter	1,200	scfm
	EU003b		2 Grain Storage Bins	683,855	bushels	683,855	bushels				
	T001		190 Proof Ethanol Storage Tank	250,000	gal	250,000	gal	VOC	Internal Floating Roof		
	T002		Denaturant Storage Tank	250,000	gal	250,000	gal	VOC	Internal Floating Roof		
	T003		200 Proof Ethanol Storage Tank	2,000,000	gal	2,000,000	gal	VOC	Internal Floating Roof		
	T004		200 Proof Ethanol Storage Tank	2,000,000	gal	2,000,000	gal	VOC	Internal Floating Roof		
	T005		Denaturant Storage Tank	126,900	gal	126,900	gal	VOC	Internal Floating Roof		
	T010		Fuel Ethanol/INon-Fuel Ethanol Storage Tank	70,000	gal	70,000	gal	VOC	Internal Floating Roof		
	T011		Fuel Ethanol/INon-Fuel Ethanol Storage Tank	500,000	gal	500,000	gal	VOC	Internal Floating Roof		
	T012		Fuel Ethanol/INon-Fuel Ethanol Storage Tank	500,000	gal	500,000	gal	VOC	Internal Floating Roof		
	T013		Denaturant (TBA or equivalent) Storage Tank	16,000	gal	16,000	gal	VOC, HAPs			
Insignificant Activity	T006		Diesel Storage Tank	2,000	gal	2,000	gal				
Insignificant Activity	T007		Stillage Storage Tank	500,000	gal	500,000	gal				
Insignificant Activity	T008		Syrup Storage Tank	61,000	gal	61,000	gal				
Insignificant Activity	EU011		Slurry Tank	60,000	gal/hr	69,000	gal/hr				
Insignificant Activity	EU056		Parts Washer	125	gal/yr	125	gal/yr				
	T009		Gasoline Storage Tank	294	gal	294	gal	VOC, HAP			

Fugitive Source			**Description**					**Pollutants**	**Control Equipment**
	F001		Grain Receiving	840	ton/hr	840	ton/hr	TSP/PM10	None
EU034, EU033, EU035, EU050	F002		DDG Loading	220	ton/hr (DDGS)	220	ton/hr (DDGS)	TSP/PM10	None
	F003		Paved Roads					TSP/PM10	None
	F004		Equipment leaks					VOC	Leak Detection and Repair Program
	F005		Cooling Towers	36,000	gal/min			TSP/PM10	High Efficiency Mist Eliminators
Insignificant Activity	F006		DDGS Storage	--	--	293,633	tons/yr	TSP/PM10	None
Insignificant Activity	F007		Wet Cake Pad					VOC	None

Appendix A: Emission Calculations
PTE Summary

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Uncontrolled Potential to Emit (tons/yr)								
Emission Point	**Description**	**PM**	**PM10**	**PM2.5***	**SO2**	**NOx**	**VOC**	**CO**
SV001	Grain Receiving, Conveyors, Storage Bins, DDGS conveyor, DDGS Rail Loadout	352.15	352.15	352.15	-	-	5.87	-
SV002	Corn Scalper, Surge Bin	37.54	37.54	37.54	-	-	-	-
SV003	Hammermill #1	180.21	180.21	180.21	-	-	-	-
SV004	Hammermill #2	180.21	180.21	180.21	-	-	-	-
SV005	Hammermill #3	180.21	180.21	180.21	-	-	-	-
SV006	Hammermill #4	180.21	180.21	180.21	-	-	-	-
SV007	Hammermill #5	180.21	180.21	180.21	-	-	-	-
SV008	Scrubber during RTO downtime (AOS2)	-	-	-	-	-	16,633.05	-
SV009	RTO Stack	1,257.06	1,257.06	1,257.06	156.04	60.98	7,248.90	1,230.78
SV010	DDG Fluid Bed Cooler	1,314.00	1,533.00	1,533.00	3.68	-	24.97	-
SV011	DDG Silo Loading	60.07	60.07	60.07	2.19	-	0.89	-
SV012	DDG Silo Bypass	60.07	60.07	60.07	2.19	-	0.89	-
SV013	Boiler EU027	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV014	Boiler EU028	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV015	Diesel Generator	9.25	5.30	5.30	53.46	317.17	9.32	72.69
SV016	Truck and Rail Loading Rack (EU036 & EU055)	-	-	-	-	21.94	2,569.85	55.19
SV017	Centrifuges	-	-	-	-	-	15.23	-
SV018	Belt conveyor EU002b and grain bins EU003b	22.00	22.00	22.00	-	-	-	-
SV019		22.00	22.00	22.00	-	-	-	-
SV020		22.00	22.00	22.00	-	-	-	-
T001-T005, T009-T013	Storage Tanks	-	-	-	-	-	8.81	-
EU038 - EU046	Corn Oil Separation Process	-	-	-	-	-	0.02	-
F001	Grain Receiving (Fugitive)	662.26	217.07	36.79	-	-	-	-
	190 Proof Loadout	-	-	-	-	-	3.29	-
	Total	**4,721.8**	**4,498.6**	**4,318.3**	**218.3**	**443.9**	**26,524.5**	**1,407.8**
Fugitives (not counted toward Part 70/PSD Applicability)								
F002	DDG Loadout	6.4	1.5	1.5	-	-	5.87	-
F003	Paved Roads	20.2	4.0	1.0	-	-	-	-
F004	Equipment leaks	-	-	-	-	-	156.09	-
F005	Cooling Towers	9.87	9.87	9.87	-	-	-	-
F006	DDGS Storage	0.48	0.12	0.12	-	-	0.89	-
F007	Wet Cake Production	-	-	-	-	-	5.32	-
	Total	36.9	15.6	12.5	0.0	0.0	168.2	0.0

*PM2.5 listed is direct PM2.5

**RTO By-pass is limited to only operate 500 hours per year.

Fugitives from the grain elevator are counted toward Part 70/PSD Applicability

Appendix A: Emission Calculations
PTE Summary

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Potential to Emit after Control (tons/yr)								
Emission Point	**Description**	**PM**	**PM10**	**PM2.5***	**SO_2**	**NOx**	**VOC**	**CO**
SV001	Grain Receiving, Conveyors, Storage Bins, DDGS conveyor, DDGS Rail Loadout	3.52	3.52	3.52	-	-	5.87	-
SV002	Corn Scalper, Surge Bin	0.38	0.38	0.38	-	-	-	-
SV003	Hammermill #1	1.80	1.80	1.80	-	-	-	-
SV004	Hammermill #2	1.80	1.80	1.80	-	-	-	-
SV005	Hammermill #3	1.80	1.80	1.80	-	-	-	-
SV006	Hammermill #4	1.80	1.80	1.80	-	-	-	-
SV007	Hammermill #5	1.80	1.80	1.80	-	-	-	-
SV008	Scrubber during RTO downtime (AOS2)	-	-	-	-	-	26.58	-
SV009	RTO Stack	125.71	125.71	125.71	156.04	60.98	144.98	123.08
SV010	DDG Fluid Bed Cooler	13.14	15.33	15.33	3.68	3.6792	24.97	-
SV011	DDG Silo Loading	0.60	0.60	0.60	2.19	2.19	0.89	-
SV012	DDG Silo Bypass	0.60	0.60	0.60	2.19	2.19	0.89	-
SV013	Boiler EU027	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV014	Boiler EU028	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV015	Diesel Generator	0.53	0.30	0.30	3.05	18.10	0.53	4.15
SV016	Truck and Rail Loading Rack (EU036 & EU055)	-	-	-	-	21.94	51.40	55.19
SV017	Centrifuges	-	-	-	-	-	1.22	-
SV018	Belt conveyor EU002b and grain bins EU003b	0.22	0.22	0.22	-	-	-	-
SV019		0.22	0.22	0.22	-	-	-	-
SV020		0.22	0.22	0.22	-	-	-	-
T001-T005, T009-T013	Storage Tanks	-	-	-	-	-	8.81	-
EU038 - EU046	Corn Oil Separation Process	-	-	-	-	-	0.02	-
F001	Grain Receiving (Fugitive)	132.45	43.41	7.36	-	-	-	-
	190 Proof Loadout	-	-	-	-	-	3.29	-
Total		**288.93**	**208.86**	**172.80**	**167.88**	**152.93**	**276.20**	**231.54**
Fugitives (not counted toward Part 70/PSD Applicability)								
F002	DDG Loadout	3.18	0.77	0.77	-	-	5.87	-
F003	Paved Roads	10.1	2.0	0.50	-	-	-	-
F004	Equipment leaks	-	-	-	-	-	16.77	-
F005	Cooling Towers	9.87	9.87	9.87	-	-	-	-
F006	DDGS Storage	0.24	0.06	0.06	-	-	0.89	-
F007	Wet Cake Production	-	-	-	-	-	5.32	-
Total		**23.41**	**12.72**	**11.20**	**0.00**	**0.00**	**28.85**	**0.00**

** PM2.5 listed is direct PM2.5*

Appendix A: Emission Calculations
PTE Summary

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Potential to Emit after Issuance (tons/yr)								
Emission Point	**Description**	**PM**	**PM10**	**PM2.5***	**SO_2**	**NOx**	**VOC**	**CO**
SV001	Grain Receiving, Conveyors, Storage Bins, DDGS conveyor, DDGS Rail Loadout	10.3	12.0	12.0	-	-	5.87	-
SV002	Corn Scalper, Surge Bin	1.2	1.4	1.4	-	-	-	-
SV003	Hammermill #1	5.3	6.1	6.1	-	-	-	-
SV004	Hammermill #2	5.3	6.1	6.1	-	-	-	-
SV005	Hammermill #3	5.3	6.1	6.1	-	-	-	-
SV006	Hammermill #4	5.3	6.1	6.1	-	-	-	-
SV007	Hammermill #5	5.3	6.1	6.1	-	-	-	-
SV008	Scrubber during RTO downtime (AOS2)	-	-	-	-	-	26.58	-
SV009	RTO Stack	125.7	145.0	145.0	156.0	61.0	145.0	123.1
SV010	DDG Fluid Bed Cooler	13.1	15.3	15.3	4.38	-	24.97	-
SV011	DDG Silo Loading	1.8	2.1	2.1	2.19	-	0.89	-
SV012	DDG Silo Bypass	1.8	2.1	2.1	2.19	-	0.89	-
SV013	Boiler EU027	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV014	Boiler EU028	1.17	4.67	4.67	0.37	21.92	3.38	24.56
SV015	Diesel Generator	0.53	0.30	0.30	3.05	18.10	0.53	4.15
SV016	Truck and Rail Loading Rack (EU036 & EU055)	-	-	-	-	1.8	6.4	4.5
SV017	Centrifuges	-	-	-	-	-	1.22	-
SV018	Belt conveyor EU002b and grain bins EU003b	0.22	0.22	0.22	-	-	-	-
SV019		0.22	0.22	0.22	-	-	-	-
SV020		0.22	0.22	0.22	-	-	-	-
T001-T005, T009-T013	Storage Tanks	-	-	-	-	-	8.81	-
T001-T005, T009	Corn Oil Separation Process	-	-	-	-	-	0.02	-
F001	Grain Receiving (Fugitive)	18.9	6.19	1.05	-	-	-	-
	190 Proof Loadout	-	-	-	-	-	3.3	-
Total		**202.9**	**225.0**	**219.8**	**168.6**	**124.7**	**231.2**	**180.9**
Fugitives (not counted toward Part 70/PSD Applicability)								
F002	DDG Loadout	0.48	0.12	0.12	-	-	0.89	-
F003	Paved Roads	10.1	2.02	0.50	-	-	-	-
F004	Equipment leaks	-	-	-	-	-	16.77	-
F005	Cooling Towers	9.87	9.87	9.87	-	-	-	-
F006	DDGS Storage	0.24	0.06	0.06	-	-	0.89	
F007	Wet Cake Production****	-	-	-	-	-	5.32	0.15
	Total	**20.71**	**12.07**	**10.54**	**0.00**	**0.00**	**23.87**	**0.15**

Note: The shaded cells indicate where issued limits are included.

*PM2.5 listed is direct PM2.5

**RTO By-pass is limited to only operate 500 hours per year.

***The centrifuges are normally controlled by the RTO. Emissions are included in the RTO Stack. During RTO downtime, emissions are uncontrolled and shown here.

DDGS Silo Bypass (EU031) Limited PM (tons/yr) = Ltd. PM (lbs/hr) x (1 ton/2000 lbs) x (8760 hrs/yr) = 0.41 lbs/hr x (1/2000) x (8760)
DDGS Silo Loading (EU031) Limited PM10/PM2.5 (tons/yr) = Ltd. PM10/PM2.5 (lbs/hr) x (1 ton/2000 lbs) x (8760 hrs/yr) = 0.48 lbs/hr x (1/2000) x (8760)
DDGS Silo Bypass (EU030) Limited PM (tons/yr) = Ltd. PM (lbs/hr) x (1 ton/2000 lbs) x (8760 hrs/yr) = 0.41 lbs/hr x (1/2000) x (8760)
DDGS Silo Loading (EU030) Limited PM10/PM2.5 (tons/yr) = Ltd. PM10/PM2.5 (lbs/hr) x (1 ton/2000 lbs) x (8760 hrs/yr) = 0.48 lbs/hr x (1/2000) x (8760)

Appendix A: Emission Calculations
HAP Summary

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Emission changes included with modification

Emission Point	Description	Uncontrolled HAPs PTE (ton/yr)																						
		Acetaldehyde	Acrolein	Benzene	Carbon Disulfide	Carbonyl Sulfide	Cumene	Ethylbenzene	Formaldehyde	Hexane	Naphthalene	Toluene	Xylenes	Arsenic	Beryllium	Cadmium	Chromium	Lead	Manganese	Mercury	Methanol	Nickel	Selenium	Total HAPs
SV001	Grain Receiving, Conveyors, Storage Bins, DDGS conveyor, DDGS Rail Loadout	0.49	0.44	-	-	-	-	-	0.09	-	-	-	-	-	-	-	-	-	-	-	0.55	-	-	1.57
SV002	Corn Scalper, Surge Bin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV003	Corn Hammermill #1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV004	Corn Hammermill #2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV005	Corn Hammermill #3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV006	Corn Hammermill #4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV007	Corn Hammermill #5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV008	RTO By-pass Stack / Scrubber*	74.68	0.01	-	-	-	-	-	1.28E-02	-	-	-	-	-	-	-	-	-	-	-	1.28E-02	-	-	74.72
SV009	RTO Stack	146.00	158.67	1.38E-03	0.19	0.10	-	-	146.05	1.18	4.01E-04	2.23E-03	-	1.31E-04	7.88E-06	7.23E-04	9.20E-04	3.29E-04	2.50E-04	1.71E-04	146.00	1.38E-03	1.58E-05	293.24
SV010	DDG Fluid Bed Cooler	1.84	0.44	-	0.07	0.06	-	-	0.44	-	-	-	-	-	-	-	-	-	-	-	0.88	-	-	3.72
SV011	DDG Silo Loading	0.07	0.07	-	0.03	0.03	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	0.30
SV012	DDG Silo Bypass	0.07	0.07	-	0.03	0.03	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	0.30
SV013	Boilers #1 and #2	-	-	2.58E-03	-	-	-	-	9.21E-02	2.21	-	4.18E-03	-	-	-	1.35E-03	1.72E-03	6.14E-04	4.67E-04	-	-	2.58E-03	-	2.32
SV015	Emergency Diesel Generator	2.33E-03	7.29E-04	7.18E-02	-	-	-	-	7.30E-03		-	2.60E-02	1.79E-02	-	-	-	-	-	-	-	-	-	-	0.13
SV016	Truck and Rail Loading Rack	0.29	-	35.62	0.00	-	15.19	30.37	-	192.72	-	227.78	227.78	-	-	-	-	-	-	-	0.15	-	-	729.90
SV017	Centrifuge	1.29	0.0832954	-	-	-	-	-	0.015865797	-	-	-	-	-	-	-	-	-	-	-	0.03	-	-	1.42
T001-T005, T009-T013	Tanks	0.00E+00	0.00E+00	1.55E-02	-	-	-	-	0.00E+00	1.93E+00	-	0.00E+00	-	-	-	-	-	-	-	-	0.00E+00	-	-	1.95
EU038 - EU046	Corn Oil Separation Process	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
F002, F006	DDGS Storage & Loadout (Fugitive)	0.15	0.14	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	0.47
F004	Equipment Leaks	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
F007	Wetcake Pad	0.04	0.01	0.00	0.00	-	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.15
F001	Grain Receiving (Fugitive)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00
	Total	224.9	159.9	35.7	0.32	0.22	15.2	30.4	146.8	198.3	0.0	227.8	227.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	148.0	0.0	0.0	1110.5

