BUNGE

February 22, 2019

Ms. Grace Hall
Environmental Engineer
Air Division
Alabama Department of Environmental Management
1400 Coliseum Blvd
Montgomery, AL 36110

RE: Bunge North America, Inc. – Decatur Facility
Facility ID 712-0026

Dear Ms. Hall:

Please find enclosed three copies of a permit application package for a plant expansion project at our Bunge North America – Decatur, Alabama facility.

Construction of the plant expansion is scheduled to begin in the third quarter of 2019. Engineering is still in the early stages for portions of this project and therefore, details of some the emission sources are not yet fully available. Estimated emissions from the future portions of the expansion are included in the calculations. An overview of their scope is included in this application because they are part of the expansion project that triggered a PSD review. Additional information, including model numbers and capacities, will be provided as the information becomes available.

This application consists of permit application forms for those sources , a project description, process flow diagrams, emission calculations, air quality data, and BACT analyses for PM and VOC. Bunge understands that no permit application fee is required to be submitted with this application and you will determine how much the permit fee will be.

Please contact Christa Andrew in our corporate office at 314-292-2707 or by email at christa.andrew@bunge.com if you have questions or concerns relative to this application.

Sincerely,

Bunge North America, Inc.

Michael Klauke
Facility Manager

Enclosure

Cc: Jason Davis – Bunge North America, Decatur
Christa Andrew. St. Louis

Bunge North America
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Decatur, Alabama

February 2019

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1.0 FACILITY OVERVIEW

Bunge North America, Inc. (Bunge) owns and operates an oilseed processing plant in Decatur, Alabama. The plant site is located along the Tennessee River. The immediate area has residential, institutional, and otherwise populated communities. The Decatur plant was originally constructed in 1972 and commenced operation in 1974. The original owner and operator of the plan was Goldkist. The plant was sold to Bunge North America, Inc. (Bunge Corporation at the time) in 1982. In 2012 Bunge expanded the plant to include an edible oils packaging plant.

The facility consists of an integrated soybean processing and edible oil refining facility operating under SIC Code 2075 and an edible oils blending and packaging plant operating under SIC Code 2079.

With this application, Bunge is seeking authorization to modify the facility to accommodate a crush rate of 175,000 bushels a day. The plant is an existing major stationary source. An evaluation of the baseline emissions and projected emissions was conducted. Based on this evaluation, it was determined that the increase in VOC emissions will be over the significant rate of 40 tons per year and PM over 25 tons per year. The increase for all other pollutants was below the significance threshold.

1.1 APPLICATION OVERVIEW

This application document addresses the required PSD requirements and contains:

- the forms required by Alabama Department of Environmental Management (ADEM) for a complete renewal application.
- BACT Analysis
- PSD Calculations
- Process Flow Diagrams

Bunge is requesting that the throughput level be increased to 61,425,000 bushels per year.

1.2 PROPOSED PLANT MODIFICATIONS

To further serve our customers, an expansion at the facility will be undertaken. The goal is to increase the crush rates from 132,000 bushels per day to 175,000 bushels per day. Bunge plans to physically modify the following systems:

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1. **DT system – EX-2**
   A new ten (10) tray 240 inch diameter Desolventizer Toaster (DT) is proposed to be installed to replace the existing seven (7) tray 220 inch DT. Conveying requirements from the discharge of the DT to the inlet of the DC are included.

2. **DC system – EX-2**
   A new six (6) deck Dryer-Cooler (DC) – 4 drying decks and 2 cooling decks will be installed in the same location as the existing DTDC. The existing four cyclones will be reused and two new cyclones will be added. Two existing fans will remain and one new one will be added for an increase in the air flowrate.

3. **Drying system – CD-6**
   A new, smaller soybean dryer will be required in addition to the existing Law Marot dryer to achieve the total drying capacity for the new crush rate. The new dryer will be located near the existing soybean dryer.

4. **New Tempering Grain Storage**
   At 175,000 bushel per day (BPD) crush rate, additional grain storage and tempering is required. A new, 60' diameter and 118' tall grain storage silo will be installed to achieve the required capacity. It will be aspirated to an existing baghouse (CD-3) without an increase in air flow.

5. **Distillation system – EX-1**
   There are three (3) large pieces of equipment in the distillation system that will need to be replaced to achieve the desired crush rate. First, the existing 1st stage evaporator and Dome Separator will be replaced with a new system.

   Second, the existing Primary vacuum condenser will be replaced. Third, the solvent water separator/hexane work tank will be replaced with a larger unit. Other items that will likely need to be replaced or upgraded in the extraction process are the stripper condenser, solvent heater, mineral oil heater, mineral oil cooler, and waste water stripper.

6. **Cracking mill system – PR4**
   The existing six cracking mills will be replaced with new, larger cracking mills to achieve the required total cracking capacity of 175k BPD crush rate. The existing baghouse and fan will not change however and therefore the emissions will not change.

7. **Flaking mill system – PR7**
   Four (4) new, larger flaking mills will be added to the existing twelve flaking mills system to achieve 175k BPD crush rate. Additional flaking mill aspiration capacity will be added with a new fan and baghouse required for the new flaking mills. Additional conveying will be required.

8. **Bean Conditioner – PR6**
   The existing rotary steam tube bean conditioner will be removed and a new vertical bean conditioner will be installed. Additional conveying will be required.

9. **New 120 Boiler – BO5**
   At 175k BPD crush rate, the increased load on the existing boilers will require that one of them be replaced. Existing boiler BO5 will be replaced with a new 120 mmbtu/hr boiler at the current boiler house.

10. **New Diesel-Fired Fire Water Engine**
    An additional fire water pump will be installed with a diesel fuel fired engine.

In addition, a swap will be made between the baghouses that are currently used for grain cleaning and the headhouse. No new baghouses will be installed but the existing baghouses will be used for the other source. The baghouse on RS-2 will be used for CD-1 and vise versa.

Because the throughput of the facility will be increased, an increase in utilization of other equipment will occur. This increased utilization is addressed in the PSD applicability discussion in Section 2.

1.3 APPLICABLE REGULATORY REQUIREMENTS

This section of the application provides a review of the Alabama Department of Environmental Management Administrative Code air regulations found in 335-3 and those federal regulations applicable to this project. Compliance with the applicable requirements are discussed below.

1.3.1 Visible Emissions

ADEM Admin. Code 335-3-4-.01 limits opacity to 20%. Unless otherwise stated, the facility may discharge into the atmosphere from any source of emission, particulate of an opacity not greater than that designated as forty percent (40%) opacity during one six (6) minute period in any sixty (60) minute period. Bunge has installed or will install particulate controls or maintain good operating procedures on modified sources of particulate matter. Bunge expects that all visible emissions will be below 20% opacity.

1.3.2 Fugitive Dust and Fugitive Emissions

Per ADEM 335-3-4-.02, as is currently done, Bunge shall take reasonable precautions to prevent particulate matter from becoming airborne. Good work practices will continue to ensure that visible dust emissions are not discharged beyond the property line.

1.3.3 Process Industries – General Particulate Matter Limits

Bunge will not cause or permit the emissions of particulate matter in any one hour from any source in excess of the amount shown in Table 4-2 of section 335-3-4-.04 for the process weight per hour allocated to each source.

1.3.4 Sulfur Compound Emissions

ADEM Adm. Code 335-3-5-.01 limits SOx emissions to 4.0 pounds per mm BTU input. The new boiler will be a natural gas fired boiler and will thus be below this limit.

335-3-5-.05 applies to equipment not regulated by rules 3353-5-.01-.04. No other processes emit sulfur compounds and therefore, this rule does not apply to the facility.

1.3.5 Organic Compound Emissions

No new storage tanks will be installed and therefore 335-3-6-.03 and 335-3-6-.26 do not apply. VOCs will be discussed further under the Vegetable Oil MACT regulation section below.

1.3.6 New Source Performance Standards (NSPS)

ADEM has incorporated USEPA's regulations governing Standards of Performance for New Stationary Sources designated in rules 335-3-10-.02 and 03. The following NSPS will apply to the expansion.

- **40 CFR Part 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units** – This standard applies to each steam generating unit that commences construction, modification or reconstruction after June 19, 1984 and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 100 million BTUs/hr. This regulation will apply to the new boiler which will be designed to meet these requirements.
- **40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial – Commercial – Institutional Steam Generating Units** – This standard applies to each steam generating unit that commences construction, modification or reconstruction after June 9, 1989 and that has a maximum heat input capacity of 100 million BTUs/hr or less but greater than 10 mm BTUs/hr. This regulation will continue to apply to existing boilers at the facility.
- **40 CFR Part 60, Subpart DD, Standards of Performance for Grain Elevators** – This standards applies to each affected facility at any storage elevator with more than 1 million bushel storage capacity. Affected

facilities include grain dryers. The new grain dryer to be installed with this project is subject to this regulation. It will be designed to meet these requirements.

- **40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines -** This standards applies to each CI ICE manufactured as a certified National Fire Protection Association fire pump engine after July 1, 2006. This standard applies to the fire pump engines at the facility.

1.3.7 Permits Required

ADEM Adm. Code 335-3-14-.01(a) requires any person constructing or modifying any equipment that will cause, increase or eliminate air pollutants to submit an application for an air permit to construct. This application is submitted in order to fulfill the requirements of this section.

335-3-14-.01(b) requires that before any such equipment be operated, an air permit be obtained from the director.

335-3-14-.04 Prevention of Significant Deterioration Permitting (PSD). The requirements of this rule apply to the major modification of any existing major stationary source. The Bunge Decatur plant is a major source with the potential to emit more than 250 tons per year of one or more of the regulated air pollutants.

The emissions from this project have been evaluated and determined to be a major modification. VOC and PM emissions are projected to be over the significant increase level. Therefore, a PSD evaluation was performed for the VOC and PM increases. A Model Emission Rate for Ozone Precursors (MERP) analysis was performed and presented below.

1.3.8 Major Source Operating Permit (MSOP – "Title V")

The facility will be required to submit an application to incorporate the construction permit into its current MSOP ("Title V" permit) within 12 months after commencing operation of the proposed expansion. Existing CAM Plans are included in the MSOP.

1.3.9 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

ADEM has incorporated USEPA's regulations governing Hazardous Air Pollutants in rule 335-3-11. These are also known as the Maximum Achievable Control Technology (MACT) standards. The following MACT standards will apply to affected facilities at the plant as part of the expansion.

- **40 CFR Part 63, Subpart GGGG – Solvent Extraction for Vegetable Oil Production –** The Decatur facility is currently subject to this regulation and the planned modification does not change that. The plant is currently in compliance with these rules and will continue to comply with these requirements.

- **40 CFR Part 63, Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters** – Existing boilers at the facility are subject to the requirements of these rules. The regulations will also apply to the proposed new boiler which will be designed to meet these requirements. In addition, the plant will perform the required work practices once the boiler is operating.

- **40 CFR Part 63, Subpart ZZZZ – Reciprocating Internal Combustion Engines (RICE)** – Existing RICE units at the facility are subject to the requirements of these rules. The plant is currently in compliance with these rules and will continue to comply with these requirements.

1.3.10 National Ambient Air Quality Standards (NAAQS)

The NAAQS and accompanying appedices as set forth in 40 CFR 50 have been incorporated by reference into ADEM Adm. Code 335-3-1-.03. The VOC emission levels resulting from the expansion are above the PSD major modification threshold. There is no NAAQS for PM or VOC. Although VOC is a precursor to ozone which has a NAAQS, there is no EPA approved method for evaluating the 8-hour ozone standard, therefore no ambient air analysis is required for ozone or PM at this time and no PSD ambient air quality analysis has been prepared for the proposed plant expansion. A MERP analysis was performed and is presented in Section 2.

Pre-construction monitoring is required for PSD projects in which the net increase in VOC emissions for the project is 100 tons per year or more. Monitoring conducted by the state will be used for these purposes.

1.4 Proposed Permit Limits

As part of the permit and regulatory review, limits on emissions or operations of the plant were assumed or determined as required pursuant to the review in Section 1.3 above, in the emissions calculations or in the BACT analyses attached to this application. This section of the permit discusses these limits and identifies the limits Bunge is proposing to be incorporated into the construction permit that are being added or modified as part of this project.

1.4.1 Operational Limit

The Decatur plant is being expanded to accommodate a crush rate of 175,000 bushels of soybeans per day in order to meet customer demands. The facility is currently permitted at 56,575,000 bushels on a 12-month rolling total basis.

Bunge is requesting that this limit be replaced with a limit of 61,425,000 bushels per 12-months rolling total.

1.4.2 NSPS Limits

As discussed in Section 1.3.6 above, 40 CFR Part 60, Subpart Db will apply to the new boiler. 40 CFR Part 60, Subpart DD will apply to the new grain dryer. 40 CFR Part 60, Subpart IIII will apply to the new fire pump engine. The new boiler, the new grain dryer and the new fire pump engine will be designed to meet the limits in the applicable subparts.

1.4.3 MACT Limits

As discussed in Section 1.3.8 above, 40 CFR Part 63 Subparts GGGG, DDDDD and ZZZZ apply to the facility. The extraction process at the Decatur plant is already subject to Subpart GGGG. The expansion project does not affect the plant's status under the Veg Oil MACT standard. No new permit limits will apply to the facility in regards to this rule.

The new boiler will be subject to the Boiler MACT. The facility is already subject to it and has performed energy assessments. Other requirements of the rule – notifications, tune-ups, etc. – will be met as appropriate.

RICE units at the facility are subject to Subpart ZZZZ as will the new fire pump engine. Permit limits per the RICE MACT will apply.

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2.0 PSD APPLICABILITY EVALUATION

2.1 OVERVIEW OF PROJECT

Bunge North America is proposing to expand the Decatur, Alabama plant and is seeking authorization to make certain modifications to the facility that will increase the soybean processing capacity to 175,000 bushels per day (on a 12 month rolling average basis). The plant expansion proposed will include physical modifications of existing emissions units. There will also be emission units that will experience increased utilization as a result of the additional soybean processing. The emission units that are going to be physically modified as part of the expansion project were listed in Section 1.2.

The emission units that will not be modified but will experience direct increases in annual utilization as a result of the soybean capacity increase are as follows:

- Truck, Rail & Barge Receiving (RS-1a, RS-1b, RS-3b)
- Headhouse (RS-2)
- Grain Storage (RS-5a-g)
- Bean Cleaning (CD-1)
- Hulls Storage (MH-2c, MH-2e-f)
- Meal Loadout via Truck, Rail, and Barge (RS-3a, MH-4, MH-5)

Ancillary emission units that will not be modified but will experience indirect increases in annual utilization as a result of the expansion are:

- Boilers (BO3, BO4, BO6, REF 1&2, REF5)

The evaluation will show that the proposed project will only be subject to PSD permitting for VOCs and PM.

2.2 PERMITTING EVALUATION METHODOLOGY

The PSD program is applicable in attainment areas where there is a new major facility or a major modification at an existing major facility that results in a net significant emissions increase in any PSD pollutant. A major modification is a physical change or changes in method of operation at an existing source that exceeds the annual significant level as defined in ADEM Regulation 335-3-14-.04. Morgan County is attainment for all criteria pollutants.

The following sections discuss the methodology used in the project emissions increase evaluation conducted to assess PSD applicability. The net emissions increase for the modification was evaluated by comparing the baseline actual emissions to the projected actual emissions for the modified and debottlenecked emission sources included in the proposed expansion.

A hybrid test was used as some emission units were modified and new emissions units will be added. ADEM's PSD permitting regulations are detailed in ADEM Admin. Code 335-3-14-.04, *Air Permits Authorizing Construction in Clean Air Areas (Prevention of Significant Deterioration Permitting (PSD))* and specifically 335-3-14-.04(1)(i) *Hybrid test for projects that involve multiple types of emissions units.*

2.3 BASELINE ACTUAL EMISSIONS

The start of construction for the expansion project is scheduled to take place in the fall of 2019. To conduct the permitting evaluation, an assessment of the baseline emissions was first performed. To determine the baseline emissions, the historical actual emissions have been reviewed. The facility is required to maintain records of the soybeans received and processed on a 12-month rolling total basis. Emissions are directly based on these numbers. Ten years of data prior to the anticipated permit application submittal date were reviewed and the period from 9/1/14 – 8/30/16 was chosen as the baseline period. Emissions and throughputs during this period were representative of current operating conditions.

The actual material throughputs for the selected 24 month period was averaged to determine the throughputs and used to determine the baseline emissions.

Emissions from both the modified and unmodified units are included below. Even though modifications are not being made to all the emission units at the facility, the sources listed below and in Section 2.1 will be affected by the future increase in the soybean processing capacity. These emissions increases must also be considered in the PSD evaluation so the baseline emissions from these sources are also determined. The same 24 month period was used to determine the emissions from these units. Fugitive emissions not captured by control devices are also included.

A summary of the baseline emissions is presented below. The emissions calculations and other assumptions are presented in Appendix A.

TABLE 1
BASELINE ACTUAL EMISSIONS

FUGITIVE EMISSIONS		PM TPY	PM10 TPY	PM2.5 TPY	NOx TPY	VOC TPY
RAIL UNLOADING	RS-1a	5.55	1.35	0.23		
TRUCK UNLOADING	RS-1b	2.01	0.63	0.11		
BARGE UNLOADING	RS-3b	0.95	0.24	0.04		
BARGE LOADOUT	RS-3a	4.79	0.71	0.05		
MEAL TRUCK LOADOUT	MH-4	10.23	1.51	0.10		
MEAL RAIL LOADOUT	MH-5	2.72	0.40	0.03		
TOTAL :		**26.3**	**4.8**	**0.6**	**0.0**	**0.0**
POINT SOURCES						
TRUCK UNLOADING & SCREENINGS GRIND BH	RS-1b	0.37	0.37	0.063		
BARGE UNLOADING/LOADING BAGHOUSE	RS-3a/3b	0.084	0.084	0.042		
HEADHOUSE	RS-2	0.65	0.65	0.32		
BEAN STORAGE TANKS	RS-5a-g	8.70	2.19	0.37		
CLEAN & SCALP	CD-1	0.63	0.63	0.32		
BEAN CONDITIONER	PR-6	3.25	1.95	0.73		
FLAKERS	PR-7	4.1	4.1	2.87		
EXTRACTION	EX-1					639.0
DTDC	EX-2	6.39	6.39	2.41		
HULLS STORAGE	MH-2c	1.16	0.29	0.05		
PELLETED HULLS STORAGE	MH-2e-f	0.15	0.04	0.01		
MEAL TRUCK LOADOUT	MH-4	0.28	0.28	0.14		
MEAL RAIL LOADOUT	MH-5	0.05	0.05	0.03		
TOTAL		**25.81**	**17.02**	**7.35**	**0.00**	**639**

2.4 PROJECTED ACTUAL EMISSIONS

The projected annual throughputs is based on the amount of soybeans expected to be processed after the expansion is complete. Bunge is requesting that the facility-wide soybean throughput be increased to 61,425,000 bushels per year during any consecutive twelve (12) month period.

To determine the projected actual emissions, the projected annual throughput given above, AP-42 emissions factors, and stack test data from similar Bunge facilities were used. Emissions from both the modified and unmodified units are included below. Even though modifications are not being made to all the emission units at the facility, they will be affected by the future increase in the soybean processing capacity. These emissions increases were considered in the PSD evaluation.

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Fugitive emissions not captured by control devices are also included. The evaluation took into consideration the two-week shutdown that the plant takes every year.

A new grain dryer will be installed to accommodate the additional soybeans processed as a result of the expansion. These emissions are based on a stack test provided by the manufacturer. In addition, an existing boiler (B05) will be replaced with a new, larger unit that will be able to supply the extra steam required to process the increased bean throughput.

A summary of the projected actual emissions is presented below. The emissions calculations and other assumptions are presented in Appendix A.

TABLE 2
PROJECTED ACTUAL EMISSIONS

FUGITIVE EMISSIONS		PM TPY	PM10 TPY	PM2.5 TPY	NOx TPY	VOC TPY	CO2e TPY
RAIL UNLOADING	RS-1a	3.68	0.9	0.15			
TRUCK UNLOADING & SCREENINGS GRIND	RS-1b	2.67	0.83	0.14			
BARGE UNLOADING	RS-3b	7	1.77	0.23			
BARGE LOADING	RS-3a	12.19	1.81	0.12			
MEAL TRUCK LOADOUT	MH-4	13.21	1.96	0.13			
MEAL RAIL LOADOUT	MH-5	1.02	0.15	0.01			
TOTAL		**39.8**	**7.4**	**0.8**	**0**	**0**	
POINT SOURCES							
TRUCK UNLOADING & SCREENINGS GRIND BH	RS-1b	0.28	0.28	0.14			
BARGE UNLOADING BH	RS-3b	0.32	0.32	0.16			
BARGE LOADING BH	RS-3a	0.21	0.21	0.11			
HEADHOUSE	RS-2	0.32	0.32	0.16			
BEAN STORAGE TANKS	RS-5a-g	11.52	2.9	0.51			
CLEAN & SCALP	CD-1	1.29	1.29	0.65			
NEW GRAIN DRYER	CD-6	7.28	1.82	0.31	11.07	0.61	13310
VERTICAL BEAN CONDITIONER	PR-6	0.63	0.63	0.61			
FLAKERS	PR-7	5.37	5.37	2.69			
EXTRACTION	EX-1					985.6	
DT	EX-2	-	-	-			
DC	EX-2	11.39	11.39	4.29			
HULLS STORAGE	MH-2c	1.54	0.39	0.07			
PELLETED HULLS STORAGE	MH-2e-f	0.20	0.05	0.01			
MEAL TRUCK LOADOUT	MH-4	0.36	0.36	0.18			
MEAL RAIL LOADOUT	MH-5	0.02	0.02	0.01			
NEW DIESEL FIRE PUMP			0.03		0.47	0.04	16.5
TOTAL		**40.7**	**25.4**	**9.9**	**11.5**	**986.3**	**13326.5**

2.5 BASELINE ACTUAL TO PROJECTED ACTUAL EMISSIONS

The projected actual annual emissions given above were compared to the baseline actual emissions given in Table 1. The differences between the baseline and projected annual rates gives the estimated emissions increase used to evaluate PSD applicability. The table below summarizes the baseline actual to projected actual emissions. The emissions calculations and other assumptions are presented in Appendix A.

A portion of the projected actual emissions could have been accommodated (CHA) during the baseline period and are therefore, excludable from the projected emissions increase. The excludable emissions are from existing baghouses and cyclones using the same concentrations used for projected future emissions and were based on the same operating hours anticipated after the expansion. The emissions included in Table 3 below are a summary of Tables 1 and 2.

TABLE 3
BASELINE ACTUAL TO PROJECTED EMISSIONS

BASELINE	PM TPY	PM10 TPY	PM2.5 TPY	NOx TPY	VOC TPY	CO2e TPY
FUGITIVE	26.25	4.85	0.55	0.00	0.0	
POINT	25.81	17.02	7.35	0.00	639.0	
TOTAL	**52.06**	**21.9**	**7.9**	**0.0**	**639.0**	
FUTURE POTENTIALS						
FUGITIVE	39.77	7.42	0.78	0	0	
POINT	40.73	25.38	9.90	11.54	986.3	13326.5
TOTAL	**80.50**	**32.8**	**10.7**	**11.5**	**986.3**	**13327**

2.6 ADDITIONAL EMISSIONS INCREASES – ANCILLARY UNITS

In addition to the emissions increase associated with physically modified emission units and unmodified emission units affected by the expansion (seeing increased utilization), there will also be emission increases from ancillary emission units.

These units support the plant and are therefore affected by the expansion. The plant has 7 natural gas combustion units. One of the main boilers will be replaced in order to supply sufficient steam to the plant after the expansion is complete. The remaining boilers will also need to produce more steam for the processing of the additional soybean capacity and therefore the amount of natural gas combusted will increase after the expansion is complete. The increase in natural gas combusted is based on the amount of natural combusted per ton of bean processed in 2014-2015 multiplied by the future projected soybean processing rate. Fuel oil was not combusted in the boilers during this time and the plant can no longer burn fuel oil. Only natural gas can be combusted in the units.

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TABLE 4
BOILER EMISSIONS

BASELINE EMISSIONS		PM TPY	PM10 TPY	PM2.5 TPY	NOx TPY	VOC TPY	CO2e TPY
GEKA BOILERS	REF 1-2	0.30	0.30	0.30	3.88	0.21	4,671
BOILERS	BO3-4	3.09	3.09	3.09	19.21	2.23	48,839
BOILER BO5	BO5	1.54	1.54	1.54	9.60	1.12	24,420
GARIONI BOILER	REF5	0.08	0.08	0.00	0.42	0.06	1,256
AJAX HOT WATER HEATER	BO6	0.03	0.03	0.00	0.37	0.02	448
TOTAL		**5.0**	**5.0**	**4.9**	**33.5**	**3.6**	**79635**
PROJECTED EMISSIONS							
GEKA BOILERS	REF 1-2	0.43	0.43	0.43	5.66	0.31	6800
BOILERS	BO3-4	4.20	4.20	4.20	26.92	3.04	66458
NEW BOILER	BO5	2.55	2.55	2.55	16.31	1.84	40277
GARIONI	REF5	0.12	0.12	0.12	0.61	0.08	1828
AJAX HOT WATER HEATER	BO6	0.04	0.04	0.04	0.55	0.03	658
TOTAL		**7.3**	**7.3**	**7.3**	**50.1**	**5.3**	**116021**

2.7 EXPANSION PROJECT TOTAL EMISSIONS INCREASES

The baseline actual to projected actual emissions results are summarized in Table 5 below. The emissions calculations and other assumptions are presented in Appendix A. The PSD applicability analysis shows that the expansion project will result in a significant emissions increase for PM and VOCs and requires PSD review for these two pollutants. SO2 and CO are included in the emissions summary but do not trigger PSD review.

TABLE 5
TOTAL EXPANSION PROJECT EMISSIONS INCREASES

(Tables 3 & 4 Totals)	PM TPY	PM10 TPY	PM2.5 TPY	NOx TPY	VOC TPY	CO2e TPY
BASELINE	57.1	26.9	12.8	33.5	642.7	79635
PROJECTED ACTUALS	87.8	40.1	18.0	61.6	991.6	129348
DIFFERENCES: FUTURE POTENTIALS - BASELINE	**31**	13.2	5.2	28.1	**349**	49,713
PSD THRESHOLDS	25	15	10	40	40	75,000

2.8 MODELED EMISSION RATES FOR PRECURSORS (MERPs) ASSESSMENT

As shown above, the VOC emissions from the expansion are above the Significant Emissions Rate (SER) of 40 tons per year found in ADEM's PSD regulations in ADEM Admin. Code 335-3-14-.04. The Applicable national Ambient Air Quality Standards (NAAQS) and the PSD increments are subject to air quality analysis in a typical review. However, no NAAQS or PSD increment exists for VOC but do for ozone. Ground level ozone is predominantly a secondary pollutant formed through photochemical reactions driven by emissions of NOx and VOCs in the presence of sunlight. Per the revised and updated 40 CFR Part 51, Appendix W, precursor emission impacts to ozone should be considered in the PSD analysis. To that end, EPA views the Modeled Emission Rates for Precursors (MERPs) as a type of Tier 1 demonstration tool that provides a simple way to relate maximum downwind impact with a critical air quality threshold.

2.8.1 VOC Precursor Assessment for O_3

EPA's modeling results of hypothetical sources are used to demonstrate that the air quality impacts of ozone from this project would be expected to be below the critical air quality thresholds. These MERPs are given in Table 7.1 in the draft Guidance on the Development of Modeled Emission Rates for Precursors as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program and are further discussed below.

Table 7.1 Most Conservative (Lowest) Illustrative MERP Values (tons per year) by Precursor*

Precursor	Area	8-hr O3
NOx	Eastern US	170
VOC	Eastern US	1159

*From Guidance Document

The estimated annual increases of VOC and NOX from the Decatur expansion project are:
VOCs – 349 tons per year
NOx – 28.1 tons per year.

These rates are well below the values modeled by EPA given in Table 7.1 (the MERP) and therefore the air quality impacts are expected to be below the critical air quality threshold.

In addition, the NOx and VOC precursor contributions to the 8-hour daily maximum ozone are considered together to determine if the air quality impact would exceed the critical air quality threshold as shown below. A value less than 100% indicates that the critical air quality threshold will not be exceeded when considering the combined impacts.

(28.1 tpy NOX/170 tpy NOX 8-hr daily max O3 MERP) + (349 tpy VOC / 1159 VOC 8-hr daily max O3 MERP) x 100% = 46.64%

which is less than 100%. Therefore, the critical air quality threshold will not be exceeded.

2.8.2 Preconstruction Ambient Air Monitoring

The initial significant impact area (SIA) determination must also address preconstruction monitoring for sources that exceed the significant monitoring concentrations. There is no specific concentration prescribed for ozone, but for any source that will have an increase of 100 tons per year or more of VOCs, pre or post operation monitoring for ozone may be considered for any source that triggers PSD review for NOx or VOCs. The state has conducted monitoring for ozone and results are included in Appendix B.

2.9 ADDITIONAL IMPACT ANALYSIS - ADEM Admin. Code Regulation 335-3-14-.04(14)

The plant is proposing an increase from 56.575 mm bushels per 12 month rolling total to 61.425 mm bushels per 12 month rolling total. Bunge does not anticipate any impact on visibility, soils or vegetation that would occur as a result of this modification which is less than a 10% increase in the throughput of the plant.

APPENDIX A

BASELINE EMISSIONS CALCULATIONS S[illegible]IARY

BUNGE NORTH AMERICA, INC.
Decatur, AL

2/21/2019

POINT SOURCES

Source name	State Source #	PM Controlled (Tons/Yr)	PM10 Controlled (Tons/Yr)	PM2.5 Controlled (Tons/Yr)	PMcon Controlled (Tons/Yr)	NOx (Tons/Yr)	SOx (Tons/Yr)	CO (Tons/Yr)	VOC (Tons/Yr)	HAP's (Tons/Yr)
TRUCK UNLOADING & SCREENINGS GRIND BH	RS-1b	0.37	0.37	0.063		0.00	0.00	0.00	0.00	0.00
BARGE UNLDNG/LOADNG BAGHOUSE	RS-3a/3b	0.084	0.084	0.042		0.00	0.00	0.00	0.00	0.00
HEADHOUSE	RS-2	0.65	0.65	0.324		0.00	0.00	0.00	0.00	0.00
BEAN TANKS - 7	RS-5 a - g	8.70	2.19	0.373		0.00	0.00	0.00	0.00	0.00
CLEAN & SCALP	CD-1	0.63	0.63	0.317		0.00	0.00	0.00	0.00	0.00
GRAIN DRYER	CD-2	16.2	4.0	0.688	1.0	18.2	0.11	15.3	1.0	
TEMPORING/DAY TANKS	CD-3	0.124	0.124	0.062						
PRIMARY DEHULL FILTER	PR-1	1.62	1.62	0.812		0.00	0.00	0.00	0.00	0.00
DEHULLING & ASPIRATOR FILTER	PR-2	1.62	1.62	0.812						
CRACKING/CONVEY FILTER	PR-4	0.36	0.36	0.182						
CONDITIONING	PR-6	3.25	1.95	0.734		0.00	0.00	0.00	0.00	0.00
HULL GRIND	PR-5	0.58	0.58	0.289		0.00	0.00	0.00	0.00	0.00
FLAKING	PR-7	4.1	4.1	2.867		0.00	0.00	0.00	0.00	0.00
EXTRACTOR, EVAP/COND, OIL STRIPPER, HEX STOR. TANKS	EX-1	0.00	0.00	0.000		0.00	0.00	0.00	639.0	409.0
MEAL DRY & COOL	EX-2	6.39	6.39	2.410		0.00	0.00	0.00	0.0	0.0
SHIFT RUN TANKS	EX-3 a - f	0.00	0.00	0.000		0.0	0.00	0.0	0.00	0.00
CRUDE OIL STORAGE	EX-4 a - f	0.00	0.00	0.000		0.0	0.00	0.0	0.00	0.00
MEAL GRIND & ADDITIVE TANK	MH-1	0.44	0.44	0.219		0.00	0.00	0.00	0.00	0.00
HULL PELLET COOLER	MH-3	1.16	1.16	0.809		0.00	0.00	0.00	0.00	0.00
HULLS STORAGE BIN	MH-2 c	1.159	0.292	0.050		0.00	0.00	0.00	0.00	0.00
PELLETTED HULLS STORAGE BINS (2)	MH-2 e-f	0.153	0.037	0.0063		0.00	0.00	0.00	0.00	0.00
MEAL STORAGE BIN	MH-2 g	0.073	0.073	0.037		0.00	0.00	0.00	0.00	0.00
HULL REC FILTER	MH-6	0.020	0.020	0.010		0.00	0.00	0.00	0.00	0.00
MEAL TRUCK LOADOUT	MH-4	0.28	0.28	0.139		0.00	0.00	0.00	0.00	0.00
MEAL RAIL LOADOUT	MH-5	0.051	0.051	0.025		0.00	0.00	0.00	0.00	0.00
MEAL HOUSE & LOADOUT & STORAGE (b) BINS	MH-7	1.14	1.14	0.571		0.00	0.00	0.00	0.00	0.00
GEKA BOILER	REF1 & 2	0.30	0.30	0.295	0.22	3.88	0.023	3.26	0.21	
REFINERY	REF-3	0.00	0.00	0.000		0.0	0.00	0.0	0.0	0.0
NO 1 SILO - BLEACHING CLAY	REF-4	0.00018	0.00018	0.000		0.00	0.00	0.00	0.00	0.00
GARIONI NAVAL BOILER	REF-5	0.079	0.079		0.060	0.418	0.0063	0.88	0.057	
NO 2 SILO - FILTER AID	REF-6	0.00006	0.00006	0.000		0.00	0.00	0.00	0.00	0.00
NO. 3 SILO BLEACHING CLAY	REF-7	0.00018	0.00018	0.000						
N GAS/OIL BOILER	BO3, 4 & 5	4.63	4.63	4.630	3.47	28.81	0.37	51.2	3.35	
NATURAL GAS WATER HEATER - PKG	BO6	0.028	0.028		0.021	0.373	0.0022	0.31	0.020	
TOTAL Point Source Emissions:		54.84	33.92	16.88	4.81	51.70	0.51	70.94	643.69	408.99

FUGITIVE EMISSIONS

Source name		PM (Tons/Yr)	PM10 (Tons/Yr)	PM2.5 (Tons/Yr)	VOCs (Tons/Yr)	HAPs (Tons/Yr)
RAIL UNLOADING	RS-1a	5.55	1.35	0.230	0.00	0.00
TRUCK UNLOADING & SCREENINGS GRIND	RS-1b	2.01	0.63	0.106	0.00	0.00
BARGE UNLOADING	RS-3b	0.95	0.24	0.041	0.00	0.00
BARGE LOADING	RS-3a	4.79	0.71	0.048		
MEAL TRUCK LOADOUT	MH-4	10.23	1.51	0.101		
MEAL RAIL LOADOUT	MH-5	2.72	0.40	0.027	0.00	0.00
TOTAL Fugitive Emissions:		26.3	4.8	0.6	0.0	0.0

Bunge North America, Inc.
DECATUR, AL
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EU#	Emission Unit Description	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)	SO_2 (ton/yr)	NOx (ton/yr)	CO (ton/yr)	VOC (ton/yr)	n-Hexane (ton/yr)	CO_2 (ton/yr)	N_2O (ton/yr)	Methane (ton/yr)	CO_{2e} (ton/yr)
		Projected Actual Emissions											
RECEIVING & STORAGE													
RS-1a	Rail Unloading Pits - Fugitives	3.68	0.90	0.15									
RS-1b	Truck Unloading Pits:												
	Baghouse Emissions	0.28	0.28	0.14									
	Fugitive Emissions	2.67	0.83	0.14									
RS-2	Headhouse to Storage Tanks, Elevator Legs, Belt Conveyor to Storage	0.32	0.32	0.16									
RS-3a	Barge Loading:												
	Barge Loading Fugitive	12.19	1.81	0.12									
	Baghouse Emissions	0.21	0.21	0.11									
RS-3b	Barge Unloading and Aspiration of Unloading to Baghouse	0.32	0.32	0.16									
	Barge Receiving Fugitive	7.00	1.77	0.23									
RS-5a-g	Soybean Storage Tanks	11.52	2.90	0.51									
CLEANING & DRYING													
CD-1	Cleaning and Process Tanks w/Dust System Collector	1.29	1.29	0.65									
CD-2	Law-Marrot Grain Dryer	16.18	4.05	0.69	0.11	18.22	15.31	1.00	0.33	22,846	0.122	0.438	22,893
CD-6	New Grain Dryer	7.28	1.82	0.31	0.07	11.07	9.30	0.61	0.20	13,283	0.071	0.255	13,310
CD-3	Temporing/Day Tanks w/baghouse	0.12	0.12	0.06									
BEAN PREP													
PR-1	Dehulling Aspiration #1	1.62	1.62	0.81									
PR-2	Dehulling Aspiration #2	1.62	1.62	0.81									
PR-4	Cracking Aspiration	0.36	0.36	0.18									
PR-6	Vertical Bean Conditioner - New	0.63	0.63	0.61									
PR-5	Hull Grind	0.58	0.58	0.29									
PR-7	Flaking - w/new Baghouse & Fan	5.37	5.37	2.69									
BOILER HOUSE													
BO-3	Natl Gas Boiler	2.10	2.10	2.10	0.17	13.46	23.21	1.52	0.50	33,161	0.177	0.636	33,229
BO-4	Natl Gas Boiler	2.10	2.10	2.10	0.17	13.46	23.21	1.52	0.50	33,161	0.177	0.636	33,229
BO-5	New Natural Gas Fired Boiler	2.55	2.55	2.55	0.20	16.31	28.14	1.84	0.60	40,195	0.214	0.770	40,277
BO-6	Hot Water Heater (5.25 MMBH - Packaging)	0.04	0.04	0.04	0.00	0.55	0.46	0.03	0.01	657	0.004	0.013	658

