FACT SHEET FOR: OP26M1-016 **DATE:** **DRAFT**

DWEE ID: 85814

Name of Source: Valero Albion Plant

Source Classification: Class I at time of issuance
Area Source of Hazardous Air Pollutants (HAPs)

Regulatory changes may supersede information in this document. If the source should add or change equipment or change processes such that a NESHAP or NSPS subpart becomes an applicable requirement, it is the source's obligation to comply with that subpart and applicable requirements whether or not they are identified in the associated permitting action or Title 129. Also note that the NESHAP and NSPS subparts are subject to change. Detailed information related to NESHAP and NSPS subparts can be found on the DWEE Air Toxics Notebook and DWEE NSPS Notebook located on the DWEE website (https://dwee.nebraska.gov/). The DWEE website can also be used to find other permit related and facility specific information that is not identified in this fact sheet.

DESCRIPTION OF THE SOURCE OR ACTIVITY:

This operating permit OP26M1-016, in conjunction with OP24R1-033, approves the operation of an ethanol manufacturing plant producing approximately 165.5 million gallons of denatured ethanol annually.

Valero Renewable Fuels Company, LLC (dba Valero Albion Plant) has not constructed its own grain receiving operations. Instead, Cargill AgHorizon owned by Cargill Incorporated (Cargill) (DWEE ID #01446) provides all the grain necessary for ethanol production. In a determination letter dated June 1, 2018 and labeled *"Common Control Determination"*, DWEE document ID# 20180003922, determined that Valero and Cargill are to be considered separate sources for air permitting purposes.

PERMIT REVISION:

On April 30, 2026, Valero Albion Plant submitted an operating permit modification application OP26M1-016 to incorporate the applicable requirements of Construction Permit CP26-004 issued July 6, 2026. Construction Permit CP26-004 authorized new particulate matter emissions for the grain conveyor baghouse (C-10), hammermill baghouse (C-20), and DDGS storage and loadout baghouse (C-50).

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

The change in emissions for this project is shown in the potential to emit (PTE) table below {pollutants in the facility not listed below did not have any change in PTE}:

Regulated Pollutant	Potential Emissions[1] (tons/year)	Potential Emissions after Revision (tons/year)	Change in Potential Emissions[2] (tons/year)
Particulate Matter (PM)	109.73	115.51	5.78
Particulate Matter less than or equal to 10 microns (PM_{10})	102.47	108.25	5.78
Particulate Matter less than or equal to 2.5 microns ($PM_{2.5}$)	95.71	101.48	5.77
Greenhouse Gases (GHGs)	796,352	770,586	-25,766
Carbon Dioxide Equivalents (CO_2e)	798,098	772,176	-25,922

[1] The potential emissions are from the fact sheet associated with Operating Permit OP24R1-033.
[2] The change in potential emissions calculations were provided in the Air Quality Permit Revision Request Form received on April 30, 2026, and is located in the DWEE's file for this source.

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Title 129, Chapter 9, Section 005 – Significant Permit Revisions

The source requested a significant operating permit revision to its existing operating permit as per Title 129, Chapter 9, Section 005 [1]

> Title 129, Chapter 9, Section 005 A "significant permit revision" is any revision or change to a permit that cannot be accomplished as an administrative permit amendment or as a minor permit revision. Any relaxation in existing monitoring, reporting, or recordkeeping shall be considered significant.
>
> Title 129, Chapter 9, Section 005.01 A source may request a significant permit revision by submitting the application forms and information in accordance with Chapter 6, Section 002 for operating permit revisions or Chapter 3, Section 001.05, for construction permit revisions.
>
> Title 129, Chapter 9, 005.03 For operating permits only, the permit shield described in Chapter 6, Section 003.12, shall apply to a significant permit revision only after the Director approves the permit revision, provided that the permit contains a permit shield.

[1] Section 005.02 is not included because it contains instructions for the DWEE.

Valero Albion Plant complied with all the above applicable requirements when submitting their application for the significant operating permit revision.

SUPPLEMENTAL INFORMATION:

Title 129, Chapter 13, Section 004 – Hazardous Air Pollutants (MACT and T-BACT) [State Enforceable Only]

Valero is subject to State BACT (Best Available Control Technology) as explained in detail in the factsheet for construction permit CP18-062 issued October 7, 2019.

The BACT requirements include the following:

Process	BACT Equipment/Activities
Fermentation	CO_2 Scrubber with 65% control efficiency or emissions of 20 ppmvd for Total HAP
Distillation	Recuperative Thermal Oxidizer System
Ethanol and Denaturant Loadout	Submerged Filling Ethanol Loadout Flare
DDGS Drying	Recuperative Thermal Oxidizer System
Storage Tanks	Tanks are equipped with Internal Floating Roofs
Equipment Leaks	Leak Detection and Repair (LDAR)

No emission units located at Valero are subject to the case-by-case MACT requirements of this section since the controlled emissions from the source are less than ten (10) tons/year of any individual HAP and less than twenty-five (25) tons/year of combined HAPs.

All of the T-BACT equipment/activities listed above are standard in ethanol plants. Please note that these T-BACT conditions are state enforceable only.

Proposed changes to the specific permit requirements of Operating Permit #OP24R1-033 issued on February 28, 2025 made in Significant Operating Permit Revision #OP26M1-016 received on April 30, 2026 are in bold print and underlined, deletions are in ~~strikethrough~~ and the descriptions of changes to permit conditions are in *italics*.

SPECIFIC PERMIT CONDITIONS DISCUSSION:

III. REVISED SPECIFIC PERMIT CONDITIONS:

(A) Specific Conditions for Grain Handling and Hammermilling

(1) Permitted Emission Points:

(a) The following table identifies emission points, emission units, permitted capacities, permitted fuel types, required control equipment the source must operate, and applicable standards at the source at the time of permit issuance, in accordance with operating permit ~~application~~ #OP24R1-033~~, received August 16, 2024~~**issued February 28, 2025**, ~~and~~ construction permit **Construction Permit CP26-004, Condition III.(A)(2) issued July 6, 2026**~~#CP18-062, issued October 7, 2019~~, **and significant operating permit modification application OP26M1-016 submitted April 30, 2026,** including any supporting information received prior to issuance of this permit:

Emission Point ID#:			
Control Equipment ID# and Description	**Emission Unit Description**	**Applicable NSPS Requirements**	**Applicable NESHAP Requirements**
Emission Point ID#: EP-10			
C-10: Grain Conveyor Baghouse, 99% Control Efficiency, installed in 2007	EU-01: Grain Conveyor, 185.6 tons/hr maximum capacity; installed in 2007	None	None
Emission Point ID#: EP-20			
C-20: Hammermill Baghouse, 99% Control Efficiency, installed in 2024	EU-02: Hammermill #1, 185.6 tons/hr maximum capacity; installed in 2007	None	None
	EU-03: Hammermill #2, 185.6 tons/hr maximum capacity; installed in 2007		
	EU-04: Hammermill #3, 185.6 tons/hr maximum capacity; installed in 2007		
	EU-05: Hammermill #4, 185.6 tons/hr maximum capacity; installed in 2007		

(2) Emission Limitations and Testing Requirements:

(a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Performance testing, if required, shall be conducted in accordance with Standard Condition I.(M).

Emission Point ID#: EP-10				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
PM (Filterable)	**0.32**~~0.14~~ lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit CP26-004, Condition III.(A)(2) issued July 6, 2026** ~~Construction Permit CP18-062, Condition III.(A)(2), issued October 7, 2019~~	No
PM_{10}[2]	**0.32**~~0.14~~ lb/hr[1]	Three 1-hour test runs or test method average		No
Opacity	< 20 Percent[3]	6 Minutes	Title 129, Chapter 15, Section 001.04	No
Emission Point ID#: EP-20				
PM (Filterable)	**1.29**~~0.37~~ lb/hr	Three 1-hour test method average	**Construction Permit CP26-004, Condition III.(A)(2) issued July 6, 2026** ~~Construction Permit CP18-062, Condition III.(A)(2), issued October 7, 2019~~	Yes[4]
PM_{10}[2]	**1.29**~~0.37~~ lb/hr	Three 1-hour test method average		Yes[4]
Opacity	< 20 Percent[3]	6 Minutes	Title 129, Chapter 15, Section 001.04	No

[1] Compliance with Conditions III.(A)(3)(b) demonstrates compliance with the PM limitations.
[2] Filterable and Condensable
[3] Compliance with Condition III.(A)(3)(c) demonstrates compliance with the opacity limitation.
[4]Compliance with this limit is demonstrated through testing in accordance with Condition III.(A)(2)(b).

(b) In order to demonstrate compliance with Condition III.(A)(2) ~~and to verify the assumptions used in the permit application #OP24R1-033~~, the source shall conduct a performance test for PM (filterable) and PM_{10} (filterable and condensable) on C-20 hammermill baghouse, emission point, EP-20, while all associated controlled units are operating. The performance test shall be conducted in accordance with Condition I.(M). [~~Title 129,~~ Title 129, Chapter 6, Section 003.13; Title 129, Chapter 15, Section 005.01]

(i) The performance test shall be conducted within one (1) year of permit issuance.

(3) Operational and Monitoring Requirements:

(a) All emissions from the emission units identified in Condition III.(A)(1) shall be controlled as follows: EU-01 shall be controlled by the Grain Conveyor Baghouse (C-10); and EU-02, EU-03, EU-04, and EU-05 shall be controlled by the Hammermill Baghouse (C-20) [Construction Permit **CP26-004, Condition III.(A)(3)(a), issued July 6, 2026**~~CP18-062, Condition III.(A)(3)(a), issued October 7, 2019~~].

(b) Operation and maintenance of each baghouse (C-10 and C-20) shall be in accordance with the following requirements [Construction Permit **CP26-004, Condition III.(A)(3)(b), issued July 6, 2026**~~CP18-062, Condition III.(A)(3)(b), issued October 7, 2019~~]:

(i) The baghouse shall be operated and be controlling emissions at all times when the

associated emission units are in operation.

(ii) The baghouse shall be equipped with an operational pressure differential indicator. Pressure differential indicator readings shall be recorded at least once each day that the associated baghouse is operating.

(iii) Baghouse filter bags are to be inspected and/or replaced as often as necessary to ensure proper operation or more frequently as indicated by pressure differential indicator readings or other indication of bag failure.

(iv) Observations at least once each day during daylight hours of baghouse operation shall be conducted to determine whether there are visible emissions from the stack, leaks, noise, or other indications that corrective action is needed. If corrective action is required, it shall occur immediately.

(c) A source representative shall conduct visible emissions surveys for each emission point, EP-10 and EP-20, on a daily basis. These surveys shall be conducted during daylight hours while each emission unit is operating under normal conditions [Title 129, Chapter 6, Section 003.03; Chapter 15, Section 001.04].

(i) For deviation reporting purposes, visible emissions (excluding water vapor) from any emission point shall be considered a deviation and shall be reported in accordance with Condition II.(A).

(d) The source shall operate **baghouse C-10 in accordance with its respective CAM plan submitted by the source on June 29, 2026, and shall operate baghouse C-20 in accordance with its respective CAM plan submitted by the source on February 3, 2026**~~the hammermill baghouse (C-20) in accordance with the Hammermill Baghouse Compliance Assurance Monitoring (CAM) Plan~~**s**~~, submitted by the source on August 16, 2024.~~ The CAM requirements include, but are not limited to, the following (See Attachment**s** A **and E**) [40 CFR 64.6(c); Title 129, Chapter 6, Section 010]:

(i) CAM requirements for pressure differential indicator:

1. A minimum pressure differential of 0.05 inches of water shall be maintained during operation.
2. Pressure differential is measured across the system.
3. The pressure differential will be recorded a minimum of once per day during operations.

(ii) The source shall comply with the obligations to conduct monitoring and fulfill other obligations as specified in 40 CFR 64.7 and 64.9.

(4) Recordkeeping and Reporting Requirements:

(a) The source shall keep records documenting the date, time, and pressure differential reading for each day the associated baghouse is in operation [Construction Permit **CP26-004, Condition III.(A)(5)(a), issued July 6, 2026**~~CP18-062, Condition III.(A)(5)(a), issued October 7, 2019~~].

(b) The source shall keep filter replacement records including the date the filter replacement occurred and the type of filter installed [Construction Permit **CP26-004, Condition III.(A)(5)(b), issued July 6, 2026**~~CP18-062, Condition III.(A)(5)(b), issued October 7, 2019~~].