Emission Point	Description	HAPs - After Issuance (ton/yr)																						
		Acetaldehyde	Acrolein	Benzene	Carbon Disulfide	Carbonyl Sulfide	Cumene	Ethylbenzene	Formaldehyde	Hexane	Naphthalene	Toluene	Xylenes	Arsenic	Beryllium	Cadmium	Chromium	Lead	Manganese	Mercury	Methanol	Nickel	Selenium	Total HAPs
SV001	Grain Receiving, Conveyors, Storage Bins, DDGS conveyor, DDGS Rail Loadout	0.07	0.07	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	0.24
SV002	Corn Scalper, Surge Bin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV003	Corn Hammermill #1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV004	Corn Hammermill #2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV005	Corn Hammermill #3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV006	Corn Hammermill #4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV007	Corn Hammermill #5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
SV008	RTO By-pass Stack / Scrubber*	2.98	0.01	-	-	-	-	-	6.40E-03	-	-	-	-	-	-	-	-	-	-	-	6.40E-03	-	-	3.27
SV009	RTO Stack	3.78	4.11	1.38E-03	0.19	0.10	-	-	3.83	1.18	4.01E-04	2.23E-03	-	1.31E-04	7.88E-06	7.23E-04	9.20E-04	3.29E-04	2.50E-04	1.71E-04	3.78	1.38E-03	1.58E-05	7.56
SV009	RTO Stack (Scrubber Bypass)	0.31	0.27						0.03												0.04			0.65
SV010	DDG Fluid Bed Cooler	1.84	0.44	-	0.07	0.06	-	-	0.44	-	-	-	-	-	-	-	-	-	-	-	0.88	-	-	3.72
SV011	DDG Silo Loading	0.04	0.03	-	0.03	0.03	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	0.04	-	-	0.18
SV012	DDG Silo Bypass	0.04	0.03	-	0.03	0.03	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	0.04	-	-	0.18
SV013	Boilers #1 and #2	-	-	2.58E-03	-	-	-	-	9.21E-02	2.21E+00	-	4.18E-03	-	-	-	1.35E-03	1.72E-03	6.14E-04	4.67E-04	-	-	2.58E-03	-	2.32
SV015	Emergency Diesel Generator	1.33E-04	4.16E-05	4.10E-03	-	-	-	-	4.17E-04	-	-	1.48E-03	1.02E-03	-	-	-	-	-	-	-	-	-	-	0.01
SV016	Truck and Rail Loading Rack	3.07E-04	-	0.11	0.00	-	0.05	0.10	-	0.36	-	7.22E-01	7.22E-01	-	-	-	-	-	-	-	1.53E-04	-	-	2.06
SV017	Centrifuge	1.03E-01	6.66E-03	-	-	-	-	-	1.27E-03	-	-	-	-	-	-	-	-	-	-	-	2.54E-03	-	-	0.11
T001-T005, T009-T013	Tanks	0.00	0.00E+00	1.55E-02	-	-	-	-	0.00E+00	1.93E+00	-	0.00E+00	-	-	-	-	-	-	-	-	0.00E+00	-	-	1.95
EU038 - EU046	Corn Oil Separation Process	0.00	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
F002, F006	DDGS Storage & Loadout (Fugitive)	0.15	0.14	-	-	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	0.47
F004	Equipment Leaks	0.00	0.00	2.23E-03		-			0.00	2.78E-01											0.00			0.28
F007	Wetcake Pad	0.04	0.01			-			0.09												0.02			0.15
	Total	9.36	5.11	0.14	0.32	0.22	0.05	0.10	4.52	5.96	0.00	0.73	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.06	0.00	0.00	23.14

Appendix A: Emission Calculations
Grain Receiving and Loading Operations and DDGS Loadout

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

PTE - Captured Emissions:

Baghouse ID	Process Description	Control Device	Outlet Grain Loading (gr/dscf)	Maximum Air Flow Rate (scfm)	PTE of PM/PM10 after Control* (lbs/hr)	PTE of PM/PM10 after Control (tons/yr)	PTE of PM2.5 after Control** (lbs/hr)	PTE of PM2.5 after Control (tons/yr)	Control Efficiency (%)	PTE of PM/PM10/PM2.5 before Control (tons/yr)
CE001	Grain Receiving (EU001), Conveyors (EU002a/002c), Storage Bins (EU003a), DDGS Conveyor (EU033), and DDGS rail loadout spout (EU035)	Baghouse	0.004	23,450	0.80	3.52	0.80	3.52	99%	352.2
CE002	Grain Scalper (EU 004), Surge Bin (EU 005) and	Baghouse	0.004	2,500	0.09	0.38	0.09	0.38	99%	37.5
CE003	Hammermill #1 (EU 006)	Baghouse	0.004	12,000	0.41	1.80	0.41	1.80	99%	180.2
CE004	Hammermill #2 (EU 007)	Baghouse	0.004	12,000	0.41	1.80	0.41	1.80	99%	180.2
CE005	Hammermill #3 (EU 008)	Baghouse	0.004	12,000	0.41	1.80	0.41	1.80	99%	180.2
CE006	Hammermill #4 (EU 009)	Baghouse	0.004	12,000	0.41	1.80	0.41	1.80	99%	180.2
CE007	Hammermill #5 (EU 010)	Baghouse	0.004	12,000	0.41	1.80	0.41	1.80	99%	180.2
CE019	Rollermill (EU049)	Baghouse	0.004	500	0.02	0.08	0.02	0.08	99%	7.5

Baghouse ID	Process Description	Control Device	Outlet Grain Loading PM/PM10 (gr/dscf)	Maximum Air Flow Rate (scfm)	PTE of PM/PM10 after Control* (lbs/hr)	PTE of PM/PM10 after Control (tons/yr)	PTE of PM2.5 after Control** (lbs/hr)	PTE of PM2.5 after Control (tons/yr)	Control Efficiency (%)	PTE of PM/PM10 before Control (tons/yr)	PTE of PM2.5 before Control (tons/yr)
CE016	Belt conveyor EU002b and grain bins EU003b	Baghouse	0.005	1,200	0.05	0.22	0.05	0.22	99%	22.0	22.0
CE017		Baghouse	0.005	1,200	0.05	0.22	0.05	0.22	99%	22.0	22.0
CE018		Baghouse	0.005	1,200	0.05	0.22	0.05	0.22	99%	22.0	22.0

*Assume all PM emissions equal PM10 emissions.

** Assume controlled PM2.5 emissions equal PM/PM10 emissions.

Methodology

PTE of PM/PM10 after Control (lbs/hr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr
PTE of PM/PM10 after Control (tons/yr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr x 8760 hr/yr x 1 ton/2000 lbs
PTE of PM/PM10 before Control (tons/yr) = PTE of PM/PM10 after Control (tons/yr) / (1-Control Efficiency)

Appendix A: Emission Calculations
Grain Receiving and Loading Operations and DDGS Loadout

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Limited:

Baghouse ID	Process Description	Control Device	Limited PM (lbs/hr)[1]	Limited PM10 (lbs/hr)[1]	Limited PM2.5 (lbs/hr)	Limited PM (ton/yr)	Limited PM10 (ton/yr)	Limited PM2.5 (ton/yr)
CE001	Grain Receiving (EU001), Conveyors (EU002a/002c), Storage Bins (EU003a), DDGS Conveyor (EU033) and DDGS rail loadout spout (EU035)	Baghouse	2.36	2.73	2.73	10.34	11.96	11.96
CE002	Grain Scalper (EU 004), Surge Bin (EU 005) and	Baghouse	0.27	0.31	0.31	1.18	1.36	1.36
CE019	Rollermill (EU049)	Baghouse	0.02	0.02	0.02	0.08	0.08	0.08
CE003	Hammermill #1 (EU 006)	Baghouse	1.21	1.40	1.40	5.30	6.13	6.13
CE004	Hammermill #2 (EU 007)	Baghouse	1.21	1.40	1.40	5.30	6.13	6.13
CE005	Hammermill #3 (EU 008)	Baghouse	1.21	1.40	1.40	5.30	6.13	6.13
CE006	Hammermill #4 (EU 009)	Baghouse	1.21	1.40	1.40	5.30	6.13	6.13
CE007	Hammermill #5 (EU 010)	Baghouse	1.21	1.40	1.40	5.30	6.13	6.13
CE016	Belt conveyor EU002b and grain bins EU003b	Baghouse	0.05	0.05	0.05	0.22	0.22	0.22
CE017		Baghouse	0.05	0.05	0.05	0.22	0.22	0.22
CE018		Baghouse	0.05	0.05	0.05	0.22	0.22	0.22

5 lb/hr
25 lb/day

[1] Limited PM and PM10 emissionrate are current permit limits, except for the proposed Rollermill (EU049).

PTE - Fugitive Emissions:

Unlimited

Unit ID	Unit Description	Max Capacity (ton/hr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Baghouse ID	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Capture Efficiency (%)	Fugitive PM Emissions (tons/yr)	Fugitive PM10 Emissions (tons/yr)	Fugitive PM2.5 Emissions (tons/yr)
F001	Grain Receiving	840	0.18	0.059	0.010	CE001	662.3	217.1	36.8	80%	132.45	43.41	7.36
F008	Grain Truck Loadout	115	0.09	0.029	0.005	None	43.3	14.6	2.5	0%	43.32	14.61	2.47
											lbs/hr	lbs/hr	lbs/hr
											40.13	13.25	2.24

Note: Emission factors are from AP-42, Chapter 9.9.1 - Grain Elevators, Table 9.9.1-1 (04/03). Assume all the grain receiving and loadout is by truck, which is the worst case scenario.
There are no fugitive emissions from the grain handling operations because the emissions from these units are 100% captured.
Fugitive PM/PM10 Emissions (tons/yr) = Annual Throughput Limit (tons/yr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 1 ton/2000 lbs

Limited

Unit ID	Unit Description	Annual Throughput Limit (tons/yr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Baghouse ID	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Capture Efficiency (%)	Fugitive PM Emissions (tons/yr)	Fugitive PM10 Emissions (tons/yr)	Fugitive PM2.5 Emissions (tons/yr)
F001	Grain Receiving	1,048,689	0.18	0.059	0.010	CE001	94.4	30.9	5.2	80%	18.88	6.19	1.05
F008	Grain Truck Loadout	280,000	0.09	0.029	0.005	None	12.0	4.1	0.7	0%	12.04	4.06	0.69
											lbs/hr	lbs/hr	lbs/hr
											7.06	2.34	0.40

Note: Emission factors are from AP-42, Chapter 9.9.1 - Grain Elevators, Table 9.9.1-1 (04/03). Assume all the grain receiving and loadout is by truck, which is the worst case scenario.
There are no fugitive emissions from the grain handling operations because the emissions from these units are 100% captured.

Appendix A: Emission Calculations
RTO Stack

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1. Process Description:

Emission point SV009 includes the emissions from the fermentation system, the distillation system (including the non-fuel ethanol distillation system), the DDGS dryers and centrifuges. The fermentation system and distillation systems vent to a scrubber which then exhausts into the regenerative thermal oxidizer (RTO). The DDGS dryers and centrifuges vent directly to the RTO.
The RTO exhausts through stack SV009.
The RTO is scheduled to operate 8760 hr/yr, however by permit it is allowed to be by-passed up to 500 hr/yr.

Each dryer has a 60 MMBtu/hr natural gas fired burner. The dryers do not have the capacity to combust any other fuel. The dryers are connected in series, therefore, all of the DDGS is processed by each dryer.

The RTO controls emissions from the dryers and the fermentation/distillation scrubber.

RTO VOC Control Efficiency =	98.00%	
RTO HAP Control Efficiency =	97.00%	
RTO NOx Control Efficiency =	0.00%	
RTO CO Control Efficiency =	90.00%	
RTO PM Control Efficiency* =	90.00%	
RTO SO2 Control Efficiency =	0.00%	
Yearly operation limit=	8760	hours
EF safety factor =	1.5	
	Conversion:	2000 lbs = 1 ton

** 90% PM emissions control includes multicone recovery*

Natural Gas Combustion

Unit	Rated Capacity	
Dryers	120	MMBTU/Hr
RTO	30	MMBTU/Hr

	Emission Factor	
Pollutant	**lb/MMBTU**	**Source**
SO2	0.0006	AP-42 Section 1.4
NOx	0.0817	AP-42 Section 1.4
NOx	0.1373	Previous Stack Test for RTO

AP-42 emission factors from Section 1.4 were converted to lb/MMBtu assuming a heating value of 1020 Btu/ft3 for natural gas.

