

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date:

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600016
Inspector's Name: Mitch Revels
Date of Last Inspection: 03/15/2018
Compliance Code: 3 / Compliance - inspection

<p align="center">Facility Data</p> <p>Applicant (Facility's Name): Cargill, Inc. - Fayetteville</p> <p>Facility Address: Cargill, Inc. - Fayetteville 1754 River Road Fayetteville, NC 28312</p> <p>SIC: 2075 / Soybean Oil Mills NAICS: 311222 / Soybean Processing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>				<p align="center">Permit Applicability (this application only)</p> <p>SIP: 02D .0503, 02D .0515, 02D .0516, 02D .0521, 02D .0524, 02D .0530, 02D .0535, 02D .1109, 02D .1111 NSPS: Subpart Dc NESHAP: Subpart GGGG, Subpart ZZZZ PSD: PSD Avoidance: 02Q .0317 (for 02D .0530 – VOC and SO₂) NC Toxics: 112(r): Other:</p>																																																			
<p align="center">Contact Data</p> <table border="1"> <tr> <td> <p align="center">Facility Contact</p> <p>Terry Crawford EHS Coordinator (910) 233-6606 1754 River Road Fayetteville, NC 28312</p> </td> <td> <p align="center">Authorized Contact</p> <p>Johan Clairret Facility Superintendent (910) 223-6671 1754 River Road Fayetteville, NC 28312</p> </td> <td> <p align="center">Technical Contact</p> <p>Arun Nagineni Crush Superitendent (910) 233-6600 1754 River Road Fayetteville, NC 28312</p> </td> </tr> </table>				<p align="center">Facility Contact</p> <p>Terry Crawford EHS Coordinator (910) 233-6606 1754 River Road Fayetteville, NC 28312</p>	<p align="center">Authorized Contact</p> <p>Johan Clairret Facility Superintendent (910) 223-6671 1754 River Road Fayetteville, NC 28312</p>	<p align="center">Technical Contact</p> <p>Arun Nagineni Crush Superitendent (910) 233-6600 1754 River Road Fayetteville, NC 28312</p>	<p align="center">Application Data</p> <p>Application Number: 2600016.18A, 2600016.18D, 2600016.18E Date Received: 03/23/2018; 09/21/2018, 11/26/2018 Application Type: Modification, Minor-Modi, Modification Application Schedule: TV-Sign-501(b)(2) Part II; TV-Minor; TV-Sign-501(b)(2) Part II</p> <p align="center">Existing Permit Data</p> <p>Existing Permit Number: 03903/T45 Existing Permit Issue Date: 10/09/2018 Existing Permit Expiration Date: 03/31/2021</p>																																																
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<p>Review Engineer: Urva Patel</p> <p>Review Engineer's Signature: _____ Date: _____</p>					<p align="center">Comments / Recommendations:</p> <p>Issue 03903/T46 Permit Issue Date: Permit Expiration Date:</p>																																																		

1. Purpose of Application:

Currently, Cargill, Inc. – Fayetteville (Cargill) holds Title V Permit No. 03903T45 with an expiration date of March 31, 2021.

This permit modification consolidates three separate permit applications. (**Application No. 2600016.18A, 2600016.18D and 2600016.18E**)

Application ID No. 2600016.18A

The application is submitted as a second step (Part II) of two-step significant modification for the installation and operation of a new extractor (**ID No. ES31A**) and the replacement of the mineral oil absorber (**ID No. CD29**) with a new mineral oil absorber (**ID No. CD31**); installation and operation of a vertical seed conditioner (**ID No. ES83**) and associated cyclone (**ID No. CY83**); and modification to the raw soybean processing area including the whole bean storage bin (**ID No. ES39**), primary dehauling (**ID No. ES65**), crackling (**ID No. ES5**), and grinding (**ID No. ES18A**) in accordance with 15A NCAC 02Q .0501(b)(2). The new absorber continues to control emissions from **ID No. ES31A**. This second step application takes these modifications to public notice and EPA review in order to extend the permit shield as described in General Condition R to this equipment. No modifications to the permitted equipment as originally submitted in the first step application are needed as part of this second step.

A regulatory review for these sources was completed in the issuance of permit 03903T39 indicating expected compliance with all applicable emission limits. Please, see Judy Lee's **September 4, 2015** permit review, which is provided as Attachment 1 to this document.

In addition, the application includes several changes to the raw soybean processing area including the following: Install a new extractor (**ID No. ES31A**); update the description of **ID Nos. ES32A and ES32B** to reflect the additional release point and rename the source to **ID No. ES32**; replacement of the meal drying operation (**ID No. ES13**), rotary meal cooler (**ID No. ES14**) and associated cyclones (**ID Nos. CY13 and CY14**) with a new dryer cooler system (**ID No. ES15**) with four cyclones (**ID Nos. CY15A through CY15D**); update the description of this source; update a list of control set up changes; and update the list of insignificant activity.

Application ID No. 2600016.18D

The minor modification application (**Application No. 2600016.18D**) was received on September 21, 2018. The facility has proposed to install a new bean aspirator cyclone (**ID No. C108**) in parallel with the existing pod grinder cyclone (**ID No. C106**) that will vent to the pod grinder dust collector (**ID No. BF106**). The new cyclone is intended to increase the efficiency of the cleaning process prior to sending the beans to the dryer.

Application ID No. 2600016.18E

The application is submitted as a second step (Part II) of two-step significant modification to change the throughput limit of 1.07 million tons per year through the grain dryer (**ID No. ES82**) to 1.2 million tons per year (Condition 2.1 A.5.a). This second step application takes these modifications to public notice and EPA review in order to extend the permit shield as described in General Condition R to this equipment. No modifications to the permitted equipment, as originally submitted in the first step application, are needed as part of this second step.

A regulatory review for this change was completed in the issuance of permit 03903T45 indicating expected compliance with all applicable emission limits. Please, see Urva Patel's **October 9, 2018** permit review, which is provided as Attachment 2 to this document.

In addition, the facility has following requests:

- To reduce the maximum processing rate of the dryer from 18,000 bushels per hour to 6,000 bushels per hour to reflect the as-built capacity of the unit.
- To add a diesel fuel oil portable storage tank (**ID No. IES-105**) as an insignificant activity.

2. Facility Description:

Cargill operates a soybean oil extraction process (Standard Industrial Classification [SIC] Code 2075 – Soybean Processing). Cargill processes soybeans for animal feed and oil at this facility. The processes at the facility are subdivided into six separate operation groups:

- Raw soybean storage and handling;
- Raw soybean processing;
- Oil extraction, meal drying, cooling;
- Oil refining, handling, storage, crude unloading and load out;
- Miscellaneous support sources and boilers; and
- Meal and hull handling, storage and loadout.

3. Application Chronology:

Application Chronology

March 23, 2018	Received this application as Part II Significant modification of the TV permit (2600016.18A).
March 23, 2018	Sent acknowledgement letter indicating that the application (2600016.18A) for permit modification was complete.
April 26, 2018	Received application for addition to insignificant activity list.
September 21, 2018	Received this application for minor modification (2600016.18D).
September 25, 2018	DAQ issued 10 days - acknowledgement letter allowing Cargill to implement the proposed changes immediately, provided the facility complied with both the applicable requirements governing the changes and the interim permit terms and monitoring, recordkeeping, and reporting conditions identified in the application for minor modification.
November 26, 2018	Received this application as Part II Significant modification of the TV permit (2600016.18E).
November 27, 2018	Sent acknowledgement letter indicating that the application (2600016.18E) for permit modification was complete.
March 29, 2019	Revised minor modification application (2600016.18D) addendum received. The revision included technical contact information and revised emissions terms in Attachment 1 - Emission Calculations (potential emissions in lieu of projected actual emissions). For detailed information, see Section 11.

4. Summary of Changes to the Existing Permit (Permit No. 03903T45):

Page No.	Section	Description of Changes
Cover Letter	N/A	<ul style="list-style-type: none">Updated cover letter with application number, permit numbers, dates, fee class, PSD increment statement, and Director name.
Permit Cover	N/A	<ul style="list-style-type: none">Inserted new issuance and complete application date, application number, facility information.
	Insignificant Activity List	<ul style="list-style-type: none">Removed IES-68, IES-72 and IES-73Modified IES-75Added IES-80, IES-100 through 105
3	Section 1 Table	<ul style="list-style-type: none">Revised description of pre-cleaned soybean dryer (ID No. ES82) - maximum processing rate of the dryer from 18,000 bushels per hour to 6,000 bushels per hourRevised control set-up of ES39, ES12, ES18A, ES5 and ES65
4, 11, 12, 36, 50	1, 2.1 B, 2.2 C, 2.5	<ul style="list-style-type: none">Revised control device setup: C12B to C12A (ES39)
4, 11, 36, 50	1, 2.1B, 2.2C, 2.5	<ul style="list-style-type: none">Revised control device setup: BF41 to BF65 and C12A to C12B (ES12)
5, 18	1, 2.1 F	<ul style="list-style-type: none">Revised control device setup: BF65 to BF41 (ES18A)
4, 11	1, 2.1 B	<ul style="list-style-type: none">Revised control device setup: BF65 to BF41 (ES5)

Page No.	Section	Description of Changes
4, 11, 36, 50	1, 2.1B, 2.2C, 2.5	<ul style="list-style-type: none"> Revised control device setup: C65D and C65E to C65A and C65B (ES65)
3, 7, 36	1, 2.1 A, 2.2 C	<ul style="list-style-type: none"> Rearranged control device description ID No. C106, C108, and BF106 (ES4)
3, 11, 36	1, 2.1 B, 2.2 C	<ul style="list-style-type: none"> Rearranged control device description ID No. C12A and BF65 (ES39)
3, 11, 36	1, 2.1B, 2.2 C	<ul style="list-style-type: none"> Rearranged control device description ID No. C12B, C12C, and BF65 (ES12)
5, 37	Section 1 Table 2.2 C	<ul style="list-style-type: none"> Revised emission source ID No. and description of Floor sweeping fans (ID No. ES32)
7, 8 15, 35, 36, 50	2.1 A 2.1 A.1.c 2.1 D 2.2 B 2.2 C 2.5	<ul style="list-style-type: none"> Added a new bean aspirator cyclone (ID No. C108)
Cover and throughout	Cover and throughout	<ul style="list-style-type: none"> Updated regulation references from “2D” and “2Q” to “02D” and “02Q” to be consistent with regulation nomenclature.

5. Compliance Status:

DAQ has reviewed the compliance status of this facility. During the most recent inspection conducted on March 15, 2018, Mitch Revels of the Fayetteville Regional Office indicated that the facility appeared to be in compliance with all applicable requirements. Additionally, a signed Title V Compliance Certification (Form E5) indicating that the facility was in compliance with all applicable requirements was submitted with Application No. 2600016.18E on November 16, 2018.

Five-year Compliance History:

- The facility was inspected on March 15, 2018 and appeared to be in compliance with all applicable air quality regulations.
- On November 14, 2017, a (Notice of Violation) NOV issued for deficient monitoring and late startup notification.
- On September 1, 2017, NOV issued for failure to provide supplemental information for a permit application when that additional information was discovered. This related to the de-rating of a temporary boiler (ID No. ES43).
- On August 15, 2017, NOV issued for deficient monitoring and recordkeeping for bagfilter inspections.
- On March 21, 2017, NOV issued for deficient monitoring and recordkeeping for bagfilter (ID No. BF9) and vacuum systems (ID Nos. ES86 and ES87).
- The facility was inspected on January 18, 2017 and appeared to be in compliance with all applicable air quality regulations.
- The facility was inspected on March 1, 2016 and appeared to be in compliance with all applicable air quality regulations.
- The facility was inspected on November 19, 2014 and appeared to be in compliance with all applicable air quality regulations.
- The facility was inspected on February 20, 2014 and appeared to be in compliance with all applicable air quality regulations.
- On November 12, 2013, a (Notice of Deficiency) NOD issued for exceeding toxics limit for n-hexane emissions.
- The facility was inspected on October 30, 2013 and appeared to be in compliance with all applicable air quality regulations.

All NOV's and NOD's have been resolved.

6. New/Modified Equipment/Changes in Emissions:

Application ID No.: 2600016.18A

The application is submitted as a second step (Part II) of two-step significant modification. The facility received Permit No. 03903T39 on September 4, 2015, which authorized construction of an upgraded extraction system at the Fayetteville facility. As stated in Permit No. 03903T39, Cargill must submit a Title V permit modification application to incorporate the new

sources into the Title V Permit within 12 months of startup. Cargill constructed several new pieces of equipment at the facility and started operation of the new equipment on July 10, 2017; therefore, the Title V significant modification application must be submitted on or before July 10, 2018. This requirement was met with the submittal of permit application no. 2600016.18A on March 23, 2018.

Cargill is requesting several modifications to the Title V permit in the second step application to revise equipment and control device identifiers in the Title V permit: update floor sweeping (fugitive) release point information; update control setup changes and the control device listing in the permit; and update the insignificant activities list at the site.

- Control Setup changes:
 - ES39 vents to cyclone C12A, then to bagfilter BF65
 - ES12 vents to cyclones C12B and C12C, then to bagfilter BF65
 - ES18A vents to cyclones CY9 and CY10, then to bagfilter BF41
 - ES5 vents directly to BF41
 - ES65 cyclones are labeled as C65D and C65E in the permit and they should be renamed as C65A and C65B.
- Fugitive release point:

The facility planned to dismantle and demolish the original extractor building, including the existing floor sweeping units (ES32A and ES32B). However, the facility discovered that the building and floor sweeping operation could not be removed, during construction. Additionally, the existing floor sweeping units would be inadequate to prevent the accumulation of hexane vapors within the new extraction building. Therefore, the facility decided to install an additional exhaust vent to assist with floor sweeping in the new building. This change does not affect emissions or production and is purely a safety device. This change was reflected in the state-only application and modelling submitted in February 2016. Cargill is requesting to update the description of ES-32A and ES32B to reflect the additional release point and to rename the source to ES32.

Per the second step application submittal for this permit modification, the following changes were requested (see Form A1, A2 for more details):

Equipments to be ADDED:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES83	Vertical seed conditioner	CY83	Cyclone (33 inches in diameter)
ES15	Dryer cooler system	CY15A, CY15B, CY15C, and CY15D	Four cyclones (80 inches in diameter each)
ES31A	Soybean oil/Hexane solvent extraction process/desolventizer/toaster	CD31	Packed column mineral oil absorber and scrubber
ES30	Screw Conveyor (1,204,500 tpy soybeans) which transports soybean meat flakes to the solvent extraction process (ES31)	N/A	N/A

Insignificant Activity List

Emission Source ID No.	Emission Source Description	Size or Production Rate
IES-80	Wet meal drag conveyor	
IES-100	FreeFlo Tank	4015 TPY
IES-101	Fuel Oil Tank	572 gallons
IES-102	Fuel Oil Tank	572 gallons
IES-103	Foam fire suppressant tank	1400 gallons
IES-104	Foam fire suppressant tank	1400 gallons

Equipment to be MODIFIED:

Emission Source ID NO.	Emission Source Description	Control Device ID NO.	Control Device Description
ES65	Primary dehulling / Cyclones	BF65, C65A, C65B	Bagfilter (6,738 square feet of filter area) installed on the exhaust of two cyclones (112 inches in diameter, each)
ES5	Cracking process (consisting of cracking roll mills, and some of the bean conveying equipment)	BF41	Bagfilter (6,738 square feet of filter area)
ES39	Whole bean storage bin, duo aspirators, and some of the bean conveying equipment	BF65, CF12A	Bagfilter (6,738 square feet of filter area) in series with one simple cyclone (108 inches in diameter)
ES18A	Hull grinding operation	BF41, CY9, CY10	Bagfilter (6,738 square feet of filter area) in series with two cyclones (60 inches in diameter, each)
ES12	Secondary dehulling operation	BF65, C12B, C12C	Bagfilter (6,738 square feet of filter area) in series with two simple cyclones (84 and 108 inches in diameter, respectively)
ES-32	Floor Sweeping Fans	N/A	N/A

Insignificant Activity List

Emission Source ID No.	Emission Source Description	Size or Production Rate
IES-75	Diesel Tank	572 gallon

Equipment to be REMOVED:

Insignificant Activity list:

Emission Source ID No.	Emission Source Description
IES-68	Bean conditioning
IES-72	Diesel fuel oil storage tank (150 gallons capacity)
IES-73	Gasoline storage tank (500 gallons capacity)

Please, see **September 4, 2015** Permit review (03903T39), which is provided as Attachment 1 to this document for more details.

Application ID No.: 2600016.18D

The facility has proposed to install a new bean aspirator cyclone (**ID No. C108**) in parallel with the existing pod grinder cyclone (**ID No. C106**) that will vent to the pod grinder dust collector (**ID No. BF106**). The new cyclone is intended to increase the efficiency of the cleaning process prior to sending the beans to the dryer. This new control device (**ID No. C108**) will be attached to the bean cleaning operation (**ID No. ES4**).

Cargill is projecting an additional 130 hours of operation per year as a result of decreased downtime for maintenance and cleaning. A majority of the air flow from the new cyclone will be recycled within the process, and the additional air flow to BF106 can be accommodated by the existing 16,000 acfm fan. Since the air exhaust directly from C108 is not released to atmosphere, there are no emissions from the unit itself. Therefore, the potential emissions from BF106 (and facility-wide) will not increase as a result of this project. However, facility-wide actual emissions will not increase due to the projected 130 hours of additional operation per year.

The emissions associated with this modification is provided in the following emission summary table:

Attachment 1 - Emission Calculations

Emissions Summary

Baseline Actual Emissions

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Grain Dryer	21.36	3.22	0.23	0.03	4.20	0	3.53	2.1E-05
Bagfilters	48.16	4.06	1.68	---	---	---	---	---
Cyclones	94.53	25.23	12.23	---	---	---	---	---
Oil Extraction	---	---	---	---	---	463.32	---	---
Boilers	0.18	0.18	0.15	0.21	34.51	2.04	28.99	1.7E-04
Total	164.22	32.69	14.29	0.23	38.72	465.36	32.52	1.9E-04

Potential Emissions

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Grain Dryer	30.10	4.60	0.38	0.12	19.21	1.06	16.14	9.6E-05
Bagfilters	54.37	4.58	1.90	---	---	---	---	---
Cyclones	103.06	27.50	13.33	---	---	---	---	---
Oil Extraction	---	---	---	---	---	476.55	---	---
Boilers	0.24	0.24	0.20	0.28	46.49	2.56	39.05	2.3E-04
Total	187.77	36.92	15.82	0.39	65.70	480.16	55.19	3.3E-04

Project Emissions Increase Summary

Emissions	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Potential Emissions	187.77	36.92	15.82	0.39	65.70	480.16	55.19	3.3E-04
Baseline Actual Emissions	164.22	32.69	14.29	0.23	38.72	465.36	32.52	1.9E-04
Emissions Increase	23.54	4.24	1.52	0.16	26.98	14.80	22.67	1.3E-04
SER	25	15	10	40	40	40	100	0.6
Exceeds?	No	No	No	No	No	No	No	No

Attachment 1 - Emission Calculations

Throughputs and Baseline Data

Baseline and Potential Facility Non-Fuel Throughputs

Parameter	Non-VOC Baseline Actual Throughput ¹	VOC Baseline Actual Throughput ²	Potential Throughput ³	Units
Hours of Operation	7,759	---	8,760	hr/yr
Soybeans Processed	853,487	---	1,200,000	tpy
Hexane Losses	---	415.03	476.55	tpy
Solvent Loss Ratio	---	0.18	0.14	gal/ton

Baseline and Potential Facility Fuel Throughputs

Fuel	Heat Input Capacity (MMBtu/hr)	Non-VOC Baseline Actual Throughput ¹	VOC Baseline Actual Throughput ²	Potential Throughput ⁴	Units
Natural Gas					
Boilers	108.9	545,365	566,478	929,789	Mscf/yr
ES41	99	452,588	513,176	---	Mscf/yr
ES80	9.9	92,777	53,303	---	Mscf/yr
Grain Dryer	45	84,077	0	384,211	Mscf/yr
Landfill Gas					
Boilers	62.9	306,530	367,886	1,136,091	Mscf/yr
ES41	53	272,639	365,730	---	Mscf/yr
ES80	9.9	33,891	2,156	---	Mscf/yr
Equivalent Natural Gas ⁵					
Boilers	---	144,899	173,903	537,041	Mscf/yr
ES41	---	128,879	172,884	---	Mscf/yr
ES80	---	16,020	1,019	---	Mscf/yr

¹ The baseline period for all pollutants except VOC is October 2014 through September 2016. Raw baseline data is provided on the following page. The hours of operation are calculated assuming the maximum process rate of 110 tons per hour.

² The baseline period for VOC is November 2012 through October 2014. The solvent loss ratio was taken to be the average of this 24-month period.

³ To be conservative, Cargill has elected to calculate potential emissions at maximum capacity.

⁴ Potential throughput is calculated using the heat input capacities and 8,760 hours of operation.

⁵ The landfill gas usage was scaled to the equivalent usage of natural gas using the heating values listed in 40 CFR 98.

Cargill is an existing major stationary source under Prevention of Significant Deterioration (PSD) with a potential to emit over 250 tpy of NO_x, SO₂, VOC, and PM.

According to Application 2600016.18D, adding the new been aspirator cyclone (ID No. C108) represents a physical change or change in the method of operation. As such, the emissions resulting from the modification were reviewed to determine if the project would be considered a major modification under Prevention of Significant Deterioration (PSD) rules. Cargill assessed the applicability of PSD for these pollutants by performing the comparison test of baseline actual emissions (BAE) to potential emissions (PTE). For all pollutants, the emissions increases were below the PSD significant emission rate (SER).

As per the application, the facility has calculated baseline actual emissions for October 2014 through September 2016 for all pollutant except VOC. The baseline actual emissions period for VOC is November 2012 through October 2014. The hours of operation are calculated assuming the maximum process rate of 110 tons per hour. The potential emissions are calculated at maximum capacity and 8,760 hours of operation.

Cargill has evaluated the potential emissions as shown as per above in the emission summary. As can be seen in the table, the emission increase associated with this modification is less than the SER for all PSD pollutants, and PSD review is not required.

Application ID No.: 2600016.18E

The application is submitted for second step (Part II) of two-step significant modification. The facility received Permit No. 03903T45 on October 9, 2018, which authorized the change of the throughput limit of grain dryer to 1.2 million tons per year at the Fayetteville facility. As stated in the Permit No. 03903T45, the facility must submit a Title V permit modification application to incorporate the new sources into the Title V Permit within 12 months of startup.

The facility is also requesting following changes with the application ID No. 2600016.18E. These are new changes and were not included in the Part I application:

- To reduce the maximum processing rate of the dryer from 18,000 bushels per hour to 6,000 bushels per hour to reflect the as-built capacity of the unit. This change in processing rate does not change the annual potential to emit or regulatory applicability.
- To add a diesel fuel oil portable storage tank (**ID No. IES-105**) as an insignificant activity.

Per application submittal for this permit modification, the following changes were requested (see Form A1, A2 for more details):

Equipment to be ADDED:

Insignificant Activity list

Emission Source ID No.	Emission Source Description
IES-105	Diesel fuel oil portable storage tank (100 gallons capacity)

Equipment to be MODIFIED:

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-82 MACT GGGG NSPS DD	Direct fired pre-cleaned soybean dryer (45 million Btu per hour heat input; 6,000 bushels soybeans per hour maximum design capacity or 1,576,800 tons per year)	N/A	N/A

- To change the current throughput limit of 1.07 Million tons per year through the dryer (**ID No. ES-82**: Condition 2.1 A.5.a) to 1.2 million tons per year.
- To reduce the maximum processing rate of the dryer from 18,000 bushels per hour to 6,000 bushels per hour to reflect the as-built capacity of the unit. This change in processing rate does not change the annual potential to emit or regulatory applicability.

Please, see **October 9, 2018** permit review (03903T045), which is provided as Attachment 2 to this document for detailed emissions discussion.

7. Regulatory Review

Unless specifically noted, a detailed discussion of the following list of equipment and all associated permit conditions is not included as applicability status has not changed. The permit conditions have been modified to reflect the most current language, as necessary. The facility is expected to be in continued compliance.

15A NCAC 02D .0503 "Particulates from Fuel Burning Indirect Heat Exchangers"
15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"
15A NCAC 02D .0516 "Sulfur Dioxide Emissions from Combustion Sources"
15A NCAC 02D .0521 "Control of Visible Emissions"
15A NCAC 02D .0524 New Source Performance Standards (40 CFR Part 60 Subpart Dc)
15A NCAC 02D .0530 "Prevention of Significant Deterioration" (PM, NO_x and SO₂)
15A NCAC 02D .0535 "Excess Emissions Reporting and Malfunctions"
15A NCAC 02D .1109 "Case-by-Case Maximum Achievable Control Technology (MACT)"
15A NCAC 02D .1111 "Maximum Achievable Control Technology (40 CFR 63, Subpart GGGG)"
15A NCAC 02D .1111 "Maximum Achievable Control Technology (40 CFR 63, Subpart ZZZZ)"
15A NCAC 02D .1806 "Control and Prohibition of Odorous Emissions"
15A NCAC 02Q .0317 "Avoidance Conditions" for 15A NCAC 02D .0530 (VOC and SO₂)

8. NSPS, NESHAP/MACT, NSR/PSD, 112(r), CAM

NSPS

This facility is subject to New Source Performance Standards (NSPS), 40 CFR 60, Subpart Dc as noted above. This permit modification does not change this status.

NESHAP/MACT

This facility is a major source for HAPs emissions and is subject to the National Emission Standards for Hazardous Air Pollutants, 40 CFR 63 Subpart GGGG, Subpart ZZZZ and Subpart DDDDD.; however, this permit modification does not affect this status.

NSR/PSD

The facility is a major source under the Federal Prevention of Significant Deterioration (PSD) program. The facility currently has BACT limits for PM, NO_x and SO₂; as well as PSD avoidance conditions for VOCs and SO₂.

The Part II modifications (Application Nos. 2600016.18A and 2600016.18E) were previously evaluated for PSD applicability under the Part I applications. There are no pollutants above the SER threshold associated with these modifications; therefore, a PSD review is not triggered at this time.

The minor modification (Application No. 2600016.18D) was also evaluated for PSD applicability. The facility used potential emissions to demonstrate the project did not exceed the SER threshold for any pollutant. Therefore, no PSD review is triggered for the minor modification. (See Section 6 above – Application 2600016.18D).

Increment

The PSD minor source base line date for PSD increment tracking in Cumberland County was July 26, 1978 for particulate matter (PM₁₀) and sulfur dioxide (SO₂) emissions.

PSD increment tracking for PSD Class II purposes is required as part of the Part I Significant modification (Application No. 2600016.18B) due to an increase in PM/PM₁₀/PM_{2.5} emissions of 0.8 lb/hr pounds per hour (lbs/hr). (Please refer to the emission summary in an Attachment 2 below.)

112(r)

This facility is NOT subject to the requirements of the Chemical Accident Release Prevention Program, Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above applicability thresholds.

Compliance Assurance Monitoring (CAM)

The facility is currently subject to CAM. This modification does not propose the addition of any new control devices; therefore, a review of CAM is not necessary at this time.

9. Facility-Wide Air Toxics:

The current permit includes modeled emission rates based on previous approved modeling demonstrations. This application does not trigger an air toxics review or request any changes of emission limits. No further air toxics evaluation is required at this time.

10. Facility Emission Review:

Based on the potential emissions shown below, this facility is classified as a Title V facility.

Pollutant	Expected Actual Emissions TPY	Potential Emissions TPY
Particulate Matter (PM)	188.06	188.06
Particulate Matter <2.5 (PM _{2.5})	16.07	16.07
Particulate Matter <10 (PM ₁₀)	37.22	37.22
Sulfur Dioxide (SO ₂)	0.66	0.66
Nitrogen Oxide (NO _x)	110.30	110.30
Carbon Monoxide (CO)	92.88	92.88
Volatile Organic Compounds (VOC)	<487.4	<487.4
Total Hazardous Air Pollutants (HAP)	302.19	302.19
Greenhouse Gases CO ₂ Equivalent (CO ₂ e)	21,170	130,400

11. Facility Comments on Draft Permit:

From: Megan Featherling <mfeatherling@trinityconsultants.com>

Sent: Wednesday, March 06, 2019 2:47 PM

To: Patel, Urva P <Urva.Patel@ncdenr.gov>; Revels, Mitchell <mitchell.revels@ncdenr.gov>; Parekh, Samir <samir.parekh@ncdenr.gov>

Cc: Johan Clairet <Johan_Clairet@cargill.com>; Scott Schuelke <Scott_Schuelke@cargill.com>; Terry Crawford <Terry_Crawford@cargill.com>

Subject: [External] RE: Cargill, Inc. - Fayetteville (2600016)

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Urva,

Our comments are tracked in the attached comments.

Cargill requests that the new .0530(u) condition be removed from the permit based on the use of potential emissions in the PSD calculations. The permit application submitted in September 2018 included projected actual emissions at maximum equipment capacity (i.e., potentials). Per 51.166(b)(40)(ii)(d), a facility may elect to use potential to emit in lieu of projected actual emissions. Based on the potential to emit of the units involved in the project, the project emissions do not exceed the PSD SERs. Therefore, use of projected actual emissions is not needed to avoid applicability of PSD.

If we need to discuss this request in further detail prior to issuing the permit, please let us know and we can set up a conference call.

Feel free to reach out if you have any questions about our comments.