Projected Actual Emissions

EU#	Emission Unit Description	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)	SO_2 (ton/yr)	NOx (ton/yr)	CO (ton/yr)	VOC (ton/yr)	n-Hexane (ton/yr)	CO_2 (ton/yr)	N_2O (ton/yr)	Methane (ton/yr)	CO_{2e} (ton/yr)
	SOLVENT EXTRACTION												
EX-1	EXTRACTOR, NEW EVAP/COND,OIL STRIPPER, HEX STOR. TANKS							985.6	630.8				
EX-2	MEAL DRY & COOL (DC) D1 New	0.70	0.70	0.26									
EX-2	MEAL DRY & COOL (DC) D2 New	0.70	0.70	0.26									
EX-2	MEAL DRY & COOL (DC) D3 New	1.98	1.98	0.75									
EX-2	MEAL DRY & COOL (DC) D4 New	1.98	1.98	0.75									
EX-2	MEAL DRY & COOL (DC) C1 New	3.01	3.01	1.13									
EX-2	MEAL DRY & COOL (DC) C2 New	3.01	3.01	1.13									
EX-3-4	CRUDE OIL TANKS - Insig. Activities												
	MEAL HANDLING												
MH-1	MEAL GRIND & ADDITIVE TANK w/BH	0.44	0.44	0.22									
MH-2c	HULLS STORAGE TANK	1.54	0.39	0.068									
MH-2e-f	PELLETTED HULLS STORAGE BINS (2)	0.203	0.049	0.008									
MH-2g	MEAL STORAGE BIN	0.073	0.073	0.037									
MH-3	HULL PELLET COOLER w/CYCLONE	1.16	1.16	0.81									
MH-4	MEAL TRUCK LOADOUT w/BAGHOUSE	0.36	0.36	0.18									
MH-4	Fugitive Emissions	13.21	1.96	0.13									
MH-5	MEAL RAIL LOADOUT w/BAGHOUSE	0.02	0.02	0.01									
MH-5	Fugitive Emissions	1.02	0.15	0.01									
MH-6	HULL REC CYCLONE w/FILTER	0.020	0.020	0.01									
MH-7	MEAL HOUSE & LOADOUT & STORAGE BINS	1.14	1.14	0.57									
	REFINERY												
REF-1	GEKA BOILER	0.21	0.21	0.21	0.02	2.83	2.38	0.16	0.05	3,393	0.02	0.065	3,400
REF-2	GEKA BOILER	0.21	0.21	0.21	0.02	2.83	2.38	0.16	0.05	3,393	0.02	0.065	3,400
REF-3	REFINERY							VOCs INCLUDED IN EXTRACTOR EMISSIONS					
REF-4	NO 1 SILO - BLEACHING CLAY	0.0002	0.0002	0.0001									
REF-6	NO 2 SILO - DE	0.0001	0.0001	0.0000									
REF-5	GARIONI STEAM GENERATOR (5 mbh)	0.12	0.12	0.12	0.01	0.61	1.28	0.08	0.03	1,824	0.01	0.035	1,828
REF-7	NO. 3 SILO - BLEACHING CLAY	0.0002	0.0002	0.0001									
	Diesel Fire Pumps		0.18		0.16	2.48	0.54	0.20					
	Cooling Tower - Extraction	0.26	0.06	0.03									
	Cooling Tower - Refinery	0.26	0.06	0.03									

Existing sources

New or modified sources

Baghouses on these sources were swapped

Bunge North America, Inc.
DECATUR, AL
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EU#	Emission Unit Description	Stack Height (ft)	Stack Diameter (in) (inches)	Stack Discharge (h, ov, uv)	Exhaust Flow (acfm)	Exit Velocity (fps)	Exit Temperature (°F)
		Stack Parameters					
RECEIVING & STORAGE							
RS-1a	Rail Unloading Pits - Fugitives	Fugitive Dust Emissions					Ambient
RS-1b	Truck Unloading Pits:						
	Baghouse Emissions	10	30	vertical	27,713	73.7	Ambient
	Fugitive Emissions	Fugitive Truck Receiving Emissions					
RS-2	Headhouse to Storage Tanks, Elevator Legs, Belt Conveyor to Storage	130	18" x 23"	vertical	12,419	72.0	Ambient
RS-3a	Barge Loading:						
	Barge Loading Fugitive	Fugitive Barge Loading Emissions					
	Baghouse Emissions	15	20" x 20"		10,000	60.0	Ambient
RS-3b	Barge Unloading and Aspiration of Unloading to Baghouse				15,000		Ambient
	Barge Receiving Fugitive	Fugitive Barge Receiving Emissions					
RS-5a-g	Soybean Storage Tanks	Squares: 97' Rounds: 91'	Squares: 56" x 56" Rounds: 30" diam				Ambient
CLEANING & DRYING							
CD-1	Cleaning and Process Tanks w/Dust System Collector	10	20" x 20"	vertical	25,310	151.9	Ambient
CD-2	Law-Marrot Grain Dryer	95.3	4 @ 3'x5'	vertical	270,000	75.0	110
CD-6	New Grain Dryer	95.3	2 @ 3'x5'	vertical	135,000		110
CD-3	Temporing/Day Tanks w/baghouse				2,400		Ambient
BEAN PREP							
PR-1	Dehulling Aspiration #1	10	20" x 20"		45,000	270.0	Ambient
PR-2	Dehulling Aspiration #2	10	20" x 20"		45,000	270.0	Ambient
PR-4	Cracking Aspiration	6	18" x 23"		10,080	58.4	Ambient
PR-6	Vertical Bean Conditioner - New	64.8	13	vertical	4,050		140
PR-5	Hull Grind	16	36		16,000	37.7	Ambient
PR-7	Flaking - w/new Baghouse & Fan	10	40" x 40"	vertical	40,000	60.0	140
BOILER HOUSE							
BO-3	Natl Gas Boiler	55	42		24,385		116
BO-4	Natl Gas Boiler	55	42		24,385		116
BO-5	New Natural Gas Fired Boiler	55	42		29,550		116
BO-6	Hot Water Heater (5.25 MMBH - Packaging)	49	18		1,100		250

		Stack Parameters					
EU#	Emission Unit Description	Stack Height (ft)	Stack Diameter (in) (inches)	Stack Discharge (h, ov, uv)	Exhaust Flow (acfm)	Exit Velocity (fps)	Exit Temperature (°F)
	SOLVENT EXTRACTION						
EX-1	EXTRACTOR, NEW EVAP/COND,OIL STRIPPER, HEX STOR. TANKS	60	6		350	30.0	90
EX-2	MEAL DRY & COOL (DC) D1 New	44	30	vertical	17,500	59.4	158
EX-2	MEAL DRY & COOL (DC) D2 New	44	30	vertical	17,500	59.4	140
EX-2	MEAL DRY & COOL (DC) D3 New	41	30	vertical	17,500	59.4	127.4
EX-2	MEAL DRY & COOL (DC) D4 New	41	30	vertical	17,500	59.4	122
EX-2	MEAL DRY & COOL (DC) C1 New	41	30	vertical	17,500	59.4	102.2
EX-2	MEAL DRY & COOL (DC) C2 New	41	30	vertical	17,500	59.4	98.6
EX-3-4	CRUDE OIL TANKS - Insig. Activities						
	MEAL HANDLING						
MH-1	MEAL GRIND & ADDITIVE TANK w/BH	10	20" x 20"		17,800	106.8	Ambient
MH-2c	HULLS STORAGE TANK	No stack - bin vents					Ambient
MH-2e-f	PELLETTED HULLS STORAGE BINS (2)	No stack - bin vents					Ambient
MH-2g	MEAL STORAGE BIN	120	12"		1,800		Ambient
MH-3	HULL PELLET COOLER w/CYCLONE	8.5	20" x 26"		8,000	37.0	Ambient
MH-4	MEAL TRUCK LOADOUT w/BAGHOUSE	12	34" x 39"		30,000	54.3	Ambient
MH-4	Fugitive Emissions						
MH-5	MEAL RAIL LOADOUT w/BAGHOUSE	12	34" x 39"		30,000	54.3	Ambient
MH-5	Fugitive Emissions						
MH-6	HULL REC CYCLONE w/FILTER	110	7.92		900	44.0	Ambient
MH-7	MEAL HOUSE & LOADOUT & STORAGE BINS	12	33		28,000	78.6	Ambient
	REFINERY						
REF-1	GEKA BOILER	33	24"	vertical w/ cap	10,400		700
REF-2	GEKA BOILER	33	24"	vertical w/ cap	10,400		700
REF-3	REFINERY						
REF-4	NO 1 SILO - BLEACHING CLAY	80	12" x 12"	horizontal	1,100		ambient
REF-6	NO 2 SILO - DE	80	12" x 12"	horizontal	1,100		ambient
REF-5	GARIONI STEAM GENERATOR (5 mbh)	33	12"	vertical w/ cap	2,600		700
REF-7	NO. 3 SILO - BLEACHING CLAY	80	12" x 12"	horizontal	1,100		ambient
	Diesel Fire Pumps	6	8"	horizontal	1,400		961
	Cooling Tower - Extraction	34	3 @ 225"	vertical	1,307,000		90
	Cooling Tower - Refinery	28	4 @ 192"	vertical	1,270,000		90

Existing sources

New or modified sources

Baghouses on these sources were swapped

BUNGE NORTH AMERICA, INC. **FUTURE POTENTIAL EMISSIONS ESTIMATE** 21-Feb-19

1400 Market St NE, Decatur, AL

Facility ID: 712-0026

Operation time		Production		Conversion Factors		
8,424	hr/yr	175,000	bu/day	Soybeans	60	lb/bushel
351	days/yr	61425000	bu/yr	Soybean Meats	56	lb/bushel
		1,842,750	ton/yr	Soybean Hulls	4	lb/bushel
				Hull Pellets	4	lb/bushel
				Soybean Meal	45	lb/bushel
				Soybean Oil	11.5	lb/bushel

The following equations were used for the emissions calculations below.

lb/hr= EF lb/ton x TP ton/hr; ton/yr = EF lb/ton x TP ton/yr x 1/2000
lb/hr= G x Q x 60/7000; ton/yr = G x Q x 60/7000x H hr/year/2000
lb/hr= EF lb/ton x TP ton/hr x (1-CpE/100); ton/yr = EF lb/ton x TP ton/yr x (1-CpE/100)

Rail Unloading Pits

RS-1a

Transfer Rate/hour	375	tons/hr	
Control Efficiency	40	%	due to shed enclosure
Operation	1277	hours/year	
Annual Throughput	382,987	ton/year	based on projected receipts from each mode of receipt

Emission Factors

		Units	Basis
PM	0.032	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0078	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0013	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	12.00	2.93	0.49	6.13	1.49	0.25
Fugitive Emissions	7.20	1.76	0.29	3.68	0.90	0.15

Truck Unloading Pits

RS-1b

Maximum Transfer Rate/hour	375	tons/hr	
Average Transfer Rate/hour	375	tons/hr	
Capture Efficiency	95	%	shed enclosure and aspiration
Operation	3309.2191	hours/year	
Annual Throughput	992,766	ton/year	based on projected receipts from each mode of receipt
Grain Loading	0.00071	grain/dscf	Bean Receiving Test: Council Bluffs, October 1999 @ 90% CL
Baghouse Fan Flow Rate	27,713	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

Truck Receiving

Hopper Bottom		Units	Basis
PM	0.035	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0078	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0013	lb/ton	AP-42, Table 9.9.1-1
Straight Truck		**Units**	**Basis**
PM	0.180	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0590	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0100	lb/ton	AP-42, Table 9.9.1-1

Percentage Hopper Bottom	50%	Enter the percentage of hopper bottom trucks vs straight trucks.
Percentage Straight Truck	50%	

Combined		Units	Basis
PM	0.108	lb/ton	Calculated
PM10	0.033	lb/ton	Calculated
PM2.5	0.006	lb/ton	Calculated

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	40.31	12.53	2.12	53.36	16.58	2.80
Baghouse Emissions	0.17	0.17	0.08	0.28	0.28	0.14
Fugitive Emissions	2.02	0.63	0.11	2.67	0.83	0.14

Headhouse to Storage Tank, Conveyor, Scales and Boot Aspiration

RS-2

Maximum Transfer Rate/hour	1125	tons/hr	Based on maximum receiving rate from truck, rail and barge.
Average Transfer Rate/hour	300	tons/hr	Only receiving from one source.
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8424	hours/year	
Annual Throughput	1,842,750	ton/year	
Grain Loading	0.0007	gr/cfm	Bean Receiving Test: Council Bluffs, October 1999:
Baghouse Fan Flow Rate	12,419	scfm	**WAS GRAIN CLEANING BAGHOUSE**
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	0.061	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0340	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0058	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	68.63	38.25	6.53	56.20	31.33	5.34
Baghouse Emissions	0.08	0.08	0.038	0.32	0.32	0.16

Barge Unloading and Aspiration of Unloading and Transfer Conveyor

RS-3b

Barge Unloading

Maximum Transfer Rate/hour	375	tons/hr	maxiumum rate due to repositioning barges
Average Transfer Rate/hour	375	tons/hr	
Capture Efficiency	80	%	aspiration capture
Operation	2491	hours/year	
Annual Throughput	466,997	ton/year	based on projected receipts from each mode of receipt
Grain Loading	0.0020	grain/dscf	expected exhaust concentration
Baghouse Fan Flow Rate	15,000	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

Barge Receiving

		Units	Basis
PM	0.150	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0380	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0050	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	56.25	14.25	1.88	35.02	8.87	1.17
Fugitive Emissions	11.25	2.85	0.38	7.00	1.77	0.23
Baghouse Emissions	0.26	0.26	0.13	0.32	0.32	0.16

RS-3a

Meal Loadout by Barge

Maximum Transfer Rate/hour	147	tons/hr	maxiumum rate due to repositioning barges
Average Transfer Rate/hour	147	tons/hr	
Capture Efficiency	80	%	aspiration capture
Operation	8424	hours/year	
Annual Throughput	451,474	ton/year	based on projected loadout by each mode of transportation

Emission Factors

		Units	Basis
PM	0.270	lb/ton	AP-42, Table 9.11.1-1
PM10	0.0400	lb/ton	AIRS Mar 1990 SCC 3-02-007-91
PM2.5	0.00268	lb/ton	Per PM Calculator PM2.5:PM10 ratio of 0.067

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	39.69	5.88	0.39	60.95	9.03	0.60
Fugitive Emissions	7.94	1.18	0.08	12.19	1.81	0.12

Baghouse Emissions - Barge Loadout

Operation	8424	hours/year	
Grain Loading	0.000583	gr/scfm	Meal Loadout Test: Council Bluffs, June 2006
Baghouse Fan Flow Rate	10,000	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Baghouse Emissions	0.05	0.05	0.02	0.21	0.21	0.11

Soybean Storage Tanks

RS-5a-g

Maximum Transfer Rate/hour	375	tons/hr	Based on conveying rate
Average Transfer Rate/hour	219	tons/hr	
Capture Efficiency	50	%	due to settling chamber action in bin because of height
Control Efficiency	100	%	and size of silos
Operation	8760	hours/year	
Annual Throughput	1,842,750	ton/year	

Emission Factors

		Units	Basis
PM	0.025	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0063	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0011	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	9.38	2.36	0.41	23.03	5.80	1.01
Bin Vent Emissions	4.69	1.18	0.21	11.52	2.90	0.51

Scalping, Screening, Deck Cleaner and Process Bin Aspiration

CD-1

Maximum Transfer Rate/hour	450	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8424	hours/year	
Annual Throughput	1,842,750	ton/year	
Grain Loading	0.0014	gr/cfm	PM emission basis: Bean Cleaning Council Bluffs, Nov 2008
Baghouse Fan Flow Rate	25,310	scfm	**WAS HEADHOUSE BAGHOUSE**
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	0.075	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0190	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0032	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	33.75	8.55	1.44	69.10	17.51	2.95
Baghouse Emissions	0.31	0.31	0.15	1.29	1.29	0.65

Law-Marrot Grain Dryer

CD-2

Particulate Emissions

Maximum Transfer Rate/hour	250 tons/hr	
Average Transfer Rate/hour	250 tons/hr	
Operation	8424 hours/year	
Annual Throughput	1,391,277 ton/year	
PM Grain Loading	0.00166 grain/dscf	from stack test data provided by manufacturer
PM10 Grain Loading	0.000415 grain/dscf	AP42 PM:PM10 ratio
PM2.5 Grain Loading	0.0000706 grain/dscf	AP42 PM10:PM2.5 ratio
Baghouse Fan Flow Rate	270,000 scfm	

Emission Factors

		Units	Basis
PM	0.220	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0550	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0094	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	55.00	13.75	2.35	153.04	38.26	6.54
Potential	3.842	0.960	0.163	16.18	4.05	0.69

Combustion Emissions

Heat Content of Fuel	1000	MMBtu/MMCF	Natural Gas
Heat Input Capacity	45.2	MMBtu/hr	
Maximum Firing Rate	0.0452	MMCF/hr	
Operation	8424	hours/year	
	364.42	MMCF/yr	

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
-	-	-	0.6	100.0	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998

PM emissions are covered in dryer PM emissions

	PM	**PM10**	**PM2.5**	**SO_2**	**NOx**	**CO**	**VOC**	**n-hexane**
Max Hourly (lb/hr)	55.00	13.75	2.35	0.027	4.52	3.80	0.25	0.08
Max Annual (tpy)	16.18	4.05	0.69	0.11	18.22	15.31	1.00	0.33

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

	CO_2	**N_2O**	**Methane**	**CO_{2e}**
Max Hourly (lb/hr)	5,424	0.029	0.104	5,435
Max Annual (tpy)	22,846	0.122	0.44	22,893

Law-Marrot Grain Dryer - NEW

CD-6

Particulate Emissions

Maximum Transfer Rate/hour	125 tons/hr	design rate of upgraded dryer
Average Transfer Rate/hour	125 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	7582 hours/year	Will be used to dry additional annual throughput. Assume 90% of current operating hours.
Max Throughput	695,639 ton/year	Assumes the maximum amount dried in this dryer is half of the annual throughput.
PM Grain Loading	0.00166 grain/dscf	from stack test data provided by manufacturer
PM10 Grain Loading	0.000415 grain/dscf	AP42 PM:PM10 ratio
PM2.5 Grain Loading	0.0000706 grain/dscf	AP42 PM10:PM2.5 ratio
Baghouse Fan Flow Rate	135,000 scfm	

Emission Factors

		Units	Basis
PM	0.220	lb/ton	AP-42, Table 9.9.1-1
PM10	0.0550	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0094	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Potential	1.921	0.480	0.082	7.28	1.82	0.31

Combustion Emissions

Heat Content of Natural Gas	1000	MMBtu/MMCF
Heat Input Capacity	29.2	MMBtu/hr
Maximum Firing Rate	0.0292	MMCF/hr
Operation	7581.6	hours/year
	221.38	MMCF/yr

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
-	-	-	0.6	100.0	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998
PM emissions are covered in dryer PM emissions

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	1.92	0.48	0.08	0.018	2.92	2.45	0.16	0.05
Max Annual (tpy)	7.28	1.82	0.31	0.07	11.07	9.30	0.61	0.20

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	3,504	0.019	0.067	3,511
Max Annual (tpy)	13,283	0.1	0.3	13,310

Temporing/Day Tanks NEW TANK WILL BE ASPIRATED TO CD-3 - There will be no increase in emissions.

CD-3

Maximum Transfer Rate/hour	450	tons/hr	
Average Transfer Rate/hour	450	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8424	hours/year	
Annual Throughput	1,391,277	ton/year	
Grain Loading	0.0014	gr/cfm	PM emission basis: Bean Cleaning Council Bluffs, Nov. 2008
Baghouse Fan Flow Rate	2,400	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Baghouse Emissions	0.03	0.03	0.01	0.12	0.12	0.06

Dehulling Aspiration #1

PR-1

Maximum Transfer Rate/hour	219	tons/hr	
Average Transfer Rate/hour	219	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8424	hours/year	
Annual Throughput	1,842,750	ton/year	
Grain Loading	0.00100	gr/scf	PM emission Dehulling stack test Council Bluffs, Oct. 1999
Baghouse Fan Flow Rate	45,000	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	0.360	lb/ton	AP-42, Table 9.11.1-1
PM10	0.360	lb/ton	AP-42, Table 9.11.1-1
PM2.5	0.0240	lb/ton	AP-42, Table 9.11.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Emissions to Baghouse	78.75	78.75	5.25	331.70	331.70	22.11
Emissions from Baghouse	0.39	0.39	0.19	1.62	1.62	0.81

Dehulling Aspiration #2

PR-2

Maximum Transfer Rate/hour	219 tons/hr	
Average Transfer Rate/hour	219 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8424 hours/year	
Annual Throughput	1,842,750 ton/year	
Grain Loading	0.00100 gr/scf	PM emission Dehulling stack test Council Bluffs, Oct. 1999
Baghouse Fan Flow Rate	45,000 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	0.360	lb/ton	AP-42, Table 9.11.1-1
PM10	0.360	lb/ton	AP-42, Table 9.11.1-1
PM2.5	0.0240	lb/ton	AP-42, Table 9.11.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Emissions to Baghouse	78.75	78.75	5.25	331.70	331.70	22.11
Baghouse Emissions	0.39	0.39	0.19	1.62	1.62	0.81

Cracking Aspiration

PR-4

Maximum Transfer Rate/hour	219 tons/hr	
Average Transfer Rate/hour	219 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8424 hours/year	
Annual Throughput	1,842,750 ton/year	
Grain Loading	0.00100 gr/scf	PM emission Dehulling stack test Council Bluffs, Oct. 1999
Baghouse Fan Flow Rate	10,080 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	0.360	lb/ton	AP-42, Table 9.11.1-1
PM10	0.360	lb/ton	AP-42, Table 9.11.1-1
PM2.5	0.0240	lb/ton	AP-42, Table 9.11.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Emissions to Baghouse	78.75	78.75	5.25	331.70	331.70	22.11
Baghouse Emissions	0.09	0.09	0.04	0.36	0.36	0.18

Vertical Bean Conditioner

PR-6

Maximum Transfer Rate/hour	219 tons/hr	
Average Transfer Rate/hour	219 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8424 hours/year	
Annual Throughput	1,719,900 ton/year	
PM2.5 Grain Loading	0.00414 grain/dscf	Emissions from March 2016 stack test in Destrehan
PM10 Grain Loading	0.0043 grain/dscf	Emissions from March 2016 stack test in Destrehan
Cyclone Fan Flow Rate	4,050 scfm	
PM2.5:PM10 Ratio	0.7000 controlled:	conservatively based on cyclone stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Cyclone Emissions	0.150	0.150	0.144	0.63	0.63	0.61

Flaker Aspiration

PR-7

Maximum Transfer Rate/hour	219 tons/hr	
Average Transfer Rate/hour	219 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8,424 hours/year	
Annual Throughput	1,842,750 ton/year	
Grain Loading	0.00372 grain/dscf	Council Bluffs 2014 Stack Test on FA2 - Flaker Baghouse, 90%CI
Cyclone Fan Flow Rate	40,000 scfm	
PM2.5:PM10 Ratio	0.5000	PM2.5:PM10 Ratio from EPA PM calculator

Emission Factors

Flaking		Units	Basis
PM	0.370	lb/ton	AP-42, Table 9.11.1-1
PM10	0.3700	lb/ton	AP-42, Table 9.11.1-1
PM2.5	0.1850	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator for baghouses(0.5)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
PM Emissions using EF	80.94	80.94	40.47	340.91	340.91	170.45
Baghouse Emissions	1.28	1.28	0.64	5.37	5.37	2.69

Hull Grind w/baghouse

PR-5

Maximum Transfer Rate/hour	14.6 tons/hr	
Average Transfer Rate/hour	14.6 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8424 hours/year	
Annual Throughput	122,850 ton/year	
Grain Loading	0.0010 grain/dscf	PM emissions from Dehulling Test: Council Bluffs, October 1999
Baghouse Fan Flow Rate	16,000 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	Basis
PM	2.000	lb/ton	AP-42, Table 9.11.1-1
PM10	1.20	lb/ton	from AIRS 1990 for SCC 3-02-007-86
PM2.5	0.4524	lb/ton	Per PM Calculator PM2.5:PM10 ratio of 0.377

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Emissions	29.17	17.50	6.60	122.85	73.71	27.79
Baghouse Emissions	0.14	0.14	0.07	0.58	0.58	0.29

Extraction Process
EX-1

Maximum Transfer Rate/hour	219	tons/hr
Average Transfer Rate/hour	219	tons/hr
Capture Efficiency	NA	%
Operation	8,424	hours/year
Annual Throughput	1,842,750	ton/year

Emission Factors

		Units	Basis			
VOC	1.0697	lb/ton	Veg Oil MACT, SLR:		0.19	gal/ton
n-hexane	0.6846	lb/ton			5.63	lb/gal
				64%		n-hexane

	VOC (lb/hr)	n-hexane (lb/hr)	VOC (ton/yr)	n-hexane (ton/yr)
Uncontrolled Potential	234.0	149.8	985.6	630.8

VOC and n-hexane emissions come from three sources, 1) fugitive, 2) mineral oil absorber and 3) DTDC stacks

Mineral Oil Absorber
NA

Maximum Transfer Rate/hour	164	tons/hr	
Average Transfer Rate/hour	164	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	1,382,063	ton/year	
%LEL	100	%	Could go as high as 100%
LEL	0.0120	cf hex/cf	LEL for hexane is 1.2 cf of hexane per 100 cf of air.
hexane vapor density	0.2150	controlled:	conservatively based on baghouse stack test data
MOA exhaust air flow rate	350	scfm	
n-hexane %	0.64	Hexane is 64% n-hexane	

lb/hr=%LEL x LEL (cf hexane/cf air) x Q (cf/min) x 60 (min/hr) x ρ (lb/cf)

	VOC (lb/hr)	n-hexane (lb/hr)	VOC (ton/yr)	n-hexane (ton/yr)
MOA Emissions*	54.2	34.7	228.2	146.1

***Note: Annual emissions are already included in the emissions from EX-1.**

Dryer Cyclones
EX-2 Dryers 1 & 2

Maximum Transfer Rate/hour	164	tons/hr	
Average Transfer Rate/hour	164	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	1,382,063	tons meal/year	
Grain Loading	0.00111	grain/dscf	Council Bluffs 2006 Stack Test on DC2, 90%CI
Baghouse Fan Flow Rate	17,500	scfm	
PM2.5:PM10 Ratio	0.3770	controlled:	conservatively based on stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Process Cyclone Emissions	0.167	0.167	0.063	1.40	1.40	0.53

Dryer Cyclones
EX-2 Dryers 3 & 4

Maximum Transfer Rate/hour	164	tons/hr	
Average Transfer Rate/hour	164	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	1,382,063	ton/year	
Grain Loading	0.00314	grain/dscf	Council Bluffs 2003 Stack Test on DC3, 90%CI
Baghouse Fan Flow Rate	17,500	scfm	
PM2.5:PM10 Ratio	0.3770	controlled:	conservatively based on stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Process Cyclone Emissions	0.471	0.471	0.178	3.97	3.97	1.50

Cooler Cyclones

EX-2 Coolers 1&2

Maximum Transfer Rate/hour	164 tons/hr	
Average Transfer Rate/hour	164 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8,424 hours/year	
Annual Throughput	1,382,063 ton/year	
Grain Loading	0.00476 grain/dscf	Council Bluffs 2009 Stack Test on DC4, 90%CI
Baghouse Fan Flow Rate	17,500 scfm	
PM2.5:PM10 Ratio	0.3770 controlled:	conservatively based on stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Process Cyclone Emissions	0.71	0.71	0.27	6.01	6.01	2.27
TOTAL CYCLONE EMISSIONS				11.39	11.39	4.29

HULL PROCESSING

Hull Pellet Cooler w/cyclone

MH-3

Maximum Transfer Rate/hour	14.6 tons/hr	
Average Transfer Rate/hour	14.6 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8,424 hours/year	
Annual Throughput	122,850 ton/year	
Exhaust Fan Flow Rate	8,000 scfm	
PM2.5:PM10 Ratio	0.7000 controlled:	conservatively based on baghouse stack test data
Grain Loading	0.004 gr/dscf	Morristown pellet cooler test Mar 2011 (95% UL)

Emission Factors

Pelletizing		**Units**	**Basis**
PM	0.150	lb/ton	AP-42, Table 9.9.1-2 for SCC 3-02-008-16 HE Cyclone
PM10	0.0750	lb/ton	50% of PM per footnote (g) of AP42 section 9.9.1
PM2.5	0.0283	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.377)

AP-42 Emission Factor assumes cyclone control, so back calculate using 90% cyclone control

		Units	**Basis**
PM	1.500	lb/ton	0.150/(1-0.90)
PM10	0.750	lb/ton	0.0750/(1-0.90)
PM2.5	0.283	lb/ton	0.0283/(1-0.90)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	21.88	10.94	4.12	92.14	46.07	17.37
Cyclone Emissions	0.27	0.27	0.19	1.16	1.16	0.81

Hull Storage

MH-2c

Maximum Transfer Rate/hour	14.6 tons/hr	Max and Avg are equal
Average Transfer Rate/hour	14.6 tons/hr	
Operation	8,424 hours/year	
Annual Throughput	122,850 ton/year	

Emission Factors

Hull Storage		**Units**	**Basis**
PM	0.025	lb/ton	AP-42, Table 9.9.1-1 for grain storage because emission and particle size should be similar.
PM10	0.0063	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.0011	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Potential Particulate Emissions	0.36	0.09	0.02	1.54	0.39	0.068

Controlled and uncontrolled emission are equal because there are no controls.

Hull Pellet Storage Bins (2)

MH-2-e-f

Maximum Transfer Rate/hour	14.6	tons/hr	
Average Transfer Rate/hour	14.6	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	122,850	ton/year	

Emission Factors

Pellet Storage		Units	Basis
PM	0.0033	lb/ton	AP-42, Table 9.9.1-2 for Feed Shipping SCC 3-02-008-03
PM10	0.0008	lb/ton	AP-42, Table 9.9.1-2 for Feed Shipping SCC 3-02-008-03
PM2.5	0.0001	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.17)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Potential Particulate Emissions	0.048	0.012	0.002	0.203	0.049	0.008

HULL REC CYCLONE w/FILTER

MH-6

Maximum Transfer Rate/hour	14.6	tons/hr	
Average Transfer Rate/hour	14.6	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	122,850	ton/year	
Grain Loading	0.00061	gr/dscf	Council Bluffs June 2006 compliance tests - Dehulling filter
Baghouse Fan Flow Rate	900	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

Hull Storage		Units	Basis
PM	0.360	lb/ton	AP-42, Table 9.9.1-1 for grain storage because emission and particle size should be similar.
PM10	0.360	lb/ton	AP-42, Table 9.9.1-1
PM2.5	0.024	lb/ton	AP-42, Table 9.9.1-1

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Emissions	5.25	5.25	0.35	22.11	22.11	1.48
Baghouse Emissions	0.005	0.005	0.002	0.02	0.02	0.01

MEAL PROCESSING

Meal Grinding/Sizing

MH-1

Maximum Transfer Rate/hour	164	tons/hr	
Average Transfer Rate/hour	164	tons/hr	
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	8,424	hours/year	
Annual Throughput	1,382,063	ton/year	average hourly rate x hours/yr
Grain Loading	0.000683	gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Exhaust Fan Flow Rate	17,800	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

Emission Factors

Meal		Units	Basis
PM	0.340	lb/ton	AP-42, Table 9.11.1-1
PM10	0.340	lb/ton	AP-42, Table 9.11.1-1
PM2.5	0.1282	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.377)

AP-42 Emission Factor assumes cyclone control, so back calculate using 90% cyclone control

		Units	Basis
PM	3.40	lb/ton	0.340/(1-0.90)
PM10	3.40	lb/ton	0.340/(1-0.90)
PM2.5	1.282	lb/ton	0.1282/(1-0.90)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	557.81	557.81	210.30	2349.51	2349.51	885.76
Baghouse Emissions	0.10	0.10	0.05	0.44	0.44	0.22

Meal Storage w/Baghouse

MH-2g

Maximum Transfer Rate/hour	350 tons/hr	
Average Transfer Rate/hour	350 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8,424 hours/year	
Annual Throughput	1,382,063 ton/year	
Grain Loading	0.0011 grain/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Exhaust Fan Flow Rate	1,800 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

Meal Storage		Units	Basis
PM	0.2700	lb/ton	AP-42, Table 9.11.1-1 for meal loadout
PM10	0.0400	lb/ton	AIRS 1990 for SCC 3-02-007-91
PM2.5	0.0027	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.067)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	94.5	14.0	0.94	186.6	27.6	1.85
Baghouse Emissions	0.017	0.017	0.009	0.073	0.073	0.037

Meal Loadout Dust Collector #1 - Truck

MH-4

Maximum Transfer Rate/hour	300 tons/hr	
Average Transfer Rate/hour	300 tons/hr	
Capture Efficiency	90 % aspirated to dust collector	
Operation	4,076 hours/year	Based on throughput and hourly rate x 1.25 for efficiency
Annual Throughput	978,193 ton/year	
Grain Loading	0.0007 gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Baghouse Fan Flow Rate	30,000 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

Meal Loadout		Units	Basis
PM	0.2700	lb/ton	AP-42, Table 9.11.1-1 for meal loadout
PM10	0.0400	lb/ton	AIRS 1990 for SCC 3-02-007-91
PM2.5	0.0027	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.067)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Emissions	81.00	12.00	0.80	132.06	19.56	1.31
Baghouse Emissions	0.18	0.18	0.09	0.36	0.36	0.18
Fugitive Emissions	8.10	1.20	0.08	13.21	1.96	0.13

Meal Loadout Dust Collector #2 - Rail

MH-5

Maximum Transfer Rate/hour	750 tons/hr	
Average Transfer Rate/hour	750 tons/hr	
Capture Efficiency	90 % aspirated to dust collector	
Operation	130 hours/year - increased by 30% to reflect actual loadout rate	
Annual Throughput	75,246 ton/year	
Grain Loading	0.0011 gr/dscf	Council Bluffs Nov 99 & June00 tests - Meal finishing filter
Baghouse Fan Flow Rate	30,000 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

Meal Loadout		**Units**	**Basis**
PM	0.2700	lb/ton	AP-42, Table 9.11.1-1 for meal loadout
PM10	0.0400	lb/ton	AIRS 1990 for SCC 3-02-007-91
PM2.5	0.0027	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.067)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Emissions	202.50	30.00	2.01	10.16	1.50	0.10
Baghouse Emissions	0.29	0.29	0.15	0.02	0.02	0.01
Fugitive Emissions	20.25	3.00	0.20	1.02	0.15	0.010

MEAL HOUSE & LOADOUT & STORAGE BINS DUST COLLECTOR

MH-7

Maximum Transfer Rate/hour	300 tons/hr	
Average Transfer Rate/hour	164.1 tons/hr	
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	8,424 hours/year	
Annual Throughput	1,382,063 ton/year	
Grain Loading	0.0011 gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Baghouse Fan Flow Rate	28,000 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

Emission Factors

		Units	**Basis**
PM	0.2700	lb/ton	AP-42, Table 9.11.1-1 for meal loadout
PM10	0.0400	lb/ton	AIRS 1990 for SCC 3-02-007-91
PM2.5	0.0027	lb/ton	PM2.5:PM10 Ratio from EPA PM calculator (0.067)

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Emissions	81.00	12.00	0.80	186.58	27.64	1.85
Baghouse Emissions	0.27	0.27	0.136	1.14	1.14	0.57

No. 1 Silo - Bleaching Clay

REF-4

Maximum Transfer Rate/hour	33 tons/hr	
Average Transfer Rate/hour	33 tons/hr	Based on max truck unloading rate
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	43.5 hours/year	- throughput divided by hourly rate increased by 50% to reflect actual rate
Annual Throughput	943 ton/year	estimate based on past usage and ratioed to future usage
Grain Loading	0.0011 gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Exhaust Fan Flow Rate	1,100 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Silo Filter Emissions	0.011	0.011	0.005	0.00023	0.00023	0.00012

No. 2 Silo - Filter Aid

REF-6

Maximum Transfer Rate/hour	33 tons/hr	
Average Transfer Rate/hour	33 tons/hr	Based on max truck unloading rate
Capture Efficiency	100 %	completely enclosed aspiration system
Operation	15.5 hours/year	- throughput divided by hourly rate increased by 50% to reflect actual rate
Annual Throughput	335 ton/year	equals tons/hour x hours/year
Grain Loading	0.0011 gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Exhaust Fan Flow Rate	1,100 scfm	
PM2.5:PM10 Ratio	0.5000 controlled:	conservatively based on baghouse stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Silo Filter Emissions	0.011	0.011	0.005	0.00008	0.00008	0.00004

No. 3 Silo - Bleaching Clay

REF-7

Maximum Transfer Rate/hour	33	tons/hr	Based on max truck unloading rate
Capture Efficiency	100	%	completely enclosed aspiration system
Operation	43.5	hours/year -	throughput divided by hourly rate increased by 50% to reflect actual rate
Annual Throughput	943	ton/year	estimate based on past usage and ratioed to future usage
Grain Loading	0.0011	gr/dscf	Council Bluffs Nov 99 & June 00 tests - Meal finishing filter
Exhaust Fan Flow Rate	1,100	scfm	
PM2.5:PM10 Ratio	0.5000	controlled:	conservatively based on baghouse stack test data

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Silo Filter Emissions	0.011	0.011	0.005	0.00023	0.00023	0.00012

Cooling Tower

Maximum Transfer Rate/hour	840,000	gal/hr	recirculation rate
Average Transfer Rate/hour	840,000	gal/hr	based on 14000 gpm recirc rate
Capture Efficiency	0	%	there is no control
Operation	8760	hours/year	
Annual Throughput	7.36E+09	gal/year	average hourly rate x hours/yr

"Atmospheric Emissions From Evaporative Cooling Towers, Wayne Micheletti, 2005 Cooling Technology Institute Annual Conference"

TDS (ppm)	PM10 EF lb/1000 gal recirc	PM2.5 EF	
500	0.00003	0.00001	
1,000	0.00005	0.00002	
2,500	0.00009	0.00005	
5,000	0.00016	0.00009	
10,000	0.00028	0.00016	
11,500	0.000313	0.0001825	Interpolated values
20,000	0.0005	0.00031	

These values are based on a drift rate of 0.002%

lb/hr= EF lb/ton x TP ton/hr; ton/yr = EF lb/ton x TP ton/yr x 1/2000
1/3rd of emissions from each of three cells

Emission Factors

		Units	Basis
PM	0.00021	lb/1000 gal	Mass balance using a TDS of 2,500ppm and drift rate of 0.001%
PM10	0.000045	lb/1000 gal	Used TDS/table and drift rate, assuming a TDS of 2,500ppm and 0.001% drift rate.
PM2.5	0.000025	lb/1000 gal	Used TDS/table and drift rate, assuming a TDS of 2,500ppm and 0.001% drift rate.

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	0.058	0.0126	0.007	0.3	0.1	0.03

Controlled and uncontrolled emission are equal because there are no controls.

Cooling Tower

Maximum Transfer Rate/hour	840,000	gal/hr	recirculation rate
Average Transfer Rate/hour	840,000	gal/hr	based on 14000 gpm recirc rate
Capture Efficiency	0	%	there is no control
Operation	8760	hours/year	
Annual Throughput	7.36E+09	gal/year	average hourly rate x hours/yr

Emission Factors

		Units	Basis
PM	0.00021	lb/1000 gal	Mass balance using a TDS of 2,500ppm and drift rate of 0.001%
PM10	0.000045	lb/1000 gal	Used TDS/table and drift rate, assuming a TDS of 2,500ppm and 0.001% drift rate.
PM2.5	0.000025	lb/1000 gal	Used TDS/table and drift rate, assuming a TDS of 2,500ppm and 0.001% drift rate.

	PM (lb/hr)	PM10 (lb/hr)	PM2.5 (lb/hr)	PM (ton/yr)	PM10 (ton/yr)	PM2.5 (ton/yr)
Uncontrolled Potential	0.058	0.0126	0.007	0.3	0.1	0.03

Controlled and uncontrolled emission are equal because there are no controls.