Alexandria RTO Stack Test - 2/16/17

Test Results	Run 1	Run 2	Run 3	Average	With Safety Factor (SF)	Potential to Emit	Current Permit Limits	Proposed Permit Limits
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	5.82	6.37	6.75	6.32	9.48	10.90	33.1	33.1
HAPs	0.76	1.05	1.08	0.96	1.44	1.66	2.36	2.00
Acetaldehyde	0.16	0.17	0.16	0.16	0.24	0.28	1.00	1.00
Acrolein	0.45	0.7	0.76	0.63	0.95	1.09	1.09	1.09
Methanol	0.07	0.11	0.1	0.09	0.14	0.16	1.00	1.00
Formaldehyde	0.07	0.07	0.06	0.07	0.11	0.12	1.00	1.00
CO	13.38	13.87	14.66	13.97	20.96	24.10	28.1	28.1
PM	7.54	6.52	4.62	6.23	9.35	10.75	28.7	28.7
PM10	7.54	6.52	4.62	6.23	9.34	10.74	33.1	33.1
PM2.5	7.54	6.52	4.62	6.23	9.34	10.74	33.1	33.1

POET Marion Engineering Test - 04/22/2024 - 04/25/2024 - SV009 (RTO)

	4/22/2024	4/25/2024	4/25/2024	4/25/2024	
	15:10 - 16:10	15:30-16:30	16:30-17:30	17:30-18:30	Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SO2	19.2	26.3	24.8	24.7	23.8

POET Marion Engineering Test - 07/10/2018 - 7/11/2018 - SV009 (RTO)

	7/10/2018	7/11/2018	Average
	lb/hr	lb/hr	lb/hr
Hydrogen Sulfide	0.0158	0.0252	0.021
Carbonyl Sulfide*	0.0136	0.0177	0.016
Carbon Disulfide*	0.0181	0.0384	0.028

*Hazardous Air Pollutant
The 2024 and 2018 engineering tests were completed with the processing aid online

Appendix A: Emission Calculations
RTO Stack

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

RTO Emissions based on stack test

	Uncontrolled Potential to Emit		Controlled Potential to Emit	
	lbs/hr	TPY	lbs/hr	TPY
VOC	545.10	2387.54	10.90	47.75
HAPs	55.20	241.78	1.66	7.25
CO	240.98	1055.50	24.10	105.55
PM	107.47	470.71	10.75	47.07
PM10	107.41	470.46	10.74	47.05
PM2.5	107.41	470.46	10.74	47.05
SO2**	35.63	156.04	35.63	156.04
NOx***	13.92	60.98	13.92	60.98
Acetaldehyde	9.20	40.30	0.28	1.21
Acrolein	36.23	158.67	1.09	4.76
Methanol	5.18	22.67	0.16	0.68
Formaldehyde	4.03	17.63	0.12	0.53
Carbonyl Sulfide	0.02	0.10	0.02	0.10
Carbon Disulfide	0.04	0.19	0.04	0.19

** Based on engineering testing at another POET site and a 1.5 safety factor

*** Based on previous stack test and AP-42 data

RTO Emissions based on stack test or permit limit, whichever is higher

	Uncontrolled Potential to Emit		Limited Potential to Emit (Based on 8760 hours/year)		Limited Potential to Emit (Based on 7660 hours/year)**	
	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
VOC	1655.00	7248.90	33.10	145.0	33.10	125.12
HAPs	66.67	292.00	2.00	8.76	2.00	7.56
CO	281.00	1230.78	28.10	123.08	28.10	106.22
PM	287.00	1257.06	28.70	125.71	28.70	108.49
PM10	331.00	1449.78	33.10	144.98	33.10	125.12
PM2.5	331.00	1449.78	33.10	144.98	33.10	125.12
SO2	35.63	156.04	35.63	156.04	35.63	134.66
NOx	13.92	60.98	13.92	60.98	13.92	52.63
Acetaldehyde*	33.33	146.00	1.00	4.38	1.00	3.78
Acrolein	36.23	158.67	1.09	4.76	1.09	4.11
Methanol	33.33	146.00	1.00	4.38	1.00	3.78
Formaldehyde	33.33	146.00	1.00	4.38	1.00	3.78
Carbonyl Sulfide	0.02	0.10	0.02	0.10	0.02	0.10
Carbon Disulfide	0.04	0.19	0.04	0.19	0.04	0.19

* Permit limit requested by Permitee to remain minor source of HAPs

**Hourly emission limit for Highest HAP (acetaldehyde) and total HAP during AOS1 and AOS2 are higher than during normal operation. Therefore, the annual PTE of HAPs is based on operating normal operation for 7660 hours/year, and AOS1 and AOS2 for 500 hours/yr each

Appendix A: Emission Calculations
RTO Stack-Combustion

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1. Process Description:

There are two DDG dryers. Each dryer will be 60 MMBtu/hr and be fired on natural gas. There is no back-up fuel. The dryer exhaust is directed to the RTO at all times the dryers are operating. The RTO has an estimated HAP control efficiency of 97% for organic HAP. Metal HAPs are not controlled by the RTO.

Dryers MMBtu/hr	Organic HAP Control Eff.
120.0	97%

2. Potential to Emit (PTE) HAPs from the dryers:

HAP Pollutant	Emission Factor [1] (lb/MMSCF)	Potential to Emit Emissions (Uncontrolled) (lb/hr)	Potential to Emit Emissions (Uncontrolled) (ton/yr)	Potential to Emit Emissions (Controlled) (lb/hr)	Potential to Emit Emissions (Controlled) (ton/yr)
Benzene	2.10E-03	2.52E-04	1.10E-03	7.56E-06	3.31E-05
Formaldehyde	7.50E-02	9.00E-03	3.94E-02	2.70E-04	1.18E-03
Hexane	1.80E+00	2.16E-01	9.46E-01	6.48E-03	2.84E-02
Naphthalene	6.10E-04	7.32E-05	3.21E-04	2.20E-06	9.62E-06
Toluene	3.40E-03	4.08E-04	1.79E-03	1.22E-05	5.36E-05
Arsenic	2.00E-04	2.40E-05	1.05E-04	2.40E-05	1.05E-04
Beryllium	1.20E-05	1.44E-06	6.31E-06	1.44E-06	6.31E-06
Cadmium	1.10E-03	1.32E-04	5.78E-04	1.32E-04	5.78E-04
Chromium	1.40E-03	1.68E-04	7.36E-04	1.68E-04	7.36E-04
Cobalt	8.40E-05	1.01E-05	4.42E-05	1.01E-05	4.42E-05
Lead	5.00E-04	6.00E-05	2.63E-04	6.00E-05	2.63E-04
Manganese	3.80E-04	4.56E-05	2.00E-04	4.56E-05	2.00E-04
Mercury	2.60E-04	3.12E-05	1.37E-04	3.12E-05	1.37E-04
Nickel	2.10E-03	2.52E-04	1.10E-03	2.52E-04	1.10E-03
Selenium	2.40E-05	2.88E-06	1.26E-05	2.88E-06	1.26E-05
		0.23	**0.99**	**7.50E-03**	**3.28E-02**

1 - Emission factor is from AP-42, 5th Edition, Section 1.4, 7/98

Appendix A: Emission Calculations
RTO Stack-Combustion

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1. Process Description:

POET Biorefining - Alexandria will operate an RTO to control emissions from the fermentation and distillation systems, the DDG dryers. The RTO is equipped with five natural gas fired burners rated at 6 MMBtu/hr each for a total of 30 MMBTU/hr. The RTO is not equipped with burners to combust any fuel other than natural gas.

2. Potential to Emit (PTE) HAPs from the RTO:

HAP Pollutant	Emission Factor [1] (lb/MMBtu)	Potential to Emit Emissions (lb/hr)	(ton/yr)
Benzene	2.10E-03	6.30E-05	2.76E-04
Formaldehyde	7.50E-02	2.25E-03	9.86E-03
Hexane	1.80E+00	5.40E-02	2.37E-01
Naphthalene	6.10E-04	1.83E-05	8.02E-05
Toluene	3.40E-03	1.02E-04	4.47E-04
Arsenic	2.00E-04	6.00E-06	2.63E-05
Beryllium	1.20E-05	3.60E-07	1.58E-06
Cadmium	1.10E-03	3.30E-05	1.45E-04
Chromium	1.40E-03	4.20E-05	1.84E-04
Cobalt	8.40E-05	2.52E-06	1.10E-05
Lead	5.00E-04	1.50E-05	6.57E-05
Manganese	3.80E-04	1.14E-05	4.99E-05
Mercury	2.60E-04	7.80E-06	3.42E-05
Nickel	2.10E-03	6.30E-05	2.76E-04
Selenium	2.40E-05	7.20E-07	3.15E-06
		5.66E-02	**0.25**

1 - Emission factor is from AP-42, 5th Edition, Section 1.4, 7/98

Total HAPs from Dryers and RTO

HAP Pollutant	CAS	Potential to Emit Emissions (lb/hr)	(ton/yr)
Benzene	71-43-2	3.15E-04	1.38E-03
Formaldehyde	50-00-0	1.13E-02	4.93E-02
Hexane	110-54-3	2.70E-01	1.18
Naphthalene	91-20-3	9.15E-05	4.01E-04
Toluene	108-88-3	5.10E-04	2.23E-03
Arsenic	7440-38-2	3.00E-05	1.31E-04
Beryllium	7440-41-7	1.80E-06	7.88E-06
Cadmium	7440-43-7	1.65E-04	7.23E-04
Chromium	7440-47-3	2.10E-04	9.20E-04
Cobalt	7440-48-4	1.26E-05	5.52E-05
Lead	NA	7.50E-05	3.29E-04
Manganese	7439-96-5	5.70E-05	2.50E-04
Mercury	7439-97-6	3.90E-05	1.71E-04
Nickel	7440-02-0	3.15E-04	1.38E-03
Selenium	7782-49-2	3.60E-06	1.58E-05
		0.28	**1.24**

Appendix A: Emission Calculations
RTO during Scrubber Bypass (AOS1)

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

The scrubber must occasionally be temporarily shut down for scheduled maintenance to maintain the removal efficiency of the unit, or for other operational reasons. In these events, the fermentation, distallation systems (including the non-fuel ethanol distillation system), DDGS Dryers and set of 4 centrifuges continue to be operated in normal mode and the flow to the scrubber will be bypassed and vent directly to the RTO. This operating scenario will be limited to less than 500 hours per calendar year.

In this operating scenario, emissions normally directed to the scrubber will bypass the scrubber flow directly to the RTO where the VOCs and HAPs are thermally oxidized. The RTO has been designed to achieve a minimum of **98.0%** reduction in VOC and **97%** reduction in HAP emissions.

RTO VOC Control Efficiency =	98.00%
RTO HAP Control Efficiency =	97.00%
RTO NOx Control Efficiency =	0.00%
RTO CO Control Efficiency =	90.00%
RTO PM Control Efficiency* =	90.00%
RTO SO2 Control Efficiency =	0.00%
Yearly operation limit=	500 hours
EF safety factor =	1.5
Conversion:	2000 lbs = 1 ton

** 90% PM emissions control includes multicone recovery*

Natural Gas Combustion

Unit	Rated Capacity	
Dryers	120	MMBTU/Hr
RTO	30	MMBTU/Hr

	Emission Factor	
Pollutant	**lb/MMBTU**	**Source**
SO2	0.0006	AP-42 Section 1.4
NOx	0.0817	AP-42 Section 1.4
NOx	0.1373	Test

AP-42 emission factors from Section 1.4 were converted to lb/MMBtu assuming a heating value of 1020 Btu/ft3 for natural gas.

Alexandria Scrubber Bypass Stack Test - 2/16/17

Test Results	Run 1	Run 2	Run 3	Average	With EF Safety Factor (SF)	Current Permit Limits
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	20.98	17.86	18.79	19.21	33.14	33.1
HAPs	0.76	0.74	1.07	0.86	1.48	2.60
Acetaldehyde	0.16	0.15	0.05	0.15	0.26	1.25
Acrolein	0.46	0.44	0.74	0.55	0.95	1.09
Methanol	0.07	0.09	0.12	0.09	0.16	1.00
Formaldehyde	0.08	0.06	0.06	0.06	0.10	1.00
CO	13.75	13.74	13.43	13.64	23.53	28.1
PM	7.54	6.52	4.62	6.23	10.75	28.7
PM10	7.54	6.52	4.62	6.23	10.75	33.1
PM2.5	7.54	6.52	4.62	6.23	10.75	33.1

Appendix A: Emission Calculations
RTO during Scrubber Bypass (AOS1)

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001
Significant Source Modification No.:
Part 70 Operating Permit Renewal No.: 095-43506-00127
Reviewer:

RTO Emissions based on stack test

	Uncontrolled Potential to		Controlled Potential	
	lbs/hr	TPY	lbs/hr	TPY
VOC	1656.86	414.22	33.14	8.28
HAPs	49.45	12.36	1.48	0.37
CO	235.29	58.82	23.53	5.88
PM	107.47	26.87	10.75	2.69
PM10	107.47	26.87	10.75	2.69
PM2.5	107.47	26.87	10.75	2.69
SO2**	0.09	0.02	0.09	0.02
Acetaldehyde	8.62	2.16	0.26	0.06
Acrolein	31.63	7.91	0.95	0.24
Methanol	5.18	1.29	0.16	0.04
Formaldehyde	3.45	0.86	0.10	0.03

**Based on AP-42 emission factor

RTO Emissions based on stack test or permit limit

	Uncontrolled Potential to		Controlled Potential	
	lbs/hr	TPY	lbs/hr	TPY
VOC	1657.00	414.25	33.14	8.29
HAPs	86.62	21.66	2.60	0.65
CO	281.00	70.25	28.10	7.03
PM	287.00	71.75	28.70	7.18
PM10	331.00	82.75	33.10	8.28
PM2.5	331.00	82.75	33.10	8.28
SO2	0.09	0.02	0.09	0.02
Acetaldehyde	41.67	10.42	1.25	0.31
Acrolein	36.33	9.08	1.09	0.27
Methanol	5.18	1.29	0.16	0.04
Formaldehyde	3.45	0.86	0.10	0.03

Appendix A: Emission Calculations
PTE from Scrubber during RTO Downtime (AOS2)

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

1. Process Description:

The RTO must occasionally be temporarily shut down for unscheduled maintenance or other operational reasons. In this event, the DDGS dryers will be shut down, however, the fermentation tanks and distillation systems (including the non-fuel ethanol distillation system) will continue to be operated in normal mode. The emissions from these sources will be vented to the scrubber stack SV008. The emissions will be controlled by the wet scrubber, CE008. The new non-fuel ethanol distillation system will indirectly vent to the scrubber (via the main plant). The emissions will be controlled by the wet scrubber.

Stack Test Data with Safety Factor

Safety factor =	1.4

1a. Fermentation

Alexandria RTO Bypass Stack Test 2-18-15

Test Results	Run 1	Run 2	Run 3	Average	With Safety Factor (SF)	Potential to Emit	Current Permit Limits
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	12.1	11.49	11.49	11.84	16.58	21.66	75.95
HAPs	4.67	4.72	4.68	4.69	6.57	8.58	9.33
Acetaldehyde	4.64	4.69	4.65	4.66	6.52	8.53	8.53
Acrolein	0.01	0.01	0.01	0.01	0.01	0.02	NA
Methanol	0.01	0.01	0.01	0.01	0.01	0.02	NA
Formaldehyde	0.01	0.01	0.01	0.01	0.01	0.02	NA

Alexandria Ferm Scrubber Stack Test 2-16-17

Test Results	Run 1	Run 2	Run 3	Average	With Safety Factor (SF)	Potential to Emit	Current Permit Limits
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	15.59	14.56	14.78	14.98	20.97	24.11	75.95
Acetaldehyde	3.6	3.33	3.41	3.45	4.83	5.55	8.53

Appendix A: Emission Calculations
PTE from Scrubber during RTO Downtime (AOS2)

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

1b. Non-Fuel Grade Ethanol Disitillation

Distillation Scrubber Performance Test Results from POET Preston, MN 7/12/2017

Test Results	Run 1	Run 2	Run 3	Average	With Safety Factor (SF)
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	0.06	0.05	0.06	0.0567	0.08
Acetaldehyde	0.011	0.01	0.01	0.0103	0.01
Acrolein	0.0004	0.0004	0.0004	0.0004	0.0006
Methanol	0.0004	0.0003	0.0003	0.0003	0.0005
Formadehyde	0.0003	0.0002	0.00027	0.0003	0.0004
Beerfeed (GPM)	649.8	652.3	650.1	650.73	

Distillation System - Uncontrolled	lb/hr	ton/yr
VOC	6.53	28.6
Acetaldehyde	0.05	0.2
Acrolein	0.002	0.01
Methanol	0.002	0.01
Formaldehyde	0.0012	0.01
Total Uncontrolled HAP	0.1	0.23

ALE Beerfeed	1070 gpm
PRE Beerfeed	650 gpm

Distillation System - Controlled	lb/hr	ton/yr
VOC	0.13	0.6
Acetaldehyde	0.02	0.1
Acrolein	0.001	0.004
Methanol	0.001	0.003
Formaldehyde	0.0006	0.003
Total Uncontrolled HAP	0.026	0.11

Appendix A: Emission Calculations
PTE from Scrubber during RTO Downtime (AOS2)

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1c. Total Scrubber PTE - Controlled

Scrubber - Controlled	lb/hr	Controlled/Limited (ton/yr)
VOC	24.24	8.5
Acetaldehyde	5.57	2.0
Acrolein	0.02	0.007
Methanol	0.02	0.007
Formaldehyde	0.02	0.007
Total Uncontrolled HAP	8.61	3.01

2. Potential to Emit (PTE) of VOC and HAP from the scrubber:

Scrubber VOC Control Efficiency = 98%
Scrubber HAP Control Efficiency = 50%
Yearly operation limit= 700 hours

Uncontrolled	lb/hr	ton/yr
VOC	3797.5	16633.1
Acetaldehyde	17.1	74.7
Acrolein	0.0	0.01
Methanol	0.036591	1.28E-02
Formaldehyde	0.036591	1.28E-02
Total Uncontrolled HAP	17.2	74.7

Permit limits or stack test data with safety factor (whichever is greater)

Controlled/Limited	lb/hr	ton/yr
VOC	75.95	26.58
Acetaldehyde	8.53	2.98
Acrolein*	0.02	0.0064
Methanol*	0.02	0.0064
Formaldehyde*	0.02	0.0064
Total Limited/Controlled HAP	9.33	3.27

* Permit limit requested by Permitee to remain minor source of HAPs

Methodology

PTE after Control (tons/yr) = Emission Rate after Control (lbs/hr) x 500 hr/yr x 1 ton/2000 lbs

PTE before Control (tons/yr) = PTE after Control (tons/yr) / (1- Control Efficiency)

Appendix A: Emission Calculations
DDGS Fluid Bed Cooler

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

The following calculations are for the emissions of total suspended particulate (TSP), particulate matter less than 10 micron (PM10), and particulate matter less than 2.5 micron (PM2.5) from the DDGS Fluid Bed Cooler. For the purposes of these calculations, TSP, PM10, and PM2.5 are assumed to be equal.