Thank you,

.....
Megan Featherling, PE
Senior Consultant

Office: **704-553-7747 x101**
Email: mfeatherling@trinityconsultants.com

From: Patel, Urva P <Urva.Patel@ncdenr.gov>
Sent: March 7, 2019 2:24 PM
To: Megan Featherling <mfeatherling@trinityconsultants.com>
Cc: Johan Clairet <Johan_Clairet@cargill.com>; Scott Schuelke <Scott_Schuelke@cargill.com>; Terry Crawford <Terry_Crawford@cargill.com>
Subject: RE: [External] RE: Cargill, Inc. - Fayetteville (2600016)

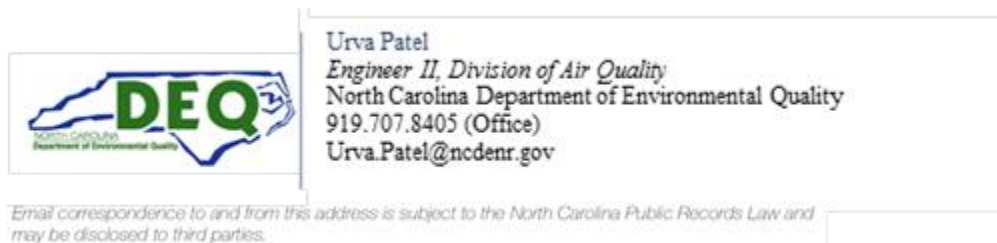
Hello Ms. Megan,

- 1) As per your email on December 12, 2018 , Emissions from C108 assumed to be projected actual emissions. I agree a facility may elect to use potential to emit in lieu of projected actual emissions. But in the application submitted on September 2018, you have used projected actual emissions instead of potential emissions. By North Carolina Air Regulation, the facility - who use projected actual emissions rather than potential emissions to demonstrate the SER isn't exceeded, has to accept 02D .0530(u). Therefore, please confirm your emissions throughout the application. i.e. Page 1 of 10, 5 of 10 etc... We need clarification from Responsible Official or from you through Responsible Official.
- 2) Please, sent us letter from RO or application form for change in Technical contact.

Let me know, if you have any concern.

Thank you.

Regards,
Urva



From: Megan Featherling <mfeatherling@trinityconsultants.com>
Sent: Tuesday, March 19, 2019 9:45 AM
To: Patel, Urva P <Urva.Patel@ncdenr.gov>
Cc: Johan Clairet <Johan_Clairet@cargill.com>; Scott Schuelke <Scott_Schuelke@cargill.com>; Terry Crawford <Terry_Crawford@cargill.com>
Subject: RE: [External] RE: Cargill, Inc. - Fayetteville (2600016)

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Urva,

Attached is a draft application addendum for the Cargill Fayetteville facility. Could you please confirm that it includes all the information you need to address your comments below? Once we receive confirmation, we'll have this signed and submitted to you.

Thanks,

.....
Megan Featherling, PE
Senior Consultant

Office: **704-553-7747 x101**

Email: mfeatherling@trinityconsultants.com

12. Public Notice/EPA and Affected State(s) Review

For Applications (2600016.18A and 2600016.18E)

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. South Carolina is an affected state within 50 miles of the facility.

13. Other Regulatory Considerations:

- A Permit Application fee is required for Permit Application Nos. 2600016.18A, 2600016.18D and 2600016.18E.
- A P.E. Seal is required for Permit Application Nos. 2600016.18A and 2600016E.
- A P.E. Seal is NOT required for Permit Application No. 2600016.18D.
- A 30-day public notice and 45-day EPA review is required for Permit Application Nos. 2600016.18A and 2600016.18E.
- A 30-day public notice and 45-day EPA review is NOT required for Permit Application No. 2600016.18D.
- A Zoning Determination is NOT required for Permit Application Nos. 2600016.18A and 2600016.18E.
- A Zoning Determination is required for Permit Application No. 2600016.18D.

14. Recommendations/Conclusion:

TBD

Attachment 1

Permit Review for Air Permit No. 03903T39 issued September 4, 2015

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date: September 4, 2015

Region: Fayetteville Regional Office (FRO)
County: Cumberland
NC Facility ID: 2600016
Inspector's Name: Robert Hayden
Date of Last Inspection: 11/19/2014
Compliance Code: 3 / Compliance - inspection

Facility Data			Permit Applicability (this application only)				
<i>Applicant (Facility's Name):</i> Cargill, Inc. - Fayetteville Facility Address: Cargill, Inc. - Fayetteville 1754 River Road Fayetteville, NC 28312 SIC: 2075 / Soybean Oil Mills NAICS: 311222 / Soybean Processing Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			SIP: 2D .0516, .0521, .0524, .0706, .0958, .1111, and .1806 NSPS: IIII NESHAP: GGGG, ZZZZ PSD: PSD Avoidance: 2Q .0317 for 2D .0530 NC Toxics: 112(r): Other:				
Contact Data			Application Data				
Facility Contact	Authorized Contact	Technical Contact	<i>Application Number:</i> 2600016.14F <i>(including the following consolidations 2600016.14A through 2600016.14D)</i> Date Received: 12/19/2014 Application Type: Modification Application Schedule: TV-Sign-501(c)(2) <i>Existing Permit Data</i> Existing Permit Number: 03903/T38 Existing Permit Issue Date: 09/30/2013 Existing Permit Expiration Date: 08/31/2018**				
Michael Klauke Facility Superintendent (910) 433-4907 1754 River Road Fayetteville, NC 28312	Michael Klauke Facility Superintendent (910) 433-4907 1754 River Road Fayetteville, NC 28312	Michael Klauke Facility Superintendent (910) 433-4907 1754 River Road Fayetteville, NC 28312					
<i>Total Actual emissions in TONS PER YEAR (tpy):</i>							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2013	0.3600	58.87	428.48	49.45	43.57	264.76	264.71 [Hexane, n-]
2012	0.3400	56.33	380.48	47.32	47.04	235.04	234.99 [Hexane, n-]
2011	0.3200	51.79	310.25	43.52	137.98	191.55	191.51 [Hexane, n-]
2010	238.03	94.69	382.39	49.39	140.34	253.78	236.60 [Hexane, n-]
2009	307.93	241.90	384.60	14.27	139.99	252.19	237.89 [Hexane, n-]
2008	383.15	151.02	433.90	73.42	127.48	298.88	268.43 [Hexane, n-]
2007	479.18	202.23	451.19	78.69	132.09	344.33	310.45 [Hexane, n-]

<p>Review Engineer: Judy Lee</p> <p>Review Engineer's Signature: _____ Date: 9/4/2015</p>	<p>Comments / Recommendations:</p> <p>Issue Permit No.: 03903/T39 Permit Issue Date: September 4, 2015 Permit Expiration Date: August 31, 2018**</p>
--	--

1. Purpose of Application

This permitting action is for significant modification of an existing Title V Air Quality Permit pursuant to 15A North Carolina Administrative Code (NCAC) 2Q .0501(c). This facility is currently operating under Title V Air Quality Permit No. **03903T38** issued on September 30, 2013. On December 19, 2014 North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality (DAQ) Raleigh Central Office (RCO) received a Title V Air Quality Permit Application from Cargill, Incorporated (Cargill) – Fayetteville located in Cumberland County for modification of their existing Title V permit for replacement of existing mineral oil absorber (CD-29) and stripper; and installation of a new Soybean oil/Hexane solvent extraction process/desolventizer/toaster (extractor). Cargill's existing extractor, mineral absorber and stripper will be shut down and removed. The existing units will be removed prior to the startup of the new sources. Cargill will also conduct several upgrades to the soybean processing operations.

In addition, Cargill also submitted the following modification requests that will be processed along with this significant modification (Application ID No. 2600016.14F):

Application ID No.	Application Received Date	Application Type	Application Description
2600016.14A	2/10/2014	Minor Modification processed under new procedures. Ten day letter sent on 2/10/2014	Replace existing shell of cyclone 6C, which controls emissions from the soybean flaker process (ES6); PE Seal required
2600016.14B	2/27/2014	Minor Modification processed under new procedures. Ten day letter sent on 3/8/2014	Replacement of two (2) existing emergency firepumps (one diesel and one electric; ID No. ES-81 & No ID No., respectively) with 2 new 399 brake Horsepower CI emergency diesel-fired firepumps (ID Nos. ES-83 & ES-84)
2600016.14C	7/8/2014	Minor Modification processed under new procedures. Ten day letter sent on 7/18/2014	Modification of existing primary and secondary dehulling aspiration process (ES65 and ES12) and replacement of existing bagfilter (BF12)
2600016.14D	9/2/2014	502(b)(10) processed under new procedures; however, questions regarding NSPS Subpart DD applicability. Sent to EPA for determination. Emailed approval on 10/16/2014	Removing cyclone CY30; replacing existing raw flake conveyor (ES-30) with new larger conveyor – proposed new screw conveyor

Cargill's previous permit (Permit No. 03903T37) expired on June 30, 2013**.

***An application to renew Permit No. 03903T37 has been timely filed, so that an application shield pursuant to 15A NCAC 2Q .0512(b)(1) remains in effect. Permit No. 03903T37 shall not expire until the renewal permit has been issued or the request has been denied, and all terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or the request has been denied pursuant to 15A NCAC 2Q .0513(c).*

15A NCAC 2Q .0513 PERMIT RENEWAL AND EXPIRATION

(a) Permits being renewedand affected State and EPA review.

(b) Permit expiration terminates the facility's right to operate unless a complete renewal application has been submitted at least nine months before the date of permit expiration.

(c) If the permittee or applicant has complied with Rule .0512(b)(1) of this Section, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

The renewal application was received by DAQ – RCO on September 21, 2012 (due on September 30, 2012), or at least nine months prior to the expiration date, with additional application amendments received as detailed below. Therefore, per 2Q .0513, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

2. Facility Description

Cargill operates a soybean oil extraction process (Standard Industrial Classification [SIC] Code 2075 – Soybean Processing). Cargill processes soybeans for animal feed and oil at this facility. The Fayetteville facility is considered both a Soybean Processing and Refining Facility.

The Cargill-Fayetteville facility consists of two plants:

- 1) Crush Plant where soybean meal and crude oil are produced, and
- 2) Refinery Plant where the crude oil is refined to edible soybean oil.

The vegetable oil processing operations at the Cargill facility are subdivided into six separate operations as described in United States Environmental Protection Agency's (US EPA) AP-42, Chapter 9, Section 9.11.1 (11/95):¹

- Raw soybean storage and handling;
- Raw soybean processing;
- Oil extraction, meal drying, cooling;
- Oil refining, handling, storage, crude unloading and load out;
- Miscellaneous support sources and boilers; and
- Meal and hull handling, storage and loadout.

Refer to Section 2 – Process Description of the renewal application for more detailed information or AP-42.

[Excerpt from 1. Executive Summary of significant modification submittal]²

Cargill Incorporated (Cargill) operates an oilseed processing facility at 1754 River Road in Fayetteville, North Carolina (Fayetteville facility). The Fayetteville facility is a major stationary source as defined under Section 502 of the Clean Air Act and the North Carolina Administrative Code Title 15A, Chapter 2, Subchapter 2Q, Section 500 (NCAC 15A 2Q.500).

...

Cargill is proposing modifications to the Fayetteville facility that will increase the capacity of the facility's oil extraction process.

...

The facility is located in Cumberland County, which is currently designated as "attainment" or "unclassifiable" for all criteria pollutants. Therefore, the proposed project is not subject to Nonattainment New Source Review (NNSR) and is potentially subject to Prevention of Significant Deterioration (PSD) permitting, which is discussed in Section 4.1 of this application.

Oilseed processing facilities are not on the list of 28 named source categories. Therefore, the PSD major source threshold is 250 tpy of a criteria air pollutant. The Fayetteville facility is an existing major PSD source, since potential emissions of volatile organic compounds (VOC) exceed the 250 tpy threshold. Thus, the net emission increases from

¹ US EPA **AP-42**, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Volume I, Chapter 9, Food and Agricultural Industry, 9.11.1 Vegetable Oil Processing, November 1995.

² Cargill, Inc. Oil Extractor Replacement Application – Fayetteville, North Carolina, Construction Permit Application – December 2014 received by RCO Air Permits Section December 19, 2014 (Application No. 2600016.14F) for significant modification to Permit No. 03903T38.

the project must be compared to the PSD Significant Emission Rates (SER) to determine if PSD permitting is required. Cargill is requesting emission limitations to ensure that the net emissions increase from the project will not exceed any PSD SER. ...

3. Application Chronology

Please see the attached Comprehensive Application Reports, 2600016.14A through 2600016.14D and 2600016.14F; and email correspondence for more details.

On December 19, 2014 DAQ RCO received a significant modification request from Cargill – Fayetteville for modification of their existing Title V permit for replacement of existing mineral oil absorber (CD-29) and installation a new extractor and mineral oil absorber and stripper.

On February 4, 2015 an additional technical information request via email was sent to Taylor Loftis of Trinity Consultants (Trinity) on behalf of Cargill regarding the natural gas-fired boiler.

On February 17, 2015 Cargill's consultant, Taylor Loftis, responded via email regarding the natural gas-fired boiler.

On March 6, 2015 an additional technical information request via email and via US Parcel Post (USPS) was sent to Cargill and Trinity regarding incomplete application forms, manufacturer's specifications, Particulate Matter (PM) Calculator emissions referenced in the analysis and Prevention of Significant Deterioration (PSD) netting analysis.

On March 22, 2015 an additional technical information response was received via email from Cargill via Trinity. The response was incomplete; however, it did contain completed DENR application forms, Kice Industries, Inc. letter dated September 28, 1999 indicating a cyclone efficiency of 98.4% for typical flour dust, Kice Industries, Inc. PDF of the cyclone, PM Calculator directions and a PSD netting analysis from September 2013 when the new grain dryer was permitted; however, not the final analysis.

On April 20, 2015 this review engineer met with permitting supervisors (Booker Pullen, Mark Cuilla and William Willets) to discuss insufficiencies and discrepancies in Cargill's application (i.e. sample calculations, manufacturers supporting data for new equipment, process flow diagram (PFD), PSD netting analysis supporting data) versus historical permit documents.

On April 24, 2015 a second additional technical information request via email and via USPS was sent to Cargill and Trinity regarding incomplete application forms, manufacturer's specifications, emissions data, contemporaneous period with supporting documentation, and PSD netting analysis.

On May 13, 2015 a third additional technical information request via email was sent to Cargill and Trinity regarding incomplete information regarding toxics, Maximum Achievable Control Technology (MACT) Subpart GGGG, Cargill – Fayetteville's Solvent Loss Ratio (SLR) and whether this modification triggers Cargill as a new source under MACT.

On June 9, 2015 Cargill (Mr. Nathan Dehne, Mr. Michael Klauke, Mr. Scott Schuelke and Mr. Taylor Loftis of Trinity Consultants) and DAQ (Mr. William Willets, Mr. Booker Pullen, Mr. Mark Cuilla and Ms. Judy Lee of RCO and Mr. Robert Hayden of FRO) representatives had a teleconference to discuss the additional information requests and other questions that arose during the conference call. During the conference call on June 9, 2015 Cargill stated that only the desolventizer/toaster (DT) was replaced, not the extractor; therefore, not a capacity increase.

On June 10, 2015 Mr. Loftis, Cargill's consultant submitted a process flow diagram (PFD) with the proposed changes to the process via email with the process flow of the new equipment (e.g., VSC and meal drying system) and removal of items to be deleted or replaced shown (e.g. extractor, meal dryer and cooler).

On June 15, 2015, Mr. Hayden, FRO in response to Ms. Lee's email inquiring if their files contained the application for the 2008 extractor replacement, sent RCO via email the Executive Summary from the 2006 permit application which stated "Cargill submitted a construction and operation permit application for the replacement of a desolventizer/toaster (DT) unit in the soybean oil extraction process in June 2006. ... Cargill requests that the modification ... be incorporated into the Title V permit." Per Mr. Hayden's regional comments the DT is larger and

more efficient, but will not increase emissions nor de-bottleneck facility emissions. The hexane bottleneck continues to be the oil extraction operation (ID No. ES-31).”

On June 19, 2015 Mr. Loftis, Cargill’s consultant submitted a PFD with the proposed changes to the process via email which included the process flow rates as requested during the June 9th conference call. Mr. Loftis also requested a call to go through the addition information requests. A meeting was scheduled for June 23, 2015 between DAQ and Cargill.

On June 23, 2015 Cargill’s consultant, Taylor Loftis, sent an email regarding how Cargill determined emissions from the volatile organic compounds (VOC) and particulate matter (PM) sources as well as how they utilized the EPA PM Calculator, as well as a step by step walk through as to how Cargill arrived at their PSD Avoidance limitation for VOC from the new extraction equipment prior to our scheduled teleconference for discussion.

On June 23, 2015 Cargill’s consultant, Taylor Loftis, and DAQ (Judy Lee of RCO, Robert Hayden, Gregory Reeves, Steven Vozzo, FRO) held a teleconference regarding some of the remaining questions and items needed to consider the application complete for processing. Mr. Loftis stated that although Cargill’s true potential for the extractor is 629 tpy of VOCs, they wanted to place a limit on how much solvent loss (100% VOC) can be lost and track monthly. They sized the conveyor so that it will only run at extractor process rate of 110,000 bushels per day. Mr. Vozzo, FRO asked about the anticipated permit issuance date. Ms. Lee stated that as long as we received everything requested in a timely fashion and the PSD netting analysis works out there should be no problem meeting the September timeframe.

On July 8, 2015 DAQ sent an email to Cargill’s consultant, Taylor Loftis, regarding the analysis provided on June 23rd indicating that based on this review engineers review of the calculations submitted and Cargill’s current permit, the refinery emissions are not allowed to be included in the PSD Avoidance condition for the extractor because the extractor has a separate PSD Avoidance limit of 622 tpy VOC and the refinery has its own PSD Avoidance limit of 56 tpy. If you remove the refinery emissions from the PSD netting analysis calculation for VOC emissions from the extractor, then the emissions would be 48 tons; thus PSD would be triggered.

On July 9, 2015 Cargill’s consultant, Taylor Loftis replied that the 56 tpy VOC limit for the refinery only applies to the oil that Cargill imports (i.e. “non-Fayetteville”). The existing permit contained two separate PSD Avoidance limits. Mr. Loftis requested a conference call to discuss the facility –wide PSD Avoidance conditions in the permit. This call was scheduled for July 13th.

On July 13, 2015 Cargill’s consultant, Taylor Loftis and DAQ (Booker Pullen and Judy Lee of RCO) held a teleconference regarding the PSD Avoidance Condition and netting analysis that was provided on June 23rd. Based on discussions it was determined that the best avenue for Cargill due to the extraction process and the interconnection with the refinery was to combine the extractor and refinery VOC avoidance conditions back together into one Facility-wide avoidance condition based on baseline actuals plus 40. Mr. Loftis is going to discuss with Cargill to make sure they concur and provide DAQ with revised calculations.

On July 14, 2015 Cargill’s consultant, Taylor Loftis and DAQ staff (Booker Pullen, William Willets and Judy Lee) discussed a couple of options. Email correspondence was between this review engineer and Cargill’s consultant, Mr. Loftis (Please see discussion under Section 5 below).

On July 28, 2015 Cargill’s consultant, Taylor Loftis and DAQ (Tom Anderson, Alex Zarnowski and Judy Lee of RCO) held a teleconference regarding the toxics evaluation for Cargill due to the age of the existing modeling, relocation of sources, potential increase in emissions, changes in modeling data in the last ten years and potential residual risk. However, after discussions with Mr. William Willets, Chief of the Permitting Section, it was determined that as long as Cargill is willing to be constrained by existing limits in their current permit, no modeling will be required (See Section 5 & 7 below for more details).

On July 28, 2015 Cargill’s consultant, Taylor Loftis, sent an email with an attachment of calculations for Cargill Fayetteville’s facility-wide VOC PSD avoidance limitation indicating that they used the same baseline as proposed in the application, April 2007 through March 2009 and the limit will be 487.4 tpy VOC based on Cargill’s calculations.

On July 28, 2015 DAQ responded after a quick review that there are no sample calculations included in the attached portable document format (PDF), only tables with emission factors and values.

On July 29, 2015 Cargill's consultant, Taylor Loftis, sent an email with an attachment of calculations for Cargill Fayetteville's facility-wide VOC PSD avoidance limitation to support the previous tables. Later that day Mr. Loftis also sent a draft copy of Cargill's permit as discussed during the June 9th teleconference due to the many changes involved with the proposed project, complexity of the soybean vegetable oil process, and emission units that Cargill believed should be subject to MACT GGGG. He also indicated that he was working on finalizing a revised PDF of the entire application based on the changes made in the last couple of weeks (toxics and PSD avoidance).

On July 31, 2015 Cargill's consultant, Taylor Loftis, sent an email which included a PDF of the revised regulatory discussion that includes the MACT new source versus existing source cost analysis and air toxics applicability based on discussions from July 28th.

On July 31, 2015 DAQ responded that everything looked good and requested a Word version since the PDF's are not convertible in case any of the language needed to be used in the review. Also, since we have focused mainly on VOCs due to the complexity of the extractor and the PSD Avoidance condition, has anything changed in regards to the PM emissions since the original submittal?

On July 31, 2015 in response to the PM question, Mr. Loftis, responded that they had changed the control scenario for ES-15 from 5 cyclones at 12,500 actual cubic feet per minute (acfm) to 4 cyclones at 16,000 acfm. Mr. Loftis also attached an updated Appendix B and the word version of the regulatory review and new PSD avoidance cap of 487.4 tpy VOC emissions calculations and tables.

On July 31, 2015 in response to the changes to ES-15, DAQ responded that since Cargill has modified the system and the control devices are each greater than 10,000 acfm we will need a new professional engineer (PE) Seal pursuant to 15A NCAC 2Q .0112.

On July 31, 2015 in response to the PE Seal requirement, Mr. Loftis, responded that they would get the forms in the mail with the required PE Seal.

On August 7, 2015 the revised DENR forms for the ES-15 system and PE Seal were received by DAQ.

On August 10, 2015 this review engineer emailed Mr. Loftis in regards to the cyclones associated with ES-15. The new Form C4 submittals had the cyclone diameters at 74 inches, yet the diagram submitted at 80. Asked for clarification whether it was supposed to be 80 inches in diameter per diagram? Mr. Loftis' response was yes.

On August 12, 2015 this review engineer emailed Mr. Loftis in regards to ES-15. While working on the review and the calculation for 2D .0515, revised Table B.5-3 list the grain loading rate of 0.03 grains per cubic feet (gr/cf); however, the new Form C4 received on August 7th list 0.01 gr/cf. The 2D .0515 calculation shows compliance using both, as well as AP-42 Emission Factors, so compliance is not an issue. DAQ needs to confirm the grain loading rate for emission purposes.

On August 17, 2015 Cargill's consultant, Taylor Loftis responded to the grain loading question regarding ES-15 stating it should be 0.03 gr/cf and that he has updated the form with both changes and will send a new copy.

4. Permit Modifications/Changes and Emission Source Module (ESM) Discussion

Changes to Cargill's current permit (**Air Quality Permit Number 03903T38**) for this modification are summarized in the table below:

Old Page No. [Air Quality Permit No. 03903T38]	New Page No. [Air Quality Permit No. 03903T39]	Condition No.	Changes
Cover Letter, Attachments	Cover Letter, Attachments and Pages 1 through 54	Entire permit, where applicable	Modified to reflect current permit number, issue and effective date, and associated application information. Updated language with current shell guidance. Added requirement to file a complete Title V application within 12 months.

Old Page No. [Air Quality Permit No. 03903T38]	New Page No. [Air Quality Permit No. 03903T39]	Condition No.	Changes
and Pages 1 through 57			Added asterisk regarding Renewal and Permit Expiration.
Attachment		Table of Changes	Updated per this permit modification.
		Insignificant Activities	No changes associated with this permit modification.
3 – 5	3 – 5	Section 1 – Equipment Table	Added process rates to existing equipment where available. Added MACT GGGG applicability to existing sources that by definition are subject to MACT GGGG. Removed the following sources and control devices: BF10, 5C, C65A, C65B, C65C, ES30, CY30, ES13, CY13, ES14, CY14, ES42 and ES81. Renamed CD29 to CD31, desolventizer/toaster to ES31B Separated the desolventizer/toaster from the extraction process. Added the following new sources and control devices: C65D, C65E, ES83, CY83, ES30 (replacement), ES31A (replacement), ES15, CY15A through CY15D, ES84 and ES85
5 – 8	6 – 9	Section 2.1 – A.	Added MACT Subpart GGGG applicability to table of limits and standards. Under 5.a. added particulate matter by limiting the soybean dryer ...
9 – 11	9 – 11	Section 2.1 – B.	Added MACT Subpart GGGG applicability to table of limits and standards. Removed Raw flake reddler downspout/raw flake conveyor (ID No. ES30) with one simple cyclone (ID No. CY30). Replaced bagfilter 5C and 10 with BF65. Replaced simple cyclone C12A with CF12B. Replaced three simple cyclones C65A through C65C with two simple cyclones in parallel C65D and C65E. Added new Vertical Seed Conditioner (ID No. ES83) controlled by high efficiency cyclone (ID No. CY83). Added screw conveyor (ID No. ES30) transports soybean meal “flakes” to extraction process (ID No. ES31)
11 – 12	12 – 13	Section 2.1 – C.	Added MACT Subpart GGGG applicability to table of limits and standards. Replaced existing meal drying operation (ID No. ES13) and rotary meal cooling operation (ID No. ES14) controlled by cyclones (CY13 and CY14) with new steam heated soybean meal dryer and cooler (ID No. ES15) controlled by four cyclones (ID Nos. CY15A through CY15D).
12 – 13	13 – 14	Section 2.1 – D.	Updated description of Soybean Oil/Hexane Solvent Extraction Process (ID No. ES31) due to extractor replacement and to be more representative of the operations at the Cargill facility. Separated the desolventizer-toaster (DT) due to the process flow of the extraction process. The extractor actually feeds the DT. The extractor is now referred to as ES31A and the DT as ES31B. Renamed the mineral oil absorber per Cargill’s request to CD31.
14 – 15	15 – 16	Section 2.1 – E.	Updated descriptions and changes to control devices to be more representative of the operations at the Cargill facility. Correction to citation references.
15 – 17	16 – 18	Section 2.1 – F.	Added MACT Subpart GGGG applicability to table of limits and standards. Updated descriptions and changes to control devices to be more representative of the operations at the Cargill facility. Replaced existing Bagfilter 5C with BF65. Correction to citation references.
18 – 19	19 – 20	Section 2.1 – G.	Removed PSD Avoidance condition for oil refinery and referred to Facility-wide condition in Section 2.2-C.1. Correction to citation references.

Old Page No. [Air Quality Permit No. 03903T38]	New Page No. [Air Quality Permit No. 03903T39]	Condition No.	Changes
19 – 22	20 – 22	Section 2.1 – H.	No change other than citation corrections.
22 – 26	N/A	Section 2.1 – I. (old)	Removed Natural gas-fired Boiler (ID No. ES-42)
26 – 29	N/A	Section 2.1 – J. (old)	Replaced existing propane-fired and 250 hp diesel-fired emergency engines (one with no ID and ID No. ES81) with two new - 399 bhp CI diesel-fired emergency engines (ID Nos. (ES84 and ES85). Added MACT Subpart ZZZZ and NSPS IIII applicability to table of limits and standards. Added new regulatory applicability for Subpart IIII and ZZZZ.
N/A	22 – 25	Section 2.1 – I. (new)	
29 – 31	26 – 28	Section 2.2 – A.	Updated Section 2.2-A.2. toxics due to changes in equipment and hexane 24 hour production limit inadvertently being left out of Cargill's permit. Cargill agreed to be constrained by their current toxics limits; therefore, no modeling was required.
31 – 32	28 – 29	Section 2.2 – B.	No change
32 – 33	29 – 30	Section 2.2 – C.	Modified PSD Avoidance Condition for VOC emissions by combining the extraction process (ES31A and ES31B) and the oil refinery process (ES34) into one Facility-wide Avoidance condition. Removed existing 2D .0530(u) conditions because they have been satisfied or due to this modification they are no longer necessary.
33 – 44	30 – 41	Section 2.2 – D	Updated emission sources based on changes associated with this permit modification. Added MACT affected sources per definition of a Vegetable Oil Production Process found in MACT GGGG per 40 CFR 63.2872. No regulatory changes.
45 – 46	42 – 43	Section 2.3	Updated extraction process ID Nos. ES31A & ES31B
46	43	Section 2.4	Updated extraction process ID Nos. ES31A & ES31B
46 – 47	43 – 44	Section 2.5	Updated emission sources based on changes associated with this permit modification. A new CAM demonstration is due at Renewal so this section will be updated and reviewed in more detail at that time.
48-57	45 – 54	Section 3	Updated with most recent General Conditions (Version 3.6) & List of Acronyms

- ✓ *Emission Source Module (ESM) or Title V Equipment Editor (TVEE) was updated accordingly (refer to pink sheet for approval).*

5. New Equipment/Change in Emissions and Regulatory Review

Per 1. Executive Summary, 1.1 Proposed Project of the application, the proposed project consists of two steps:

- Cargill proposes to replace the mineral oil absorber (CD-29) on the existing solvent extraction process (ES-31)³ with a new unit to better recover solvent from the current extraction process. The replacement will not be like-

³ Per review for Air Quality Permit No. 03903T31 issued on 3/7/2008 proposed replacement extraction unit capacity of 1,204,491 tpy soybeans for a processing rate increase of 9.1% (original process capacity of 1,095,372 tpy soybeans per Appendix E - Consent Decree (CD) 05-2037-JMR-FLN signed on February 27, 2006). During conference call on

kind; therefore, Cargill has included the extractor as a new unit in this permit application.⁴ The new absorber and stripper will be installed adjacent to the existing extraction equipment and will control emissions from ES-31, until the second step of the project is completed. This step of the project will not result in any increased throughput, potential or actual, or emissions from the facility.