(c) The source shall keep records documenting the date, time, observations, and corrective actions taken for each day the associated baghouse is in operation [Construction Permit **CP26-004, Condition III.(A)(5)(c), issued July 6, 2026**~~CP18-062, Condition~~

~~III.(A)(5)(c), issued October 7, 2019~~].

(d) The results of each visible emissions survey for each emission point (EP-10 and EP-20) shall be recorded in a log, which shall include, at a minimum, the following items [Title 129, Chapter 6, Section 003.03; Title 129, Chapter 15, Section 001.04]:

(i) The emission points included in the survey.

(ii) All emission points from which visible emissions occurred (except for water vapor).

(iii) Emission points for which the emission units were not in operation during the survey.

(iv) Each entry shall be dated and initialed by the person conducting the visible emissions survey.

(e) The source shall maintain the following CAM-related records for **baghouse C-10 in accordance with its respective CAM plan submitted by the source on June 29, 2026, and maintain the following CAM-related records for baghouse C-20 in accordance with its respective CAM plan submitted by the source on February 3, 2026.** ~~the hammermill baghouse (C20) in accordance with its respective CAM plan, submitted by the source on August 16, 2024~~. The CAM requirements include, but are not limited to, the following (See attachment**s** A **and E**) [Title 129, Chapter 6, Section 010]:

(i) Records of all excursions.

(ii) Records of all corrective actions taken in response to excursions.

(iii) All reporting and recordkeeping as required by 40 CFR 64.9.

III.(A): Specific Conditions for Grain Handling and Hammermilling

This condition incorporates the revisions requested in construction permit CP26-004into the corresponding operating permit condition: increasing in the pound per hour (lb/hr) permit limitations for particulate matter for the Grain Conveyor Baghouse (C-10) and the Hammermill Baghouse (C-20) based on updated methodology and current operating conditions. The source also proposed to incorporate Compliance Assurance Monitoring (CAM) requirements under EP-10.

III. REVISED SPECIFIC PERMIT CONDITIONS:

(D) Specific Conditions for DDGS Storage, and Loadout

(1) Permitted Emission Points:

(a) The following table identifies emission points, emission units, permitted capacities, permitted fuel types, required control equipment the source must operate, and applicable standards at the source at the time of permit issuance, in accordance with operating permit ~~application~~ #OP24R1-033~~, received August 16, 2024~~**issued February 28, 2025**, ~~and~~ construction permit **Construction Permit CP26-004, Condition III.(A)(2) issued July 6, 2026**~~#CP18-062, issued October 7, 2019~~, **and significant operating permit modification application OP26M1-016 submitted April 30, 2026,** including any supporting information received prior to issuance of this permit:

Emission Point ID#			
Control Equipment ID# and Description	**Emission Unit Description**	**Applicable NSPS Requirements**	**Applicable NESHAP Requirements**
Emission Point ID#: EP-50			
C-50: DDGS Storage and Loadout Baghouse	EU-31: DDGS Storage Silos, installed in 2007	None	None
	EU-32: DDGS Conveyor, installed in 2007		
	EU-33: DDGS Truck and Rail Loadout Spout, installed in 2007		

(2) Emission Limitations and Testing Requirements:

(a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Performance testing, if required, shall be conducted in accordance with Standard Condition I.(M).

Emission Point ID#: EP-50				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
PM (Filterable)	~~0.17~~ **0.39** lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit, CP26-004, Condition III.(D)(2)(a), issued July 6, 2026**~~Construction Permit CP18-062, Condition III.(D)(2), issued October 7, 2019~~	No
PM_{10}	~~0.17~~ **0.39** lb/hr[2]	Three 1-hour test runs or test method average	**Construction Permit, CP26-004, Condition III.(D)(2)(a), issued July 6, 2026**~~Construction Permit CP18-062, Condition III.(D)(2), issued October 7, 2019~~	No
Opacity	< 20 Percent[3]	6 Minutes	Title 129, Chapter 15, Section 001.04	No

[1] Filterable only
[2] Filterable and Condensable
[3] Compliance with Condition III.(D)(3)(d) demonstrates compliance with the Opacity limitation.

(3) Operational and Monitoring Requirements:

(a) All emissions from the emission units identified in Condition III.(D)(1) shall be controlled by pollution control equipment as follows: EU-31, EU-32, and EU-33 shall be controlled by the DDGS Storage and Loadout Baghouse (C-50) [Construction Permit **CP26-004, Condition III.(D)(3)(a), issued July 6, 2026** ~~CP18-062, Condition~~

~~III.(D)(3)(a), issued October 7, 2019~~].

(b) Operation and maintenance of each baghouse shall be in accordance with the following requirements: [Construction Permit **CP26-004, Condition III.(D)(3)(b), issued July 6, 2026**~~CP18-062, Condition III.(D)(3)(b), issued October 7, 2019~~]

(i) The baghouse shall be operated and be controlling emissions at all times when the associated emission units are in operation.

(ii) The baghouse shall be equipped with an operational pressure differential indicator. Pressure differential indicator readings shall be recorded at least once each day that the associated baghouse is operating.

(iii) Baghouse filter bags are to be inspected and/or replaced as often as necessary to ensure proper operation or more frequently as indicated by pressure differential indicator readings or other indication of bag failure.

(iv) Observations at least once each day during daylight hours of baghouse operation shall be conducted to determine whether there are visible emissions from the stack, leaks, noise, or other indications that corrective action is needed. If corrective action is required, it shall occur immediately.

(c) DDGS storage and loadout operations shall be located inside a building [Construction Permit **CP26-004, Condition III.(D)(3)(c), issued July 6, 2026** ~~CP18-062, Condition III.(D)(3)(c), issued October 7, 2019~~].

(d) A source representative shall conduct visible emissions surveys for ~~each~~ emission point EP-50 on a daily basis. These surveys shall be conducted during daylight hours while each emission unit is operating under normal conditions [Title 129, Chapter 6, Section 003.03; Chapter 15, Section 001.04].

(i) For deviation reporting purposes, visible emissions (excluding water vapor) from any emission point shall be considered a deviation and shall be reported in accordance with Condition II.(A).

(e) The source shall operate the DDGS Storage and Loadout Baghouse (C-50) in accordance with the Compliance Assurance Monitoring (CAM) Plan, submitted by the source on June 29, 2026. The CAM requirements include, but are not limited to, the following (See Attachment F) [40 CFR 64.6(c); Title 129, Chapter 6, Section 010]:

(i) CAM requirements for pressure differential indicator:

1. A minimum pressure differential of 0.05 inches of water shall be maintained during operation.

2. Pressure differential is measured across the system.

3. The pressure differential will be recorded a minimum of once per day during operations.

(ii) The source shall comply with the obligations to conduct monitoring and fulfill other obligations as specified in 40 CFR 64.7 and 64.9.

(4) Recordkeeping and Reporting Requirements:

(a) The source shall keep records documenting the date, time, and pressure differential reading for each day the associated baghouse is in operation [Construction Permit **CP26-004, Condition III.(D)(5)(a), issued July 6, 2026** ~~CP18-062, Condition III.(D)(5)(a),~~

~~issued October 7, 2019~~].

(b) The source shall keep filter replacement records including the date the filter replacement occurred and the type of filter installed [Construction Permit **CP26-004, Condition III.(D)(5)(b), issued July 6, 2026** ~~CP18-062, Condition III.(D)(5)(b), issued October 7, 2019~~].

(c) The source shall keep records documenting the date, time, observations, and corrective actions taken for each day the associated baghouse is in operation [Construction Permit **CP26-004, Condition III.(D)(5)(c), issued July 6, 2026** ~~CP18-062, Condition III.(D)(5)(c), issued October 7, 2019~~].

(d) The results of each visible emissions survey for emission point (EP-50) shall be recorded in a log, which shall include, at a minimum, the following items [Title 129, Chapter 6, Section 003.03; Title 129, Chapter 15, Section 001.04]:

(i) The emission points included in the survey.

(ii) All emission points from which visible emissions occurred (except for water vapor).

(iii) Emission points for which the emission units were not in operation during the survey.

(iv) Each entry shall be dated and initialed by the person conducting the visible emissions survey.

(e) The source shall maintain the following CAM-related records for the DDGS Storage and Loadout Baghouse (C-50) in accordance with its respective CAM plan, submitted by the source on June 29, 2026. The CAM requirements include, but are not limited to, the following (See attachment F) [Title 129, Chapter 6, Section 010]:

(i) Records of all excursions.

(ii) Records of all corrective actions taken in response to excursions.

(iii) All reporting and recordkeeping as required by 40 CFR 64.9.

III.(D): Specific Conditions for DDGS Storage, and Loadout

This condition incorporates the revisions requested in construction permit CP26-004 into the corresponding operating permit condition: increasing in the pound per hour (lb/hr) permit limitations for particulate matter for the Distillers' Dried Grains Solubles Storage and Loadout Baghouse (C-50) based on updated methodology and current operating conditions. The source also proposed to incorporate Compliance Assurance Monitoring (CAM) requirements under EP-50.

Attachment E:

Compliance Assurance Monitoring Plan

Grain Conveyor Baghouse Stack (EP-10)

Compliance Assurance Monitoring Plan for Valero Renewable Fuels Company, LLC – dba Valero Albion Plant

EP-10/C-10 – Grain Conveyor Baghouse

I. Background

A. Emissions Unit

Description: EU-01 Grain Conveyor

Facility: Valero Renewable Fuels Company, LLC dba Valero Albion Plant

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.: Nebraska Administrative Code (NAC) Title 129, Chapters 2 and 3

PM/PM_{10} Emission Limit: 0.32 lb/hr

Current Monitoring Requirements:

1) Monitor and record daily differential pressure
2) Perform daily observations of leaks, noise, or other indications that corrective action is necessary.

C. Control Technologies

Fabric Filter Baghouse (C-10)

II. Fabric Filter Control System (EP-10/C-10) Monitoring Approach

A. Indicator

Pressure differential will be used as the performance indicator.

B. Measurement Approach

The key elements of the monitoring approach, including the indicators to be monitored, indicator ranges, and performance criteria are presented in Table 1.

Table 1. Monitoring Approach

I. Indicator	Pressure differential
A. Measurement Approach	Pressure differential across the baghouse is measured with a pressure differential gauge.
II. Indicator Range	An excursion is defined as a pressure differential outside of 0.05 to 6.0 in. H_2O.
A. Corrective Action	Excursions trigger a response per 40 CFR 64.7(d) and reporting and recordkeeping per 40 CFR 64.9.
B. QIP Threshold	An accumulation of excursions outside the indicator range of greater than or equal to 5 percent of total operating time for a reporting period, excluding periods of startup, shutdown, and malfunction.
III. Performance Criteria	

A. Data Representativeness	Pressure differential is measured across the system
B. Verification of Operational Status	N/A
C. QA/QC Practices and Criteria	Calibrate, maintain, and operate instrumentation in accordance with manufacturer's recommendation.
D. Monitoring Frequency	Pressure differential is monitored continuously.
Data Collection Procedure	Pressure differential is manually recorded daily.
Averaging Period	N/A
E. Record Keeping	Maintain for a period of five (5) years records of electronic media and corrective actions taken in response to excursions.
F. Reporting	Number, duration, and cause of any excursion and the corrective action taken.
Frequency	Semiannually

III. Justification

A. Background

PM and PM_{10} emissions from the Grain Conveyor System are controlled by the Grain Conveyor Baghouse.

B. Rationale for Selection of Performance Indicator

Baghouses operate by collecting particulate on porous fabric bags, thus resulting in a pressure differential across the system. The gas stream is passed through the fabric which results in pressure; too much pressure indicates a possible plugging of the system and too little indicates possible bag breakage. Therefore, pressure drop is the best indicator of baghouse performance.

C. Rationale for Selection of Indicator Ranges

Baghouses remove dust from a gas stream by passing the stream through a porous fabric. Particles form a porous cake on the fabric that acts as the filtration device. This porous cake is routinely removed and collected and returned to the process. Baghouses are highly efficient for controlling filterable PM and PM10. Baghouses are subject to failure if they are not properly operated and maintained. An indicator pressure drop of 0.05 to 6 inches of water is recommended to achieve the required control efficiency.

