MARYLAND DEPARTMENT OF THE ENVIRONMENT

AIR AND RADIATION ADMINISTRATION
APPLICATION FOR A PERMIT TO CONSTRUCT

DOCKET #04-25

COMPANY: Perdue AgriBusiness LLC

LOCATION: 6906 Zion Church Road
Salisbury, MD 21804

APPLICATION: Installation of a soybean oil extractor and associated equipment

ITEM	DESCRIPTION
1	Notice of Application and Informational Meeting
2	Permit to Construct and New Source Review Application Forms - Forms 5, 5T, 5EP (3), 6 - NSR Applicability Analysis - LAER Analysis
3	Emissions Calculations, Process Flow Diagrams, Vendor Data, AERMOD Results
4	Environmental Justice (EJ) Information - EJ Fact Sheet and MDE Score and Screening Report
5	Zoning Information

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF APPLICATION AND INFORMATIONAL MEETING

The Maryland Department of the Environment, Air and Radiation Administration (ARA) received an application for an Air Quality Permit to Construct and major New Source Review Approval from Perdue AgriBusiness LLC on September 27, 2024 for the installation of a soybean oil extractor and associated equipment. The proposed installations will be located at 6906 Zion Church Road, Salisbury, MD 21804.

In accordance with HB 1200/Ch. 588 of 2022, the applicant provided an environmental justice (EJ) Score for the census tract in which the project is located using the MDE EJ Screening Tool. The EJ Score, expressed as a statewide percentile, was shown to be 81 which the Department has verified. This score considers three demographic indicators – minority population above 50%, poverty rate above 25% and limited English proficiency above 15%. Multiple environmental health indicators are used to identify overburdened communities.

Copies of the application, the MDE EJ Screening Tool Report (which includes the score), and other supporting documents are available for public inspection on the Department's website at https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/index.aspx (click on Docket Number 04-25). Any applicant-provided information regarding a description of the environmental and socioeconomic indicators contributing to that EJ score can also be found at the listed website. Such information has not yet been reviewed by the Department. A review of the submitted information will be conducted when the Department undertakes its technical review of all documents included in the application.

Pursuant to the Environment Article, Section 1-603, Annotated Code of Maryland, an Informational Meeting has been scheduled so that citizens can discuss the application and the permit review process with the applicant and the Department.

An Informational Meeting will be held on Wednesday, April 23, 2025 from 6:00 pm to 8:00 pm at Beaver Run Elementary School, 31481 Old Ocean City Road, Salisbury, MD 21804.

The Department will provide an interpreter for deaf and hearing impaired persons provided that a request is made for such service at least ten (10) days prior to the meeting. further information may be obtained by calling Ms. Shannon Heafey at 410-537-4433.

Christopher R. Hoagland, Director
Air and Radiation Administration

PERDUE AgriBusiness

September 26, 2024

Suna Sariscak
Manager, Air Quality Permits Program
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

Re: Permit to Construct/New Source Review Approval Application

Dear Ms. Sariscak:

Perdue AgriBusiness LLC (PAB) is submitting a Permit-to-Construct (PTC) application to the Maryland Department of the Environment (MDE), which includes a New Source Review (NSR) approval application, to authorize past and proposed changes to its existing Soybean Processing Plant (the Project) at its Zion Church Road facility (the ZCR Facility) in Salisbury, Maryland. The Project is a modification to the existing Soybean Processing that will not only provide higher oil yields than the current system but will also provide for better solvent recovery and emissions control. When the Project is completed, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 tons per year with a solvent loss ratio (SLR, gallons solvent loss per rolling 12-month total/ton of soybeans processed per rolling 12-month total) that is the lowest rate permitted for any other modified existing soybean processing plant in the U.S.

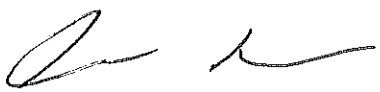
This application includes an NSR applicability analysis, concluding that the Project is subject to Nonattainment NSR (NNSR) for VOC emissions, but is not subject to the Prevention of Significant Deterioration (PSD) program for other regulated pollutants. Also, the application contains analyses demonstrating compliance with all applicable NNSR Program requirements, as well as MDE Toxic Air Pollutant (TAP) requirements.

PAB and MDE signed a Consent Decree (C-22-CV-24-000274) which was entered into the Circuit Court for Wicomico County on July 31, 2024. Paragraph 30 of Section III, *Work to be Performed,* of the Consent Decree states, "within sixty (60) days of the entry of this Consent Decree, PAB shall submit to the Department a complete air quality permit to construct application, pursuant to COMAR 26.11.02.11, a complete New Source Review ("NSR") applicability analysis and a complete NSR approval application pursuant to COMAR 26.11.17 for the Emissions Units". This application satisfies these requirements.

Perdue is a fourth-generation, family-owned, food and agricultural company that has operated in Maryland for more than 100 years. Perdue's vision is to be the most trusted name in food and agricultural products. We are committed to being responsible stewards of our natural resources and protecting the environment.

Appropriately permitting this Project is of utmost importance to PAB. We look forward to working closely and collaboratively with you as you review this application. Please contact Ms. Jaclyn Mays, Director Environmental Compliance and Services (Jaclyn.mays@perdue.com, 410.341.2055) with any questions or need any additional information.