- The second step of the project is to install the new extractor,⁵ which will utilize the new mineral oil absorber referenced above (Cargill wishes to rename the mineral oil absorber CD31). The existing extractor will be shut down and removed from service prior to startup of the new extraction equipment. At that time, the proposed new mineral oil absorber and stripper will be disconnected from the existing extraction equipment and connected to the new extraction equipment. After the new extractor is installed, the new screw conveyor feeding the extractor will be the bottleneck⁶. Per Cargill's application potential throughput for the extraction process will be limited to 110,000 bushels per day, which equates to 1,204,491.24 tons of soybeans per year.⁷
- As part of the proposed project, the meal drying operation (ES-13), rotary meal cooler (ES-14) and associated cyclones (CY-13 and CY-14) will be shut-down and replaced with a new dryer cooler system (ES-15) originally designed with five (5) cyclones; however, system design parameters changed to only four (4) cyclones.⁸

Cargill is also proposing several changes to the primary dehulling (ES-65) area.

- First, a vertical seed conditioner (VSC)⁹ and associated cyclone will be added. Additional equipment will also be installed to recycle air from the primary dehulling cyclones back to the aspirators. To reduce moisture in the recycle system, a small slip stream will be sent to bagfilter BF-65. Due to higher air flow, the primary dehulling aspirators and cyclones will also be replaced with new units.
- In addition to the new extraction equipment, Cargill will be replacing two (2) fire pumps in the refinery and removing two (2) existing bagfilters (5C and BF10) as part of this project. Emissions from 5C and BF10 will be re-routed to bagfilter BF-65.

Proposed Equipment Changes

June 9, 2015 between DAQ staff (FRO and RCO) and Cargill, Cargill stated that only the desolventizer/toaster was replaced, not the extractor. On June 15, 2015, Mr. Hayden, FRO, sent RCO confirmation via email that replacement was only of the DT unit, which is part of the soybean oil extraction process.

⁴ Ibid 2 - Per Form B9 the proposed extractor unit has a maximum design capacity of 4,583.33 bushels per hour (bph) at 8,760 hours per year (hrs/yr) equates to 40,149,708 bushels of soybeans per year (bpy). Using a weight of 60 pounds per bushel (lbs/b) of soybeans equals 1,204,419.24 (1.2 million) tpy soybeans. [This contradicts new information gained during the June 9th, 2015 conference call as well as information provided by Cargill as part of their application submittal for issued Permit No. 03903T38, which was the basis for their PSD Avoidance condition for PM for the replacement dryer. Specific Condition 2.1-A.5. of their current permit (03903T38), which limits the soybean dryer throughput to less than 1.07 million tpy of soybeans processed in order to avoid triggering PSD; per the application (2600016.13A) submittal the extraction process was the bottleneck.]

⁵ Ibid 2 & 4 - Per Form B9 based on the proposed extractor's maximum design capacity for hexane of 160 lbs per hour input; usage per year equates to 700.8 tons of hexane (VOC).

⁶ Per email correspondence dated September 11, 2014 during replacement of the existing Reddler Downspout raw flake conveyor (ID No. ES-30), the bottleneck of the process was the extractor (ES-31). However, with this significant modification, the new extractor's process rate will be 1,204,419.24 tpy (See footnote 4). Refer to 502(b)(10) submittal (Application No. 2600016.14D). Per Cargill's Initial Title V Permit review the raw flake conveyor (ID No. ES-30) has a process rate of 137.5 tph based on an input process rate of 4,583 bph; which equates to 1,204,412 tpy soybeans processed.

⁷ Ibid 2 - 110,000 bpd, which equates to 1,204,491.24 tpy for a process rate increase of 11.2%
[110,000 bpd * 60 lbs/b * day/24 hrs * 8,760 hrs/yr * ton/2000 lbs]

⁸ Cargill changed the system design of ES-15 from 5 cyclones to 4; thus, DAQ requested submittal of new application forms with PE Seal which were received on August 7, 2015.

⁹ Based on internet searches VSC is manufactured by Crown Iron Works Company. It is a combination heater and dryer used on free flowing granular solids such as soybeans and rapeseed. The heater is a stacked design with multiple heating sections using low-pressure steam heated oval tubes.

Per application submittal for this significant permit modification received on December 19, 2014 and additional information received from February 17, 2015 through August 17, 2015, the following changes were requested (see Form A2, email correspondence and application submittal/amendments for more details):

Equipment to be ADDED –

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-83 ¹⁰	Vertical seed conditioner	CY83	Cyclone (33 inches in diameter)
ES-15 ¹¹	Dryer cooler system	CY15A, CY15B, CY15C, and CY15D CY15E	Five Four cyclones (74-80 inches in diameter each)
ES-31 ¹²	Soybean oil/Hexane solvent extraction process/desolventizer/toaster	CD29 CD31	Packed column mineral oil absorber and scrubber
ES-30 ¹³	Screw Conveyor (1,204,500 tpy soybeans) which transports soybean meat flakes to the solvent extraction process (ES31)	N/A	N/A

Equipment to be MODIFIED –

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-65 ¹⁴	Primary dehulling / Cyclones	BF65, C65D, C65E	Bagfilter (6,738 square feet of filter area) installed on the exhaust of two cyclones (112 inches in diameter, each)
ES-5	Cracking process (consisting of cracking roll mills, and some of the bean conveying equipment)	BF65	Bagfilter (6,738 square feet of filter area)
ES-39	Whole bean storage bin, duo aspirators, and some of the bean conveying equipment	BF65, CF12B	Bagfilter (6,738 square feet of filter area) in series with one simple cyclone (108 inches in diameter)

¹⁰ Ibid 2 - Form B references AP-42 for Emission Factor (EF); however, VSC is a new technology that is not found in AP-42. Through internet searches a similar permit for a Cargill facility in Kansas was found and reviewed for emissions comparison from this unit since Cargill uses EPA's PM emission calculator.

¹¹ Ibid 8

¹² Ibid 2 & 4 - Existing 23 year old soybean oil/hexane solvent extraction process (ID No. ES-31) will be modified with a new larger more efficient unit. The DT (Permit No. 0393T31 issued on 3/7/2008), which is part of the extraction process was previously replaced. Only the 23 year old extractor unit will be replaced during this modification. The proposed unit has capacity of 1,204,419.24 tpy soybeans.

¹³ Ibid 6 - 502(b)(10) request submitted 9/2/2014 to remove CY30 & replace existing raw flake conveyor (ES-30) with new larger screw conveyor. Per application submittal, Projected Actual Emissions (PAE) of 12.28 tpy VOC emissions increase from extraction process (ES-31) due to increase efficiency and less down time with new screw conveyor.

¹⁴ Minor Modification received on July 8, 2014 (Application No. 2600016.14C).

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-18A	Hull grinding operation	BF65, CY9, CY10	Bagfilter (6,738 square feet of filter area) in series with two cyclones (60 inches in diameter, each)

Equipment to be REMOVED –

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-13	Meal drying operation (steam heated)	CY13 ¹⁵	Cyclone (102 inches in diameter)
ES-14	Rotary meal cooling operation and flow agent tank	CY14 ¹⁶	Cyclone (126 inches in diameter)
ES-42 ¹⁷	Natural gas-fired boiler (80 million Btu per hour heat input)	N/A	N/A
ES-30 ¹⁸	Raw flake Reddler downspout / raw flake conveyor	CY30	Cyclone (24 inches in diameter)

Emissions

The latest emissions inventory (EI) data for Cargill is provided in the table at the beginning of this review as reported by Cargill and exported from IBEAM for the last five years emission inventory submittals. In addition 2007 and 2008 EI data have been added due to the baseline emissions period the facility has chosen for VOC emissions for their contemporaneous netting analysis (Refer to PSD Avoidance or 2Q .0317 below). Total Facility-Wide emissions for the facility after controls and limitations are provided in the table below along with the proposed project emissions increases and decreases as presented in Tables from the application submittal or amendments. The emissions summary as presented in below was from Table 3-4 of the original application and Tables from supplemental application amendments were also used to update the summary table below. Based on the Table below net emissions from the proposed project and the sum of all net emissions increases and decreases from the contemporaneous period will be less than PSD SER thresholds for all pollutants. A summary of emissions from each type of source can be found in Appendix B of the application submittal and amendments.

Pollutant	Table B.1-7. Proposed Project Emissions Increase¹⁹	Table B.1-6. Net Emissions Increase Summary (B + C – A + D)²⁰	Potential Emissions – Form D1 (After controls / Limitations)
	Tons per year (tpy)		
Carbon monoxide (CO)	26.6	--	60.55

¹⁵ Permit 03903T37 issued on 9/15/11 for replacement cyclones. Existing cyclones were 17,200 acfm, proposed replacements were 18,000 acfm (CY13) and 30,000 acfm (CY14). 2D .0530(u) condition added (ES-13 & ES-14).

¹⁶ Ibid 15

¹⁷ Permit 03903T35 issued on 10/26/2010 to add as “Temporary Boiler.” Permit 03903T38 issued 9/30/2013 to change from “Temporary Boiler” to ES-42, also part of netting analysis. PSD Avoidance limit for PM added.

¹⁸ Ibid 6 & 13 – Per Cargill’s consultant, Taylor Loftis on July 13, 2015, via teleconference the VOC associated with this change was absorbed into the entire Extraction replacement project.

¹⁹ Appendix B submitted via email on July 31, 2015 from Cargill’s Consultant, Taylor Loftis.

²⁰ Ibid 19

Pollutant	Table B.1-7. Proposed Project Emissions Increase ¹⁹	Table B.1-6. Net Emissions Increase Summary (B + C – A + D) ²⁰	Potential Emissions – Form D1 (After controls / Limitations)
	Tons per year (tpy)		
Nitrogen oxides (NOx)	31.7	--	71.80
Particulate Matter (PM) or Total Suspended Particulate (TSP) of 100 microns (µm) or less	-33.0 (netting)	-33.0	173.37
PM<10 µm (PM ₁₀)	-5.4 (netting)	-5.4	39.06
PM<2.5 µm (PM _{2.5})	3.5 (netting)	3.5	19.92
Sulfur dioxide (SO ₂)*	0.2	--	0.83
Volatile Organic Compounds (VOC)	39.98 (netting) ^a	40	487.4
Lead	0.00016	--	0.000365
Hazardous Air Pollutants (HAP)	--	--	NR
Largest Individual HAP (n-Hexane)	--	--	372.68
Toxic Air Pollutants (TAP)	--	--	NR
GREENHOUSE GASES (GHG)			
Methane (CH ₄)	--	--	NR
Nitrous Oxide (N ₂ O)	--	--	NR
Carbon Dioxide (CO ₂)	--	--	NR
CO ₂ Equivalent (CO ₂ e)	35,095.4	--	79,222

NR = Not Reported

^a Cargill is requesting an avoidance limit for VOC emissions to less than 487.4 tpy Facility-wide.

*SO₂ - Previous years actual emissions were 238.03 tpy for 2010 and 307.93 tpy for 2009 – significant decrease due to replacement of the coal-fired boiler (ID No. 22) with the natural gas-fired boiler (ES-42).

➤ PSD Historical Overview

Permit No. 03903R21 issued on March 15, 2002 was the first permit issued to Cargill that included a PSD avoidance limit for VOC (Hexane). Prior to issuance of R21, the soybean oil/hexane solvent extraction process was listed as using non-photochemically reactive solvent.²¹

Upon issuance Air Quality Permit No. 03903R21 contained a Facility-wide PSD Avoidance condition of less than 662 tons per year VOCs per consecutive 12-month period per Specific Condition A.12 based on the following PSD determination per excerpt from the review for issued permit No. 03903R21:²²

The facility submitted this application as a request to install a new 12,000 ft² (heating tube surface area) steam tube rotary dryer and remove from use, a smaller 4,000 ft² rotary dryer. Cargill is currently permitted to operate two steam tube rotary dryers in parallel, both collectively identified as source ID No. 13. One dryer is 5,500 ft² and the second is 4,000 ft²

Emissions Limit

The Permittee has requested that the facility-wide VOC (hexane) emissions be limited to 662 tpy. This restriction will ensure that the significance level for VOC emissions (40 tpy) is not exceeded, thereby allowing the facility to avoid 15A NCAC 2D .0530 "PREVENTION OF SIGNIFICANT DETERIORATION".

²¹ Please refer to issued permit 03903R20 dated January 23, 2002 and review (Application No. 2600016.01A).

²² Please refer to issued permit 03903R21 dated March 15, 2002 and review (Application No. 2600016.02A).

The Permittee has requested a facility-wide production limit of less than 100,034 bushels of soybean per 24 hour period (midnight to midnight).²³ This will allow the facility to avoid 15A NCAC 2Q .0700 "TOXIC AIR POLLUTANT PROCEDURES".

a. New Equipment:

- i. The addition of one 12,000 ft² (heating tube surface area) steam tube rotary meal dryer
- ii. The removal of one 4,000 ft² steam tube rotary meal dryer

b. Change in Emissions:

PSD Issues

The installation of a 12,000 ft² steam tube rotary meal dryer is considered a modification to the facility. The facility is currently a "major stationary source" and therefore the applicant must demonstrate that this is not a "major modification" by showing that it will not result in a net emissions increase above the PSD significance levels or undergo PSD review. Cargill has elected to define the potential increase associated with this modification to be less than PSD significant. They will do this by taking an enforceable limit on facility-wide VOC emissions set at actual emissions plus 40 tpy.

24 Months Worth of Data Prior to Modification			
Year	Bean Throughput (tpy)	Hexane Usage (gallons)	Hexane Usage (tpy)
2000	796,433	252,951	721
2001	888,000	218,270	622

The applicant included the annual emissions for the two years preceding this change (2000 & 2001). The year 2000 had significantly higher hexane emissions. Cargill explained that that 2000 was characterized by poor operational uptime due in part to equipment reliability. Periods of operational downtime are characterized by higher emissions because the hexane present in the process must be purged and vented in order to safely repair equipment. It was decided that because 2000 included an unusually high number of shutdown events that it was not representative of normal source operation. Therefore the NCDAQ will allow only the 2001 time period as representative of normal source operation.

VOC Limitation

Hexane Usage for 2001 = 218,270 gallons (based on mass balance)

Hexane baseline = (218,270 gallons) x (5.7 lb / gal)²⁴ x (1 ton / 2000 lb) = 622 tpy

Limitation for Hexane Usage = 622 + 40 = 662 tpy

- **Facility-Wide Limitation for Hexane Usage = 662 tpy²⁵**

Note: This limit is consistent with the recommended method of estimating annual hexane emissions from soybean solvent extraction facilities. Both AP-42 and the current MACT practice is to obtain the annual hexane usage from the specific plant's records, and to assume that all hexane make-up is due to losses to the air (AP-42 Section 9.11.1.3)

²³ This limit has been inadvertently omitted from Cargill's permit; thus, during this significant modification it will be added under the 2D .1100 condition. The limit is based on "the maximum actual emission rate at which the sources actually emitted for the applicable averaging period during the two-years preceding the modification."

²⁴ Per Handbook of Chemistry and Physics, *Density of Hexane* is 0.6563 grams/Liter = 5.477 lb/gal. Therefore, the hexane calculation was incorrect and the PSD Avoidance baseline for Hexane was overestimated:

5.5 lb/gallons x 218,270 gallons = 600 tpy

²⁵ A Facility-wide enforceable VOC emissions limit of 662 tpy was set based on current actual emissions from calendar year 2001, baseline actuals of 622 tpy, plus 40 tpy (VOC significant emissions rate) to Permit No. 03903R21 issued on 3/15/2002.

2D .1100 North Carolina Air Toxics

For state air toxics purposes toxics the dryer emits n-hexane which is a NC air toxics. This new dryer has the potential to increase n-hexane emissions however in order to avoid the NC air toxics program Cargill has agreed to cap actual emission at the current level. N-hexane has a 24-hour averaging time, therefore, consistent with the regulations Cargill must cap actual emissions. For TAPs with 24-hour averaging times, actual emissions are defined in the regulation at 15A NCAC 2Q .0703(1)(ii) as “the maximum actual emission rate at which the source actually emitted for the applicable averaging period during the two-year preceding the ... modification.” The applicant reviewed the production records and has determined on November 13, 2001 **the facility processed 100,034 bushels of product (soybeans)**. This 24-hour production rate represents “actual emissions” of n-hexane and therefore **the permit will be conditioned to limit any 24-hour period to less 100,034 bushels processed**. The permit will also contain a quarterly reporting condition that will require Cargill to report the highest 24-hour production rate, in bushels of soybean, over the previous calendar year quarter in order to demonstrate compliance with this production limit.

PM/PM10 emissions are below the PSD Significance Levels of 25/15 tpy. Therefore no restriction for these emissions will be required.

[End of excerpt from review for issued permit 03903R21]

The following table includes changes to Cargill’s permit in regards to PSD Avoidance since inclusion of their Facility-Wide PSD Avoidance condition as discussed above:

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change
03903T22	8/4/2003	Facility-wide ²⁶ <662 tpy VOCs Boiler (ID No. ES-40) < 40 tpy SO2	This Initial Title V Air Permit Application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information was the initial Title V application submitted to the Division on February 13, 1996. Facility-wide includes: Meal Drying and Cooling Operations associated with the Soybean Oil Extraction Process consisting of: one meal drying operation (ID No. ES-13) with associated simple cyclone (ID No. CY-13) and one rotary meal cooling operation (ID No. ES-14) with associated simple cyclone (ID No. CY-14); Soybean oil/hexane solvent extraction process (ID No. ES-31) including two underground hexane storage tanks (ID Nos. ES-29A and ES-29B) with one associated packed column mineral oil absorber (ID No. CD-29), and Floor sweeping No. 1 and No. 2 (ID No. ES-32A and ES-32B); and Oil refinery (ID No. ES-34). To avoid toxics due to potential increases in n-hexane, the permit will contain a condition to limit any 24-hour period to less than 100,034 bushels of product (soybeans) processed.
03903T23	2/10/2004	Facility-wide ²⁷ <662 tpy VOCs Boiler (ID No. ES-40) < 40 tpy SO2	Cargill request the replacement of an existing bagfilter (BF-12, 58 square feet of filter area) with a new one (also identified as BF-12) with a larger filter area (184 square feet of filter area). The facility also submitted an application to correct administrative errors in their initial Title V operating permit.

²⁶ Ibid 25

²⁷ Ibid 25

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change
03903T24	4/30/2004	<p>Facility-wide²⁸ <662 tpy VOCs</p> <p>Boiler (ID No. ES-40) < 40 tpy SO₂</p> <p>Oil refinery (ID No. ES-34) < 56 tpy VOCs</p>	<p>Cargill requests the replacement of the old deodorizer for the oil refinery (ID No. ES-34) with a new unit. In addition to the new deodorizer, several other equipment changes are associated with the proposed project. The existing Dowtherm Boiler (ID No. ES-19) will be replaced by a new natural gas / landfill gas boiler (9.9 million Btu per hour maximum heat input, ID No. ES-20) that will have a heat input of less than 10 million Btu per hour and be classified as an insignificant activity pursuant to 2Q .0503(8). Additional insignificant activities that will be added to the facility include an anhydrous ammonia chiller (capacity less than 10,000 pounds of ammonia), a closed loop non-contact cooling tower that replaces an existing open-contact cooling tower, and ancillary equipment associated with the new deodorizer including pumps, piping and heat exchanger systems.</p> <p>There will be an increase in VOC emissions from this modification. The total potential VOCs from the facility will now be estimated to be 744 tpy. However, this proposed modification conflicts with the current PSD avoidance condition that limits facility-wide VOC emissions. In order to avoid that conflict, the facility requested processing of this application as a significant modification pursuant to 2Q .0516 while utilizing 2Q .0501(d)(2) that allows for construction and operation of the new deodorizer pursuant to 2Q .0504 procedures. However, before beginning operation, the facility shall file an application and obtain a permit modifying the construction and operation permit to meet the requirements of 2Q .0500 pursuant to 2Q .0516.</p> <p>VOC emissions for the modified oil refinery with new deodorizer were calculated using mass balance equations based on operation at maximum capacity and a high hexane content crude oil. Estimated potential emissions from the modified oil refinery are 66 tpy per the application while the past actual emissions from the refinery were approximately 16 tpy. The potential emissions increase is greater than the PSD significance level of 40 tpy of VOCs. Therefore, a new limit on potential VOC emissions [56 tpy = past actuals plus significance level] for the modified oil refinery with new deodorizer (ID No. ES-34 will be set.</p>

²⁸ The facility requested that the current Facility-wide PSD avoidance limit be separated into two PSD avoidance limits: one PSD Avoidance limit for the oil extraction process (ID No. ES-31) and another PSD avoidance limit for the oil refinery (ID No. ES-34). This change was process as a two-step significant modification; therefore, the first part was processed as a 90 significant modification and issued as Permit No. 03903T24. The existing PSD avoidance condition must remain in place until the permit is modified pursuant to 2Q .0516 and goes through EPA and public notice, which was processed and issued as Permit No. 03903T25. The new PSD avoidance limit for the VOC emissions from the refinery will be placed in Part II of the permit to ensure PSD compliance [56=(16+40)]. See review for issued permit No. 03903T25.

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change
03903T25 ²⁹	3/29/2005	Oil extraction process emission sources (ID Nos. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) < 622 tpy VOCs Boiler (ID No. ES-40) < 40 tpy SO2 Oil refinery (ID No. ES-34) < 56 tpy VOCs	<p>Cargill requested the replacement of the old deodorizer for the oil refinery (ID No. ES-34) with a new unit. In addition to the new deodorizer, several other equipment changes were associated with the last modification. The existing Dowtherm Boiler (ID No. ES-19) was replaced by a new natural gas / landfill gas boiler (9.9 million Btu per hour maximum heat input, ID No. ES-20) that has a heat input of less than 10 million Btu per hour and was classified as an insignificant activity pursuant to 2Q .0503(8). Additional insignificant activities that were added to the facility include an anhydrous ammonia chiller (capacity less than 10,000 pounds of ammonia), a closed loop non-contact cooling tower that replaced an existing open-contact cooling tower, and ancillary equipment associated with the new deodorizer including pumps, piping, and heat exchanger systems. Cargill also requested the replacement of the clay conveying receiver operation (ES-26) and associated bagfilter (BF-13) with an enclosed auger system that will have no emission point and not require permitting.</p> <p>The facility requested that the current facility-wide PSD avoidance limit be separated into one PSD avoidance limit for the oil extraction process emission sources (ID No. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) and another PSD avoidance limit for the oil refinery emission sources (ID No. ES-34). DAQ concurs with the facility's description of the independent operation of the oil extraction process and the oil refinery. Since the permit is being modified pursuant to 2Q .0516, the existing facility-wide PSD avoidance limit for VOCs will be replaced by the new PSD avoidance limits (see below) for VOC emissions from the oil extraction process and from the oil refinery.</p> <p>The VOC emissions from the oil extraction process during 2000/2001 calendar years (CY) were calculated by multiplying the total solvent loss from the extraction process by the fraction of solvent emitted to the air from the extraction process (~ 97%). The average oil extraction process emissions were estimated to be 646 tons per year (tpy) during the 2000/2001 CY, and those years were considered to be more representative than the 2001 CY data used in 2002 meal dryer replacement modification. The potential emissions increase was greater than the PSD significance level of 40 tpy of VOCs for the replacement of the steam meal dryer (ES-13) in 2002 (Note: Meal dryer is a part of the oil extraction process). Therefore, a revised limit on potential VOC emissions [686 tons per year = past actuals plus significance level] for the oil extraction process will be set.</p> <p>VOC emissions for the modified oil refinery with new deodorizer (see 03903T24 above).</p> <p>EPA commented that "two significant emission rate limits were applied at the facility (i.e. two – 40 tpy VOC limits added in the calculation). EPA stated that there may be no more than one less than significant emission rate added to the calculated two-year baseline for both limits added to the facility total emissions. EPA considers these two projects (2002 meal dryer and 2004 deodorizer replacements) to be essentially the same modification since the 2002 meal dryer project set a facility-wide (including both the oil extraction and refinery processes) VOC limit of 662 tpy.</p>
03903T26	3/30/2005	No Change	The applicant has requested to install a landfill gas/natural gas fired boiler (ID No. ES41)
03903T27	7/8/2005	No Change	The applicant has requested to replace two cyclones (ID Nos. 6AC and 6BC) on two flake mills (ES6A and ES6B) with one collection system and cyclone (ID No. 6A). The two existing dust collection systems had flow rates of about 5,000 acfm each with each cyclone being 59 inches in diameter. The new system will have a flow rate of 22,500 acfm with a cyclone of 29 inches in diameter.

²⁹ Ibid 28 - In order to alleviate EPA's concerns, Cargill has requested (via letter received by fax on March 23, 2005) to modify the proposed permit by revising the PSD avoidance limit for the oil extraction process from 686 tpy to 622 tpy (the original baseline). The proposed PSD avoidance limit for the oil refinery [56 (=16+40) tpy] will remain the same. EPA approved the change (via email on March 24, 2005). Please refer to review for permit 0393T25 issued on March 29, 2005.

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change
03903T28	10/13/2005	No Change	This application is for: a) To update the TAP emissions limits, b) Remove Hot dehulling (ID No. ES66) from the permit. c) Correct the emission source and device description d) Increase the solvent n-hexane content limit in Permit Condition 2.2 A. 2. a. i. A.
03903T29	12/13/2005	No Change	This administrative amendment was made to the title V permit in order to correct the due date for the annual compliance certification from January 30 to March 1 in General Condition P and other changes as described in the table below:
03903T30	9/24/2007	No Change	This Permit application is for an Administrative Amendment to remove the Boiler MACT requirements from the Air Permit due to vacatur.
03903T31	3/7/2008	Oil extraction process emission sources (ID Nos. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) < 622 tpy VOCs* Boiler (ID No. ES-40) < 40 tpy SO2 Oil refinery (ID No. ES-34) < 56 tpy VOCs *Added a <u>2D .0530(v)</u> condition for replacement of (ID No. ES-31). <u>Now 2D .0530(u)</u>	The purpose of this application - renewal with modification to the existing 23 year old soybean oil/hexane solvent extraction process (ID No. ES31) with a larger new unit ³⁰ in the soybean oil/hexane solvent extraction process desolventizer/toaster.* However, only the soybean oil/hexane solvent extraction process replacement and enforcement of Consent Decree 05-2037-JMR-FLN were taken care of as part of this permit modification (application No. 2600016.07D) The new unit will be larger and expected to operate more efficiently by the addition of another deck (the current scrubber has 7 decks). The new unit will incorporate best management practices by capturing solvent hexane vapors and recondense the vapors for reuse in the soybean oil/hexane solvent extraction process. This modification will not result in an increased process rate for the source. The mineral oil scrubber (ID No. CD29) will not be modified as part of the proposed project. Pursuant to 2D .0530(v), the applicant relied on the use of PAE emissions to demonstrate that replacement of the solvent extraction process (ID No. ES-31) would not result in a significant emissions increase. The applicant (2600016.06C) also requested a particulate matter standard on their existing landfill gas and natural gas-fired boiler (ID No. ES41) to comply with NSPS subpart Dc regulation. The applicant eventually withdrew this request. Enforcement of Consent Decree 05-2037-JMR-FLN: The consent decree (CD) signed on February 27, 2006 by the applicant and EPA listed this facility as being subject to certain requirements as outlined below: Appendix A - Oilseed Processing, Appendix B - Boiler SO2 emission control plan, Appendix D - NOx emissions, Appendix E - VOC emissions – Soybean Processing Plants, Appendix M - Performance testing plan for boiler ES22, and Appendix N - Extraction Solvent Loss Record Keeping Template. The applicant opted to comply with only the appendix A and N with this application. Per the CD Cargill was supposed to come in and request to modify the SLR if any plant capacity changed within 3 years of issuance of the CD.

³⁰ Ibid 3 & 4 - Review for issued Permit No. 03903T31 indicates the extractor was replaced with a 1.2 million tpy extractor; however, per conversations with Cargill and documentation from FRO it appears that the extractor was never actually replaced, only the DT. Appendix E of CD listed the Fayetteville facility as 1,095,372 tons soybeans per year capacity. Per review of the CD Cargill was supposed to come in and request to modify the SLR in their current permit at the time of modification if any plant capacity changed within 3 years of issuance of the CD; however, Cargill states that they did not change capacity; thus, this was not required.

