NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date: XX/XX/2005

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600016
Inspector's Name: Sally McKinney
Date of Last Inspection: 09/03/2004
Compliance Code: 3/In Compliance - Inspection

Facility Data

Applicant (Facility's Name): Cargill Inc - Fayetteville

Facility Address:
Cargill Inc - Fayetteville
1754 River Road
Fayetteville, NC 28301

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

Permit Applicability (this application only)

SIP: 2D .0521, .0958, and .1806
NSPS:
NESHAP:
PSD:
PSD Avoidance: 2Q .0317 (VOCs)
NC Toxics: 2D .1100
112(r):
Other:

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Jaysen Schock Plant Manager (910) 433-4922 1754 River Road Fayetteville NC, 28301	Jaysen Schock Plant Manager (910) 433-4922 1754 River Road Fayetteville NC, 28301	Jaysen Schock Plant Manager (910) 433-4922 1754 River Road Fayetteville NC, 28301

Application Data

Application Number: 2600016.04B
Date Received: 03/04/2004
Application Type: Modification
Application Schedule: TV-Significant

Existing Permit Data
Existing Permit Number: 03903/T24
Existing Permit Issue Date: 04/30/2004
Existing Permit Expiration Date: 07/31/2008

Review Engineer: Jeff Twisdale

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 03903/T25
Permit Issue Date: XX/XX/2005
Permit Expiration Date: 07/31/2008

1. Purpose of Application:

Cargill, Inc., North American Oilseed Processing, Fayetteville Facility (Cargill) receives soybeans and then dries, dehulls, conditions, flakes, and extracts oil from the bean flakes. The hulls, soybean meal from depleted flakes, and soybean oil are then processed and transferred off-site. The facility considered both a Soybean Processing and a Refining Facility. The 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 facility currently operates under 03903T24, issued April 30, 2004, with an expiration date of July 31, 2008. 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.

The following changes incorporated in the permit revision are summarized below:

Old Page	New Page	Section	Change
Page 5	Page 5	Section 1 Table - Control Device Description and footnote (*) for the bagfilter (BF-12) installed on fine clay receiving operation (ES-25)	removed footnote (*) and reference to Part II Construction Permit for replacement bagfilter (BF-12)
Page 5	Page 5	Section 1 Table - Emission Source Description for existing clay conveying receiver operation (ES-26) and associated bagfilter (BF-13)	removed description for existing clay conveying receiver operation (ES-26) and associated bagfilter (BF-13)
Page 5	Page 5	Section 1 Table - Emission Source Description and footnote (**) for modified oil refinery w/ new deodorizer (ES-34)	removed footnote (**) and reference to Part II Construction Permit for modified oil refinery (ES-34)
Page 14	Page 14	Section 2.1 E.1. – Specific condition for particulate emissions testing of boiler (ES-22)	revised required testing date for particulate testing of boiler (ES-22) since testing was recently completed
Page 19	Page 19	Section 2.1 G Table - Emission Source Description and footnote (*) for replacement bagfilter (BF-12) for fine clay receiving operation (ES-25)	removed footnote (*) and reference to Part II Construction Permit for replacement bagfilter (BF-12)
Page 19	Page 19	Section 2.1 G Table - Emission Source Description for existing clay conveying receiver operation (ES-26) and associated bagfilter (BF-13)	removed description for existing clay conveying receiver operation (ES-26) and associated bagfilter (BF-13)
Page 23	Page 23	Section 2.1 I Table - Emission Source Description and footnote (**) for modified oil refinery w/ new deodorizer (ES-34)	removed footnote (**) and reference to Part II Construction Permit for modified oil refinery (ES-34)
Page 23	Page 23	Section 2.1 I Table - PSD Avoidance Limit for VOC emissions from modified oil refinery (ES-34)	revised PSD Avoidance Limit for VOC emissions (< 56 tpy) from modified oil refinery (ES-34)
Page 24	Page 24	Section 2.1 I.2. - PSD Avoidance Condition for VOC emissions from modified oil refinery (ES-34)	added PSD Avoidance Condition for VOC emissions (< 56 tpy) from modified oil refinery (ES-34)
Page 27	Page 27	Section 2.2 C Table - PSD Avoidance Limit for VOC emissions from oil extraction process emission sources (ES31, ES29A, ES29B, ES32A, ES32B, ES13 and ES14)	revised PSD Avoidance Limit for VOC emissions (< 686 tpy) from oil extraction process emission sources
Pages 28 – 43	Pages 28 – 38	Section 2.2 D - MACT Subpart GGGG Condition for Solvent Extraction for Vegetable Oil Production	revised the MACT Subpart GGGG condition to incorporate the Compliance Plan by reference, and to add the low-HAP solvent compliance option, etc.
Pages 43 – 50	Pages 39 - 46	Part I Section 3 - General Conditions	updated the general conditions with the latest conditions available
Pages 51-53	NA	Part II Sections 1, 2 & 3 - Construction Permit Table and associated specific/general conditions for replacement bagfilter (BF-12) and modified oil refinery (ES-34) w/ new deodorizer	removed replacement bagfilter (BF-12) and modified oil refinery (ES-34) w/ new deodorizer in table plus associated specific conditions