The selected QIP threshold for the pressure differential is greater than or equal to 5 percent of total operating time excluding periods of startup, shutdown, and malfunction during a semi-annual reporting period. If the QIP threshold is exceeded during a semi-annual reporting period, a QIP will be developed and implemented.

Attachment F:

Compliance Assurance Monitoring Plan

DDGS Storage and Loadout Baghouse Stack (EP-50)

Compliance Assurance Monitoring Plan for Valero Renewable Fuels Company, LLC – dba Valero Albion Plant

EP-50/C-50 – DDGS Storage and Loadout

I. Background

A. Emissions Unit

Description: **EU-31 DDGS Storage Silos**
EU-32 DDGS Conveyor
EU-33 DDGS Rail Loadout Spout

Facility: **Valero Renewable Fuels Company, LLC dba Valero Albion Plant**

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.: **Nebraska Administrative Code (NAC) Title 129, Chapter 3**

PM/PM_{10} Emission Limit: **0.39 lb/hr**

Current Monitoring Requirements:

1) **Monitor and record daily differential pressure**
2) **Perform daily observations of leaks, noise, or other indications that corrective action is necessary.**

C. Control Technologies

Fabric Filter Baghouse (C-50)

II. Fabric Filter Control System (EP-50/C-50) Monitoring Approach

A. Indicator

Pressure differential will be used as the performance indicator.

B. Measurement Approach

The key elements of the monitoring approach, including the indicators to be monitored, indicator ranges, and performance criteria are presented in Table 1.

Table 1. Monitoring Approach

I. Indicator	Pressure differential
A. Measurement Approach	Pressure differential across the baghouse is measured with a pressure differential gauge.
II. Indicator Range	An excursion is defined as a pressure differential outside of 0.05 to 6.0 in. H_2O.
A. Corrective Action	Excursions trigger a response per 40 CFR 64.7(d) and reporting and recordkeeping per 40 CFR 64.9.
B. QIP Threshold	An accumulation of excursions outside the indicator range of greater than or equal to 5 percent of total operating time for a reporting period, excluding periods of startup, shutdown, and malfunction.
III. Performance Criteria	
A. Data Representativeness	Pressure differential is measured across the system
B. Verification of Operational Status	N/A
C. QA/QC Practices and Criteria	Calibrate, maintain, and operate instrumentation in accordance with manufacturer's recommendation.
D. Monitoring Frequency	Pressure differential is monitored continuously.
Data Collection Procedure	Pressure differential is manually recorded daily.
Averaging Period	N/A
E. Record Keeping	Maintain for a period of five (5) years records of electronic media and corrective actions taken in response to excursions.
F. Reporting	Number, duration, and cause of any excursion and the corrective action taken.
Frequency	Semiannually

III. Justification

A. Background

PM and PM_{10} emissions from the DDGS Storage and Loadout System are controlled by the DDGS Storage and Loadout Baghouse.

B. Rationale for Selection of Performance Indicator

Baghouses operate by collecting particulate on porous fabric bags, thus resulting in a pressure differential across the system. The gas stream is passed

through the fabric which results in pressure; too much pressure indicates a possible plugging of the system and too little indicates possible bag breakage. Therefore, pressure drop is the best indicator of baghouse performance.

C. Rationale for Selection of Indicator Ranges

Baghouses remove dust from a gas stream by passing the stream through a porous fabric. Particles form a porous cake on the fabric that acts as the filtration device. This porous cake is routinely removed and collected and returned to the process. Baghouses are highly efficient for controlling filterable PM and PM10. Baghouses are subject to failure if they are not properly operated and maintained. An indicator pressure drop of 0.05 to 6 inches of water is recommended to achieve the required control efficiency.

The selected QIP threshold for the pressure differential is greater than or equal to 5 percent of total operating time excluding periods of startup, shutdown, and malfunction during a semi-annual reporting period. If the QIP threshold is exceeded during a semi-annual reporting period, a QIP will be developed and implemented.

Attachment F: Compliance Assurance Monitoring Plan - DDGS Storage and Loadout Baghouse Stack (EP-50)

This attachment incorporates the Compliance Assurance Monitoring (CAM) requirements under EP-50.

STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended September 28, 2022.

Compliance with this permit shall not be a defense to any enforcement action for violation of an ambient air quality standard.

Form 3.0 Sections 3.1, 3.2, 3.4, 3.5, and 3.6 Substitute - Criteria, GHG, and CO_2e Emissions

Source Summary

Process Data

Maximum Capacity (Anhydrous Ethanol Produced)	161,404,891	gallons per year					
Grain to Ethanol Conversion Factor	2.78	gallons of Ethanol per bushel of corn					
Grain Density:	56	lb/bushel for Corn					
Total Grain Required for Ethanol Plant	1,625,661	ton/yr	=	58,059,313	bu/yr	=	185.6 ton/hr

Process or Unit	Pollutants (tons/year)											
	Particulate Matter (PM)	**Particulate Matter (PM_{10})**	**Particulate Matter ($PM_{2.5}$)**	**Sulfur Oxides (SO_x)**	**Nitrogen Oxides (NO_x)**	**Carbon Monoxide (CO)**	**Volatile Organic Compounds (VOC)**	**Carbon Dioxide (CO_2)**	**Methane (CH_4)**	**Nitrous Oxide (N_2O)**	**GHGs (mass basis)**	**GHGs (CO_2e basis)[1]**
Valero Renewable Fuels Company, LLC Emissions (dba Valero Albion Plant); Ethanol Plant												
Grain Conveying and Hammermilling (EP10 & EP20)	7.05	7.05	7.05	-	-	-	-	-	-	-	-	-
Fermentation Scrubber (EP40)	3.15	3.15	3.15	-	-	-	105.12	507,618	-	-	507,618	507,618
TO - DDGS (EP30)	64.08	64.08	64.08	81.47	99.80	97.24	35.92	262,800	5.04	4.82	262,810	264,399
Tanks (EP120 to EP170)	-	-	-	-	-	-	4.41	-	-	-	-	-
Liquid Loadout (EP80)	-	-	-	-	-	-	0.92	-	-	-	-	-
Loadout Vapor Combustion (EP80)	3.26E-03	3.26E-03	3.26E-03	2.58E-04	0.68	3.52	2.36E-03	115.32	0.00	1.05E-03	115.32	115.68
DDGS Cooling and Loadout (EP50, EP70 & FS40)	17.03	17.00	16.99	-	-	-	8.02	-	-	-	-	-
MWDGS Storage and Loadout (EP110)	-	-	-	-	-	-	3.73	-	-	-	-	-
Equipment Leaks (FS30)	-	-	-	-	-	-	54.05	-	-	-	-	-
Cooling Tower (EP100)	24.11	16.88	10.13	-	-	-	-	-	-	-	-	-
Emergency Fire Pump Engine (EP90)	0.08	0.08	0.08	0.08	1.16	0.25	0.09	42.80	1.74E-03	3.47E-04	42.80	42.95
Process Vents	-	-	-	-	-	-	19.09	-	-	-	-	-
Haul Roads (FS10)	15.52	3.10	0.76	-	-	-	-	-	-	-	-	-
Total Source Emissions incl. Fugitives	**131.03**	**111.35**	**102.25**	**81.54**	**101.64**	**101.00**	**231.35**	**770,577**	**5.04**	**4.82**	**770,586**	**772,176**
Total Source Emissions excl. Fugitives	**115.51**	**108.25**	**101.48**	**81.54**	**101.64**	**101.00**	**177.30**	**770,577**	**5.04**	**4.82**	**770,586**	**772,176**

[1] Global Warming Potentials (GWPs) for CO2, CH4, and N2O from 40 CFR 98, Subpart A, Table A-1

Form 3.0 Section 3.1 Substitute - Potential Emissions

Ethanol Process Information

Process Data

Maximum Capacity (Anhydrous Ethanol Produced)	161,404,891	gallons per year			
Grain to Ethanol Conversion Factor	2.78	gallons of Ethanol per bushel of corn			
Grain Density:	56	lb/bushel for Corn			
Total Grain Receiving Throughput:	1,625,661	ton/yr	=	185.6	ton/hr
	1,625,661	ton/yr	=	58,059,313	bu/yr
DDGS produced by a Bushel of Grain	15.5	lb DDGS/bushel of Corn			
Dryer is capable of drying % of MWDGS	100%				
DDGS Generated (10% Moisture)	449,960	ton/yr			
DDGS Generated (Dry Basis)	404,964	ton/yr			
100% MWDGS Generated (55% Moisture)	899,919	ton/yr			
Corn Oil produced by a Bushel of Grain	1.2	lbs of Corn Oil per bushel of corn			

Maximum Production/Throughputs

Product #1: Denatured Ethanol (97.51% Ethanol, 2.49% Denaturant)	165,526,501	gallons/year
Product #2: WDGS	899,919	tons/year
Product #3: DDGS	449,960	tons/year
Product #4: Corn Oil Production	9,094,611	gallons/year
Raw Material #1: Grain	1,625,661	tons/year
Raw Material #2: Denaturant	4,121,610	gallons/year
Raw Material #3: Corrosion Inhibitor (1.3 gallons/ 42000 gallons of denatured ethanol)	5,123	gallons/year
Anhydrous Ethanol Produced	161,404,891	gallons/year

Permitted Limitations

Emergency Fire Water Pump Engine Operating Hours	250.00	hours/year

Additional Information

Maximum amount of DDGS produced	100	ton/hr
Maximum DDGS Loadout	120	ton/hr
Amount of Grain Transported from Cargill	185.6	ton/hr

Form 3.0 Section 3.1 Substitute - Potential Emissions

Grain Conveying and Hammermilling: EP-10 and EP-20

$PM/PM_{10}/PM_{2.5}$ Emissions from Grain Conveying and Hammermilling

Emission Point ID#	Control Equipment ID#	Emission Point Description	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions[1]	
			(C) (lb/hour)	(D) = (C)x8760/2000 (ton/year)
EP-10	CE10	Grain Conveyor Baghouse	0.32	1.38
EP-20	CE20	Hammermill Baghouse	1.29	5.67

[1] $PM/PM_{10}/PM_{2.5}$ emissions are based on the respective stack airflow rate and manufacturer's Emission Statement for particulate matter greater than 2 microns in size.

Total Emissions from Grain Conveying and Hammermilling

Particulate Matter (PM)	7.05	tons/year
Particulate Matter (PM_{10})	7.05	tons/year
Particulate Matter ($PM_{2.5}$)	7.05	tons/year

Form 3.0 Section 3.1 Substitute - Potential Emissions

Fermentation Scrubber: EP-40

Emission Units Routed to the Fermentation Scrubber

Emission Unit ID#	Emission Source
EU23	Fermenter #1
EU24	Fermenter #2
EU25	Fermenter #3
EU26	Fermenter #4
EU27	Fermenter #5
EU28	Fermenter #6
EU29	Fermenter #7
EU30	Beerwell

Anhydrous Ethanol Produced (AEP):	161,404,891	gallons/year
	161.40	MMgal/year
	0.0184	MMgal/hr

Pollutant	(A) Controlled Emission Factor (lb/MMgal AEP)	Potential Controlled Emission Rate[1]		Permit Limitations	
		(B) (lb/hr)	(C) = (B) x 8760 / 2,000 (ton/yr)	lb/hour	ton/year
Particulate Matter (PM/PM_{10})	-	0.72	3.15	0.72	3.15
Particulate Matter ($PM_{2.5}$)[2]	-	0.72	3.15	0.72	3.15
Volatile Organic Compounds (VOC)	-	24.00	105.12	24.00	105.12
Carbon Dioxide (CO_2)[3]	6,290,000	115,895	507,618	-	-
Individual Hazardous Air Pollutants (HAP)					
Acetaldehyde[4]	-	1.00	4.38	2.01	8.80
Acrolein	-	0.43	1.88	N/A	N/A
Formaldehyde	-	0.12	0.53	N/A	N/A
Methanol	-	0.19	0.83	N/A	N/A
Total HAPs	-	1.73	7.58	N/A	N/A

[1] Emission factors are from CP18-062, unless stated elsewhere. PM/PM10 emission factor is based on 99% confidence interval statistical analysis applied to test results from site's previous stack testing that includes total particulate (condensable and filterable). HAPs emission factor is based on stack test results of February 12, 2008 and are considered the average of three test runs.