PROJECTED ACTUAL COMBUSTION EMISSIONS

CD-2 & CD-6 **Grain Dryers**
See Emission Data tab for dryer emissions calculations.

1,842,750 tons of beans

Boiler House
BO-3 and BO-4

Natural Gas Combustion

Heat Content of Fuel	1000	MMBtu/MMCF
Heat Input Capacity	99	MMBtu/hr PER EACH
Maximum Firing Rate	0.099	MMCF/hr
Operation	7581.6	hours/year

Based on the "Could Have Accommodated Natural Gas Combustion Numbers" and bean throughput
0.8758 mcf of natural gas /ton of beans was combusted in the 3 old main boilers
Assume that based on size, BO3 and BO4 will supply 62.26% of the required steam.
With 10% loss in efficiency: mcf of gas / ton of beans x tons of beans x 1.1 =
1105.36 MMCF/yr

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
7.6	7.6	7.6	0.6	48.7	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998 except NOx and CO

Per Boiler

	PM	**PM10**	**PM2.5**	**SO_2**	**NOx**	**CO**	**VOC**	**n-hexane**
Max Hourly (lb/hr)	0.75	0.75	0.75	0.059	4.82	8.32	0.54	0.18
Max Annual (tpy)	2.10	2.10	2.10	0.17	13.46	23.21	1.52	0.50

Total for both boilers

	PM	**PM10**	**PM2.5**	**SO_2**	**NOx**	**CO**	**VOC**	**n-hexane**
Max Hourly (lb/hr)	1.50	1.50	1.50	0.12	9.64	16.63	1.09	0.36
Max Annual (tpy)	4.20	4.20	4.20	0.33	26.92	46.42	3.04	0.99

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

Per Boiler

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	11,880	0.063	0.228	11,904
Max Annual (tpy)	33,161	0.177	0.636	33,229

Boiler House
BO-5 Existing Fuel Oil

Heat Content of Fuel	135,000	Btu/Gal
Heat Input Capacity	99	MMBtu/hr
Maximum Firing Rate	0.733333	KGal/hr
Operation	7581.6	hours/year
	5559.84	KGal/yr

Emission Factors (lb/KGal)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC
2	2	2	7.1	20	5	0.34

'Emission factors for fuel oil combustion taken from AP42, Tables 1.3-1 & -3,September 1998. Combustion of distillate oil.
SO2 emission factor = 142*%S

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	1.47	1.47	1.47	5.207	14.67	3.67	0.25	0.00
Max Annual (tpy)	5.56	5.56	5.56	19.74	55.60	13.90	0.95	0.00

Boiler House
BO-5 New

Natural Gas Combustion

Heat Content of Fuel	1000	MMBtu/MMCF
Heat Input Capacity	120	MMBtu/hr
Maximum Firing Rate	0.12	MMCF/hr
Operation	7581.6	hours/year

Based on the "Could Have Accommodated Natural Gas Combustion Numbers" and bean throughput
0.8758 mcf of natural gas /ton of beans was combusted in the 3 old main boilers
Assume that based on size, BO5 will supply 37.74% of the required steam.
With 10% loss in efficiency: **669.91 MMCF/yr**

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
7.6	7.6	7.6	0.6	48.7	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998 except NOx and CO

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	0.91	0.91	0.91	0.072	5.84	10.08	0.66	0.22
Max Annual (tpy)	2.55	2.55	2.55	0.20	16.31	28.14	1.84	0.60

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	14,400	0.077	0.276	14,430
Max Annual (tpy)	40,195	0.21	0.77	40,277

GEKA Boilers
REF 1 & 2

Natural Gas Combustion

Heat Content of Fuel	1000	MMBtu/MMCF
Heat Input Capacity	13	MMBtu/hr PER EACH
Maximum Firing Rate	0.013	MMCF/hr
Operation	7581.6	hours/year

Based on the "Could Have Accommodated Natural Gas Combustion Numbers" and bean throughput
0.0558 mcf of natural gas /ton of beans was combusted in the GEKAs
With 10% loss in efficiency: **113.11 MMCF/yr**

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
7.6	7.6	7.6	0.6	100.0	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998.

Per Boiler

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	0.10	0.10	0.10	0.008	1.30	1.09	0.07	0.02
Max Annual (tpy)	0.21	0.21	0.21	0.02	2.83	2.38	0.16	0.05

Total for both boilers

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	0.20	0.20	0.20	0.016	2.60	2.18	0.14	0.05
Max Annual (tpy)	0.43	0.43	0.43	0.03	5.66	4.75	0.31	0.10

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

Per Boiler

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	1,560	0.008	0.030	1,563
Max Annual (tpy)	3,393	0.02	0.07	3,400

GARIONI NAVAL BOILER
REF 5

Natural Gas Combustion

Heat Content of Fuel	1000	MMBtu/MMCF
Heat Input Capacity	5	MMBtu/hr PER EACH
Maximum Firing Rate	0.005	MMCF/hr
Operation	7581.6	hours/year

Based on the "Could Have Accommodated Natural Gas Combustion Numbers" and bean throughput
0.015 mcf of natural gas /ton of beans was combusted in the GEKAs

With 10% loss in efficiency: **30.41 MMCF/yr**

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
7.6	7.6	7.6	0.6	40.0	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998 except NOx and CO

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	0.04	0.04	0.04	0.003	0.20	0.42	0.03	0.01
Max Annual (tpy)	0.12	0.12	0.12	0.01	0.61	1.28	0.08	0.03

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	600	0.003	0.012	601
Max Annual (tpy)	1,824	0.01	0.03	1,828

PACKAGING - HOT WATER HEATER - AJAX
BO-6

Natural Gas Combustion

Heat Content of Fuel	1000	MMBtu/MMCF
Heat Input Capacity	5.25	MMBtu/hr
Maximum Firing Rate	0.00525	MMCF/hr
Operation	7581.6	hours/year

Based on the "Could Have Accommodated Natural Gas Combustion Numbers" and bean throughput
0.0054 mcf of natural gas /ton of beans was combusted in the GEKAs
With 10% loss in efficiency: **10.95 MMCF/yr**

Emission Factors (lb/MMCF)

PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
7.6	7.6	7.6	0.6	100.0	84	5.5	1.8

Emission factors for natural gas combustion are from AP42, Tables 1.4-1,-2,-3, July 1998 except NOx and CO

	PM	PM10	PM2.5	SO_2	NOx	CO	VOC	n-hexane
Max Hourly (lb/hr)	0.04	0.04	0.04	0.003	0.53	0.44	0.03	0.01
Max Annual (tpy)	0.04	0.04	0.04	0.003	0.55	0.46	0.03	0.01

Greenhouse Gasses

Emission Factors (lb/MMCF)			Global Warming Potential		
CO_2	N_2O	Methane	CO_2	N_2O	Methane
120,000	0.64	2.3	1.0	310	21

	CO_2	N_2O	Methane	CO_{2e}
Max Hourly (lb/hr)	630	0.003	0.012	631
Max Annual (tpy)	657	0.004	0.013	658

Emergency Fire Pump Engines #1 and #2

Engine HorsePower	801	HP
Diesel Fuel Max Sulfer %	0.0015	%
Consumption	31.6	gal/hr
Operation	100	hours/year

NSPS Subpart IIII

Emission Factors (lb/HP · hr)

PM10	SO_2	NOx	CO	VOC
0.002200	0.002050	0.0310	0.0067	0.002474

Emission factors for natural gas combustion are from AP42, Table 3.3-1,

	PM10	SO_2	NOx	CO	VOC
Max Hourly (lb/hr)	1.76	1.64	24.83	5.35	1.98
Max Annual (tpy)	0.18	0.16	2.48	0.54	0.20

TOTAL CF CONSUMED PER YEAR INCLUDING GRAIN DRYER=
2515.53 MMCF/YR

BUNGE

APPENDIX B

Feb. 5, 2019

CERTIFICATION EVALUATION AND CONCURRENCE FLAG MEANINGS

FLAG	MEANING
M	The monitoring organization has revised data from this monitor since the most recent certification letter received from the state.
N	The certifying agency has submitted the certification letter and required summary reports, but the certifying agency and/or EPA has determined that issues regarding the quality of the ambient concentration data cannot be resolved due to data completeness, the lack of performed quality assurance checks or the results of uncertainty statistics shown in the AMP255 report or the certification and quality assurance report.
S	The certifying agency has submitted the certification letter and required summary reports. A value of "S" conveys no Regional assessment regarding data quality per se. This flag will remain until the Region provides an "N" or "Y" concurrence flag.
U	Uncertified. The certifying agency did not submit a required certification letter and summary reports for this monitor even though the due date has passed, or the state's certification letter specifically did not apply the certification to this monitor.
X	Certification is not required by 40 CFR 58.15 and no conditions apply to be the basis for assigning another flag value
Y	The certifying agency has submitted a certification letter, and EPA has no unresolved reservations about data quality (after reviewing the letter, the attached summary reports, the amount of quality assurance data submitted to AQS, the quality statistics, and the highest reported concentrations).

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450 END)

Feb. 5, 2019

PQAOS USED IN THIS REPORT

PQAO	AGENCY DESCRIPTION
0013	Al Dept Of Env Mgt

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRON ·AL PROTECTION AGENCY
AIR QUAL . SYSTEM
QUICK LOOK REPORT (AMP450 END)

Feb. 5, 2019

METHODS USED IN THIS REPORT

PARAMETER	METHOD CODE	COLLECTION METHOD	ANALYSIS METHOD
44201	047	INSTRUMENTAL	ULTRA VIOLET

Note: The * indicates that the mean does not satisfy summary criteria.

Note: These reported values do not reflect the combination of 14129 and 85129 and validation substitution tests utilized for Design Value Calculations

Feb. 5, 2019

Ozone (44201) Alabama Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2015	047	99	243	245	.064	.063	.063	.063	0	Y	0
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2016	047	100	244	245	.070	.069	.069	.067	0	Y	0
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2017	047	95	233	245	.064	.062	.061	.060	0	Y	0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM
QUICK LOOK REPORT (AMP450)

Feb. 5, 2019

Ozone (44201) Alabama Parts per million (007)

1-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX> STD	EST DAYS> STD	MISS DAYS< STD	CERT and EVAL	EDT
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2015	047	244	245	.087	.072	.070	.069	0	0.0	1	Y	0
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2016	047	244	245	.077	.076	.075	.075	0	0.0	1	Y	0
01-103-0011	1	0013	Decatur	Morgan	P.O. BOX 2224 WALLACE DEVELOPMENT CENTER. DECATUR, ALABAMA	2017	047	236	245	.070	.069	.066	.065	0	0.0	1	Y	0

Note: The * indicates that the mean does not satisfy summary criteria.

Feb. 5, 2019

EXCEPTIONAL DATA TYPES

EDT	DESCRIPTION
0	NO EVENTS
1	EVENTS EXCLUDED
2	EVENTS INCLUDED
5	EVENTS WITH CONCURRENCE EXCLUDED

Note: The * indicates that the mean does
not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: MDA

QUICKLOOK CRITERIA PARAMETERS

Report Request ID: 1714387 | Report Code: AMP450 | Feb. 5, 2019

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	01	103									

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
QUICK LOOK	44201		

SELECTED OPTIONS

Option Type	Option Value
EVENTS PROCESSING	EXCLUDE REGIONALLY CONCURRED EVENTS
MERGE PDF FILES	YES
AGENCY ROLE	PQAO
WORKFILE DELIMITER	,

SORT ORDER

Order	Column
1	PARAMETER_CODE
2	STATE_CODE
3	COUNTY_CODE
4	SITE_ID
5	POC
6	DATES
7	EDT_ID

DATE CRITERIA

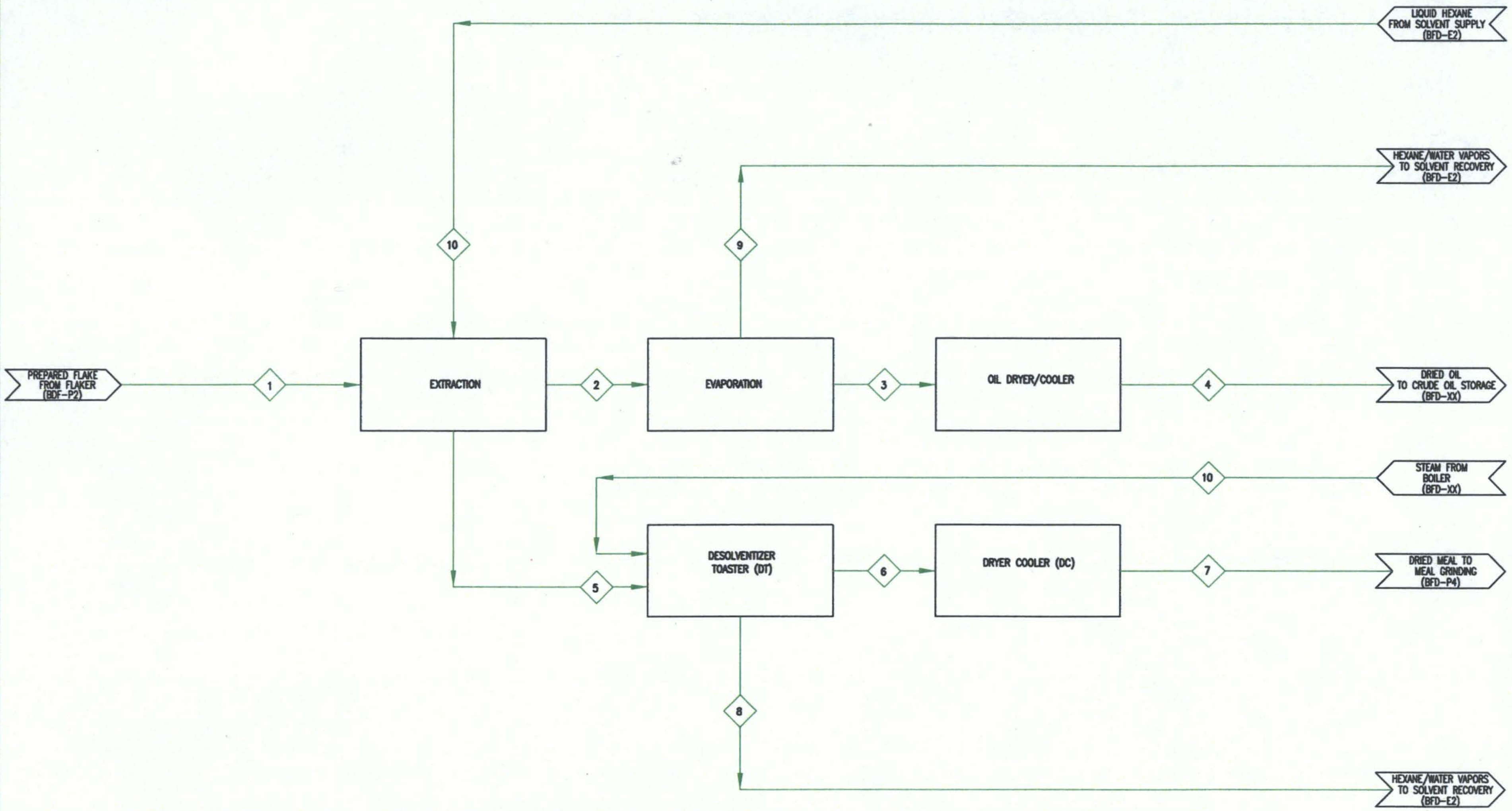
Start Date	End Date
2015	2017

APPLICABLE STANDARDS

Standard Description
Ozone 1-hour 1979
Ozone 8-Hour 2008

BLOCK FLOW DIAGRAMS AND

SITE PLANS



STREAM No.	1	2	3	4	5	6	7	8	9	10	11
STREAM NAME	PREPARED FLAKES TO EXTRACTION	FULL MISCELLA FROM EXTRACTION	HOT OIL FROM EVAPORATION	DRIED OIL TO CRUDE OIL STORAGE	WET FLAKES FROM EXTRACTION	TOASTED FLAKES TO DRYER COOLER	DRIED FLAKES TO MEAL GRINDING	HEXANE VAPORS FROM DT TO SOLVENT RECOVERY	HEXANE VAPORS FROM EVAPORATION TO SOLVENT RECOVERY	STEAM FROM BOILER	HEXANE SUPPLY TO EXTRACTION
TOTAL FLOWRATE (LBS/Hr)											

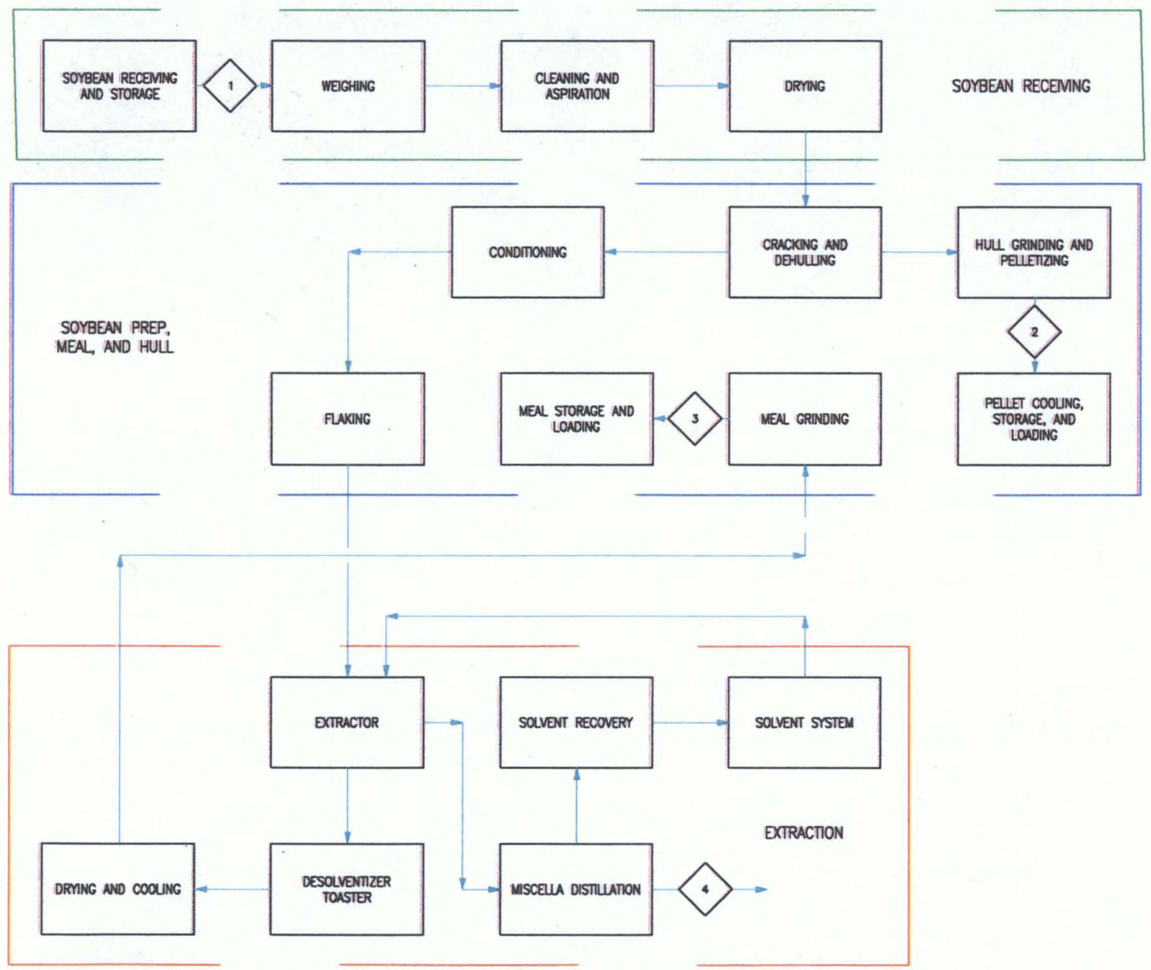
FLOW BALANCE

RELEASED FOR REVIEW ONLY
JANUARY 25, 2018

BUNGE NORTH AMERICA
Operations-Support Group

EXTRACTOR, DT, DC, EVAPORATOR BLOCK FLOW DIAGRAM
DECATUR, AL 175,000 BPD EXPANSION PROJECT
EXTRACTION DEPARTMENT
DECATUR, AL

DWG. NO. BFD E-1



MATERIAL BALANCE					
STREAM NO.		1	2	3	4
STREAM NAME		WHOLE BEANS TO MAIN PLANT	PELLETIZED HULLS TO LOADOUT	GROUND MEAL TO LOADOUT	EXTRACTION OIL TO CRUDE OIL STORAGE
	UNITS				
TOTAL FLOWRATE	BU/DAY	175,000			
TOTAL FLOWRATE	STPD		331	3,824	
TOTAL FLOWRATE	LBS/DAY				1,967,000
TOTAL FLOWRATE	LBS/HR				
ANNUAL PRODUCTION	MM LBS/YR				
MOISTURE	% BY WT	12.0			

RELEASED FOR REVIEW ONLY
April 26, 2018

Revisions

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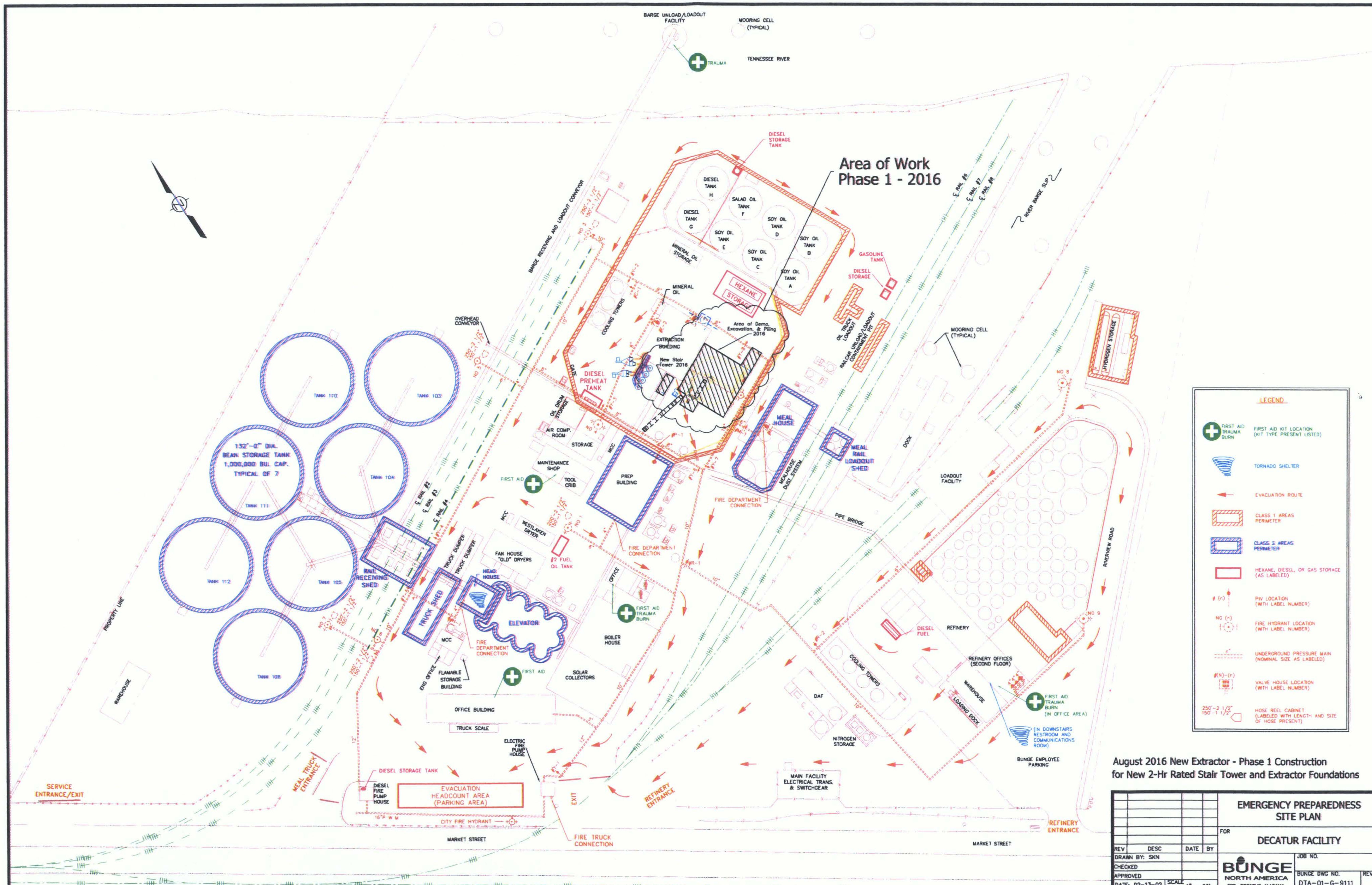
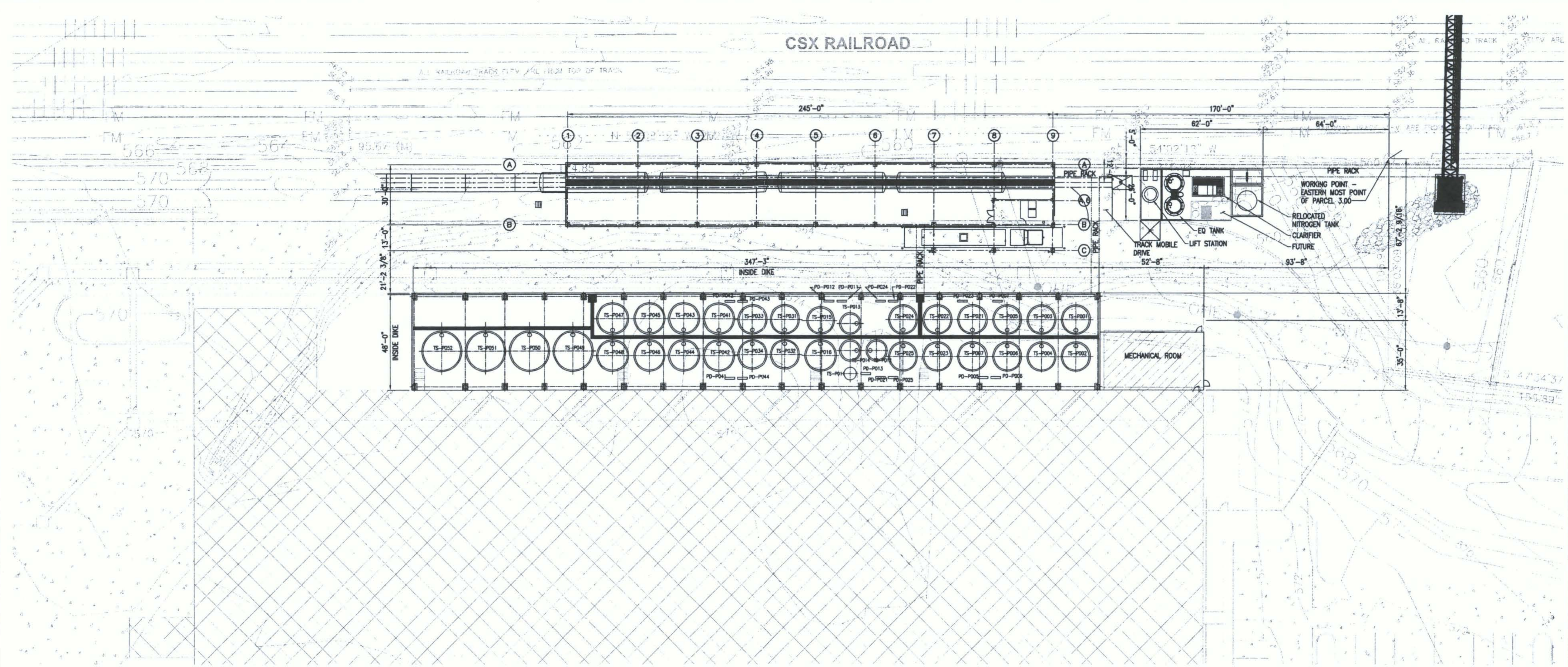
Dr.By: | Engr.:
Date | Scale

BUNGE NORTH AMERICA
Operations–Support Group

TAG#: | REV#:
DWG. NO.


Area of Work
Phase 1 - 2016
BARGE UNLOAD/LOADOUT FACILITY
MOORING CELL (TYPICAL)
TENNESSEE RIVER
TRAUMA
DIESEL STORAGE TANK
DIESEL TANK H
DIESEL TANK G
SALAD OIL TANK F
SOY OIL TANK D
SOY OIL TANK E
SOY OIL TANK C
SOY OIL TANK B
SOY OIL TANK A
MINERAL OIL STORAGE
MINERAL OIL
HEXANE STORAGE
GASOLINE TANK
DIESEL STORAGE
OIL TRUCK LOADOUT
RAILCAR UNLOAD/LOADOUT CONTAINMENT PIT
RIVER BARGE SLIP
Area of Demo, Excavation, & Piling 2016
EXTRACTION BUILDING
New Stair Tower 2016
COOLING TOWERS
DIESEL PREHEAT TANK
OVERHEAD CONVEYOR
BUNGE RECEIVING AND LOADOUT CONVEYOR
MEAL HOUSE
MEAL RAIL LOADOUT SHED
MEAL HOUSE DUST SYSTEM
DOCK
LOADOUT FACILITY
MOORING CELL (TYPICAL)
HYDROGEN STORAGE
AIR COMP. ROOM
STORAGE
MCC
MAINTENANCE SHOP
TOOL CRIB
FIRST AID
PREP BUILDING
FIRE DEPARTMENT CONNECTION
PIPE BRIDGE
TANK 102
TANK 103
TANK 104
TANK 111
TANK 112
TANK 105
TANK 106
132'-0" DIA. BEAN STORAGE TANK 1,000,000 BU. CAP. TYPICAL OF 7
RAIL RECEIVING SHED
TRUCK DUMPER
TRUCK SHED
HEAD HOUSE
ELEVATOR
FAN HOUSE "OLD" DRYERS
WESTLAKEN DRYER
#2 FUEL OIL TANK
OFFICE
FIRST AID TRAUMA BURN
BOILER HOUSE
SOLAR COLLECTORS
FLAMABLE STORAGE BUILDING
ENG OFFICE
OFFICE BUILDING
TRUCK SCALE
ELECTRIC FIRE PUMP HOUSE
PROPERTY LINE
WAREHOUSE
RIVERVIEW ROAD
DIESEL FUEL
REFINERY
REFINERY OFFICES (SECOND FLOOR)
COOLING TOWERS
DAF
WAREHOUSE
LOADING DOCK
NITROGEN STORAGE
FIRST AID TRAUMA BURN (IN OFFICE AREA)
(IN DOWNSTAIRS RESTROOM AND COMMUNICATIONS ROOM)
BUNGE EMPLOYEE PARKING
MAIN FACILITY ELECTRICAL TRANS. & SWITCHGEAR
SERVICE ENTRANCE/EXIT
MEAL TRUCK ENTRANCE
DIESEL STORAGE TANK
DIESEL FIRE PUMP HOUSE
EVACUATION HEADCOUNT AREA (PARKING AREA)
CITY FIRE HYDRANT
MARKET STREET
EXIT
FIRE TRUCK CONNECTION
REFINERY ENTRANCE
REFINERY ENTRANCE
MARKET STREET
LEGEND
FIRST AID KIT LOCATION (KIT TYPE PRESENT LISTED)
TORNADO SHELTER
EVACUATION ROUTE
CLASS 1 AREAS PERIMETER
CLASS 2 AREAS PERIMETER
HEXANE, DIESEL, OR GAS STORAGE (AS LABELED)
PIV LOCATION (WITH LABEL NUMBER)
FIRE HYDRANT LOCATION (WITH LABEL NUMBER)
UNDERGROUND PRESSURE MAIN (NOMINAL SIZE AS LABELED)
VALVE HOUSE LOCATION (WITH LABEL NUMBER)
HOSE REEL CABINET (LABELED WITH LENGTH AND SIZE OF HOSE PRESENT)
August 2016 New Extractor - Phase 1 Construction
for New 2-Hr Rated Stair Tower and Extractor Foundations
EMERGENCY PREPAREDNESS SITE PLAN
FOR
DECATUR FACILITY
REV
DESC
DATE
BY
DRAWN BY: SKN
CHECKED
APPROVED
DATE: 02-13-02
SCALE 1" = 60'
BUNGE NORTH AMERICA
SPD - DECATUR, ALABAMA
JOB NO.
BUNGE DWG NO. DTA-01-G-9111



SITE PLAN
1"=20'-0"

TANK NO.	DIAMETER	HEIGHT	CAPACITY	PRODUCT	TANK NO.	DIAMETER	HEIGHT	CAPACITY	PRODUCT
TS-P001	13'-6"	34'-0"	250,000#	SHORTENING	TS-P025	13'-6"	34'-0"	250,000#	LIQUID SHORTENING BLEND
TS-P002	13'-6"	34'-0"	250,000#	SHORTENING	TS-P031	13'-6"	34'-0"	250,000#	PALM OIL
TS-P003	13'-6"	34'-0"	250,000#	SHORTENING	TS-P032	13'-6"	34'-0"	250,000#	PALM OIL
TS-P004	13'-6"	34'-0"	250,000#	SHORTENING	TS-P033	13'-6"	34'-0"	250,000#	PALM OIL
TS-P005	13'-6"	34'-0"	250,000#	SHORTENING	TS-P034	13'-6"	34'-0"	250,000#	PALM OIL
TS-P006	13'-6"	34'-0"	250,000#	SHORTENING	TS-P041	14'-6"	34'-0"	295,000#	COLD TEST BLEND
TS-P007	13'-6"	34'-0"	250,000#	SHORTENING	TS-P042	14'-6"	34'-0"	295,000#	COLD TEST BLEND
TS-P011	6'-4"	10'-0"	11,000#	EMULSIFIER SCALE	TS-P043	14'-6"	34'-0"	295,000#	HI OLEIC SALAD OIL TANK
TS-P012	9'-6"	20'-0"	70,000#	VREST	TS-P044	14'-6"	34'-0"	295,000#	SBO SALAD OIL TANK
TS-P013	9'-6"	20'-0"	70,000#	ESTRIC	TS-P045	14'-6"	34'-0"	295,000#	SBO SALAD OIL TANK
TS-P014	9'-6"	20'-0"	70,000#	PGME	TS-P046	14'-6"	34'-0"	295,000#	CORN OIL TANK
TS-P015	12'-6"	20'-0"	100,000	MAG FAT	TS-P047	14'-6"	34'-0"	295,000#	CANOLA OIL TANK
TS-P016	14'-6"	34'-0"	295,000#	PALM KERNEL	TS-P048	14'-6"	34'-0"	295,000#	CANOLA OIL TANK
TS-P021	13'-6"	34'-0"	250,000#	LIQUID SHORTENING BLEND	TF-P049	19'-1"	34'-0"	500,000#	HIGH OLEIC CANOLA
TS-P022	13'-6"	34'-0"	250,000#	LIQUID SHORTENING BLEND	TF-P050	19'-1"	34'-0"	500,000#	HIGH OLEIC CANOLA
TS-P023	13'-6"	34'-0"	250,000#	LIQUID SHORTENING BLEND	TF-P051	19'-1"	34'-0"	500,000#	HIGH OLEIC CANOLA
TS-P024	13'-6"	34'-0"	250,000#	LIQUID SHORTENING BLEND	TF-P052	19'-1"	34'-0"	500,000#	HIGH OLEIC CANOLA

THIS IS A CADD DRAWING.
DO NOT REVISE MANUALLY.
CADD FILE No. 11003790GAP1100
PLOT DATE 01/24/12

SITE PLAN

BUNGE

BUNGE OILS, INC.
PACKAGING PLANT
DECATUR, ALABAMA

I.C. THOMASSON ASSOCIATES, INC.
CONSULTING ENGINEERS
NASHVILLE TENNESSEE

DATE 01/24/12 BY RDB — ISSUED FOR CONSTRUCTION
DATE 11/03/11 BY RDB — ISSUED FOR BIDS

DRAWN BY MBC | CHECKED BY RDB | JOB No. 110037.90 | ISSUE DATE 11/03/11 | SHEET No. GA-P1-100

LAW MAROT DRYER SPECS

AND DRYER STACK TEST RESULTS

LAW-MAROT-MILPRO

PROPOSAL
18-1408A

Date: 2018-12-06

BUNGE NORTH AMERICA (DECATUR AL) (DEL)
Att. IAN MESSMORE
1400 MARKET ST NE
DECATUR, AL
35601
Ian.Messmore@bunge.com

Phone: 256-301-4006
Fax: 256-301-4039

Project : NEW SC3-5.220 PL2B DRYER

Dear Mr. IAN MESSMORE

It is a pleasure to offer the following solution designed to fit your requirements.