The controlled potential TSP/PM10/PM2.5 emissions were calculated by multiplying the design grain loading from the fabric filter by the design flow rate for the source and converting to a pound per hour emission rate. The equation for the calculations is:

Ec lb/hr = G gr/dscf x 1 lb / 7000 gr x Q dscfm x 60 minutes / hour

Where:

The uncontrolled potential emission were calculated by multiplying the AP-42 emission

Eu ton/yr = Ef * Q

Where:
Q = Annual Throughput

Qddgs = 293,633 tons/year

Conversion Factors:

1 ton =	2000	lb
1 lb =	7000	gr
1 year =	8760	hours
1 hour =	60	minutes

Assumptions:

PM Control Efficiency 99%

Given:
Capacity = 34 ton/hr
All point source emissions from these emission units will be controlled by a fabric filter.

Appendix A: Emission Calculations
DDGS Fluid Bed Cooler

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Baghouse ID	Process Description	Control Device	Outlet Grain Loading (gr/dscf)[1]	Maximum Air Flow Rate (scfm)	PTE of PM/PM10 after Control[3] (lbs/hr)	PTE of PM/PM10 after Control (tons/yr)	PTE of PM2.5 after Control[3] (lbs/hr)	PTE of PM2.5 after Control (tons/yr)	Control Efficiency (%)	PTE of PM/PM10/PM2.5 before Control (tons/yr)
CE010	DDGS Fluid Bed Cooler	Baghouse	0.004	23,800	0.82	3.57	0.82	3.57	99%	357.4

			Permit Limits	
	Uncontrolled	Uncontrolled (based on 8760 hrs/yr)	Controlled[3]	Controlled[3]
	lbs/hr	Unc. TPY	lbs/hr	TPY
PM	300.00	1314.00	3.00	13.14
PM10	350.00	1533.00	3.50	15.33
PM2.5	350.00	1533.00	3.50	15.33

[1] This is assumed loading. Stack tests have indicated that this is a conservative assumption

[2] Assumed control efficiency

[3] Current permit limits

The DDGS cooler is also a source of VOC emissions because the DDGS retains a small quantity of ethanol after drying. This ethanol is emitted from the cooler stack. The cooler is not controlled. The concentration of VOC in the DDGS cooler exhaust ranges from 50 to 100 PPMV. The HAP and VOC emissions are based upon engineering estimates from similar facilities.

Hours of Operation= 8760 hrs/year
Safety Factor = 1.5

Appendix A: Emission Calculations
DDGS Fluid Bed Cooler

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

2013 Stack test POET Alexandria

Test Results	**Run 1**	**Run 2**	**Run 3**	**Average**	**with SF**	**Current Permit Limit**
	lb/hr	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**	**lb/hr**
VOC	1.16	1.02	1.08	1.09	1.64	5.7
Acetaldehyde	0.1	0.05	0.05	0.07	0.11	NA
Methanol	0.03	0.03	0.03	0.03	0.05	NA
Acrolein	0.01	0.01	0.01	0.01	0.02	NA
Formaldehyde	0.02	0.02	0.02	0.02	0.03	NA
Total HAP	0.16	0.11	0.11	0.12	0.18	NA

Marion Engineering Test - 04/23/2024 04/24/2024 - SV010 (Fluid Bed)					
	4/22/2024	4/23/2024	4/23/2024	4/24/2024	Average
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
SO2	0.56	0.26	0.052	0.055	0.23

Cooler Emission rates based on stack test or permit limit, whichever is higher

	Uncontrolled Potential to Emit		Controlled Potential to Emit		**Limited Potential to Emit**	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
SO2	0.84	3.68	0.84	3.68	1.00	4.38
VOC	5.70	24.97	5.70	24.97	5.70	24.97
Acetaldehyde	0.42	1.84	0.42	1.84		
Methanol	0.20	0.88	0.20	0.88		
Acrolein	0.10	0.44	0.10	0.44		
Formaldehyde	0.10	0.44	0.10	0.44		
Carbonyl Sulfide	0.01	0.06	0.01	0.06		
Carbon Disulfide	0.02	0.07	0.02	0.07		
Total HAPs	0.85	3.72	0.85	3.72		

Sulfur HAPs are assumed to be twice the emission rate of the DDGS Silo Baghouse
SO2 is calculated based on maximum engineering test result and a 1.5 safety factor. Limited PTE of 1.00 lb/hr adds additional buffer.

Appendix A: Emission Calculations
DDGS Handling

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1. Potential to Emit PM/PM10/PM2.5

Baghouse ID	Process Description	Control Device	Outlet Grain Loading (gr/dscf)	Maximum Air Flow Rate (scfm)	PTE of PM/ PM10/ PM2.5 after Control (lbs/hr)	PTE of PM/PM10 after Control (tons/yr)	PTE of PM2.5 after Control* (tons/yr)	Control Efficiency (%)	PTE of PM/PM10 before Control (tons/yr)	PTE of PM/PM10 before Control (lbs/hr)	PTE of PM2.5 before Control (ton/yr)
CE011	DDGS Silo Loading (EU030)	Baghouse	0.004	4,000	0.14	0.60	0.60	99%	60.1	13.7	60.1
CE012	DDGS Silo Bypass (EU031)	Baghouse	0.004	4,000	0.14	0.60	0.60	99%	60.1	13.7	60.1
Total						1.20	1.20		120.14	27.43	120.14

Assume all PM emissions equal PM10 emissions.

* Assume controlled PM2.5 emissions equal PM/PM10 emissions.

Methodology

PTE of PM/PM10 after Control (lbs/hr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr
PTE of PM/PM10 after Control (tons/yr) = Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x 60 mins/hr x 1/7000 lb/gr x 8760 hr/yr x 1 ton/2000 lbs
PTE of PM/PM10 before Control (tons/yr) = PTE of PM/PM10 after Control (tons/yr) / (1-Control Efficiency)

1. Potential to Emit PM/PM10/PM2.5 based on current permit limits

Baghouse ID	Process Description	Control Device	Limited PM (lbs/hr)	Limited PM10 (lbs/hr)	Limited PM2.5 (lbs/hr)	Limited PM (ton/yr)	Limited PM10 (ton/yr)	Limited PM2.5 (ton/yr)
CE011	DDGS Silo Loading (EU030	Baghouse	0.41	0.48	0.48	1.80	2.10	2.10
CE012	DDGS Silo Bypass (EU031)	Baghouse	0.41	0.48	0.48	1.80	2.10	2.10

2. DDGS Loadout - Fugitives

Uncontrolled

Unit ID	Unit Description	Max Throughput (tons/hr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Shed Capture Efficiency (%)	Fugitive PM Emissions (tons/yr)	Fugitive PM10 Emissions (tons/yr)	Fugitive PM2.5 Emissions (tons/yr)
F002	DDGS truck loadout (EU034)	220	0.0033	0.0008	0.0008	3.18	0.77	0.77	50%	1.59	0.39	0.39
F002	DDGS Container Loadout (EU050)	220	0.0033	0.0008	0.0008	3.18	0.77	0.77	50%	1.59	0.39	0.39
Total						6.36	1.54	1.54		3.18	0.77	0.77
										lbs/hr	lbs/hr	lbs/hr
										0.73	0.18	0.18

Appendix A: Emission Calculations
DDGS Handling

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Limited

Unit ID	Unit Description	Limited Throughput (tons/yr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Shed Capture Efficiency (%)	Limited Fugitive PM Emissions (tons/yr) (F002)	Limited Fugitive PM10 Emissions (tons/yr) (F002)	Limited Fugitive PM2.5 Emissions (tons/yr) (F002)
F002	DDGS truck loadout (EU034)	293,633	0.0033	0.0008	0.0008	0.48	0.12	0.12	50%	0.24	0.06	0.06
F002	DDGS Container Loadout (EU050)	293,633	0.0033	0.0008	0.0008	0.48	0.12	0.12	50%	0.24	0.06	0.06
						0.97	0.23	0.23		0.48	0.12	0.12
										lbs/hr	lbs/hr	lbs/hr
										0.11	0.03	0.03

Notes:
Emission factors are from AP-42, Chapter 9.9.1
Truck loadout and Container loading cannot take place simultaneosly. Assuming worst case scenario for PTE.
Fugitive Emissions (tons/yr) = Max Throughput (tons/hr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 8760 hr/yr x 1 ton/2000 lbs
Limited Fugitive Emissions (tons/yr) = Annual Throughput Limit (tons/yr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 1 ton/2000 lbs

3. DDGS Storage- Fugitives

Uncontrolled

Unit ID	Unit Description	Max Throughput (tons/hr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Shed Capture Efficiency (%)	Fugitive PM Emissions (tons/yr)	Fugitive PM10 Emissions (tons/yr)	Fugitive PM2.5 Emissions (tons/yr)
F006	DDGS Storage	33.52	0.0033	0.0008	0.0008	0.48	0.12	0.12	50%	0.24	0.06	0.06
										lbs/hr	lbs/hr	lbs/hr
										0.06	0.01	0.01

Limited

Unit ID	Unit Description	Limited Throughput (tons/yr)	Uncontrolled PM Emission Factor (lbs/ton)	Uncontrolled PM10 Emission Factor (lbs/ton)	Uncontrolled PM2.5 Emission Factor (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10 Emissions (tons/yr)	Uncontrolled PM2.5 Emissions (tons/yr)	Shed Capture Efficiency (%)	Limited Fugitive PM Emissions (tons/yr)	Limited Fugitive PM10 Emissions (tons/yr)	Limited Fugitive PM2.5 Emissions (tons/yr)
F006	DDGS Storage	293,633	0.0033	0.0008	0.0008	0.48	0.12	0.12	50%	0.24	0.06	0.06
										lbs/hr	lbs/hr	lbs/hr
										0.06	0.01	0.01

Notes:
Emission factors are from AP-42, Chapter 9.9.1-Table 1 (Grain Shipping-Truck) and 9.9.1-Table 2 (Animal Feed Mills-Feed Shipping)
Fugitive Emissions (tons/yr) = Max Throughput (tons/hr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 8760 hr/yr x 1 ton/2000 lbs
Limited Fugitive Emissions (tons/yr) = Annual Throughput Limit (tons/yr) x Uncontrolled Emission Factor (lbs/ton) x (1-Capture Efficiency%) x 1 ton/2000 lbs

Appendix A: Emission Calculations
DDGS Handling

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

4. Potential to Emit VOC & HAPs :

Stack Vent	Process Description	Hourly Throughput (ton/hr)	Uncontrolled VOC (lbs/hr)	Uncontrolled VOC (tons/yr)	Uncontrolled Acetaldehyde (lbs/hr)	Uncontrolled Acetaldehyde (tons/yr)	Uncontrolled Acrolein (lbs/hr)	Uncontrolled Acrolein (tons/yr)	Uncontrolled Methanol (lbs/hr)	Uncontrolled Methanol (tons/yr)	Uncontrolled Formaldehyde (lbs/hr)	Uncontrolled Formaldehyde (tons/yr)	Uncontrolled Carbon Disulfide (lbs/hr)	Uncontrolled Carbon Disulfide (tons/yr)	Uncontrolled Carbonyl Sulfide (lbs/hr)	Uncontrolled Carbonyl Sulfide (tons/yr)	Uncontrolled Total HAPs (lbs/hr)	Uncontrolled Total HAPs (tons/yr)
SV011	DDGS Silo Loading (EU030)	34	0.20	0.89	0.02	0.07	0.02	0.07	0.02	0.08	0.00	0.01	0.01	0.03	0.01	0.03	0.07	0.30
SV012	DDGS Silo Bypass (EU031)	34	0.20	0.89	0.02	0.07	0.02	0.07	0.02	0.08	0.00	0.01	0.01	0.03	0.01	0.03	0.07	0.30
SV001	DDGS Loadout (EU033,035)	220	1.34	5.87	0.11	0.49	0.10	0.44	0.13	0.55	0.02	0.09					0.36	1.57
Total			1.7	7.7	0.1	0.64	0.1	0.6	0.2	0.7	0.0	0.1	0.0	0.1	0.0	0.1	0.5	2.2

*The fabric filters and shed do not provide control for VOC or HAPs, therefore Controlled PTE is not calculated separately on this page, as it will be equal to the Uncontrolled PTE.