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change				
03903T32	7/11/2008	No Change	<p>This application is for the renewal for their Title V permit.</p> <p>The applicant requested that the emission source ID Nos. ES6A and ES6B now be listed as once source (This is essentially a single source, ID No. ES-6) and the ID No., change for cyclone (ID No. 6C) to (ID No. ES-6C). This source and control device will now be listed in the permit as described below:</p> <table border="1"> <tr> <td>ES-6</td><td>Soybean flaker process</td><td>6C</td><td>cyclone (29 inches in diameter)</td></tr> </table>	ES-6	Soybean flaker process	6C	cyclone (29 inches in diameter)
ES-6	Soybean flaker process	6C	cyclone (29 inches in diameter)				
03903T33	2/24/2010	Removed Boiler (ID No. ES-40) < 40 tpy SO2	<p>Removed ES-40 per facility request received July 23, 2009 as part of their modeling submittal</p> <p>Director's Call or "Gang of 42"</p>				
03903T34	4/27/2010	No Change	<p>This application review will focus only on developing an appropriate 112j permit, meeting all applicable requirements in 15A NCAC 2D .1109, for the following affected sources:</p> <ul style="list-style-type: none"> Coal/No. 6 fuel oil/No. 2 fuel oil/natural gas/landfill gas/refinery skimmings/reducer oil-fired boiler (129 million Btu/hr heat input rate, ID No. ES-22) Landfill gas/natural gas-fired boiler (53 million Btu per hour heat input for landfill gas and 99 million Btu per hour for natural gas, ID No. ES-41) Natural gas/landfill gas-fired boiler (9.9 million Btu per hour heat input, ID No. ES-80) 				
03903T35	10/26/2010	No Change	<p>This permitting action is for modification of an existing Title V permit to add one natural gas-fired temporary boiler (80 million Btu per hour, ID No. ES-TEMP). The unit is a temporary boiler used to provide steam to the Cargill Fayetteville facility soybean oil manufacturing process. The facility currently has BACT limits for PM, NOx and SO₂; as well as PSD avoidance conditions for VOCs and SO₂. This modification was evaluated for PSD and there are no pollutants above the SER threshold associated with this significant modification; therefore, a PSD review is not triggered at this time.</p>				
03903T36	5/2/2011	No Change	<p>In accordance with 2Q .0514 "Administrative Permit Amendments", the Permittee is seeking a permit revision to clarify that the particulate matter (PM) BACT limit (0.1 lb/million Btu) for an existing, 129 million Btu/hr coal/No. 6 fuel oil/natural gas-fired boiler, in Section 2.1 E.4. a. includes only "filterable" PM emissions.</p>				

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change																				
03903T37	9/16/2011	<p>Oil extraction process emission sources (ID Nos. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) < 622 tpy VOCs*</p> <p>Oil refinery (ID No. ES-34) < 56 tpy VOCs</p> <p>*Added 2D .0530(u) condition for replacement of simple cyclones (ID No. CY13 and CY14)</p>	<p>This application for a permit modification is made to replace two simple cyclones (ID Nos. CY13 and CY14) installed on existing meal drying and rotary meal cooling operations (ID Nos. ES13 and ES14). New cyclone (CY13, 102 inches in diameter) is the same diameter as the existing cyclone being replaced. New cyclone (CY14, 126 inches in diameter) is slightly larger in diameter than the existing cyclone being replaced (102 inches in diameter).</p> <p>The existing cyclones were originally permitted with an air flow rate of 17,200 acfm. The air flow rates for the proposed replacement cyclones will be; 18,000 acfm for CY13, and 30,000 acfm for CY14.</p> <p>Cargill is an existing major stationary source with a potential to emit over 250 tpy of NOx, SO2, VOC, and PM. According to the application, Cargill has calculated past actual emissions from ES13 and ES14 using the grain loading rate (0.03 gr/CF), exhaust flow rate, and actual hours of operation from the 24-month period from January 1, 2007 to December 31, 2008 (5,756 hours). Cargill has calculated future projected actual emissions based on outlet grain loading (0.03 gr/CF), new exhaust flow rates, and projected hours of operation (8,040 hours). PM-10 and PM-2.5 emissions are calculated using speciation data provided in EPA’s PM Calculator. Cargill has evaluated the actual emissions increase in accordance with the definition in 40 CFR 51.166(a)(7)(iv)(c).</p> <p>The following table taken from the application compares past actual emissions to projected actual emissions.</p> <table><tr><th>Pollutant</th><th>Past Actual (tpy)</th><th>Future Projected Actuals (tpy)</th><th>Emissions Increase (tpy)</th><th>Significant Emission Rate (tpy)</th></tr><tr><td>PM</td><td>25.46</td><td>49.62</td><td>24.16</td><td>25</td></tr><tr><td>PM-10</td><td>15.53</td><td>30.27</td><td>14.74</td><td>15</td></tr><tr><td>PM-2.5</td><td>5.86</td><td>11.41</td><td>5.56</td><td>10</td></tr></table> <p>Potential emissions from ES13 and ES14 based on 8,760 hours per year are; PM = 54.06 tpy, PM-10 = 32.98 tpy and PM-2.5 = 12.43 tpy.</p> <p>*Pursuant to 15A NCAC 2D .0530(u), the applicant relied on the use of projected actual emissions to demonstrate that the modification involving the replacement of simple cyclones (ID No. CY13 and CY14) [2600016.11A] would not result in a significant emissions increase.</p>	Pollutant	Past Actual (tpy)	Future Projected Actuals (tpy)	Emissions Increase (tpy)	Significant Emission Rate (tpy)	PM	25.46	49.62	24.16	25	PM-10	15.53	30.27	14.74	15	PM-2.5	5.86	11.41	5.56	10
Pollutant	Past Actual (tpy)	Future Projected Actuals (tpy)	Emissions Increase (tpy)	Significant Emission Rate (tpy)																			
PM	25.46	49.62	24.16	25																			
PM-10	15.53	30.27	14.74	15																			
PM-2.5	5.86	11.41	5.56	10																			

Permit #	Issue Date	2Q .0317 PSD Avoidance	Description of Change
03903T38	9/30/2013	<p>Oil extraction process emission sources (ID Nos. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) < 622 tpy VOCs*</p> <p>Oil refinery (ID No. ES-34) < 56 tpy VOCs</p> <p>*Added PM 2Q .0317 Avoidance condition for replacement of Soybean dryers (ID No. ES-16 & ES-17)</p>	<p><i>This permit application is for addition of one new natural gas-fired grain dryer. The dryer will be capable of processing up to 18,000 bushels of grain per hour, will have a maximum heat input capacity of 53 million Btu per hour and will replace two existing grain dryers at the facility. The proposed direct-fired soybean dryer (ID No. ES-82) will perform the same function as two existing dryers (ID Nos. ES-16 & ES-17) that will be decommissioned.</i></p> <p>As part of the modification request, the following changes were also requested:</p> <ul style="list-style-type: none"> ✓ Removal of existing coal-fired boiler (ID No. 22) and all associated coal and ash handling equipment; ✓ Add requirements for an existing fire pump; and ✓ Make other administrative changes to the permit. <p>Cargill is submitting this application to install a new soybean dryer with a drying capacity of 18,000 bushels per hour. The two existing soybean dryers (ID Nos. ES-16 and ES-17) will be shut down and removed. The new dryer will be direct fired with two natural gas burners with a maximum heat input capacity of 45 million Btu/hr. The total facility production capacity will not increase as a result of the proposed project, as the drying operation is not the bottleneck at the facility. The facility is limited by the extraction process, which has a maximum throughput of 1.07 million tons of soybeans per year and is not being modified as part of this project.</p> <p>In accordance with Rule 2Q .0317 Avoidance Condition for 2D .0530 for Particulate, the Permittee is avoiding the applicability of 15A NCAC 2D .0530(g) for soybean dryer (ID No. ES-82) by limiting the soybean dryer throughput to less than 1,070,000 tons per year of soybeans per consecutive 12-month period.</p>

In addition to requirements provided in Section 3 – General Conditions, this facility is currently subject to the following regulatory requirements:

15A NCAC 2D .0515 “Particulates from Miscellaneous Industrial Processes”
15A NCAC 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”
15A NCAC 2D .0521 “Control Of Visible Emissions”
15A NCAC 2D .0524 “New Source Performance Standards” (40 CFR Part 60, Subpart Dc, DD)
15A NCAC 2D .0535 “Excess Emissions Reporting and Malfunctions”
15A NCAC 2D .0614 “Compliance Assurance Monitoring” (40 CFR Part 64, CAM Rule)
15A NCAC 2D .0958 “Work Practices for Sources of Volatile Organic Compounds”
15A NCAC 2D .1100 “Control of Toxic Air Pollutants”
15A NCAC 2D .1109 “Case-by-Case Maximum Achievable Control Technology (MACT)”
15A NCAC 2D .1111 “Maximum Achievable Control Technology (40 CFR 63, Subpart GGGG, ZZZZ)”
15A NCAC 2D .1806 “Control and Prohibition of Odorous Emissions”
15A NCAC 2Q .0317 “AVOIDANCE CONDITIONS” for 15A NCAC 2D .0530 (PM and VOC)
15A NCAC 2Q .0700 “Toxic Air Pollutant Procedures”
15A NCAC 2Q .0705 “Existing Facilities and SIC Calls”
15A NCAC 2Q .0711 “Emission Rates Requiring a Permit”
15A NCAC 2Q .0712 “Calls by the Director”
Consent Decree 05-2037-JRM-FLN

Regulations added/updated/reviewed/modified significantly as part of this significant modification are:

- 15A NCAC 2D .0530 “PREVENTION OF SIGNIFICANT DETERIORATION” (PM, NO_x and SO₂)

Cargill was previously subject to PSD BACT limits for an existing Coal/No. 6 fuel oil/No. 2 fuel oil/natural gas/landfill gas/refinery skimmings/reducer oil-fired boiler (129 million Btu per hour heat input). The previous permit contained BACT limits for PM, NO_x and SO₂ associated with the existing boiler (ID No. ES-22), which were removed along with the boiler during the last permit modification (issued permit No. 03093T38). Cargill originally proposed including this boiler (ID No. ES-22) in the netting analysis; however, per teleconference between DAQ (Mr. Don van der Vaart, Mr. John Evans and this review engineer) and Cargill via Trinity (Mr. Taylor Loftis and Mr. Tony Jabon) this was not allowed as part of the netting analysis due to the timeframe in which the boiler was shutdown.

- 15A NCAC 2Q .0317 “AVOIDANCE CONDITIONS” for 15A NCAC 2D .0530 (PM and VOC)

Currently Cargill’s permit contains the following PSD avoidance conditions:

Pollutant	Limit	Source	Permit Condition
Particulate Matter	Soybean dryer throughput to less than 1,070,000 tons of soybeans processed per year	Direct-fired pre-cleaned soybean dryer (ID No. ES-82)	Specific Condition 2.1-A.5
Volatile Organic Compounds	Emissions shall be less than 56 tons per year consecutive 12 month period	Oil refinery (ID No. ES-34) with refinery building, deodorizer, storage tanks, truck loading area, and refinery sump.	Specific Condition 2.1-G.2
	Less than 622 tons per year	Oil Extraction Process consisting of the following: One Soybean oil/hexane solvent extraction process (ID No. ES-31) including two underground hexane storage tanks (ID Nos. ES-29A and ES-29B) with packed column mineral oil absorber (ID No. CD-29), and Floor sweeping No. 1 and No. 2 (ID No. ES-32A and ES-32B); Meal Drying operation (ID No. ES-13) with simple cyclone (ID No. CY-13); and Rotary meal cooling operation (ID No. ES-14) with simple cyclone (ID No. CY-14)	Specific Condition 2.2-C.1.

- ❖ 2D .0530(u) Use of Projected Actual Emissions to demonstrate that the replacement of the solvent extraction process (ID ES-31) would not result in a significant emissions increase.
- ✓ Based on the Annual PSD Avoidance Report submitted on February 21, 2014 the 2013 throughput was 837,577 tpy soybeans processed (27,916,441 bushels/yr). Projected was 1,095,372 tpy soybeans processed (36,508,749 bushels/yr); thus, compliance indicated.
- ❖ 2D .0530(u) Use of Projected Actual Emissions to demonstrate that the modification involving replacement of simple cyclones (ID No. CY13 and CY 14) would not result in a significant emissions increase.

- ✓ Based on the Annual PSD Avoidance Report submitted on February 21, 2014 the 2013 operating hours for ES-13 and ES-14 are calculated based on the total soybeans processed (tons) and equipment throughput rate of 110 tons/hr; therefore, operating hours = 837,577 tpy soybeans processed/110 tph = 7,614.34 hours.

Emission Source	Control Device	Grain Loading (gr/CF)	Flow rate (ACFM)	Pollutant	2013 (lb/hr)	2013 (tpy)	Projected Emissions (tpy)
ES-13	CY13	0.03	18,000	PM	12.34	46.99	49.62
				PM10	7.53	28.66	30.27
ES-14	CY14		30,000	PM2.5	2.84	10.81	11.41

- ✓ $18,000 \text{ acfm} * 0.03 \text{ grains/cf} * 1 \text{ lb/7,000 grains} * 60 \text{ min/hr} = 4.6286 \text{ lbs/hr outlet PM} * 7,614.34 \text{ hours} * 1 \text{ ton/2000 lbs} = 17.62 \text{ tpy PM}$
- ✓ $30,000 \text{ acfm} * 0.03 \text{ grains/cf} * 1 \text{ lb/7,000 grains} * 60 \text{ min/hr} = 7.7143 \text{ lbs/hr outlet PM} * 7,614.34 \text{ hours} * 1 \text{ ton/2000 lbs} = 29.37 \text{ tpy PM}$
- ✓ $[17.62 + 29.37] \text{ tpy PM} = 46.99 \text{ tpy PM}$; thus, compliance indicated.

The 2D .0530(u) conditions have been satisfied or as part of this modification are no longer necessary; thus, they will be removed during this significant permit modification.

15A NCAC 2D .0530 "PREVENTION OF SIGNIFICANT DETERIORATION" (PM and VOC)

Cargill - Fayetteville is an existing major PSD stationary source with a potential to emit over 250 tpy of VOC and PM thresholds. Thus, the net emissions increases from the project must be compared to the PSD Significant Emission Rates (SER) to determine if PSD permitting is triggered. According to the application, Cargill has determined that the net emissions increase from the project will not exceed any PSD SER. Although the proposed changes were previously described under Section 1 above and the beginning of this section, a recap was summarized below for convenience.

Cargill is submitting this application to install the following new equipment:

- Replace the mineral oil absorber (ID No. CD-29) on the existing solvent extraction process (ID No. ES-31)³¹ with a new unit to better recover solvent from the current extraction process.
- The second step of the project is to install a new solvent extractor (ID No. ES-31)³², which will utilize the new mineral oil absorber referenced above. After the new extractor is installed, the screw conveyor feeding the extractor will be the bottleneck³³. Potential throughput for the extraction process will be limited to 110,000 bushels per day (1.20 million tons of soybeans per year).³⁴
- As part of the proposed project, the meal drying operation (ES-13), rotary meal cooler (ES-14) and associated cyclones (CY-13 and CY-14) will be shut-down and replaced with a new dryer cooler system (ID No. ES-15) with four (4) cyclones.³⁵

Cargill is also proposing several changes to the primary dehulling (ES-65) area:

³¹ Ibid 3

³² Ibid 4

³³ Ibid 12 & 13

³⁴ Ibid 7 - After this modification the new screw conveyor will have a process rate of 1,204,500 tpy of soybeans; the extractor will have a process rate of 1,204,491.24 tpy of soybeans. Thus, essentially equivalent, yet the conveyor is approximately 10 tpy larger.

³⁵ Ibid 8

- A Vertical Seed Conditioner (ID No. ES-83)³⁶ and associated cyclone will be added.
- Cargill will be replacing two (2) existing emergency fire-pumps in the refinery with two new CI emergency diesel-fired firepumps.³⁷
- Removing two (2) existing bagfilters (5C and BF10) as part of this project.
- Emissions from 5C and BF10 will be re-routed to bagfilter BF-65.
- Overflow to bagfilter (BF-65) will be reduced from 50,000 to 29,000 ACFM.

Cargill's application³⁸ states "Overall increase in emissions from all existing emission sources due to the increased capacity of the proposed extractor (ES-31)"

Based on their application, "As summarized in Table 1-1. Proposed Project Emissions Increases, net emission increases from the proposed project and the sum of all net emission increases and decreases from the 5 year contemporaneous period will be less than the PSD major modification thresholds for all pollutants."

Per Cargill's application submittal Section 3 – Emission Calculation Methodology, the methodology used in the project emissions increase evaluation conducted to assess PSD applicability under the NSR program is provided.

Cargill believes that, due to extended economic downturn in recent years, a five-year window for baseline actual emissions is not fully representative of operations at the Fayetteville facility. Therefore, Cargill requests to utilize the full ten-year PSD window under 40 CFR 52.21.

Emissions increases for this project were calculated using a baseline period from April 2007 to March 2009 for VOC, and January 2012 to December 2013 for all other pollutants.

Since the bottleneck is in the extraction process the equipment upstream is not required to operate continuously; thus, the baghouses and cyclones will not be required to operate 8,760 hours per year to supply the annual potential throughput of 1,070,000 tons of soybeans.³⁹ Cargill has used 8,040 hours per year as their projected actual hours of operation for the cyclones and baghouses. The process equipment upstream of the extraction area operates at about 150 tons per hour, which results in roughly 7,133 hours per year to produce 1,070,000 tons of soybean to be processed through the dryer.

In order to demonstrate that the project will not trigger PSD permitting, Cargill has calculated post project emissions based on facility potential throughput. The resulting PSD permitting calculations are based on past actual throughput of 883,154 tons of soybeans processed per year and potential throughput of 1.07 million tons of soybeans processed per year after the completion of the proposed project.

- ❖ Cargill is requesting emission limits to ensure that the net emissions increase from this proposed extraction project will not exceed any PSD Significant Emissions Rate (SER).

Since Cargill is a major stationary source, the non-applicability to PSD⁴⁰ must be addressed, including a determination of whether the modification to add the proposed new equipment, removal and/or modification of existing equipment which results in "debottlenecking"⁴¹ is in and of itself a major modification per 40 CFR 51.166.

³⁶ Ibid 9

³⁷ Refer to minor modification request (Application No. 2600016.14B) received on February 27, 2014.

³⁸ Ibid 2

³⁹ Ibid 2 & 4 – This is not the potential of the extraction process based on Form B9. This is Cargill's PSD Avoidance limit for PM placed in issued Permit No. 03903T38 for addition of Soybean dryer (ID No. ES-82) "contemporaneous netting analysis."

⁴⁰ Please refer to 15A NCAC 2D .0530 or Title 40 of the Code of Federal Regulations 51.166.

⁴¹ Ibid 2 – Cargill's application contradicts itself on the process rate of the extractor so this has to be sorted out.

40 CFR 51.166(2)(i)⁴² defines *major modification* as any physical change in or change in the method of operation of a major stationary source that would result in: a significant emissions increase (as defined in paragraph (b)(39) of this section) of a regulated NSR pollutant (as defined in paragraph (b)(49) of this section); and a significant net emissions increase of that pollutant from the major stationary source.

40 CFR 51.166(b)(2) outlines the steps necessary to make this decision.

- ✓ Step 1 – Physical Change? Yes, due to the new sources being added and existing sources being modified or removed as summarized above.

*“The proposed extractor, mineral oil absorber, primary dehulling aspirators and cyclones, VSC, and dryer cooler system **will not be identical or functionally equivalent to any existing equipment.** Therefore, the proposed extractor, mineral oil absorber, VSC, and dryer cooler system **do not meet the definition of a replacement unit in 40 CFR 52.21(b)(33) and will be classified as new units.**”⁴³*

DAQ sent an additional information request to Cargill on March 6, 2015 regarding the proposed extractor being “new” or “existing” in Cargill’s response dated March 22, 2015 they state “As you mentioned, we have listed emission source ID No. ES-31 as “modified” on Form A2. We have also noted that we are replacing the extractor and mineral oil absorber with “new” equipment. Both of these statements are indeed true because emission source ID No. ES-31, as you noted in your email also contains the desolventizer/toaster (DT), which will not be replaced as part of this project. Based on that, we believe that the most accurate way to describe emission source ES-31 on Form A2, is “modified.”

Based on a review of Title 40 – Protection of Environment, Chapter I, Subchapter C, Part 51, Subpart I – Review of New Sources and Modifications § 51.166 Prevention of Significant Deterioration of Air Quality of the electronic Code of Federal Regulations (CFR) by this review engineer, to meet the definition of a replacement unit as defined in §51.166 Prevention of Significant Deterioration of Air Quality (b) Definitions:⁴⁴

(32) *Replacement unit* means an emissions unit for which all the criteria listed in paragraphs (b)(32)(i) through (iv) of this section are met. No creditable emission reductions shall be generated from shutting down the existing emissions unit that is replaced.

(i) The emissions unit is a reconstructed unit within the meaning of §60.15(b)(1) of this chapter, or the emissions unit completely takes the place of an existing emissions unit.

(ii) The emissions unit is identical to or functionally equivalent to the replaced emissions unit.

(iii) The replacement does not change the basic design parameter(s) (as discussed in paragraph (y)(2) of this section) of the process unit.

(iv) The replaced emissions unit is permanently removed from the major stationary source, otherwise permanently disabled, or permanently barred from operation by a permit that is enforceable as a practical matter. If the replaced emissions unit is brought back into operation, it shall constitute a new emissions unit.

Per Section 3.4.3 Extractor With this application Cargill is proposing a PSD Avoidance limit of 476.5 tons of VOC per 12-month rolling period for the extraction (i.e. solvent loss).⁴⁵

- ✓ Step 2 – Significant Emissions Increase? Yes

Based on DAQ’s interpretation of PSD regulations and information provided with the application, the proposed extractor is a new unit with potential to emit (PTE) of 462.21 tpy VOC per Table 3-3, Projected Actual Emissions (PAE) associated with this modification of 25.15 tpy VOC per Table B.1-2 and Baseline Actual Emissions (BAE) of 16.87 tpy based on Table B.1.1-1, which equates to an emissions increase summary of 470.5 tpy VOC (SER for VOC

⁴² Please see attached documentation [Unit 4 & 5]

⁴³ Ibid 2

⁴⁴ 40 CFR Part 51§ 51.166 Prevention of Significant Deterioration of Air Quality (b) Definitions (32) Replacement

⁴⁵ Ibid 2

is 40 tpy) per Table 3-4, which also shows an increase above significance (SER) for PM/PM₁₀/PM_{2.5} of 25/15/10, respectively; thus, the analysis proceeds to a netting analysis.

✓ Step 3 – Significant Net Emissions Increase?

Net emissions increase (NEI) is defined by 40 CFR 52.21(b)(3)(i):⁴⁶

“Net Emissions Increase” means, with respect to any regulated NSR pollutant ... the amount by which the sum of the following exceeds zero:

(a) The increase in emissions ... as calculated pursuant to paragraph (a)(2)(iv) [for existing units, calculated by actual-to-projected actual or actual-to-potential; for new units, calculated by actual to-potential] of this section; and

(b) Any other increases or decreases in actual emissions...that are contemporaneous with the particular change and are otherwise creditable. Baseline emissions for calculating increases and decreases...shall be determined as provided...

The “project emission increases” accounts only for emissions related to the proposed project itself. If the emission increases estimated exceed the major modification thresholds, then the applicant may perform a 5-year contemporaneous netting analysis. The netting analysis includes all projects for which emission increases or decreases occurred. If the resulting net emission increases exceed the major modification threshold after completing the netting analysis, then NSR permitting is required.

Cargill is proposing a PSD avoidance limit of 476.5 tons of VOC for the extractor. During DAQ’s conference call with Cargill on June 9, 2015 it was determined that the proposed extractor did not meet the definition of replacement because of the basic design parameters of the proposed new extractor as discussed in paragraph (y)(2) of 40 CFR Part 51§ 51.166 (b) Definitions (y) Equipment Replacement Revisions (2) Basic Design Parameters;⁴⁷ thus, it will be considered a new unit for PSD purposes and the analysis must be based on the units potential to emit (PTE), see *Replacement* definition above or refer to the CFR for more information.

Cargill must clearly demonstrate using the following equation [B+D-A+C] that the sum of all values does not exceed the Significant Emissions Rate (SER), where:

A = Baseline Actual Emissions (BAE)

B = Projected Actual Emissions (PAE) for existing sources

C = Contemporaneous Increases and Decreases

D = Potential to Emit (PTE) for new sources

In this case Cargill’s contemporaneous netting analysis was provided in Table 3-5 of the application submittal.⁴⁸

Based on Cargill’s netting analysis as presented in Section 3-4 of the application for VOC emissions and summarized below:

$$[B+D-A+C] = [(B+D-A)=(25.14+462.21-16.87) = [470.48 +C]=[470.48+ (0.97-0.53+1.31-432.29)] = [470.48-430.54] = 39.94 \text{ tpy VOC increase, which is below the 40 ton SER for VOC.}$$

Volatile Organic Compounds (VOC) Emissions are:

Based on the process at Cargill prior to the extractor as stated above all emissions are PM. The “flaked” soybean meat leaves the **Raw Soybean Processing** via the currently permitted Raw Flake Conveyor (ID No. ES-30) controlled by cyclone (CD No. CY30)⁴⁹ which has a process rate of 137.5 tons per hour or 4,583 bushels per hour, which is equivalent to 1,204,412 tons per year of soybeans.

⁴⁶ Please refer to 40 CFR Part 52§ 52.21

⁴⁷ 40 CFR Part 51§ 51.166 Prevention of Significant Deterioration of Air Quality (b) Definitions (32) Replacement

⁴⁸ Ibid 2

⁴⁹ Ibid 13 - The Raw Flake Conveyor will be replaced by a new Screw Conveyor sized to 110,000 bushels per day (4,583.33 bushels per hour), which is equivalent to 1,204,500 tons per year of Soybeans.

For the extractor (ID No. ES-31), the proposed new equipment's process rate would be taken from the completed form(s); then the VOC emissions would be calculated as follows:

Based on Cargill's application submittal and the additional information received via email from Mr. Taylor Loftis on March 22, 2015 the proposed Soybean oil/Hexane solvent extraction process/desolventizer/toaster (ID No. ES-31), from here after referred to as the Extractor, has a maximum design capacity of 4,583.33 bushels per hour soybeans and 160 lbs per hour of hexane entering the process per Form B9 – Emission Source.

Per Form B9 Maximum Design Capacity = 4,583.33 bushels of soybeans per hour & 160 lbs of hexane per hour

- ✓ $4,583.33 \text{ bushels/hr} * 60 \text{ pounds/bushel soybeans}^{50} * \text{ton}/2000 \text{ lb} * 8,760 \text{ hours/year} = 1,204,499 \text{ tons Soybeans per year processed}$

$4,583.33 \text{ bushels/hr} * 60 \text{ pounds/bushel soybeans} * \text{ton}/2000 \text{ lb} * 0.19 \text{ gallons solvent/tons soybean}^{51} * 5.5 \text{ lbs hexane/gal solvent}^{52} * \text{ton}/2000 \text{ lb} * 8,760 \text{ hours/year} = 629.35 \text{ tons per year VOC (Hexane is a VOC/TAP; n-Hexane is a VOC/HAP/TAP)}$

- ✓ $160 \text{ lbs hexane/hr} * \text{ton}/2000 \text{ lbs} * 8,670 \text{ hrs/yr} = 700.8 \text{ Hexane (VOC/TAP)}$

Therefore, the PTE for the proposed extractor is 629 tons per year VOC, which exceeds the 40 tons per year SER. The modification is and of itself significant; hence, netting is required.

Thus, based on the above PTE of 629.35 tpy for VOC emissions from the proposed extractor, the information submitted in Appendix B of Cargill's application used for netting would be:

Cargill's consultant, Taylor Loftis, wanted to discuss the additional information requests and the remaining PSD issues; therefore, a teleconference was scheduled for June 23, 2015. That morning Mr. Loftis sent an email regarding how they determined emissions from the VOC and PM sources, including detailed instructions on how they utilized the EPA PM Calculator, as well as a step by step walk through as to how Cargill arrived at their PSD Avoidance limitation for VOC from the new extraction equipment of 476.5 tpy. The following attendees were on the teleconference, Cargill's consultant, Taylor Loftis and DAQ representatives (Judy Lee of RCO; Robert Hayden, Gregory Reeves and Steven Vozzo of FRO). During the teleconference VOC emissions from the solvent loss crush plant and off-site oil refinery were discussed as well as Cargill's true potential of 629 tpy VOC emissions from the extraction process. Cargill provided a new netting analysis that shows they are below the 40 ton SER for VOCs. Cargill would like to limit how much solvent loss (100% VOC) can be lost from the extractor and track it monthly in order to stay below the SER. Cargill also stated that they used EPA's PM Calculator to calculate their PM emissions and assume $PM_{10} = PM_{2.5}$. Taylor stated that the PM emissions calculator requires you to enter everything into a SIC calculator which is basically an Access database and then you choose the control devices, etc.

- The VOC emissions information provided via email from Mr. Loftis on June 23, 2015 are summarized below:

VOC Emissions from the Fayetteville facility can be separated into three categories:

- Emissions from Combustion
- Emissions from Refining
- Emissions from Solvent Loss

Solvent loss emissions from the facility are generated by hexane solvent usage in the crush plant. The solvent is stored in tanks (ES-29a and ES-29b) and introduced into the process in the extractor, which is one piece of equipment in the extraction process (ES-31). Due to the nature of the process, solvent emissions are released from several points downstream of the extractor (drying, cooling, and mineral oil scrubber vent), as well as portions emitted as fugitives

⁵⁰ USDA Weights, Measures, and Conversion Factors for Agricultural Commodities and Their Products, Agricultural Handbook Number 697, Table 31 – Soybean Products, Page 43, http://ers.usda.gov/media/935958/ah697_002.pdf

⁵¹ Current permitted Solvent Loss Ratio (SLR) due to CD

⁵² Ibid 24

and some amount remaining in the crude oil produced. Emissions of VOC from solvent loss are calculated using a mass balance approach, provided in Condition 2.2-D.9 of the Title V permit. The equations provided in Condition 2.2-D.9 provide the methodology for calculating annual emissions from solvent loss. An example calculation for the period from

Actual Emissions

$$\text{VOC (tons)} = \text{12-Month Rolling Solvent Loss [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

Where:

$$\text{12-Month Rolling Solvent Loss} = \sum (\text{Monthly Solvent Loss [gal]})_i$$

Sum from $i=1$ to $i=n$

Where:

$$\text{Monthly Solvent Loss} = (\text{SOLV}_B + \text{SOLV}_E + \text{SOLV}_R \pm \text{SOLV}_A)$$

Where:

SOLV_B = Solvent Inventory at the beginning of the month

SOLV_E = Solvent Inventory at the end of the month

SOLV_R = Solvent Shipments received during the month

SOLV_A = Solvent Adjustment (zero, unless calculating solvent loss for MACT ratio)

n = Number of months in the calculation period, usually 12

Actual Emissions from April 2007 through March 2009

April 2007 – March 2008

$$\text{VOC (tons)} = 157,864 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 434.1 \text{ tons}$$

April 2008 – March 2009

$$\text{VOC (tons)} = 166,255 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 457.2 \text{ tons}$$

Actual Emissions (Annual Average of 24-month period)

$$\text{VOC (tons)} = (157,864 \text{ [gal/yr]} + 166,255 \text{ [gal/yr]}) \div 2 \text{ [years]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 162,060 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = \mathbf{445.7 \text{ [tons]}}$$

PSD Net Emissions Increase (VOC)⁵³

The PSD SER for VOC is 40 tons per year, which is the maximum allowed net emissions increase resulting from a project without triggering PSD permitting. The PSD net emissions increase for this project was calculated as follows:

$$\text{Net Emissions Increase (tpy)} = \text{Potential to Emit from New Units} + \text{Projected Actual Emissions from Associated Units (tpy)} - \text{Baseline Emissions from Associated Units (tpy)} \pm \text{Emissions from Contemporaneous Projects (tpy)}$$

Potential to Emit from New Units (tpy)

- Extraction (ES-31, includes releases from ES-15 (dryer/cooler), ES-34 (refinery), and all fugitive releases)

Potential to Emit from Solvent Loss in Extraction (tpy): = 476.5 tons per year

➤ Cargill requests that the potential to emit from the new extraction process be limited to 476.5 tpy.