Sylvain Cliche (Ext. : 354)
Representative
scliche@lmm.info

LMM
LAW-MAROT-MILPRO
1150 Brouillette, Saint-Hyacinthe, QC J2T 2G8
T 450 771-6262 | F 450 771-6264
www.lmm.info

PROPOSAL
18-1408A

Proposed to:
BUNGE NORTH AMERICA (DECATUR AL) (DEL)
Attn: IAN MESSMORE
1400 MARKET ST NE
DECATUR, AL
35601
Phone: 256-301-4006
Fax: 256-301-4039

Shipping location: Same address

E-Mail: Ian.Messmore@bunge.com

Validity Period of Proposal	Delivery Conditions	Currency	Representative	Lead Time	Taxes	DATE yyyy-mm-dd
30 days	Our Plant	USD	Sylvain Cliche	—	Extra	2018-12-06

Qty	Description & Item No.	Total

Project : **NEW SC3-5.220 PL2B DRYER**

SECTION 1

SECTION 1,01

1 SC3-5.220PL2B LAW Dryer
* 3,0 x 5.2 meter grain columns
* (20) 1 meter high drying or cooling sections
* (3) 1 meter high top buffer reserve sections, reinforced internally.
* 2400mm (8') support frame, made of **galvanized** structural steel
* (2) Collecting hopper, complete with access door and level sensors designed for hazardous location
* (1) Dryer filling hopper, inlet flange of 24" x 24", made of galvanised steel. Not lined
* Collecting hoppers **covered with AR400 liners**
* Dryer fans motor bases modified

1 Ventilation system including:
* Double inlet air blower with motor mount assembly
* (1) 250HP, 1800 RPM, 480V, **XPROOF (Class I, Class II, Div.1, GroupD & G) WEG motor** (Main fan)
* (1) Louver controlled with **Rotork actuator: IQT125 FA10 FM Class 1 Div 1**

1 Lower section filtration system including:
* Filters made of 900 microns self cleaning stainless steel mesh
* Filters cleaned with rotary arm, fitted with 2 high pressure aspiration nozzles
* (6) Rotary filters with 0.75HP, 1800RPM, 480V, **XPROOF (Class II, Div.1, Group D & G) WEG motor**
* (3) Rotary Filter Fans with 15HP, 3600 RPM, 480V, **XPROOF (Class II, Div.1, Group D & G) WEG motor**
* (1) Dust fan with 3HP, 3600 RPM, 480V, **XPROOF (Class II, Div.1, Group D & G) WEG motor**
* (1) Dust screw with 0.75HP, 1800 RPM, 480V, **XPROOF (Class II, Div.1, Group D & G) WEG motor**

1 Hydraulic actuation system for discharge grid and louvre including:
* Unit designed for cold weather dryer operation
* (2) hydraulic cylinders
* 1.5kW, 600VAC, 1ph, 60Hz oil heater
* 2HP, 1800 RPM, 480V, **XPROOF (Class II, Div.1, Group D & G)** motor for gear pump
* All necessary hydraulic solenoids **XPROOF (Class II, Div.1, Group D & G)** mounted on the hydraulic unit
* Oil tank with low level sensor

STAIRS, CATWALKS AND ACCESS

1 Inside catwalks and ladders
* Inside catwalks and ladders for an easier access to grain columns, temperature probes and rotary filters

1 SC3-5.220PL2B LAW dryer catwalks and full access doors to answer most confined space issues.

1 Catwalk with railings on the roof of the dryer

1 Staircases on the side of the dryer. Provides access to all catwalks

1 **All painted parts to be galvanized (except all extractor components)**

GAS BURNERS, GAS TRAINS, PIPING AND FIELD INSPECTION

1 Eclipse AH-MA Pulsed air burners
* Bottom Burner: 15 MBTU/h
* Top Burner: 17 MBTUh
* **Note:** BTU above are estimated. Engineered values will be provided later for construction

1 Gas trains designed as per NFPA code including:
* Gas regulator designed for 20psig gas supply
* All safety devices
* Any modification required by local administrative obligation are **not included**

1 On-site gas piping **not included**:
* Gas train pre-assembled
* Regulator and safety valve venting as per code **not included**

1 Field approval by local authorithy **not included**:

CONTROL PANEL, JUNCTION BOXES AND ELECTRICAL PRE-WIRING

1 Control panel including:
* Control panel for IO. Soft-start and motor starters **not inclued**
* Horner PLC and man-machine interface
* **Control panel must be installed in an heated room (temperature 10°C and above)**
* **Control panel and junction boxes components using LMM standard**

2 Pre-wired junction boxes for bottom and top gas train including:
*(2) Panel NEMA 4/12
* Panels are mounted on the gas train and all devices installed on the gas train are pre-wired to those junction boxes
* All necessary terminal strip
* Tech cable and seal tight connections
* Cable from this junction box to the control panel is **not included**

2 Junction box for air flow switches and spark generator:
*(1) Panel NEMA 4/12
* These panels are installed on the dryer pre-assembled modules and components inside the dryer are pre-wired
* Panel heater with thermostat
* All necessary terminal strip

1 Junction box for discharge grid, louver and hydraulic pump components:
*(1) Panel NEMA 4/12
* No electrical components are pre-wired to this junction box. This box is shipped loose.
* All necessary terminal strip

3 Junction boxes for temperature probes:
*(3) Panels NEMA 4/12
* These panels are installed on the dryer pre-assembled modules and components inside the dryer are pre-wired
* All necessary terminal strip

1 Junction boxe for temperature probes and top grain reserve level sensor
*(1) Panel NEMA 4/12
* This panel is installed on the dryer pre-assembled module and components inside the dryer are pre-wired
* All necessary terminal strip

LMM
LAW-MAROT-MILPRO
1150 Brouillette, Saint-Hyacinthe, QC J2T 2G8
T 450 771-6262 | F 450 771-6264
www.lmm.info

PROPOSAL
18-1408A

LMM regularly enriches its products with its latest innovations.
Its products can be modified without notice. The performance / quality is increased when modified.

INSPECTION VISITS AND COMMISSIONNING

1 Inspection visits and commissionning
- 2 LMM supervisor during dryer erection (5 days on-site)
- 1 LMM supervisor pre-commissionning visit (2 days on-site)
- 1 Start-up (5 working days worth of labour by an experimented technician at job site)
- 1 After start-up visit, verification and supplementary training (3 days on site)
- Travel expenses included

DRYER PRE-ASSEMBLY AND DELIVERY

1 Dryer pre-assembly and installation made by experienced millwrigths in St-Hyacinthe including
- Manpower for dryer pre-assembly
- Work supervisor on-site
- Tools and worker trailers
- Truck Unloading
- Lift trucks
- ***Some parts (fan ducting, catwalks, etc.) may not be pre-assembled***

1 Pre-assembled modules loaded on truck including
- Manpower
- Packaging and tarping
- Anchors and frame
- Cables, turnbuckles, etc.
- Crane

DRAWINGS AND MANUALS

1 Shop drawings will include:
* General layout
* Anchors information with dead and live load
* General information on requirement for gas piping
* List of end-devices with their location
* Discharge hopper flange details and location
* Autocad and Adobe format
* Delivered a maximum of 16 weeks after order

1 Manuals provided are:
* Binder with dryer components for on-site assembly
* Operation and maintenance manual
* Electronic format only

1 Electrical drawings, Engineering and Project Management
* Electrical drawings
* Engineering and Project Management

1 164 820 $

SECTION 1.02 **Option Vigitemp**

1 Vigitemp for 5,2m deep dryer with the following description:
- Tagged temperatures probes installed on 12 steel wires
- (4) temperature probes junction boxes
- Mulitconductor cable
- PLC probe scanner including
  - Analog input modules
- The system includes the following features:
  - If one of the probe reading reaches a limit, an alarm is displayed but no action is taken
  - The second relay signal can be used to activate an immersion system ***(not included with the system)***

Note: The PLC system must be installed in the control room or in an heated environment

44 110 $

1 208 930 $
Total Section 1

LAW-MARROT-MILPRO
1150 Brouillette, Saint-Hyacinthe, QC J2T 2G8
T 450 771-6262 | F 450 771-6264
www.lmm.info

PROPOSAL
18-1408A

SECTION 2 PAINT

Standard Paint: LMM GREY (RAL-7044) — No charge

SECTION 3 TRANSPORT

Shipping point: Our Plant (Freight charges at customer expense) — Not Included
Transport the dryer from LMM shop (location to be determined) to Decatur (AL)
LMM will provide 2 Beams. The beams are used to carry the modules from the trucks to the dryer
BUNGE will return to LMM the two beams once the dryer is finished building (at BUNGE's expenses)
(3) Flat bed trucks standard required
(18) Drop-deck bed trucks wide load required

SECTION 4 INSTALLATION

Installation NOT INCLUDED – The delivery will be revised if the installation is required

SECTION 5 NOT INCLUDED ITEMS

* Civils Works
* Electrical Wiring
* Motor starters and soft-start for dryer motors
* Grain Handling Equipment
* Plumbing Works
* Receiving, unloading, storage & insurance of goods.
* Field supervisor & other field works not specified in proposal.
* Any other item not specified in proposal.

SECTION 6 PAYMENT TERMS

**These terms are valid only upon Credit Application Approval*

30% Partial payment requested with signed contract
20% when 33% of the dryer pre-assembly completed in Vendor plant
20% when 66% of the dryer pre-assembly completed in Vendor plant
20% when 100% of the dryer pre-assembly completed in Vendor plant
10% 15 days after start-up, with a maximum of 90 days after delivery

GRAND-TOTAL : 1 208 930 $

The sales conditions of LMM are applicables and can be supplied upon request.

GENERAL SALES CONDITIONS

1 ORDERS AND QUOTATIONS: All orders or quotations are subject to acceptance and approval by the manager of LAW-MAROT-MILPRO, hereafter called «the Company».

2 SHIPMENT: The Company cannot be held responsible for delays in delivery caused by circumstances beyond its control.

3 DAMAGES AND GUARANTEE: The Company warrants its products against defects in workmanship and material under normal use and service when set up and operated in accordance with factory instructions for a period of one year from date of shipment from its originating plant at St-Hyacinthe, Canada. All obligations and liabilities under this guarantee are limited to repairing or replacing at our option, f.o.b. factory of shipping origin, of such allegedly defective components returned, carrier charges prepaid.

This limited warranty does not apply to normal wear items or any product s which have been subject to misuse, misapplication, neglect (including without limitation, inadequate maintenance), accident, improper installation, modification adjustment, repair or which had its nameplate altered or removed. All repairs or replacements are made subject to factory inspection of returned parts.

The Company accepts no liability for incidental or consequential charges which include, but are not limited to removal, installation, downtime, etc.... Defects as defined in the above paragraph shall not include decomposition by chemical reaction (corrosion). The materials offered for this application are not to be considered guaranteed against wear and/or corrosion and are subject in all cases to verification and acceptance by the Purchaser.

Guarantee on equipment and accessories furnished by sub-suppliers shall be limited to the guarantee given by the manufacturer of such units. The Company will not assume responsibility for contingent liability through the alleged failure or failures of any of its product or their accessories.

4 TAXES AND PERMITS: Purchaser agrees to bear all taxes or permits of any kind now or hereafter imposed on this contract on the manufacture, sale, lease, shipment, installation, possession, or use of the items covered by the transaction. Purchaser will have to produce proof of any tax exemption by supplying a certificate showing numbers and articles of the applicable by-law.

5 CANCELLATION: Orders are accepted with the understanding that they are not subject to cancellation except on terms that will indemnify against any loss. The Company and the manufacturers which whom the business is placed.

6 INSPECTIONS: No provisions has been made in the quoted price for inspection by federal, provincial or municipal bodies. Where necessary customer shall undertake to provide for such inspection and make any corrections required by the inspectors, at his own expense.

7 OWNERSHIP: The Company retains ownership of the equipment presently sold until final payment is received in full. In the event of default of payment in accordance with the conditions herein mentioned and stipulated, the Company shall have the right, at its option, either get full payment of the matured instalments, or to regain possession of the said equipment, without indemnity nor remittance of the instalments received on the sale price, and in the latter case the buyer shall be free of the balance of payments or the notes corresponding thereto.

As long as the sale price has not been paid in full, the buyer shall under penalty of damages and interest incurred by the Company, take reasonable care of the equipment presently sold and inform the Company without delay of any seizure which might be executed on the said equipment.

At least of written agreement, our company will not substitute any equipment or material, change price of any kind, modification or cancellation of actual terms in actual document. Our representative will keep right to refuse any changes requested by customer if those are very differents from supplied specifications.

In all time, our company will remains the owner of all commercial names copy right & intellectual property or commercial secret related to that proposal or contract and updated design following start-up or commissionning.

8 INSTALLATION: (where applicable) Unless authorized in writing by the Company, when the installation must be made by the Company., the Purchaser shall not use such equipment before the installation work is completed. Not withstanding any provisions to the contrary herein, it is expressly agreed that if the Company cannot have the work entirely done by its own employees for whatever reason including, among other things, the obligation to carry out the work by workmen who are not the Company employees following the implementation of any law, regulation or directive from, among other things, the Commission de la construction du Québec (CCQ) or other similar entity, or any union, syndicate or trade association, the Company may at its sole discretion, by written notice given to the client, end its execution of the work, which will be handed over to the client in the state they where when the Company put an end to the said work, without any recourse by the Purchaser against the Company in this regard

In such case, this agreement will be resolved from the date of the notice and all amounts owed to the Company for the work done until the date of the notice must be paid in full to the Company within seven (7) days from the date of said notice. Moreover, if the Purchaser wants the Company to carry out the work while complying with the requirements of an entity such as here above mentioned, (being understood that the Company will not be compelled to agree to continue the work), the Purchaser will be responsible for all additional costs incurred by the Company in such circumstances, being understood that the Company will only resume work whlen an agreement according to the cost modification will be agreed upon and signed by both parties.

9 START-UP AND TRAINING: Normaly this service is not included with this contract.
Separate proposal will be supplied by your representative or by our customer service agent. Otherwise a separate item can be previously added to the proposal.

10 INSURANCE: The customer shall be responsible for insuring the goods against the risks of fire, theft and public liability from the moment it has been delivered at the requested point.

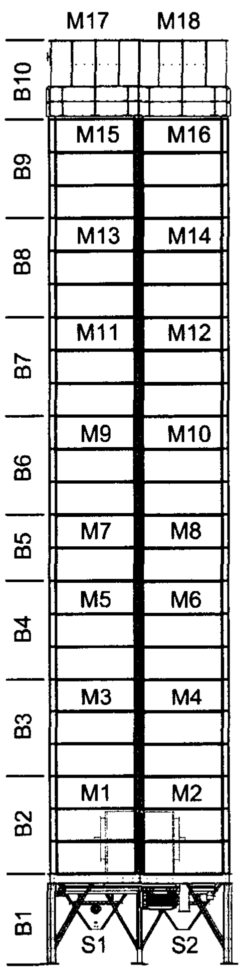
11 PAYMENT: Unless otherwise agreed in writing the goods shall become payable upon delivery independently of the installation date.

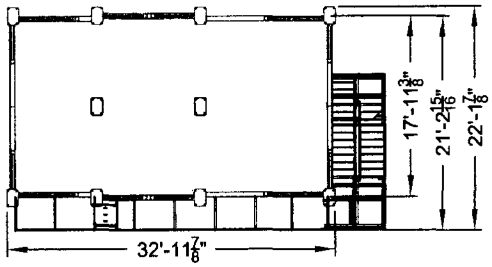
12 For the purpose of this contract all parties concerned will be considered as having residency in the district of St-Hyacinthe, Quebec., Canada.

Confirm your purchase intent to Mr. Sylvain Cliche who will send you the contract

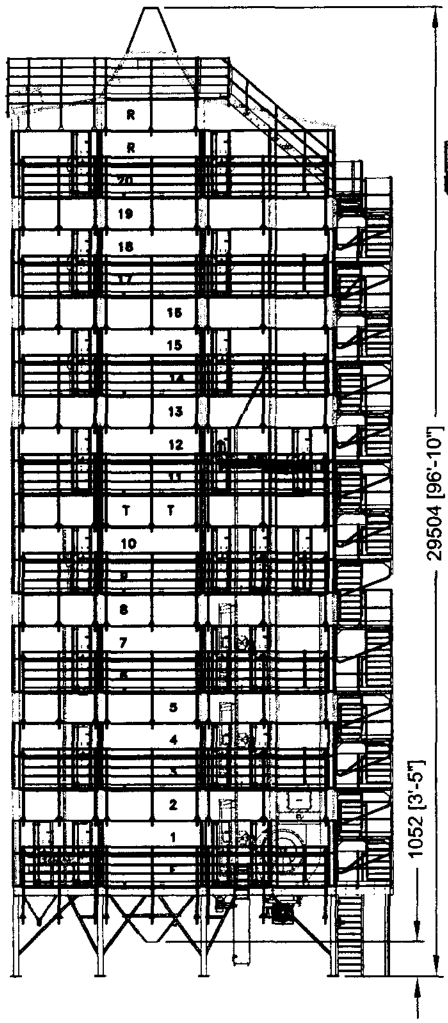
LAW-MAROT-MILPRO

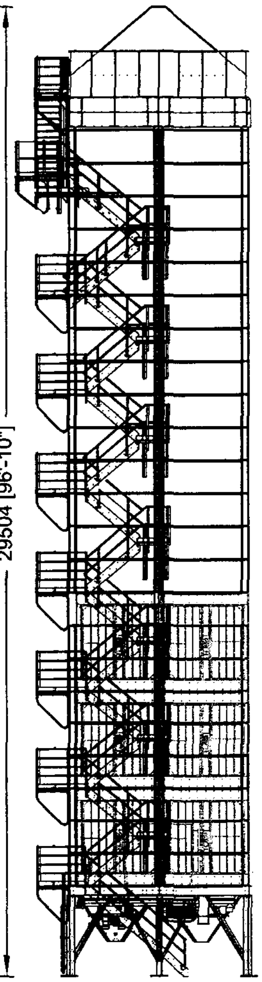
TRANSPORT	
T1	S1
T2	S2
T3	S3
T4	M1
T5	M2
T6	M3
T7	M4
T8	M5
T9	M6
T10	M7
T11	M8
T12	M9
T13	M10
T14	M11
T15	M12
T16	M13
T17	M14
T18	M15
T19	M16
T20	M17
T21	M18





PRELIMINARY
THESE DOCUMENTS ARE NOT TO BE USED FOR CONSTRUCTION (OR FOR MANUFACTURING)





BUREAU
VERITAS

16, Jubin road
P.O. BOX 26
69571 Dardilly Cedex
Phone : (047) 229-7070
Fax : (047) 835-6310

EMISSION CONTROL
GRAIN BIN

CUSTOMER **: CEREGRAIN**
76, Marboz ave P.O. BOX 7130
01007 BOURG EN BRESSE

BUSINESS **: Silo de VILLEFRANCHE SUR SAONE**

69 VILLEFRANCHE SUR SAONE

INTERVENTION DATE : November 7th 2000

FILE REFERENCE : LYN9P000109X/Rapport n° 00196 – Indice 0

Did at Dardilly , November 13th 2000

Manager responsable

A.PILOTTO

This report include 12 pages and annexes

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et Conseil de Surveillance
au capital de 105 122 785
17 bis, place des Reflets
La Défense 2, 92400 Courbevoie
RCS Nanterre B 775 690 621

http://www.fr.bureauveritas.com

SUMMARY

1. BREF DESCRIPTION OF THE INSTALLATION

The grain storage bin, operated by the CEREGRAIN company, and installed in the industrial and port area of VILLIFRANCE SUR SAONE, is composed among others, of the following :

1 Grain Dryer type 99 SRD / BT /C3

- Production of hot air : Natural gas boiler
- Filtration : - Lower air (metallic screens with 950 microns opening stainless steel wire mesh)
  - Upper air (flat filter in 1 000 microns opening stainless steel)
- No-chimney outlet

The used air corridor is equipped with 6 non-normalized (12 cm x 12 cm) flanges located close to the used air exhaust shutters

2. PURPOSE OF THE INTERVENTION

To measure, during the corn harvest season, the dryer total dust concentration and hourly flow rate.

3. INTERVENTION PROCEDURE

The intervention was conducted on November 7th 2000 in order to run the test at the rated dryer capacity.

Incoming throughput : 2 300 tons/day
Upper hot air temperature: 100° C
Lower hot air temperature : 90 ° C

4. MATERIAL AND METHODS

Described in Annex 2

5. RESULTS

ESTABLISHMENT	**CEREGRAIN – VILLEFRANCHE (69)**			
CONTROL DATE	**07/11/00**			
CONTROL PARAMETER	Total dust Concentration on dry gas	Hourly flow Of humid gas	Average Hourly dust flow	Maximum concentration allowed by authorities
UNIT	Mg/Nm^3	Nm^3/h	Kg/h	Mg/Nm^3
DRYER	3.8	53500	1.92	50

ANNEXES

- Annex 1 : Calculation Form
- Annex 2 : Material
- Annex 3 : Intervention procedure
- Annex 4 : Detailed Results

Annex 1 : Calculation Formulas

CALCULATION FORMULAS

Note : The purpose of this is to explain the calculation formulas used in the different spreadsheets for the determination of the results presented in this report.

MOISTURE LEVEL

Normal volume of sampled dry gas in Nm^3 = Vng
Normal volume of related steam in Nm^3 = Vnva
Condensed mass of water in the line in g = MH_2O

$$\%\text{ of Moisture on humid gas} = \frac{Vnva * 100}{(Vng + Vnva)} \quad \text{where } Vnva = \frac{22.4 * MH_2O}{18} * 10\,E^{-3}$$

TO CONVERT A LEVEL ON DRY GAS INTO A LEVEL ON HUMID GAS

Level on dry gas = Tgs
Gas moisture level in % = Thg

$$\text{Level on humid gas} = Tgs * \frac{(100 - Thg)}{100}$$

TO CONVERT A LEVEL ON HUMID GAS INTO A LEVEL ON DRY GAS

Level on humid gas = Tgh
Gas moisture level in % = Thg

$$\text{Level on dry gas} = Tgh * \frac{100}{(100 - Thg)}$$

TO SHOW A LEVEL OF CO_2 ON HUMID GAS IN %

Level of CO_2 on humid gas measured in % = TCO2
Level on humid gas to show = Tgh

$$\text{Showed level of } C0_2 \text{ on humid gas at } x\% = Tgh * \frac{x}{TCO2}$$

TO SHOW A LEVEL OF CO_2 ON DRY GAS IN %

Level of CO_2 on dry gas measured in % = TCO2
Level on dry gas to show = Tgs

$$\text{Showed level of } CO_2 \text{ on dry gas at } x\% = Tgs * \frac{x}{TCO2}$$

TO SHOW A LEVEL OF O_2 ON DRY GAS IN %

Level of O_2 on dry gas measured in % = TO2
Level on dry gas to show = Tgs

$$\text{Showed level of } O_2 \text{ on dry gas at x\%} = Tgs * \frac{(21 - x)}{(21 - TO2)}$$

TO CONVERT A LEVEL EXPRESSED IN *ppm* INTO A LEVEL EXPRESSED IN mg/Nm^3

Gross ppm level = Tppm
Molar masse of gas in g/mol = Masse mol.

$$\text{Level expressed in } mg/Nm^3 = Tppm * \frac{\text{Masse mol.}}{22.4}$$

TO EXPRESS A GROSS GAS VOLUME IN NORMAL CONDITIONS

Local atmospheric pressure in mbar = Patmo
Gas temperature in °C = O
Gross gas volume in m^3 = Vgb

$$\text{Gas volume expressed in normal conditions in } Nm^3 = Vgb * \frac{Patmo * 273}{(273 + O) * 1013}$$

GAS DENSITY

Dry smoke density = §f
Sucked water vapour density = §H2O
Humidity level = TH2O
Molar mass of an x component = Mx

Gas density = §f * (100 – TH2O) + §H2O

$$\text{Where } \S f = \frac{MC02}{22.4} * \frac{TC02}{100} + \frac{MO2}{22.4} * \frac{TO2}{100} + \frac{MN2}{22.4} * \frac{(100 - TC02 - TO2)}{100}$$

$$\text{and } \S H20 = \frac{MH2O}{22.4} * \frac{TH2O}{100}$$

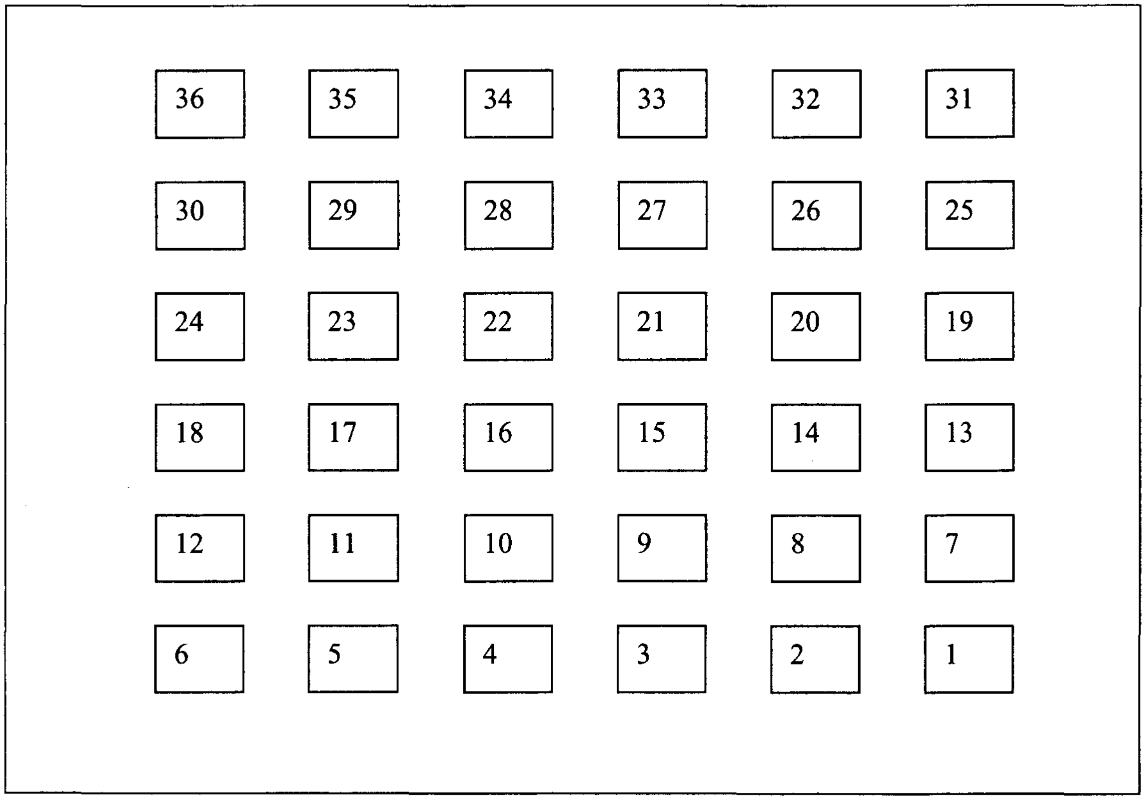
ANNEX 2 : Materials

PARAMETERS	MATERIAL AND METHOD	REFERENCE	SENSIBILITIES
Atmospheric pressure	Barometer	–	0.5 mbar
Temperature	Type K (chromel-alumel) thermocouple and Chauvin Arnoux numeric Thermometer or pick-up central equipped with universal Inlet	NF EN60584-1	0.1 °C
Throughput, dynamic and static pressure	CETIAT (coefficient 1) type pitot tube + KIMO differential numerical micromanometer	NF X 10 112 ISO 10780	0.1 daPa
Weight	Sartorius and Mettler precision scale	–	0.1 mg
Humidity	Pumping then absortion by silica gel after condensation (use of diaphragm pump, gas meter and thermometer)	–	1%
Dust	Sampling done in isocinetism on a frame perpendicular to the gas flow. Chartered device EMISSION SA type MPM 80 with stainless steel probe	NF X 44 052	0.1 mg/Nm3
Filter	Fiberglass filter, without binder, 118 mm or 90 mm diameter holdup efficiency of 99.9% for NaCL particles of 0.6 micrometer average. Guaranteed composition in traces of elements	–	–

ANNEX 3

SAMPLE PICK UP SECTION

WIDTH : 2.4 meter according to the contracter
LENGTH : 12 meter



Right length uphill< 5 Dh

Right length downstream< 5 Dh

DISTANCE BETWEEN SAMPLING POINTS ….

Points 6, 12, 18, 24, 30 and 36 were not accessible with the probes that were on site that day.

points	1	2	3	4	5	6
Distance in cm On the axe	20	60	100	140	180	220

ANNEX 4

RESULTS SPREADSHEETS		
JOB SITE		CEREGRAIN- Villefranche
DATE		07/11/00
LOCATION OF CONTROL		Dryer
DUCTING TYPE		Rectangular ducting
PARAMETERS	UNIT	RESULTS
Local atmospheric pressure	mbar	970
Static pressure in ducting	mbar	1.8
Gas temperature	°C	38
Level of carbon dioxide on dry gas	%	0
Level of carbon dioxide on humid gas	%	0
Level of oxygen on dry gas	%	20.9
Level of oxygen on humid gas	%	5.4
Gas average density	kg/Nm^3	1.26
Average speed of gas	m/s	6.1
Gas throughput in experimental conditions	m^3/h	637240
Gas throughput in normal conditions	Nm^3	535633
Actual total duration of sampling	min	63
Volume of gas sampled	Nm^3	5.289
Weight of dust sampled	mg	19
Level of dust on humid gas on gross (sample)	mg/Nm^3	3.6
Level of dust on dry gas on gross (sample)	mg/Nm^3	3.8
Hourly flow weight	kg/h	1.924

ANNEX 4

RESULTS SPREADSHEETS		
JOB SITE		CEREGRAIN- Villefranche
DATE		07/11/00
LOCATION OF CONTROL		Dryer
DUCTING TYPE		Rectangular DUCTING
PARAMETERS	UNIT	RESULTS
Meter display - Start	m^3	19.464
Meter display - Finish	m^3	19.758
Condensated water volume	ml	8
Weight of water in silicagel	g	4
Gas temperature on meter	°C	18
Local atmospheric pressure	mbar	970
Normal volume of sampled dry gas	Nm^3	0.264
Normal volume of related water	Nm^3	0.015
Humidity level on humid gas	%	5.4

GAS DENSITY		
PARAMETERS	UNIT	RESULTS
Level of carbon dioxide on dry gas	%	0
Level of oxygen on dry gas	%	20.9
Level of humidity on humid gas	%	5.4
Density of humid gas	Kg/Nm^3	1.26

GAS FLOW IN DUCTING		
PARAMETERS	UNIT	RESULTS
Area of sampling section	m^2	28.800
Average speed of gas in sampling section	m/s	6.1
Gas throughput in experimental conditions	m^3/h	637240
Gas throughput in normal conditions	Nm^3/h	535633

DUST PICK-UP CONDITIONS

JOB SITE			CEREGRAIN- Villefranche		
DATE			07/11/00		
LOCATION OF CONTROL			DRYER		
DUCTING TYPE			Rectangular ducting		
Diaphragm temperature		150℃	Depression temperature		300 mbar
		15.5	Coefficient K		21.5
N° sampling points	Dynamic pressure (daPa)	Speed (m/s)	Differentiel Pressure (daPa)	Sampling Duration (min)	Weight of dust Sampled
1	0.0	0.0	0	0	0.000
2	0.0	0.0	0	0	0.000
3	1.8	5.8	39	3	0.168
4	5.2	9.9	112	3	0.284
5	6.0	10.6	129	3	0.305
7	0.0	0.0	0	0	0.000
8	0.0	0.0	0	0	0.000
9	1.5	5.3	32	3	0.152
10	5.0	9.7	107	3	0.278
11	6.0	10.6	129	3	0.305
13	0.0	0.0	0	0	0.000
14	0.0	0.0	0	0	0.000
15	2.8	7.3	60	3	0.208
16	6.0	10.6	129	3	0.305
17	6.6	11.3	146	3	0.325
19	0.0	0.0	0	0	0.000
20	1.0	4.3	22	3	0.128
21	3.3	7.9	71	3	0.226
22	6.0	10.8	129	3	0.305
23	6.5	11.1	140	3	0.318
25	0.0	0.0	0	0	0.000
26	1.4	5.1	30	3	0.147
27	3.5	8.1	75	3	0.233
28	6.0	10.6	129	3	0.305
29	7.5	11.9	161	3	0.341
31	0.0	0.0	0	0	0.000
32	1.0	4.3	22	3	0.126
33	3.0	7.5	65	3	0.217
34	5.5	10.2	118	3	0.292
35	6.8	11.3	145	3	0.325
	Average speed	6.1 m/s	Total sampling	63 min	5.289 Nm^3

BUNGE NORTH AMERICA
DECATUR, ALABAMA

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

PARTICULATE MATTER EMISSIONS (PM)

February 2019

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The proposed modification at the Bunge North America Decatur, Alabama facility will involve the modification of several emission units that have potential to emit particulate matter emissions. Particulate Matter (PM) emissions from this project are subject to Prevention of Significant Deterioration (PSD) regulations, since the potential PM emissions will exceed 25 tons per year. Because the Soybean Processing Facility located in Decatur, Alabama will be subject to PSD regulations; an analysis of Best Available Control Technology (BACT) must be conducted. The sources of PM emissions addressed in this BACT Analysis consist of particulate sources with dry exhaust streams, particulate exhaust streams with high moisture content, and combustion unit (utility boiler).

The controlled PM emissions from new or operationally modified sources are:

Sources	**PM**
Exhaust Streams (wet & dry)	40.7
Fugitive Dust	39.8
Combustion Units	7.3
Total	**84.6**

The purpose of this BACT analysis is to determine a control technology for the PM emissions that would be considered BACT. As part of this effort, the technologies listed in Section 5, which are used to control particulate matter emissions from industrial process sources, were evaluated in terms of their technical feasibility in controlling emissions of particulate matter. The technologies for particulate matter controls were divided into several groups:

- Dry Exhaust Streams
- Exhaust Streams with High Moisture Content
- Combustion sources (Utility boiler)

Based on the BACT analysis, the following are proposed as BACT for the following particulate matter (PM) sources:

Emissions Source	**Proposed BACT**
Dry Exhaust Streams	Fabric Filter dust collectors that achieve an outlet grain loading of approximately 0.002 grains per dry standard cubic feet of air flow
Exhaust Streams with High Moisture Content	High efficiency cyclones
Utility Boiler	Use of clean fuels like natural gas and good combustion practices

1.0 INTRODUCTION

The Clean Air Act (CAA) and regulations promulgated by the Alabama Department of Environmental Management (ADEM) require that major air pollution sources undergoing construction comply with all applicable Prevention of Significant Deterioration (PSD) provisions and Nonattainment area New Source Review Requirements. The Federal PSD rules apply to areas classified as attainment and new major stationary sources (sources with a potential to emit 250 tons/year or more of any criteria pollutant). The EPA regulations require that a major stationary source undergoing a major modification apply Best Available Control Technology (BACT) for each regulated PSD pollutant that it would have the potential to emit in significant amounts. BACT need not necessarily result in an emissions control device. Rather, BACT is an emission limitation made on a case-by-case basis taking into consideration several project-specific factors. In no case, however, is BACT allowed to be less stringent than the emissions limits established by an applicable New Source Performance Standards (NSPS).

In EPA policy and interpretative documents, the Agency has generally called for a separate BACT analysis for each emissions unit at a facility. However, the EPA has supported a logical grouping of emission units and considered controls available for individual pollutants. This evaluation will be based on logical grouping of emission units and controls available for particulate matter (PM).

The EPA has implemented the "top-down" method for determining BACT, which ADEM follows. In general, the top-down process requires that all available control technologies be ranked in descending order of emission control effectiveness. The following is a step-by-step description of a typical top-down BACT analysis.

1) Identify all control technologies;
2) Eliminate technically infeasible options;
3) Rank remaining control technologies by emission control effectiveness;
4) Evaluate most effective controls and document results; and,
5) Select BACT.

2.0 PROJECT AND PROCESS DESCRIPTION

Soybean oil processing typically consists of oilseed handling/elevator operations (receiving, storing, and cleaning the raw soybeans); preparing the soybeans for the solvent extraction and oil desolventlzing, oil refining, and desolventizing and processing the spent soybean flakes.

Soybeans received at the facility are sampled and analyzed for moisture content, foreign matter, and damaged seeds. The beans are weighed and conveyed to silos for storage prior to processing. The beans are then removed from the silo and cleaned of foreign material and loose hulls. An aspiration system is used to remove loose hulls from the soybeans. The beans are passed through dryers to reduce their moisture content and then conveyed to process bins for temporary storage and tempering for 1-5 days in order to facilitate dehulling. The soybeans are then processed in a succession of preparation operations prior to extraction. These operations include cracking, dehulling, and flaking. Hulls are ground and sent to storage. Some are pelletized before shipment.

Flakes are conveyed to the solvent extraction system where they are mixed with solvent and vegetable oil is extracted from the flakes. The solvent oil mixture is processed to remove the solvent from the oil. The "spent" flakes are sent through a series of operations to desolventize, dry, and cool the flakes. The resulting soybean meal is ground and transferred to storage, From there, the meal is loaded out by truck, rail or barge for shipment off-site.

Some support facilities are needed for this plant. They include boilers, cooling towers, emergency generator, and fire water pump engines.

The emission units that are going to be physically modified as part of this project are:

- The addition of a new grain dryer (CD-6);
- A new bean storage bin will be added and will be exhausted to an existing baghouse (CD-3).
- The addition of a new vertical bean conditioner and the removal of the existing rotary steam tube bean conditioner (PR-3);
- Existing cracking mills will be replaced but will exhaust to the existing baghouse with the existing fan. (PR-4).
- Four new flaking mills and accompanying conveying equipment will be added to the existing flaking system. A new fan and baghouse will be installed to accommodate the new equipment (PR-7).

- Replacement of the existing Desolventizer Toaster/Dryer Cooler (DTDC) with 2 separate units; A new DT and a new DC will be added with new conveying equipment, new cyclones and a new fan (EX-2).
- Equipment as part of the existing solvent distillation system in extraction will be replaced – VOC emissions (EX-1).
- A new, larger utility boiler will be added and an existing boiler will be removed (B05).

3.0 ESTIMATED PARTICULATE MATTER EMISSIONS BASIS

The estimated baseline and projected actual PM emissions are summarized in Tables 1-5 in Section 2 of the PSD Permit Application Project and Permitting Process document enclosed herewith. Emissions calculations are included in Appendix A of that document. Table 5 provides the projected increases from the proposed modifications and illustrate that the project triggers PSD review for particulate matter (PM) and volatile organic compounds (VOCs).

4.0 ECONOMIC ANALYSIS ASSUMPTIONS

A significant part of the BACT analysis deals with cost effectiveness and comparisons of the various technically feasible options. The following defines the approach that would be used if a cost effectiveness evaluation is required.

4.1 Cost Assumptions

- Capital and operating costs for new equipment are available from EPA (EPA-450/3-79-006)
- The prices for utilities will be based on site-specific data for electricity and natural gas.
- An interest rate of 8% with 15-year equipment life would be used.

4.2 Cost of Compliance

For the BACT analysis, capital costs of compliance are annualized.

i. Total Annual Costs = Indirect Annual Costs + Operations & Maintenance Costs

ii. Indirect Annual Costs = Capital Recovery Factor (CRF) x Total Installed Cost (TIC)

Where:

$$\text{Capital Recovery Factor (CRF)} = \frac{i(1+i)^n}{\left((1+i)^n - 1\right)}$$

Life of Equipment, n = 15 years [1]

Annual Interest Rate, i = 8%

Yielding:

CRF = 0.1098

4.3 Cost Effectiveness

Cost effectiveness is used to assess the potential for emissions reduction in the most economical way. For BACT analyses, it is defined as dollars per ton of emissions removed ($/ton).

The analysis evaluates capital, operating, and maintenance costs for the various control options. The cost effectiveness is used to evaluate which control options are economically feasible.

Annual Cost Effectiveness

Emissions removal is calculated for each technology or technique, and the $/ton of emission removed would be calculated as:

$$\frac{\text{Total Annualized Costs of Control Option}}{(\text{Baseline Annual Emissions - Control Option Annual Emissions})}$$

Based on assumed 15-year life for new equipment (EPA/452/B-02-001).

5.0 CONTROL TECHNOLOGY FEASIBILITY

The definition of BACT requires that emission controls for each emission source and each pollutant of concern be evaluated on a case-by-case basis, taking into consideration energy, environmental, and economic impacts and other costs. Only commercially available and field-proven technologies need to be investigated. If the control technology has been installed and operated successfully on the type of source under review, it is demonstrated and it is technically feasible (EPA, 1990). Options may also be eliminated when they have unacceptable energy, cost, or non-air quality environmental impacts. Options for only the sources physically modified will be reviewed.