[2] Assume $PM_{2.5}$ emissions equal PM_{10} and PM for fermentation scrubber

[3] CO_2 emissions have been estimated using an emission factor of 6.29 pounds of CO_2 emitted per gallon of ethanol produced. Emission factor from RTI International's December 14, 2010, draft "Greenhouse Gas Emissions Estimation Methodologies for Biogenic Emissions from Selected Source Categories: Solid Waste Disposal, Wastewater Treatment, Ethanol Fermentation" found on EPA's TTN website on 6/7/11

[4] Acetaldehyde is part of a group limitation in CP17-058, which effectively limits total HAP.

Form 3.0 Section 3.1 Substitute - Potential Emissions

TO/HRSG Stack (100% DDGS Production): EP-30

Emission Units Routed to the two (2) 160.0 MMBtu/hr TO/HRSG

Emission Unit ID#	Emission Source	Emission Unit ID#	Emission Source	Emission Unit ID#	Emission Source
EU06	Mixer	EU15	Yeast Tank #1	EU22	200 Proof Condenser
EU07	Slurry Tank #1	EU16	Yeast Tank #2	EU34	DDGS Dryer #1
EU08	Slurry Tank #2	EU17	Beer Column	EU35	DDGS Dryer #2
EU09	Flash Tank	EU18	Side Stripper	EU36	TO/HRSG #1
EU10	Cook Tubes	EU19	Rectifier Column	EU37	DDGS Dryer #3
EU11	Liquefaction Tank #1	EU20	190 Proof Condenser	EU38	DDGS Dryer #4
EU12	Liquefaction Tank #2	EU21	Molecular Sieve 1-9	EU39	TO/HRSG #2

Process Emissions

Pollutant	Potential Controlled Emission Rate		Permit Limitations	
	(lb/hr)[1]	(ton/yr)[2]	lb/hour	ton/year[2]
Particulate Matter (PM/PM_{10})	14.63	64.08	14.63	64.08
Particulate Matter ($PM_{2.5}$)[3]	14.63	64.08	14.63	64.08
Sulfur Dioxide (SO_2)	18.60	81.47	18.60	81.47
Nitrogen Oxides (NO_x)[4]	32.00	140.16	32.00	99.80
Carbon Monoxide (CO)	22.20	97.24	22.20	97.24
Volatile Organic Compounds (VOC)	8.20	35.92	8.20	35.92
Individual Hazardous Air Pollutants (HAP)				
Acetaldehyde[5]	0.53	2.33	2.01	8.80
Acrolein	0.85	3.72	N/A	N/A
Formaldehyde	0.15	0.66	N/A	N/A
Methanol	0.30	1.31	N/A	N/A
Total HAPs	1.83	8.03	N/A	N/A

[1] Emission factors are from CP18-062, unless stated elsewhere. PM/PM_{10} emission factor is based on 99% confidence interval statistical analysis applied to test results from site's previous stack testing that includes total particulate (condensable and filterable). Acetaldehyde emission factor is based on stack test results of February 11-14, 2008 and are considered the average of three test runs Other Speciated HAPs are based on 99% confidence interval statistically analysis applide to stack test results of October 2-4, 2012.

[2] ton/year = lb/hr x 8,760 (hr/yr) / 2,000 (lb/ton)

[3] Considering $PM_{2.5}$ fraction of total PM as 1.0 from CEIDARS $PM_{2.5}$ emission factor scaling table.

[4] Considering NO_x emission rate of 29.00 lb/hr (= 0.1 lb/MMBtu*160 MMBtu/hr*2); however, Source requested NOx emission rate of 100 tons/yr to ensure that the system remains a minor nested source in regards to PSD applicability.

[5] Acetaldehyde is part of a group limitation in CP17-058, which effectively limits total HAP.

Form 3.0 Section 3.1 Substitute - Potential Emissions

TO/HRSG Stack (100% DDGS Production): EP-30
HAP Combustion Emissions

Natural Gas Combustion Emissions from TO/HRSGs (Two (2) 145.0 MMBtu/hr Units) and Dryers (Four (4) 55.0 MMBtu/hr Units)

Total Heat Input Capacity	510.0	MMBtu/hr		
Heat Content of Natural Gas AP-42, Table 1.4-1, Footnote a	1,020	MMBtu/MMscf		
Potential Natural Gas Throughput	0.50	MMscf/hr =	4380.00	MMscf/yr
Limited Natural Gas Throughput	**No Limit**	MMscf/yr		
Limited Operating Hours	**No Limit**	hr/year		

Pollutant	(A) Emission Factor[1] (lb/MMscf)	(B) = (A) x MMscf/hr Emission Rate (lbs/hr)		(D) = (C)/2000 Emission Rate (tons/year)	
		Potential	Limited	Potential	Limited
Benzene	2.10E-03	1.05E-03	1.05E-03	4.60E-03	4.60E-03
Dichlorobenzene	1.20E-03	6.00E-04	6.00E-04	2.63E-03	2.63E-03
Hexane	1.80	0.90	0.90	3.94	3.94
Lead Compounds	5.00E-04	2.50E-04	2.50E-04	1.10E-03	1.10E-03
Naphthalene	6.10E-04	3.05E-04	3.05E-04	1.34E-03	1.34E-03
Polycyclic Organic Matter (POM)	8.82E-05	4.41E-05	4.41E-05	1.93E-04	1.93E-04
Toluene	3.40E-03	1.70E-03	1.70E-03	7.45E-03	7.45E-03
Arsenic Compounds (ASC)	2.00E-04	1.00E-04	1.00E-04	4.38E-04	4.38E-04
Beryllium Compounds (BEC)	1.20E-05	6.00E-06	6.00E-06	2.63E-05	2.63E-05
Cadmium Compounds (CDC)	1.10E-03	5.50E-04	5.50E-04	2.41E-03	2.41E-03
Chromium Compounds (CRC)	1.40E-03	7.00E-04	7.00E-04	3.07E-03	3.07E-03
Cobalt Compounds (COC)	8.40E-05	4.20E-05	4.20E-05	1.84E-04	1.84E-04
Manganese Compounds (MNC)	3.80E-04	1.90E-04	1.90E-04	8.32E-04	8.32E-04
Mercury Compounds (HGC)	2.60E-04	1.30E-04	1.30E-04	5.69E-04	5.69E-04
Nickel Compounds (NIC)	2.10E-03	1.05E-03	1.05E-03	4.60E-03	4.60E-03
Selenium Compounds (SEC)	2.40E-05	1.20E-05	1.20E-05	5.26E-05	5.26E-05
Total HAPs	1.81	0.91	0.91	3.97	3.97

[1]Emission Factors from AP-42 Tables 1.4-3 and 1.4-4 (7/98)

[2]For Potential Emissions (C) = (B) x 8,760 (hours/year)/2000; For Limited Emissions, if no operational limitations (C) = (B) x 8,760 (hours/year)/2000, if natural gas throughput limitation (C) = Limited Throughput (MMscf/year) x (A) (lb/MMscf), if hourly limitation (C) = Limited Hours (hours/year) x (B)

Greenhouse Gas (GHGs) Emissions

GHGs	(A) Emission Factor[1] (lb/MMscf)	(B) = (A)x MMscf/hr Potential Emission Rate (lbs/hr)	(C) = (B)xOT Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Carbon Dioxide (CO_2)	120,000	60,000	525,600,000	262,800
Methane (CH_4)	2.3	1.1500	10,074	5.04
Nitrous Oxide (N_2O)	2.2	1.1000	9,636	4.82

[1]Emission Factors from AP-42 Table 1.4-2 (7/98)

Form 3.0 Section 3.1 Substitute - Potential Emissions

Process Vents

Annual Throughput of denatured ethanol= **165,526,501** gallons/yr

Emission Point ID#	Uncontrolled Vent	VOC Concentration[1] (lbs/gallon of denatured ethanol)	VOC Emissions (lb/hr)	VOC Emissions (ton/year)
-	Whole Stillage Tank Vent	6.38E-05	1.21	5.28
-	Thin Stillage Tank Vent	5.62E-05	1.06	4.65
-	Syrup Tank Vent	3.80E-05	0.72	3.14
-	Meth Feed/Cook Water Overflow Vent	7.27E-05	1.37	6.01

[1] The VOC emission factors are based upon testing results from similar facilities, accepted by the DWEE for process tank vents air emission assumptions

Total VOC from Vent Emissions: 4.36 lb/hr
19.09 ton/yr

Hazardous Air Pollutant	**HAP Fraction[2]**	**HAP Emissions**	
		(lb/hr)	**(ton/yr)**
Acetaldehyde	6.74E-03	0.03	0.13
Acrolein	2.96E-05	1.29E-04	5.66E-04
Methanol	1.54E-03	6.72E-03	0.03
Total HAP	-	0.04	0.16

[2] The HAP weight fractions are based upon default weight fractions, accepted by the DWEE for process tank vents air emission assumptions

Form 3.0 Section 3.1 Substitute - Potential Emissions

TO/HRSG Stack (100% MWDGS Production): EP-30

Emission Units Routed to the two (2) 160 MMBtu/hr TO/HRSG

Emission Unit ID#	Emission Source	Emission Unit ID#	Emission Source	Emission Unit ID#	Emission Source
EU06	Mixer	EU15	Yeast Tank #1	EU22	200 Proof Condenser
EU07	Slurry Tank #1	EU16	Yeast Tank #2	EU34	DDGS Dryer #1
EU08	Slurry Tank #2	EU17	Beer Column	EU35	DDGS Dryer #2
EU09	Flash Tank	EU18	Side Stripper	EU36	TO/HRSG #1
EU10	Cook Tubes	EU19	Rectifier Column	EU37	DDGS Dryer #3
EU11	Liquefaction Tank #1	EU20	190 Proof Condenser	EU38	DDGS Dryer #4
EU12	Liquefaction Tank #2	EU21	Molecular Sieve	EU39	TO/HRSG #2

Process Emissions

Pollutant	Potential Controlled Emission Rate		Permit Limitations	
	(lb/hr)[1]	(ton/yr)[2]	lb/hour	ton/year[2]
Volatile Organic Compounds (VOC)	8.20	35.92	8.20	35.92
Individual Hazardous Air Pollutants (HAP)				
Acetaldehyde	0.53	2.33	N/A	<8.80
Acrolein	0.85	3.72	N/A	N/A
Formaldehyde	0.15	0.66	N/A	N/A
Methanol	0.30	1.31	N/A	N/A
Total HAPs	1.83	8.03	N/A	N/A

[1]Controlled Emission Rates (lb/hr) provided by the source in application. Based on information provided by the vendor.

[2]ton/year = lb/hr x 8,760 (hr/yr) / 2,000 (lb/ton)

Greenhouse Gas (GHGs) Emissions

GHGs	(A) Emission Factor[1] (lb/MMscf)	(B) = (A)x MMscf/hr Potential Emission Rate (lbs/hr)	(C) = (B)xOT Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Carbon Dioxide (CO_2)	120,000	47,059	412,235,294	206,118
Methane (CH_4)	2.3	0.9020	7,901	3.95
Nitrous Oxide (N_2O)	2.2	0.8627	7,558	3.78

[1]Emission Factors from AP-42 Table 1.4-2 (7/98)

Form 3.0 Section 3.1 Substitute - Potential Emissions

TO/HRSG Stack (100% MWDGS Production): EP-30
HAP Combustion Emissions

Natural Gas Combustion Emissions from TO/HRSGs (Two (2) 160.0 MMBtu/hr Units) and Dryers (Two (2) 55.0 MMBtu/hr Units)

Total Heat Input Capacity	400.0	MMBtu/hr		
Heat Content of Natural Gas AP-42, Table 1.4-1, Footnote a	1,020	MMBtu/MMscf		
Potential Natural Gas Throughput	0.39	MMscf/hr =	3435.29	MMscf/yr
Limited Natural Gas Throughput	**No Limit**	MMscf/yr		
Limited Operating Hours	**No Limit**	hr/year		