Projected Actual Emissions from Associated Units

- Refinery (ES-34, non-Fayetteville oil)

Projected Actual VOC increase from refining (tpy): 7.09 tpy (Only includes refining NF crude oil)

⁵³ Information provided via email on June 23rd from Mr. Taylor Loftis of Trinity Consultants to DAQ.

Only NF crude processing is included to avoid double counting.

- Combustion of Natural Gas and Landfill Gas (ES-41 and ES-80)

See Section 3.3 for discussion on how projected actual natural gas, landfill gas, and refinery throughputs were calculated.

Projected Actual VOC increase from combustion (tpy): 2.96 tpy from NG and 0.79 from LFG.

Baseline Emissions from Associated Units

- Refinery (ES-34)

Baseline Actual VOC emissions from refining (tpy): 2.88 tpy from refining NF crude oil

- Combustion of Natural Gas and Landfill Gas (ES-41 and ES-80)

Baseline VOC from combustion calculated using actual NG and LFG usages during the baseline period.

Baseline Actual VOC emissions from combustion (tpy): 0.62 tpy from NG and LFG, combined

Emissions Increase from Project

Emissions Increase (tpy) = Potential Emissions from New Units + Projected Actual Emissions from Associated Units (tpy) – Baseline Emissions from Associated Units (tpy)

Emissions Increase (tpy) = 476.5 (Extraction) + 7.09 (Refinery, NF) + 3.75 (Combustion) – 2.88 (Refining Baseline) – 0.62 (Combustion Baseline)

Emissions Increase (tpy) = 483.8 tpy

Table B.1-5 Contemporaneous Increases and Decreases provides a summary of the following emission values:

The PSD net emissions increase for this project was calculated as follows:

Net VOC Emissions Increase (tpy) = Project Emissions Increase (tpy) +/- Contemporaneous Increases and Decreases (tpy)

Net VOC Emissions Increase (tpy) = 483.8 tpy – 443.9 tpy

Net VOC Emissions Increase (tpy) = 39.9 tpy

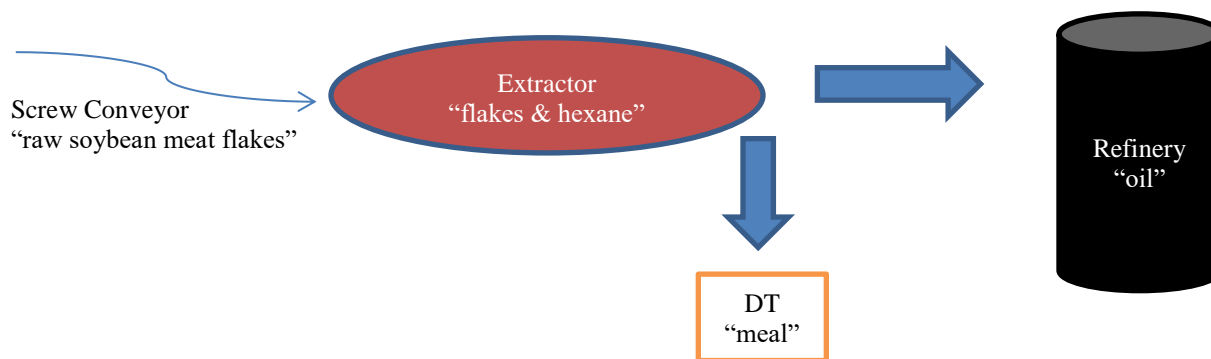
The oil refinery (ID No. ES-34) has its own PSD Avoidance Condition of 56 tpy VOC emissions.⁵⁴ Per the PSD Avoidance limit all refinery emissions are accounted for under that emissions cap; therefore, the above calculation is incorrect. If you remove refinery emissions, the new calculation for the extractor = 479.63 – 431.62 [-443.9+12.28 from screw conveyor]⁵⁵ = 48.01; therefore, greater than 40 tons SER.

On July 13, 2015 Cargill's consultant, Taylor Loftis, and DAQ (Booker Pullen and Judy Lee of RCO) held a teleconference regarding the PSD Avoidance Condition and Cargill's PSD Net Emissions Increase calculation for VOC emissions discussed above. Mr. Loftis indicated that Cargill always calculates the extractor emissions with the refinery emissions included and that the screw conveyor project maybe going away or delayed. DAQ indicated that we needed to know whether or not to include the screw conveyor project? Also, we reviewed Cargill's current permit and the review for issued Permit 03903T25, which is when the PSD Avoidance Condition for the oil refinery was added. Per the review for issued Permit 03903T25 the oil refinery process vegetable oils from the on-site extraction process as well as from other off-site facilities. In addition, Cargill's permit indicates that all oil refinery emissions are included under the 56 tpy VOC emissions cap.⁵⁶ Based on discussions during this conference call between DAQ staff and Cargill's consultant, it was determined that the best avenue for Cargill appears to be combining the existing extractor – Oil extraction process emission sources (ID Nos. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14) PSD Avoidance condition of less than **622** tpy VOCs and the existing refiner – Oil refinery (ID No. ES-34) PSD Avoidance condition of less than **56** tpy VOCs together into one Facility-Wide avoidance condition as it originally started out due to the process flow of the two operations:

⁵⁴ Ibid 29

⁵⁵ Ibid 13

⁵⁶ Specific Condition 2.1-G.2. of Cargill's current Permit (Permit No. 03903T38)



The screw conveyor feeds the “raw soybean meat flakes” to the extractor where “hexane solvent” is added. The extractor then feeds “meal” to the DT and “oil” to the refinery.

Based on our discussion, Cargill’s PSD analysis will now be based on BAE instead of PTE because there will be an overall reduction going from the two existing PSD Avoidance limits plus significance to one Facility-wide PSD Avoidance limit for VOC. Mr. Loftis is going to discuss this approach with Cargill to make sure they concur and provide DAQ with revised calculations once the best approach is determined.

On July 14, 2015, Cargill’s consultant, Taylor Loftis, sent an email regarding the oil refinery’s PSD Avoidance Condition removal stating *“I believe it’s still DAQ policy to remove “old” (at one time old meant, older than 5 years) PSD avoidance conditions from permits. The basis was that the facility had provided sufficient data to show that the project did not trigger PSD. In Cargill’s case, I think the 56 tpy limit on ES-34 has been in the permit 10 years now and we can be confident that the 2004 deodorizer project did not trigger PSD. I have a couple of NC permits where this strategy was used if you all would like to review those.*

If it is still DAQ policy to remove those limits after the facility’s provided sufficient data, then I think the cleanest way to limit this project’s emissions would be to include the Fayetteville crude oil refinery emissions in the limit on extraction. I think this also fits in well with the idea that any increase in these emissions would be attributable to this project rather than the 2004 deodorizer project.”

Mr. Loftis provided the Ardagh (formerly Saint-Gobain) site in Wilson⁵⁷ as an example. Per William Willets, DAQ Permitting Chief, it is DAQ policy and older PSD Avoidance conditions may be removed if the applicant can demonstrate that the emissions unit’s actual emissions, over an extended time period during normal source operation, are well below the PSD significance levels or PSD Avoidance limit. In such instances the PSD Avoidance condition can be removed.

Internal discussions between DAQ staff (William Willets, Booker Pullen and Judy Lee of RCO) determined that the best approach was to base the new PSD Avoidance analysis on VOC baseline actual emissions from the extraction process and the refinery process plus 40 tpy significance. This review engineer sent Mr. Loftis an email stating that DAQ concurred this would be the best approach for this project based on the process flow of the two operations.

[Excerpt from review for deodorizer modification]

Prevention of Significant Deterioration (PSD) Issues:⁵⁸

This facility is a major stationary source for PSD considering the current facility-wide limit on potential VOC emissions [**662 tons per year**] is greater than 250 tons per year. However, this proposed modification conflicts

⁵⁷ Saint-Gobain Containers (Facility ID No. 9800155) issued Permit No. 03713T28. Refer to permit and review for Saint-Gobain Containers dated November 16, 2012 (Application No. 9800155.11F) for an example where DAQ has removed PSD Avoidance Conditions in cases where the facility has used less than 50% of the PSD Avoidance Condition since installation of the equipment.

⁵⁸ Review for Issued Permit No. 03903T25 dated March 29, 2005

with the current PSD avoidance condition that limits facility-wide VOC emissions. In order to avoid that conflict, the facility requested processing of this application as a significant modification pursuant to 2Q .0516 while utilizing 2Q .0501(d)(2) that allows for construction and operation of the new deodorizer pursuant to 2Q .0504 procedures during the previous modification. Prior to beginning operation, the facility has filed an application and will obtain a permit modifying the construction and operation permit to meet the requirements of 2Q .0500 pursuant to 2Q .0516.

The facility requested that the current facility-wide PSD avoidance limit be separated into one PSD avoidance limit for the oil extraction process emission sources (**ID No. ES-31, ES-29A, ES-29B, ES-32A, ES-32B, ES-13 and ES-14**) and another PSD avoidance limit for the oil refinery emission sources (**ID No. ES-34**). DAQ concurs with the facility's description of the independent operation of the oil extraction process and the oil refinery. Since the permit is being modified pursuant to 2Q .0516, the existing facility-wide PSD avoidance limit for VOCs will be replaced by the new PSD avoidance limits (see below) for VOC emissions from the oil extraction process and from the oil refinery.

The VOC emissions from the oil extraction process during 2000/2001 calendar years (CY) were calculated by multiplying the total solvent loss from the extraction process by the fraction of solvent emitted to the air from the extraction process (~ 97%). The average oil extraction process emissions were estimated to be 646 tons per year (tpy) during the 2000/2001 CY, and those years were considered to be more representative than the 2001 CY data used in 2002 meal dryer replacement modification. The potential emissions increase was greater than the PSD significance level of 40 tpy of VOCs for the replacement of the steam meal dryer (ES-13) in 2002 (Note: Meal dryer is a part of the oil extraction process). Therefore, a revised limit on potential VOC emissions [**686 tons per year = past actuals plus significance level**] for the oil extraction process will be set.

VOC emissions for the modified oil refinery with new deodorizer were calculated using mass balance equations based on operation at maximum capacity and a high hexane content crude oil. Estimated potential emissions from the modified oil refinery are 66 tons per year (tpy) per the application while the past actual emissions from the refinery during 2000/2001 CY were 16 tpy. Therefore, a new limit on potential VOC emissions [**56 tons per year = past actuals plus significance level**] for the modified oil refinery with new deodorizer will be set.

In order to continue to avoid applicability of this regulation, calculations of VOC emissions will be made at the end of each month. All VOC emissions shall be determined by multiplying the total amount of each type of VOC-containing material consumed during the month by the VOC content of the material. Also, VOC emissions from off-site crude oil at the refinery shall be determined by multiplying the total amount of off-site oil processed at the refinery by the average hexane content of the monthly shipments. For each shipment of off-site crude oil that is to be processed at the refinery, the facility shall sample and record the crude oil residual hexane concentration. The monthly totals of off-site crude oil processed at the refinery shall also be recorded. A log will be kept of the VOC calculations and the total VOC emissions. A summary report of the monitoring and record keeping activities will be submitted within 30 days after each calendar year semiannual period.

Based on Cargill's email dated July 14, 2015, this review engineer ran reports from IBEAM's report database By Pollutant and Operating Scenario for VOC emissions from the oil refinery (ID No. ES-34) and the solvent extraction process (ID Nos. ES-31, ES-13 and ES-14) since installation of the deodorizer as summarized below:

EI Year	VOC Emissions from Refinery (tons)	VOC Emissions from Extraction (tons)
2005	12.16	346.58
2006	15.30	379.61
2007	16.39*	433.54
2008	12.98	419.61
2009	11.50	371.88
2010	11.76	369.36
2011	11.44	295.95
2012	14.58	362.8
2013	25.57*	399.67
2014	15.01	369.05
2015	NR	NR

The above summary table shows only two incidences where the refinery emissions exceeded the past actuals of 16 tpy that the 56 tpy VOC emissions for the oil refinery limit was based; thus, the modification at the time of permitting actually did require the “actuals plus significance level (40)” in order to avoid triggering PSD, unlike the Ardagh example above.

15A NCAC 2Q. 0317: AVOIDANCE CONDITIONS for 15A NCAC 2D. 0530: PREVENTION OF SIGNIFICANT DETERIORATION for Oil Refinery (ID No. ES-34)⁵⁹

This condition originated at the time the unit was modified and the PSD Avoidance Condition of 56 tpy was placed in the permit in 2005. Per current DAQ policy, as discussed above, older PSD avoidance conditions may be removed if the applicant can demonstrate that the emission unit’s actual emissions, over an extended time period during normal source operation, are well below the PSD significance levels or PSD avoidance limit. A review of emission inventory data as summarized above shows that the actual emissions from the oil refinery have been well below (at least 50%) of the current PSD Avoidance limit. In this instance, although there are two years that the emissions exceeded the BAE of 16 tpy that the oil refinery limit was based on Cargill is ratcheting down their existing solvent extraction limit of 622 tpy to below 500 tpy; therefore, DAQ feels that with the exception of these two outliers, such a demonstration has been made. Thus, the PSD Avoidance condition will be removed as part of this significant modification.

- ❖ Per Cargill’s email with attachments dated July 28, 29 & 31, 2015 from Cargill’s consultant, Mr. Taylor Loftis, the following Facility-wide VOC PSD Avoidance limit is proposed:

“Please find the attached calculations for Cargill Fayetteville’s facility-wide VOC PSD avoidance limitation. We have used the same baseline as we proposed in the application, April 2007 through March 2009.

For the purposes of this analysis, I have not separated the emissions from processing “Fay-crude” in the refinery or those from meal drying and cooling (ES13 and ES14) from the solvent loss material balance around the extraction equipment (ES31), and have only included emissions in the refinery from processing of imported crude oil.

The raw data we used in our calculations is included in Table B.2-4.

Based on our calculations, we believe the limit will be 487.4 tons per year.”

Refer to original application submittal⁶⁰ or amendments for calculations and/or more details. Below are the revised calculations submitted on July 29, 2015 to support the analysis provided on July 28 and 31, 2015 that shows Cargill’s request for a limit of **487.4** tpy VOC Facility-wide:

- ❖ VOC Emissions from the Fayetteville facility can be separated into three categories:

- * Emissions from Combustion
- * Emissions from Refining
- * Emissions from Solvent Loss

Emissions from combustion are calculated using a VOC emissions factor (e.g., 5.5 lb/MMscf) and a gas throughput, which is based on the unit’s operating capacity in MMBtu/hr. An example for ES41 is included below:

Example 1 - Combustion ES41

Heat Input Rating = 99 MMBtu/hr (for natural gas)
NG heating value = 1,026 MMBtu/MMscf
Emission Factor = 5.5 lb VOC/MMscf (AP-42, Section 1.4)
Baseline Natural Gas Usage = 15,065 Mscf/yr
Baseline Landfill Gas Usage = 369,280 Mscf/yr

Actual (baseline) Emissions (natural gas)

⁵⁹ Ibid 60

⁶⁰ Ibid 2

$$\text{VOC (tpy)} = 5.5 \text{ [lb VOC/MMscf]} \times 15,065 \text{ [Mscf/y]} \div 1,000 \text{ [Mscf/MMscf]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tpy)} = 0.04 \text{ tons VOC/yr}$$

Actual (baseline) Emissions (landfill gas)

$$\text{Equivalent Natural Gas usage (Mscf/yr)} = 369,280 \text{ Mscf LFG/yr} \times 485 \text{ Btu/scf LFG} \times 1,026 \text{ Btu/scf NG}$$

$$\text{Equivalent Natural Gas usage (Mscf/yr)} = 174,562 \text{ Mscf/yr}$$

$$\text{VOC (tpy)} = 5.5 \text{ [lb VOC/MMscf]} \times 174,562 \text{ [Mscf/y]} \div 1,000 \text{ [Mscf/MMscf]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tpy)} = 0.48 \text{ tons VOC/yr}$$

This calculation can be found in Tables B.3-1 through B.3-4 of Appendix B in the original application.

Emissions from ES80 are calculated using the same methodology and baseline period. Calculations for ES80 can be found in Tables B.3.5 through B.3.8 of Appendix B in the original application.

Emissions from the shutdown of ES42 are calculated using the same methodology used for natural gas combustion from ES41, however the emissions from the shutdown are calculated using the last two years of operation for ES42, which was from January 2012 through December 2013, in accordance with 40 CFR 51.166(b)(3)(i)(b). Those calculations can be found in Table B.7-4 and B.7-5 in Appendix B of the original application.

Emissions from the remaining combustion sources in the contemporaneous period (ES82 and new fire pumps) were calculated based on their capacity (MMBtu/hr or hp) and AP-42 emission factors, assuming 8,760 hours per year. These calculations can be found in Table B.5-3 through B.5-6 of the revised PSD Avoidance Limit calculations, submitted July 28, 2015.

Example 2 – Refinery Emissions from Non-Fayetteville Crude

Emissions from the refinery are calculated using a mass balance approach. There is currently a limit on VOC emissions from the refinery of 56 tons VOC per year. The below calculation is an example of how emissions from oil refining that are not produced in the Crush Plant in Fayetteville. These oils are typically referred to as “non-Fayetteville” or “N-F” crude oils.

Baseline Actual Emissions

$$\text{VOC (tons)} = (\sum (\text{N-F Crude Oili [lbs, i]} \times \text{Average hexane contenti [ppm, i]} \times 10^{-6}) \div 2,000 \text{ [lb/ton]})$$

Where:

N-F Crude Oili = Pounds of non-Fayetteville produced crude oil processed through the refinery during the calendar month, for oil “i”

Average hexane content = Measured average hexane content for N-F Oil shipments received during the calendar month

Baseline Actual Emissions (e.g., April 2007)

$$\text{VOC (tons)} = (2,380,423 \text{ [lbs, peanut]} \times 77.60 \text{ [ppm]} \times 10^{-6} + 2,358,243 \text{ [lbs, soy]} \times 55.70 \text{ [ppm]} \times 10^{-6}) \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 0.16 \text{ tons}$$

The total baseline VOC emissions from refining are calculated by taking the sum of the monthly VOC emissions from refining of N-F crude oil for the 24-month baseline period, divided by 2 in order to get an annual average. The values can be found in Appendix B, Table B.6-3 of the original application and result in an annual average emission rate during the baseline period of 2.88 tons per year of VOC.

This calculation can be found in Table B.6-3 in Appendix B of the original application.

Example 3 – Contemporaneous Decrease from shutdown of existing Solvent Loss Equipment

Solvent loss emissions from the facility are generated by hexane solvent usage in the crush plant. The solvent is stored in tanks (ES29a and ES29b) and introduced into the process in the extractor, which is one piece of equipment in the extraction process (ES31). Due to the nature of the process, solvent emissions are released from several points downstream of the extractor (drying, cooling, and mineral oil scrubber vent), as well as portions emitted as fugitives and some amount remaining in the crude oil produced. Emissions of VOC from solvent loss are calculated using a

mass balance approach, provided in Condition 2.2-D.9 of the Title V permit. The equations provided in Condition 2.2-D.9 provide the methodology for calculating annual emissions from solvent loss. An example calculation for the period from April 2007 through March 2009 is provided below.

Baseline Actual Emissions

$$\text{VOC (tons)} = \text{12-Month Rolling Solvent Loss [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

Where:

$$\text{12-Month Rolling Solvent Loss} = \sum (\text{Monthly Solvent Loss [gal]})_i$$

Sum from i=1 to i=n

Where:

$$\text{Monthly Solvent Loss} = (\text{SOLV}_B + \text{SOLV}_E + \text{SOLV}_R \pm \text{SOLV}_A)$$

Where:

SOLV_B = Solvent Inventory at the beginning of the month

SOLV_E = Solvent Inventory at the end of the month

SOLV_R = Solvent Shipments received during the month

SOLV_A = Solvent Adjustment (zero, unless calculating solvent loss for MACT ratio)

n = Number of months in the calculation period, usually 12

Actual Emissions from April 2007 through March 2009

April 2007 – March 2008

$$\text{VOC (tons)} = 157,864 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 434.1 \text{ tons}$$

April 2008 – March 2009

$$\text{VOC (tons)} = 166,255 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 457.2 \text{ tons}$$

Baseline Actual Emissions (Annual Average of 24-month period)

$$\text{VOC (tons)} = (157,864 \text{ [gal/yr]} + 166,255 \text{ [gal/yr]}) \div 2 \text{ [years]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 162,060 \text{ [gallons]} \times 5.5 \text{ [lb/gal]} \div 2,000 \text{ [lb/ton]}$$

$$\text{VOC (tons)} = 445.66 \text{ [tons]}$$

These values are calculated in Table B.2-2, with data from Table B.2-4 in Appendix B of the original application. VOC losses from the extraction process are not all released via the mineral oil scrubber vent. A portion of the solvent used to extract the oil remains in the meal when it leaves the extractor and is then released in equipment further downstream from the extraction unit itself (e.g., drying, cooling, refining, etc.). The table below shows the percentage of solvent emissions released for each release point from July 31, 2015 email.

Table B.2-3. Fuel Heating Values and Solvent Loss Ratios

Process Variable	Value	Units
Landfill Gas Heating Value ^d	485	Btu/CF
Natural Gas Heating Value ^d	1,026	Btu/CF
% Remaining in Oil ^e	3%	% of total
% Lost in Meal Drying	56%	% of total
% Lost in Meal Cooling	4%	% of total
% Lost in Final Vent	7%	% of total
% Lost as Fugitive	30%	% of total

a. Non-VOC Baseline Actual throughputs are based on the 24-month period from January 2012 through December 2013. VOC Baseline Actual throughputs are based on the period from April 2007 to March 2009.

b. Projected hours of operation based on a maximum possible operating time of 8,760 hours per year. Projected soybean throughput is based on a maximum extractor capacity of 110,000 bushels/day.

c. Baseline actual solvent losses are based on data from the VOC baseline period. Potential solvent losses are based on a proposed facility-wide VOC PSD avoidance limit of 487.45 tons per 12-month rolling period.

d. Natural gas and landfill gas heating values are based on default values from Table C-1 to 40 CFR 98 Subpart C.

e. Oil extracted at the Fayetteville facility is refined on-site and at other Cargill refineries. Solvent remaining in the crude oil is assumed to be emitted during the refining process.

Cargill Fayetteville Example Calculations Application No. 2600016.14F

Table B.1-5 Contemporaneous Increases and Decreases

Project Emissions Increases and Decreases	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	VOC (tpy)
Soybean Dryer Shutdown (ES-16) - September 2013	-4.52	-1.21	-0.58	--
Soybean Dryer Shutdown (ES-17) - September 2013	-77.72	-19.43	-3.32	--
New Soybean Dryer (ES-82) - October 2013	28.09	5.35	1.61	0.97
Shutdown Natural Gas Boiler (ES-42) - December 2013	-0.74	-0.74	-0.74	-0.53
Replace 2 Fire Pumps - March 2014	0.07	0.07	0.07	1.31
Clay Silo Modification (ES-25) - July 2014	0.09	0.03	0.01	--
Replace Raw Flake Conveyor, eliminate Cyclone (CY30) - Expected 3Q2015	-0.40	-0.11	-0.05	--
Cyclones Shutdown (ES-13, ES-14) - Expected 3Q2015	-48.51	-12.94	-6.27	--
Primary Dehulling (ES-65) - Expected 3Q2015	-16.84	-0.09	-0.03	--
Oil Extraction (ES-31) - Expected 3Q2015	--	--	--	-445.66
Total Increases and Decreases (D)	-120.5	-29.1	-9.3	-443.9

Table B.1-7. Proposed PSD Avoidance Limitation

Source	VOC (tpy)
Baseline Actual VOC Emissions (A)	3.50
Contemporaneous Project Emissions Increases and Decreases (B)	-443.91
PSD Significant Emission Rate (SER)	40.00
Proposed VOC Emission Limitation = (A) - (B) + SER	487.42

Therefore, the two existing PSD Avoidance conditions contained in Cargill's permit for VOC emissions will be replaced with one Facility-Wide PSD Avoidance Condition of less than **487.4** tpy VOC emissions per Table B.1-7. utilizing the Contemporaneous Increases and Decreases provided in Table B.1-5. above.⁶¹

Particulate Matter (PM) Emissions:

Cargill's process begins with whole soybeans being processed in the **Raw Soybean Storage and Handling** which consist of oilseed handling/elevator operations. The soybeans are then sent from the silos in preparation of soybeans for solvent extraction in the **Raw Soybean Processing**. At the end of these operations the soybeans are "flaked" meat ready to be transported to the oil extraction process. The only emissions from dehulling and flaking are PM.

For the Vertical Seed Conditioner (VSC, ID No. ES-83) Form B indicates that the Potential to Emit from this emission source is 351.88 tons per year for PM and 93.91 tons per year for PM₁₀ before controls. Form B also references AP-42 as the source of emission factors (EF). AP-42 Table 9.11.1-1 **Total Particulate Emission Factors For Soybean Milling** list an emission factor of 0.010 pounds of particulate per ton of soybeans processed for Bean Conditioning (SCC 3-02-007-87) controlled by a cyclone. Per Form B9 the maximum design capacity of the VSC is 137.50 tons of Soybeans processed per hour; thus:

$$\begin{aligned} 137.50 \text{ tons soybeans processed per hr} * 0.010 \text{ lb particulate per ton of soybeans} &= \\ 1.375 \text{ pounds of particulate per hour} &= 1.38 \text{ lbs/hr} \end{aligned}$$

Appendix B – Table B.5-5 uses a grain loading rate of 0.03 grains per cubic feet using the cyclones flow rate of 5,000 acfm based on EPA's PM Calculator resulting in 1.29 lbs PM per hour or using grain loading and acfm with the following calculation:

$$5,000 \text{ acfm} * 0.03 \text{ grains/cf} * \text{lb}/7,000 \text{ grains} * 60 \text{ min/hr} = 1.286 \text{ lbs/hr outlet PM}$$

Based on the internet searches performed by this review engineer the VSC is a relatively new technology. DAQ was able to find a VSC permitted at another Cargill facility located in Kansas.⁶² AP-42 is supposed to be a fall back for EF if there is no site specific data or data available on similar technology (i.e., if there is no better data available). Data from another Cargill Soybean processing plant for a VSC would be more reliable than data from AP-42 when available or emissions data from the manufacturer.

Based on this Technical Review for Permit to Construct or Modify an Air Contaminant Source PSD Permit Review the PM limit (gr/dscf) and PM₁₀ limit (gr/dscf) controlled by a cyclone are 0.010 and 0.0075, respectively. This equates to:

⁶¹ Both Table B.1-7. and Table B.1-5. Are from Appendix B of the email submitted on July 28, 2015.

⁶² Technical Review for Permit to Construct or Modify an Air Contaminant Source PSD Permit Review Construction Permit No. 1140, March 24, 2006/July 13, 2006

$$5,000 \text{ acfm} * 0.01 \text{ grains/cf} * 1\text{b}/7,000 \text{ grains} * 60 \text{ min/hr} = 0.4286 \text{ lbs/hr outlet PM}$$

$$5,000 \text{ acfm} * 0.0075 \text{ grains/cf} * 1\text{b}/7,000 \text{ grains} * 60 \text{ min/hr} = 0.3214 \text{ lbs/hr outlet PM}_{10}$$

Based on AP-42 data above, the EF's used are more conservative than the EF found in the PSD Permit Review for the VSC; therefore, the use of AP-42 is acceptable in this case.

Excerpt below is from Cargill's consultant, Taylor Loftis, emails dated June 23, 2015, July 29, 2015 and July 31, 2015 for PM and VOC emissions used in the netting analysis:⁶³

- Particulate Matter from Baghouses and Cyclones – no change from June 23rd email to July 29th, 2015
- Table of PM Calculator Data for Baghouses – no change from June 23rd email to July 29th, 2015
- Revised Appendix B – Detailed Emission Calculations – B.1. Emissions Summary Pages 1 & 2 of 27 where copied (only have a PDF version) and inserted below. These two pages consist of:

Table	Title
Table B.1-1	Baseline Actual Emissions
Table B.1-2	Projected Actual Emissions (Associated Units)
Table B.1-3	Potential Emissions from New and Modified Units
Table B.1-4	Project Emissions Increase Summary
Table B.1-5	Contemporaneous Increases and Decreases (September 2010 to August 2015) ⁶⁴
Table B.1-6	Net Emissions Increase Summary
Table B.1-7	PSD Significant Emission Rate Comparison

⁶³ Emails from Cargill's consultant, Taylor Loftis, regarding PSD Avoidance calculations for PM and VOC emissions, EPA's PM Calculator, updated Appendix B, etc.

⁶⁴ Per Cargill's application the Contemporaneous period for VOC emissions was supposed to be April 2007 through March 2009, so this is believed to be a typo.