5.1 List of Control Options and Elimination of Technically Infeasible Options

An initial list of potential technologies was developed using the following information sources:

- EPA RACT/BACT/LAER Clearinghouse (RBLC) database
- EPA AP-42. Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Air Sources. Appendix B. September 1996. This document provides a list of control technologies and removal efficiencies for several particle size ranges.
- Stationary Source Control Techniques Document for Fine Particulate Matter; EPA Contract No. 68-D-98-026 ; October 1998
- EPA Air Pollution Control Cost Manual EPA/452/B-02-001; January 2002
- EPA-452/F-03-015 (CATC Technical Bulletins (TB) & Air Pollution Technology Fact Sheets (FS))
- Recently Issued permits for Soybean Processing Facilities

Based on a recent database query of permits issued up to July 2018, the following BACT determination related to the listed sources were identified and presented in Table 5.1 below:

Table 5.1-Summary of RBLC Database Review

Facility	Date	RBLC ID #	Emission Unit	BACT Requirements
Northstar Agri Industries	5/11/2018	OK-0156	1. Dry Process Exhausts 2. Wet/Moist Exhausts 3. Fugitive PM	1.Control Method: Baghouse Emission Limit: PM10 - 0.0050 gr/dscf 3-hr avg 2. Control method: High Efficiency Cyclones Emission Limit: PM10 - 0.13 gr/dscf 3-hr avg. 3. Pave Haul Roads
Northstar Agri Industries		MN-0086	1. Seed Prep, Pellet Cooler, Can-Pass, meal Cooler, Cookers	1. TPM – Cyclones Emission Limit: 0.0260 gr/dscf
AG Processing Inc. Soybean Processing Facility	08/18/2015	NE-0059 (draft)	1.Grain Receiving via Rail 2.Grain dryer 3. Millfeed	1.Control Method: Baghouse Emission Limit: 0.0030 gr/dscf of Filterable PM (FPM) and PM10 3-hour or test method average. 2.Control Method: None Emission Limit: 0.0030 gr/dscf of Filterable PM (FPM) and PM10 and 6.440 lb/hr. 3-hour or test method average. 3. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf of Filterable PM (FPM) and PM10 and 0.72 lb/hr. 3-hour or test method

				average.
			4. Rotary Conditioner	4. Control Method: None Emission Limit: 0.10 gr/dscf of Filterable PM (FPM) and 0.26 lb/hr. PM10 – 0.061 gr/dscf & 0.16 lb/hr. 3-hour or test method average.
			5. Flaker with Process Cyclone	5. Control Method: None Emission Limit: 0.0080 gr/dscf of Filterable PM (FPM) and 0.96 lb/hr. PM10 – 0.008 gr/dscf & 0.59 lb/hr. 3-hour or test method average
			6.Meal Grinding	6.Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf of Filterable PM (FPM) and PM10 and 0.39 lb/hr. 3-hour or test method average
			7.Meal Bins	7. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf and 0.08 lb/hr of Filterable PM (FPM) and PM10. 3-hour or test method average
			8.Calcium Bin	8. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf and 0.04 lb/hr of Filterable PM (FPM) and PM10. 3-hour or test method average
			9. Grain Cleaning	9. Control Method:

				Baghouse. Emission Limit: 0.0030 gr/dscf of Filterable PM (FPM) and PM10 and 0.44 lb/hr. 3-hour or test method average
			10. Dryer/Cooler	10. Control Method: Wet Venturi Scrubber Emission Limit: 0.0025 gr/dscf and 1.16 lb/hr of Filterable PM (FPM). PM10 - 0.0025 gr/dscf and 0.71 lb/hr. 3-hour or test method average
			11.Grain Receiving via truck and Grain Handling – 6 units	11.Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf and 0.82 lb/hr of Filterable PM (FPM) and PM10. 3-hour or test method average
			12.DDGS and Pellet Storage /loadout	12. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf and 0.75 lb/hr of Filterable PM (FPM) and PM10. 3-hour or test method average
			13. Mill Feed Receiving	13. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf and 0.03 lb/hr of Filterable PM (FPM) and PM10. 3-hour or test method average
			14.Pellet Cooler	14. Control Method:

				Baghouse. Emission Limit: 0.0030 gr/dscf and 0.33 lb/hr of Filterable PM (FPM). PM10: 0.003 gr/dscf and 0.20 lb/hr. 3-hour or test method average
			15.Cooling Tower	15.Control Method: Drift loss design spec and TDS conc. limit. Emission Limit for TPM: 0.0005% drift loss. 3000 ppm – once per month
			16. 2 – 200 mm btu/hr boilers -	16.Control Method: None Emission Limit for PM10 - 0.0074 lb/mmbtu – natural gas. 3 hr or test method average. NESHAP
American Energy Producers, Inc. Soybean Processing Plant	05/29/2015	MO-0081 (final)	1.Grain receiving and transfer	1.Control Method: Partial enclosures and intake hoods directed to a Baghouse Emission Limit: 0.0030 gr/dscf of Filterable PM10 (FPM10) test method average
			2.Meal and hull loadout	2.Control Method: Partial enclosures and intake hoods directed to a Baghouse Emission Limit: 0.0030 gr/dscf of FPM10 test method average

			3.Aspirator, cascade dryer, cascade cooler, jet dryer, hullosenator, bean cracker, secondary aspirator and hull pellet cooler	3. Control Method: controlled by one or more cyclones. The exhaust from the fines aspirator will be routed to a baghouse Emission Limit: 0.0030 gr/dscf of FPM10. test method average
			4.Vertical seed conditioner and flaking operations	4. Control Method: Conditioner controlled by cyclones. Flaking operation controlled by a cyclone and then a baghouse. Emission Limit: 0.0060 gr/dscf of FPM10 test method average
			5.Hull grinding	5. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf of FPM10. Test Method Average
			6.Meal grinding	6. Control Method: Baghouse. Emission Limit: 0.0030 gr/dscf of FPM10. Test Method Average
			7.Meal drying decks and meal cooling deck	7. Control Method: Each deck is controlled by a minimum of one cyclone. Emission Limit: 0.0050 gr/dscf of FPM10 Test Method Average.
			8. Haul Roads	8. Control Method: Paving

				all haul roads, watering, washing and cleanings of all haul roads as necessary to control fugitive emissions.
			9. Cooling Towers	9. Control Method: High efficiency drift eliminators.
			10. Two-95 MMBtu/hr boilers	10. Control Method: None Emission Limit: 0.0072 lb/MMBtu of TPM when combusting natural gas. 0.0236 lb/MMBtu limit applies only when combusting fuel oil. test method average
			11. DE hopper and silica hopper	11. Control Method: Baghouse
Bunge North America	05/07/2007	IA-0085 (final)	1.Flaker Aspiration	1. Control Method: Baghouse Emission Limit: 0.0060 gr/dscf of PM based on 3 hours average
			2.Expander	2. Control Method: None Emission Limit: 0.0080 gr/dscf of PM and 0.0060 gr/dscf for FPM10 based on 3 hours average
			3. Dryer Cooler	3. Control Method: None – cyclone recovery considered part of process unit. Emission Limit: 0.0075 gr/dscf of PM and 0.0050 gr/dscf for FPM10 based on 3 hours average

5.1.1 Basis for Identification of Applicable Options

The list of available options was determined based on literature review and review of RBLC database. The table below (Table 5.2) provides a list of available control technologies for particulate matter controls:

Table 5.2-Control technologies available for exhaust stream particulate matter emissions

Control Technology Reviewed	Control Technology Carried Forward? (Yes/No)	Comment
Gravity collector	No	Technically feasible but not carried forward due to very low efficiency compared to other technologies
Electrostatic precipitator	No	The use of a high voltage current to remove highly explosive grain dust particulate from a gas stream would be catastrophic. This control is not well demonstrated in the grain industry, and is considered technically infeasible.
Mist eliminator	No	Technically not feasible because this technology is applicable only for liquid particulate matter
Fabric Filter System (baghouse)	Yes	Technically feasible
Cyclones	Yes	Technically feasible and more effective for high moisture content particulate matter
Centrifugal collector	Yes	Technically feasible and more effective for high moisture content particulate matter
Fabric Filter System (cartridge filter)	Yes	Technically feasible
Packed/Tray-gas absorption column	Yes	Technically feasible as the PM material need not be soluble in water for removal
Spray tower	Yes	Technically feasible
Venturi Scrubber	Yes	Technically feasible
Metal fabric filter screen	Yes	Technically feasible
Wet cyclonic separator	Yes	Technically feasible

5.1.2 Basis for Determination of Technical Feasibility of Options

This section provides information on the technologies that were determined to be technical feasibility, and the reason for their feasibility. To select an appropriate control device to propose as BACT, control options were compared to the characteristics of the waste stream, the source type, and the air contaminants of concern. These unique characteristics were considered in selecting control equipment and establishing specific control effectiveness. The character of the air contaminant also dictates the choice of control devices.

5.1.2.1 Baghouse (Fabric Filter) for Dry Particulate Exhaust

Baghouses are commonly used to control dry exhaust stream particulate emissions. The collection efficiency of a baghouse (fabric filter system) for particle size in the range 6-10 μm is 99.5% (EPA, 1995). Filters and dust collectors (baghouses) collect PM by passing gases through a fabric that acts as a filter. The most commonly used is the bag filter, or baghouse. The various types of filter media include woven fabric, needled felt, plastic, ceramic, and metal. The operating temperature of the gas stream influences the choice of fabric. Accumulated particles are removed by mechanical shaking, reversal of the gas flow, or a stream of high-pressure air.

Advantages:

1. Relative insensitivity to gas stream fluctuations and large changes in inlet dust loadings (for continuously cleaned filters).
2. Recirculation of filter outlet air.
3. Dry recovery of collected material for subsequent processing and disposal.
4. No corrosion problems.
5. Simple maintenance.
6. As high voltage is not present, baghouses have the ability to collect flammable dust.
7. High collection efficiency for dry exhaust streams.
8. Relatively simple operation.

Disadvantages:

1. Need for fabric treatment to remove collected dust and reduce seepage of certain dusts
2. Relatively high maintenance costs
3. Explosion and fire hazard of certain dusts at concentration of ~50 g/m^3 in the presence of accidental spark or flame, and fabric fire hazard in case of readily oxidizable dust collection
4. Shortened fabric life at elevated temperatures and in the presence of acidic or alkaline

particulate or gas constituents

5. Potential crusty caking or plugging of the fabric, or need for special additives due to moisture or tacky materials.

The use of the baghouse filter is considered technically feasible for control of particulate matter emissions from dry exhaust streams. The collection efficiency of a fabric filter system for particle size in the range 6-10 µm is 99.5%.

5.1.2.2 Cyclone for High Moisture Content Particulate Exhaust

Cyclones are used to control PM, and primarily PM greater than 10 micrometers in aerodynamic diameter. High efficiency cyclones are designed to be effective for PM less than or equal to 10 micrometers and less than or equal to 2.5 micrometers (PM10 and PM2.5). The collection efficiency of cyclones varies as a function of particle size and design. High efficiency single cyclones can remove 5 micrometer particles at up to 90 percent efficiency, with higher efficiencies achievable for larger particles. The control efficiency ranges for high efficiency single cyclones are 80 to 99 percent for PM, 60 to 95 percent for PM10 and 20-70 percent for PM2.5.

For high moisture content exhaust streams present at soybean processing plants, the application of baghouses to control particulate emissions from these facilities would likely result in bag failures. Due to removal of moisture in the drying and cooling process, the exhaust gas from this equipment is at or close to saturation conditions and condensation inside the baghouse would blind the filter media. For fabric filter operations with high moisture gas streams, heat addition would be required to raise the gas stream temperature 100 deg F above the dew point temperature. For fabric filter operations in potentially solvent rich areas such as the Dryer and Cooler, explosive suppression would also be required to ensure the required safety. For these reasons, Bunge proposes to use high-efficiency cyclones for the dryers and coolers that have high moisture content exhaust streams. The cyclones are considered an inherent part of the process for product recovery though and not control technology.

Advantages:

1 Low Capital cost
2 No moving parts, therefore, few maintenance requirements and low operating costs
3 Relatively low pressure drop, compared to amount of PM removed
4 Temperature and pressure limitations are only dependent on the materials of construction
5 Can remove high moisture particulates and dry particulates
6 Relatively small space requirement

Disadvantages:

1 Relatively low PM collection efficiencies, particularly for PM less than 10 micrometer in size
2 Unable to handle sticky or tacky materials
3 High efficiency units may experience high pressure drops
4 Higher pressure drops may translate to higher energy usage and operating costs
5 Higher efficiency units are exceedingly large and may require more space than is available

5.1.2.3 Centrifugal collector

Removal of PM is achieved by centrifugal and inertial forces, induced by forcing particulate-laden gas to change direction. This type of technology is a part of the group of air pollution controls collectively referred to as "precleaners," because they are oftentimes used to reduce the inlet loading of particulate matter (PM) to downstream collection devices by removing larger, abrasive particles. Centrifugal collector is technically feasible and so it is carried forward to the next step for control effectiveness evaluation.

5.1.2.4 Cartridge Filters

Cartridge filters serve the same function as the bags in standard fabric filter baghouse, but self-contained cartridges (rather than bags) are used for PM capture (EPA, 2003). The removal efficiency of a cartridge filter is generally less than the baghouse filter (EPA, 2000) as shown in Table 6.1 below. As this is technically feasible, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.5 Packed/Tray-gas Absorption Column

This type of technology is a part of the group of air pollution controls collectively referred to as "wet scrubbers." Removal of air pollutants is achieved by inertial or diffusional impaction, reaction with a sorbent or reagent slurry, or absorption into liquid solvent (EPA, 2003). The collection efficiency of a Packed/Tray-gas absorption column for particle size in the range 6-10 μm is 99% (EPA, 1995). As this is technically feasible for particulate matter, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.6 Spray Tower

This type of technology is a part of the group of air pollution controls collectively referred to as "wet scrubbers." Removal of air pollutants is achieved by inertial or diffusional impaction, reaction with a sorbent or reagent slurry, or absorption into liquid solvent (EPA, 2003). The collection efficiency of a spray tower for particle size in the range 6-10 μm is 90% (EPA, 1995). As this is technically feasible, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.7 Venturi Scrubber

This type of technology is a part of the group of air pollution controls collectively referred to as "wet scrubbers." Venturi scrubbers are also known as venturi jet scrubbers, gas-atomizing spray scrubbers, and ejector-venturi scrubbers. Removal of air pollutants is achieved by inertial and diffusional interception. The collection efficiency of a venturi scrubber for particle size in the range 6-10 μm is 99% (EPA, 1995). As this is technically feasible, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.8 Metal Fabric Filter Screen

The collection efficiency of a metal fabric filter screen for particle size in the range 6-10 μm is 20% (EPA, 1995). As this is technically feasible, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.9 Wet Cyclonic Separator

Wet cyclonic separator uses a combination of centrifugal force and water spray to enhance control efficiency. The collection efficiency of a wet cyclonic separator for particle size in the range 6-10 μm is 85% (EPA, 1995). As this is technically feasible, it is carried forward to the next step for control effectiveness evaluation.

5.1.2.10 Boiler

The new main boiler will be fired on natural gas. Emissions from these sources will be inherently low due to firing of natural gas which contains only trace amounts of noncombustible material. Therefore, the use of post-combustion controls to further reduce particulate matter emissions would not be effective. A review of the RBLC database for natural gas fired units revealed that the listed sources did not use any post-combustion particulate matter (PM) control device to meet BACT standards. The database indicates that natural gas fired boilers utilize good combustion practices as a means of minimizing particulate emissions. Based on the above, the use of good combustion practices and use of natural gas are proposed as BACT for particulate matter.

5.1.3 Basis for Rejection of Options

This section provides information on the technologies that were not selected due to technical infeasibility, and the reason for their infeasibility.

5.1.3.1 Gravity Collector

Removal is achieved by reducing the gas velocity to enable the dust to settle out by the action of gravity. This type of technology is a part of the group of air pollution controls collectively referred to as "precleaners" because they are oftentimes used to reduce the inlet loading of particulate matter (PM) to downstream collection devices by removing larger, abrasive particles. A gravity collector is technically feasible but not carried forward due to very low efficiency (< 10%) compared to other technologies.

5.1.3.2 Electrostatic precipitators (ESPs)

Electrostatic precipitators (ESPs) remove particles by using an electrostatic field to attract the particles onto the electrodes. Collection efficiencies for well-designed, well-operated, and well-maintained systems are typically in the order of 99.9% or more of the inlet dust loading, based on the particle size distribution. ESPs are especially efficient in collecting fine particulates and can also capture trace emissions of some toxic metals with an efficiency of 99%. They are less sensitive to high temperatures than are fabric filters, and they operate with a very low pressure drop. Their consumption of electricity is similar to that of fabric filters. ESPs have been used for the recovery of process materials such as cement, as well as for pollution control. They typically add 1–2% to the capital cost of a new industrial plant. The use of a high voltage current to remove highly explosive grain dust particulate from a gas stream would be catastrophic. This control is not well demonstrated in the grain industry, and is considered technically infeasible.

5.1.3.3 Mist Eliminator

In some cases, gaseous contaminants may be removed from a gas stream by contacting the contaminated gas stream with a spray of a liquid stream. This results in dissolution of the gaseous contaminants in the droplets of the liquid, which become entrained in the gas stream. Mist eliminators or entrainment separators intercept the gas stream to remove the entrained droplets. This technology is technically infeasible because it is applicable only to remove liquid droplets and not solid particulates like the ones found in the soybean processing plant.

6.0 RANK REMAINING CONTROL TECHNIQUES BY EFFECTIVENESS

This section evaluates the relative effectiveness of the options deemed technically feasible in reducing the impact of emissions, regardless of cost. Table 6.1 below lists the control technologies in descending order of efficiency.

6.1 Exhaust Vent Streams

Table 6.1 Ranking of Control technologies by efficiency (in descending order).

Control Technology Reviewed	Removal Efficiency	Control Technology Carried Forward? (Yes/No)	Comment
Fabric Filter System (baghouse)	99.5%	Yes	The baghouse is determined to be the top control as it has the highest efficiency for dry exhaust stream particulate emissions.
High Efficiency Cyclones	80-99%	Yes	The cyclone is determined to be the top control for high moisture content particulate matter.
Centrifugal collector	95%	No	Inferior. Low efficiency (50-95% for 10 µm particles, depending on the configuration) compared to other technologies
Fabric Filter System (cartridge filter)	99%	No	Inferior because of lower removal efficiency at the working velocity.
Packed/Tray-gas absorption column	50-95%	No	Inferior because of lower removal efficiency for PM. Limited to streams with low inlet PM concentrations. High maintenance costs could be incurred. Liquid waste stream disposal issue.
Spray tower	90%	No	Inferior because of lower removal efficiency. Liquid stream to dispose of.
Venturi Scrubber	70-99%	No	Inferior. High pressure drop, large amounts of wastewater produced and contaminated PM to dispose of.
Wet cyclonic separator	85%	No	Inferior because of lower removal efficiency and can't handle sticky materials.
Metal fabric filter screen	20%	No	Inferior. Very low removal efficiency.

6.2 Utility Boiler

Table 6.2 Ranking of Control technologies

Pollutant	**Available Control Alternatives**	**Selected BACT option?**	**Negative Impacts**	**Emission Rate**	**Average Cost Effectiveness ($/ton)**
PM	Good Combustion Practices; use of natural gas fuel	Yes	N/A	7.6 lb/MMSCF	N/A
PM_{10}		Yes	N/A		N/A
$PM_{2.5}$		Yes	N/A		N/A

6.3 Grain Dryer

The review of permits for soybean processing facilities does not reveal any controls for grain dryer The Decatur facility is proposing to install a grain dryer equipped with filters made of 900 micron self-cleaning stainless steel mesh. In addition, a set of rotary filters will assist in controlling dust from the exhaust. This technology is inherent to the design of grain dryers.

7.0 CONCLUSIONS

This BACT Analysis is developed in support of a PSD permit application for emissions of particulate matter from Bunge North America's Decatur, Alabama soybean processing plant. This BACT analysis indicates that the only particulate matter control technologies that are both technically feasible and cost effective are as follows:

- Fabric Filter dust collectors that achieve an outlet grain loading of approximately 0.002 grains per dry standard cubic feet of air flow are considered BACT for emissions with dry particulate exhaust streams. This control will be utilized for most units that generate dry exhaust streams. This control has the highest control efficiency for all feasible control technologies. Therefore, average cost effectiveness was not calculated.
- High efficiency cyclones that achieve an outlet grain loading of approximately 0.025 grains per standard cubic feet of air flow are considered BACT for emission units with high moisture content. This control technology has the highest control efficiency for particulate matter emissions with high moisture content. Therefore, average cost effectiveness was not calculated.
- Particulate matter emissions from the utility boiler will be minimized through the use of clean fuels like natural gas and good combustion practices.

Table 7-1
Proposed BACT Limits and Technology for Bunge North America

EP-ID	Description	Status	Existing Control	Proposed Control	Proposed Limit	Units
CD-6	Grain Dryer	New	-	Stainless Steel Screens	0.0017	gr/scf
CD-3	New Bean Storage Bin	New	Baghouse	Baghouse*	0.002	gr/scf
PR-4	Cracking Mills	New	Baghouse	Baghouse*	0.002	gr/scf
PR-6	Bean Conditioner	New/ Replacement	Cyclone	Cyclone	0.025	gr/scf
PR-7	Flaking Aspiration	New	Baghouse	Baghouse	0.002	gr/scf
D1	Meal Dryer	New	Cyclone	Cyclone	0.025	gr/scf
D2	Meal Dryer	New	Cyclone	Cyclone	0.025	gr/scf
D3	Meal Dryer	New	Cyclone	Cyclone	0.025	gr/scf
D4	Meal Dryer	New	Cyclone	Cyclone	0.025	gr/scf
C1	Meal Cooler	New	Cyclone	Cyclone	0.025	gr/scf
C2	Meal Cooler	New	Cyclone	Cyclone	0.025	gr/scf
B05	Main Boiler	New	Good Combustion Practices	Good Combustion Practices	0.005	gr/scf

*Will use existing baghouses.

References

1. EPA Air Pollution Control Technology Fact Sheet (EPA-452/F-03-005, EPA-452/F-03-015)
2. EPA. (1990). *New Source Review Workshop Manual.* USEPA.
3. EPA. (1995). *AP-42. Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Air Sources. Appendix B.* Research Triangle Park, NC: US EPA.
4. EPA Air Pollution Control Cost Manual EPA/452/B-02-001; January 2002
5. EPA. (2003). *CATC Technical Bulletins (TB) & Air Pollution Technology Fact Sheets (FS).* USEPA. Retrieved March 27, 2014, from http://www.epa.gov/ttncatc1/products.html#aptecfacts

BUNGE NORTH AMERICA
DECATUR, ALABAMA

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS

February 2019

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EXECUTIVE SUMMARY

This Best Available Control Technology (BACT) Analysis is developed in support of the Prevention of Significant Deterioration (PSD) permit application for emissions of Volatile Organic Compounds from the Bunge North America soybean extraction plant in Decatur, Alabama. The proposed modification at this soybean manufacturing facility involves the use of a Volatile Organic Compound (VOC) – hexane - for extracting oil from soybeans. A significant increase in VOC emissions will occur with this plant expansion. The sources of the hexane emissions from this process are:

- fugitive emissions
- mineral oil absorber
- Meal dryer and meal cooler (DC stacks)
- Meal and Oil Product (negligible source of VOC)

A BACT analysis was performed for each physically or operationally modified emission unit that emits VOCs and is associated with the expansion project. A new natural gas fired boiler will also be added in support of the expansion. The combustion of natural gas also results in volatile organic compound emissions.

The purpose of this BACT analysis is to determine a control technology for the VOC emissions that would be considered BACT. As part of this effort, the following technologies, which are used to control VOC emissions from industrial process sources, were evaluated for hexane extraction: VOC Destruction control and VOC Recapture Control. VOC destruction control includes regenerative thermal oxidizer (RTO), recuperative thermal incineration and catalytic incinerator. The VOC recapture control consists of activated carbon adsorption, absorption system and condensation system.

Good combustion practices were evaluated for the new boiler and described below.

The following is a summary of the results of the BACT analysis:

1. RTOs and Incinerators have not been proven to control VOC emissions from soybean oil extraction plants as this project is not aware of any applications of this technology to existing solvent extraction plants.
2. Incineration, RTO and carbon adsorption of the point source emission streams are considered a serious safety concern.
3. The facility will meet BACT as defined in EPA's BACT/LAER Clearinghouse, which will require the use of a mineral-oil scrubber with a 99% control efficiency to limit VOC emissions in the extraction process. Good combustion practices will be adhered to for the new boiler.
4. Due to the nature of the operation and the difficulty in quantifying emissions from the mineral oil scrubber, compliance would be based on the overall solvent losses as measured by VOC inventory measures. The majority of the hexane emission limits come from the design of the equipment. This set of equipment is

such that more emissions are controlled by the absorber and less by the meal dryers and meal cooler. Therefore, the real performance of the plant is determined by the overall Hexane emission rate in terms of gallons per ton of soybean processed or crushed.

5. For the conventional soybean extraction process, Bunge proposes as BACT the limit of 0.19 gallons of solvent per ton of soybean processed or crushed as set forth in the "Consent Decree". The methodology of 40 CFR Part 63, Subpart GGGG-National Emission Standards for Hazardous Air Pollutants-Solvent Extraction for Vegetable Oil Production (Vegetable Oil Production MACT) shall be used to monitor and demonstrate compliance.
6. Boiler MACT identifies work practice standards – boiler tune-ups – as the method to reduce hexane emissions from natural gas combustion.

1.0 INTRODUCTION

The Clean Air Act (CAA) and regulations promulgated by the Alabama Department of Environmental Management (ADEM) require that major air pollution sources undergoing construction comply with all applicable Prevention of Significant Deterioration (PSD) provisions and Nonattainment area New Source Review (NSR) Requirements. The Federal PSD rules apply to areas classified as attainment and sources with a potential to emit 100 tons per year or 250 tons/year or more of any pollutant depending on the classification of the facility. The major source threshold for Soybean manufacturing is 250 tons per year of any criteria pollutant.

The expansion at the Decatur plant is classified as a major modification for VOCs because its potential VOC emissions exceed 40 tons per year in an attainment area. The regulations of the EPA and ADEM require that a major modification at a major stationary source subject to PSD apply Best Available Control Technology (BACT).

The EPA defines BACT as "an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the Director, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs." In no case is BACT allowed to be less stringent than the emissions limits established by an applicable New Source Performance Standard (NSPS).

In EPA policy and interpretative documents, the Agency has generally called for a separate BACT analysis for each emissions unit at a facility. However, the EPA has supported a logical grouping of emission units and considered controls available for individual pollutants. This evaluation will be based on logical grouping of emission units. Controls available for individual pollutants will be considered.

For BACT analysis, the EPA has implemented the "top-down" method for determining BACT, which ADEM follows. In general, the top-down process requires that all available control technologies be ranked in descending order of emission control effectiveness. The following is a step-by-step description of a typical top-down BACT analysis:

1) Identify all control technologies and process alternatives;
2) Eliminate technically infeasible options;
3) Rank remaining control technologies by emission control effectiveness;
4) Evaluate most effective controls and document results and eliminate any technology with unacceptable impacts; and,
5) Select the remaining most effective control technology as BACT.

2.0 PROCESS DESCRIPTION

At the Decatur, Alabama soybean extraction facility, vegetable oil is extracted from the soybeans using hexane as a solvent. Solvent is emitted from the extraction of the oil with hexane, from desolventizing and further processing of the extraction products (oil and meal).

During solvent extraction, hexane is used to wash the processed raw materials (flaked soybeans), in a countercurrent extractor. Two product streams emerge from the extractor: solvent laden flakes and a solvent-oil mixture. The extraction is followed by filtration and separation of the two streams. Hexane is removed from the solvent-oil mixture through distillation, and from the flakes through a desolventizer toaster. The hexane vapor is recovered by condensers and in the mineral oil absorber. The recovered solvent is returned to storage to be reused. The "crude" oil is transferred to storage tanks before being further processed. The desolventized flakes are then ground for use as soybean meal.

Recommended abatement techniques to prevent and control VOCs include the following: process improvement and abatement technologies. Process improvement techniques include: proper recovery of solvents by distilling the oil from the extractor and implementing leak prevention systems. Abatement technologies include: recovery of solvent vapors from the desolventizer-toaster by use of condensers to treat condensates with high solvent content, and treatment of remaining hexane-laden air from the condensers/reboilers with a mineral oil scrubber.

Ancillary equipment includes natural gas fired boilers to provide steam for the above mentioned processes.

3.0 ESTIMATED VOC EMISSIONS BASIS

Volatile Organic Compounds (VOCs) are the principal emissions from soybean oil extraction processes. The VOC emissions are caused by the use of the oil-extraction solvent, hexane. The sources within the soybean oil processing plant that generate solvent emissions include the extractor main vent system, the meal dryer exhaust air, meal cooler exhaust air, and fugitive losses. The largest single source of VOC emissions in soybean oil plants is the extractor. It is estimated that 50 to 70 percent of the emissions from soybean oil plants would be lost from the extractor if the extractor vent (main vent) is controlled with only a chilled water condenser. Extractor emissions can be reduced 95-99 percent with a properly designed and operated mineral oil absorber installed after the condenser on the main vent.

Another 11 to 32 percent of VOC emissions are lost from the post-desolventizer dryer and cooler exhaust vents. A portion of the solvent retained in the desolventized flakes is evaporated in the dryer and cooler and vented to the atmosphere. Add-on controls on post-desolventizing vents (dryer, cooler vents) are unapplied to this source due to safety concerns. In fact, the National Soybean Products Association has raised doubts regarding the safety of add-on controls on these vents. Another source of VOC emissions in soybean oil plants is fugitive emissions. Since these losses result mainly from leaks and spill, control is best affected by an adequate maintenance and housekeeping program. Additional small losses occur from processing of the meal and oil. As was stated earlier, trace amounts of solvent remain in the meal and oil after the extraction process. Some of this solvent is emitted to the atmosphere as the meal and oil are processed further.

The VOC losses from emission sources within the respective processes are summarized below in Table 1. The sources below are being operationally modified and are subject to BACT.

Table 3-1 - VOC Emissions

Source Description	VOC Control Method	Percentage of Loss (%)
Main Vent (Extractor Vent)	Mineral Oil Absorber (MOA)	20
Post-Desolventizer Vents (Dryer and Cooler Vents)	None	4.5
Refining	None	2.8
Hexane Storage	None	0.1
Meal Product	None	14.6
Fugitive Loss	Maintenance and	58

	housekeeping program	
Total from Extraction Processes		**100%**
New Boiler	Good Combustion Practices	**1.84 TPY**

4.0 CONTROL TECHNOLOGY EFFECTIVENESS & COST ANALYSIS

The definition of BACT requires that emission controls for each emission source and each pollutant of concern be evaluated on a case-by-case basis, taking into consideration energy, environmental, and economic impacts and other costs. Only commercially available and field-proven technologies need to be investigated. If the control technology has been installed and operated successfully on the type of source under review, it is demonstrated and it is technically feasible (USEPA, 1990).[1]

Options may also be eliminated when they have unacceptable energy, cost, or non-air quality environmental impacts.

4.1 List of Control Options and Elimination Technically Infeasible Options

The first step in a BACT analysis is to identify all available control technologies. An initial list of potential technologies was developed using the following information sources:

- EPA RACT/BACT/LAER Clearinghouse
- 40 CFR 63, Subpart GGGG-National Emissions Standard for Hazardous Air Pollutants -Solvent Extraction for Vegetable Oil Production
- EPA's Economic Impact Analysis for the NESAHPs regulation (EPA-452/R-01-005)
- Recently Issued permits for Soybean Processing Facilities

The following sections present a detailed discussion of each of the BACT information and controls.

4.1.1 BACT Clearinghouse Analysis – Solvent Extraction Process

This step is undertaken by first reviewing the RACT/BACT/LAER Clearing house (RBLC) database on VOC control technologies in Soybean Manufacturing facilities or similar. This database contains BACT determinations made and approved by different State Agencies for similar sources and processes.

Based on a database query of permits issued up to July 2018, the following BACT determinations related to soybean manufacturing processes were identified and presented in Table 4.1 below.

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1 EPA New Source Review Workshop Manual, October 1990

Table 4.1-Summary of RBLC Database Review – Soybean Extraction Plants

Facility	Date	RBLC ID #	Emission Unit	VOC BACT Requirements
Cargill, Inc., Sioux City Soybean Oil Extraction Plant	07/05/2013	IA-0115 (draft)	Soybean Extraction Process	Control Method: Mineral Oil Absorber System Emission Limit: 0.14 Gal/ton - 12 month rolling average Emission Limit: 737.76 tons/year -12 month rolling average
Perdue Agribusiness, LLC / Marietta	1/29/18	PA-0308 (final)	1.Soybean Oil Extraction Plant 2.Meal Dryer 3.Meal Cooler	1. Control Method: Good Work Practices and LDAR; Emission Limit:0.028 lb/ton SLR ; 7.24 tons 2. Control Method: LDAR; Emission Limit: 0.023 lb/ton ; 50.42 tons any 12-month rolling total 3. Control Method: LDAR; Emission Limit: 0.102 lb/ton; 25.21 tons any 12-month rolling total
Perdue Agribusiness, LLC	11/02/2017	VA-0327 (final)	1. Soybean Extraction Process 2. Equipment Leaks 3.4 – 27 mmBTU/hr boilers 4. Emergency Generator 5. 2 Grain Dryers	1. Control Method: Mineral Oil Absorber System Emission Limit: 0.152 Gal/ton -12 month rolling average 2. Control Method: Leak Detection and Repair (LDAR) Monitoring System 3. Control Method : None Emission Limit: 0.1 lb/hr 4. Control Method : None Emission Limit: 0.49 lb/hr 5. Control Method : None Emission Limit: 0.21 lb/hr
Archer Daniels Midland Company	07/06/2016	IA-0111 (final)	1.Extractor and Desolventizer Toaster Dryer	1. Control Method: Mineral Oil Absorber System and Good Operating Practices.

Des Moines Soybean Processing Plant			Cooler 2. Equipment Leak	Emission Limit: 0.14 gal/ton – 12 month rolling average 788 tons/year -12 month rolling total 2. Control Method: Leak Detection and Repair (LDAR) Monitoring System. Emission Limit: 788 tons/year - 12 month rolling total
Consolidated Grain and Barge Company Soybean Oil Extraction Plant	06/08/2016	IN-0209 (final)	1. Extraction System 2.Overall Solvent Loss Ratio 3. DTDC Dryers 4.DTDC Cooler	1. Control Method: Mineral Oil Absorber System (99.5% efficient). Emission Limit:0.048 lb/ton 2. Control Method: None Emission Limit: 0.19 Gal/ton 3. Control Method: None Emission Limit: 0.1520 lb/ton 4. Control Method: None Emission Limit: 0.1520 lb/ton
AG Processing Sergeant Bluff	03/23/2016	IA-0103 (final)	Soybean Oil Extraction	Control Method: Mineral Oil Scrubber (99.9% Eff). Emission Limit:0.1450 Gal/ton 12-month rolling average
AG Processing Inc. Soybean Processing Facility	08/18/2015	NE-0059 (draft)	Soybean Extraction Process 2 – 200 mmBtu/hr natural gas and fuel oil – fired boilers	Control Method: Mineral Oil Absorber System. During SSM, the source must comply with 40 CFR 63.2852. Emission Limit: 381.26 ton/yr - 12 month rolling total Control Method: None Emission Limit: 0.0054 lb/mmBtu

American Energy Producers, Inc. Soybean Processing Plant	05/29/2015	MO-0081 (final)	1.Extraction System 2.Desolventizing-Toasting	1. Control Method: Condenser and a Mineral Oil Absorber with Chiller System Emission Limit: 0.0560 lb/ton 2.Control Method: Evaporators and a Mineral Oil Absorber System
Archer Daniels Midland Company Soybean Processing Plant	04/15/2015	MO-0082 (final)	1.Soybean Oil Extraction 2.Dual Fired 85.6 MMBtu/hr Water-tube Boiler	1. Control Method: use of condensation for solvent recovery and uncondensed vapors routed to a Mineral Oil Absorber. Emission Limit 1: 0.15 gal/ton-12 month rolling average excluding malfunction period. Emission Limit 2: 0.1710 Gal/ton-12 month rolling average including malfunction period. 2. Emission Limit: 0.0055 lb/MMBtu when burning natural gas and 0.0010 lb/MMBtu when burning other fuels
Louis Dreyfuls Agricultural Industries LLC Soybean Processing Facility	08/13/2013	IN-0150 (final)	1.Soybean Oil Extraction Plant 2.Meal Dryers 3.Meal Cooler 4.Overall Solvent Loss Ratio 5. Fugitive Hexane Loss	1. Control Method: Combined Condenser and Mineral Oil Scrubber System. Emission Limit:0.048 lb/ton 2.Emission Limit: 0.03 Gal/ton 3.Emission Limit: 0.03 Gal/ton 4. Emission Limit: 0.141 Gal/ton 5. Enhanced LDAR Program

Archer Daniels Midland-Fremont Soybean Oil Manufacturing Plant	02/24/2009	NE-0048 (final)	1.Soybean Oil Extraction 2.Fugitive Emissions	1. Control Method: Mineral Oil Scrubber Emission Limit: 0.1650 lb/ton 12 month rolling total including SSM periods 2.LDAR

4.1.2 VOC Control Technology Options Analysis

VOC control technology options fall into two distinct categories: VOC destruction control and VOC recapture control: VOC destruction control includes regenerative thermal oxidizer (RTO), recuperative thermal incineration and catalytic incinerator. The VOC recapture control consists of activated carbon adsorption, absorption system and condensation System.

4.1.2.1 VOC Destruction Control Methods

The list of potentially applicable VOC Destruction control methods are listed in the table below:

Table 4-2 VOC Destruction Control Technologies

Control Technologies Reviewed	Control Technologies Carried Forward (Yes/No)	Comment
Regenerative Thermal Oxidizer (RTO)	No	Technically infeasible
Recuperative thermal incineration	No	Technically infeasible
Catalytic incineration	No	Technically infeasible

4.1.2.2 VOC Recapture Control Methods

The list of potentially applicable VOC Recapture control methods are listed in the table below:

Table 4-3 VOC Recapture Control Technologies

Control Technologies Reviewed	Control Technologies Carried Forward (Yes/No)	Comment
Condensation	No	Technically infeasible
Absorption	Yes	Technically feasible
Carbon Adsorption	No	Technically infeasible

4.2 Discussion on Technical Feasibility/Infeasibility – Main Vent

The following discussion provides information on how the technologies to be carried forward for further evaluation were selected. To select an appropriate control device to propose as BACT, control options were compared to the characteristics of the waste stream, the process, the source type, and the air contaminants of concern. These unique characteristics were considered in selecting control equipment and establishing specific control effectiveness. The character of the air contaminant also dictates the choice of control devices. This section provides information on the technologies selected for additional review.

4.2.1 Regenerative Thermal Oxidizer or Equivalent Incineration System

Incineration or thermal oxidation is the process of oxidizing combustible materials by raising the temperature of the material above its auto-ignition point in the presence of oxygen, and maintaining it a at high temperature for sufficient time to complete combustion to carbon dioxide and water. VOC destruction efficiency depends upon design criteria (i.e., combustion chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical thermal incinerator design efficiencies range from 95 to 98+% and above, depending on system requirements and characteristics of the contaminated stream. The typical requirements/design conditions needed to meet most regulatory requirements are a destruction efficiency of at least 98% or an exit concentration of no more than 20 parts per million by volume (ppmv).