Pollutant	(A) Emission Factor[1] (lb/MMscf)	(B) = (A) x MMscf/hr Emission Rate (lbs/hr)		(C) = (B)/2000 Emission Rate[2] (tons/year)	
		Potential	Limited	Potential	Limited
Particulate Matter (PM/PM_{10})	7.6	2.98	2.98	13.05	13.05
Particulate Matter ($PM_{2.5}$)	7.6	2.98	2.98	13.05	13.05
Sulfur Dioxide (SO_2)	0.6	0.24	0.24	1.03	1.03
Nitrogen Oxides (NO_x)[3]	0.041	16.40	16.40	71.83	71.83
Carbon Monoxide (CO)	84	32.94	32.94	144.28	144.28
Individual Hazardous Air Pollutants (HAP)					
Benzene	2.10E-03	8.24E-04	8.24E-04	3.61E-03	3.61E-03
Dichlorobenzene	1.20E-03	4.71E-04	4.71E-04	2.06E-03	2.06E-03
Hexane	1.80	0.71	0.71	3.09	3.09
Lead Compounds	5.00E-04	1.96E-04	1.96E-04	8.59E-04	8.59E-04
Naphthalene	6.10E-04	2.39E-04	2.39E-04	1.05E-03	1.05E-03
Polycyclic Organic Matter (POM)	8.82E-05	3.46E-05	3.46E-05	1.51E-04	1.51E-04
Toluene	3.40E-03	1.33E-03	1.33E-03	5.84E-03	5.84E-03
Arsenic Compounds (ASC)	2.00E-04	7.84E-05	7.84E-05	3.44E-04	3.44E-04
Beryllium Compounds (BEC)	1.20E-05	4.71E-06	4.71E-06	2.06E-05	2.06E-05
Cadmium Compounds (CDC)	1.10E-03	4.31E-04	4.31E-04	1.89E-03	1.89E-03
Chromium Compounds (CRC)	1.40E-03	5.49E-04	5.49E-04	2.40E-03	2.40E-03
Cobalt Compounds (COC)	8.40E-05	3.29E-05	3.29E-05	1.44E-04	1.44E-04
Manganese Compounds (MNC)	3.80E-04	1.49E-04	1.49E-04	6.53E-04	6.53E-04
Mercury Compounds (HGC)	2.60E-04	1.02E-04	1.02E-04	4.47E-04	4.47E-04
Nickel Compounds (NIC)	2.10E-03	8.24E-04	8.24E-04	3.61E-03	3.61E-03
Selenium Compounds (SEC)	2.40E-05	9.41E-06	9.41E-06	4.12E-05	4.12E-05
Total HAPs	1.81	0.71	0.71	3.11	3.11

[1]Emission Factors from AP-42 Tables 1.4-3 and 1.4-4 (7/98)

[2]For Potential Emissions (C) = (B) x 8,760 (hrs/yr)/2000; For Limited Emissions, if no operational limitations (C) = (B) x 8,760 (hrs/yr)/2000, if natural gas throughput limitation (C) = Limited Throughput (MMscf/yr) x (A) (lb/MMscf)/2000, if hourly limitation (C) = Limited Hours (hrs/yr) x (B)/2000

[3]NO_x Emission Factor provided by source in application, based on vendor information, and in units of lb/MMBtu

Form 3.0 Section 3.1 Substitute - Potential Emissions

DDGS Storage and Loadout: EP-50, EP-70, and FS40

PM/PM_{10} Emissions from DDGS Cooling, Storage, and Loadout

Emission Point ID#	Control Equipment ID#	Emission Point Description	Controlled $PM/PM_{10}/PM_{2.5}$ Emissions	
			(C) (lb/hour)[1]	(D) = (C) x 8760 / 2000 (ton/year)
EP70[1]	C74	DDGS Cooling Drum Baghouse	3.49	15.29
EP50[2]	C50	DDGS Storage and Loadout Baghouse	0.39	1.71

[1] Emission factors are from CP18-062, unless stated elsewhere. Assumes $PM_{2.5}$ emissions equal PM_{10} and PM for baghouses

[2] PM/PM10/PM2.5 emissions are based on the respective stack airflow rate and manufacturer's Emission Statement for particulate matter greater than 2 microns in size.

PM Fugitive Emissions from DDGS Storage and Loadout

Emission Point ID#	Emission Point Description	(A) Hourly Throughput	(B) Annual Throughput	(C) Percent Uncaptured[1]	Emission Factors[2] (lbs/ton)	PM Emissions	
		(tons/hour)	(tons/year)		(D) PM	(E)=(A)x(C)x(D) (lbs/hr)	(F)=(A)x(C)x(D)/2000 (tons/yr)
FS40	DDGS Loadout	120	449,960	5%	3.30E-03	1.98E-02	3.71E-02

PM_{10} Fugitive Emissions from DDGS Storage and Loadout

Emission Point ID#	Emission Point Description	(A) Hourly Throughput	(B) Annual Throughput	(C) Percent Fugitives[1]	Emission Factors[2] (lbs/ton)	PM_{10} Emissions	
		(tons/hour)	(tons/year)		(D) PM_{10}	(E)=(B)x(C)x(D) (lbs/hr)	(F)=(B)x(C)x(D)/2000 (tons/yr)
FS40	DDGS Loadout	120	449,960	5%	8.00E-04	4.80E-03	9.00E-03

$PM_{2.5}$ Fugitive Emissions from DDGS Storage and Loadout

Emission Point ID#	Emission Point Description	(A) Hourly Throughput	(B) Annual Throughput	(C) Percent Fugitives[1]	Emission Factors[2] (lbs/ton)	$PM_{2.5}$ Emissions	
		(tons/hour)	(tons/year)		(D) $PM_{2.5}$	(E)=(A)x(C)x(F) (lbs/hr)	(L)=(B)x(C)x(D)/2000 (tons/yr)
FS40	DDGS Loadout	120	449,960	5%	3.30E-05	1.98E-04	3.71E-04

[1]DWEE Standard value for uncaptured emissions loading in an enclosure.

[2]Emission Factors are from AP-42 Section 9.9.1 (5/2003). Considering $PM_{2.5}$ fraction of total PM as 0.01 from CEIDARS PM2.5 emission factor scaling table.

Form 3.0 Section 3.1 Substitute - Potential Emissions

DDGS Storage and Loadout: EP-50, EP-70, and FS40
VOC and HAP Emissions from DDGS Cooling

Maximum Amount of DDGS Produced:	449,960	tons DDGS/year
	51.37	tons DDGS/hour

Pollutant	Emission Rate[1] (A) (lb/hr)	(B) = (A) x 8760/2000 (ton/yr)
Volatile Organic Compounds (VOC)	1.83	8.02
Individual Hazardous Air Pollutants (HAP)		
Acetaldehyde	0.19	0.85
Acrolein	0.28	1.24
Formaldehyde	1.87E-02	8.18E-02
Methanol	9.33E-02	0.41
Total HAPs	0.59	2.58

[1]VOC emission rate is from CP07-0037 issued on May 16, 2008
HAPs emission rate is based on the stack test results of February 12, 2008 (Considered the average of the three test run).

Total Emissions from DDGS Cooling, Storage, and Loadout (EP70, EP50, FS40)

Pollutant	Emission Rates	
	lb/hr	tons/year
Particulate Matter (PM)	3.90	17.03
Particulate Matter (PM_{10})	3.88	17.00
Particulate Matter ($PM_{2.5}$)	3.88	16.99
Volatile Organic Compounds (VOC)	1.83	8.02
Individual Hazardous Air Pollutants (HAP)		
Acetaldehyde	0.19	0.85
Acrolein	0.28	1.24
Formaldehyde	1.87E-02	8.18E-02
Methanol	9.33E-02	0.41
Total HAPs	0.59	2.58

Form 3.0 Section 3.1 Substitute - Potential Emissions

Tanks: TK001, TK002, TK003, TK004, TK005, and TK006

Liquid Throughputs

Anhydrous Ethanol Produced:	161,404,891	gallons/year
Denaturant Usage:	4,121,610	gallons/year
Denatured Ethanol Produced:	165,526,501	gallons/year
Corrosion Inhibitor	5,123	gallons/year
Corn Oil Production	9,094,611	gallons/year

Storage Tanks VOC Emission Summary

Tank ID#	Product Stored	Tank Capacity	Throughput	Turnovers	VOC[1]	Amount of VOC from Ethanol[1]	Amount of VOC from Denaturant[1]
		(gallons)	(gallons/year)		(lbs/yr)	(lbs/yr)	(lbs/yr)
TK001	Ethanol Product	1,447,000	80,705,007	56	752.80	752.80	-
TK002	Ethanol Product	1,447,000	80,705,007	56	752.80	752.80	-
TK003	200-Proof Ethanol	188,000	161,404,891	859	1,305.93	1,305.93	-
TK004	Denaturant	188,000	4,121,610	22	4,310.12	-	4,310.12
TK005	190-Proof Ethanol	188,000	169,899,885	904	1,363.07	1,363.07	-
TK006	Corrosion Inhibitor	2,185	5,123	2	13.27	-	-
Gas Tank	Unleaded Gasoline	1,000	1,376	1	316.10	-	-

[1]VOC emissions calculated by using Tamura Environmental Tank Emissions Spreadsheet v4.2.2.0

Total VOC Emissions **8814.09** **lb/yr**
4.41 **ton/yr**

Storage Tanks HAP Emission Summary

Material	Hazardous Air Pollutant	HAP Fraction	HAPs from Individual Tanks (lbs/yr)							Total Individual HAPs	Total Individual HAPs
			TK001	TK002	TK003	TK004	TK005	TK006	Gas Tank	lb/year	tons/yr
Anhydrous Ethanol	Acetaldehyde	2.00E-04	0.15	0.15	0.26	-	0.27	-	-	0.83	4.17E-04
	Methanol	2.00E-04	0.15	0.15	0.26	-	0.27	-	-	0.83	4.17E-04
Denaturant[1]	Benzene	7.69E-03	-	-	-	33.14	-	-	-	33.14	1.66E-02
	Ethyl Benzene	5.30E-03	-	-	-	22.84	-	-	-	22.84	1.14E-02
	1,2,4-Trimethylbenzene	1.40E-04	-	-	-	0.60	-	-	-	0.60	3.02E-04
	n-Hexane	9.45E-02	-	-	-	407.39	-	-	-	407.39	0.20
	Toluene	8.52E-03	-	-	-	36.72	-	-	-	36.72	1.84E-02
	Xylenes	5.90E-04	-	-	-	2.54	-	-	-	2.54	1.27E-03
Corrosion Inhibitor	Methanol	4.50E-01	-	-	-	-	-	5.97	-	5.97	2.99E-03
Unleaded Gasoline[2]	Benzene	5.00E-02	-	-	-	-	-	-	15.80	15.80	7.90E-03
	Cumene	5.00E-02	-	-	-	-	-	-	15.80	15.80	7.90E-03
	Ethyl Benzene	5.00E-02	-	-	-	-	-	-	15.80	15.80	7.90E-03
	1,2,4-Trimethylbenzene	6.00E-02	-	-	-	-	-	-	18.97	18.97	9.48E-03
	n-Hexane	3.00E-02	-	-	-	-	-	-	9.48	9.48	4.74E-03
	Toluene	3.00E-01	-	-	-	-	-	-	94.83	94.83	4.74E-02
	Xylenes	2.50E-01	-	-	-	-	-	-	79.02	79.02	3.95E-02
								Total HAPs from Storage Tanks:		760.61	0.38

[1] Denaturant HAP fractions from Facility monthly analytical results

[2] Unleaded Gasoline HAP fractions from Valero Unleaded Gasoline MSDS - June 30, 2020

Form 3.0 Section 3.1 Substitute - Potential Emissions

Ethanol Liquid Loadout: EP-80

Anhydrous Ethanol Loading Rate:	161.40	MMgal/yr
Denaturant Loading Rate:	4.12	MMgal/yr
Corrosion Inhibitor Loading Rate:	5.12E-03	MMgal/yr
Denatured Ethanol Loading Rate:	165.53	MMgal/yr

Vapor Recovery Control Efficiency provided in Application

	Rail loadout
Capture efficiency:	99.0%
Control efficiency:	98.0%
Overall control efficiency:	97.02%

Material Physical Data

	Ethanol	Denaturant (Natural Gasoline)	Corrosion Inhibitor
Molecular weight (M, lbs/lbs-mole)	46.1	66	32.04
Temperature (T, deg R)[1]	509.92	509.69	509.92
Vapor pressure (P, psia)[2]	0.4673	5.7448	1.0536
Liquid molecular weight (ML)	46.07	92	32.04
Density (D, lb/gal)	6.6	5.6	7.7
Liquid Mole Fraction (X)[3]	0.99	1.07E-02	5.27E-05

[1]Temperatures from Tamura v4.2.2.0, average ambient temperature for Grand Island, NE

[2]Vapor pressures for gasoline (RVP-13) and ethanol obtained from Tamura v4.2.2.0 using annual average temperature for Grand Island, NE
Vapor pressure for natural gasoline assumed equal to that of gasoline

[3]Liquid Mole Fraction (X) was calculated as follows, where V = loading rate:

$$X = \frac{\left(\frac{D*V}{ML}\right)}{\left(\frac{D_{ethanol}*V_{ethanol}}{ML_{ethanol}}\right)+\left(\frac{D_{denaturant}*V_{denaturant}}{ML_{denaturant}}\right)+\left(\frac{D_{corrosion\_inhibitor}*V_{corrosion\_inhibitor}}{ML_{corrosion\_inhibitor}}\right)}$$

Hazardous Air Pollutant Weight Fractions

Individual HAPs	Weight Fraction of VOC Emissions		
	Ethanol	Denaturant	Corrosion Inhibitor
Acetaldehyde	2.00E-04	N/A	N/A
Benzene	N/A	7.69E-03	N/A
Cumene	N/A	N/A	N/A
Ethyl benzene	N/A	5.30E-03	N/A
1,2,4-Trimethylbenzene	N/A	1.40E-04	N/A
n-Hexane	N/A	9.45E-02	N/A
Methanol	2.00E-04	N/A	0.45
Toluene	N/A	8.52E-03	N/A
Xylene	N/A	5.90E-04	N/A
Total HAPs	4.00E-04	0.12	0.45

Saturation Factors

$S_{\text{normal dedicated, submerged loading}}$	0.6	Saturation factor

Rail loadout is assumed to be in dedicated railcars, which previous load was denatured ethanol.
All ethanol loadout is assumed to be denatured ethanol, which is worst case for VOC/HAP emissions.