Particulate Matter from Baghouses and Cyclones

The following is an example calculation for emissions from baghouses and cyclones using the EPA PM Calculator to determine PM₁₀ and PM_{2.5} emissions. The basis for emissions from the cyclones and baghouses at the Fayetteville facility is outlet grain loading rate, which is conservatively set at 0.01 gr/cf for baghouses and 0.03 gr/cf for cyclones. An example calculation for PM, PM₁₀, and PM_{2.5} is provided below:

ES-54 (BF-35)

Controlled PM Emissions

Projected Actual PM Emissions (tpy) = Grain Loading Rate (gr/cf) × Air Flow (acfm) × 60 (min/hr)
Operating Hours (hr/yr) ÷ 7,000 (gr/lb) ÷ 2,000 (lb/ton)

Projected Actual PM Emissions (tpy) = 0.01 (gr/cf) × 600 (acfm) × 60 (min/hr) × 8,760 (hr/yr) ÷
7,000 (gr/lb) ÷ 2,000 (lb/ton)

Projected Actual PM Emissions (tpy) = 0.23

The EPA PM Calculator provides a ratio of controlled PM₁₀ to uncontrolled PM and controlled PM_{2.5} to uncontrolled PM. Uncontrolled PM emissions from baghouses and cyclones are conservatively estimated using the controlled emissions and an assumed control efficiency of the equipment, 99% for baghouses and 98.4% for cyclones. An example calculation for uncontrolled PM from baghouses is provided below:

Uncontrolled PM Emissions

Uncontrolled PM Emissions (tpy) = Controlled PM Emissions (tpy) ÷ (1-99% control efficiency)

Uncontrolled PM Emissions (tpy) = 22.5

Controlled PM₁₀ Emissions

Projected Actual PM₁₀ Emissions (tpy) = Uncontrolled PM Emissions (tpy) × 2,000 (lb/ton) ×
0.08 (lb PM₁₀ controlled/100 lb PM uncontrolled)⁴ ÷ 100 (lb PM/100 lb PM) ÷ 2,000 (lb/ton)

Projected Actual PM₁₀ Emissions (tpy) = 0.02

Ratio of PM₁₀ controlled to uncontrolled PM taken from EPA PM Calculator for SCC 30200791 "Soybean: Bulk Unloading" with primary control device code 18 "Fabric Filter - Low Temperature, I.E. T<180F" and no secondary control (i.e., control code 999 "uncontrolled"). PM_{2.5} is calculated in the same manner as PM₁₀, only using a different ratio pulled for the same combination of source classification code (SCC), primary control code, and secondary control code. Emissions from cyclones are calculated using the same methodology as provided above. A table of all SCC, control codes and PM Calculator ratios for both baghouses and cyclones are provided in the following tables.

⁴ EPA PM Calculator is available for downloading at the following web address:

<http://www.epa.gov/ttn/chief/eiinformation.html>, under the sub heading *Emission Inventory Tools*.

Table of PM Calculator Data for Baghouses

Emission Source ID	SCC Description	SCC Code	Primary Control ID	Secondary Control ID	PM Calculator - lb PM ₁₀ controlled / 100 lb PM _{uncont.}	PM Calculator - lb PM _{2.5} controlled / 100 lb PM _{uncont.}	PM ₁₀ Control Efficiency	PM _{2.5} Control Efficiency
ES-1, ES-33	Soybean: Grain Receiving	30200781	18	999	0.08	0.01	99.47	99
ES-2	Soybean: Grain Receiving	30200781	18	999	0.08	0.01	99.47	99
ES-3A, ES-27, ES-61	Soybean: Grain Receiving	30200781	18	999	0.08	0.01	99.47	99
ES-3B, ES-62, ES-63, ES-64, ES-316	Soybean: Grain Handling	30200782	18	999	0.08	0.01	99.47	99
ES-4	Soybean: Bean Conditioning	30200787	7	18	0.05	0.04	99.91	99.8
ES-5, ES-18A	Soybean: Cracking and Dehulling	30200785	18	999	0.08	0.01	99.47	99
ES-11	Soybean: Meal Dryer	30200789	18	999	0.42	0.23	99.31	99
ES-39	Soybean: Bean Conditioning	30200787	7	18	0.05	0.04	99.91	99.8
ES-12	Soybean: Cracking and Dehulling	30200785	121	18	0.0055	0.002	99.96	99.8
ES-51	Soybean: Bulk Loading	30200791	18	999	0.08	0.01	99.47	99
ES-52	Soybean: Bulk Loading	30200791	18	999	0.08	0.01	99.47	99
ES-53	Soybean: Bulk Loading	30200791	18	999	0.08	0.01	99.47	99
ES-54	Soybean: Bulk Loading	30200791	18	999	0.08	0.01	99.47	99
ES-65 Past	Soybean: Cracking and Dehulling	30200785	7	18	0.0055	0.002	99.96	99.8
ES-65 Potential	Soybean: Cracking and Dehulling	30200785	121	18	0.0055	0.002	99.96	99.8

Table of PM Calculator Data for Cyclones

Emission Source ID	SCC Description	SCC Code	Primary Control ID	Secondary Control ID	lb PM ₁₀ controlled / lb	lb PM _{2.5} controlled / lb	PM ₁₀ Control Efficiency	PM _{2.5} Control Efficiency
ES-6A, ES-6B	Soybean: Flaking	30200788	7	999	0.427	0.207	89.34	80
ES-13	Soybean: Meal Dryer	30200789	7	999	0.427	0.207	89.34	80
ES-13	Soybean: Meal Dryer	30200789	7	999	0.427	0.207	89.34	80
ES-14	Soybean: Meal Cooler	30200790	7	999	0.427	0.207	89.34	80
ES-15	Soybean: Meal Dryer and Cooler	30200789 30200790	7	999	0.427	0.207	89.34	80
ES-83	Soybean: Vertical Seed Conditioner	30200789	7	999	0.427	0.207	89.34	80

Appendix B
Detailed Emission Calculations
Cargill Fayetteville Facility

B.1. Emissions Summary

Table B.1-1. Baseline Actual Emissions

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Refinery (ES34)	--	--	--	--	2.88	--	--	--	--
Combustion (ES41)	2.65	2.65	2.65	29.28	0.52	0.21	34.86	1.74E-04	35,685
Combustion (ES80)	0.13	0.13	0.13	1.41	0.10	0.01	1.67	8.37E-06	2,011
Bagfilters	41.22	4.51	1.86	--	--	--	--	--	--
Cyclone (ES6)	22.74	6.07	2.94	--	--	--	--	--	--
Total Emissions (A)	66.74	13.36	7.57	30.69	3.50	0.22	36.53	1.83E-04	37,696

Table B.1-2. Projected Actual Emissions (Associated Units)

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Refinery (ES34)	--	--	--	--	7.09	--	--	--	--
Facility-wide Natural Gas Usage	4.09	4.09	4.09	45.22	2.96	0.32	53.84	2.69E-04	64,626
Facility-wide Landfill Gas Usage	1.09	1.09	1.09	12.07	0.79	0.09	14.37	7.19E-05	8,165
Bagfilters	35.10	4.31	1.81	--	--	--	--	--	--
Cyclone (ES6)	25.34	6.76	3.28	--	--	--	--	--	--
Total Emissions (B)	65.62	16.25	10.28	57.30	10.85	0.41	68.21	3.41E-04	72,791

Table B.1-3. Potential Emissions from New and Modified Units

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Oil Extraction (ES34)	--	--	--	--	476.6	--	--	--	--
Dryer Cooler System (ES15)	72.08	19.24	9.33	--	--	--	--	--	--
Vertical Seed Conditioner (ES83)	5.63	1.50	0.73	--	--	--	--	--	--
Primary Dehulling (ES65)	10.89	0.06	0.02	--	--	--	--	--	--
Total Emissions (C)	88.60	20.80	10.08	0.00	476.6	0.00	0.00	0.00	0.00

Table B.1-4. Project Emissions Increase Summary

Emissions	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
(B) Projected Actual Emissions (Associated Units) - Table B.1-2	65.62	16.25	10.28	57.30	10.8	0.41	68.21	3.41E-04	72,791
(C) Potential Emissions (New Units) - Table B.1-3	88.60	20.80	10.08	--	476.6	--	--	--	--
(A) Baseline Actual Emissions (Associated Units) - Table B.1-1	66.74	13.36	7.57	30.69	3.50	0.22	36.53	1.83E-04	37,696
Total Change (B+C-A)	87.5	23.7	12.8	26.6	483.9	0.2	31.7	1.6E-04	35,095.4
SER	25	15	10	100	40	40	40	0.6	75,000
Exceeds SER?	YES	YES	YES	No	YES	No	No	No	No

a. Netting Required for total PM, PM₁₀, PM_{2.5} and VOC.

B.1. Emissions Summary

Table B.1-5. Contemporaneous Increases and Decreases (September 2010 to August 2015)

Project Emissions Increases and Decreases	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	VOC (tpy)
Soybean Dryer Shutdown (ES16) - September 2013	-4.52	-1.21	-0.58	--
Soybean Dryer Shutdown (ES17) - September 2013	-77.72	-19.43	-3.32	--
New Soybean Dryer (ES82) - October 2013	28.09	5.35	1.61	0.97
Shutdown Natural Gas Boiler (ES42) - December 2013	-0.74	-0.74	-0.74	-0.53
Replace 2 Fire Pumps - March 2014	0.07	0.07	0.07	1.31
Clay Silo Modification (ES25) - July 2014	0.09	0.03	0.01	--
Replace Raw Flake Conveyor, eliminate Cyclone (CY30) - Expected 3Q2015	-0.40	-0.11	-0.05	--
Cyclones Shutdown (ES13, ES14) - Expected 3Q2015	-48.51	-12.94	-6.27	--
Primary Dehulling (ES65) - Expected 3Q2015	-16.84	-0.09	-0.03	--
Oil Extraction (ES31) - Expected 3Q2015	--	--	--	-445.66
Total Increases and Decreases (D)	-120.5	-29.1	-9.3	-443.9

Table B.1-6. Net Emissions Increase Summary

Emissions	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	VOC (tpy)
(B) Projected Actual Emissions (Associated Units) - Table B.1-2	65.6	16.3	10.3	10.8
(C) Potential Emissions (New Units) - Table B.1-3	88.6	20.8	10.1	476.6
(A) Baseline Actual Emissions (Associated Units) - Table B.1-1	66.7	13.4	7.6	3.5
(D) Contemporaneous Increases and Decreases - Table B.1.5	-120.5	-29.1	-9.3	-443.9
Total Change (B+C-A+D)	-33.0	-5.4	3.5	40.0
SER	25	15	10	40
Exceeds SER?	No	No	No	No

Table B.1-7. PSD Significant Emission Rate Comparison

Pollutant	Project Increase (tpy)	PSD SER (tpy)	% of SER
Total PM (netting)	-33.0	25	< 1%
PM ₁₀ (netting)	-5.4	15	< 1%
PM _{2.5} (netting)	3.5	10	35%
CO	26.6	100	27%
VOC (netting) ^a	39.98	40	99.95%
SO ₂	0.2	40	< 1%
NO _x	31.7	40	79%
Lead	1.6E-04	0.6	< 1%
CO ₂ e	35,095.4	75,000	47%

a. Cargill is requesting an avoidance limit for VOC and will limit VOC emissions from the facility to less than 487.4 tpy of VOC. The proposed emission limit is calculated as follows:

PSD Avoidance Limit (tpy) = Baseline Emissions (3.5 tpy) - Σ contemporaneous increase and decreases (-443.9 tpy) + SER (40 tpy)

PSD Avoidance Limit (tpy) = 487.4 tpy

As shown in the above tables, there is no significant emissions increase of VOC or PM emissions above PSD SER; hence, PSD permitting is not required.

❖ Evaluation of equipment and other applicable regulations:

➤ Soybean Oil/Hexane Solvent Extraction and Oil Desolventizing Process

Soybean oil/hexane solvent extraction process (ID No. ES31A) controlled by a packed column mineral oil absorber – ceramic saddle (ID No. CD31)

Desolventizer – Toaster (ID No. ES31B) controlled by a packed column mineral oil absorber – ceramic saddle (ID No. CD31)

ES31A MACT GGGG	Soybean oil/Hexane solvent extraction process (4,583.33 bushels per hour; 160 pounds hexane per hour maximum design capacity or 1,204,499 tons of soybeans per year)	CD29 CD31	packed column mineral oil absorber - ceramic saddle (6.5 gallons per minute mineral oil injection rate)
ES31B MACT GGGG	Desolventizer-toaster (maximum capacity of 1,204,491 tons per year) receives the soybean “meal” from the extractor (ES31) then sends it to the meal dryer and cooler	CD31	packed column mineral oil absorber - ceramic saddle (6.5 gallons per minute mineral oil injection rate)

15A NCAC 2D .1111 “Maximum Achievable Control Technology” (40 CFR 63 Subpart GGGG)

Per Subpart GGGG – National Emission Standards for Hazardous Air Pollutants: Solvent Extraction for Vegetable Oil Production, §63.2833 Is My Source Categorized as Existing or New? Per Table 1 of §63.2833 – Categorizing Your Source as Existing or New, Cargill must determine if this modification meets the definition of a significant modification as defined in §63.2872 or §63.2833(b) Reconstruction of a source as defined in §63.2. In general, a vegetable oil production process is reconstructed if the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost for constructing a new vegetable oil production process, and it is technically and economically feasible for the reconstructed source to meet the relevant new source requirements of this subpart. The effect of reconstruction on the categorization of your existing and new affected source is described in paragraphs (b)(1) and (2) of this section.

Based on Table 1 of §63.2840 – Oilseed Solvent Loss Factors for Determining Allowable HAP Loss, the oilseed solvent loss factor (gal/ton) for new and existing sources for a conventional soybean facility are both the same, 0.2 gal/ton, yet for specialty soybean facilities new and existing are 1.7 and 1.5 gal/ton, respectively. Desolventizer-toasters are listed as conventional and specialty; however, Cargill representatives indicated during the June 9th, 2015 conference call that Cargill – Fayetteville was still considered a conventional soybean facility after the DT replacement in 2008 and that this modification will not affect the type of oilseed process.

The above information was asked for in an additional information request dated May 12, 2015. During the June 23, 2015 conference call Cargill explained that the plant is considered a conventional soybean facility; thus, the solvent loss factor (gal/ton) for new and existing sources are both the same, 0.2 gal/ton. However, Cargill is subject to a different SLF due to a global Consent Decree (See below). Cargill provided the additional requested information via email on July 31, 2015:

The proposed project will not meet the definition of reconstruction, because the fixed capital cost for this project does not exceed 50% of the fixed capital cost for constructing a new vegetable oil production process. The estimated capital cost of building a comparable new vegetable oil processing facility is \$150 million and the estimated cost for the proposed project is \$30 million or 20% of the fixed capital required to construct a comparable new facility. Therefore, the facility will continue to be an existing source with respect to Subpart GGGG.

Compliance with this rule involves the use of solvent that contains HAP. Therefore, MACT Subpart GGGG applies to the extractor and mineral oil absorber. The proposed VSC, dryer cooler system and cyclones will not contain or contact HAP therefore they have no compliance requirements under MACT Subpart GGGG. Applicable MACT

Subpart GGGG requirements are listed in Condition 2.2.D of the facility's operating permit. Cargill will continue to comply with MACT Subpart GGGG requirements as listed in the operating permit following the proposed project.

In addition to the above information as part of this permit modification and review of this MACT, additional permitted sources were found to be MACT applicable due to the definition of an affected source per §63.2872. An affected source is a vegetable oil production process, which in general is the collection of continuous process equipment and activities that produce crude vegetable oil and meal products by removing oil from oilseeds through direct contact with an organic solvent, such as hexane isomer blend. The definition of vegetable oil production process as provided in 40 CFR 63.2872(c) is provided below:

Vegetable oil production process means the equipment comprising a continuous process for producing crude vegetable oil and meal products, including specialty soybean products, in which oil is removed from listed oilseeds through direct contact with an organic solvent. Process equipment typically includes the following components: oilseed preparation operations (including conditioning, drying, dehulling and cracking), solvent extractors, desolventizer-toasters, meal dryers, meal coolers, meal conveyor systems, oil distillation units, solvent evaporators and condensers, solvent recovery system (also referred to as a mineral oil absorption system), vessels storing solvent-laden materials, and crude meal packaging and storage vessels. A vegetable oil production process does not include vegetable oil refining operations (including operations such as bleaching, hydrogenation, and deodorizing) and operations that engage in additional chemical treatment of crude soybean meals produced in specialty desolventizer units (including operations such as soybean isolate production).

An existing affected source is a source that was constructed or began construction before May 26, 2000 and reconstruction has not occurred. Therefore, Cargill remains an existing affected source under MACT GGGG. No emission limits or requirements have changed

In accordance with the Consent Decree as discussed below, the Solvent Loss Factor (SLF) (gal/ton) for oilseed referenced in Cargill's current permit is remains unchanged from 0.19 gallons of solvent per ton of oilseed processed.

Consent Decree 05-2037-JMR-FLN:

The consent decree signed on February 27, 2006 by the applicant and EPA listed this facility as being subject to certain requirements as outlined below:

Appendix		A	-		Oilseed		Processing,
Appendix	B	-	Boiler	SO ₂	emission	control	plan,
Appendix		D	-		NO _x		emissions,
Appendix	E	-	VOC	emissions	-	Soybean	Processing
Appendix	M	-	Performance	testing	plan	for	boiler
Appendix N	Extraction Solvent Loss Record Keeping Template.						

The applicant plans to follow this consent decree in the following manner:

Appendix A: Oilseed Processing.

This facility as a oilseed processing facility" and thus subject to the consent decree. However, there are no specific requirements associated with this appendix.

Appendix B: Boiler SO₂ Emission Control Plan.

This facility is listed as a part of the SO₂ control plan. However, as stated on page 7, paragraph 2, of the consent decree, permitting of the plant specific SO₂ reductions is not required until three years from the date of entry into the consent decree. This permitting date is therefore February 27, 2009. The applicant preferred not to apply for any SO₂ reductions at this time and will apply for this reduction prior to February 27, 2009.

Appendix D: Boiler NO_x Emission Control Plan

This facility is listed as part of the NO_x control plan. However, as stated in Appendix D, column 7, compliance with the plant specific NO_x limit is not required until ten years from the date of

entry into the consent decree. Compliance is therefore required on February 27, 2016. The applicant preferred not to apply for any NO_x reductions at this time and will apply for this reduction prior to February 27, 2016.

- Appendix E: Extraction VOC Emission Control Plan - Soybean Processing Plants
As per the applicant “the Fayetteville plant is subject to the VOC Emission Control Plan and has requested incorporation of the 0.19 gallon VOC per ton soybean processed plant specific limit in a letter to the DAQ on February 28, 2007. Cargill originally requested a reference to the Consent Decree, however through our experience with the Cargill's Raleigh Plant it was understood that a more detailed incorporation was required. Cargill has assumed that testing, monitoring, recordkeeping, and reporting established in Permit No. 03840T32 for Cargill's sister facility in Raleigh would be used in the Fayetteville plant permit. This assumption is based on conversations between Mr. Tony Jabon of Trinity Consultants and Mr. William Willets and Mr. Don van der Vaart on August 15, 2007.”
- Appendix M: Performance Testing Plan
See response to Appendix B: Boiler SO₂ Emission Control Plan
- Appendix N: Extraction Solvent Loss Recordkeeping Template
See response to Appendix E: Extraction VOC Emission Control Plan

Regulatory Basis: The consent decree indicates that this consent decree settles a complaint that the EPA filed against Cargill alleging that Cargill commenced construction of a major emitting facility and major modifications of a major emitting facility in violation of the New Source Review requirements. The consent decree further requires that the permit requirements established pursuant to the consent decree are “applicable requirements” under Title V of the Clean Air Act and shall survive the termination of the consent decree. Therefore, the requirements included in the new permit, Air Quality Permit No. 3903T39 pursuant to this consent decree will not reference the consent decree itself but be will placed in the schedule of compliance part of the permit (i.e. in section 2.3. A.) and subject to the 15A NCAC 2D .0530 “Prevention of Significant Deterioration” regulations. Once the facility has submitted all the plans to comply with all the above appendixes, these requirements under section 2.3 can then be moved to the corresponding sources and applicable regulatory requirements.

Emission Limits: Paragraph 19 of the consent decree requires the applicant to submit permit applications within 3 years of entry into this consent decree that propose a final SLR (solvent loss ratio) limit for each conventional soybean processing facility listed in Appendix E of the consent decree. This proposed SLR limits shall:

- i) Provide in units of gallons of VOC solvent loss per ton of oilseed processed, on a 12-month rolling average; and
- ii) Be no less stringent than either (1) an existing permit limit (if applicable) or (2) the applicable limit set forth in 40 CFR Part 63, Subpart GGGG “Solvent Extraction for Vegetable Oil Production.”

The current permit does not include an SLR limit. The applicable limit set forth in “Solvent Extraction for Vegetable Oil Production.” MACT 40 CFR Part 63, Subpart GGGG for this facility is 0.20 gallons of solvent per ton of soybean processed on a 12-month rolling average. The applicant has proposed an SLR limit of 0.19 gallons of solvent per ton of soybean processed on a 12-month rolling average. This is acceptable per the requirements of the consent decree cited above and is utilized as the SLR limit in subsection 2. 3. A. of the new permit Air Quality Permit No. 3903T39.

Though this facility only processes soybeans, paragraphs 19, 20 and 22 of the consent decree require that Cargill meet a capacity weighted average SLR for its Soybean Processing Plants (listed in Appendix E of the consent decree) and/or Corn Germ or Sunflower Processing Plants (listed in Appendix F of the consent decree) as follows:

- i) Beginning 12 months after 1 year from entry into the consent decree the capacity weighted average SLR for at least 5 plants must be:
 - a. ≤ 0.175 for Soybean Processing Plants, or
 - b. ≤ 0.30 for Corn Germ or Sunflower Processing Plants
- ii) Beginning 12 months after 2 years from entry into the consent decree the capacity weighted average SLR for at least 10 plants must be:
 - a. ≤ 0.175 for Soybean Processing Plants, or
 - b. ≤ 0.30 for Corn Germ or Sunflower Processing Plants
- iii) For each soybean processing plant the first compliance determination will be based on the first 12 operating

- months of data collected after the third year from entry into the consent decree.
- iv) The capacity weighted average SLR shall be based on design capacities for each facility and calculated via the formula in Appendix E of the consent decree (that formula is reproduced below for convenience):

$$\text{Weighted average SLR} = \frac{\sum(\text{Seedi} * \text{SLRi})}{\sum(\text{Seedi})}$$

Where:

Seedi = Design capacity of oilseed plant i; and
SLRi = Final SLR limit for oilseed plant i

Permit No. 3903T39 will not require the applicant to verify compliance with the capacity weighted average SLR requirements (i.e. the individual facility SLRs and design capacities) of the consent decree cited above because all requirements of the Consent Decree have been met as of October 1, 2013.⁶⁵

Monitoring: Paragraph 19 of the consent decree requires the applicant to account for solvent loss and quantity of oilseeds processed as necessary to comply with the proposed final solvent loss limit beginning 3 years from the date of entry into the consent decree. Further, Paragraph 30(d) of the consent decree requires that compliance with the SLR limits be calculated on a monthly basis and determined in accordance with Subpart GGGG. Therefore, in accordance with §63.2853 and §63.2855, for any calendar month in which any quantity of soybean is processed the applicant shall determine, by the end of the calendar month following that month:

- i) The solvent loss (in gallons) for that month;
- ii) The cumulative solvent loss for the preceding 12 consecutive months during which any quantity of soybean was processed;
- iii) The tons (on an “as received” basis) of soybean processed for that month;
- iv) The cumulative tons (on an “as received” basis) of soybean processed for the preceding 12 consecutive months during which any quantity of soybean was processed;
- v) The SLR for that month;
- vi) The SLR on a 12 consecutive operating month rolling average.;
- vii) The malfunction results in a shutdown of the solvent extraction system (ID No. ES-31); and
- viii) Cumulative solvent losses during malfunction periods do not exceed 4,000 gallons in a 12-operating month rolling period.

Section 2.3 A of Permit No. 3903T39 (Section 2.3 A. 1. c.) includes language stating that the applicant shall be considered in noncompliance with 2D .0530 if:

- i) This monitoring is not conducted as required; or
- ii) The monitoring indicates that the applicant did not maintain an SLR of ≤ 0.19 for this facility (Section 2.3 A. 1. d.).

Recordkeeping: Paragraph 30(d) of the consent decree requires that these records be kept in the form of the table in Attachment N “Extraction Solvent Loss Recordkeeping Template” that show total solvent losses, solvent losses during malfunction periods, and adjusted solvent losses (i.e. total solvent losses minus malfunction losses) monthly and on a twelve month rolling average basis. A suitable table is attached to Permit No. 3903T39 (Section 2.3 A. 1. e.).

Paragraph 37 of the consent decree requires the Permittee to retain the records required by this decree for a period of five years unless other state or local regulations require longer retention periods. The General Condition O already requires that records be retained for at least 5 years. Therefore, subsection 2.3 A of Permit 3903T39 will include standard language indicating that the Permittee will be considered in noncompliance with 2D .0530 if these records are not maintained (in written or electronic format) (section 2.3 A. 1. e.).

Reporting: Paragraphs 36 and 38 of the consent decree require Cargill to submit semiannual written reports within 30 days after the end of each semiannual reporting period that describe the consent decree requirements, the applicable deadlines and the dates the tasks were completed. These paragraphs further specify that each report shall also contain:

- i) Any deviations from emission limitations (including deviations resulting from equipment malfunctions) that have been detected by the monitoring and recordkeeping requirements of the consent decree;
- ii) The probable cause of such deviations;

⁶⁵ November 25, 2014 email correspondence between DAQ and FRO regarding termination of Consent Decree.

- iii) Any corrective actions or preventive measures taken. If no deviations occurred during a reporting period, submit a written report which states that fact; and
- iv) The compliance certification described in the format of Paragraphs 38 of the Consent Decree 05-2037-JRM-FLN (Section 2.3 A. 1. f. iii.).

The Consent Decree and termination of will be discussed in more detail during processing of Cargill's renewal permit which is currently in house; however, termination of the Consent Decree does not change Cargill's current permitted requirements, especially the more stringent SLR.⁶⁶

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The provisions of the Consent Decree attached as Exhibit A to this Court's Order of May 29, 2012 (Document 98) relating to the following facilities are hereby terminated, with the exception of Paragraphs 39 and 78, which shall survive termination of the Consent Decree:

Oilseed Processing Facilities

Fayetteville, North Carolina
Gainesville, Georgia
Sidney, Ohio
Sioux City, Iowa

15A NCAC 2D .0521 "Control of Visible Emissions"

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources which are required to install, operate, and maintain continuous opacity monitors, six-minute averaging periods may exceed 20 percent opacity if: (1) No six-minute period exceeds 87 percent opacity; (2) No more than one six-minute period exceeds 20 percent opacity in any hour; and (3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Compliance is expected because Cargill is replacing the extractor with a new more efficient unit.

15A NCAC 2D .1100/2Q .0711/2Q .0705/2Q .0706 "Toxic Air Pollutants" and Removal of toxic limitations per SESSION LAW 2012-91 – HOUSE BILL 952 – See Section 7 below.

Cargill is currently subject to NC Air Toxics as it was triggered prior to MACT affected (Subpart DDDD and GGGG) sources being exempted. The Permittee is required to not exceed specific emission limits for hexane (n-hexane), as well as several toxics from combustion sources.

Based on Cargill's permit application,⁶⁷ potential emissions of n-Hexane exceed the toxic air pollutant emission rate (TPER) and have been modeled, yet this project will not result in n-Hexane emissions that exceed previously modeled rates. Therefore, a new modeling demonstration is not required. The proposed extractor and mineral oil absorber and stripper are part of 40 CFR 63, Subpart GGGG affected source as described in Section 4.4 of the application submittal; thus, Cargill request that the state toxic requirements associated with the sources regulated under MACT Subpart GGGG be removed from Condition 2.2-A.2 of the operating permit.

- ❖ Please refer to Section 5 above under PSD Historical Overview for more detailed information regarding the toxic limitations for n-Hexane in order to avoid PSD.

⁶⁶ Ibid 3 & 53

⁶⁷ Ibid 2

- ❖ Existing State only regulation requiring the emissions of n-hexane from the Soybean Oil/Hexane Extraction Process to be less than 188.7 lb/day.

To ensure compliance with the above limits, the permit currently contains the following restrictions:

- a) total hexane received at the facility shall be limited to 75% n-hexane by weight; and
- b) highest percent n-hexane by weight per shipment received shall be recorded in a logbook and made available to DAQ personnel upon request.
- c) 24 hour production limit shall not exceed 100,034 bushels of soybeans to avoid triggering toxics for n-Hexane from the meal dryer (ID No. ES15), “actual emissions are capped”⁶⁸

After discussions with DAQ Air Quality Analysis Branch (AQAB), Tom Anderson and Alex Zarnowski on July 28, 2015, this review engineer, Booker Pullen and Mr. William Willets, Chief of DAQ’s Permitting Section, it was determined that since the modification did not increase toxic air pollutants and Cargill is willing to be constrained by existing limits in their current permit, no modeling will be required (See Section 7 below for more details). [15A NCAC 2Q .0706]

Cargill did not request any increase in toxics emissions and have chosen to stay constrained to their current limits; thus, this modification did not result in a net emissions increase of any listed TAPs that the facility was previously emitting, nor any new TAPs. Therefore, pursuant to:

15A NCAC 2Q .0706 MODIFICATIONS

(a) The owner or operator shall comply with Paragraphs (b) and (c) of this Rule for modification of any facility required to have a permit because of applicability of a Section in 15A NCAC 2D, other than 15A NCAC 2D .1100. This Paragraph does not apply to facilities whose emissions of toxic air pollutants result only from insignificant activities, as defined in Rule .0103(20) of this Subchapter, or sources exempted under Rule .0102 of this Subchapter.