5. Annual Potential to Emit VOC & HAPs:

Stack Vent	Process Description[1]	Annual Throughput (ton/yr)	Annual Potential to Emit VOC (lbs/hr)	Annual Potential to Emit VOC (tons/yr)	Annual Potential to Emit Acetaldehyde (lbs/hr)	Annual Potential to Emit Acetaldehyde (tons/yr)	Annual Potential to Emit Acrolein (lbs/hr)	Annual Potential to Emit Acrolein (tons/yr)	Annual Potential to Emit Methanol (lbs/hr)	Annual Potential to Emit Methanol (tons/yr)	Annual Potential to Emit Formaldehyde (lbs/hr)	Annual Potential to Emit Formaldehyde (tons/yr)	Annual Potential to Emit Carbon Disulfide (lbs/hr)	Annual Potential to Emit Carbon Disulfide (tons/yr)	Annual Potential to Emit Carbonyl Sulfide (lbs/hr)	Annual Potential to Emit Carbonyl Sulfide (tons/yr)	Annual Potential to Emit Total HAPs (lbs/hr)	Annual Potential to Emit Total HAPs (tons/yr)
SV011	DDGS Silo Loading (EU030)	146816	0.20	0.45	0.02	0.04	0.02	0.03	0.02	0.04	0.00	0.01	0.01	0.03	0.01	0.03	0.07	0.18
SV012	DDGS Silo Bypass (EU031)	146816	0.20	0.45	0.02	0.04	0.02	0.03	0.02	0.04	0.00	0.01	0.01	0.03	0.01	0.03	0.07	0.18
SV001	DDGS Loadout (EU033,035)	293633	1.34	0.89	0.11	0.07	0.10	0.07	0.13	0.08	0.02	0.01					0.36	0.24
Total			1.7	1.8	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.6

[1]DDGS will be routed to either DDGS Silo or DDGS Flat Storage. Therefore, it is assumed on an annual basis that the total DDGS production is split evenly between the

6. Potential to Emit VOC & HAPs - Fugitive Emissions:

Baghouse ID	Process Description	Capture	Hourly Throughput (ton/hr)	Uncontrolled VOC (lbs/hr)	Uncontrolled VOC (tons/yr)	Uncontrolled Acetaldehyde (lbs/hr)	Uncontrolled Acetaldehyde (tons/yr)	Uncontrolled Acrolein (lbs/hr)	Uncontrolled Acrolein (tons/yr)	Uncontrolled Methanol (lbs/hr)	Uncontrolled Methanol (tons/yr)	Uncontrolled Formaldehyde (lbs/hr)	Uncontrolled Formaldehyde (tons/yr)	Uncontrolled Total HAPs (lbs/hr)	Uncontrolled Total HAPs (tons/yr)
F002	Uncaptured Emissions From DDGS Loadout (F002)(EU034 & EU050)	0.00%	220	1.34	5.87	0.11	0.49	0.10	0.44	0.13	0.55	0.02	0.09	0.36	1.57
F006	Uncaptured Emissions From DDGS Storage(F006)	0.00%	34	0.20	0.89	0.02	0.07	0.02	0.07	0.02	0.08	0.00	0.01	0.05	0.24

7. Limited Potential to Emit VOC & HAPs - Fugitive Emissions:

Baghouse ID	Process Description	Capture	Annual Throughput (ton/yr)	Limited VOC (lbs/hr)	Limited VOC (tons/yr)	Limited Acetaldehyde (lbs/hr)	Limited Acetaldehyde (tons/yr)	Limited Acrolein (lbs/hr)	Limited Acrolein (tons/yr)	Limited Methanol (lbs/hr)	Limited Methanol (tons/yr)	Limited Formaldehyde (lbs/hr)	Limited Formaldehyde (tons/yr)	Limited Total HAPs (lbs/hr)	Limited Total HAPs (tons/yr)
F002	Uncaptured Emissions From DDGS Loadout (F002)(EU034 & EU050)	0.00%	293,633	1.34	0.89	0.11	0.07	0.10	0.07	0.13	0.08	0.02	0.01	0.36	0.24
F006	Uncaptured Emissions From DDGS Storage(F006)	0.00%	293,633	0.20	0.89	0.02	0.07	0.02	0.07	0.02	0.08	0.00	0.01	0.05	0.24

Methodology
Uncontrolled PTE (lbs/hr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed throughput (ton/hr) x safety factor
Uncontrolled PTE (tons/yr) = Uncontrolled PTE (lb/hr) x 8760 hours/yr / 2000 lbs/ton
Limited PTE (lb/hr) = Uncontrolled PTE (lb/hr)
Limited PTE (tons/yr) = stack test result (lb/hr) / tested throughput (ton/hr) x proposed annual throughput (ton/yr) / 2000 lbs/ton x safety factor

8. Potential to Emit - SO2

SO2 Emissions		Uncontrolled Potential to Emit		Controlled Potential to Emit		Limited Potential to Emit	
Stack Vent	Process Description	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year
SV011	DDGS Storage Silo #1	0.50	2.19	0.50	2.19	0.50	2.19
SV012	DDGS Silo Bypass #1	0.50	2.19	0.50	2.19	0.50	2.19

Baghouse provides no control for SO2; therefore controlled emissions = uncontrolled emissions
SO2 emissions are assumed to be half of the emission rate for the fluid bed

POET - Gowrie Stack Test 11-9-17

Test Results	Run 1	Run 2	Run 3	Average
	lb/hr	lb/hr	lb/hr	lb/hr
VOC	0.25	0.26	0.25	0.25
Process Rate	Run1	Run 2	Run 3	Average
	ton/hr	ton/hr	ton/hr	ton/hr
DDGS Loadout[1]	104	104	104	104

POET - Corning Stack Test 10-25-17

Acetaldehyde	0.025	0.042	0.031	0.033
Acrolein	0.031	0.029	0.029	0.030
Methanol	0.032	0.039	0.039	0.037
Formaldehyde	0.006	0.006	0.006	0.006
Process Rate	Run1	Run 2	Run 3	Average
	ton/hr	ton/hr	ton/hr	ton/hr
DDGS Loadout[1]	161	161	161	161

Emission Factors (DDGS Handling)		With 2.5 safety factor:
	lb/ton	
VOC	2.44E-03	6.09E-03
Acetaldehyde	2.03E-04	5.07E-04
Acrolein	1.84E-04	4.61E-04
Methanol	2.28E-04	5.69E-04
Formaldehyde	3.73E-05	9.32E-05

Conversions

1 lb =	7000 grains
1 ton =	2000 pounds
1 hour =	60 minutes
1 year =	8760 hours

Appendix A: Emission Calculations
DDGS Handling

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Safety Factor = 2.5

Marion Engineering Test - 07/12/2018 SV011 (DDGS Storage Silo)

	7/10/2018
	lb/hr
Hydrogen Sulfide	0.0046
Carbonyl Sulfide*	0.0026
Carbon Disulfide*	0.0031

*Hazardous Air Pollutant

Appendix A: Emission Calculations
PTE from NG Boilers EU027 and EU028 (> 100MMBtu)

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Heat Input Capacity MMBtu/hr		Potential Throughput MMCF/yr
143.0	Boiler EU027	1228.1
143.0	Boiler EU028	1228.1

	Pollutant						
	PM*	PM10*	PM2.5*	SO2	NOx**	VOC	CO**
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	35.7	5.5	40.0
Potential Emission in tons/yr Boiler EU027	1.2	4.7	4.7	0.4	21.9	3.4	24.6
Potential Emission in tons/yr Boiler EU028	1.2	4.7	4.7	0.4	21.9	3.4	24.6

*PM emission factor is filterable PM only from AP-42. Boiler PM10 and PM2.5 emissions factors from NG_process_gas_LPG_PM_factors, USEPA, March 30, 2012

**Emission Factors for NOx and CO are based on manufacturer's certified emission factors for low NOx burners. The manufacturer's emission factors are less than the AP-42 values and have been verified by performance testing.

Methodology

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04
(AP-42 Supplement D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

HAP emissions calculations.

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	1.29E-03	7.37E-04	4.61E-02	1.11E+00	2.09E-03

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	3.07E-04	6.75E-04	8.60E-04	2.33E-04	1.29E-03

Methodology is the same as above

Total HAPS for each boiler: **1.16** **TPY**
Total HAPS for both boilers: **2.32** **TPY**

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emission Calculations
Ethanol Loadout Rack and Flare

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Denatured ethanol (95% to 98% ethanol), E85 (70% to 85% ethanol), undenatured ethanol and non-fuel grade ethanol will be shipped by either truck loading rack or railcar loading rack. The loading rack can only load by truck or rail individually; not both at the same time. Both railcars and trucks will be filled by submerged loading process. Both loadout operations will be controlled by a flare (CE15), which has a control efficiency of 98% for VOC and HAPs. The non-fuel grade ethanol rail loadout will utilize the same platform as the exisiting fuel grade rail loadout and have the same pump capacity. Therefore, total maximum hourly rail loadout capacity at the facility is not changed. The non-fuel grade ethanol truck loadouts will be stationed at a seperate location than the exisiting loadouts. Therfore, the total maximum hourly truck loadout capacity at the facility will increase. The annual loadout capacity is not changed, as the maximum 190 proof ethanol produced is unchanged. Railcars will be dedicated fleets, but the trucks may be used to carry gasoline prior to filling with ethanol.

According to AP-42, Chapter 5.2 - Transportation and Marketing of Petroleum Liquids (06/08), the VOC emission factors for the truck and rail loading racks can be estimated from the following equation:

$$L = 12.46 \times (SPM)/T$$

where:
L = loading loss (lbs/kgal)
S = a saturation factor (see AP-42, Table 5.2-1)
P = true vapor pressure of the liquid loaded (psia)
M = molecular weight of vapors
T = temperature of the bulk liquid loaded (degree R)

Previous Stored Liquid	***S**	**P** (psia)	**M** (lbs/mole lbs)	**T** (degree R)	**L** (lbs/kgal)	
Gasoline (dedicated vapor balance)	1.0	5.58	66.00	516	8.89	Loading gasoline into vessel that previously carried gasoline
Gasoline (clean cargo)	0.5	5.58	66.00	516	4.44	Loading gasoline into vessel that previously carried nothing
E-85 Ethanol (dedicated normal)	0.6	2.16	56.02	516	1.75	Loading E-85 into vessel that previously carried E-85
E-85 Ethanol (clean cargo)	0.5	2.16	56.02	516	1.46	Loading E-85 into vessel that previously carried nothing
Denatured Ethanol (dedicated normal)	0.6	0.95	49.34	516	0.68	Loading denatured ethanol into vessel that previously carried denatured ethanol
Denatured Ethanol (clean cargo)	0.5	0.95	49.34	516	0.57	Loading denatured ethanol into vessel that previously carried nothing
Undenatured Ethanol (dedicated normal)	0.6	0.75	46.07	516	0.50	Loading undenatured ethanol into vessel that previously carried undenatured ethanol
Undenatured Ethanol (clean cargo)	0.5	0.75	46.07	516	0.42	Loading undenatured ethanol into vessel that previously carried nothing

True vapor pressure and the molecular weight are calculated within Tanks 4.0.9d software using Fort Wayne, IN meterological data.
Gasoline service is assuming RVP10 gasoline
Denatured ethanol is assumed to be 95% ethanol and 5% RVP15 gasoline
E-85 ethanol is assumed to be 70% ethanol and 30% RVP15 gasoline

Denaturant Content		
Denatured Ethanol =	5%	Denaturant
E85 =	30%	Denaturant
Undenatured Ethanol =	0%	Denaturant

Source-Specific Emission Factors

		(lbs/kgal)
The emission factor for loading denatured ethanol to rail which previously contained denatured ethanol = L (Denatured ethanol, normal) =	Denatured Ethanol to Rail	0.68
The emission factor for loading E-85 to rail which previously contained denatured ethanol or E-85 = L (Denatured ethanol, normal) =	E-85 to Rail	1.75
The emission factor for loading undenatured ethanol to rail which previously contained denatured ethanol = L (denatured ethanol, dedicated vapor balance) - L (denatured ethanol, clean cargo) + L (undenatured ethanol, clean cargo) =	Undenatured Ethanol to Rail	0.53
The emission factor for loading denatured ethanol to trucks which stored gasoline previously = L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo) + L (denatured ethanol, clean cargo) =	Denatured Ethanol to Truck	5.01
The emission factor for loading E-85 to trucks which previously contained denatured ethanol or E-85 = L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo) + L (E-85, clean cargo) =	E-85 to Truck	5.90
The emission factor for loading undenatured ethanol to trucks which stored gasoline previously = L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo) + L (undenatured ethanol, clean cargo) =	Undenatured Ethanol to Truck	4.86

Conversions

1 year =	8760 hours
1 ton =	2000 pounds

Appendix A: Emission Calculations
Ethanol Loadout Rack and Flare

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

1. Throughputs:

Truck and Rail Combined (MMgal/yr)(Worst Case for PTE Calculations)	
Denatured Ethanol (For PTE) or	96.84
Undenatured Ethanol (for PTE) and	92.00
E-85 (For PTE)	11.43
Total of Products Loaded (For PTE)	108.27
Total Non-Fuel Grade Ethanol Production	40.00

Truck and Rail Combined (MMgal/yr)(Maximum Allowable Per Product)	
Denatured Ethanol (Maximum)	105.26
Undenatured Ethanol (Maximum)	100.00
E-85 (Maximum)	11.43
Total of Products Loaded (Maximum)	108.27

Ethanol Loading Capacity EU036

Truck (gal/hr)	Rail (gal/hr)	Total (MMgal/yr)
78,000	72,000	108.27

Ethanol Loading Capacity EU055 (Non-Fuel Grade)

Truck (gal/hr)	Rail (gal/hr)	Total (MMgal/yr)
72,000	72,000	40.00

2. Hourly Potential to Emit (Annual Unrestricted):

	Maximum Loading Capacity kgal/hr	Uncontrolled Emission Factor lb/kgal	Controlled Emission Factor lb/kgal	Emissions Uncontrolled lb/hr	Emissions Uncontrolled ton/yr	Control Efficiency %	Emissions Controlled lb/hr	Emissions Controlled ton/yr
Denatured ethanol loaded out via truck:	78	5.01	0.100	391.01	1712.62	98%	7.82	34.25
Denatured ethanol loaded out via rail:	72	0.68	0.014	49.08	214.97	98%	0.98	4.30
Undenatured ethanol loaded out via truck:	78	4.86	0.097	379.18	1660.80	98%	7.58	33.22
Undenatured ethanol loaded out via rail:	72	0.53	0.011	38.16	167.13	98%	0.76	3.34
E85 loaded out via truck:	78	5.90	0.118	460.58	2017.34	98%	9.21	40.35
E85 loaded out via rail:	72	1.75	0.035	126.14	552.51	98%	2.52	11.05
Undenatured/non-fuel grade ethanol loaded out via truck:	72	4.86	0.097	350.01	1533.05	98%	7.00	30.66
Undenatured/non-fuel grade ethanol loaded out via rail:	72	0.53	0.011	38.16	167.13	98%	0.76	3.34
Worst case scenario =			**0.118**	**586.72**	**2569.85**		**11.73**	**51.40**
Worst case scenario for EU055 =			**0.097**				**7.76**	**34.00**

Emissions Uncontrolled (lb/hr) = Throughput (kgal/hr) x Emission Factor (lb/kgal)
Emissions Controlled (lb/hr) = Emissions Uncontrolled (lb/hr) x (1 - Control Efficiency)

3. Limited Annual Potential to Emit:

	Limited* Throughput kgal/yr	Uncontrolled Emission Factor lbs/kgal	Limited Emissions Uncontrolled ton/yr	Control Efficiency %	Limited Emissions Controlled ton/yr	Limited Emissions Controlled lbs/hr
All denatured ethanol loaded out via truck:	96,842	5.01	242.73	98%	4.85	1.11
All denatured ethanol loaded out via rail:	96,842	0.68	33.01	98%	0.66	0.15
All undenatured ethanol loaded out via truck	92,000	4.86	223.62	98%	4.47	1.02
All undenatured ethanol loaded out via rail	92,000	0.53	24.38	98%	0.49	0.11
All E85 loaded out via truck:	11,429	5.90	33.74	98%	0.67	0.15
All E85 loaded out via Rail:	11,429	1.75	10.01	98%	0.20	0.05
Undenatured/non-fuel grade ethanol loaded out via truck:	40,000	4.86	97.23	98%	1.94	0.44
Undenatured/non-fuel grade ethanol loaded out via rail:	40,000	0.53	10.60	98%	0.21	0.05
Total combined loadout throughput limit	108,270	5.90	319.66	98%	6.39	1.46

Emissions Uncontrolled (ton/yr) = Throughput (kgal/yr) x Emission Factor (lb/kgal) / 2000 lb/ton
Emissions Controlled (ton/yr) = Emissions Uncontrolled (ton/yr) x (1 - Control Efficiency)
Limited Emissions Controlled (lbs/hr) = Limited Emissions Controlled (tons/yr) x (2000 lbs/ton) x (1 yr/8760 hrs)

Appendix A: Emission Calculations
Ethanol Loadout Rack and Flare

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

4. Potential to Emit HAPs:

Flare Control Efficiency = 98%

	Source Specific Uncontrolled Emission Factors									
HAP	Gasoline HAP Fraction[1]	Denaturant HAP Fraction[2]	Undenatured Ethanol HAP Fraction[3]	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	E85 to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	E85 to Truck	Maximum Controlled
				lb/kgal	lb/kgal	lb/kgal	lb/kgal	lb/kgal	lb/kgal	lb/kgal
Acetaldehyde	0.00E+00	0.00E+00	4.00E-04	0.00026	0.00021	0.00049	0.00022	0.00017	0.00041	0.0000
Benzene	2.30E-02	2.20E-03	0.00E+00	0.00007	0.00001	0.00116	0.10229	0.10223	0.10320	0.0021
Carbon Disulfide	0.00E+00	0.00E+00	0.00E+00	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000
Cumene	1.00E-02	0.00E+00	0.00E+00	0.00000	0.00000	0.00000	0.04445	0.04445	0.04445	0.0009
Ethylbenzene	2.00E-02	0.00E+00	0.00E+00	0.00000	0.00000	0.00000	0.08890	0.08890	0.08890	0.0018
Hexane	7.00E-02	2.74E-01	0.00E+00	0.00934	0.00156	0.14401	0.31892	0.31114	0.43115	0.0086
Methanol	0.00E+00	0.00E+00	2.00E-04	0.00013	0.00010	0.00025	0.00011	0.00008	0.00020	0.0000
Toluene	1.50E-01	0.00E+00	0.00E+00	0.00000	0.00000	0.00000	0.66673	0.66673	0.66673	0.0133
Xylenes	1.50E-01	0.00E+00	0.00E+00	0.00000	0.00000	0.00000	0.66673	0.66673	0.66673	0.0133
Total	0.42	0.28	0.00	0.01	0.00	0.15	1.89	1.88	2.00	0.0400

[1]This is the highest HAP percentage for gasoline vapors as per the Flint Hills gasoline SDS, issue date of 12-03-2014. Assumed truck tanker hauled gasoline for prior load.