Form 3.0 Section 3.1 Substitute - Potential Emissions

Ethanol Liquid Loadout: EP-80

VOC Emissions

Denatured Ethanol Emission Factor Calculations

	Railcar Loadout Uncontrolled Emission Factor (lbs VOC/Mgal)	Railcar Loadout Controlled Emission Factor (lbs VOC/Mgal)
$EF_{ethanol}$	0.31	9.32E-03
$EF_{denaturant}$	5.97E-02	1.78E-03
$Ef_{corrosion\ inhibitor}$	2.61E-05	7.77E-07
EF_{VOC}	0.37	1.11E-02

VOC emission factor equation from AP-42, Section 5.2.2 - Loading Losses (1/1995)
EF = 12.46*S*P*M/T*(1-eff/100)*X = lbs/Mgal per component

Form 3.0 Section 3.1 Substitute - Potential Emissions

Ethanol Liquid Loadout: EP-80

Form 3.0 Section 3.1 Substitute - Potential Emissions

Ethanol Liquid Loadout: EP-80

Total VOC Emission Calculations from Denatured Ethanol Loadout

Loadout Type/Material	(A) Denatured Ethanol Loaded Out (Mgal/year)	(B) Uncontrolled Emission Factor (lbs VOC/Mgal)	(C)=(A)x(B)/2000 Total Uncontrolled VOC Emissions (tons/year)	(D) Capture Efficiency (%)	(E)=(C)*(D) Captured VOC Emissions (tons/year)	(F)=(C)-(E) Uncaptured VOC Emissions (tons/year)	(G) Control Efficiency (%)	(H)=(E)x[1-(G)] Captured and Controlled VOC Emissions (tons/year)	(I)=(F)+(H) Total VOC Emissions
100% Loadout By Rail			**30.82**		30.51	**0.31**		**0.6102**	**0.92**
Rail Loadout									
Ethanol	165,527	0.31	25.88	99.0%	25.62	0.26	98.0%	0.51	0.77
Denaturant		5.97E-02	4.94	99.0%	4.89	4.94E-02	98.0%	9.78E-02	0.15
Corrosion Inhibitor		2.61E-05	2.16E-03	99.0%	2.14E-03	2.16E-05	98.0%	4.27E-05	6.43E-05

Controlled Hazardous Air Pollutant Emissions assuming 100% Rail Loadout

Hazardous Air Pollutant	Rail Loadout (ton/yr)			Maximum Controlled HAP Emissions (tons/year)
	Ethanol	Denaturant	Corrosion Inhibitor	
Acetaldehyde	1.54E-04	N/A	N/A	1.54E-04
Benzene	N/A	1.13E-03	N/A	1.13E-03
Ethyl benzene	N/A	7.80E-04	N/A	7.80E-04
1,2,4-Trimethylbenzene	N/A	2.06E-05	N/A	2.06E-05
n-Hexane	N/A	1.39E-02	N/A	0.01
Methanol	1.54E-04	N/A	2.89E-05	1.83E-04
Toluene	N/A	1.25E-03	N/A	1.25E-03
Xylene	N/A	8.69E-05	N/A	8.69E-05
Total HAPs	3.08E-04	1.72E-02	2.89E-05	0.02

Total Emissions from Denatured Ethanol Loadout

Pollutant	Ethanol Loadout Emissions (tons/year)
Volatile Organic Compounds (VOC)	0.92
Individual HAPs	
Acetaldehyde	1.54E-04
Benzene	1.13E-03
Ethyl benzene	7.80E-04
1,2,4-Trimethylbenzene	2.06E-05
n-Hexane	1.39E-02
Methanol	1.83E-04
Toluene	1.25E-03
Xylene	8.69E-05
Total HAPs	0.02

Form 3.0 Section 3.1 Substitute - Potential Emissions

Loadout Vapor Combustion Unit: EP-80

Flaring Emissions

(A) Denatured Ethanol Loaded Out	165,526,501	gallons/year
(B) Conversion Factor	0.1337	cfm/gallon
(C) Heating Value of Gas	850	Btu/cfm
(D) Annual Heat Input to Flare	18,811.26	MMBtu/year
(D) = (A) x (B) x (C) / 1,000,000		
Flare Heat Input Capacity	6.4	MMBtu/hr
Operating Time	8,760	hr/yr

Pollutant	(E) Emission Factor (lb/MMBtu)	(F) = (E)x MMBtu/hr Potential Emission Rate (lbs/hr)	(G) = (D)x(E) Potential Emission Rate (lbs/year)	(H) = (G)/2000 Potential Emission Rate (tons/year)
Nitrogen Oxides (NO_x)	0.068	0.44	1279.17	0.64
Carbon Monoxide (CO)	0.37	2.37	6960.17	3.48
Volatile Organic Compounds (VOC)	VOCs accounted for in Liquid Loadout			

[1]Emission Factors for Waste Gas from AP-42 Tables 13.5-1 and 13.5-2 (9/91) in lb/MMBtu

Greenhouse Gas Emissions	VOC Emissions Combusted[1]	High Heat Value (HHV)[2]	Emission Factor[2]			Emissions		
			CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
Rail Loadout	(tons/year)	(MMBtu/lb)	(lb/MMBtu)	(lb/MMBtu)	(lb/MMBtu)	(tons/yr)	(tons/yr)	(tons/yr)
Ethanol	25.62	0.0127	150.88	0.0024	0.00024	49.20	7.91E-04	7.91E-05
Denaturant	4.89	0.0202	147.45	0.0022	0.00022	14.59	2.18E-04	2.18E-05
Corrosion Inhibitor[3]	2.14E-03	0.0109	150.88	0.0024	0.00024	3.52E-03	5.65E-08	5.65E-09
TOTAL						**63.79**	**1.01E-03**	**1.01E-04**

[1] The maximum amount of vapors combusted is based on the maximum amount of ethanol that can be loaded out by rail as shown in the liquid loadout tab

[2] From 40 CFR 98, Subpart C, Tables C-1 and C-2

[3]Corrsion Inhibitor assumed to be similar to Ethanol based upon 40 CFR 98, Subpart MM.

Form 3.0 Section 3.1 Substitute - Potential Emissions

Loadout Vapor Combustion Unit: EP-80

Pilot Emissions

Total Heat Input Capacity of Pilot	0.1	MMBtu/hr
Heating Value	1,020	Btu/scf
Operating Time	8,760	hr/yr
Total Natural Gas Usage	0.0001	MMscf/hr

Pollutant	(A) Emission Factor[1] (lb/MMscf)	(B) = (A)x MMscf/hr Potential Emission Rate (lbs/hr)	(C) = (B)xOT Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Particulate Matter (PM/PM_{10})	7.6	0.0007	6.5271	0.0033
Particulate Matter ($PM_{2.5}$)	7.6	0.0007	6.5271	0.0033
Sulfur Dioxide (SO_2)	0.6	0.0001	0.5153	0.0003
Nitrogen Oxides (NO_x)	100	0.0098	85.8824	0.0429
Carbon Monoxide (CO)	84	0.0082	72.1412	0.0361
Volatile Organic Compounds (VOC)	5.5	0.0005	4.7235	0.0024
Greenhouse Gas Emissions (GHGs)				
Carbon Dioxide (CO_2)	120,000	11.7647	103,059	51.53
Methane (CH_4)	2.3	0.0002	2	9.88E-04
Nitrous Oxide (N_2O)	2.2	0.0002	2	9.45E-04
Individual Hazardous Air Pollutants (HAP)				
Benzene	2.10E-03	2.06E-07	1.80E-03	9.02E-07
Dichlorobenzene	1.20E-03	1.18E-07	1.03E-03	5.15E-07
Formaldehyde	7.50E-02	7.35E-06	6.44E-02	3.22E-05
Hexane	1.8	1.76E-04	1.55	7.73E-04
Lead Compounds	5.00E-04	4.90E-08	4.29E-04	2.15E-07
Naphthalene	6.10E-04	5.98E-08	5.24E-04	2.62E-07
Polycyclic Organic Matter (POM)	8.82E-05	8.65E-09	7.57E-05	3.79E-08
Toluene	3.40E-03	3.33E-07	2.92E-03	1.46E-06
Arsenic Compounds (ASC)	2.00E-04	1.96E-08	1.72E-04	8.59E-08
Beryllium Compounds (BEC)	1.20E-05	1.18E-09	1.03E-05	5.15E-09
Cadmium Compounds (CDC)	1.10E-03	1.08E-07	9.45E-04	4.72E-07
Chromium Compounds (CRC)	1.40E-03	1.37E-07	1.20E-03	6.01E-07
Cobalt Compounds (COC)	8.40E-05	8.24E-09	7.21E-05	3.61E-08
Manganese Compounds (MNC)	3.80E-04	3.73E-08	3.26E-04	1.63E-07
Mercury Compounds (HGC)	2.60E-04	2.55E-08	2.23E-04	1.12E-07
Nickel Compounds (NIC)	2.10E-03	2.06E-07	1.80E-03	9.02E-07
Selenium Compounds (SEC)	2.40E-05	2.35E-09	2.06E-05	1.03E-08
Total HAPs	-	1.85E-04	1.62	8.11E-04

[1]Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98).