2. Application Chronology

The attached IBEAM Comprehensive Application Report details the application chronology. The application was initially received on March 3, 2004. The determination of consistency with the local zoning agency was received on March 24, 2004, and additional application forms were received on April 16, 2004. Cargill filed another application on August 18, 2004 requesting replacement of the clay conveying receiver operation with an enclosed auger system with no emission point that was consolidated with this application on September 2, 2004.

3. Modified Equipment/Change in Emission and Regulatory Review

This modification to an existing Title V permit will be handled as a significant modification per 2Q .0516.

One new deodorizer replaced the existing deodorizer at the existing oil refinery (ID No. ES-34). A detailed analysis of the process is given below in paragraph (a) of this section. The same regulations (2D .0521, .0958, 2D .1100 (in lieu of 2Q .0711), .1806 and 2Q .0317 (2D .0530 avoidance) and their associated specific conditions continue to apply to the modified/new deodorizer at the oil refinery. Continued compliance with the above regulations and associated specific conditions is expected.

a. One modified oil refinery (ID No. ES-34) with a new deodorizer

i. Description

The oil refinery processes vegetable oils from the on-site extraction process as well as from other off-site facilities. The refinery process consists three steps: 1) refining; 2) bleaching; and 3) deodorizing. Residual hexane in the vegetable oils that remains after the extraction process is removed during the refining process. An assumption is made that all residual hexane in the oil following extraction is emitted to the atmosphere from the refinery. Because the residual hexane in the oil will be emitted during a number of steps during the refining process, and the sum of all hexane emissions from the refinery are relatively small, a single fugitive emission point for the entire refinery is appropriate. The modified oil refinery with a new deodorizer will allow operation of the refinery at its designed rate. Although the deodorizer will have some excess capacity, the capacity of the refinery will still be limited by the refining and bleaching operations. The new deodorizer will increase operational reliability and produce a higher quality (lower transfat) oil. Also, the new unit will increase the deodorizing capacity to accommodate future refinery capacity plus the ability to process additional refined and bleached oil.

ii. Applicable Regulatory Requirements:

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

Regulated Pollutant	Limits/Standards	Applicable Regulation
visible emissions	20 percent opacity	2D .0521
odors	odorous emissions shall be controlled	2D .1806
volatile organic compounds	work practice standards	2D .0958
toxic air pollutants	See TAP Section 9 below	2D .1100
volatile organic compounds	See PSD Section 7 below	2Q .0317 (2D .0530 Avoidance)

a) 2D .0521 "Control of Visible Emissions"

i) Regulation Analysis

The oil refinery/deodorizer were established after July 1, 1971 and are subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance with this regulation should be indicated since the latest inspection report did not cite any opacity exceedances for the oil refinery.

ii) Monitoring/Recordkeeping/Reporting Requirements

The same monitoring (monthly visual observation), recordkeeping (maintain log on-site and make available upon request) and reporting (semiannual summary report) apply.

b) 2D .1806 "Control and Prohibition of Odorous Emissions" **State-Only Requirement**

i) Regulation Analysis

The Permittee 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. Compliance with this regulation should be indicated since the latest inspection report did not cite any odorous concerns for the oil refinery nor the facility.

c) 2D .0958 "Work Practices for Sources of Volatile Organic Compounds"

i) Regulatory Analysis

The oil refinery process is subject to 2D .0958. The facility uses only nonphotochemically reactive VOCs (hexane) for the extraction of vegetable oil.