[2]Based on the average weight fraction of the denaturant used at the plant (Markwest 2016 data)

[3]Assumed weight fraction in 200 proof ethanol, based on testing done by POET in Feb and March 2016.

Methodology

Denatured Ethanol to Rail (lbs/kgal) = L (Denatured ethanol, normal) x (Denaturant% x Denaturant HAP Fraction + Ethanol% x Ethanol HAP Fraction)

E85 to Rail (lbs/kgal) = L (E85, normal) x (Denaturant% x Denaturant HAP Fraction + Ethanol% x Ethanol HAP Fraction)

Undenatured Ethanol to Rail (lbs/kgal) = (L (denatured ethanol, dedicated vapor balance) - L (denatured ethanol, clean cargo)) x (Denaturant% x Denaturant HAP Fraction + Ethanol% x Ethanol HAP Fraction) + L (undenatured ethanol, clean cargo) x (ethanol HAP Fraction)

Denatured Ethanol to Truck (lbs/kgal) = (L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo)) x Gasoline HAP Fraction + L (denatured ethanol, clean cargo) x (Denaturant% x Denaturant HAP Fraction + Ethanol% x Ethanol HAP Fraction)

E85 to Truck (lbs/kgal) = (L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo)) x Gasoline HAP Fraction + L (E-85, clean cargo) x (Denaturant% x Denaturant HAP Fraction + Ethanol% x Ethanol HAP Fraction)

Undenatured Ethanol to Truck (lbs/kgal) = (L (gasoline, dedicated vapor balance) - L (gasoline, clean cargo)) x Gasoline HAP Fraction + L (undenatured ethanol, clean cargo) x Ethanol HAP Fraction =

	Hourly Potential to Emit Before Control								
HAP	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	E85 to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	E85 to Truck	Worst Case Total	Unlimited PTE Before Control w/ both loadouts	Unlimited PTE Before Control for EU055
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	ton/year	ton/year
Acetaldehyde	0.019	0.015	0.04	0.02	0.01	0.03	0.07	0.29	0.12
Benzene	0.005	0.001	0.08	7.98	7.97	8.05	8.13	35.62	32.24
Carbon Disulfide	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cumene	0.000	0.000	0.00	3.47	3.47	3.47	3.47	15.19	14.02
Ethylbenzene	0.000	0.000	0.00	6.93	6.93	6.93	6.93	30.37	28.03
Hexane	0.672	0.112	10.37	24.88	24.27	33.63	44.00	192.72	98.61
Methanol	0.009	0.008	0.02	0.01	0.01	0.02	0.03	0.15	0.06
Toluene	0.000	0.000	0.00	52.01	52.01	52.01	52.01	227.78	210.26
Xylenes	0.000	0.000	0.00	52.01	52.01	52.01	52.01	227.78	210.26
Total	0.71	0.14	10.51	147.29	146.67	156.14	166.64	729.90	593.61

	Hourly Potential to Emit After Control								
HAP	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	E85 to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	E85 to Truck	Worst Case Total	Unlimited PTE After Control w/ both loadouts	Unlimited PTE After Control EU055
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	ton/year	ton/year
Acetaldehyde	0.000	0.000	0.001	0.000	0.00	0.00	0.00	0.01	0.00
Benzene	0.000	0.000	0.002	0.160	0.16	0.16	0.16	0.71	0.64
Carbon Disulfide	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00
Cumene	0.000	0.000	0.000	0.069	0.07	0.07	0.07	0.30	0.28
Ethylbenzene	0.000	0.000	0.000	0.139	0.14	0.14	0.14	0.61	0.56
Hexane	0.013	0.002	0.207	0.498	0.49	0.67	0.88	3.85	1.97
Methanol	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00
Toluene	0.000	0.000	0.000	1.040	1.04	1.04	1.04	4.56	4.21
Xylenes	0.000	0.000	0.000	1.040	1.04	1.04	1.04	4.56	4.21
Total	0.014	0.003	0.210	2.946	2.93	3.12	3.33	14.60	11.87

Appendix A: Emission Calculations
Ethanol Loadout Rack and Flare

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Limited Annual Potential to Emit

HAP	Denatured Ethanol to Rail	Undenatured Ethanol to Rail	E85 to Rail	Denatured Ethanol to Truck	Undenatured Ethanol to Truck	E85 to Truck	Limited Potential to Emit After Control	Limited PTE based on permit limits	Limited PTE After Control EU055
	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/year
Acetaldehyde	0.000	0.00	0.00	0.00	0.00	0.00	0.00		0.000
Benzene	0.000	0.00	0.00	0.10	0.09	0.01	0.11	0.11	0.041
Carbon Disulfide	0.000	0.00	0.00	0.00	0.00	0.00	0.00		0.000
Cumene	0.000	0.00	0.00	0.04	0.04	0.01	0.05	0.05	0.018
Ethylbenzene	0.000	0.00	0.00	0.09	0.08	0.01	0.10	0.10	0.036
Hexane	0.009	0.00	0.02	0.31	0.29	0.05	0.36	0.47	0.125
Methanol	0.000	0.00	0.00	0.00	0.00	0.00	0.00		0.000
Toluene	0.000	0.00	0.00	0.65	0.61	0.08	0.72	0.72	0.267
Xylenes	0.000	0.00	0.00	0.65	0.61	0.08	0.72	0.72	0.267
Total	0.01	0.00	0.02	1.83	1.73	0.23	2.06		0.75

Methodology
Limited PTE after Control (tons/year) = combined ethanol product loadout (gal/yr) x HAP emission factor (lb/kgal) x (1 ton/2000 lbs) x (1 kgal/1000 gallons)
HAP emissions are based on worst-case emission scenario.
HAP emission factors are based on content of HAP in product (denaturant, gasoline, or ethanol), content of material in product (E85, denatured ethanol, or undenatured ethanol), and VOC emission factor calculations above
PTE of HAP before Control (lb/hr) = Uncontrolled HAP Emission Factor (lb/kgal) x Loadout Rate (gal/hr) / 1000 gal/kgal
PTE of HAP before Control (tons/yr) = Worst Case PTE of HAP before Control (lb/hr) x 8,760 (hrs/yr) / 2,000 (lbs/ton)
PTE of HAP after Control (lb/hr) = PTE of HAP before Control (lb/hr) x (1-Control Efficiency)
PTE of HAP after Control (lb/hr) = Worst Case PTE of HAP after Control (lb/hr) x 8,760 (hrs/yr) / 2,000 (lb/ton)
Limited PTE of HAP after Control (tons/yr) = Uncontrolled HAP Emission Factor (lb/kgal) x throughput (MMgal/yr) x (1-Control Efficiency) x 1,000 (Kgal/MMgal) / 2,000 (lb/ton)

5. Flare Emissions from Combustion of VOCs from the Ethanol Loading Rack	Heat Input Capacity	Max Hourly Rate (Rail & Truck)	Annual Production Limit
	MMBtu/hr	kgal/hr	kgal/yr
	0.055	150.0	108,271

	Pollutant	
	CO**	NOx**
Emission Factor (lb/kgal)	0.084	0.0334
Potential to Emit in lbs/hr	12.60	5.01
Avg Limited Potential to Emit (lb/hr)	19.92	0.41
UNRESTRICTED Potential to Emit (TPY)	55.19	21.94
LIMITED Potential to Emit in tons/yr	**4.55**	**1.81**

Emission factors for NO_x and CO are based on the information provided by the flare manufacturer (John Zink Company).
PM, PM10, PM2.5, and SO2 emission factors are negligible due to the smokeless design and minimal H2S levels in the fuel.
0.055
VOC emission calculations can be found above in loading rack calculations.

Appendix A: Emission Calculations
Fugitive Dust Emissions - Paved Roads

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Paved and Unpaved Roads at Industrial Site
The following calculations determine the amount of emissions created by paved roads, based on 8,760 hours of use and AP-42, Ch 13.2.1 (1/2011).
New truck load out pads will be installed with this modification. Trucks will travel 600 feet on a paved road to the new load out pads to load non-fuel grade ethanol.

Vehicle Informtation (provided by source)

Type	Maximum trips per day (trip/day)	Maximum Weight Loaded (tons/trip)	Total Weight driven per day (ton/day)	Maximum one-way distance (feet/trip)	Maximum one-way distance (miles/trip)	Maximum one-way miles (miles/day)	Maximum one-way miles (miles/yr)
PAVED ROADS							
DDGS Haul Out (Out)	59	15.0	885.0	1980	0.375	22.1	8075.6
DDGS Haul Out (In)	59	40.0	2360.0	1980	0.375	22.1	8075.6
Ethanol/Industrial Alcohol Haul Out (In)	54	15.0	810.0	1980	0.375	20.3	7391.3
Ethanol/Industrial Alchol Haul Out (Out)	54	40.0	2160.0	1980	0.375	20.3	7391.3
Denaturant Delivery (In)	9	40.0	360.0	1980	0.375	3.4	1231.9
Denaturant Delivery (Out)	9	15.0	135.0	1980	0.375	3.4	1231.9
Grain Delivery (In)	300	40.0	12000.0	1980	0.375	112.5	41062.5
Grain Delivery (Out)	300	15.0	4500.0	1980	0.375	112.5	41062.5
Corn Oil (In)	4	40.0	160.0	1980	0.375	1.5	547.5
Corn Oil (Out)	4	15.0	60.0	1980	0.375	1.5	547.5
Wet Cake (In)	19	15.0	283.5	1980	0.375	7.1	2587.4
Wet Cake (Out)	19	40.0	756.1	1980	0.375	7.1	2587.4
Chemical Delivery (In)	6	40.0	240.0	1980	0.375	2.3	821.3
Chemical Delivery (Out)	6	15.0	90.0	1980	0.375	2.3	821.3
Non-Fuel Grade Ethanol (In)	20	15.0	300.0	600	0.114	2.3	829.5
Non-Fuel Grade Ethanol (Out)	20	40.0	800.0	600	0.114	2.3	829.5
Totals	**941.8**		**25899.7**			**342.7**	**125093.8**

Equations from AP-42 Section 13.2.1 Paved Roads

Average Vehicle Weight Per Trip =	27.5	tons/trip
Average Miles Per Trip =	0.36	miles/trip

Unmitigated Emission Factor, Ef = [k * (sL)^0.91 * (W)^1.02] (Equation 1 from AP-42 13.2.1)

	PM	PM10	PM2.5	
where k =	0.011	0.0022	0.00054	lb/VMT = particle size multiplier (AP-42 Table 13.2.1-1)
W =	27.5	27.5	27.5	tons = average vehicle weight (provided by source)
sL =	1.1	1.1	1.1	g/m^2 = silt loading value for corn wet mills - Table 13.2.1-3)

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = E * [1 - (p/4N)] (Equation 2 from AP-42 13.2.1)

Mitigated Emission Factor, Eext = Ef * [1 - (p/4N)]

where p =	120	days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)
N =	365	days per year

	PM	PM10	PM2.5	
Unmitigated Emission Factor, Ef =	0.353	0.071	0.0173	lb/mile
Mitigated Emission Factor, Eext =	0.324	0.065	0.0159	lb/mile
Dust Control Efficiency =	50%	50%	50%	(pursuant to control measures outlined in fugitive dust control plan)

Appendix A: Emission Calculations
Fugitive Dust Emissions - Paved Roads

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Total Paved Road Emissions

Process	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 (tons/yr)	Mitigated PTE of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 (tons/yr)	Controlled PTE of PM (tons/yr)	Controlled PTE of PM10 (tons/yr)	Controlled PTE of PM2.5 (tons/yr)
DDGS Haul Out (Out)	1.42	0.28	0.07	1.31	0.26	0.06	0.65	0.13	0.03
DDGS Haul Out (In)	1.42	0.28	0.07	1.31	0.26	0.06	0.65	0.13	0.03
Ethanol Haul Out (In)	1.30	0.26	0.06	1.20	0.24	0.06	0.60	0.12	0.03
Ethanol Haul Out (Out)	1.30	0.26	0.06	1.20	0.24	0.06	0.60	0.12	0.03
Denaturant Delivery (In)	0.22	0.04	0.01	0.20	0.04	0.01	0.10	0.02	0.00
Denaturant Delivery (Out)	0.22	0.04	0.01	0.20	0.04	0.01	0.10	0.02	0.00
Grain Delivery (In)	7.24	1.45	0.36	6.64	1.33	0.33	3.32	0.66	0.16
Grain Delivery (Out)	7.24	1.45	0.36	6.64	1.33	0.33	3.32	0.66	0.16
Corn Oil (In)	0.10	0.02	0.00	0.09	0.02	0.00	0.04	0.01	0.00
Corn Oil (Out)	0.10	0.02	0.00	0.09	0.02	0.00	0.04	0.01	0.00
Wet Cake (In)	0.46	0.09	0.02	0.42	0.08	0.02	0.21	0.04	0.01
Wet Cake (Out)	0.46	0.09	0.02	0.42	0.08	0.02	0.21	0.04	0.01
Chemical Delivery (In)	0.14	0.03	0.01	0.13	0.03	0.01	0.07	0.01	0.003
Chemical Delivery (Out)	0.14	0.03	0.01	0.13	0.03	0.01	0.07	0.01	0.003
Non-Fuel Grade Ethanol (In)	0.15	0.03	0.01	0.13	0.03	0.01	0.07	0.01	0.003
Non-Fuel Grade Ethanol (Out)	0.15	0.03	0.01	0.13	0.03	0.01	0.07	0.01	0.003
Totals	**22.05**	**4.41**	**1.08**	**20.24**	**4.05**	**0.99**	**10.12**	**2.02**	**0.50**