Form 3.0 Section 3.1 Substitute - Potential Emissions

Loadout Vapor Combustion Unit: EP-80
Total Loadout Vapor Combustion Unit Emissions

Pollutant	Total Potential Emission Rate (lb/hr)	Total Potential Emission Rate (tons/year)
Particulate Matter (PM/PM_{10})	7.45E-04	3.26E-03
Particulate Matter ($PM_{2.5}$)	7.45E-04	3.26E-03
Sulfur Dioxide (SO_2)	5.88E-05	2.58E-04
Nitrogen Oxides (NO_x)	0.16	0.68
Carbon Monoxide (CO)	0.80	3.52
Volatile Organic Compounds (VOC)	5.39E-04	2.36E-03
Greenhouse Gas Emissions (GHGs)		
Carbon Dioxide (CO_2)	26.33	115.32
Methane (CH_4)	4.56E-04	2.00E-03
Nitrous Oxide (N_2O)	2.39E-04	1.05E-03
Individual Hazardous Air Pollutants (HAP)		
Benzene	2.06E-07	9.02E-07
Dichlorobenzene	1.18E-07	5.15E-07
Formaldehyde	7.35E-06	3.22E-05
Hexane	1.76E-04	7.73E-04
Lead Compounds	4.90E-08	2.15E-07
Naphthalene	5.98E-08	2.62E-07
Polycyclic Organic Matter (POM)	8.65E-09	3.79E-08
Toluene	3.33E-07	1.46E-06
Arsenic Compounds (ASC)	1.96E-08	8.59E-08
Beryllium Compounds (BEC)	1.18E-09	5.15E-09
Cadmium Compounds (CDC)	1.08E-07	4.72E-07
Chromium Compounds (CRC)	1.37E-07	6.01E-07
Cobalt Compounds (COC)	8.24E-09	3.61E-08
Manganese Compounds (MNC)	3.73E-08	1.63E-07
Mercury Compounds (HGC)	2.55E-08	1.12E-07
Nickel Compounds (NIC)	2.06E-07	9.02E-07
Selenium Compounds (SEC)	2.35E-09	1.03E-08
Total HAPs	1.85E-04	8.11E-04

Form 3.0 Section 3.1 Substitute - Potential Emissions

MWDGS Loadout: EP-110

Maximum amount of WDGS produced	899,919	tons/year
	102.73	tons/hour

Pollutant	(A) Emission Factor[1] (lb/ton WDGS)	Potential Emission Rate	
		(B) = (A) x ton WDGS/hr (lb/hr)	(C) = (B) x 8760/2000 (ton/yr)
Volatile Organic Compounds (VOC)	8.30E-03	0.85	3.73
Individual Hazardous Air Pollutants (HAP)			
Acetaldehyde	1.11E-04	1.14E-02	4.99E-02
Acrolein	1.67E-05	1.72E-03	7.51E-03
Formaldehyde	2.22E-04	2.28E-02	9.99E-02
Methanol	4.44E-05	4.56E-03	2.00E-02
Total HAPs	-	4.05E-02	1.77E-01

[1]Emission Factors based on November 2, 2004 emissions testing at DENCO, LLC in Morris, MN

Form 3.0 Section 3.1 Substitute - Potential Emissions

Cooling Tower: EP-100

Circulation rate:	3,300,000	gal/hr
	28,908,000	Mgal/yr (based on 8,760 hrs/yr)
Drift loss percent:	0.005	%
Water density:	8.34	lbs/gal
TDS concentration:	4,000	ppm single sample event
	4,000	ppm average annual rate

Emission Factor Calculation for PM and PM_{10}

Emission factor equation from AP-42, Section 13.4-2 (01/1995)

$$\text{PM emission factor} = \left(\frac{ppmTDS}{1{,}000{,}000\,lbswater}\right)\left(\frac{8.34\,lbs}{gal}\,water\right)\left(\frac{1{,}000\,gal}{1Mgal}\right)\left(\frac{0.005}{100}\,driftloss\right)$$

PM emission factor =	0.001668	lbs/Mgal single sample event (highest hourly rate)
PM emission factor =	0.001668	lbs/Mgal average annual rate

Hourly Emissions = (lbs/Mgal single sample event)(hourly throughput gal/hr)(1 Mgal/1,000 gal)
Annual Emissions = (lbs/Mgal average annual rate)(annual throughput Mgal/yr)/(2,000 lbs/ton)

Cooling Tower Emission Summary

Pollutant	Hourly PTE (lbs/hr)	Annual PTE (tons/year)
PM	5.50	24.11
PM_{10} [1]	3.85	16.88
$PM_{2.5}$ [2]	2.31	10.13

PM_{10} and $PM_{2.5}$ emissions estimated to be 70% and 42% (respectively) of total PM emissions based on Appendix A to *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology* published by the South Coast Air Quality Management District

Form 3.0 Section 3.1 Substitute - Potential Emissions

Equipment Leaks: FS-30

Potential to Emit from leaking Ethanol via Equipment Leaks

Type of Component	Plant Area		
	Fermentation	Distillation	Tank Farm/Loadout
	(A) Percent TOC in Plant Area		
	15%	82%	100%
	(B) Number of Components		
Valves (Gas/Vapor)	0	201	9
Valves (Light Liquid)	199	308	264
Pumps (Light Liquid)	12	11	10
Compressor Seals (Gas/Vapor)	0	0	0
Pressure Relief Valves (Light Liquid)	0	0	13
Pressure Relief Valves (Gas/Vapor)	0	34	1
Sampling Connections	0	0	0
Open-ended Lines	0	0	0
Flanges[1]	460	1086	682

[1] Flange counts estimated using Valero Hartley comparative data for connectors in LeakDas, as the facility has similar component counts

Fermentation and Distillation Equipment Leaks Calculations

Type of Component	Total Number of Components	(C) Leaking Emission Factor (kg/hr/source)	VOC Uncontrolled Emissions		(F) LDAR (cont.eff. %)	VOC Controlled Emissions	
			(D) = SUM[(A)x(B)x(C)]x2.21 (lb/hr)	(E) = (D)x8760/2000 (ton/year)		(G) = (D)x[1-(F)] (lb/hr)	(H) = (E)x[1-(F)] (ton/year)
Valves (Gas/Vapor)	201	5.97E-03	2.17	9.52	67%	0.72	3.14
Valves (Light Liquid)	507	4.03E-03	2.52	11.02	61%	0.98	4.30
Pumps (Light Liquid)	23	1.99E-02	0.48	2.08	69%	0.15	0.65
Compressor Seals (Gas/Vapor)	0	0.23	0.00	0.00	0%	0.00	0.00
Pressure Relief Valves (Light Liquid)	0	1.99E-02	0.00	0.00	0%	0.00	0.00
Pressure Relief Valves (Gas/Vapor)	34	0.10	6.41	28.07	67%	2.11	9.26
Sampling Connections	0	1.50E-02	0.00	0.00	0%	0.00	0.00
Open-ended Lines	0	1.70E-03	0.00	0.00	0%	0.00	0.00
Flanges	1546	1.83E-03	3.88	17.00	0%	3.88	17.00

VOC Emissions are calculated from *Protocol for Leak Emission Estimates* , EPA-453/R-95-017, November 1995 or based on the design emission rate

Tank Farm/Loadout Equipment Leaks Calculations

Type of Component	Total Number of Components	(C) Leaking Emission Factor (kg/hr/source)	VOC Uncontrolled Emissions		(F) LDAR (cont.eff. %)	VOC Controlled Emissions	
			(D) = SUM[(A)x(B)x(C)]x2.21 (lb/hr)	(E) = (D)x8760/2000 (ton/year)		(G) = (D)x[1-(F)] (lb/hr)	(H) = (E)x[1-(F)] (ton/year)
Valves (Gas/Vapor)	9	5.97E-03	0.12	0.52	67%	3.92E-02	0.17
Valves (Light Liquid)	264	4.03E-03	2.35	10.30	61%	0.92	4.02
Pumps (Light Liquid)	10	1.99E-02	0.44	1.93	69%	0.14	0.60
Compressor Seals (Gas/Vapor)	0	0.23	0.00	0.00	0%	0.00	0.00
Pressure Relief Valves (Light Liquid)	13	1.99E-02	0.57	2.50	0%	0.57	2.50
Pressure Relief Valves (Gas/Vapor)	1	0.10	0.23	1.01	67%	7.58E-02	0.33
Sampling Connections	0	1.50E-02	0.00	0.00	0%	0.00	0.00
Open-ended Lines	0	1.70E-03	0.00	0.00	0%	0.00	0.00
Flanges	682	1.83E-03	2.76	12.08	0%	2.76	12.08

VOC Emissions are calculated from *Protocol for Leak Emission Estimates* , EPA-453/R-95-017, November 1995 or based on the design emission rate

Total VOC Emissions	12.34	lb/hr
	54.05	ton/year
VOC Emissions from Fermentation	7.84	lb/hr
and Distillation	34.34	ton/year
VOC Emissions from Tank	4.50	lb/hr
Farm/Loadout	19.70	ton/year

Hazardous Air Pollutant	Weight Percent HAP in Fermentation and Distillation	Weight Percent HAP in Final Product*	HAP Emissions	
			lb/hr	ton/year
Acetaldehyde	0.0002	1.98E-04	2.46E-03	1.08E-02
Benzene	0	8.25E-05	3.71E-04	1.63E-03
Ethylbenzene	0	5.69E-05	2.56E-04	1.12E-03
Hexane	0	1.01E-03	4.56E-03	2.00E-02
Methanol	0.0002	2.22E-04	2.57E-03	1.12E-02
Toluene	0	9.14E-05	4.11E-04	1.80E-03
Xylene	0	6.33E-06	2.85E-05	1.25E-04
Total HAPs	-	-	1.07E-02	4.67E-02

*Weight percent HAP in Final Product based upon HAP Fraction from Tanks Tab and liquid Mole Fraction from Liquid Loadout Tab

Form 3.0 Section 3.1 Substitute - Potential Emissions

Emergency Fire Pump Engine: EP-90

Internal Combustion of Diesel Fuel in Engines (< 600 hp)

Total Horsepower	300	HP
Total Heat Input Capacity	2.10	MMBtu/hr

Calculated using a brake-specific fuel consumption (BFSC) factor of 7,000 Btu/HP per AP-42, Table 3.3-1 (10/96), footnote (a)

Sulfur Fuel Limit	0.05	weight % sulfur
Limited Operating Hours	250	hr/year

Pollutant	(A) Emission Factor[1] (lb/MMBtu)	(B) = (A)xMMBtu/hr Emission Rate (lbs/hr)		(C) = (B)xOperating Hours Emission Rate (lbs/year)		(D) = (C)/2000 Potential to Emit (tons/year)	
		Potential	Limited	Potential	Limited	Potential	Limited
Particulate Matter (PM/PM_{10})	0.31	0.65	0.65	5702.76	162.75	2.85	0.08
Particulate Matter ($PM_{2.5}$)[2]	0.30	0.63	0.63	5514.57	157.38	2.76	0.08
Sulfur Dioxide (SO_x)	0.29	0.61	0.61	5334.84	152.25	2.67	0.08
Nitrogen Oxides (NO_x)	4.41	9.26	9.26	81126.36	2315.25	40.56	1.16
Carbon Monoxide (CO)	0.95	2.00	2.00	17476.20	498.75	8.74	0.25
Volatile Organic Compounds (VOC)	0.36	0.76	0.76	6622.56	189.00	3.31	0.09
Greenhouse Gas Emissions (GHGs)							
Carbon Dioxide (CO_2)[3]	163.05	342.41	342.41	2,999,535.78	85603.19	1499.77	42.80
Methane (CH_4)[3]	6.61E-03	1.39E-02	1.39E-02	121.67	3.47	0.06	1.74E-03
Nitrous Oxides (N_2O)[3]	1.32E-03	2.78E-03	2.78E-03	24.33	0.69	0.01	3.47E-04
Individual Hazardous Air Pollutants (HAP)							
1,3 - Butadiene	3.91E-05	8.21E-05	8.21E-05	7.19E-01	2.05E-02	3.60E-04	1.03E-05
Acetaldehyde	7.67E-04	1.61E-03	1.61E-03	1.41E+01	4.03E-01	7.05E-03	2.01E-04
Acrolein	9.25E-04	1.94E-03	1.94E-03	1.70E+01	4.86E-01	8.51E-03	2.43E-04
Benzene	9.33E-04	1.96E-03	1.96E-03	1.72E+01	4.90E-01	8.58E-03	2.45E-04
Formaldehyde	1.18E-03	2.48E-03	2.48E-03	2.17E+01	6.20E-01	1.09E-02	3.10E-04
Naphthalene	8.48E-05	1.78E-04	1.78E-04	1.56E+00	4.45E-02	7.80E-04	2.23E-05
Polycyclic Organic Matter (POM)	8.32E-05	1.75E-04	1.75E-04	1.53E+00	4.37E-02	7.65E-04	2.18E-05
Toluene	4.09E-04	8.59E-04	8.59E-04	7.52E+00	2.15E-01	3.76E-03	1.07E-04
Xylene	2.85E-04	5.99E-04	5.99E-04	5.24E+00	1.50E-01	2.62E-03	7.48E-05
Total HAPs	-	0.0099	0.0099	86.5734	2.47	0.0433	0.0012

[1]Emission Factors are from AP-42 Tables 3.3-1 and 3.3-2 (10/96)
Conversion Factor: Heat Capacity of Diesel Fuel is 137,000 Btu/gal (AP-42 Appendix A)
Note: Sulfur Dioxide Emission Factor = 1.01 x Sulfur Content (%)
Note: kgal = 1000 gallons
Note: Potential Operating Hours is 8760

[2] Considering PM2.5 fraction of total PM as 0.967 from CEIDARS PM2.5 emission factor scaling table.