A straight thermal incinerator is comprised of a combustion chamber and does not include any heat recovery of exhaust air by a heat exchanger. The heart of the thermal incinerator is a nozzle-stabilized flame maintained by a combination of auxiliary fuel, waste gas compounds, and supplemental air added when necessary. Upon passing through the flame, the waste gas is heated from its inlet temperature to its ignition temperature. The ignition temperature varies for different compounds and is usually determined empirically. It is the temperature at which the combustion reaction rate exceeds the rate of heat losses, thereby raising the temperature of the gases to some higher value. Thus, any organic/air mixture will ignite if its temperature is raised to a sufficiently high level.

Thermal incinerators (regenerative and recuperative) can be used to reduce emissions from almost all VOC emission points, including reactor vents, distillation vents, solvent operations, and operations performed in ovens, dryers, and kilns. They can handle minor fluctuations in flow. Their fuel consumption is high, so thermal units are best suited for smaller process applications with moderate-to-high VOC loadings.

Regenerative Thermal Oxidizers and Incinerators have not been proven for use in controlling VOC emissions from soybean oil extraction plants. This project is not aware of any application of these control devices to any solvent extraction plant. The reason may be because the exhaust from the mineral oil absorber will include small amount of oil in aerosol form. The aerosol is likely to cause carbonization and degradation of packing in an RTO leading to a loss of heat transfer. Any degradation of the packing system would make the RTO ineffective in controlling VOC emissions. Therefore, the use of an RTO on the outlet of the main process vent is considered technically infeasible.

In a catalytic incineration system, the process vent gases are heated by a burner up to incineration temperature. The gas then passes through the catalyst, which enhances the destruction of the VOCs by decreasing the amount of energy required for incineration and lowering the fuel requirements over a standard flame.

The exhaust from the meal dryer/cooler will include particulate materials. The packing material and the inlet screen in the regenerative part of an RTO are susceptible to plugging by particulate matter. The potential plugging will cause the RTO to malfunction. Additionally, the cooler's low exhaust temperature and high gas volume tend to affect this reduction method. Therefore, an RTO to control VOC emissions for the meal dryer/cooler is technically infeasible for this application.

In addition to the technical problems associated with an RTO, RTOs and incineration are not feasible for safety reasons. The National Fire Protection Agency (NFPA) standards for solvent extraction plants require that any flame operations such as RTOs be located at least 100 feet from the process area[3]. These standards also require that barriers are located between the extraction process and the possible source of vapor ignition and shall be at least 15 m (50 ft.) from the extraction process. This is to prevent any flashbacks into the process area. The presence of fugitive hexane vapors at the plant and the presence of an open flame from an RTO present an unacceptable risk of explosion and fire hazard. Therefore, this control technology was not carried into the cost, environmental, and energy impact analyses phase of the BACT evaluation as it was considered not technically feasible.

4.2.2 Activated Carbon Adsorption

Carbon adsorbers have been used principally to control the emission of VOC. Control efficiencies of carbon adsorption systems vary, depending on the characteristics of the organics, the variety of organics, the presence of moisture, and the properties of the carbon. Carbon systems have varying effectiveness for streams with mixtures of compounds, compounds with molecular weights less than 100, and streams with high humidity. Often, adsorbed compounds can be stripped by other compounds in the waste stream. Organic compounds are classified into four categories based on the adsorptive capacity of carbon (Norit, 2007). Hexane is placed in Category 3 with a rating of satisfactory adsorption capacity. Substances are adsorbed as well, but not as efficiently as substances with a 4 rating. One pound of activated carbon adsorbs about 10 to 25% of its weight – average about 1/6 (16.7%), with a rating of high adsorptive capacity by carbon.

Carbon Adsorption system is not used to control VOC emissions in soybean oil extraction facilities for technical and safety reasons. These technical and safety reasons can be classified into three aspects including sulfur plugging of the carbon, overheating and limitation of capacity. Carbon Adsorption systems were widely used in the 1950s. In the late 1950s, mineral oil absorption systems began to replace carbon units. The identified technical issues for carbon adsorption systems are very much the same as the RTO/Incineration units. The aerosol oil in the mineral oil absorber exhaust and the PM in the meal dryer/cooler exhaust causes fouling of the carbon bed. Additionally, soybeans naturally contain small amounts of sulfur compounds that could cause fouling of the carbon bed. While the PM concentrations in the meal dryer/cooler exhaust can be reduced by a high efficiency filtration system, the aerosol oils and sulfur compounds cannot be efficiently removed.

From a safety standpoint, carbon adsorption system is considered not feasible for soybean oil extraction facilities because the absorption of hexane unto carbon causes an exothermic reaction. This issue is more pronounced during an upset in the plant. During upset conditions, concentration of hexane increases and causes additional heat build-up in the carbon bed. Overheating could make the carbon adsorbers a potential source of ignition. Therefore, this control technology was not carried into the cost, environmental, and energy impact analyses phase of the BACT evaluation as it was considered not technically feasible.

4.2.3 Absorption System (Mineral Absorption System)

In general, absorption is a mass transfer operation in which one or more soluble components of a gas mixture are dissolved in a liquid that has low volatility under the process conditions. The pollutant diffuses from the gas into the liquid when the liquid contains less than the equilibrium concentration of the gaseous component. The difference between the actual concentration and the equilibrium concentration provides the driving force for absorption.

A properly designed gas absorber will provide thorough contact between the gas and the solvent in order to facilitate diffusion of the pollutant. The rate of mass transfer between the two phases is largely dependent on the surface area exposed and the time of contact. Other factors governing the absorption rate, such as the solubility of the gas in the particular solvent and the degree of the chemical reaction, are characteristic of the constituents involved and are relatively independent of the equipment used.

The suitability of gas absorption as a pollution control method is generally dependent on the following factors: 1) availability of suitable solvent; 2) required removal efficiency; 3) pollutant concentration in the inlet vapor; 4) capacity required for handling waste gas; and, 5) recovery value of the pollutant(s) or the disposal cost of the unrecoverable solvent.

Specifically, Mineral Oil Absorption System or solvent air separation system is widely used in the Soybean Extraction process throughout the world. Cold mineral oil is used to absorb solvent from vent gases before discharging clean gases to the atmosphere. Non-condensable gases enter the mineral oil absorber at the bottom and rise through the tower packing. The non-condensable gases are flowing counter-currently to the cold mineral oil at the top. The solvent is subsequently absorbed by the mineral oil, and desolventized gases are drawn off through a demister at the top.

The solvent-laden mineral oil collected at the bottom of the absorption column is pumped through a heat exchanger, and finally to the top of the mineral oil stripper. Here the solvent is removed from the mineral oil by live steam evaporation as the mineral oil trickles down through the tower packing. The solvent vapors drawn off at the top of the stripping column travel back to the vent condenser. Solvent-free mineral oil collected at the bottom of the mineral oil stripper is recycled through the mineral oil interchanger/cooler, then back to the absorption column where the cycle is repeated.

Absorption is used successfully and economically on the extraction main vent. Therefore, this technology is deemed technically feasible and carried forward.

4.2.4 Condensation

Refrigerated condensers are used for treating emission streams with high VOC concentrations (usually > 5,000 ppmv) in applications involving gasoline bulk terminals, storage, etc. (EPA, 2002). The emission stream enters a heat exchanger and encounters the cold surface of the tube carrying the refrigerant. The emission stream temperature drops to the dew point of its VOC constituent. The VOC liquefies and drops out of the emission stream. The VOC free emission stream is then vented to the stack while the condensed solvent is collected for reuse or disposal.

Since condensation systems are recommended for emission streams containing greater than 5,000 ppm and the subject emissions stream will nearly always be below 5,000 ppm, this technology was not carried into the cost, environmental, and energy impact analyses phase of the BACT evaluation as it was considered not technically feasible.

4.3 Discussion on Technical Feasibility/Infeasibility – Meal Processing

VOC emissions from meal processing are generally low in concentration and have high flow rates. Because of these characteristics, meal processing emissions have historically been controlled by pollution prevention methods due to the unreasonable costs of trying to implement add-on controls. The following VOC control technology is considered available at this time for meal processing.

4.3.1 Thermal or Catalytic Oxidation

This technology was discussed in the previous section.

4.3.2 Carbon Adsorption

This technology was discussed in the previous section.

4.3.3 Optimization of Desolventizer Toaster/Dryer/Cooler

A faulty or poorly designed or operated DTDC may result in inadequate desolventization of the meal. This results in higher VOC emissions from all downstream meal processing, including the subsequent dryer and cooler vents and meal grinding and meal loadout. Emission reductions at all meal processing vents may be accomplished by improving the desolventizing equipment to achieve better operation. Replacement – which this project proposes – of the desolventizing equipment has the following advantages: reduced VOC loss, increased meal quality, enhanced loss prevention, and possible reduced steam consumption.

4.4 BACT Analysis for New Boiler

The following sections present a detailed discussion of the BACT information and controls for the new main boiler.

4.4.1 BACT Clearinghouse Analysis – New Main Boiler

This step is undertaken by first reviewing the RACT/BACT/LAER Clearing house (RBLC) database on VOC control technologies for natural gas fired boilers. This database contains BACT determinations made and approved by different State Agencies for similar sources and processes.

Based on a database query of permits issued up to August 2018, the following BACT determinations related to boilers were identified and presented in Table 4.4 below.

Table 4-4 Summary of RBLC Database Review – Boilers

Facility	Date	RBLC ID #	Emission Unit	VOC BACT Requirements
Duke Energy Indiana, LLC	07/25/2018	IN-0287	Auxiliary Boiler	Control Method: Good combustion practices
Midwest Fertilizer Company	8/22/17	IN-0263	1. Startup Heater 2. Natural Gas Auxiliary Boilers	Control Method: Good combustion practices Emission Limit: 0.3780 lb/hr, 3 hr average; 200 hr/year Control Method: Good combustion practices Emission Limit: 1. 5.5 lb/mmcf – 3 hr avg; 2. 1877.39 mmcf/12-month rolling total 3. Only combust natural gas.
Indeck Niles, LLC	3/8/18	MI-0423	Auxiliary Boiler	Control Method: Good combustion practices Emission Limit: 0.004 lb/mmbtu
REXTAC, LLC	11/16/17	TX-0813	2 - 223 mm Btu/hr boilers	Control Method: Good combustion practices Emission Limit: 0.0005 lb/mmbtu
Indorama Ventures Olefins, LLC	4/28/17	LA-0314	2 - 248 mm Btu/hr boilers	Control Method: Good combustion practices and proper maintenance Emission Limit: 0.0054 lb/mmbtu
Ag Processing Inc.	8/18/15	NE-0059	200 mm Btu/hr boilers	No controls. 0.0054 lb/mmbtu
Moundsville Power	5/1/18	WV-0025	100 mmBtu/hr boiler	Control Method: Good combustion practices and use of natural gas Emission Limit: 0.6 lb/hr; 0.006 lb/mmbtu

4.4.2 VOC Control Technology Options Analysis

VOC generation in regards to industrial boilers results from combustion of fuels or leaks in oil or gas piping.

Good Combustion Practices: Good combustion practices include operating the system based on the design and recommendations provided by the manufacturer and by maintaining proper air-to-fuel ratios with periodic maintenance checks. A well operated system utilizing good combustion practices is the most prevalent and cost effective measure for reducing VOC emissions from the proposed boiler.

Proposed VOC BACT

Proposed good combustion practices to be implemented by Bunge will maintain VOC emissions below the emission limit. Good combustion practices will be considered BACT for VOCs for the new main boiler.

5.0 RANK REMAINING CONTROL TECHNIQUES BY EFFECTIVENESS

This section evaluates the relative effectiveness of the various options considered technically feasible and carried forward. The most effective treatment option would be mineral oil absorber for the extraction main vents. Table 6.1 presents the effectiveness of the control technologies that are technically feasible:

Table 5.1: Effectiveness of the control technologies that are technical feasible for Soybean Extraction Process - Main Vent

Control Technologies Reviewed	Effectiveness or Removal Efficiency
Mineral Oil Absorber	95%

The control technology that was identified as technically feasible for Soybean Extraction Process – Meal Processing was:

- Optimization of Desolventizer Toaaster/Dryer/Cooler.

The control technology that was identified as technically feasible for the new main boiler was:

- Good Combusion Practices.

6.0 EVALUATION OF MOST EFFECTIVE CONTROL TECHNIQUE(S)

Since the other control systems are deemed technically infeasible and the selected control device, DTDC optimization, and good combustion practices are deemed "achieved in practice", and are the most effective emission control technologies, cost effective justification is not required. No additional evaluation of technological options.

The control technologies listed in Table 6-1 below represent VOC BACT for the proposed plant expansion.

Table 6-1 Proposed BACT for Plant Expansion at Bunge

Source	Control Technology
Main Vent	Mineral Oil Absorber
Meal Processing	Optimization of DT/DC
New Boiler	Good Combustion Practices

7.0 CONCLUSIONS

This BACT Analysis is developed in support of a PSD permit application for emissions of VOC from Bunge's Decatur, Alabama Soybean Extraction Plant. The sources of VOC emissions addressed in this BACT Analysis are the extraction main process vent, fugitive emissions, post-desolventizer vents (DT/DC vents) and the new main boiler.

An evaluation of the BACT for soybean extraction plants has shown that mineral-oil absorption continues to be most viable, safe, and efficient means of solvent recovery for soybean extraction plants.

Safety-analysis and technical analysis have conclusively shown that incineration and carbon adsorption are not feasible controls for hexane extraction plants. In fact, the National Fire protection Association Standards precludes the use of incineration systems, and previous industry experience with carbon adsorbers has shown that carbon adsorption is unsafe and unreliable in soybean extraction hexane recovery application. Therefore, carbon adsorption and incineration are not currently considered viable, safe, and effective economic control options. On the basis of the above, Mineral Oil Absorption should be considered BACT for the extraction main vent. Additionally, the control efficiency of the mineral oil absorber is above 95% VOC recovery efficiency which is the highest efficiency of all the available control technologies. Bunge is also recommending that since it is difficult to quantify hexane emission loss to the atmosphere, BACT should be defined for soybean extraction plants on the basis of total measured hexane inventory loss. This is consistent with other BACT determinations for soybean plants and the Vegetable Oil NESHAP (40 CFR Part 63, Subpart GGGG) and the consent decree. Bunge proposes a solvent loss limit of 0.19 gallons of hexane lost per ton of soybeans processed on a 12-month rolling total basis, including startups, shutdowns, and malfunctions and equipment leaks. Based on 61,425,000 bushels per year, this limit would result in an annual solvent loss of 986 tons per year.

Add-on controls on post desolventizing vents (dryer, cooler vents) are unapplied to this source due to safety concerns. In fact, the National Soybean Products Association has raised doubts regarding the safety of add-on controls on these vents. Another source of VOC emissions in soybean oil plants is fugitive emissions. Since these losses result mainly from leaks and spill, control is best affected by an adequate maintenance and housekeeping program. Effectiveness will be demonstrated by complying with the overall solvent loss ratio of 0.19 gallons per ton.

Good combustion practices will be considered BACT for VOCs for the new main boiler.

8.0 REFERENCES

ATSDR. (2008). *Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Phenol.* Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

EPA. (2002). *EPA Air Pollution Control Cost Manual. EPA/452/B-02-001. Sixth Edition.* Research Triangle Park, NC 27711: USEPA Office of Air Quality Planning and Standards.

NJR. (2009). Control and Prohibition of Air Pollution by Volatile Organic Compounds and Oxides of Nitrogen. Air Pollution Control. New Jersey Department of Environmental Protection, Division of Air Quality.

Retrieved May 27, 2014, from http://www.lexisnexis.com/njoal/

Norit. (2007). Activated Carbon-Information Sheet. Adsorptive Capacity for Vapor Contaminants. Retrieved April 4, 2014, from http://www.norit.com/files/documents/Adsorp_Capacity_of_Vapor_Contam_rev2.pdf

USEPA. (1990). *New Source Review Workshop Manual.* USEPA.

EPA. (1978). *Control of Volatile Organic Emissions from Manufacture of Vegetable Oils. EPA/450/2-78-035. OAQPS No. 1.2-110.* Research Triangle Park, NC 27711: USEPA Office of Air Quality Planning and Standards.

AP42, Fifth Edition, Compiliation of Air Pollutant Emissions Factors, Volume 1 Stationary Point and Area Sources

APPLICATION FORMS

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

Facility Number [| |] - [| | |]

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. **Name of Facility, Firm, or Institution:** Bunge North America, Inc

Facility Physical Location Address

Street & Number: 1400 Market St NE

City: Decatur **County:** Morgan **Zip:** 35601

Facility Mailing Address (If different from above)

Address or PO Box: Same

City: **State:** **Zip:**

Owner's Business Mailing Address

2. **Owner:** Bunge North America, Inc

Street & Number: 1391 Timberlake Manor Parkway **City:** St Louis

State: MO **Zip:** 63017 **Telephone:** 314-292-2000

Responsible Official's Business Mailing Address

3. **Responsible Official:** Michael Klauke **Title:** Plant Manager

Street & Number: 1400 Market St NE

City: Decatur **State:** AL **Zip:** 35601

Telephone Number: 256-301-4021 **E-mail Address:** michael.klauke@bunge.com

Plant Contact Information

4. **Plant Contact:** Jason W. Davis **Title:** Safety & Environmental Manager

Telephone Number: 256-301-4038 **E-mail Address:** jasonw.davis@bunge.com

5. **Location Coordinates:**

UTM 503005 **E-W** 3829217 **N-S**

Latitude/Longitude 34° 36' 18.6" N **LAT** 86° 57' 59.9" W **LONG**

6. **Permit application is made for:**

☐ Existing source (initial application)

☑ Modification

☐ New source (to be constructed)

☐ Change of ownership

☐ Change of location

☐ Other (specify) ______________________

Existing source (permit renewal)

If application is being made to construct or modify, please provide the name and address of installer or contractor

Not yet selected

____

______________________ **Telephone** ______________________

Date construction/modification to begin ____________ **to be completed** ____________

7. **Permit application is being made to obtain the following type permit:**

☑ Air permit

☐ Major source operating permit

☐ Synthetic minor source operating permit

☐ General permit

8. **Indicate the number of each of the following forms attached and made a part of this application: (if a form does not apply to your operation indicate "N/A" in the space opposite the form). Multiple forms may be used as required.**

_______ **ADEM 104 - INDIRECT HEATING EQUIPMENT**

_______ **ADEM 105 - MANUFACTURING OR PROCESSING OPERATION**

_______ **ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION**

_______ **ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES**

_______ **ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS**

_______ **ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES**

_______ **ADEM 110 - AIR POLLUTION CONTROL DEVICE**

_______ **ADEM 112 - SOLVENT METAL CLEANING**

_______ **ADEM 438 - CONTINUOUS EMISSION MONITORS**

_______ **ADEM 437 - COMPLIANCE SCHEDULE**

9. **General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):**

Soybean processing and soybean oil refining SIC 2075, NAICS 311224

Edible oils blending and packaging SIC 2079, NAICS 311225

10. <u>For those making application for a synthetic minor or major source operating permit</u>, please summarize each pollutant emitted and the emission rate for the pollutant. Indicate those pollutants for which the facility is major.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no

*Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: ____
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. **List all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.**

Insignificant Activity	Basis

13. List and explain any exemptions from applicable requirements the facility is claiming:

a.
b.
c.
d.
e.
f.
g.
h.
i.

14. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a. Project Description
b. Emission Calculations
c. Specifications Documents
d. Process Flow Diagrams
e. BACT Analysis
f. Air Quality Data
g. Stack Test Report
h.
i.

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.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

[signature]	Plant Manager	2/22/2019
SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE	DATE

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   RS-1a Rail Unloading Pits – Fugitive Emissions

   RS-1b Truck Unloading Pits – with Baghouse

   RS-3b – Barge Unloading – see separate form

   Soybeans are unloaded from rail, truck or barge and transferred to storage. The total annual input quantity is for all 3 sources, but each source can unload at 375 tons/hr.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): ____________

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 750,000 each

   Manufactured date: 1972-74

   Proposed installation date: NA

   Original installation date (if existing): 1972-74

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	375 ton/hr	750,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

The rail unloading station is located inside a shed enclosure reducing fugitive emissions by 40%.

None of the three unloading stations are able to continuously unload due to the need to reposition the railcar, truck or barge. These sources are also limited by bottlenecks downstream of this process.

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
RS-1a	Fugitive Source					
RS-1b	10	577	2.5	73.7	27,713	Ambient

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
RS-1a	See Attached Emission Calculations				PWR $E=17.31P^{0.16}$	-
RS-1b	See Attached Emission Calculations				PWR $E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ______________________ Date: February 21, 2019

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   RS-2 Headhouse to Storage Tank Conveyor, Scales, Elevator Boot Section – with Baghouse

   Soybeans received by rail, truck or barge are conveyed, elevated, weighed, sampled and transferred to storage.

3. Type of unit or process (e.g., calcining kiln, cupola furnace):

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 2250000

   Manufactured date: 1972-74 Proposed installation date: NA

   Original installation date (if existing): 1972-74

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans received	300 ton/hr	2,250,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

This process can not handle grain faster than the combined receipt of grain by rail, truck or barge (375 ton/hr each).

The source is also limited by bottlenecks downstream of this process.

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
RS-2	130	577	18" x 23"	72	12,419	Ambient

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions		Basis of Calculation	Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)		(lb/hr)	(units of standard)
RS-2	See Attached Emission Calculations				PWR $E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

X Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ______________________ Date: February 21, 2019

PERMIT APPLICATION
FOR
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Do not write in this space

1. **Name of firm or organization:** Bunge North America, Inc

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number ____

Barge Unloading System - RS-3b

Soybean unloading

This dock system includes enclosed conveyors, excavator, unloading hopper, and dust collector.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Barge unloading system

Make: Kice or Mac **Model:** To be determined

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 750,000

Manufactured date: NA **Proposed installation date:** 12/2018

Original installation date (if existing): NA

Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): None

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Soybeans	370,000	750,000	1,842,750

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):** NA **MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Soybeans	1,842,750	tons

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?

☑ Yes ☐ No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

	Stack					
Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
RS-3b					15,000	Ambient

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
RS-3b	See Attached Emission Calculations					

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

☑ (Check box if extra pages are attached)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☑ Yes ☐ No

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☑ Yes ☐ No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐ Yes ☑ No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ______________________ Date: 2/21/19

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1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   RS-5a-g Soybean Storage Tanks (atmospheric vents)

   Beans arriving at the plant are ultimately sent to one of these seven one million bushel storage tanks.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Grain Storage Tanks

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 375 ton/hr

   Manufactured date: 1972-74

   Proposed installation date: NA

   Original installation date (if existing): 1972-74

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	375 ton/hr	750,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft³				
L. P. Gas	-	Btu/ft³				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Grain throughput is limited by downstream processes in the plant.

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
RS-5a-g – square vents	97	577	4.67 x 4.67	Unknown	Unknown	Ambient
Round vents	91	577	2.5	Unknown	Unknown	Ambient

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions		Basis of Calculation	Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)		(lb/hr)	(units of standard)
RS-5a-g	See Attached Emission Calculations				PWR $E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: __________ Date: February 21, 2019

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Do not write in this space

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2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   CD-1 - Bean Cleaning Process

   After beans are received, they are scalped, screened and cleaned prior to being processed. CD-1 is the baghouse through which this equipment is aspirated. The plant is installing new screens, bucket elevator, and new conveyors in 2018/19. The baghouse currently used for the headhouse will be used for bean cleaning and the baghouse currently used for bean cleaning will be used for the headhouse.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Grain Screening and Cleaning

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 450 ton/hr

   Manufactured date: May 2018

   Proposed installation date: May 2018

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable): May 2018

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	218.8 ton/hr	900,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Grain throughput will be limited by the plant wide throughput of 61,425,000 bushel per year.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack			Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	Height Above Grade (Ft)	Base Elevation (Ft)	Diameter (Ft)			
CD-1	10	577	1.67 x 1.67	151.9	25310	Ambient
Existing						

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions		Basis of Calculation	Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)		(lb/hr)	(units of standard)
CD-1	See Attached Emission Calculations				PRW $E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ______________________ Date: 2/21/19

PERMIT APPLICATION
FOR
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2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   CD-2 Law Marot Grain Dryer

   45.2 mmBtu/hr counter current flow grain dryer

   10,000 bushel/hr

   Even though this is above the total throughput of the plant, operations are limited by bottlenecks downstream of the dryer.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Grain Dryer

   Make: Law Marot Model: SC3-10.4-20 PL2B

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 900000

   Manufactured date: 2015 Proposed installation date:

   Original installation date (if existing): September 2015

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	250 ton/hr	500,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): ___ MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Throughput is limited by processes downstream of the dryer.

A plant wide throughput limit of 61,425,000 bushel per year is proposed.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
CD-2	95.3	577	Four 3'x5' vents	75	270000	110

* std temperature is 68ºF - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
CD-2	See Attached Emission Calculations				PWR $E=17.31\ P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ______________________ Date: 2/21/19

PERMIT APPLICATION
FOR
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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   CD-6 Law Marot Grain Dryer

   29.2 mmBtu/hr counter current flow grain dryer
   10,000 bushel/hr

   Even though the throughput from the two dryers is above the total throughput of the plant, operations are limited by bottlenecks downstream of the dryers.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Grain Dryer

   Make: Law Marot Model: To be determined

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 250000

   Manufactured date: 2019 Proposed installation date: Sept. 2019

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable):

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	125 ton/hr	250,000	1,842,750

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): ___ MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Throughput is limited by processes downstream of the dryers.

A plant wide throughput limit of 61,425,000 bushel per year is proposed.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
CD-6	95.3	577	Two 3'x5' vents		135000	110

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
CD-6	See Attached Emission Calculations				PWR $E=17.31\ P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ____________________ Date: 2/21/19

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   PR-6 Bean Conditioning

   After the soybeans are cracked and dehulled, they pass through the conditioner. This process heats the beans with steam to make them pliable and keep them hydrated in order to permit the flaking of the beans and prevent further breaking into small pieces.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Vertical bean conditioner

   Make: To be determined Model: To be determined

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 437,500

   Manufactured date: 2019 Proposed installation date: 2019

   Original installation date (if existing):

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybeans	219 ton/hr	438,000	1,719,900

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
Soybean Meats	1,719,900	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
PR-6	10	577	24" x 24"	62.5	15,000	140

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
PR-6	See Attached Emission Calculations				$E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa D. Andrew

Signature: ______________________ Date: 2/21/19

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   PR-7 Flaking Rolls – with Cyclone

   Bean meats are flattened into flakes to make the extraction of the soybean oil more efficient. This emission point represents the aspiration of these flakers.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Soybean Flaking Mills

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 219 ton/hr

   Manufactured date: 2019 Proposed installation date: NA

   Original installation date (if existing): 2019

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybean Meats	219 ton/hr	438,000	1,719,900

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
Soybean Flakes	1,719,900	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Bean meats are approximately 56 lbs/bushel which equates to a maximum throughput of 1,719,900 tons/year.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack			Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	Height Above Grade (Ft)	Base Elevation (Ft)	Diameter (Ft)			
PR-7	10	577	40" x 40"	60	40,000	Ambient

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
PR-7	See Attached Emission Calculations				$E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: ____________________ Date: February 21, 2019

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   EX-1 Soybean Oil Solvent Extraction System with Solvent Recovery System

   Soybean flakes are washed with hexane to remove the oil. The flakes are then desolventized to remove the hexane and then toasted before being sent to the dryer-cooler. The hexane laden with oil is heated and evaporated leaving crude soybean oil. The hexane vapor is condensed and reused.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Extractor

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 219 ton/hr

   Manufactured date: 2016-17 Proposed installation date:

   Original installation date (if existing): May 2018

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybean Flakes	204.2 ton/hr	437,500	1,719,900

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
Soybean Flakes	1,719,900	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

It is proposed that the throughput of this facility be limited to 61,425,000 bushels/year.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

	Stack					
Emission Point	Height Above Grade (Ft)	Base Elevation (Ft)	Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
EX-1	60	577	0.5	30	350	90

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
EX-1	See Attached Emission Calculations				NA	-
	HAP				Compliance Ratio < 1.0	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐yes ☒no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☐no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: __________ Date: 2/21/19

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   EX-2 Desolventizer / Toaster (DT) and Dryer / Cooler (DC)

   Soybean meal is desolventized, toasted, then dried and cooled before being sent to the meal processing building.

   The existing DT/DC will be replaced with 2 separate units – a DT and a DC.

   There will be six cyclones associated with this process but they are inherent to the process and not considered control devices.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): DT Unit & DC unit

   Make: Desmet Model: To be determined

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 328125

   Manufactured date: 2018-19 Proposed installation date: 2020

   Original installation date (if existing): ______

   Reconstruction or Modification date (if applicable): ______

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybean Meal	164.1 ton/hr	328125	1,382,063

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft³				
L. P. Gas	-	Btu/ft³				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

Throughput is limited by the proposed plant wide throughput of 61,425,000 bushel per year.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
EX-2	44	577	6 @ 30"	59.4	105,000	98-160
						Discharge temp
						Will vary by cyclone

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
EX-2	See Attached Emission Calculations					-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☐yes ☒no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: Date: 2/21/19

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   MH-2 c Hull Storage Bin C – with Atmospheric Bin Vents

   MH-2 e,f Hull Pellet Storage Bins E and F – with Atmospheric Bin Vents

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Storage Bins

   Make: NA Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 14.6 ton/hr

   Manufactured date: 1972-74 Proposed installation date: NA

   Original installation date (if existing): 1972-74

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24 Days per week: 7 Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybean Hulls and Hull Pellets	14.6 ton/hr	29,200	122,850

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft³				
L. P. Gas	-	Btu/ft³				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
MH-2 c	No Stack					
MH-2 e,f	No Stack					

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
MH-2 c,e,f	See Attached Emission Calculations				$E=3.59P^{0.62}$	-
This source may qualify as an insignificant activity.						

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: __________ Date: 2/21/19

PERMIT APPLICATION
FOR
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Do not write in this space

1. Name of firm or organization: Bunge North America, Inc.

2. Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.

   Operating scenario number 1

   MH-4 Meal Truck Loadout – with Baghouse

   MH-5 Meal Rail Loadout – with Baghouse

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Truck and Rail Meal Loadout Stations

   Make: NA   Model: NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: Truck 300 Rail 750 ton/hr

   Manufactured date: 1972-74   Proposed installation date: NA

   Original installation date (if existing): 1972-74

   Reconstruction or Modification date (if applicable): NA

4. Normal operating schedule:

   Hours per day: 24   Days per week: 7   Weeks per year: 52

   Peak production season (if any): None

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process weight average	Maximum (lb/hr)	Quantity tons/year
Soybean Meal – Truck	164 ton/hr	600,000	1,382,063 – total for both
Rail	164 ton/hr	1,500,000	

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104): NA MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft³				
L. P. Gas	-	Btu/ft³				
Wood	-	Btu/lb				
Other (specify)	-					

7. Products of process or unit:

Products	Quantity/year	Units of production
None		

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

A plant wide throughput limit of 61,425,000 bushels per year is proposed.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Stack Height Above Grade (Ft)	Stack Base Elevation (Ft)	Stack Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
MH-4	12	577	34" x 39"	54.3	30,000	Ambient
MH-5	12	577	34" x 39"	54.3	30,000	Ambient

* std temperature is 68°F - std pressure is 29.92" in hg.

11. Air contaminants emitted: basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
MH-4	See Attached Emission Calculations				$E=17.31P^{0.16}$	-
MH-5	See Attached Emission Calculations				$E=17.31P^{0.16}$	-

12. Using a flow diagram:

(1) Illustrate input of raw materials,

(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

(Attach extra pages as needed)

Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒yes ☐no

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒yes ☐no

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☐yes ☒no

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Christa Andrew

Signature: Date: February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

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1. Name of firm or organization: Bunge North America, Inc

2. Unit Description (i.e. No. 1 Power Boiler): BO-3

Equipment manufacturer's information

Name of manufacturer: English Boiler and Tube, Co.

Model number: APP-82.5-250

Rated capacity-input: 99MM (Btu/hr.)

Boiler type: ☐ Fire tube ☒ Water tube ☐ other(specify): ______

Manufactured date: 1997

Proposed installation date: NA

Original installation date (if existing): 1997

Reconstruction or Modification date (if applicable): NA

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)		Btu/gal				

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ______ % ☐Power generation ______ % ☒Process heat 100 %

Other (specify): ____________________

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary): ____________________

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate		N/A			
Sulfur dioxide		N/A			
Nitrogen oxides		N/A			
Carbon monoxide		N/A			
VOC's		N/A			
Other		N/A			

8. Is there any emission control equipment on this emission source?

☒Yes ☐No (If "yes", complete form ADEM-110) Low NOx Burner.

9. Point Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.75	2.1	Emission Factors	1.45	
Sulfur dioxide	0.06	0.17	Emission Factors		
Nitrogen oxides	4.82	13.46	Emission Factors	9.70	
Carbon monoxide	8.32	23.21	Emission Factors		
VOC's	0.54	1.52	Emission Factors		
n-hexane	0.18	0.50	Emission Factors		

10. Stack data:

Height above grade 55 (feet) Gas temperature at exit 116 (°F)

Inside diameter at exit 3.5 (feet) Volume of gas discharged 24,000 (ACFM)

Base Elevation 577 (feet)

Are sampling ports available? ☐Yes ☒No (If "yes", describe. Draw on separate sheet if necessary):

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No (if "no", a compliance schedule, form ADEM-114, must be attached.)

Name of person preparing application: Christa Andrew

Signature: Date: February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of firm or organization: Bunge North America, Inc

2. Unit Description (i.e. No. 1 Power Boiler): BO-4

Equipment manufacturer's information

Name of manufacturer: English Boiler and Tube, Co.

Model number: APP-82.5-250

Rated capacity-input: 99MM (Btu/hr.)

Boiler type: ☐ Fire tube ☒ Water tube ☐ other(specify): ______

Manufactured date: 1997

Proposed installation date: NA

Original installation date (if existing): 1997

Reconstruction or Modification date (if applicable): NA

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)		Btu/gal				

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ____ % ☐Power generation ____ % ☒Process heat 100 %

Other (specify): ____

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary): ____

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☒Yes ☐No (If "yes", complete form ADEM-110) Low NOx Burner.

9. Point Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.75	2.10	Emission Factors	1.45	
Sulfur dioxide	0.06	0.17	Emission Factors		
Nitrogen oxides	4.82	13.46	Emission Factors	9.70	
Carbon monoxide	8.32	23.21	Emission Factors		
VOC's	0.54	1.52	Emission Factors		
n-hexane	0.18	0.50	Emission Factors		

10. Stack data:

Height above grade 55 (feet) Gas temperature at exit 116 (°F)

Inside diameter at exit 3.5 (feet) Volume of gas discharged 24,000 (ACFM)

Base Elevation 577 (feet)

Are sampling ports available? ☐ Yes ☒ No (If "yes", describe. Draw on separate sheet if necessary):

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No (if "no", a compliance schedule, form ADEM-114, must be attached.)

Name of person preparing application: Christa Andrew

Signature: Date: February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of firm or organization: Bunge North America, Inc

2. Unit Description (i.e. No. 1 Power Boiler): BO-5

Equipment manufacturer's information

Name of manufacturer: English Boiler and Tube, Co.

Model number: To be determined

Rated capacity-input: 120 MM (Btu/hr.)

Boiler type: ☐ Fire tube ☒ Water tube ☐ other(specify): ______

Manufactured date: 2019

Proposed installation date: 2020

Original installation date (if existing): NA

Reconstruction or Modification date (if applicable): NA

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft³				
L. P. Gas	-	Btu/ft³				
Wood	-	Btu/lb				
Other (specify)	-					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft³				
L. P. Gas		Btu/ft³				
Wood		Btu/lb				
Other (specify)		Btu/gal				Soybean Oil

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ______ % ☐Power generation ______ % ☒Process heat 100 %

Other (specify): ______

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary): ______

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☐Yes ☒No (If "yes", complete form ADEM-110)

9. Point Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.91	2.55	Emission Factors	1.45	
Sulfur dioxide	0.072	0.20	Emission Factors		
Nitrogen oxides	5.84	16.31	Emission Factors	9.70	
Carbon monoxide	10.08	28.14	Emission Factors		
VOC's	0.66	1.84	Emission Factors		
n-hexane	0.22	0.60	Emission Factors		

10. Stack data:

Height above grade 55 (feet) Gas temperature at exit 116 (ºF)

Inside diameter at exit 3.5 (feet) Volume of gas discharged 29,550 (ACFM)

Base Elevation 577 (feet)

Are sampling ports available? ☐Yes ☐No (If "yes", describe. Draw on separate sheet if necessary):

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No (if "no", a compliance schedule, form ADEM-114, must be attached.)

Name of person preparing application: Christa Andrew

Signature: Date: February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

			-					-				

Do not write in this space

1. Name of firm or organization: Bunge North America, Inc

2. Unit Description (i.e. No. 1 Power Boiler): REF-1 and REF-2 Process Boilers

Equipment manufacturer's information

Name of manufacturer: GEKA

Model number: NUK Model 2250

Rated capacity-input: 13MM (Btu/hr.)

Boiler type: ☐ Fire tube ☒ Water tube ☐ other(specify):

Manufactured date: 1997

Proposed installation date: NA

Original installation date (if existing): 1997

Reconstruction or Modification date (if applicable): NA

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	-	Btu/lb				
Fuel Oil	-	Btu/gal				
Natural Gas	-	Btu/ft^3				
L. P. Gas	-	Btu/ft^3				
Wood	-	Btu/lb				
Other (specify)	-	Btu/gal				

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ______ % ☐Power generation ______ % ☒Process heat 100 %

Other (specify): ____________________

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary): ____________________

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☐Yes ☒No (If "yes", complete form ADEM-110)

9. Point Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.2	0.43	Emission Factors	0.18 per boiler	
Sulfur dioxide	0.016	0.03	Emission Factors		
Nitrogen oxides	2.6	5.66	Emission Factors	1.6	
Carbon monoxide	2.18	4.75	Emission Factors		
VOC's	0.14	0.31	Emission Factors		
n-hexane	0.05	0.10	Emission Factors		

10. Stack data:

Height above grade 33 (feet) Gas temperature at exit 700 (°F)

Inside diameter at exit 2 (feet) Volume of gas discharged 10,400 (ACFM)

Base Elevation 577 (feet)

Are sampling ports available? ☐Yes ☒No (If "yes", describe. Draw on separate sheet if necessary):

11. Is this item in compliance with all applicable air pollution rules and regulations?

☒ Yes ☐ No (if "no", a compliance schedule, form ADEM-114, must be attached.)

Name of person preparing application: Christa Andrew

Signature: Date: February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

					-					-				

Do not write in this space

1. **Name of firm or organization:** Bunge North America, Inc

2. **Unit Description (i.e. No. 1 Power Boiler):** REF-5 Steam Generator

Equipment manufacturer's information

Name of manufacturer: Garioni

Model number: GMT-HP 1000

Rated capacity-input: 5 MM (Btu/hr.)