Methodology

Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)]
Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip) / [5280 ft/mile]
Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)]
Average Vehicle Weight Per Trip (ton/trip) = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)]
Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]
Unmitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Unmitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Mitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Mitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Controlled PTE (tons/yr) = [Mitigated PTE (tons/yr)] * [1 - Dust Control Efficiency]

Abbreviations

PM = Particulate Matter
PM10 = Particulate Matter (<10 um)
PM2.5 = Particle Matter (<2.5 um)
PTE = Potential to Emit

Appendix A: Emission Calculations
Cooling Tower

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Water circulation flow =	36,000	gallons per minute
Water circulation flow =	136,275	liters per minute
Drift loss =	0.005%	
Drift loss =	6.8	liters per minute
Total Dissolved Solids in cooling tower =	2500	mg/l
Total Dissolved Solids in cooling tower =	2.5	g/l
PM-10 = Drift loss (l/min) x TDS (g/l)	17.0	grams/minute
g/min x 60 =	1022.1	grams/hr
1 pound =	453.6	grams
Fugitive emissions=	2.3	lbs/hr
Total PTE =	**9.9**	**TPY**

Appendix A: Emission Calculations
Storage Tanks

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Tank	Contents [1]	Annual Throughput (gal/yr)	Capacity (gal)	No. of Turn Overs	Emissions		
					lb/year	lb/hr	Ton/year
T001	190-Proof Ethanol	105,263,158	250,000	420.0	766.42	0.09	0.38
T002	Denaturant	7,242,105	250,000	29.0	2724.99	0.31	1.36
T003	200-Proof Ethanol	96,842,105	2,000,000	48.4	658.88	0.08	0.33
T004	200-Proof Ethanol	96,842,105	2,000,000	48.4	658.88	0.08	0.33
T005	Denaturant	7,242,105	126,900	58.3	2344.05	0.27	1.17
T009	Gasoline	15,288	294	52.0	382.89	0.04	0.19
T010*	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	40,000,000	70,000	571.4	480.10	0.05	0.24
T011*	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	40,000,000	500,000	80.0	474.73	0.05	0.24
T012*	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	40,000,000	500,000	80.0	474.73	0.05	0.24
T013**	Denaturant	2,000,000	16,000	125.0	8645.18	0.99	4.32
				Total	**17,610.85**	**2.01**	**8.81**

NOTE: Emissions were calculated using the TANKS ESP Program.

* T010-T012 will be constructed with the intention of storing non-fuel grade ethanol (USP grade ethanol). With a changing market, undenatured ethanol (non-USP grade) may also be stored in these tanks for periods of time.

** T013 will be constructed with the intention of storing TBA (tert-Butyl Alcohol). An equivalent alternative denaturant may also be stored, depending on availability and price. Emission estimates are conservatively based on natural gasoline storage. Due to a higher freezing point, the tank will be mixed 75% TBA/25% Non-Fuel Grade Ethanol during the winter months. This does not affect emission calculations. This tank will have a fixed roof.

Tank	Contents [1]	Benzene	Hexane(-n)	Toluene	Acetaldehyde	Methanol	Formaldehyde	Acrolein	Total
		ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
T001	190-Proof Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T002	Denaturant	3.00E-03	3.73E-01	-	-	-	-	-	3.76E-01
T003	200-Proof Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T004	200-Proof Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T005	Denaturant	2.58E-03	3.21E-01	-	-	-	-	-	3.24E-01
T009	Gasoline	4.21E-04	5.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.29E-02
T010	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T011	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T012	Fuel Grade Ethanol/Non-Fuel Grade Ethanol	-	-	-	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
T013	Denaturant	9.51E-03	1.18E+00	-	-	-	-	-	1.19E+00
	Total	**1.55E-02**	**1.93E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**1.95E+00**

NOTE: Ethanol contains very small concentrations of HAP compounds including acetaldehyde, acrolein, methanol, and formaldehyde

Gasoline Wt Fraction

HAP	HAP Fraction*
Acetaldehyde **	0.00E+00
Acrolein	0.00E+00
Methanol	0.00E+00
Benzene	2.20E-03
Carbon Disulfide	0.00E+00
Cumene	0.00E+00
Ethylbenzene	0.00E+00
Formaldehyde	0.00E+00
n-Hexane	2.74E-01
Toluene	0.00E+00
Xylenes	0.00E+00

[1] Assume:
190-Proof Ethanol is 100% ethyl alcohol in TANKS calculations.
Denaturant is 100% gasoline (RVP 13) in TANKS calculations.
HAP fractions for Denaturant obtained from Markwest 2016 data (supplier)
200-Proof Ethanol is 100% ethyl alcohol in TANKS calculations.

Appendix A: Emission Calculations
Wet Cake Production

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

1. Process Description:
Wet cake production, storage and loadout

Wet cake production storage and loadout is a source of VOC and HAP emissions because the wet cake contains a small quantity of ethanol and HAPs. This source is not controlled. The emission factors for this process come from emissions testing at a similar facility. The operation of the dryers and DDGS cooler represent the "worst case" emission scenario and thus are presented in the potential to emit summary.

Wetcake is the grain solids from the whole stillage centrifuges, before being conveyed to the DDGS dryers. If it is not dried to produce DDGS, wetcake is stored on an outdoor pad located adjacent to the process building. Wetcake contains a small amount of residual VOC and HAP which are emitted during storage. Wetcake is loaded into trucks using a frontend loader. Since the wetcake has a high moisture content, wetcake loadout is not a source of particulate matter emissions.

Modified wetcake is being produced as local users may prefer the product over DDGS. DDGS is produced by the two dryers operating in series. Modified wet cake has been dried by only one dryer. It is drier than wet cake but not as dry as DDGS, and contains approximately 50% moisture.

The production of DDGS represent the "worst case" emission scenario as emissions from the dryers/TO and the fluid bed cooler are greater than partially dried wet cake. The worst case emissions are presented in the potential to emit summary.

Wet cake production, storage and loadout is a source of VOC and HAP emissions because the wet cake contains a small quantity of ethanol and HAPs. This source is not controlled. The emission factors for this process were based on a wet cake stack test results for DENCO, LLC in Morris, MN. This operating scenario will be limited based on production per calendar year. Wetcake will be produced when the dryers are off-line. Based on customer demand, a portion of the distillers grains production may be diverted from the dryers to the wetcake pad for off-site sale. Therefore, wetcake may be stored on the wetcake pad at the same time that the dryers and DDGS cooler are operating at full or partial capacity.

Capacity = 78.0 ton/hr maximum dryer feed rate

	VOC	Acetaldehyde	Methanol	Formaldehyde	Acrolein	Total HAPs
Emission Factor* (lb/ton wet caked)	0.0083	0.0001	0.00004	0.0002	0.00002	
PTE (Ton/yr)	2.8	0.0	0.0	0.1	0.0	1.23E-01
Limited PTE (Ton/yr)**	1.62E-01	1.95E-03	7.80E-04	3.90E-03	3.90E-04	7.02E-03

* Emission Factors provided by the source based on the stack test results for DENCO, LLC in Morris, MN.

** Wet cake production is limited to 500 hours per year.

Methodology

PTE (tons/yr) = Max. Throughput Rate (tons/hr) x Emission Factor (lbs/ton) x 500 hr/yr x 1 ton/2000 lbs

Appendix A: Emission Calculations
Wet Cake Production

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

PROPOSED:

Given:
Capacity = 98 tons/hr

Hours of Operation= 8,760 hrs/yr

Analytical Results, from DENCO Report, Dec 21, 2004

VOC	detected	8.30E-03	lb/ton of wet cake produced
Ethanol	detected	1.00E-03	lb/ton of wet cake produced
Methanol	non-detect	4.00E-05	lb/ton of wet cake produced
Acetaldehyde	non-detect	1.00E-04	lb/ton of wet cake produced
Formaldehyde	non-detect	2.00E-04	lb/ton of wet cake produced
Acrolein	non-detect	2.00E-05	lb/ton of wet cake produced

Conversion Factors:

1 lb =	453592	mg
1 ton =	2000	lb

Assumed Maximum Presence:

Detected compounds	150%	of level detected
Non-detected compounds	100%	of detection limit

The emission calculations assume that all VOC in the wet cake are emitted on-site. To account for process variables, a "safety factor" of 1.5 was applied to the detected compounds (ethanol and methanol) and the detection limit was applied to non-detected coumpounds (acetaldehyde, acrolien and formaldehyde).

Pollutant	Emission Factor	Emission Rate		
	lb/ton	lb/hr	Limited Ton/yr	Uncontrolled Ton/yr
VOC	1.25E-02	1.21	5.32	5.32E+00
Ethanol	1.50E-03	0.15	0.64	6.41E-01
Methanol	4.00E-05	0.00	0.02	1.71E-02
Acetaldehyde	1.00E-04	0.01	0.04	4.27E-02
Formaldehyde	2.00E-04	0.02	0.09	8.54E-02
Acrolein	2.00E-05	0.00	0.01	8.54E-03
Total VOC		1.21	**5.32**	**5.32**
Total HAP		0.04	**0.15**	**0.15**

Increase:			
	Total VOC	5.15	2.48
	Total HAP	0.15	0.03
	Acetaldehyde	4.08E-02	8.54E-03

Appendix A: Emission Calculations
Centrifuges

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

Whole stillage is pumped to the centrifuges where the solids (wet cake) is separated from the liquid (thin stillage). A fraction of the residual VOC and HAP contained in the whole stillage is emitted from the centrifuges during the separation process.

Emission data from a performance test completed on April 18, 2017 for the centrifuge stacks at the POET plant in Mitchell, SD was used to calculate the potential to emit. The maximum performance test run result for each pollutant is increased linearly to correspond with the proposed centrifuge process rate and then a safety factor is added.

The centrifuges (EU024) are normally vented to the RTO. It has been determined that during RTO downtime, the centrifuges are not required to be controlled. During RTO downtime, emissions are vented to stack SV017. See TSD for 095-36998-00127.

POET - Mitchell Stack Test Results April 18, 2017

Test Results	Run 1	Run 2	Run 3	Average	Maximum
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
VOC	1.92	1.82	1.57	1.77	1.920
Formaldehyde	0.0020	0.0020	0.0020	0.002	0.002
Methanol	0.0040	0.0040	0.0040	0.004	0.004
Acetaldehyde	0.1620	0.1580	0.1230	0.148	0.162
Acrolein	0.0092	0.0105	0.0019	0.0072	0.011
Total HAP				**0.1609**	**0.1785**

Process rates associated with above stack test results

Process Rates =	Run 1	Run 2	Run 3	Average
	gpm	gpm	gpm	gpm
Centrifuges 1-4	831.68	831.43	821.48	828.2
Total				**828.20**

1,000 gallons liquid per minute through all centrifuges
60,000 gallons liquid per hour through all centrifuges
525,600,000 gallons liquid per year through all centrifuges
700 Limited RTO Bypass Condition hours per year
1.5 Safety Factor

	Uncontrolled		Limited Emission	
	lb/hr	tpy	lb/hr	tpy
Total VOC	**3.48**	**15.23**	**3.48**	**1.22**
Formaldehyde	0.004	0.016	0.004	0.001
Methanol	0.007	0.032	0.007	0.003
Acetaldehyde	0.293	1.285	0.293	0.103
Acrolein	0.019	0.083	0.019	0.007
Total HAP	**0.32**	**1.42**	**0.32**	**0.11**

Appendix A: Emission Calculations
PTE VOC from Corn Oil Separation Process

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Emissions were calculated using the TANKS 4.0 Program.

Emission Unit	Description [1]	Annual Throughput (gal)	Capacity (gal)	No. of Turn Overs	Emissions		
					lb/year	lb/hr	Ton/year
EU038	Skim Centrifuge	70,956,000	20.56	3,450,626.90	10.17	1.16E-03	0.01
EU039	Oil Centrifuge	42,048,000	5.88	7,156,855.44	6.02	6.87E-04	3.01E-03
EU040	Defatted Syrup Tank (T-552)	70,956,000	1,000.00	70,956.00	10.19	1.16E-03	0.01
EU041	Emulsion Tank (T-553)	42,048,000	1,000.00	42,048.00	6.05	6.91E-04	3.03E-03
EU042	Defatted Emulsion Tank (T-555)	26,280,000	500.00	52,560.00	3.78	4.32E-04	1.89E-03
EU043	Oil Separation Tank (T-556)	15,768,500	2,350.00	6,710.00	2.59	2.96E-04	1.30E-03
EU044	Oil Rundown Tank (T-557)	7,884,000	200.00	39,420.00	1.13	1.29E-04	5.65E-04
EU045	Oil Storage Tank #1 (T-561)	7,890,000	30,000.00	263.00	0.34	3.88E-05	1.70E-04
EU046	Oil Storage Tank #2 (T-562)	7,890,000	30,000.00	263.00	0.34	3.88E-05	1.70E-04
	Total				40.61	4.64E-03	0.02

[1] Assume:
Residual Oil No. 6 used in TANKS calculations.

Appendix A: Emission Calculations
Diesel Generator EU037 (Non-Emergency Use)

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

1. Process Description:

The facility will be equipped with a 2000 kw diesel generator. The primary purpose of the generator will be to provide electricity in the event of an emergency condition at the plant and peak shaving.

2. Potential to Emit (PTE) of Generator:

Generator Manufacturer	Caterpillar		
Generator Model #	3516B		
Generator Size	2250	kW	
Conversion Factor	1.34	HP/kW	AP-42 Appendix A: Miscellaneous Data and Conversion Factors
Generator Size	3,017.25	HP	
Maximum Usage	8760	hours/year	
Potential Throughput	2.64E+07	hp-hr/yr	
Limited			
Maximum Usage	***500***	***hours/year***	
Potential Throughput	***1.51E+06***	***hp-hr/yr***	

Available Emission Factors

	Emission Guarantees (Caterpillar)	AP-42 Emission Factors Section 3.4 (10/96)	
PM	0.54 lb/hr	7.00E-04 lb/hp-hr	0.10 lb/MMBtu
PM10*	0.54 lb/hr	4.01E-04 lb/hp-hr	0.06 lb/MMBtu
PM2.5*	0.54 lb/hr	4.01E-04 lb/hp-hr	0.06 lb/MMBtu
NOx**	65.88 lb/hr	2.40E-02 lb/hp-hr	3.20 lb/MMBtu
SO2***	AP-42 Emission Factor	4.05E-03 lb/hp-hr	0.51 lb/MMBtu
VOC	0.98 lb/hr****	7.05E-04 lb/hp-hr	0.09 lb/MMBtu
CO	9.33 lb/hr	5.50E-03 lb/hp-hr	0.85 lb/MMBtu

Note: Emission factors located in AP-42 Table 3.4-1

*Conservatively assume that all PM10 = PM2.5. PM10 emission factor in lb/hp-hr was calculated using the emission factor in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.4-2).

**NOx emission factor: uncontrolled = 0.024 lb/hp-hr, controlled by ignition timing retard = 0.013 lb/hp-hr

***SO2 emission factor = 0.00809 x (Sulfur content of fuel) . The sulfur content of the fuel used for the generator will be less than 0.5 wt%.

****Emission factor for VOC was highest (Most conservative) at 50% load.

The potential emissions for the generator are either the mass emission rate not to exceed provided by Caterpillar or the appropriate emission factor multiplied by the rated capacity of the generator.