[3] Emission factors are from 40 CFR 98, Subpart C , Table C-1 for CO_2, and Table C-2 for CH_4 and N_2O

Form 3.0 Section 3.1 Substitute - Potential Emissions

Haul Road Emissions: FS-10

Paved roads {AP-42 Chapter 13.2.1 (1/11)}

Equation (2): *(modified)*

$$E = k \times (sL)^{0.91} \times (W)^{1.02} \times \left(1 - \frac{P}{4 \times 365}\right)$$

	k
PM	0.011
PM_{10}	0.0022
$PM_{2.5}$	0.00054

Unpaved roads {AP-42 Chapter 13.2.2 (11/06)}

Equation (1a): *(modified)*

$$E = k \times \left(\frac{sC}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times \left(\frac{365 - P}{365}\right) \times \left(\frac{S}{30}\right)^{d} \times (1 - CE)$$

	k	*a*	*b*	*d*
PM	4.9	0.7	0.45	0.3
PM_{10}	1.5	0.9	0.45	0.5
$PM_{2.5}$	0.15	0.9	0.45	0.5

Haul Road / Traffic Parameters

Activity / Road Description	Road Type / Silt Value		Roundtrip Length (feet)		Truck Weight (tons)			Ave. Speed (mph)	Unrestricted Maximum Throughput (units/yr)	Ave. Truck Capacity (units/truck)		Annual VMT
			empty	full	empty	full	Ave.[1]					
Denaturant Delivery	p	3.00	2,737	2,921	15	40	27.9	15	4,121,610	8,000	gal	552
100% DDGS Loadout	p	3.00	2,243	3,415	15	40	30.1	15	449,960	25	ton	19,287
100% MWDGS Loadout	p	3.00	3,260	2,398	15	40	25.6	15	899,919	25	ton	38,574
Corn Oil Loadout	p	3.00	4,028	1,630	15	40	22.2	15	9,094,611	6,250	gal	1,559

[1] Weighted average = {(distance*weight empty)+(distance*weight full)}/(Roundtrip distance)

Emission Calculations

	Emission Factors (lb/VMT)			Potential Emissions (tons/yr)		
	PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Denaturant Delivery	0.84	0.17	0.04	0.23	0.05	0.01
100% DDGS Loadout	0.90	0.18	0.04	8.71	1.74	0.43
100% MWDGS Loadout	0.77	0.15	0.04	14.78	2.96	0.73
Corn Oil Loadout	0.66	0.13	0.03	0.52	0.10	0.03
Total Annual Emissions[2]:				**15.52**	**3.10**	**0.76**

[2] Total annual emissions exclude emissions associated with DDGS (for PM) since worst case scenario is that all DGS is trucked out as MWDGS. However, worst case scenario for PM_{10} and $PM_{2.5}$ facility-wide occurs when all DGS is trucked out as DDGS due to PM_{10} and $PM_{2.5}$ emissions from the drying process.

Description of Constants/Variables

E: haul road emissions (lb/VMT)
k, d: dimensionless constants from Draft AP-42 Chapter 13.IV (paved)
k, a, b, c, d: dimensionless constants from AP-42 Tables 13.2.1-1 & 13.2.2-2 (unpaved)
sL: silt loading (g/m^2) of paved road surface

sC: silt content (%) of unpaved road surface
W: average vehicle weight (tons)
P: days/yr with at least 0.01" of precipitation
P = 90 default = 90
S: mean vehicle speed on road (mph) default = 30, minimum =15
CE: unpaved road, dust control efficiency
CE = 0 % default = 0%
VMT: vehicle miles traveled

Form 3.0 Section 3.1 Substitute - Potential Emissions

Determining Worst-Case (DDGS or MWDGS Production)

The following calculations support the determination that 100% DDGS production presents the worst-case scenario for emissions from all pollutants other than CO from Valero

100% DDGS Production Scenario

Process or Unit	Pollutants (tons/year)						
	Particulate Matter (PM)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulfur Oxides (SO_x)	Nitrogen Oxides (NO_x)	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
TO - DDGS	64.08	64.08	64.08	81.47	140.16	97.24	35.92
DDGS Cooling, Storage, and Loadout	17.00	16.99	8.02	-	-	-	0.00
Truck Traffic (DDGS Loadout)	8.71	1.74	0.43	-	-	-	-
DDGS Production Totals	**89.80**	**82.82**	**72.52**	**81.47**	**140.16**	**97.24**	**35.92**

100% MWDGS Production Scenario

Process or Unit	Pollutants (tons/year)						
	Particulate Matter (PM)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulfur Oxides (SO_x)	Nitrogen Oxides (NO_x)	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
TO - MWDGS	13.05	13.05	13.05	1.03	71.83	144.28	35.92
MWDGS Storage and Loadout	-	-	-	-	-	-	3.73
Truck Traffic (MWDGS Loadout)	14.78	2.96	0.73	-	-	-	-
WDGS Production Totals	**27.83**	**16.01**	**13.78**	**1.03**	**71.83**	**144.28**	**39.65**

Form 3.0 Sections 3.1 and 3.2 Substitute - Criteria Pollutant Emissions

Facility-Wide Emissions

Process or Unit	Pollutants (tons/year)							
	Particulate Matter (PM)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Sulfur Oxides (SO_x)	Nitrogen Oxides (NO_x)	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)	Hydrogen Sulfide (H_2S)
Grain Conveying and Hammermilling (EP10 & EP20)	7.05	7.05	7.05	-	-	-	-	-
Fermentation Scrubber (EP40)	3.15	3.15	3.15	-	-	-	105.12	-
TO - DDGS (EP30)	64.08	64.08	64.08	81.47	99.80	97.24	35.92	-
Tanks (EP120 to EP170)	-	-	-	-	-	-	4.41	-
Liquid Loadout (EP80)	-	-	-	-	-	-	0.92	-
Loadout Vapor Combustion (EP80)	3.26E-03	3.26E-03	3.26E-03	2.58E-04	0.68	3.52	2.36E-03	-
DDGS Cooling and Loadout (EP50, EP70 & FS40)	17.03	17.00	16.99	-	-	-	8.02	-
MWDGS Storage and Loadout (EP110)	-	-	-	-	-	-	3.73	-
Equipment Leaks (FS30)	-	-	-	-	-	-	54.05	-
Cooling Tower (EP100)	24.11	16.88	10.13	-	-	-	-	-
Emergency Fire Pump Engine (EP90)	0.08	0.08	0.08	0.08	1.16	0.25	0.09	-
Process Vents	-	-	-	-	-	-	19.09	-
Haul Roads (FS10)	15.52	3.10	0.76	-	-	-	-	-
Facility-wide Emissions	131.03	111.35	102.25	81.54	101.64	101.00	231.35	0.00

Form 3.0 Section 3.3 Substitute - Hazardous Air Pollutant Emissions

Facility-Wide Hazardous Air Pollutant Emissions (tons/year)

Hazardous Air Pollutant	Process or Unit									Total Single Hazardous Air Pollutants
	Fermentation Scrubber	TO Stack	Tanks	Liquid Loadout	Loadout Flare	DDGS Cooling and Loadout	Equipment Leaks	Process Vents	Fire Pump Engine	
1,3 - Butadiene	-	-	-	-	-	-	-		1.03E-05	1.03E-05
1,2,4-Trimethylbenzene	-	-	9.78E-03	2.06E-05	-	-	-			9.81E-03
Acetaldehyde	8.80E+00		4.17E-04	1.54E-04	-	8.47E-01	1.08E-02	1.29E-01	2.01E-04	9.79E+00
Acrolein	1.88E+00	3.72E+00	-	-	-	1.24E+00	-	5.66E-04	2.43E-04	6.85E+00
Benzene	-	4.60E-03	2.45E-02	1.13E-03	9.02E-07	-	1.63E-03	-	2.45E-04	3.21E-02
Cumene	-	-	7.90E-03	-	-	-	-	-	-	7.90E-03
Dichlorobenzene	-	2.63E-03	-	-	5.15E-07	-	-	-	-	2.63E-03
Ethyl benzene	-	-	1.93E-02	2.06E-05	-	-	1.12E-03	-	-	2.05E-02
Formaldehyde	5.26E-01	6.57E-01	-	-	3.22E-05	8.18E-02	-	-	3.10E-04	1.26E+00
Hexane	-	3.94E+00	2.08E-01	1.39E-02	7.73E-04	-	2.00E-02	-	-	4.19E+00
Lead Compounds	-	1.10E-03	-	-	2.15E-07	-	-	-	-	1.10E-03
Methanol	1.90E-01	1.31E+00	4.17E-04	1.83E-04	-	4.09E-01	1.12E-02	2.94E-02	-	1.95E+00
Naphthalene	-	1.34E-03	-	-	2.62E-07	-	-	-	2.23E-05	1.36E-03
Polycyclic Organic Matter (POM)	-	1.93E-04	-	-	3.79E-08	-	-	-	2.18E-05	2.15E-04
Toluene	-	7.45E-03	6.58E-02	1.25E-03	1.46E-06	-	1.80E-03	-	1.07E-04	7.64E-02
Xylene	-	-	4.08E-02	8.69E-05	-	-	1.25E-04	-	7.48E-05	4.11E-02
Arsenic Compounds (ASC)	-	4.38E-04	-	-	8.59E-08	-	-	-	-	4.38E-04
Beryllium Compounds (BEC)	-	2.63E-05	-	-	5.15E-09	-	-	-	-	2.63E-05
Cadmium Compounds (CDC)	-	2.41E-03	-	-	4.72E-07	-	-	-	-	2.41E-03
Chromium Compounds (CRC)	-	3.07E-03	-	-	6.01E-07	-	-	-	-	3.07E-03
Cobalt Compounds (COC)	-	1.84E-04	-	-	3.61E-08	-	-	-	-	1.84E-04
Manganese Compounds (MNC)	-	8.32E-04	-	-	1.63E-07	-	-	-	-	8.32E-04
Mercury Compounds (HGC)	-	5.69E-04	-	-	1.12E-07	-	-	-	-	5.70E-04
Nickel Compounds (NIC)	-	4.60E-03	-	-	9.02E-07	-	-	-	-	4.60E-03
Selenium Compounds (SEC)	-	5.26E-05	-	-	1.03E-08	-	-	-	-	5.26E-05
Total HAPS	11.40	9.67	0.38	0.02	8.11E-04	2.58	0.05	0.16	1.24E-03	

Total Hazardous Air Pollutants: **24.24**

Form 3.0 Section 3.1 Substitute - Potential Emissions

Title 129, Chapter 15 Applicability

Title 129, Chapter 15, Section 001

For process weight rates up to 60,000 lbs/hr: $E= 4.10\ p^{0.67}$

For process weight rates in excess of 60,000 lbs/hr: $E= 55.0\ p^{0.11}-40$

where E = rate of emissions in lbs/hr PM and p = process weight rate in tons/hr.

Process	P	E	Unit PM emission rate
Grain Handling Baghouse	371,155 lbs/hr 185.58 tons/hr	57.70 lbs/hr	0.32 lbs/hr
Hammermill Baghouse	371,155 lbs/hr 185.58 tons/hr	57.70 lbs/hr	1.29 lbs/hr
DDGS Cooling Baghouse	200,000 lbs/hr 100.00 tons/hr	51.28 lbs/hr	3.49 lb/hr
TO Stack	200,000 lbs/hr 100.00 tons/hr	51.28 lbs/hr	14.63 lb/hr
DDGS Storage and Loadout Baghouse	240,000 lbs/hr 120.00 tons/hr	53.13 lbs/hr	0.39 lb/hr
Cooling Tower	27,522,000 lbs/hr 13,761 tons/hr	116.90 lbs/hr	5.50 lb/hr

Title 129, Chapter 15, Section 001

Total Heat Input (MMBtu/hr)	Maximum Allowable Emissions of PM (lbs/MMBtu)
10 or less	0.6
Between 10 and 10,000	$1.026/I^{0.233}$ Where I = total heat input in MMBtu/hr.
10,000 or more	0.12

Process equipment	MMBtu/hr	Allowable PM (lbs/MMBtu)	Unit PM emission rate (lbs/MMBtu)
TO Stack	510.00	0.24	2.87E-02
Loadout Flare	6.40	0.60	1.16E-04
Fire Pump Engine	2.10	0.60	0.31