Boiler type: ☐ Fire tube ☑ Water tube ☐ other(specify): ______

Manufactured date: ______

Proposed installation date: ______

Original installation date (if existing): 7/2/12

Reconstruction or Modification date (if applicable): ______

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	NA	Btu/lb				
Fuel Oil	NA	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	NA	Btu/ft^3				
Wood	NA	Btu/lb				
Other (specify)	NA					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	NA	Btu/lb				
Fuel Oil	NA	Btu/gal				
Natural Gas	NA	Btu/ft^3				
L. P. Gas	NA	Btu/ft^3				
Wood	NA	Btu/lb				
Other (specify)	NA					

4. Purpose (if multipurpose, note percent in each use category):

☐ Space heat ____ % ☐ Power generation ____ % ☑ Process heat 100 %

Other (specify): ____________________

5. Normal schedule of operation:

Hours per day: 24 Days per week: 7 Weeks per year: 52

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work

practice standard (attach additional page if necessary): ____________________

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (If "yes", complete form ADEM-110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.04	0.12	Emission Factors		0.68 lbs/mm BTU
Sulfur dioxide	0.003	0.01	Emission Factors		4.0 lbs/mm BTU
Nitrogen oxides	0.2	0.61	Emission Factors		
Carbon monoxide	0.42	1.28	Emission Factors		
VOC's	0.03	0.08	Emission Factors		
Other	0.01	0.03	Emission Factors	n-hexane	

10. **Stack data:**

Height above grade 37 **(feet)** **Gas temperature at exit** 700 **(°F)**

Inside diameter at exit 0.833 **(feet)** **Volume of gas discharged** 2600 **(ACFM)**

Base Elevation 577 **(feet)**

Are sampling ports available? ☐ **Yes** ☑ **No** **(If "yes", describe. Draw on separate sheet if necessary):**

11. **Is this item in compliance with all applicable air pollution rules and regulations?**

☑ **Yes** ☐ **No (if "no", a compliance schedule, form ADEM-114, must be attached.)**

Name of person preparing application: Christa Andrew

Signature: ________ **Date:** February 21, 2019

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of firm or organization:** Bunge North America, Inc

2. **Unit Description (i.e. No. 1 Power Boiler):** BO-6 Hot Water Heater

Equipment manufacturer's information

Name of manufacturer: Ajax

Model number: WRFG 5250

Rated capacity-input: 5.25 MM **(Btu/hr.)**

Boiler type: ☐ Fire tube ☑ Water tube ☐ other(specify): ____________

Manufactured date: ____________

Proposed installation date: ____________

Original installation date (if existing): 12/15/12

Reconstruction or Modification date (if applicable): ____________

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	NA	Btu/lb				
Fuel Oil	NA	Btu/gal				
Natural Gas	1000	Btu/ft^3				
L. P. Gas	NA	Btu/ft^3				
Wood	NA	Btu/lb				
Other (specify)	NA					

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	NA	Btu/lb				
Fuel Oil	NA	Btu/gal				
Natural Gas	NA	Btu/ft^3				
L. P. Gas	NA	Btu/ft^3				
Wood	NA	Btu/lb				
Other (specify)	NA					

4. Purpose (if multipurpose, note percent in each use category):

☐ Space heat ______ %   ☐ Power generation ______ %   ☑ Process heat 100 %

Other (specify): ______

5. Normal schedule of operation:

Hours per day: 24   Days per week: 7   Weeks per year: 50

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work

practice standard (attach additional page if necessary): ______

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate	NA				
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☐ Yes ☑ No (If "yes", complete form ADEM-110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.04	0.04	Emission Factors		
Sulfur dioxide	0.003	0.003	Emission Factors		
Nitrogen oxides	0.53	0.55	Emission Factors		
Carbon monoxide	0.44	0.46	Emission Factors		
VOC's	0.03	0.03	Emission Factors		
Other	0.03	0.03	EF - PM cond.		
	631	658	CO2e		

10. **Stack data:**

Height above grade 49 **(feet)** **Gas temperature at exit** 250 **(°F)**

Inside diameter at exit 1.5 **(feet)** **Volume of gas discharged** 1100 **(ACFM)**

Base Elevation 577 **(feet)**

Are sampling ports available? ☐ **Yes** ☑ **No** **(If "yes", describe. Draw on separate sheet if necessary):**

11. **Is this item in compliance with all applicable air pollution rules and regulations?**

☑ **Yes** ☐ **No (if "no", a compliance schedule, form ADEM-114, must be attached.)**

Name of person preparing application: Christa Andrew

Signature: ______________________ **Date:** February 21, 2019

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

| | | | | - | | | | | - | | | | |

Do not write in this space

1. Name of firm or organization Bunge North America, Inc

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

☐Settling chamber ☐Electrostatic precipitator

☐Afterburner ☒Baghouse

☐Cyclone ☐Multiclone

☐Absorber ☐Adsorber

☐Condenser ☐Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type)

Other (describe):

3. Control device manufacturer's information:

Name of manufacturer MAC Model no. 120 MCF 361

4. Emission source to which device is installed or is to be installed:

RS-2

5. Emission parameters:

	Pollutant #1	Pollutant #2	Pollutant #3
Pollutants removed	PM	PM-10	PM-2.5
Mass emission rate (#/hr)			
Uncontrolled	68.6	38.3	6.5
Designed	0.08	0.08	0.04
Manufacturer's guaranteed	NA	NA	NA
Mass emission rate (units of the Standard)			
Required by regulation	$E=17.31P^{0.16}$	NA	NA
Manufacturer's guaranteed	NA	NA	NA
Removal efficiency (%)			
Designed	99.9	99.9	99.9
Manufacturer's guaranteed	NA	NA	NA

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	12,419	NA	12,419
(ACFM, existing conditions)	12,419	NA	12,419
Temperature (°F)	Ambient	NA	Ambient
Velocity (ft/sec)	NA	NA	72
Percent moisture	Ambient	NA	Ambient
Pressure drop (inches H_20)	NA	NA	5

7. Stack dimensions:

Height above grade 130 (feet)

Inside diameter at exit 18" x 23" (feet)

Base Elevation 577 (feet)

8. Draw a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐Blueprints ☐Particle size distribution report

☐Manufacturer's literature ☐Size-efficiency curves

☐Emissions test of existing installation ☐Fan curves

☐Other ______

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Differential Pressure Drop

12. By-pass (if any) is to be used when:

None

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	None	None	None	None
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Collected dust is recombined into the product stream.

Name of person preparing application Christa Andrew

Signature ______________________ Date February 21, 2019

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of firm or organization: Bunge North America, Inc

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

   - ☐ Settling chamber
   - ☐ Electrostatic precipitator
   - ☐ Afterburner
   - ☒ Baghouse
   - ☐ Cyclone
   - ☐ Multiclone
   - ☐ Absorber
   - ☐ Adsorber
   - ☐ Condenser
   - ☐ Wet Suppression

   Wet scrubber (kind): ______

   Stage 1 - Vapor balance (type) ______

   Other (describe): ______

3. Control device manufacturer's information:

   Name of manufacturer: MAC   Model no. 120 MCF 361

4. Emission source to which device is installed or is to be installed:

   CD-1 (Existing baghouse)

5. Emission parameters:

	Pollutant #1	Pollutant #2	Pollutant #3
Pollutants removed	PM	PM-10	PM-2.5
Mass emission rate (#/hr)			
Uncontrolled	33.8	8.6	1.4
Designed	0.31	0.31	0.15
Manufacturer's guaranteed	NA	NA	NA
Mass emission rate (units of the Standard)			
Required by regulation	$E=17.31P^{0.16}$	NA	NA
Manufacturer's guaranteed	NA	NA	NA
Removal efficiency (%)			
Designed	99.9	99.9	99.9
Manufacturer's guaranteed	NA	NA	NA

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	25310	NA	25310
(ACFM, existing conditions)	25310	NA	25310
Temperature (°F)	Ambient	NA	Ambient
Velocity (ft/sec)	NA	NA	151.9
Percent moisture	Ambient	NA	Ambient
Pressure drop (inches H_20)	NA	NA	5

7. Stack dimensions:

Height above grade 10 (feet)

Inside diameter at exit 20" x 20" (feet)

Base Elevation 577 (feet)

8. Draw a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Differential Pressure Drop

12. By-pass (if any) is to be used when:

None

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	None	None	None	None
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Collected dust is recombined into the product stream.

Name of person preparing application Christa Andrew

Signature ________ Date 2/21/19

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of firm or organization Bunge North America, Inc

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

☐ Settling chamber ☐ Electrostatic precipitator

☐ Afterburner ☒ Baghouse

☐ Cyclone ☐ Multiclone

☐ Absorber ☐ Adsorber

☐ Condenser ☐ Wet Suppression

Wet scrubber (kind): ______

Stage 1 - Vapor balance (type) ______

Other (describe): ______

3. Control device manufacturer's information:

Name of manufacturer To be determined Model no. To be determined.

4. Emission source to which device is installed or is to be installed:

PR-7-BH

5. Emission parameters:

	Pollutant #1	Pollutant #2	Pollutant #3
Pollutants removed	PM	PM-10	PM-2.5
Mass emission rate (#/hr)			
Uncontrolled	80.94	80.94	40.47
Designed	1.28	1.28	0.64
Manufacturer's guaranteed	NA	NA	NA
Mass emission rate (units of the Standard)			
Required by regulation	$E=17.31P^{0.16}$	NA	NA
Manufacturer's guaranteed	NA	NA	NA
Removal efficiency (%)			
Designed	99.9	99.9	99.9
Manufacturer's guaranteed	NA	NA	NA

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	40,000	NA	40,000
(ACFM, existing conditions)	40,000	NA	40,000
Temperature (°F)	Ambient	NA	Ambient
Velocity (ft/sec)	~58.3	NA	58.3
Percent moisture	Ambient	NA	Ambient
Pressure drop (inches H_2O)	NA	NA	NA

7. Stack dimensions:

Height above grade 60 (feet)

Inside diameter at exit 3.333 x 3.333 (feet)

Base Elevation 577 (feet)

8. Draw a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

9. Enclosed are:

☐ Blueprints
☐ Manufacturer's literature
☐ Emissions test of existing installation
☐ Other
☐ Particle size distribution report
☐ Size-efficiency curves
☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Differential pressure drop.

12. By-pass (if any) is to be used when:

None

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	None	None	None	None
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Collected dust is recombined into the product stream.

Name of person preparing application Christa Andrew

Signature ______________________ Date December 6, 2018

Sanderson, Skyler

From:	Christa Andrew <Christa.Andrew@bunge.com>
Sent:	Tuesday, April 16, 2019 11:19 AM
To:	Sanderson, Skyler
Subject:	Bunge - Decatur, PSD Permit Application
Attachments:	Decatur, AL - application cover letter and Form 103 - signed.pdf; Decatur, AL - Form107.pdf; Decatur, AL - Fire Pump emissions.xlsx; Decatur, AL - Fire Pump Specs.pdf; Application Cover Page and Summary-4-15-19.doc

Skyler:

Attached are the forms, calculations, and specs for the new diesel pump to be included with the expansion. I have also revised the PSD summary I previously submitted. Is there anything you need for this addition? I will also mail this when I know what I am including is complete.

Thanks,

Christa Andrew
Environmental Specialist
Bunge North America
1391 Timberlake Manor Parkway
Chesterfield, MO 63017
O: 314-292-2707
C: 314-603-7986

"Freedom is never more than one generation away from extinction. We didn't pass it to our children in the bloodstream. It must be fought for, protected, and handed on for them to do the same." Ronald Reagan

BUNGE

April 15, 2019

Skyler Sanderson
Environmental Engineer
Air Division
Alabama Department of Environmental Management
1400 Coliseum Blvd
Montgomery, AL 36110

RE: Bunge North America, Inc. – Decatur Facility
Facility ID 712-0026

Dear Mr. Sanderson:

Please find enclosed a permit application package for a project at our Bunge North America – Decatur, Alabama facility. This project will consist of the installation of a diesel-fired fire water pump. It should be considered part of the PSD permit application previously submitted. This application consists of permit application forms, specs and emission calculations. The fire pump engine will be subject to 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ. The fire pump engine certification demonstrates that the replacement engine meets all of the applicable emission limits.

Bunge understands that no permit application fee is required to be submitted with this application and you will determine how much the permit fee will be and invoice the plant at a later date.

Please contact Jason Davis at jasonw.davis@bunge.com or 256-301-4038 or Christa Andrew in our corporate office at 314-292-2707 or by email at christa.andrew@bunge.com if you have questions or concerns regarding this application.

Sincerely,

Bunge North America, Inc.

Michael Klauke
Facility Manager

Enclosure

Cc: Jason W. Davis – Bunge North America, Decatur
Christa Andrew. St. Louis

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

AIR DIVISION

INSTRUCTIONS FOR COMPLETION OF

FACILITY IDENTIFICATION FORM ADEM 103

This form is to be completed in duplicate for each facility operated by your firm or institution in the State of Alabama. If permit application forms are not received at every facility of a firm or institution which has more than one facility, it is still the responsibility of the owner or operator to secure application forms and submit them.

Items 1-4: Self-explanatory

Item 5: Universal Transverse Mercator Coordinates (for Alabama, N-S is between 3337.000km-3875.000km and E-W is between 362.000km-709.000km; Zone 16)

Items 6-7: Self-explanatory

Item 8: There must be at least one copy (in duplicate) of Forms ADEM 104-438. The total number of each of these will depend on the number of air contaminant sources at the facility. Submission of some of the other forms may not be necessary. This can be determined from the instructions. Each form must be completed in duplicate, but the original and copy are to be counted as one form.

Item 9: Self-explanatory

Item 10: Any facility applying for either a Synthetic Minor Operating Permit (SMOP) or a Major Operating Permit should list each pollutant and its emission rate for the facility for which the application is submitted. Also, indicate whether each pollutant is major (emissions > 100 TPY for any criteria pollutants, emissions > 10 TPY for any single HAP, or emissions > 25 TPY for any combination of HAPs). The most recent air emissions inventory done for annual operating permit fees can be substituted for Item 10, provided it shows the totals for each pollutant in the inventory. Indicate in the space that the air inventory is attached if this option is chosen.

Item 11: Self-explanatory
PSD - Prevention of Deterioration
NSPS - New Source Performance Standards
NESHAP - National Emissions Standards for Hazardous Air Pollutants
Title I - Attainment and Maintenance of NAAQS
Title IV - Acid Rain
Title VI - Stratospheric Ozone and Global Climate Protection

Item 12: Identify and list any source or activity that will be considered insignificant (emitting less than 5 TPY of any criteria pollutant, 1000 lb/yr of any air toxic, or included in the insignificant activities list previously established by the Department). Supporting documentation, including calculations, should be submitted for each activity.

Item 13: Self-explanatory

Item 14: Indicate any actual emission test of air contaminants for any operations covered in this application.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

Facility Number ☐☐☐ - ☐☐☐☐

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. **Name of Facility, Firm, or Institution:** Bunge North America, Inc

Facility Physical Location Address

Street & Number: 1400 Market St NE

City: Decatur **County:** Morgan **Zip:** 35601

Facility Mailing Address (If different from above)

Address or PO Box: Same

City: **State:** **Zip:**

Owner's Business Mailing Address

2. **Owner:** Bunge North America, Inc

Street & Number: 11720 Borman Dr **City:** St Louis

State: MO **Zip:** 63146 **Telephone:** 314-292-2000

Responsible Official's Business Mailing Address

3. **Responsible Official:** Michael Klauke **Title:** Plant Manager

Street & Number: 1400 Market St NE

City: Decatur **State:** AL **Zip:** 35601

Telephone Number: 256-301-4021 **E-mail Address:** michael.klauke@bunge.com

Plant Contact Information

4. **Plant Contact:** Jason W. Davis **Title:** Safety & Environmental Manager

Telephone Number: 256-301-4038 **E-mail Address:** jasonw.davis@bunge.com

5. **Location Coordinates:**

UTM 503150 **E-W** 3829100 **N-S**

Latitude/Longitude 34° 36' 13.4" N **LAT** 86° 57' 56.3" W **LONG**

6. Permit application is made for:

- [ ] Existing source (initial application)
- [x] Modification
- [ ] New source (to be constructed)
- [ ] Change of ownership
- [ ] Change of location
- [ ] Other (specify) ______

Existing source (permit renewal)

If application is being made to construct or modify, please provide the name and address of installer or contractor

Not yet selected

______ Telephone ______

Date construction/modification to begin ______ to be completed ______

7. Permit application is being made to obtain the following type permit:

- [x] Air permit
- [ ] Major source operating permit
- [ ] Synthetic minor source operating permit
- [ ] General permit

8. Indicate the number of each of the following forms attached and made a part of this application: (if a form does not apply to your operation indicate "N/A" in the space opposite the form). Multiple forms may be used as required.

	ADEM 104 - INDIRECT HEATING EQUIPMENT
1	ADEM 105 - MANUFACTURING OR PROCESSING OPERATION
	ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION
1	ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES
	ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS
	ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES
	ADEM 110 - AIR POLLUTION CONTROL DEVICE
	ADEM 112 - SOLVENT METAL CLEANING
	ADEM 438 - CONTINUOUS EMISSION MONITORS
	ADEM 437 - COMPLIANCE SCHEDULE

9. General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):

Soybean processing and soybean oil refining SIC 2075, NAISC 311224

Edible oils blending and packaging Sic 2079, NAICS 311225

10. <u>For those making application for a synthetic minor or major source operating permit</u>, please summarize each pollutant emitted and the emission rate for the pollutant. Indicate those pollutants for which the facility is major.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no

*Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: ____
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

12. **List all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.**

Insignificant Activity	Basis
500 Gallon Double Walled Diesel Fuel Tank	

13. **List and explain any exemptions from applicable requirements the facility is claiming:**

a. None

b.

c.

d.

e.

f.

g.

h.

i.

14. **List below other attachments that are a part of this application(all supporting engineering calculations must be appended):**

a. Specifications Documents

b. Emission Calculations

c.

d.

e.

f.

g.

h.

i.

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.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

[signature]	Plant Manager	04/16/19
SIGNATURE OF RESPONSIBLE OFFICIAL	**TITLE**	**DATE**

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Instructions for
ADEM Form 107
Permit Application for
Stationary Internal Combustion Engines

Item	Description
1	Self explanatory
2	In addition to selecting the purpose of the application, you must provide (1) the date the facility plans to commence construction if the application is for the installation or modification of an engine, and/or (2) the date the engine was first installed at this location if the application is for an engine that is currently installed at the facility.
3A, 3B, & 3C	Self explanatory
3D	Provide the name or number used to identify this engine in facility records and by facility employees. Examples include: Generator No. 1; Mainline Unit No. 12; Compressor Engine No. 7, etc.
3E	Self explanatory. Please note, if the serial number is not known at the time the application is submitted, you should provide the serial number to the Air Division upon completion of installation of the engine.
4A	If the proposed engine is a new (unused) engine, you must provide the date the engine was ordered from the manufacturer. This date is needed to determine applicability under certain federal regulations. If the proposed engine is used, you may leave this field blank.
4B	Self explanatory. However, if the engine has been/will be ordered from a manufacturer, you may enter "Unknown" if the Date of Manufacture is not known or the engine has not been manufactured yet. You should provide the Date of Manufacture to the Air Division upon completion of installation of the engine.
4C	Provide the date the engine was modified or reconstructed as defined in Subpart A of either 40 CFR Part 60 or 63, as applicable.
4D	You must only provide this information if the application is for the installation of a used engine. Applicability under federal NSPS and NESHAP regulations is not affected by moving an engine from one location to another. To correctly determine applicability, it is important to know when an engine was first placed into service.
5	Self explanatory. For engines generating electricity, please also provide the maximum electrical output and specify the units, either in kilowatts (kWe) or megawatts (MWe).
6	Self explanatory
7A, 7B & 7C	For a reciprocating engine, please provide the engine power rating in both brake horsepower and mechanical kilowatts (1 bhp =0.746 kWm). If the engine drives an electrical generator do <u>not</u> use the electrical kilowatt rating for the generator as the rating for the engine. For a combustion turbine, you only need to provide the heat input (MMBtu/hr) unless the emission factors used to calculate the potential emission are based on brake horsepower (bhp). If so, you must also provide the brake horsepower of the turbine.
7D, 7E, 7F & 7G	Self explanatory
7H	Please note that the cylinder displacement is needed for an <u>individual</u> cylinder for applicability purposes. You should divide the total engine displacement by the number of cylinders. If the cylinder displacement (volume) is in units of cubic inches, it can be converted by dividing the number of cubic inches for one cyclinder by 61.02 (i.e. 1 liter=61.02 cubic inches).
8 thru 10	Self explanatory except UTM Coordinates, which means Universal Transverse Mercator Coordinates, for Alabama, N-S is between 3337.000km-3875.000km and E-W is between 362.000km-709.000km; Zone 16
11	Mark all federal regulations under which the engine is an AFFECTED SOURCE, regardless of whether the engine has any applicable emission standards or work/management practice requirements.
12 thru 14	Self explanatory
15	This area is for you to provide any information that you wish to provide to supplement this application. If the information is providing clarification for a specific Item in the form, please indicate which Item the information is clarifying or supplementing.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

[| |] – [| | |] – [| | |]

Permit Number (ADEM Use Only)

1. Facility Name: Bunge North America, Inc. **Location:** Decatur

2. Purpose of Application:

- [X] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe: ______

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: ______

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: ______

3. Engine Identification:

A. Manufacturer's Name: Clarke Fire Pump Engines B. Model Number: JU6H-UFADX8 C. Model Year: 2020

D. Facility's Identification Number or Description: ______ E. Serial Number: ______

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: TBD B. Date Manufactured: TBD C. Date Modified/Reconstructed: NA

D. For a used engine, approximate date engine was first placed into service at any location: NA

5. Engine Function: [ ] Compression [ ] Electrical Generation (Maximum Electrical Output: ______) [X] Fire Pump Driver [ ] Other Pump Driver [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe: ______

6. Engine Operation: [X] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below: [ ] Limited Use (<100 hr/yr)

A. Hours Per Day: ______ B. Days Per Week: ______ C. Weeks per Year: ______

D. Peak Season (if any): ______

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 305 B. Maximum Engine Power (kW_m): 227.5 C. Maximum Heat Input (MMBtu/hr): 1.9

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [X] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [X] 4-Stroke RICE [ ] N/A [ ] Other: ______

F. Air/Fuel Mix: [X] Rich Burn RICE [ ] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other: ______

G. Ignition Type: [ ] Spark [X] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 6.8

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	Diesel Fuel	15 ppm		
Secondary/Backup				

9. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

A. Height above grade (feet): TBD B. Inside Diameter at Exit (feet): 0.5 C. Exhaust Gas Volume (ACFM): 1400

D. Base Elevation (feet): ______ E. Exhaust Gas Temperature°F): 961 F. Are sampling ports available? ( ) Yes ( ) No

G. UTM Coordinate (E-W) (km): ______ H. UTM Coordinate (N-S) (km): ______

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
NOx	see	attached				
CO	emission	calcs				
VOC						
PM						
SO_2						
Formaldehyde						
Total HAP						

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: ____________
- ☐ Other: ____________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx+NMHC	4.0	g/kW-hr	NSPS, Subpart IIII	3.42
CO	3.5	g/kW-hr	NSPS, Subpart IIII	0.6
PM	0.2	g/kW-hr	NSPS, Subpart IIII	0.10

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards ? ○ N/A ○ No ◉ Yes (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? ○ N/A ○ No ◉ Yes

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NO_x Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: ______
- [ ] Other: ______
- [ ] Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? (●) Yes ( ) No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please see attached engine specification sheet for more information.

Please provide the following for the person preparing this application:

Name (Print or Type): Christa Andrew

Company/Affiliation: Bunge North America, Inc.

Signature: Christa Andrew

Date: 4/11/2019

BUNGE NORTH AMERICA, INC.
SOY PROCESSING DIVISION
DECATUR, AL

Facility ID 712-0026

DIESEL FIRE PUMP EMISSIONS CALCULATIONS

Diesel Fire Pump	305 bhp	
Consumption	14.6 gal / hr	130000 Btu/gal
mm BTU/hr	1.898	
Avg. hours / year	100	

	EF[1] lb/hp-hr	Tons/yr
NO_X	0.031	**0.47**
CO	0.00668	**0.10**
SO_X	0.00205	**0.03**
PM10	0.0022	**0.03**
TOC	0.00247	**0.04**

1. AP-42, Section 3.3, Table 3.3-1. This provides a more conservative emission estimate than the spec sheet provided

CLARKE®

FIRE PUMP ENGINES

Refer to Spec 21 30 00 - 2.3

MODELS

JU6H-UFADMG	JU6H-UFADP0	JU6H-UFADR0	JU6H-UFADT0
JU6H-UFAD58	JU6H-UFADP8	JU6H-UFADR8	JU6H-UFADW8
JU6H-UFADNG	JU6H-UFADQ0	JU6H-UFADS8	JU6H-UFADX8
JU6H-UFADN0	JU6H-UFAD88	JU6H-UFADS0	JU6H-UFAD98

FM-UL-cUL APPROVED RATINGS BHP/*KW*

JU6H MODEL ♦	RATED SPEED 1760		2100		2350		2400		US-EPA (NSPS) Available Until ●
UFADMG			175	*131*	175	*131*			*No Expiration*
UFAD58	183	*137*							*No Expiration*
UFADNG	190	*142*	181	*135*	183	*137*	183	*137*	*No Expiration*
UFADN0	197	*147*	197	*147*	200	*149*	200	*149*	*No Expiration*
UFADP0			209	*156*	211	*157*	211	*157*	*No Expiration*
UFADP8	220	*164*							*No Expiration*
UFADQ0			224	*167*	226	*169*	226	*169*	*No Expiration*
UFAD88	237	*177*							*No Expiration*
UFADR0			238	*177.5*	240	*179*	240	*179*	*No Expiration*
UFADR8	250	*187*							*No Expiration*
UFADS8	260	*194*							*No Expiration*
UFADS0			260	*194*	268	*200*	268	*200*	*No Expiration*
UFADT0			274	*204*	275	*205*	275	*205*	*No Expiration*
UFADW8	282	*211*							*No Expiration*
UFADX8	305	*227.5*							*No Expiration*
UFAD98	315	*235*							*No Expiration*

Picture represents JU6H-TRWA Power Tech Plus Engine Series

● USA EPA (NSPS) Tier 3 Emissions Certified Off-Road (40 CFR Part 89) and NSPS Stationary (40 CFR Part 60 Sub Part IIII). Meet EU Stage IIIA emission levels.

♦ All Models available for Export

SPECIFICATIONS

ITEM	JU6H MODELS: MG 58 NG N0 P8 88	P0 Q0 R0 S0 T0 R8 S8 W8 X8 98
Number of Cylinders	6	
Aspiration	TRWA	
Rotation*	CW	
Overall Dimensions – in. (mm)	~~59.8 (1519) H x 56.7 (1414) L x 36.7 (933) W~~	60.9 (1547) H x 58.6 (1488) L x 40.0 (1015) W
Crankshaft Centerline Height – in. (mm)	14 (356)	
Weight – lb (kg)	1747 (791)	
Compression Ratio	~~19.0:1~~	17.0:1
Displacement – cu. in. (L)	415 (6.8)	
Engine Type	4 Stroke Cycle – Inline Construction	
Bore & Stroke – in. (mm)	4.19 x 5.00 (106 x 127)	
Installation Drawing	D628	
Wiring Diagram AC	C07651	
Wiring Diagram DC	~~C071367, C072146, C071361~~	C071368, C072146, C071761
Engine Series	~~John Deere 6068 Series Power Tech E~~	John Deere 6068 Series Power Tech Plus
Speed Interpolation	N/A	

Abbreviations: CW – Clockwise TRWA – Turbocharged with Raw Water Aftercooling N/A - Not Available L – Length W – Width H - Height

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance.
- FM-UL power ratings are shown at specific speeds, Clarke engines can be applied at a single rated RPM setting ± 50 RPM.

c UL us · Meets NFPA 20 Requirements · c FM us APPROVED

ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 mm) Hg barometer and 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m)
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25°C) ambient temperature.

ENGINE EQUIPMENT

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage (Cyclonic)
Alarms	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature, Alternate ECM Warning, Fuel Injection Malfunction, ECM Warning and Failure with Automatic Switching	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	12V-DC, 42 Amps with Poly-Vee Belt and Guard	24V-DC, 40 Amps with Poly-Vee Belt and Guard
Coupling	Bare Flywheel	UL Listed Driveshaft and Guard, JU6H-UFAD58/NG/ADMG/ADM8/K0/N0/Q0/R0-CDS30-S1; JU6H-UFADP8/P0/T0/88/R8/S8/S0/W8/X8/98- CDS50-SC at 1760/2100 RPM only
Electronic Control Module	12V-DC, Energized to Stop, Primary ECM always Powered on	24V-DC, Energized to Stop, Primary ECM always Powered on
Engine Heater	115V-AC, 1360 Watt	230V-AC, 1360 Watt
Exhaust Flex Connection	SS Flex, 150# ANSI Flanged Connection, 5" for JU6H-UFAD58/MG/NG/N0/P8/88; SS Flex, 150# ANSI Flanged Connection, 6" for JU6H-UFADP0/Q0/R0/S0/T0/R8/S8/W8/X8/98 (w/ orifice plate)	SS Flex, 150# ANSI Flanged Connection, 6" for JU6H-UFAD58/MG/NG/N0/P8/88; SS Flex, 150# ANSI Flanged Connection, 8" for JU6H-UFADP0/Q0/R0/S0/T0/R8/S8/W8/X8/98 (w/ orifice plate)
Exhaust Protection	Metal Guards on Manifolds and Turbocharger	
Flywheel Housing	SAE #3	
Flywheel Power Take Off	11.5" SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistant, Flexible, USA Coast Guard Approved, Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary Filter with Priming Pump	
Fuel Injection System	High Pressure Common Rail	
Governor, Speed	Dual Electronic Control Modules	
Heat Exchanger	Tube and Shell Type, 60 PSI (4 BAR), NPT(F) Connections – Sea Water Compatible	
Instrument Panel	Multimeter to Display English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure and One (1) Voltmeter with Toggle Switch, Front Opening	
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate Type	
Lube Oil Filter	Full Flow with By-Pass Valve	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set, Not Field Adjustable	
Raw Water Cooling Loop w/Alarms	Galvanized	Seawater, All 316SS, High Pressure
Raw Water Cooling Loop Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	Not Supplied (for Vertical Turbine Fire Pump Applications)
Run – Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	Two (2) 12V-DC	Two (2) 24V-DC
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof in Instrument Panel	
Water Pump	Centrifugal Type, Poly-Vee Belt Drive with Guard	

Abbreviations: DC – Direct Current, AC – Alternating Current, SAE – Society of Automotive Engineers, NPT(F) – National Pipe Tapered Thread (Female), ANSI – American National Standards Institute, SS – Stainless Steel

MODEL NOMENCLATURE: (10 Digit Models)

JU6H - UFADR0

- John Deere Base Engine
- 350 Series
- 6 Cylinders
- Heat Exchanger Cooled
- UL Listed
- FM Approved
- Built in USA
- EPA Tier 3 Certified
- Power Curve Number

CLARKE®

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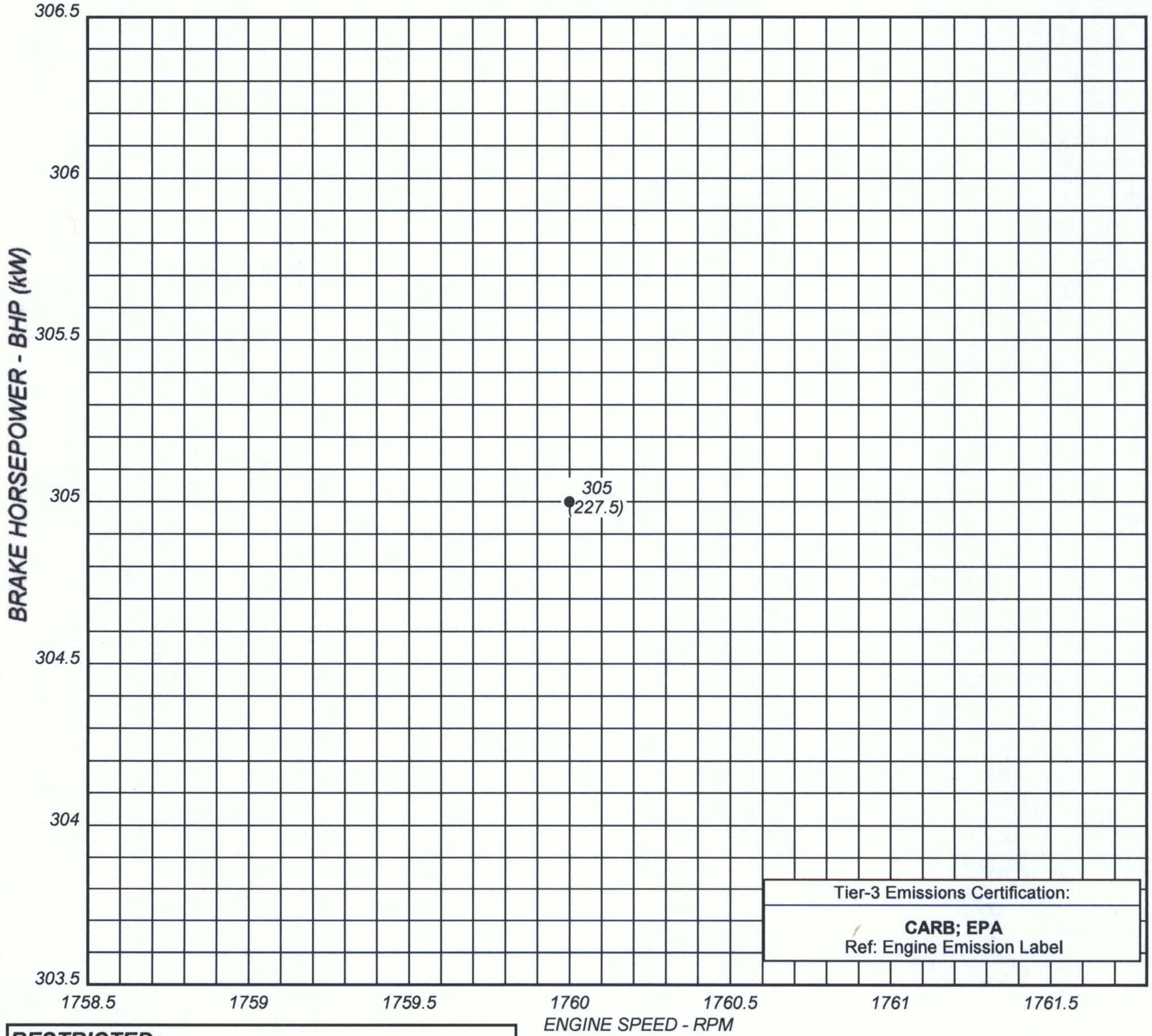
CLARKE

Fire Protection Products, Inc.

FIRE PUMP MODEL: JU6H-UFADX8
Heat Exchanger Cooled
Raw Water Charge Cooling
Tier 3 Emissions Certified



RESTRICTED:
USE ONLY FOR STAND-BY FIRE PUMP APPLICATIONS

ENGINE PERFORMANCE:
STANDARD CONDITIONS: (SAE J1349, ISO 3046)
77°F (25°C) AIR INLET TEMPERATURE
29.61 IN. (751.1MM) HG BAROMETRIC PRESSURE
#2 DIESEL FUEL (SEE C13940)

KEVIN KUNKLER 06FEB09

●———● *NAMEPLATE BHP (MAXIMUM PUMP LOAD)*

CREATED KJK	DATE CREATED 02/06/09
ENGINE MODEL JU6H-UFADX8	
DRAWING NO. C132969	REV A

CLARKE
Fire Protection Products, Inc.

JU6H-UFADX8
INSTALLATION & OPERATION DATA (I&O Data)
USA Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	6
Bore and Stroke - in (mm)	4.19 (106) X 5 (127)
Displacement - in³ (L)	415 (6.8)
Compression Ratio	17.0:1
Valves per cylinder	
Intake	2
Exhaust	2
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, High Pressure Common Rail
Firing Order (CW Rotation)	1-5-3-6-2-4
Aspiration	Turbocharged
Charge Air Cooling Type	Raw Water
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D628
Weight - lb (kg)	1747 (792)

Power Rating	**1760**
Nameplate Power - HP (kW)[1]	305 (227.5)

Cooling System - [C051386]	**1760**
Engine Coolant Heat - Btu/sec (kW)	143 (151)
Engine Radiated Heat - Btu/sec (kW)	20.5 (21.6)
Heat Exchanger Minimum Flow	
60°F (15°C) Raw H_2O - gal/min (L/min)	28 (106)
100°F (37°C) Raw H_2O - gal/min (L/min)	38 (144)
Heat Exchanger Maximum Cooling Raw Water	
Inlet Pressure - psi (bar)	60 (4.1)
Flow - gal/min (L/min)	40 (151)
Typical Engine H_2O Operating Temp - °F (°C)	180 (82.2) - 195 (90.6)
Thermostat	
Start to Open - °F (°C)	180 (82.2)
Fully Opened - °F (°C)	203 (95)
Engine Coolant Capacity - qt (L)	22.2 (21)
Coolant Pressure Cap - lb/in² (kPa)	15 (103)
Maximum Engine Coolant Temperature - °F (°C)	230 (110)
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)
High Coolant Temp Alarm Switch - °F (°C)	235 (113) - 241 (116)

Electric System - DC	**Standard**		**Optional**	
System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 32°F (0°C)				
Voltage (Nominal)	12	{C07633}	24	{C07633}
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ 0°F (-18°C)	1400		1400	
Reserve Capacity - Minutes	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0012		0.0012	
Battery Cable Minimum Size				
0-120 in. Circuit Length[2]	00		00	
121-160 in. Circuit Length[2]	000		000	
161-200 in. Circuit Length[2]	0000		0000	
Charging Alternator Maximum Output - Amp,	40	{C071363}	55	{C071365}
Starter Cranking Amps, Rolling - @60°F (15°C)	440	{RE69704/RE70404}	250	{C07819/C07820}

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. [1]Derate 3% per every 1000 ft. [304.8 m] above 300 ft. [91.4 m] and derate 1% for every 10 °F [5.55 °C] above 77° [25°C]. [2]Positive and Negative Cables Combined Length.

CLARKE
Fire Protection Products, Inc.