Pursuant to 15A NCAC 2D.0958, for all sources that use volatile organic compounds (VOC) as solvents, carriers, material processing media, or industrial chemical reactants, or in similar uses that mix, blend, or manufacture volatile organic compounds, or emit volatile organic compounds as a product of chemical reactions, and whose emissions of VOC are greater than 15 pounds per day; the Permittee shall:
(1) store all material, including waste material, containing volatile organic compounds in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use,
(2) clean up spills of volatile organic compounds as soon as possible following proper safety procedures,
(3) store wipe rags containing volatile organic compounds in closed containers,
(4) not clean sponges, fabric, wood, paper products, and other absorbent materials with volatile organic compounds,
(5) transfer solvents containing volatile organic compounds used to clean supply lines and other coating equipment into closable containers and close such containers immediately after each use, or transfer such solvents to closed tanks, or to a treatment facility regulated under section 402 of the Clean Water Act,
(6) clean mixing, blending, and manufacturing vats and containers containing volatile organic compounds by adding cleaning solvent and close the vat or container before agitating the cleaning solvent. The spent cleaning solvent shall then be transferred into a closed container, a closed tank or a treatment facility regulated under section 402 of the Clean Water Act. [15A NCAC 2D .0958(c)]

When cleaning parts with a solvent containing VOCs, the Permittee shall:
(1) flush parts in the freeboard area,
(2) take precautions to reduce the pooling of solvent on and in the parts,
(3) tilt or rotate parts to drain solvent and allow a minimum of 15 seconds for drying or until all dripping has stopped, whichever is longer,
(4) not fill cleaning machines above the fill line,
(5) not agitate solvent to the point of causing splashing. [15A NCAC 2D .0958(d)]

ii) Monitoring, Recordkeeping and Reporting Requirements

To assure compliance with work practice standards, the Permittee shall, at a minimum, perform a visual inspection once per month of all operations and processes utilizing volatile organic compounds and shall immediately initiate any corrective actions required to meet the requirements above. The inspections shall be conducted during normal operation. If the required inspections are not conducted, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958. The results of the inspections shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the date and time of each inspection; and the results of each inspection noting whether or not noncompliant conditions were observed and whether or not corrective actions were taken to restore compliance. If the required records are not maintained, the Permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958. The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

4. NSPS Issues:

None.

5. Facility Compliance Status:

Based on the last inspection by Sally McKinney of the Fayetteville Regional Office (FRO) on September 2, 2004, the facility is currently in compliance. Please note the inspection report discussed the recent particulate emission testing on the coal-fired boiler (ES-22) on July 8, 2004 that satisfied the testing condition (Ref. 2.1 E.1.c. in the existing permit (3903T24). The preliminary test results indicate that compliance will be demonstrated. Therefore, the specific condition for particulate testing of boiler (ES-22) will be revised since testing was recently completed. Particulate testing of boiler (ES-22) will be required every permit term but not longer than five years following the previous testing to ensure compliance with 2D .0530 (particulate matter).

6. Facility Emissions Review:

There will be essentially no increase in particulate matter or sulfur dioxide emissions from installation of the new deodorizer at the oil refinery. There will be an increase in VOC emissions (see PSD section below) from the modification. The total potential VOCs from the facility will now be estimated to be 744 tons per year.

7. Prevention of Significant Deterioration (PSD) Issues:

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 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.

This facility is located in Cumberland County that is currently in attainment for all pollutants except ozone; however, Cumberland County (Fayetteville Area) is part of the Early Action Compact (EAC) and is considered to be attainment as long as the status reports of the EAC are submitted timely. Cumberland County must attain national air quality standards for 8-hour ozone no later than December 2007. The minor source baseline date has been triggered for Cumberland County for PM-10 and SO_2. PSD increment would normally need to be tracked for these pollutants since the facility is also a major stationary source; however, the only increments are associated with VOCs (considered to be precursors to ozone) and are not required to be tracked at this time.