(b) The owner or operator of the facility shall submit a permit application to comply with 15A NCAC 2D .1100 if the modification results in:

(1) a net increase in emissions or ambient concentration of any toxic air pollutant that the facility was emitting before the modification; or

(2) emissions of any toxic air pollutant that the facility was not emitting before the modification if such emissions exceed the levels contained in Rule .0711 of this Section.

(c) The permit application filed pursuant to this Rule shall include an evaluation for all toxic air pollutants covered under 15A NCAC 2D .1104 for which there is:

(1) a net increase in emissions of any toxic air pollutant that the facility was emitting before the modification; ...

➤ A permit application to comply with 15A NCAC 2D .1100 is not required.

15A NCAC 2D .0958: “Work Practices for Sources of Volatile Organic Compounds”

(a) This Rule applies to all facilities that use volatile organic compounds as solvents, carriers, material processing media, or industrial chemical reactants, or in other similar uses, or that mix, blend, or manufacture volatile organic compounds, or emit volatile organic compounds as a product of chemical reactions.

(b) This Rule does not apply to:

(1) architectural or maintenance coating, or

(2) sources subject to 40 CFR Part 63, Subpart JJ.

The owner or operator of any facility subject to this Rule shall adhere to the work practices of this regulation.

15A NCAC 2D .1806 “Control and Prohibition of Odorous Emissions”

(a) Purpose. The purpose of this Rule is to provide for the control and prohibition of objectionable odorous emissions.

...

(c) Applicability. With the exceptions in Paragraph (d) of this Rule, this Rule shall apply to all operations that may produce odorous emissions that can cause or contribute to objectionable odors beyond the facility’s boundaries.

(d) Exemptions. The requirements of this Rule do not apply to:

⁶⁸ Please refer to Footnote 22 as well as issued Permit No. 03903R21 dated March 15, 2002 and review (Application No. 2600016.02A)

(1) processes at kraft pulp mills identified in Rule .0528 of this Section, and covered under Rule .0524 or .0528 of this Section;

(2) ...

(e) Control Requirements. The owner or operator of a facility subject to this Rule shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

This is a State only regulation requiring the applicant not operate the facility without implementing management practices or installing and operating odor control equipment to prevent odorous emissions.

➤ **Vertical Seed Conditioner (ID No. ES83) controlled by cyclone (CY83; 33 inches in diameter)**

Based on internet searches performed by this review engineer the Vertical Seed Conditioner is a relatively new technology manufactured by Crown Iron Works Company. The Crown Vertical Seed Conditioner (VSC) is a combination heater and dryer used on free flowing granular solids such as soybeans and rapeseed. The heater is a stacked design with multiple heating sections using low-pressure (1 Bar or 15 PSI) steam heated oval tubes. Crown's patented aspiration system dries the seeds by removing the free moisture brought to the surface during heating. A low-powered rotary style discharge creates a steady material flow to the plant with minimal electrical load requirements. In Soybean applications, seeds up to 14 percent moisture can be feed into the VSC, eliminating the use of grain dryers for processing. The typical retention time in the VSC dryer system ranges from 25 to 35 minutes depending on the required results for conditioning, drying and heating.⁶⁹

The VSC will be part of the Raw Soybean Storage and Handling Process; thus, the only pollutant is Particulate.

15A NCAC 2D .0515 "Particulates from Miscellaneous Industrial Processes"

This regulation establishes allowable emission rates for PM from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable.

Process rates for the proposed VSC (ID No. ES-83) per Form B9 is a maximum design capacity of 137.50 tons per hour of soybeans; thus, greater than 30 tons per hour. For process rates greater than 30 tons per hour, the allowable emission rate shall not exceed the level calculated with the equation $E = 55.0(P)^{0.11} - 40$, where E = allowable emission rate in lb/hr.

The new VSC allowable emissions limitation of PM in lb/hr based on the following calculation under 15A NCAC 2D .0515 would be:

$$\begin{aligned} E &= 55.0(P)^{0.11} - 40 \\ E &= 55.0(137.50)^{0.11} - 40 \\ \mathbf{E} &= \mathbf{54.5 \text{ lb/hr}} \end{aligned}$$

For VSC (ID No. ES-83) Form B references AP-42 as the source of emission factors (EF). The VSC is not listed in AP-42 (Food and Agricultural Industry, 9.11.1 Vegetable Oil Process was last revised 11/95). AP-42 Table 9.11.1-1 Total Particulate Emission Factors For Soybean Milling list an emission factor of 0.010 pounds of particulate per ton of soybeans processed for Bean Conditioning (SCC 3-02-007-87) controlled by a cyclone. Per Form B9 the maximum design capacity of the VSC is 137.50 tons of Soybeans processed per hour; thus:

$$\begin{aligned} \diamond & 137.50 \text{ tons soybeans processed per hr} * 0.010 \text{ lb particulate per ton of soybeans} = \\ & 1.375 \text{ pounds of particulate per hour} = 1.38 \text{ lbs/hr} \end{aligned}$$

Appendix B – Table B.5-5 uses a grain loading rate of 0.03 grains per cubic feet using the cyclones flow rate of 5,000 acfm based on EPA's PM Calculator resulting in 1.29 lbs PM per hour or using grain loading and acfm with the following calculation:

$$\diamond 5,000 \text{ acfm} * 0.03 \text{ grains/cf} * \text{lb}/7,000 \text{ grains} * 60 \text{ min/hr} = 1.286 \text{ lbs/hr outlet PM}$$

⁶⁹ VSC Crown Iron Works Company internet data www.crowniron.com

Based on the above calculations, compliance is expected for the proposed VSC with 2D .0515 based on a grain loading rate of 0.03 grains per cubic feet as calculated above.

15A NCAC 2D .0521 “Control of Visible Emissions”

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources which are required to install, operate, and maintain continuous opacity monitors, six-minute averaging periods may exceed 20 percent opacity if: (1) No six-minute period exceeds 87 percent opacity; (2) No more than one six-minute period exceeds 20 percent opacity in any hour; and (3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Compliance is expected due to controls.

15A NCAC 2D .0614 “Compliance Assurance Monitoring” (40 CFR 64) – See Section 6 below.

15A NCAC 2Q .0317 “AVOIDANCE CONDITIONS” for 15A NCAC 2D .0530 (PM and VOC) – See above.

➤ **Steam heated soybean meal dryer and cooler (ID No. ES15) controlled by four cyclones in parallel (CY15A through CY15D; 80 inches in diameter)**

Based on the application submittal for the meal dryer cooler system and the additional information received on August 7, 2015⁷⁰ the proposed new meal dryer and cooler system (ID No. ES15) has a maximum design capacity of 115.50 tons soybeans per hour per Form B9 and will be controlled by four conventional cyclones (CD ID Nos. CY15A through CY15D). Per Form C4, each cyclone will be 80 inches in diameter with an inlet flow rate of 16,000 ACFM each. The four simple cyclones will be installed on the exhaust of the meal dryer cooler system in parallel. The overall efficiency of the cyclones is 98.4% for PM/PM₁₀/PM_{2.5} per Form C4. The maintenance procedures for the cyclones will be annual internal inspection to ensure structural integrity such that optimum control efficiency is achieved.

The meal dryer and cooler system is part of the Meal, Cooling, Hull Handling, Storage and Loadout; thus, the primary pollutant is Particulate; however, anything downstream of the extractor (ES31) has some solvent (hexane) emissions due to the hexane used in the oil extraction process.

15A NCAC 2D .0515 “Particulates from Miscellaneous Industrial Processes”

This regulation establishes allowable emission rates for PM from any stack, vent, or outlet resulting from any industrial process for which no other emission control standards are applicable.

Process rates for the proposed meal dryer and cooler (**ID No. ES-15**) per Form B9 is a maximum design capacity of 115.50 tons per hour of soybeans; thus, greater than 30 tons per hour. For process rates greater than 30 tons per hour, the allowable emission rate shall not exceed the level calculated with the equation $E = 55.0(P)^{0.11} - 40$, where E = allowable emission rate in lb/hr. The new dryer system’s allowable emissions limitation of PM in lb/hr based on the following calculation under 15A NCAC 2D .0515 would be:

$$\begin{aligned} E &= 55.0(P)^{0.11} - 40 \\ E &= 55.0(115.50)^{0.11} - 40 \\ E &= \mathbf{52.7 \text{ lb/hr}} \end{aligned}$$

For meal dryer and cooler system (ID No. ES-15) Form B references AP-42 as the source of emission factors (EF). AP-42 (Food and Agricultural Industry, 9.11.1 Vegetable Oil Process was last revised 11/95). AP-42 Table 9.11.1-1 Total Particulate Emission Factors For Soybean Milling list an emission factor of 0.19 and 0.18 pounds of particulate per ton of soybeans processed for Meal Cooler (SCC 3-02-007-90) and Meal Dryer (SCC 3-02-007-89), respectively, controlled by a cyclone. Per Form B9 the maximum design capacity of the meal dryer and cooler system is 115.50 tons of Soybeans processed per hour; thus:

$$\diamond 115.50 \text{ tons soybeans processed per hr} * [(0.18 + 0.19)]/2 \text{ lb particulate per ton of soybeans} =$$

⁷⁰ Ibid 8

21.3675 pounds of particulate per hour = 21.4 lbs/hr

Form C4 uses a grain loading rate of 0.03 grains per cubic feet⁷¹ using the cyclones flow rate of 16,000 acfm based on the following calculation and using grain loading and acfm the outlet PM emissions are:

$$\diamond 16,000 \text{ acfm} * 0.03 \text{ grains/cf} * 1\text{b}/7,000 \text{ grains} * 60 \text{ min/hr} = 16.46 \text{ lbs/hr outlet PM}$$

Based on the above calculations the proposed meal dryer and cooler compliance with 2D .0515 is expected.

15A NCAC 2D .0521 “Control of Visible Emissions”

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources which are required to install, operate, and maintain continuous opacity monitors, six-minute averaging periods may exceed 20 percent opacity if: (1) No six-minute period exceeds 87 percent opacity; (2) No more than one six-minute period exceeds 20 percent opacity in any hour; and (3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Compliance is expected due to controls.

15A NCAC 2D .0614 “Compliance Assurance Monitoring” (40 CFR 64) – See Section 6 below.

15A NCAC 2Q .0317 “AVOIDANCE CONDITIONS” for 15A NCAC 2D .0530 (PM and VOC) – See above.

15A NCAC 2D .1111 “Maximum Achievable Control Technology” (40 CFR 63 Subpart GGGG) – See above.

15A NCAC 2D .1100/2Q .0711/2Q .0705/2Q .0706 “Toxic Air Pollutants” and Removal of toxic limitations per SESSION LAW 2012-91 – HOUSE BILL 952 – See Section 7 below.

15A NCAC 2D .0958: “Work Practices for Sources of Volatile Organic Compounds” – See above.

15A NCAC 2D .1806 “Control and Prohibition of Odorous Emissions” – See above.

➤ **Two Emergency⁷² Fire Pumps – Diesel-fired; 399 horsepower (hp) output (ID No. ES-83 & ES-84)**

The two proposed diesel-fired CI emergency fire pumps will replace existing diesel-fired emergency firepump (ID No. ES-81) and an electric emergency fire pump that is not on Cargill’s permit.

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity each	15A NCAC 2D .0521
Multiple emissions	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)	15A NCAC 2D .0524 40 CFR 60, Subpart IIII
Hazardous air pollutants	Maximum Achievable Control Technology:	15A NCAC 2D .1111 40 CFR Part 63, Subpart ZZZZ

⁷¹ Email correspondence on August 17, 2015 from Cargill’s consultant, Taylor Loftis.

⁷² Cargill proposes to only run the fire-pumps 500 hours per year; hence, emergency generators.

Regulated Pollutant	Limits/Standards	Applicable Regulation
	National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines	

15A NCAC 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

Emissions of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million Btu input. Sulfur dioxide (SO₂) formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard. Sulfur dioxide formed or reduced as a result of treating flue gases with sulfur trioxide or other materials shall also be accounted for when determining compliance with this standard.

A source subject to an emission standard for sulfur dioxide in Rules 2D .0524, .0527, .1110, .1111, .1205, .1206, .1210 or .1211 of this Subchapter shall meet the standard in that particular rule instead of the standard in this Rule.

- ✓ The two proposed fire pumps are subject to 2D .0524 and 2D .1111 (Please see requirements below). However, 2D .0524 nor .1111 specify an emission standard for SO₂ from diesel fuel combustion; thus, by default the facility is subject to 2D .0516 when combusting diesel fuel. Allowable emissions per this regulation are 2.3 pounds per million Btu heat input.

Per Form B2 – Emission Source (Internal Combustion Engines/Generators) the fire pumps are emergency fire pumps, fuel type is diesel with a sulfur content of less than 0.0015 percent by weight; 138,000 Btu/gallon with a maximum fuel capacity of 20.0 gallons per hour.

Based on AP-42, Table 3.3-1, the SO_x Emission factor is 0.00205 lb/hp-hr or 0.29 lb/mm Btu:

$$0.00205 \text{ lb/hp-hr} * \text{hp} = 0.81795 \text{ lbs/hr} (< \text{increment}) * 500 \text{ hrs/yr} * \text{ton}/2000 \text{ lbs} = \mathbf{0.2044875 \text{ tpy}}$$

Or

$$0.29 \text{ lb/mm Btu} * 20 \text{ gal/hr} * 138,000 \text{ Btu/gal} * 1 \text{ mm Btu}/10^6 \text{ Btu} = 0.8004 \text{ lbs/hr}$$

Compliance is demonstrated since the AP-42 EF is less than the allowable emissions.

15A NCAC 2D .0521 “Control of Visible Emissions”

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources which are required to install, operate, and maintain continuous opacity monitors, six-minute averaging periods may exceed 20 percent opacity if: (1) No six-minute period exceeds 87 percent opacity; (2) No more than one six-minute period exceeds 20 percent opacity in any hour; and (3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

This Rule shall apply to all fuel burning sources and to other processes that may have a visible emission. However, sources subject to a visible emission standard in Rules .0506, .0508, .0524, .0543, .0544, .1110, .1111, .1205, .1206, .1210, or .1211 of this Subchapter shall meet that standard instead of the standard contained in this Rule.

- ✓ Proposed emergency fire pumps are subject to 2D .0524 and .1111 (see below). However, neither 2D .0524 nor .1111 specify an emission standard for VE; thus, the fire pumps are subject to 20 percent opacity limit.
- ✓ Compliance is expected while firing diesel fuel due to the low sulfur content required by NSPS IIII.

15A NCAC 2D .0524, New Source Performance Standards (40 CFR Part 60, Subpart IIII); Part 60 - Standards of Performance for New Stationary Sources (NSPS), Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (For units manufactured after April 1, 2006)

§60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this

section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE ...

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

...

[71 FR 39172, July 11, 2006, as amended at 76 FR 37967, June 28, 2011]

✓ Per Form B2, the proposed emergency generators are 399 horsepower (HP) output; diesel fired emergency internal combustion engine (ICE); date manufactured is 2013.

Based on manufacturer specifications included in Attachment 4 of the original application submittal received on February 27, 2014 the engines are CLARKE fire pump engines to be used for stationary emergency standby fire pump service only. JW6H-UFAD70 Models, 6 cylinders, 9.0 Liter (549 cu. In.) displacement, John Deere 6090 Series Power Tech E, 399 brake horsepower (297.5 kW) at 2100 RPM engine speed, Tier 3 Emissions Certified, #2 Diesel fuel, Direct Injection, 4 Stroke Cycle, Compression Diesel Engine.

§60.4202 What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

(a) Stationary CI internal combustion engine manufacturers must certify ...

(b) Stationary CI internal combustion engine manufacturers must certify ...

(c) [Reserved]

(d) Beginning with the model years in table 3 to this subpart, stationary CI internal combustion engine manufacturers must certify their fire pump stationary CI ICE to the emission standards in table 4 to this subpart, for all pollutants, for the same model year and NFPA nameplate power.

...

[71 FR 39172, July 11, 2006, as amended at 76 FR 37968, June 28, 2011]

§60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of pre-2007 model year emergency stationary CI ICE ...

(b) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines ...

(c) Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants.

...

(e) Owners and operators of emergency stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests in-use must meet the NTE standards as indicated in §60.4212.

(f) Owners and operators of any modified or reconstructed emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed CI ICE that are specified in paragraphs (a) through (e) of this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

✓ JW6H-UFAD70 Models, 6 cylinders, 9.0 Liter (549 cu. In.) displacement, John Deere 6090 Series Power Tech E, 399 brake horsepower (297.5 kW) at 2100 RPM engine speed

§60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

(b) If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in §60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

✓ All appropriate monitoring, recordkeeping and reporting requirements will be added to Cargill's revised permit.

15A NCAC 2D .1111 "Maximum Achievable Control Technology," 40 CFR Part 63, Subpart ZZZZ "National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines"

§63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§ 63.6585 Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

...

(f) The emergency stationary RICE listed in paragraphs (f)(1) through (3) of this section are not subject to this subpart. The stationary RICE must meet the definition of an emergency stationary RICE in §63.6675, which includes operating according to the provisions specified in §63.6640(f).

(1) Existing residential emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(2) Existing commercial emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(3) Existing institutional emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

[69 FR 33506, June 15, 2004, as amended at 73 FR 3603, Jan. 18, 2008; 78 FR 6700, Jan. 30, 2013]

✓ Cargill is a major source of HAPs; therefore, the proposed diesel-fired emergency fire pumps (ID No. ES-83 & ES-84) are subject to 40 CFR Part 63 Subpart ZZZZ.

§63.6590 What parts of my plant does this subpart cover?

This subpart applies to each affected source.

(a) *Affected source.* An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) *Existing stationary RICE.*

...

(2) *New stationary RICE.* (i) A stationary RICE with a site rating of more than 500 brake HP ...

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(iii) A stationary RICE located at an area source of HAP emissions ...

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

(iii) A stationary RICE located at an area source of HAP emissions ...

(b) Stationary RICE subject to limited requirements. (1) An affected source which meets either of the criteria in paragraphs (b)(1)(i) through (ii) of this section does not have to meet the requirements of this subpart and of subpart A of this part except for the initial notification requirements of §63.6645(f).

(i) The stationary RICE is a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions ...

(ii) The stationary RICE is a new or reconstructed limited use stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

(2) A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions ...

(3) The following stationary RICE do not have to meet the requirements of this subpart and of subpart A of this part, including initial notification requirements:

(i) Existing spark ignition 2 stroke lean burn (2SLB) stationary RICE ...

(ii) Existing spark ignition 4 stroke lean burn (4SLB) stationary RICE ...

(iii) Existing emergency stationary RICE with a site rating of more than 500 brake HP located at a major source ...

(iv) Existing limited use stationary RICE with a site rating of more than 500 brake HP located at a major source ...

(v) Existing stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP ...

(c) Stationary RICE subject to Regulations under 40 CFR Part 60. An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;

(2) A new or reconstructed 2SLB stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(3) A new or reconstructed 4SLB stationary RICE with a site rating of less than 250 brake HP located at a major source of HAP emissions;

(4) A new or reconstructed spark ignition 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(5) A new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;

(6) A new or reconstructed emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(7) A new or reconstructed compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

[69 FR 33506, June 15, 2004, as amended at 73 FR 3604, Jan. 18, 2008; 75 FR 9674, Mar. 3, 2010; 75 FR 37733, June 30, 2010; 75 FR 51588, Aug. 20, 2010; 78 FR 6700, Jan. 30, 2013]

✓ The two proposed 399 hp diesel-fired emergency fire pumps (ID No. ES-83 and ES-84) were manufactured in 2013 and subject to NSPS IIII; therefore, per MACT ZZZZ §63.6590(c)(7) they must meet the requirements of this part by meeting the requirements of 40 CFR part 60 Subpart IIII, for CI stationary RICE.

✓ The appropriate MRR requirements will be placed in the revised permit.

15A NCAC 2Q .0523 “CHANGES NOT REQUIRING PERMIT REVISIONS”

Per 15A NCAC 2Q .0523 (a)(3) Section 502(b)(10) changes shall be made in the permit the next time that the permit is revised or renewed, whichever comes first. Thus, as part of this significant permit modification the technical review of Cargill's requested 502(b)(10) change received on September 2, 2014 via email notification. The original submission received on August 22, 2014 dated August 6, 2014 was deemed incomplete due to no signature on the 502(b)(10) notification form. The request proposed replacement of the raw flake conveyor (ID No. ES-30), which is controlled by a cyclone (CD No. CY30). This conveyor feeds the hexane solvent extraction process (ID No. ES-31), which is the bottleneck of the facility. Cargill plans to replace the raw flake conveyor with a new, larger screw conveyor, which will operate at the same hourly feed rate as the current conveyor. Cargill will be removing the cyclone (CD No. CY30), and its associated emissions because the new screw conveyor will be equipped with an air break, which will prevent back-mixing of hexane during periods of malfunction by routing the emissions out of the

process via natural draft as opposed to forced draft via cyclone. An email was sent to Cargill on September 11, 2014 requesting clarification of the project after DAQ and FRO internal discussions. Cargill's consultant, Taylor Loftis responded on September 18, 2014.

Cargill indicated that this change will not increase PM emissions; however, VOC emissions will increase by 12.28 tons per year. Cargill also certifies that this change qualifies as a 502(b)(10) change under 15A NCAC 2Q .0523.

DAQ originally sent Cargill a letter via email dated September 30, 2014 stating that we have determined that the request does not meet the criteria allowed to be processed as a 502(b)(10). The change would require at a minimum a minor modification application submittal. Part of this decision was based on the assumption that the conveyor would be subject to NSPS DD based on a review of the rule, US EPA Applicability Determination Index (ADI) Control Number: 0700052 and AP-42. However, Cargill submitted an older ADI that indicates that EPA considers soybean plants to have three distinct operations: whole bean handling, bean processing and soybean oil extraction. Thus, a new applicability determination was requested from USEPA Region 4 after internal discussions between DAQ staff (Mark Cuilla, William Willets, Brian Bland and Judy Lee of RCO; Gregory Reeves and Robert Hayden of FRO). DAQ submitted an applicability determination to EPA Region 4. Based on EPA's response dated October 15, 2014 from Mr. Bill Schrock and Mr. Scott Throwe, since the conveyor only handles flaked soybeans it is outside the range of NSPS DD; thus, not subject. Therefore, DAQ sent another letter to Cargill dated October 16, 2014 which indicated that the screw conveyor was not subject to NSPS DD, which acknowledged receipt of their notification and indicated that they may implement the change provided they have given EPA a seven day advanced notice with the information specified in 15A NCAC 2Q .0523(a)(2) and have attached a copy of the notification to your permit.

As part of this significant modification the technical review for this 502(b)(10) has been completed and rolled into this modification (See Section 5 above).

6. NSPS, NESHAPS, PSD, Attainment Status, 112(r), and CAM

NSPS

The two proposed diesel-fired emergency fire pumps (ID No. ES84 and ES85) will commence operation upon issuance of the revised permit; thus, subject to the requirements of New Source Performance Standards, Subpart IIII (See Section 5 above).

NESHAP/MACT

The emergency fire pumps (ID No. ES84 and ES85) trigger National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations or 15A NCAC 2D .1111 "Maximum Achievable Control Technology" (MACT) Subpart ZZZZ applicability (See Section 5 above).

A thorough review of MACT GGGG, especially the definition of a vegetable oil production process as provided in 40 CFR 63.2872(c), indicates that there are more affected emission sources than Cargill's current permit list; thus, Cargill's permit has been modified to reflect these changes (See Section 5 above).

The Boiler MACT, Subpart DDDDD, applies to the existing landfill gas/natural gas-fired boilers located at Cargill. However, this modification did not change any boilers; thus, the Boiler MACT language will be updated at renewal.

PSD/NAAQS

The facility is a major source under the Federal Prevention of Significant Deterioration (PSD) program. The facility previously had BACT limits for PM, NO_x and SO₂; yet, after removal of their coal-fired boiler they currently only have PSD avoidance conditions for VOC and PM due to removal of their coal-fired boiler.

This modification was evaluated for PSD and there are no pollutants above the SER threshold associated with this significant modification; therefore, a PSD review is not triggered at this time (See Section 5 above).

Attainment Status

Cumberland County is currently classified as "attainment" for Particulate and Ozone based on the Electronic Code of Federal Regulations (e-CFR) data inserted below:

Title 40: Protection of Environment

PART 81—DESIGNATION OF AREAS FOR AIR QUALITY PLANNING PURPOSES

Subpart C—Section 107 Attainment Status Designations § 81.334 North Carolina.

The minor baseline dates for Cumberland County have been triggered for PM₁₀ and SO₂ as of July 26, 1978 by Cargill and for NO_x as of August 20, 2001. Based on the netting analysis discussed under Section 5 above, there is no increase in emissions of PM₁₀, NO_x or SO₂ associated with this proposed modification.

112(r)

Per Form A3 – 112(r) Applicability Information, this facility is not subject to 40 CFR Part 68 “Prevention of Accidental Releases” Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the Risk Management Plan (RMP) thresholds in the Rule.

CAM

15A NCAC 2D .0614 “Compliance Assurance Monitoring” (40 CFR 64)

This facility is a Title V facility with potential emissions that exceed the Title V major source levels without considering controls. A Compliance Assurance Monitoring (CAM) determination is required for this modification because: (1) it is a significant permit revision; (2) the VSC, meal dryer cooler system, primary and secondary dehulling, cracking, whole bean storage bin, duo aspirators, some of the bean conveying equipment, and hull grinding are subject to an emission limitation or standard for PM; (3) this modification requires a control device to achieve compliance with 2D .0515; and (4) the emission sources have potential pre-controlled PM emissions greater than or equal to 100 tons per year.

In order to determine when CAM requirements apply, we look at the pollutant specific emission unit (PSEU). A PSEU is considered a large unit when the post control emissions are greater than 100 tons per year. This modification proposes the addition of and/or modification of the above emission sources controlled by cyclones and/or bagfilters. Pre-controlled emissions are greater than 100 tpy PM and post control emissions are less than 100 tpy PM; thus, they are NOT considered large PSEUs because post control emissions are less than 100 tons per year.

Therefore, the facility is subject to CAM requirements upon renewal or the next significant permit modification.

A Compliance Assurance Monitoring (CAM) (40 CFR Part 64) plan is not required for this modification, it will be reviewed during processing of Cargill’s renewal.

7. Facility Wide Air Toxics

This facility previously completed a facility-wide toxics evaluation and demonstrated compliance with the AALs by modeling all toxic air pollutants (TAPs) which was approved on March 7, 2008 and limitations have been incorporated into the Title V permit. In addition, the facility previously submitted a toxics modeling demonstration as a result of a Director’s Call which was received by DAQ on July 23, 2009 and approved on August 4, 2009.

Cargill previously requested a permit condition prohibiting the simultaneous operation of the natural gas-fired boiler ES-42 and the coal-fired boiler ES-22 to avoid state air toxics requirements. Since ES-22 was previously removed and ES-42 is being removed as part of this modification this limit will be removed altogether.

This proposed modification does not result in an increase in toxics emissions because the facility has chosen to stay below their existing modeled emission limits under 2D .1100. The facility will also be constrained by the limitation taken to avoid PSD (See Section 5 above). The facility-wide toxics emissions limit of hexane shall not exceed 100,034 bushels of soybeans per 24 hours production, equivalent to 4168.1 bushels of soybeans per hour or 125 tons of soybean per hour. Thus, no modeling is required. This limit had inadvertently been left out of Cargill’s permit; however, it will be added in the issued permit.

8. Facility Compliance Status [taken from latest inspection report of November 19, 2014]

VII RISK MANAGEMENT – 112R

Indications are that this facility does not require a written Risk Management Plan.

VIII FIVE YEAR NON-COMPLIANCE HISTORY:

5 Oct 10 - NOV was issued 5 Oct 2010 for exceeding a PM BACT limit, as demonstrated by stack testing. NOV was subsequently rescinded due to outdated BACT limit assumptions.

12 Nov 13 – NOD issued for exceeding NC Toxics limit for hexane

IX CONCLUSIONS AND RECOMMENDATIONS

1. The facility appeared to be operating **in compliance** on 19 November 2014, with the exception of the failure to permit the new fire pump engines. Recommend NOD for deviation from General Stipulation A.6.
2. Continue to inspect in the fall to see operation at full capacity.
3. Monitor that facility modifies permit to include new fire pump engines.
4. Check NESHAP 4Z requirements.
5. Monitor deviation for exceeding SLR and subsequent adjustment of SLR and compliance ratio record keeping.

PINK SHEET: (1) Update permit to address the two new fire pump engines. (2) Reduce the Consent Decree, Section 2.3; mention the successful completion date, and that the mandated solvent loss ratio in the CD remains, and is .19.

9. Public Notice/EPA and Affected State(s) Review

Public notice and EPA review periods are not required for this modification.

10. Conclusions, Comments, and Recommendations

PE Seal

Pursuant to 15A NCAC 2Q .0112 “Application requiring a Professional Engineering Seal,” a professional engineer’s seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

- (1) design;
- (2) determination of applicability and appropriateness;
- (3) or determination and interpretation of performance; of air pollution capture and control systems.

✓ Application No. 2600016.14A received on February 10, 2014:

A professional engineer’s seal (PE Seal) was required for this minor modification due to the size of the control device.

Form D – Technical Analysis to Support Permit Application was signed by Nicole L. Saniti on February 10, 2014, North Carolina P. E. Seal 038716.

✓ Application No. 2600016.14C received on July 8, 2014:

A professional engineer’s seal (PE Seal) was required for this minor modification due to the size of the control devices being re-routed.

Form D – Technical Analysis to Support Permit Application was signed by Dana W. Norvell on July 7, 2014, North Carolina P. E. Seal 028884.

✓ Application No. 2600016.14F received on December 19, 2014:

A professional engineer’s seal (PE Seal) was required for this significant modification.

Form D – Technical Analysis to Support Permit Application was signed by Nicole L. Saniti on December 16, 2014, North Carolina P. E. Seal 038716.