	PM lb/HP-hr	PM10 lb/HP-hr	PM2.5 lb/HP-hr	NOx lb/HP-hr	SO2 lb/HP-hr	VOC lb/HP-hr	CO lb/HP-hr
AP-42	7.00E-04	4.01E-04	4.01E-04	2.40E-02	4.05E-03	7.05E-04	5.50E-03
Caterpillar	1.79E-04	1.79E-04	1.79E-04	2.18E-02		3.25E-04	3.09E-03

	PM lb/hr	PM10 lb/hr	PM2.5 lb/hr	NOx lb/hr	SO2 lb/hr	VOC lb/hr	CO lb/hr
AP-42	2.11	1.21	1.21	72.41	12.20	2.13	16.59
Caterpillar	0.54	0.54	0.54	65.88		0.98	9.33

Appendix A: Emission Calculations
Diesel Generator EU037 (Non-Emergency Use)

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001

3. Potential to Emit (PTE) for Generator:

		PM	PM10	PM2.5	NOx	SOx	VOC	CO
		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
Unlimited	AP-42	9.25	5.30	5.30	317.17	53.46	9.32	72.69
	Caterpillar	2.37	2.37	2.37	288.55		4.29	40.87
	Worst Case	**9.25**	**5.30**	**5.30**	**317.17**	**53.46**	**9.32**	**72.69**
Limited	AP-42	0.53	0.30	0.30	18.10	3.05	0.53	4.15
	Caterpillar	0.14	0.14	0.14	18.10		0.25	2.33
	Worst Case	**0.53**	**0.30**	**0.30**	**18.10**	**3.05**	**0.53**	**4.15**

1. NOx is limited by the 500 hr/yr limit and a 72.41 lb/hr limit to avoid PSD.

4. Potential to Emit (PTE) HAPs for Generator:

HAP Pollutant	Emission Factor [1]	Unlimited	Limited
	(lb/hp-hr)	(ton/yr)	(ton/yr)
Acetaldehyde	1.76E-07	2.33E-03	1.33E-04
Acrolein	5.52E-08	7.29E-04	4.16E-05
Benzene	5.43E-06	7.18E-02	4.10E-03
Formaldehyde	5.52E-07	7.30E-03	4.17E-04
Toluene	1.97E-06	2.60E-02	1.48E-03
Xylenes	1.35E-06	1.79E-02	1.02E-03
		1.26E-01	**7.19E-03**

1. Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).
Emission Factors are from AP 42 (Supplement B 10/96) Tables 3.4-1 , 3.4-2, 3.4-3, and 3.4-4.

Appendix A: Emission Calculations
Equipment Leaks

Company Name: POET Biorefining - Alexandria, LLC
Address City IN Zip: 13179 North 100 East, Alexandria, IN 46001
Significant Source Modification No.:
Part 70 Operating Permit Renewal No.: 095-43506-00127

EQUIPMENT LEAKS

Process Stream	Equipment Component Source	Product	Component Count	Emission Factor (lb/comp.-hr)	Uncontrolled Rate (lb/hr)	Uncontrolled Rate (ton/yr)	Subpart VVa Control Effectiveness	Controlled Rate (lb/hr)	TOC Weight (%)	Emitted Water (lb/hr)	Controlled TOC (lb/hr)	Controlled TOC (ton/yr)
EU019- EU023, EU050-EU54 Distillation	Valves	Gas/Vapor	73	0.013134	0.96	4.20	92.00%	0.08	100.00%	0.000	0.077	0.336
	Valves	Light Liquid	597	0.008866	5.29	23.18	88.00%	0.64	100.00%	0.000	0.635	2.782
	Pump Seals	Light Liquid	16	0.04378	0.70	3.07	69.00%	0.22	100.00%	0.000	0.217	0.951
	Compressors	Gas/Vapor	0	0.5016	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Relief Valves	Gas/Vapor	0	0.2288	0.00	0.00	92.00%	0.00	100.00%	0.000	0.000	0.000
	Sampling Connections	All	22	0.033	0.73	3.18		0.73	100.00%	0.000	0.726	3.180
	Open Ended Lines	All	0	0.00374	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Connectors	All	2627	0.004026	10.58	46.32	93.00%	0.74	100.00%	0.000	0.740	3.243
EU011 - EU016, EU018, EU047 Fermentation	Valves	Gas/Vapor	2	0.013134	0.03	0.12	92.00%	0.00	15.00%	0.002	0.000	0.001
	Valves	Light Liquid	0	0.008866	0.00	0.00	88.00%	0.00	100.00%	0.000	0.000	0.000
	Valves	Heavy Liquid	151	0.000506	0.08	0.33	88.00%	0.01	15.00%	0.008	0.001	0.006
	Pump Seals	Heavy Liquid	8	0.01804	0.14	0.63	69.00%	0.04	15.00%	0.038	0.007	0.029
	Compressors	Gas/Vapor	0	0.5016	0.00	0.00		0.00	15.00%	0.000	0.000	0.000
	Relief Valves	Gas/Vapor	2	0.2288	0.46	2.00	92.00%	0.04	15.00%	0.031	0.005	0.024
	Sampling Connections	All	0	0.033	0.00	0.00		0.00	15.00%	0.000	0.000	0.000
	Open Ended Lines	All	0	0.00374	0.00	0.00		0.00	15.00%	0.000	0.000	0.000
	Connectors	All	488	0.004026	1.96	8.61	93.00%	0.14	15.00%	0.117	0.021	0.090
				Total	**20.92**	**91.65**		**2.63**			**2.430**	**10.643**

TANK FARM EQUIPMENT FUGITIVES

Process Stream	Equipment Component Source	Product	Component Count	Emission Factor	Uncontrolled Rate		Subpart VVa Control Effectiveness	Controlled Rate	TOC Weight	Emitted Water	Controlled TOC	
T002 , T005. T013 Denaturant Tanks	Valves	Gas/Vapor	0	0.013134	0.00	0.00	92.00%	0.00	100.00%	0.000	0.000	0.000
	Valves	Light Liquid	66	0.0089	0.59	2.57	88.00%	0.07	100.00%	0.000	0.070	0.309
	Pump Seals	Light Liquid	4	0.04378	0.18	0.77	69.00%	0.05	100.00%	0.000	0.054	0.238
	Compressors	Gas/Vapor	0	0.5016	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Relief Valves	Gas/Vapor	2	0.2288	0.46	2.00	92.00%	0.04	100.00%	0.000	0.037	0.160
	Sampling Connections	All	0	0.033	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Open Ended Lines	All	0	0.00374	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Connectors	All	250	0.004026	1.01	4.41	93.00%	0.07	100.00%	0.000	0.070	0.309
			Total (Tanks in Denaturant service)		**2.23**	**9.75**		0.23			**0.161**	**1.015**
T001, T003 - T004, T010-T012 Non-denaturant tanks (200-Proof Tanks)	Valves	Gas/Vapor	0	0.013134	0.00	0.00	92.00%	0.00	100.00%	0.000	0.000	0.000
	Valves	Light Liquid	352	0.0089	3.13	13.72	88.00%	0.38	100.00%	0.000	0.376	1.647
	Pump Seals	Light Liquid	11	0.04378	0.48	2.11	69.00%	0.15	100.00%	0.000	0.149	0.654
	Compressors	Gas/Vapor	0	0.5016	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Relief Valves	Gas/Vapor	9	0.2288	2.06	9.02	92.00%	0.16	100.00%	0.000	0.165	0.722
	Sampling Connections	All	0	0.033	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Open Ended Lines	All	0	0.00374	0.00	0.00		0.00	100.00%	0.000	0.000	0.000
	Connectors	All	1692	0.004026	6.81	29.84	93.00%	0.48	100.00%	0.000	0.477	2.089
			Total (Tanks in Ethanol Service)		**12.5**	**54.7**		**1.2**			**1.2**	**5.1**
			Total Tank Farm Equipment Fugitives		**14.7**	**64.4**		**1.4**			**1.3**	**6.1**
			Total LDAR Fugitives		**35.6**	**156.1**	**0.0**	**4.0**	**0.0**	**0.0**	**3.8**	**16.8**

Appendix A: Emission Calculations
Equipment Leaks

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**
Significant Source Modification No.:
Part 70 Operating Permit Renewal No.: **095-43506-00127**

2. Fugitive HAP Emissions:

Fugitive HAP Emissions (tons/yr) = Controlled TOC (tons/yr) x HAP Fraction

Equipment Leaks (Ethanol Service)

HAP	HAP Fraction	Fugitive HAP Emissions-Uncontroled (lbs/hr)	Fugitive HAP Emissions-Uncontroled (tons/yr)	Fugitive HAP Emissions-Controled (lbs/hr)	Fugitive HAP Emissions-Controled (tons/yr)
Acetaldehyde	2.00E-04	4.18E-03	1.83E-02	4.86E-04	2.13E-03
Methanol	2.11E-05	4.41E-04	1.93E-03	5.12E-05	2.24E-04
Formaldehyde	2.81E-05	5.87E-04	2.57E-03	6.82E-05	2.99E-04
Acrolein	1.40E-05	2.94E-04	1.29E-03	3.41E-05	1.49E-04
Totals		**5.51E-03**	**0.00E+00**	**6.39E-04**	**2.80E-03**

Tank Farm Equipment Fugitives in Ethanol Service

HAP	HAP Fraction	Fugitive HAP Emissions-Uncontroled (lbs/hr)	Fugitive HAP Emissions-Uncontroled (tons/yr)	Fugitive HAP Emissions-Controled (lbs/hr)	Fugitive HAP Emissions-Controled (tons/yr)
Acetaldehyde	2.00E-04	2.50E-03	1.09E-02	2.33E-04	1.02E-03
Methanol	2.11E-05	2.63E-04	1.15E-03	2.46E-05	1.08E-04
Formaldehyde	2.81E-05	3.50E-04	1.54E-03	3.28E-05	1.43E-04
Acrolein	1.40E-05	1.75E-04	7.68E-04	1.64E-05	7.17E-05
Total Tank Farm HAPs in Ethanol Service		3.29E-03	1.44E-02	3.07E-04	1.34E-03

Tank Farm Equipment Fugitives in Denaturant Service

HAP	HAP Fraction	Fugitive HAP Emissions-Uncontroled (lbs/hr)	Fugitive HAP Emissions-Uncontroled (tons/yr)	Fugitive HAP Emissions-Controled (lbs/hr)	Fugitive HAP Emissions-Controled (tons/yr)
Benzene	2.20E-03	4.90E-03	2.15E-02	3.55E-04	2.23E-03
Carbon Disulfide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cumene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	2.74E-01	6.10E-01	2.67E+00	4.42E-02	2.78E-01
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Tank Farm HAPs in Denaturant Service		0.615	2.694	0.045	0.280
	Total Tank farm HAPs	**0.618**	**2.708**	**0.045**	**0.282**

Total LDAR HAPs	**0.624**	**2.708**	**0.046**	**0.285**

Appendix A: Emission Calculations
190 proof loadout

Company Name: POET Biorefining - Alexandria, LLC
Source Address: 13179 North 100 East, Alexandria, IN 46001

Tote Fill Capacity	*S	P	M	T	L	Potential to Emit VOC		HAP Fraction
gpm		psia	lb/moles lbs	degree R	lbs/kgal	lb/hr	ton/yr	
25	0.6	0.75	46.07	516	0.50	0.75	**3.29**	0.0006

Equation derived from AP 42 Chapter 5.2 Transportation and Marketing of Petroleum Liquids

Methodology

L (lbs/kgal) = 12.46 x S x P (psia) x M (lb/moles lbs) x 1/T (degree R)

Potential to Emit VOC (lb/hr) = Tote Fill Capacity (gpm) / 1,000 gal x L (lbs/kgal) x 60 min

Potential to Emit VOC (ton/yr) = Potential to Emit VOC (lb/hr) x 8760hr/1yr x 1ton/2000lbs

Potential to Emit HAPs (ton/yr) = Potential to Emit HAPs (ton/yr) x HAP Fraction

Potential to Emit HAPs ton/yr
1.97E-03

Appendix A: Emission Calculations
GHG Emissions

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

Conversion Factors:

1 lb/MMBtu =	1020	Btu/scf	**Emission Factors: IPCC, April 2014**
1Kg	2.2	lb	
1 ton =	2000	lb	
1 year =	8760	hours	

Assumptions:

Generator Operating Time = 500 hr/year

Combustion Emission Factors		
	Natural Gas	Diesel
	kg/MMBtu	kg/gal
CO2	53.06	10.21
CH4	0.001	0.0008
N2O	0.000	0.00026

Global Warming Potential Factor	
CO2	1
CH4	25
N2O	298

1. Green House Gas from Natural Gas Combustion

		CO2	CH4	N2O	CO2e
	MMBtu/hr	tons/yr	tons/yr	tons/yr	tons/yr
Boiler #1	143	73,114	1	0	73,189
Boiler #2	143	73,114	1	0	73,189
Dryer #1	60	30,677	1	0	30,709
Dryer #2	60	30,677	1	0	30,709
RTO	30	15,339	0	0	15,354
Flare	0.55	281	0	0	281
Potential Emission (tons/yr)	436.6	223,202	4.2	0.4	223,432

2. Green House Gas from Diesel Combustion

				CO2	CH4	N2O	CO2e
	kW	HP	gallons	tons/yr	tons/yr	tons/yr	tons/yr
Diesel Generator	2250	3017	88256	991.21	0.08	0.03	1000.669

Methodology

Emission (tons/yr) = Throughput (MMBtu) x Emission Factor (kg/MMBtu*2.2)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential

Appendix A: Emission Calculations
GHG Emissions

Company Name: **POET Biorefining - Alexandria, LLC**
Address City IN Zip: **13179 North 100 East, Alexandria, IN 46001**

3. Green House Gas from Fermentation (Biogenic)

Fermentation Process

Given:
100,000,000 gallons of undenatured (200-proof) EtOH / year
46.06844 [g/mol] mole weight of EtOH
0.789 [g/cm^3] density of liquid EtOH
44.0095 [g/mol] mole weight of CO2

and: $C_6H_{12}O_6$ + yeast = 2 CH_3CH_2OH + 2 CO_2
sugar + yeast = ethanol + carbon dioxide

Therefore:

$$\frac{100{,}000{,}000 \text{ gal 200-proof}}{\text{year}} \times \frac{0.789 \text{ g EtOH}}{1 \text{ cm}^3} \times \frac{3{,}785.41 \text{ cm}^3}{1 \text{ gal}}$$

$$= \frac{2.99\text{E+11 g EtOH}}{\text{year}} \times \frac{1 \text{ mol EtOH}}{46.06844 \text{ g EtOH}}$$

$$= \frac{6{,}483{,}155{,}258 \text{ mol EtOH}}{\text{year}} \times \frac{2 \text{ mol } CO_2}{2 \text{ mol EtOH}}$$

$$= \frac{6{,}483{,}155{,}258 \text{ mol } CO_2}{\text{year}} \times \frac{44.0095 \text{ g } CO_2}{1 \text{ mol } CO_2} \times \frac{1 \text{ ton}}{907{,}184.74 \text{ g}}$$

= 314,512 tons CO_2 / year

Biogenic GHG= 314,512 CO2e Total in tons/yr

Total GHG Emissions (Combustion and Biogenic)			
CO2	**CH4**	**N2O**	**CO2e**
tons/yr	tons/yr	tons/yr	tons/yr
538,705.11	4.28	0.45	538,945.09