8. Maximum Achievable Control Technology (MACT) Applicability and Requirements

Based on a review of the facility's current operations and emission sources, the facility (specifically the soybean oil/hexane solvent extraction process (**ID No. ES-31**) and the two underground hexane storage tanks (**ES-29A and ES-29B**)) is subject to the **National Emission Standards for the Solvent Extraction for Vegetable Oil Production (40 CFR Part 63 Subpart GGGG)**. In accordance with 40 CFR 63.2851, the facility developed a written plan for demonstrating compliance that outlines the detailed procedures (monitor/record/report data as necessary) the facility will follow to demonstrate compliance with Subpart GGGG. In accordance with 40 CFR 63.2852, the facility developed a written Startup, Shutdown and Malfunction (SSM) Plan in accordance with 40 CFR § 63.6(e)(3) and will implement the SSM Plan when applicable. In accordance with 40 CFR 63.2862, both the compliance plan (as described in § 63.2851) and the SSM plan (as described in § 63.2852) shall be kept on-site and readily available as long as the affected sources are operational. The development and implementation of the Compliance Plan and the SSM Plan prior to the compliance date of Subpart GGGG (April 12, 2004) will help ensure compliance with the Vegetable Oil Production MACT requirements.

9. Toxic Air Pollutant (TAP) Applicability and Requirements

For facilities subject to a MACT, the owner or operator of the facility shall comply with 2D .1100 by the same deadline (April 12, 2004) that is required by the last MACT (40 CFR 63 Subpart GGGG) excluding the Combustion MACT pursuant to 2Q .0705. The facility submitted modeling information with the latest permit application that included an evaluation for all toxic air pollutants (specifically n-hexane and hexane isomers except n-hexane) covered under 2D .1104 for all sources at the facility, excluding those sources exempt from evaluation under 2Q .0702. Jamie Sellman of the Air Quality Analysis Branch reviewed and approved the air quality dispersion modeling analysis for emissions of n-hexane and hexane isomers from the facility (Ref. Memo dated April 1, 2004). The modeling analysis adequately demonstrates compliance with the Acceptable Ambient Levels (AALs) for n-hexane and hexane isomers on a source-by-source basis. The modeling analysis indicated that the maximum impacts were 94% of the 24-hr AAL for n-hexane and less than 1% of the 1-hr AAL for hexane isomers. The compliance demonstration assumes the pollutant emission rate calculations provided are correct. The emission rates modeled for the emission sources releasing n-hexane and hexane isomers were determined using the proposed VOC emissions that are limited to avoid PSD for the extraction plant (686 tpy) and the refinery (56 tpy), respectively. The maximum annual crush throughput (1,080,000 tpy) divided by the proposed VOC emissions limit determines a solvent loss factor for the source. The maximum daily (3,120 tons per day) and hourly (135 tons per hour) crush throughputs multiplied by the solvent loss factor determines the respective n-hexane and hexane isomers emission rates for each emission source. Note: The theoretical maximum daily crush is 3,240 tons per day based on a maximum hourly crush throughput of 135 tons per hour. By using the theoretical maximum daily crush throughput (3,240 tons per day), the maximum impacts are 97.6% of the AAL for n-hexane and still less than 1% of the 1-hr AAL for hexane isomers. Therefore, compliance is still demonstrated. The highest percentage n-hexane of total hexane received by the facility shall not exceed 64% by weight. RCO developed a specific condition limiting the hexane emissions utilizing % n-hexane content by weight to ensure that the facility demonstrates compliance with 2D .1100.

10. Conclusions, Comments, and Recommendations:

All applicable DAQ requirements should be met. The DRAFT permit was sent to the facility and to FRO on November 5, 2004 for their review. Cargill submitted minor comments regarding the particulate matter testing (once every permit term) on boiler (ID No. ES-22) plus the submittal of revised MACT Subpart GGGG language on November 19, 2004 since the compliance date had passed. FRO submitted comments on the revised MACT Subpart GGGG language on November 30, 2004. Therefore, RCO revised the MACT Subpart GGGG language and sent it to the facility and to FRO on December 10, 2004. No additional comments were received. Recommend issuance of this air permit after completion of public notice and EPA review periods.