JU6H-UFADX8
INSTALLATION & OPERATION DATA (I&O Data)
USA Produced

Exhaust System (Single Exhaust Outlet)	1760
Exhaust Flow - ft.³/min (m³/min)	1400 (39.6)
Exhaust Temperature - °F (°C)	961 (516)
Maximum Allowable Back Pressure - in H_2O (kPa)	30 (7.5)
Minimum Exhaust Pipe Dia. - in (mm)[3]	6 (152)

Fuel System	1760
Fuel Consumption - gal/hr (L/hr)	14.6 (55.3)
Fuel Return - gal/hr (L/hr)	21.3 (80.6)
Fuel Supply - gal/hr (L/hr)	35.9 (136)
Fuel Pressure - lb/in² (kPa)	3 (20.7) - 6 (41.4)
Minimum Line Size - Supply - in.	.50 Schedule 40 Steel Pipe
Pipe Outer Diameter - in (mm)	0.848 (21.5)
Minimum Line Size - Return - in.	.375 Schedule 40 Steel Pipe
Pipe Outer Diameter - in (mm)	0.675 (17.1)
Maximum Allowable Fuel Pump Suction Lift with clean Filter - in H_2O (mH_2O)	80 (2)
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m)	6.6 (2)
Fuel Filter Micron Size	2 (Secondary)

Heater System	Standard	Optional
Engine Coolant Heater		
Wattage (Nominal)	1360	1360
Voltage - AC, 1 Phase	115 (+5% -10%)	230 (+5%, -10%)
Part Number	{C123640}	{C123644}

Air System	1760	
Combustion Air Flow - ft.³/min (m³/min)	525 (14.9)	
Air Cleaner	Standard	Optional
Part Number	{C03244}	{C03327}
Type	Indoor Service Only, with Shield	Canister, Single-Stage
Cleaning method	Washable	Disposable
Air Intake Restriction Maximum Limit		
Dirty Air Cleaner - in H_2O (kPa)	14 (3.5)	14 (3.5)
Clean Air Cleaner - in H_2O (kPa)	7 (1.7)	5 (1.2)
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C)<*>	130 (54.4)	

Lubrication System	
Oil Pressure - normal - lb/in² (kPa)	40 (276) - 60 (414)
Low Oil Pressure Alarm Switch - lb/in² (kPa)	30 (207) to 35 (241)
In Pan Oil Temperature - °F (°C)	220 (104) - 245 (118)
Total Oil Capacity with Filter - qt (L)	34.3 (32.5)

Lube Oil Heater	Optional	Optional
Wattage (Nominal)	150	150
Voltage	120V (+5%, -10%)	240V (+5%, -10%)
Part Number	C04430	C04431

Performance	1760
BMEP - lb/in² (kPa)	331 (2280)
Piston Speed - ft/min (m/min)	1467 (447)
Mechanical Noise - dB(A) @ 1m	C133380
Power Curve	C132969

[3]Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one 90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assure engine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator on www.clarkefire.com.
{ } indicates component reference part number.

JU4H, JU4R & JU6H, JU6R ENGINE MODELS
ENGINE MATERIALS AND CONSTRUCTION

Air Cleaner
Type.............................. Indoor Usage Only
Oiled Fabric Pleats
Material........................... Surgical Cotton
Aluminum Mesh

Air Cleaner - Optional
Type.............................. Canister
Material........................... Pleated Paper
Housing........................... Enclosed

Camshaft
Material........................... Cast Iron
Chill Hardened
Location........................... In Block
Drive.............................. Gear, Spur
Type of Cam...................... Ground

Charge Air Cooler (JU6H-60,62,68,74,84, ADK0, AD58, ADNG, ADN0, ADQ0, ADR0, AAQ8, AARG, ADP8, ADP0, ADT0, AD88, ADR8, AD98, ADS0, ADW8, ADX8, AD98 only)
Type.............................. Raw Water Cooled
Materials (in contact with raw water)
Tubes............................. 90/10 CU/NI
Headers .... 36500 Muntz
Covers .... 83600 Red Brass
Plumbing .... 316 Stainless Steel/ Brass
90/10 Silicone

Charge Air Cooler (JU6R-AA67, 59, 61, PF, Q7, RF, S9, 83 only)
Type.............................. Air to Air Cooled
Materials
Core.............................. Aluminum

Coolant Pump
Type.............................. Centrifugal
Drive.............................. Poly Vee Belt

Coolant Thermostat
Type.............................. Non Blocking
Qty................................ 1

Cooling Loop (Galvanized)
Tees, Elbows, Pipe........... Galvanized Steel
Ball Valves...................... Brass ASTM B 124,
Solenoid Valve.................. Brass
Pressure Regulator........... Bronze
Strainer........................... Cast Iron (1/2" - 1" loops) or
Bronze (1.25" - 2" loops)

Cooling Loop (Sea Water)
Tees, Elbows, Pipe........... 316 Stainless Steel
Ball Valves...................... 316 Stainless Steel
Solenoid Valve.................. 316 Stainless Steel
Pressure Regulator/Strainer Cast Brass ASTM B176
C87800

Cooling Loop (316SS)
Tees, Elbows, Pipe........... 316 Stainless Steel
Ball Valves...................... 316 Stainless Steel
Solenoid Valve.................. 316 Stainless Steel
Pressure Regulator/Strainer 316 Stainless Steel

Connecting Rod
Type.............................. I-Beam Taper
Material........................... Forged Steel Alloy

Crank Pin Bearings
Type.............................. Precision Half Shell
Number........................... 1 Pair Per Cylinder
Material........................... Wear-Guard

Crankshaft
Material........................... Forged Steel
Type of Balance................ Dynamic

Cylinder Block
Type.............................. One Piece with
Non-Siamese Cylinders
Material........................... Annealed Gray Iron

Cylinder Head
Type.............................. Slab 2 Valve
Material........................... Annealed Gray Iron

Cylinder Liners
Type.............................. Centrifugal Cast, Wet Liner
Material........................... Alloy Iron Plateau, Honed

Fuel Pump
Type.............................. Diaphragm
Drive.............................. Cam Lobe

Heat Exchanger (USA) - JU4H & JU6H Only
Type.............................. Tube & Shell
Materials
Tube & Headers.............. Copper
Shell.............................. Copper
Electrode........................ Zinc

Heat Exchanger (UK) - JU4H & JU6H Only
Type.............................. Tube & Bundle

Materials
Tube & Headers.............. Copper
Shell.............................. Aluminum

Injection Pump
Type.............................. Rotary
Drive.............................. Gear

Lubrication Cooler
Type.............................. Plate

Lubrication Pump
Type.............................. Gear
Drive.............................. Gear

Main Bearings
Type.............................. Precision Half Shells
Material........................... Steel Backed-Aluminum
Lined

Piston
Type and Material............ Aluminum Alloy with
Reinforced Top Ring Groove
Cooling........................... Oil Jet Spray

Piston Pin
Type.............................. Full Floating - Offset

Piston Rings
Number/Piston................ 3
Top................................ Keystone Barrel Faced -
Plasma Coated
Second........................... Tapered Cast Iron
Third.............................. Double Rail Type
w/Expander Spring

Radiator - JU4R & JU6R Only
Type.............................. Plate Fin
Materials
Core.............................. Copper & Brass
Tank & Structure........... Steel

Valves
Type.............................. Poppet
Arrangement.................. Overhead Valve
Number/Cylinder............. 1 intake
1 exhaust
Operating Mechanism...... Mechanical Rocker Arm
Type of Lifter.................. Large Head
Valve Seat Insert............. Replaceable

DO NOT SCALE

DATUMS:

-A- - MOUNTING FACE OF FLYWHEEL

-B- - ENGINE CRANKSHAFT HORIZONTAL CENTERLINE

-C- - ENGINE CRANKSHAFT VERTICAL CENTERLINE

- CENTER OF GRAVITY OF ENGINE

- CLOCKWISE ROTATION WHEN VIEWED FROM FRONT OF ENGINE

NOTE:
THE LOOP SHOWN IS BASED ON STANDARD LOOP CONSTRUCTION AND FM SIZING CONDITIONS

FOR ALTERNATE LOOP CONSTRUCTION (STAINLESS STEEL, SEA WATER, AND HIGH PRESSURE) SIZES MAY VARY

DRAWING SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION:

ALL PLUMBING MUST BE SUPPORTED AND/OR ISOLATED SO THAT NO WEIGHT OR STRESS IS APPLIED TO ANY ENGINE COMPONENT

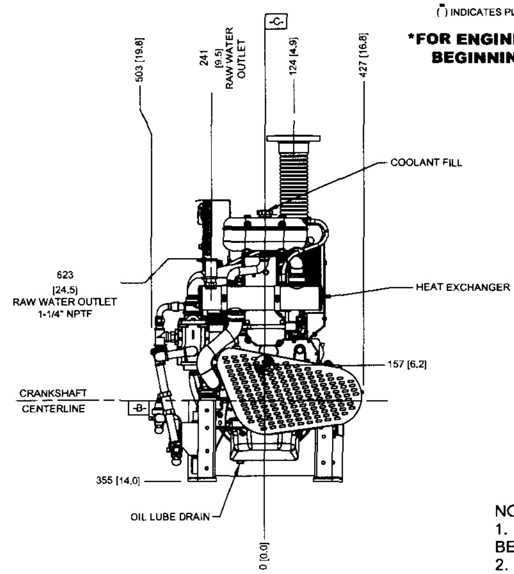
ATTENTION

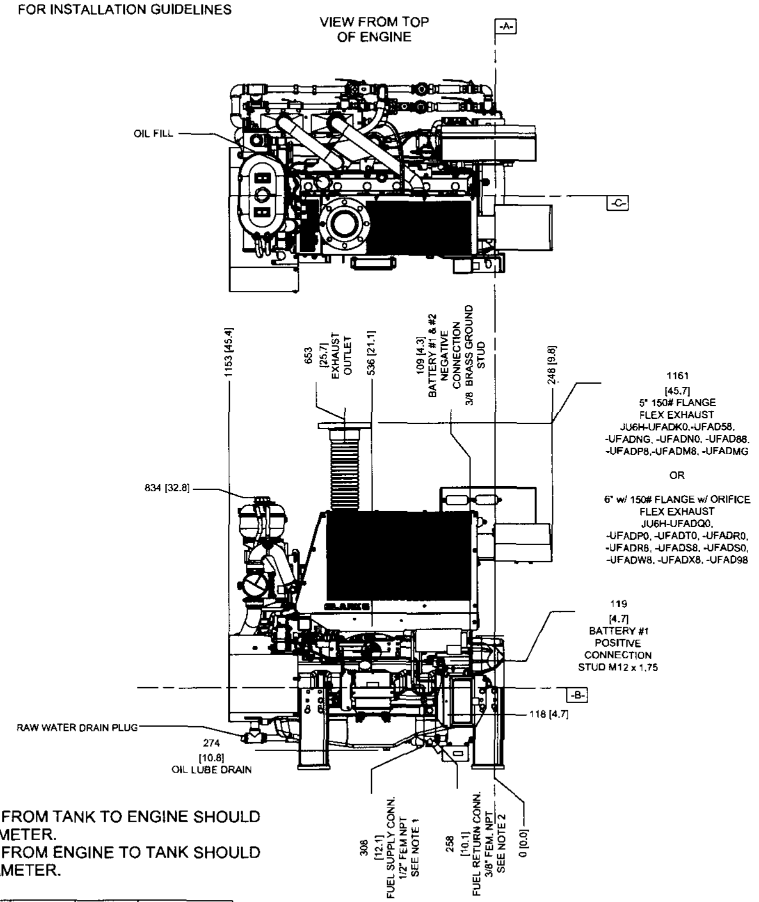
REFER TO THE SPECIFIC MODEL "INSTALLATION AND OPERATION DATA" FOR INSTALLATION GUIDELINES

"TRWA" (TURBOCHARGED w/ RAW WATER AFTERCOOLING) MODELS	JU6H-UFAD58, -UFAD88 JU6H-UFADK0* , -UFADNG JU6H-UFADP8, -UFADN0 JU6H-UFADM8, -UFADMG JU6H-UFADP8 (MODELS SHOWN)
	JU6H-UFAD98 -UFADP0 JU6H -UFADQ0, -UFADR0 JU6H-UFADR8, -UFADS0 JU6H-UFADS8, -UFADT0 JU6H-UFADW8,-UFADX8 SEE PG. 3 FOR RAW WATER INLET DIMENSIONS

(*) INDICATES PLD ENINGE MODEL ONLY

***FOR ENGINES BUILT IN USA BEGINNING APRIL 2015**





NOTES:
1. FUEL SUPPLY PIPING FROM TANK TO ENGINE SHOULD BE 1/2"MINIMUM PIPE DIAMETER.
2. FUEL RETURN PIPING FROM ENGINE TO TANK SHOULD BE 3/8" MINIMUM PIPE DIAMETER.

REV	DESCRIPTION	ECN#	DWN	APVD	DATE
H	ADDED ENGINE MODELS: JU6H-UFADM8 & JU6H-UFADMG	2173	JCA	KJK	09DEC10
J	UPDATED MOUNTING FEET AND HEATER SETUP	2063	AMC	MOD	19JUL12
K	RAW WATER OUTLET WAS 1" NPTF	2649	MOH	KJK	04DEC12
L	ADDED PIPING KIT/COOLING LOOP	3631	BKK	ASC	25NOV14
M	ADDED FLYWHEEL INFORMATION	4071	JGV	MLP	04AUG15
N	REVISED ENGINE FOOT MOUNTING HOLE LOCATIONS PAGE 2	4275	CMM	ASC	01OCT15
P	ADDED GROUND STUD LOCATION	4359	DKP	ASC	11OCT15
Q	ADDED RAW WATER INLET DIMENSION TO PAGE 2. UPDATED COOLING LOOP GEOMETRY ON PAGE 3	4741	MJM	JCA	03FEB16
R	PAGE 3 DATUM A & B WERE INCORRECTLY POSITIONED	4788	RDR	MLP	11NOV16

MACHINE TOLERANCE: DECIMAL mm / inch — X. ±1.5; X.X ±0.8 / ±0.06; X.XX ±0.3 / ±0.03; X.XXX ±0.025 / ±0.01; X.XXXX / ±0.001; ANGULAR: ±0.5°

FABRICATION TOLERANCE: DECIMAL mm / inch — X. ±3; X.X ±1.5 / ±0.12; X.XX / ±0.06; ANGULAR: ±1.0°

CONTROLLED DRAWING: YES / NO (X)

CLARKE *Fire Protection Products, Inc.*

DRWN	MWLEMING
DATE	2/25/2009
ENGR	KJKUNKLER
MATERIAL	
ASSEMBLY	
NAME	INSTALLATION DRAWING, FIRE PUMP ENGINE JU6H TIER 3 MODELS
PART NO.	D628
REV	R
SCALE	NTS
UNITS	MM [INCH]
PAGE	1 OF 3

Refer to Spec 21 30 00 - 2.3

CLARKE®

Rating Specific Emissions Data

Nameplate Rating Information

Clarke Model	**JU6H-UFADX8**
Power Rating (BHP/kW)	**305/227.5**
Certified Speed (RPM)	**1760**

Refer to **Rating Data** section on page 2 for emissions output values

Refer to Spec 21 30 00 - 2.3

Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Rating Data

Rating	6068HFC48A	
Certified Power(kW)	235	
Rated Speed	1760	
Vehicle Model Number	OEM (Clarke Fire Pump-	
Units	g/kW-hr	g/hp-hr
NOx	3.61	2.69
HC	0.08	0.06
NOx + HC	N/A	N/A
Pm	0.07	0.06
CO	0.6	0.4

Certificate Data

Engine Model Year	2017
EPA Family Name	HJDXL13.5103
EPA JD Name	650HAA
EPA Certificate Number	HJDXL13.5103-011
CARB Executive Order	
Parent of Family	6135HF485A
Units	g/kW-hr
NOx	3.31
HC	0.11
NOx + HC	N/A
Pm	0.10
CO	0.6

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

Emissions Results by Rating run on Mar-07-2017

DOUBLE WALL FUEL TANK

CAPACITY	120, 185, 300, 500, 700, & 900 GAL
TYPE	DOUBLE WALL TYPE I 360°, ABOVEGROUND, HORIZONTAL
MATERIAL	MILD CARBON STEEL
TEST	5 PSI
MIN GAUGE ATM	INNER HEADS: 12 GA OUTER HEADS: 10 GA INNER SHELL: 12 GA OUTER SHELL: 10 GA
PAINT	INTERIOR: NONE EXTERIOR: PRIMED
CONSTRUCTION	FLAT FLANGED HEADS LAP, WELD ALL EXTERIOR SEAMS ONLY
APPROVAL	UL 142

NOTES

(A) ITEMS DISPLAYED IN PHANTOM LINES FURNISHED BY OTHERS TO CONFORM TO INDIVIDUAL JOB REQUIREMENTS

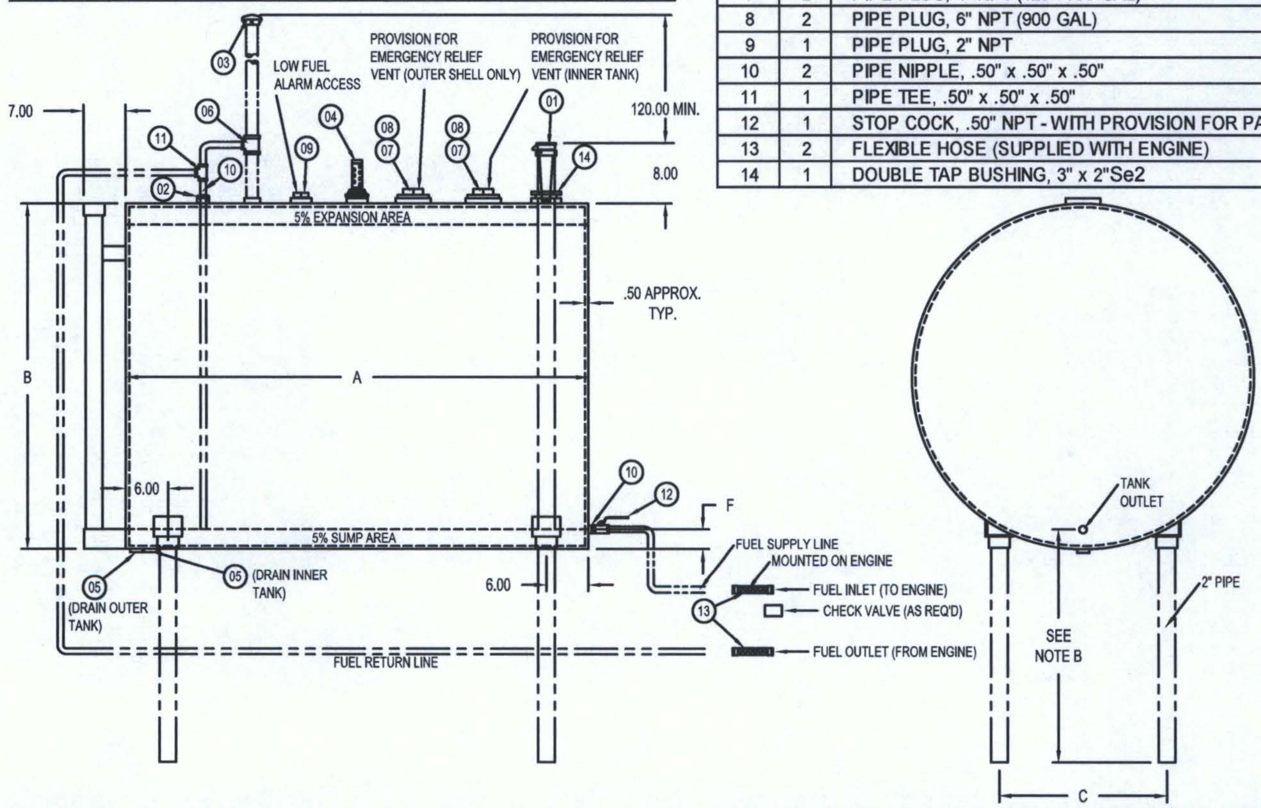
(B) INSTALL TANK IN ACCORDANCE WITH REQUIREMENTS OF LOCAL AUTHORITIES. ARRANGE TANK AS CLOSE TO ENGINE AS POSSIBLE AND LOCATE TANK OUTLET ABOVE FUEL PUMP CENTERLINE

(C) PITCH TANK TOWARD DRAIN .25" PER FOOT

(D) FOR PROPER FUEL SUPPLY AND RETURN SIZE SEE ENGINE MANUFACTURER'S RECOMMENDATION

TANK SIZE (GAL)	A	B	C	F	WT
120	41.00 (1041.4)	31.00 (787.4)	24.00 (609.6)	3.00 (76.2)	295
185	40.00 (1016)	39.00 (990.6)			380
300	60.00 (1524)				705
→ 500	65.00 (1651)	49.00 (1244.6)		4.50 (114.3)	970
700	90.00 (2286)				1600
900	115.00 (2921)				1900

ITEM	QTY	DESCRIPTION
1	1	2" FILL CAP - WITH PROVISIONS FOR PADLOCK, COMBINED WITH REMOVABLE STRAINER (MAX .06 MESH)
2	1	DOUBLE TAB BUSHINGS, 1" X .50"
3	1	VENT CAP, 2.0" NPT
4	1	DIRECT READING TANK GAUGE, 2" NPT
5	2	PIPE PLUG, 1" NPT
6	1	PIPE TEE, 2.0" x 2.0" x 0.50"
7	2	PIPE PLUG, 4" NPT (120 - 700 GAL)
8	2	PIPE PLUG, 6" NPT (900 GAL)
9	1	PIPE PLUG, 2" NPT
10	2	PIPE NIPPLE, .50" x .50" x .50"
11	1	PIPE TEE, .50" x .50" x .50"
12	1	STOP COCK, .50" NPT - WITH PROVISION FOR PADLOCK
13	2	FLEXIBLE HOSE (SUPPLIED WITH ENGINE)
14	1	DOUBLE TAP BUSHING, 3" x 2"Se2



NOT FOR CONSTRUCTION, INSTALLATION OR APPLICATION PURPOSES UNLESS CERTIFIED		
CERTIFIED FOR:		
CUSTOMER ORDER NO.:	TAG NO.	
SHOP ORDER:	CERTIFIED BY:	DATE:

BUNGE NORTH AMERICA
DECATUR, ALABAMA

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS For Emergency Diesel Fire Pump

PARTICULATE MATTER EMISSIONS (PM)
Volatile Organic Compound (VOC) Emissions

May 2019

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The proposed modification at the Bunge North America Decatur, Alabama facility will involve the modification of several emission units that have potential to emit particulate matter and volatile organic compound emissions. Particulate Matter (PM) and volatile organic compound (VOC) emissions from this project are subject to Prevention of Significant Deterioration (PSD) regulations, since the potential PM emissions will exceed 25 tons per year and a significant increase of VOCs will occur. Because the Soybean Processing Facility located in Decatur, Alabama will be subject to PSD regulations; an analysis of Best Available Control Technology (BACT) must be conducted. The sources of PM and VOC emissions addressed in this BACT Analysis consist of one combustion unit (emergency diesel-fired fire pump). BACT analyses on other sources of PM and VOCs were previously performed.

The controlled emissions from new or operationally modified sources are:

Sources	**PM10 (tpy)**	**VOC (tpy)**
Emergency Fire Pump	0.03	0.04

The purpose of this BACT analysis is to determine a control technology for the PM and VOC emissions that would be considered BACT. As part of this effort, the technologies listed in Section 5, which are used to control particulate matter emissions from industrial process sources, were evaluated in terms of their technical feasibility in controlling emissions of particulate matter.

Based on the BACT analysis, the following are proposed as BACT for the following particulate matter (PM) sources:

Emissions Source	**Proposed BACT**
Emergency Fire Pumps	Use of an engine that is Tier 3 Emissions Certified and meets NSPS. Good combustion practices will be followed.

1.0 INTRODUCTION

The Clean Air Act (CAA) and regulations promulgated by the Alabama Department of Environmental Management (ADEM) require that major air pollution sources undergoing construction comply with all applicable Prevention of Significant Deterioration (PSD) provisions and Nonattainment area New Source Review Requirements. The Federal PSD rules apply to areas classified as attainment and new major stationary sources (sources with a potential to emit 250 tons/year or more of any criteria pollutant). The EPA regulations require that a major stationary source undergoing a major modification apply Best Available Control Technology (BACT) for each regulated PSD pollutant that it would have the potential to emit in significant amounts. BACT need not necessarily result in an emissions control device. Rather, BACT is an emission limitation made on a case-by-case basis taking into consideration several project-specific factors. In no case, however, is BACT allowed to be less stringent than the emissions limits established by an applicable New Source Performance Standards (NSPS).

The EPA has implemented the "top-down" method for determining BACT, which ADEM follows. In general, the top-down process requires that all available control technologies be ranked in descending order of emission control effectiveness. The following is a step-by-step description of a typical top-down BACT analysis.

1) Identify all control technologies;
2) Eliminate technically infeasible options;
3) Rank remaining control technologies by emission control effectiveness;
4) Evaluate most effective controls and document results; and,
5) Select BACT.

2.0 PROJECT AND PROCESS DESCRIPTION

Soybean oil processing typically consists of oilseed handling/elevator operations (receiving, storing, and cleaning the raw soybeans); preparing the soybeans for the solvent extraction and oil desolventlzing, oil refining, and desolventizing and processing the spent soybean flakes.

Some support facilities are needed for this plant. They include boilers, cooling towers, emergency generator, and fire water pump engines.

The emission units that are going to be physically modified as part of this project were described in the previous BACT analyses. This unit was not included in that analysis:

- The addition of a new 305 hp fire pump engine.

3.0 ESTIMATED EMISSIONS BASIS

The estimated baseline and projected actual emissions are summarized in Tables 1-5 in Section 2 of the PSD Permit Application Project and Permitting Process document enclosed herewith. Emissions calculations are included in Appendix A of that document. Table 5 provides the projected increases from the proposed modifications and illustrate that the project triggers PSD review for particulate matter (PM) and volatile organic compounds (VOCs).

4.0 ECONOMIC ANALYSIS ASSUMPTIONS

A significant part of the BACT analysis deals with cost effectiveness and comparisons of the various technically feasible options. The following defines the approach that would be used if a cost effectiveness evaluation is required.

4.1 Cost Assumptions

- Capital and operating costs for new equipment are available from EPA (EPA-450/3-79-006)
- The prices for utilities will be based on site-specific data for electricity and natural gas.
- An interest rate of 8% with 15-year equipment life would be used.

4.2 Cost of Compliance

For the BACT analysis, capital costs of compliance are annualized.

i. Total Annual Costs = Indirect Annual Costs + Operations & Maintenance Costs
ii. Indirect Annual Costs = Capital Recovery Factor (CRF) x Total Installed Cost (TIC)

Where:

$$\text{Capital Recovery Factor (CRF)} = \frac{i(1+i)^n}{\left((1+i)^n - 1\right)}$$

Life of Equipment, n = 15 years [1]

Annual Interest Rate, i = 8%

Yielding:

CRF = 0.1098

4.3 Cost Effectiveness

Cost effectiveness is used to assess the potential for emissions reduction in the most economical way. For BACT analyses, it is defined as dollars per ton of emissions removed ($/ton).

The analysis evaluates capital, operating, and maintenance costs for the various control options. The cost effectiveness is used to evaluate which control options are economically feasible.

Annual Cost Effectiveness

Emissions removal is calculated for each technology or technique, and the $/ton of emission removed would be calculated as:

$$\frac{\text{Total Annualized Costs of Control Option}}{\left(\text{Baseline Annual Emissions - Control Option Annual Emissions}\right)}$$

Based on assumed 15-year life for new equipment (EPA/452/B-02-001).

5.0 CONTROL TECHNOLOGY FEASIBILITY

The definition of BACT requires that emission controls for each emission source and each pollutant of concern be evaluated on a case-by-case basis, taking into consideration energy, environmental, and economic impacts and other costs. Only commercially available and field- proven technologies need to be investigated. If the control technology has been installed and operated successfully on the type of source under review, it is demonstrated and it is technically feasible (EPA, 1990). Options may also be eliminated when they have unacceptable energy, cost, or non-air quality environmental impacts. Options for only the sources physically modified will be reviewed.

5.1 List of Control Options and Elimination of Technically Infeasible Options

An initial list of potential technologies was developed using the following information sources:

- EPA RACT/BACT/LAER Clearinghouse (RBLC) database
- Manufacturer Specification Sheets
- Recently Issued permits for Soybean Processing Facilities

Based on a recent database query of permits issued up to July 2018, the following BACT determinations related to the listed source were identified and presented in Table 5.1 below:

Table 5.1-Summary of RBLC Database Review

Facility	Date	RBLC ID #	Emission Unit	BACT Requirements
Toyota	4/4/2019	TX-0846	Fire Pump Diesel Engine	Control Method: None Emission Limit for PM10 – 0.02 G/Kwhr; VOC – 0.19 G/Kwhr. Meets EPA Tier 4 requirements. NSPS IIII, MACT ZZZZ
CPV Three Rivers, LLC	2/19/2019	IL-0129	Firewater Pump Engine – 422 Hp	Control Method: None Emission Limit for PM10 – 0.02 G/Kwhr; VOC – 0.19 G/Kwhr. Meets limits of the NSPS IIII, MACT ZZZZ are BACT
Shady Hills Energy Center, LLC	3/19/2019	FL-0367	Firewater Pump Engine – 347 Hp	Control Method: None Emission Limit for PM10 – 0.02 G/Kwhr; VOC – 0.19 G/Kwhr. Meets limits of the NSPS IIII, MACT ZZZZ are BACT.
Marshall Energy Center, LLC	2/19/2019	MI-0433	Fire Pump Engine – 300 Hp	Control Method: None Emission Limit for PM – 0.15 G/BHP-h; VOC – 0.75 lb/h. Meets limits of the NSPS IIII and good combustion practices.
Harrison Power	4/3/2019	OH-0377	Emergency Fire Pump – 320 Hp	Control Method: None Emission Limit for PM – 0.11 lb/hr; VOC – 2.12 lb/hr.

				Meets limits of the NSPS IIII and good combustion practices.
Fiber Industries	4/12/19	SC-0182	Emergency Fire Pumps	Control Method: None Meets limits of the NSPS IIII, comply with NESHAP ZZZZ, use ultra low sulfur diesel fuel and good combustion practices.

5.1.1 Control Technology Options

A review of the RBLC database for diesel fired emergency fire pump engines revealed that the listed sources did not use any post-combustion PM or VOC control device to meet BACT standards.

Good Combustion Practices: Good combustion practices include operating the system based on the design and recommendations provided by the manufacturer and by performing periodic maintenance checks. A well operated system utilizing good combustion practices is the most prevalent and cost effective measure for reducing emissions from the proposed fire engines.

Manufacturer's Specifications: The manufacturer certifies that the engine is NSPS Tier 3 certified and meets NSPS 40 CFR Part 60 Subpart IIII. The review of the RBLC show that this satisfies BACT for similar engines.

Proposed BACT

Proposed good combustion practices to be implemented by Bunge and the use of a certified NSPS engine will maintain PM and VOC emissions below the emission limit. Good combustion practices and an engine certified to meet NSPS 40 CFR 60 Subpart IIII will be considered BACT for PM and VOCs for the new fire pump.

6.0 RANK REMAINING CONTROL TECHNIQUES BY EFFECTIVENESS

This section evaluates the relative effectiveness of the options deemed technically feasible in reducing the impact of emissions, regardless of cost. Table 6.1 below lists the control technologies in descending order of efficiency.

6.1 Emergency Fire Pump engine

Table 6.1 Ranking of Control technologies

Pollutant	Available Control Alternatives	Selected BACT option?	Negative Impacts	Emission Rate	Average Cost Effectiveness ($/ton)
PM	Good Combustion Practices; Meets NSPS Subpart IIII	Yes	N/A	0.1 g/kW-hr	N/A
PM_{10}		Yes	N/A		N/A
$PM_{2.5}$		Yes	N/A		N/A
NOx + HC	Good Combustion Practices; Meets NSPS Subpart IIII	Yes	N/A	3.42 g/kW-hr	N/A

7.0 CONCLUSIONS

This BACT Analysis is developed in support of a PSD permit application for emissions of particulate matter and VOCs from Bunge North America's Decatur, Alabama soybean processing plant. This BACT analysis indicates that the only particulate matter control technologies that are both technically feasible and cost effective are as follows:

- Particulate matter and volatile organic compound emissions from the emergency fire pump engine will be minimized through the use of good combustion practices and the use of an engine that is certified to meet 40 CFR Part 60 Subpart IIII.

References

1. EPA. (1995). *AP-42. Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Air Sources. Appendix B.* Research Triangle Park, NC: US EPA.
2. RACT / BACT / LAER Clearinghouse – Clean Air Technology Center.

Sanderson, Skyler

From: Christa Andrew <Christa.Andrew@bunge.com>
Sent: Monday, June 10, 2019 12:46 PM
To: Sanderson, Skyler
Subject: FW: Additional Information - PSD application

Skyler:

Bunge believes that the 0.19 gal/ton BACT limit is appropriate given that the range of BACT limits in the RBLC corresponds to the same BACT control technology employed by the facility. Additionally, the BACT limit has to be achievable by the facility. The solvent loss data provided as part of the application shows that the 0.19 gal/ton solvent loss limit is most appropriate, even though the facility is currently struggling to meet the current limit. Bunge is committed to operating its facility as efficiently as possible which includes minimizing hexane loss, but the past year of operating history indicates the new extractor operates differently than the previous extractor (higher hexane carryover to the desolventizer) which can result in somewhat higher hexane loss.

Christa Andrew
Environmental Specialist
Bunge North America
1391 Timberlake Manor Parkway
Chesterfield, MO 63017
O: 314-292-2707
C: 314-603-7986

From: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Sent: Friday, June 7, 2019 4:06 PM
To: Christa Andrew <Christa.Andrew@bunge.com>
Cc: Jason W. Davis <JasonW.Davis@bunge.com>
Subject: RE: Additional Information

Christa,

We will proceed with the boiler analysis as is. Also, I have received an additional comment concerning the extractor VOC limit of 0.19 lb/ton (12-month rolling). I understand that this is the current limit and comes from a consent decree. However, in the RBLC review such limits range from 0.14 lb/ton to 0.19 lb/ton. Sometimes when a range of limits exists in the database, we are asked why the lowest was not selected for BACT. Could you provide an explanation (extractor design, inherent process constraints, etc.) for why 0.19 lb/ton is appropriate BACT for this unit as opposed to a lower limit within that range?

Please let me know if you would like to discuss or have any questions.

Thanks,

Skyler Sanderson

Environmental Engineering Specialist, Senior
Air Division, Energy Branch
Alabama Department of Environmental Management
Mail: PO Box 301463, Montgomery, AL 36130-1463
Phone: (334) 270-5647
Email: skyler.sanderson@adem.alabama.gov

From: Christa Andrew <Christa.Andrew@bunge.com>
Sent: Friday, June 7, 2019 8:07 AM
To: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Cc: Jason W. Davis <JasonW.Davis@bunge.com>
Subject: RE: Additional Information

Skyler:

My comments are attached. One comment on X039 that I didn't include is that I think you meant to add a visible emissions monitoring to EX-2 (EX-1 is VOCs only) as you have the Recordkeeping and Reporting Requirements in there.

Also, we believe that the BACT analysis for the boiler is sufficient. I have reviewed other permits and the RBLC and Good Combustion Practices and using natural gas are consistent practices for VOC and PM control. I do not believe that USEPA will require any further analysis on them as the emissions of each are very low. Some BACT analysis don't even address them, just NOx which isn't applicable here. So I've elected to leave the BACT analyses as they are.

Please let me know if you have any questions. I will only be available today until 9:00 via e-mail or my cell phone but will be back in the office on Monday.

Thanks,

Christa Andrew
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C: 314-603-7986

"Freedom is never more than one generation away from extinction. We didn't pass it to our children in the bloodstream. It must be fought for, protected, and handed on for them to do the same." Ronald Reagan

From: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Sent: Tuesday, June 4, 2019 1:54 PM
To: Christa Andrew <Christa.Andrew@bunge.com>
Subject: RE: Additional Information

Christa,

Attached are first drafts of the PSD analysis and proposed permits. Please note that these are preliminary drafts and are subject to change upon review from my supervisor. For the sake of timeliness, go ahead and look these over and get back to me with any comments or questions you may have. Once I get the drafts back and resolve any issues from my supervisor, I will send you updated drafts for final review before we send everything to public notice. At that time I will also send you a fee letter and invoice and let you know the start date of the public comment period.

Thanks,

Skyler Sanderson
Environmental Engineering Specialist, Senior
Air Division, Energy Branch
Alabama Department of Environmental Management
Mail: PO Box 301463, Montgomery, AL 36130-1463
Phone: (334) 270-5647
Email: skyler.sanderson@adem.alabama.gov

ADEM

From: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Sent: Friday, May 24, 2019 10:54 AM
To: Christa Andrew <Christa.Andrew@bunge.com>
Subject: RE: Additional Information

Hi Christa, yes, that is what I needed. I apologize for not confirming that earlier. I am about done drafting the permits and will email you drafts when finished.

Thanks,

Skyler Sanderson
Environmental Engineering Specialist, Senior
Air Division, Energy Branch
Alabama Department of Environmental Management
Mail: PO Box 301463, Montgomery, AL 36130-1463
Phone: (334) 270-5647
Email: skyler.sanderson@adem.alabama.gov

ADEM

From: Christa Andrew <Christa.Andrew@bunge.com>
Sent: Friday, May 24, 2019 10:51 AM
To: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Subject: RE: Additional Information

Hi Skyler:

Is that what you needed?

Thanks,

Christa Andrew
Environmental Specialist
Bunge North America
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O: 314-292-2707
C: 314-603-7986

"Freedom is never more than one generation away from extinction. We didn't pass it to our children in the bloodstream. It must be fought for, protected, and handed on for them to do the same." Ronald Reagan

From: Christa Andrew
Sent: Monday, May 20, 2019 3:42 PM
To: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Subject: RE: Additional Information

Skyler:

The revisions you requested can be found in Section 2.9 of the Permit Summary and in the attached BACT analysis for the Fire Pump engine. Please let me know if you need anything else.

Thanks,

Christa Andrew
Environmental Specialist
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C: 314-603-7986

"Freedom is never more than one generation away from extinction. We didn't pass it to our children in the bloodstream. It must be fought for, protected, and handed on for them to do the same." Ronald Reagan

From: Sanderson, Skyler <skyler.sanderson@adem.alabama.gov>
Sent: Wednesday, May 8, 2019 11:00 AM
To: Christa Andrew <Christa.Andrew@bunge.com>
Subject: Additional Information

Christa,

Per our phone conversation, I need a bit more information to complete the PSD review. 1) I need an Additional Impact Analysis that addresses any anticipated effects on nearby commercial growth, soil and vegetation, and visibility. You can find a description of this requirement in ADEM Admin. Code r. 335-3-14-.04(14). 2) I need a BACT analysis for the fire pump engine. You already stated it will be compliant with Tier 3 and NSPS IIII requirements, which would be considered BACT for such an engine, but please state that that is what you've proposed as BACT.

Please let me know if you have any questions about this. I will be out of the office next Monday and Tuesday and in and out this Friday, but otherwise I should be available.

Thanks,

Skyler Sanderson
Environmental Engineering Specialist, Senior
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Phone: (334) 270-5647
Email: skyler.sanderson@adem.alabama.gov

ADEM

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