- Due to changes in the design of the Meal dryer cooler system a new PE Seal was required.

Form D – Technical Analysis to Support Permit Application was signed by John Taylor Loftis on August 5, 2015, North Carolina P. E. Seal 042080.

Zoning

- ✓ Application No. 2600016.14A received on February 10, 2014:

A Zoning Consistency Determination per 2Q .0304(b) was required for this minor modification request:

A zoning determination request that satisfied the requirements of North Carolina General Statute (NCGS) 143-215.108(f) was received by RCO on February 10, 2014. The zoning consistency was signed by Mr. Kenneth Sykes, Jr., Code Enforcement Manager, Cumberland County Planning & Inspections, on February 10, 2014.

- ✓ Application No. 2600016.14B received on February 27, 2014:

A Zoning Consistency Determination per 2Q .0304(b) was required for this minor modification request:

A zoning determination request that satisfied the requirements of North Carolina General Statute (NCGS) 143-215.108(f) was received by RCO on February 27, 2014. The zoning consistency was signed by Mr. Kenneth Sykes, Jr., Code Enforcement Manager, Cumberland County Planning & Inspections, on February 25, 2014.

- ✓ Application No. 2600016.14F received on December 19, 2014:

A Zoning Consistency Determination per 2Q .0304(b) was required for this significant modification request:

A zoning determination request that satisfied the requirements of North Carolina General Statute (NCGS) 143-215.108(f) was received by RCO on December 22, 2014. The zoning consistency was signed by Mr. Kenneth Sykes, Jr., Code Enforcement Manager, Cumberland County Planning & Inspections, on December 17, 2014.

A draft copy of the permit and review were sent to the FRO on August 27, 2015. Comments were received on September 1, 2015.

A scanned signed copy of the permit was sent to the facility and FRO on September 4, 2015.

Attachment 2

Permit Review for Air Permit No. 03903T45 issued October 9, 2018

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: October 9, 2018

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600016
Inspector's Name: Mitch Revels
Date of Last Inspection: 03/15/2018
Compliance Code: 3 / Compliance - inspection

Facility Data				Permit Applicability (this application only)			
Applicant (Facility's Name): Cargill, Inc. - Fayetteville				SIP: 02D .0503, 02D .0515, 02D .0516, 02D .0521, 02D .0524, 02D .0530, 02D .0535, 02D .1109, 02D .111, 02D .1806			
Facility Address: Cargill, Inc. - Fayetteville 1754 River Road Fayetteville, NC 28312				NSPS: Subpart Dc NESHAP: Subpart GGGG, Subpart ZZZZ			
SIC: 2075 / Soybean Oil Mills NAICS: 311222 / Soybean Processing				PSD: PSD Avoidance: 02Q .0317 for VOC and SO ₂			
Facility Classification: Before: Title V After: Title V				NC Toxics:			
Fee Classification: Before: Title V After: Title V				112(r):			
Other:							
Contact Data				Application Data			
Facility Contact		Authorized Contact		Technical Contact		Application Number: 2600016.18B; 2600016.16C Date Received: 04/19/2018; 06/06/2018 Application Type: Modification Application Schedule: TV-Sign-501(b)(2) Part I; TV-minor Existing Permit Data Existing Permit Number: 03903/T44 Existing Permit Issue Date: 04/21/2017 Existing Permit Expiration Date: 03/31/2021	
Terry Crawford EHS Coordinator (910) 223-6606 1754 River Road Fayetteville, NC 28312		Johan Clairet Facility Superintendent (910) 223-6671 1754 River Road Fayetteville, NC 28312		Terry Crawford EHS Coordinator (910) 223-6606 1754 River Road Fayetteville, NC 28312			
Total Actual emissions in TONS/YEAR:							
CY	SO ₂	NO _X	VOC	CO	PM ₁₀	Total HAP	Largest HAP
2016	0.2400	38.44	364.05	32.37	25.18	212.12	212.09 [Hexane, n-]
2015	0.3200	47.59	396.38	39.99	30.00	248.89	248.86 [Hexane, n-]
2014	0.3200	48.82	413.79	40.91	28.81	259.89	259.85 [Hexane, n-]
2013	0.3600	58.87	428.48	49.45	43.57	264.76	264.71 [Hexane, n-]
2012	0.3400	56.33	380.48	47.32	47.04	235.04	234.99 [Hexane, n-]
Review Engineer: Urva Patel							
Review Engineer's Signature:				Comments / Recommendations:			
Date: 10/09/2018				Issue 03903/T45 Permit Issue Date: 10/09/2018 Permit Expiration Date: 03/31/2021			

1. Purpose of Application:

Currently, Cargill, Inc. holds Title V Permit No. 03903T44 with an expiration date of March 31, 2021.

This Permit Review is combination of two different applications (**Application No.: 2600016.18B and 2600016.18C**).

Application ID No.: 2600016.18B

The TV-Sign-501(b)(2) Part I Significant Modification application (**Application No. 2600016.18B**) was received on April 19, 2018. The facility has proposed to change the current throughput limit of 1.07 Million tons per year through the dryer (Condition 2.1 A.5.a) to 1.2 Million tons per year. This application was submitted as Administrative amendment. However, it was later determined to be a significant modification eligible for treatment under 15A NCAC 02Q .0501(b)(2).

Application ID No.: 2600016.18C

The minor modification application (**Application No. 2600016.18C**) was received on June 6, 2018. The facility has proposed to physically modify the desolventizer-toaster (D/T). These modifications include increasing the horsepower of the D/T main drive motor, modifying the top exhaust to improve flow and adding two new decks to the middle of the D/T.

2. Facility Description:

Cargill operates a soybean oil extraction process (Standard Industrial Classification [SIC] Code 2075 – Soybean Processing). Cargill processes soybeans for animal feed and oil at this facility. The processes at the facility are subdivided into six separate operation groups:

- Raw soybean storage and handling;
- Raw soybean processing;
- Oil extraction, meal drying, cooling;
- Oil refining, handling, storage, crude unloading and load out;
- Miscellaneous support sources and boilers; and
- Meal and hull handling, storage and loadout.

3. History / Background / Application Chronology:

Permit History

September 30, 2013	Air Quality Permit No. 03903T38 issued with an expiration date of August 31, 2018 for Part I of two-step TV modification air permit. This modification issued by Judy Lee. It includes addition of gas-fired grain dryer which will perform the same function as two existing dryers that will be decommissioned.
September 4, 2015	Air Quality Permit No. 03903T39 issued with an expiration date of August 31, 2018 for Part II of two-step TV modification air permit. This modification issued by Judy Lee. It includes addition of gas-fired grain dryer (Part I), replacement of existing mineral oil absorber and stripper, installation of a new Soybean oil/Hexane solvent extraction process/desolventizer/toaster (extractor), and several upgrades to the soybean processing operations.
September 25, 2015	Air Quality Permit No. 03903T40 issued with an expiration date of August 31, 2018 for Part I of two-step TV modification air permit. This modification issued by Judy Lee. It includes name change (NCDENR has recently undergone a name change and is now the <u>Department of Environmental Quality</u> (NC DEQ)).
April 21, 2016	Air Quality Permit No. 03903T41 issued with an expiration date of March 31, 2021 for renewal of the air permit. This renewal issued by Judy Lee.
July 13, 2016	Air Quality Permit No. 03903T42 issued with an expiration date of March 31, 2021 for TV minor air permit. This minor modification issued by Judy Lee. It includes addition of vacuum system for grain dryer area and the raw soybean processing area.
February 9, 2017	Air Quality Permit No. 03903T43 issued with an expiration date of March 31, 2021 for a State-Only modification of existing TV air permit. This modification issued by Judy Lee. It includes Toxic Air Pollutants condition update.

04.21.2017 Air Quality Permit No. 03903T44 issued with an expiration date of March 31, 2021 for TV minor air permit. This minor modification issued by Judy Lee. It includes addition of one backup rented natural gas-fired boiler (99.9 mmBtu/hr, ID No. ES-43).

Application Chronology

April 19, 2018 Received this application as administrative amendment of the TV permit (2600016.18B).
 April 20, 2018 Sent acknowledgement letter indicating that the application(2600016.18B) for permit modification was complete.
 June 6, 2018 Received this application for minor modification (2600016.18C).
 June 20, 2018 Sent acknowledgement letter indicating that the application(2600016.18C) for permit modification was complete.
 July 19, 2018 The Department has made a decision in consultation with the applicant to process this permit application as Part I of two-step significant modification Title V air quality permit application. (On review, it was determined the change is not minor/administrative amendment. Please, see Section 6 for more detailed information)
 September 19, 2018 Requested permit application fee for Part I of two-step significant modification Title V air quality permit application.
 September 27, 2018 Requested permit application fees received.

4. Summary of Changes to the Existing Permit (Permit No. 03903T44):

Page No.	Section	Description of Changes
Cover Letter	N/A	<ul style="list-style-type: none"> Updated cover letter with application number, permit numbers, dates, fee class, PSD increment statement, and Director name.
Permit Cover	N/A	<ul style="list-style-type: none"> Inserted new issuance and complete application date, application number, facility information.
7	2.1 A.5.a	<ul style="list-style-type: none"> Revised grain dryer (ID No. ES-82) limit from 1.07 to 1.2 million tons per year.
12 14 19 34	2.1 C Table 2.1 D Table 2.1 G Table 2.2 (B)	<ul style="list-style-type: none"> Removal of 02D .0958 permit condition as it's not applicable to Cumberland County.
Permit	Section 3	<ul style="list-style-type: none"> Updated General Conditions from version 5.2 to current shell version 5.3

5. Compliance Status:

DAQ has reviewed the compliance status of this facility. During the most recent inspection conducted on March 15, 2018, Mitch Revels of the Fayetteville Regional Office indicated that the facility appeared to be in compliance with all applicable requirements. Additionally, a signed Title V Compliance Certification (Form E5) indicating that the facility was in compliance with all applicable requirements was submitted with Application No. 2600016.18B on April 19, 2018.

Five-year Compliance History:

- The facility was inspected on March 15, 2018 and appeared to be in compliance with all applicable air quality regulations.
- On November 14, 2017, NOV issued for deficient monitoring and late startup notification.
- On September 1, 2017, NOV issued for failure to provide supplemental information for a permit application when that additional information was discovered. This related to the de-rating of a temporary boiler (ID No. ES43).
- On August 15, 2017, NOV issued for deficient monitoring and recordkeeping for Bagfilter inspections.
- On March 21, 2017, NOV issued for deficient monitoring and recordkeeping for bagfilter (ID No. BF9) and vacuum systems (ID Nos. ES86 and ES87).
- The facility was inspected on January 18, 2017 and appeared to be in compliance with all applicable air quality regulations.
- The facility was inspected on March 1, 2016 and appeared to be in compliance with all applicable air quality regulations.

- The facility was inspected on November 19, 2014 and appeared to be in compliance with all applicable air quality regulations.
- The facility was inspected on February 20, 2014 and appeared to be in compliance with all applicable air quality regulations.
- On November 12, 2013, NOD issued for exceeding toxics limit for n-hexane emissions.
- The facility was inspected on October 30, 2013 and appeared to be in compliance with all applicable air quality regulations.

6. New/Modified Equipment/Changes in Emissions:

Application ID No.: 2600016.18B

The facility is requesting to change the current throughput limit of 1.07 Million tons per year through the dryer (**ID No. ES-82**: Condition 2.1 A.5.a) to 1.2 million tons per year. Cargill is demonstrating that the emission increases associated with the requested throughput can be accounted for in the net emissions increase calculations from the original application without triggering the requirements under PSD. Essentially, the current limit on the dryer was set artificially low in 2013, and at the time the original application was submitted, a dryer throughput of 1.2 million tons would not have triggered PSD.

Per application submittal for this permit modification, the following changes were requested (see Form A1, A2 for more details):

Equipment to be ADDED: n/a

Equipment to be MODIFIED:

<i>Emission Source ID NO.</i>	<i>Emission Source Description</i>	<i>Control Device ID NO.</i>	<i>Control Device Description</i>
ES-82 MACT GGGG NSPS DD	Direct fired pre-cleaned soybean dryer (45 million Btu per hour heat input; 18,000 bushels soybeans per hour maximum design capacity or 4,730,400 tons per year)	N/A	N/A

To change the current throughput limit of 1.07 Million tons per year through the dryer (**ID No. ES-82**: Condition 2.1 A.5.a) to 1.2 million tons per year.

Equipment to be REMOVED: n/a

Changes in Emissions

Total Facility-wide emissions based on Emission Inventory (please see table at beginning of document).

Per Form B –Emissions from Source (ES-82)

B.6. Emissions from New Grain Dryer (ES-82)

Table B.6-1. ES-82 Calculation Inputs

Potential Soybean Throughput ^a	1,200,000	tpy
Potential Hours of Operation	8,040	hr/yr

Table B.6-2. ES-82 Emission Estimates

Pollutant	Emission Factor ^b (lb/ton)	Potential Emissions	
		(lb/hr)	(tpy)
PM	0.05	7.46	30.00
PM ₁₀	0.0075	1.12	4.50
PM _{2.5}	0.0005	0.07	0.30

^a Soybean throughput converted to tons per year using standard weight per bushel of soybeans from: <http://www.unc.edu/~rowlett/units/scales/bushels.html>

^b The PM emission factor is based on manufacturer specifications and data. Speciated particulate emissions based on EPA PM calculator percentages for SCC 3-02-005-04, Grain Drying.

- * 8040 hours: The grain dryer design requires downtime on biweekly basis.
- * The facility assumes 60 pounds per bushel.
- * Max processing rate: 18,000 bu/hr

B.6. Emissions from New Grain Dryer (ES-82)

Table B.6-3. ES-82 Combustion Inputs

Maximum Heat Input	45	MMBtu/hr
Potential Hours of Operation	8,040	hr/yr
Potential Natural Gas Usage	351,946	Mscf/yr
Heating Value of Natural Gas	1,028	Btu/CF

Table B.6-4. ES-82 Combustion Emissions

Pollutant	Emission Factor ^a (lb/MMscf)	Potential Emissions	
		(lb/hr)	(tpy)
PM ^b	7.6	0.33	1.34
PM ₁₀ ^b	7.6	0.33	1.34
PM _{2.5} ^b	7.6	0.33	1.34
SO ₂	0.6	0.03	0.11
NO _x	100	4.38	17.60
VOC	5.5	0.24	0.97
CO	84	3.68	14.78
Lead	5E-04	2.19E-05	8.80E-05
CO ₂ ^c	—	5,266.07	21,169.60
CO ₂ ^d	120,182.55	5,260.91	21,148.86
CH ₄ ^d	2.27	0.10	0.40
N ₂ O ^d	0.23	9.92E-03	0.04

^a Emission factors are from AP-42, 5th Edition, Section 1.4, 7/98.

^b Particulate matter from natural gas combustion has been estimated to be less than one micrometer in size, per Footnote c of AP-42, Table 1.4-2.

^c CO₂e emissions calculated based on global warming potentials of 1 for CO₂, 21 for CH₄, and 310 for N₂O, as published in 40 CFR Part 98, Subpart A, Table A-1.

^d Emission factors from 40 CFR Part 98, Subpart C.

B.1. Emissions Summary

Table B.1-1. Baseline Actual Emissions (Associated Units)

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Bagfilters	43.42	3.48	1.43	--	--	--	--	--	--
Cyclones (ES-6 and E-S30)	17.24	4.60	2.23	--	--	--	--	--	--
Oil Extraction	--	--	--	--	445.66	--	--	--	--
Total Emissions	60.7	8.1	3.7	--	445.7	--	--	--	--

Table B.1-2. Projected Actual Emissions (Associated Units)

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Bagfilters	59.59	4.77	1.96	--	--	--	--	--	--
Cyclones (ES-6 and E-S30)	23.67	6.32	3.06	--	--	--	--	--	--
Oil Extraction	--	--	--	--	463.93	--	--	--	--
Total Emissions	83.3	11.1	5.0	--	463.9	--	--	--	--

Table B.1-3. Potential Emissions from New Units

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
Soybean Dryer	31.34	5.84	1.64	14.78	0.97	0.11	17.60	8.80E-05	21,170
Total Emissions	31.34	5.84	1.64	14.78	0.97	0.11	17.60	8.80E-05	21,170

Table B.1-4. Project Emissions Increase Summary

Emissions	Total PM ^a (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	NO _x (tpy)	Lead (tpy)	CO ₂ e (tpy)
(B) Projected Actual Emissions (Associated Units) - Table B.1-2	83.26	11.09	5.02	--	463.93	--	--	--	--
(D) Potential Emissions (New Units) - Table B.1-3	31.34	5.84	1.64	14.78	0.97	0.11	17.60	8.80E-05	21,170
(A) Baseline Actual Emissions (Associated Units) - Table B.1-1	60.66	8.08	3.66	--	445.66	--	--	--	--
Total Change (B+D-A)	53.9	8.8	3.0	14.8	19.2	0.1	17.6	8.80E-05	21,170
SER	25	15	10	100	40	40	40	0.6	75,000
Exceeds?	YES	No	No	No	No	No	No	No	No

^a Netting Required for total PM.

Table B.1-5. Contemporaneous Increases and Decreases (October 2008 to September 2013)

Project Emissions Increases and Decreases	Total PM (tpy)
Coal Boiler Shutdown (ES-22) - September 2010	-32.46
Cyclone Shutdown (CY13 and CY14) - September 2011	-25.90
New Cyclones (CY13 and CY14) - September 2011	49.62
Soybean Dryer Shutdown (ES-17) - September 2013	-77.72
Soybean Dryer Shutdown (ES-16) - September 2013	-4.52
Total Increases and Decreases	-90.98

Table B.1-6. Net Emissions Increase Summary (PM)

Emissions	Total PM (tpy)
(B) Projected Actual Emissions (Associated Units) - Table B.1-2	83.26
(D) Potential Emissions (New Units) - Table B.1-3	31.34
(A) Baseline Actual Emissions (Associated Units) - Table B.1-1	60.66
(C) Contemporaneous Increases and Decreases - Table B.1.5	-90.98
Total Change (B+D-A+C)	-37.0
SER	25
Exceeds?	No

Table B.1-7. PSD Significant Emission Rate Comparison

Pollutant	Project Increase (tpy)	PSD SER (tpy)	% of SER
Total PM (netting)	-37.0	25	< 1%
PM ₁₀	8.8	15	59%
PM _{2.5}	3.0	10	30%
CO	14.8	100	15%
VOC	19.2	40	48%
SO ₂	0.1	40	< 1%
NO _x	17.6	40	44%
Lead	8.8E-05	0.6	< 1%
CO ₂ e	21,169.6	75,000	28%

As shown in the above tables, there is not significant emissions increase of any regulated pollutant. In order to avoid PSD applicability, the soybean dryer will be limited to 1.07 million tons of soybean per year (as per previous permit); thus, a PSD Avoidance condition will be added to the permit. That limit can change to 1.2 million tons of soybean per year as there is no exceedance of SER threshold as indicated in above tables.

Net Emission Summary Table B.1-6 indicates PM is still below the Significant Emission Rate (SER) threshold.

Pollutant	Table B.1-7. Proposed Project (ES-82) Emissions Increase Permit No. T38	Table B.1-7. Proposed Project (ES-82) Emissions Increase Permit No. T45 (Current)	Table B.1-6. Net Emissions Increase Summary (ES-82) (B + D – A)	Potential Emissions – Form D1 (After controls / Limitations)
	Tons per year (tpy)			
Particulate Matter (PM)	26.75+1.34 = 28.09	31.34	53.9	188.06
PM<10 µm (PM ₁₀)	4.01+1.34 = 5.35	5.84	8.8	37.22
PM<2.5 µm (PM _{2.5})	0.27+1.34 = 1.61	1.64	3	16.07
Sulfur dioxide (SO ₂)	0.11	0.11	0.1	0.66
Nitrogen oxides (NO _x)	17.60	17.60	17.6	110.30
Carbon monoxide (CO)	14.78	14.78	14.8	92.88
Volatile Organic Compounds (VOC)	0.97	0.97	19.2	<487.4
Lead	8.80E-05	8.80E-05	8.80E-05	5.6E-04
Hazardous Air Pollutants (HAP)				
Largest Individual HAP (n- Hexane)				302.19
Toxic Air Pollutants (TAP)				
iso-Hexane				352,647 lb/year
n-Hexane				604,376 lb/year
GREENHOUSE GASES (GHG)				
CO ₂ Equivalent (CO ₂ e)	21,170	21,170	21,170	130,400

Net Increase of PM due to increase in grain dryer (ID No. ES-82) capacity:

$$31.34 - 28.09 = 3.25 \text{ TPY}$$

$$\text{An increase of PM} = 3.25 * 2000 / 8040 = 0.8084 \text{ lb/hr}$$

Application ID No.: 2600016.18C

The Facility has proposed to modify the Desolventizer-Toaster (D/T). The modifications include increasing the horsepower of the D/T main drive motor, modifying the top exhaust to improve flow, and adding two new decks to the middle of the D/T.

The facility is projecting the solvent loss ratio will decrease due to the proposed modifications as the residence time is increased to improve solvent recovery. As a result, the facility will be able to process more soybeans on an annual basis while still maintaining compliance with all annual limits.

The potential emissions will not change as a result of this project and the Fayetteville facility will maintain compliance with the facility-wide VOC emission limit of 487.4 tons per year.

The proposed project does not involve replacing the D/T and the fixed capital cost of the D/T modification does not represent a significant % of the fixed capital cost of building a comparable new vegetable oil production process. Therefore, it is considered as minor modification.

Attachment 1 - Emission Calculations

Emissions Summary

Baseline Actual Emissions

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Grain Dryer	21.36	3.22	0.23	0.03	4.20	0	3.53	2.1E-05
Bagfilters	48.16	4.06	1.68	---	---	---	---	---
Cyclones	100.16	26.73	12.96	---	---	---	---	---
Oil Extraction	---	---	---	---	---	463.32	---	---
Boilers	0.18	0.18	0.15	0.21	34.51	2.04	28.99	1.7E-04
Total	169.85	34.19	15.02	0.23	38.72	465.36	32.52	1.9E-04

Projected Actual Emissions

Source	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Grain Dryer	30.10	4.60	0.38	0.12	19.21	1.06	16.14	9.6E-05
Bagfilters	54.37	4.58	1.90	---	---	---	---	---
Cyclones	103.06	27.50	13.33	---	---	---	---	---
Oil Extraction	---	---	---	---	---	476.55	---	---
Boilers	0.24	0.24	0.20	0.28	46.49	2.56	39.05	2.3E-04
Total	187.77	36.92	15.82	0.39	65.70	480.16	55.19	3.3E-04

Project Emissions Increase Summary

Emissions	Total PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	VOC (tpy)	CO (tpy)	Lead (tpy)
Projected Actual Emissions	187.77	36.92	15.82	0.39	65.70	480.16	55.19	3.3E-04
Baseline Actual Emissions	169.85	34.19	15.02	0.23	38.72	465.36	32.52	1.9E-04
Emissions Increase	17.91	2.74	0.79	0.16	26.98	14.80	22.67	1.3E-04
SER	25	15	10	40	40	40	100	0.6
Exceeds?	No	No	No	No	No	No	No	No

As indicated above in the table, the emission increase of each pollutant is below SER (significant emission rate). Therefore, PSD permitting is not required for this proposed modification of Desolventizer-Toaster (ID No. ES-31B).

Per Form D1 – Facility-Wide Emissions Summary

Pollutant	Potential Emissions – Form D1 (After controls / Limitations)
	Tons per year (tpy)
Particulate Matter (PM)	188.06
PM<10 µm (PM ₁₀)	37.22
PM<2.5 µm (PM _{2.5})	16.07
Sulfur dioxide (SO ₂)	0.66
Nitrogen oxides (NO _x)	110.30
Carbon monoxide (CO)	92.88
Volatile Organic Compounds (VOC)	<487.4
Lead	5.6E-04
Hazardous Air Pollutants (HAP)	
Largest Individual HAP (n-Hexane)	302.19

Pollutant	Potential Emissions – Form D1 (After controls / Limitations)
	Tons per year (tpy)
Toxic Air Pollutants (TAP)	
iso-Hexane	352,647 lb/year
n-Hexane	604,376 lb/year
GREENHOUSE GASES (GHG)	
CO ₂ Equivalent (CO ₂ e)	130,400

7. Regulatory Review

Unless specifically noted, a detailed discussion of the following list of equipment and all associated permit conditions is not included as applicability status has not changed. The permit conditions have been modified to reflect the most current language, as necessary. The facility is expected to be in continued compliance.

15A NCAC 02D .0503 “Particulates from Fuel Burning Indirect Heat Exchangers”
15A NCAC 02D .0515 “Particulates from Miscellaneous Industrial Processes”
15A NCAC 02D .0516 “Sulfur Dioxide Emissions from Combustion Sources”
15A NCAC 02D .0521 “Control of Visible Emissions”
15A NCAC 02D .0524, New Source Performance Standards (40 CFR Part 60 Subpart Dc)
15A NCAC 02D .0530 “PREVENTION OF SIGNIFICANT DETERIORATION” (PM, NO_x and SO₂)
15A NCAC 02D .0535 “Excess Emissions Reporting and Malfunctions”
15A NCAC 02D .1109 “Case-by-Case Maximum Achievable Control Technology (MACT)”
15A NCAC 02D .1111 “Maximum Achievable Control Technology (40 CFR 63, Subpart GGGG)”
15A NCAC 02D .1111 “Maximum Achievable Control Technology (40 CFR 63, Subpart ZZZZ)”
15A NCAC 02D .1806 “Control and Prohibition of Odorous Emissions”
15A NCAC 02Q .0317 “AVOIDANCE CONDITIONS” for 15A NCAC 02D .0530 (VOC and SO₂)

Changes in this permit

- **Removal of “15A NCAC 02D .0958: Volatile Organic Compounds”** since it is not applicable statewide anymore. On November 1, 2016, amendments to 15A NCAC 02D .0902 for VOC emissions were finalized to narrow applicability of work practice standards in 15A NCAC 02D .0958 from statewide to the maintenance area for the 1997 8-hour ozone standard. This change is being made primarily because the abundance of biogenic VOC emissions in North Carolina results in ozone formation being limited by the amount of available NO_x emissions. Provisions of the Clean Air Act require VOC requirements previously implemented in an ozone nonattainment area prior to redesignation remain in place. However, facilities outside the maintenance area counties for the 1997 8-hour ozone standard would no longer be required to comply with the work practice standards in 15A NCAC 02D .0958.

8. NSPS, NESHAP/MACT, NSR/PSD, 112(r), CAM

NSPS

This facility is subject to New Source Performance Standards (NSPS), 40 CFR 60, Subpart Dc as noted above. This permit modification does not change this status.

NESHAP/MACT

This facility is a major source for HAPs emissions and is subject to the National Emission Standards for Hazardous Air Pollutants, 40 CFR 63; however, this permit modification does not affect this status.

This facility is subject to 40 CFR 63, Subpart GGGG, Subpart ZZZZ and Subpart DDDDD.

NSR/PSD

The facility is a major source under the Federal Prevention of Significant Deterioration (PSD) program. The facility currently has BACT limits for PM, NO_x and SO₂; as well as PSD avoidance conditions for VOCs and SO₂.

This modification was evaluated for PSD applicability. There are no pollutants above the SER threshold associated with this modification; therefore, a PSD review is not triggered at this time (See Section 6 above).

Increment

The PSD minor source base line date for PSD increment tracking in Cumberland County was July 26, 1978 for particulate matter (PM₁₀) and sulfur dioxide (SO₂) emissions; and August 20, 2001 for nitrogen oxide (NO_x) emissions.

PSD increment tracking for PSD Class II purposes is required as part of this minor modification due to an increase in PM/PM₁₀/PM_{2.5} emissions of 0.8 lb/hr pounds per hour (lbs/hr). (Please refer to Section 6 above under PSD avoidance for more information).

112(r)

This facility is NOT subject to the requirements of the Chemical Accident Release Prevention Program, Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above applicability thresholds.

Compliance Assurance Monitoring (CAM)

The facility is currently subject to CAM. This modification does not propose the addition of any new control devices; therefore, a review of CAM is not necessary at this time.

9. Facility-Wide Air Toxics:

The current permit includes modeled emission rates based on previous approved modeling demonstrations. This application does not trigger an air toxics review or request any changes of emission limits. No further air toxics evaluation is required at this time.

10. Facility Emission Review:

Based on the potential emissions shown below, this facility is classified as a Title V facility.

Pollutant	Expected Actual Emissions TPY	Potential Emissions TPY
Particulate Matter (PM)	188.06	188.06
Particulate Matter <2.5 (PM _{2.5})	16.07	16.07
Particulate Matter <10 (PM ₁₀)	37.22	37.22
Sulfur Dioxide (SO ₂)	0.66	0.66
Nitrogen Oxide (NO _x)	110.30	110.30
Carbon Monoxide (CO)	92.88	92.88
Volatile Organic Compounds (VOC)	<487.4	<487.4
Total Hazardous Air Pollutants (HAP)	302.19	302.19
Greenhouse Gases CO ₂ Equivalent (CO ₂ e)	21,170	130,400

11. Public Notice/EPA and Affected State(s) Review

Public notice and EPA review periods are not required for this modification.

12. Other Regulatory Considerations:

- A Permit Application fee is required for Permit Applications No. 2600016.18B and 2600016.18C.
- A P.E. Seal is NOT required for Permit Applications No. 2600016.18B and 2600016.18C.
- A 30-day public notice and 45-day EPA review is NOT required for Permit Applications No. 2600016.18B and 2600016.18C.
- A Zoning Determination is NOT required for permit application 2600016.18B and A Zoning Determination is required for permit application 2600016.18C.

13. Recommendations/Conclusion:

DAQ recommends the issuance of Air Permit No. 03903T45 to Cargill, Inc. - Fayetteville.