Sincerely,



Jaclyn Mays

Jaclyn.Mays@Perdue.com
Director of Environmental Compliance & Services
Perdue AgriBusiness LLC

September 2024

PERMIT TO CONSTRUCT/NEW SOURCE REVIEW APPROVAL APPLICATION

Perdue AgriBusiness LLC
6906 Zion Church Road
Salisbury, Maryland 21804

Submitted To:
Maryland Department of the Environment
Air and Radiation Management Administration
1800 Washington Blvd, Suite 720
Baltimore, Maryland 21230-1720

Submitted For:
Perdue AgriBusiness LLC
6906 Zion Church Road
Salisbury, Maryland 21804

PROJECT NUMBER:
0179044

PROJECT CONTACT:
Jennifer Seinfeld
EMAIL:
jennifer.seinfeld@powereng.com
PHONE:
410-312-7915

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PERDUE IN MARYLAND

Perdue Farms is a fourth-generation, family-owned, U.S. food and agricultural company based in Salisbury, Maryland. Committed to the Eastern Shore of Maryland and Salisbury for more than 100 years, our annual economic impact in the state is $1.7 billion, which includes more than 2,500 direct jobs. We work closely with over 1,700 poultry farmers across Perdue, a significant number of those based in Maryland. Perdue AgriBusiness partners with over 1,500 Maryland farmers directly, helping local communities around the state grow, process, sell, and transport grains, oil and feed ingredients, which are then bought and sold in markets around the world.

The Zion Church Road facility in Salisbury employs approximately 400 people on-site with a portion working directly at the soybean processing plant and others supporting Perdue AgriBusiness functions on-site and at other locations. Perdue AgriBusiness has a strong tradition of hiring skilled labor within the Eastern Shore and offers competitive benefits and wages that promote economic security. All our associates have the opportunity for promotion and advancement, as well as skill training and certifications through the company sponsored education benefits.

The Zion Church Road facility is a critical part of the meat industry supply chain and is the only soybean processing facility located on the Eastern Shore. The Project described in this air permit-to-construct application is to modify and upgrade the Soybean Processing Plant and allow for a larger quantity of soybeans to be processed, providing local farmers with the opportunity to sell more of their soybean harvest locally. This will reduce the number of miles farmers are required to transport their grain for sale, which cuts down on growers' expenses and reduces transportation-related air emissions. The modified Soybean Processing Plant will be automated and controlled by process logic controllers and will allow employees to become skilled process operators. The modified Plant will be highly efficient and is expected to provide higher oil yields. It will also include an efficient and effective capture and control system for air emissions. Air emissions will meet Federal and state standards. Once complete, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 tons per year with a 0.14 solvent loss ratio (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total). A solvent loss ratio of 0.14 is the lowest permitted solvent loss ratio of any permitted modified existing soybean processing plant in the U.S.

1.0 INTRODUCTION

Perdue AgriBusiness LLC (PAB), a Perdue Farms business, is submitting this complete air quality permit-to-construct (PTC) application (which includes a complete New Source Review (NSR) approval application) (the Document) to authorize past and proposed changes to its Soybean Processing Plant at the Zion Church Road Facility (ZCR Facility) in Salisbury, Maryland. The past changes include equipment changes to three emissions units that were made during the time frame from September 2017 – May 2019. Proposed future changes include a new oil extractor system, desolventizer toaster (DT), and mineral oil scrubber system, in addition to other equipment upgrades and modifications at the Soybean Processing Plant. With the proposed future changes, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 tons/year (TPY). Together, the past changes and the proposed future changes constitute the "Project" covered in the Document.

The Document includes a complete NSR applicability analysis (for both the Prevention of Significant Deterioration (PSD) and Nonattainment NSR (NNSR) programs) to determine if the Project is a major modification to a major stationary source. Results of the PSD applicability analysis conclude that the Project emissions increases are less than the Significant Emissions Rate (SER) thresholds, and, as such, is not subject to review under the PSD program. Results of the NNSR applicability analysis conclude that the Project increase of volatile organic compound (VOC) emissions is greater than the VOC SER threshold, and, as such, is subject to review under the NNSR program.

PAB and the Maryland Department of the Environment (MDE or the Department) signed a consent decree (C-22-CV-24-000274) which was entered into the Circuit Court for Wicomico County on July 31, 2024. Paragraph 30 of Section III, *Work to be Performed,* of the Consent Decree states, "within sixty (60) days of the entry of this Consent Decree, PAB shall submit to the Department a complete air quality permit to construct application, pursuant to COMAR 26.11.02.11, a complete New Source Review ("NSR") applicability analysis and a complete NSR approval application pursuant to COMAR 26.11.17 for the Emissions Units".

The Consent Decree lists three specific components (Paragraphs 31, 32, and 33 of Section III, *Work to be Performed*) that the PTC/NSR approval application must contain. These are listed below along with a brief explanation addressing each requirement.

31. *The NSR approval application shall include an evaluation of currently available emissions controls constituting LAER technologies, as defined in COMAR 26.11.17.01(B)(15). In no case shall an acceptable LAER emission limitation be greater than an annual average solvent loss ratio of 0.152 gallons of solvent per ton of soybeans processed, as calculated on a 12-month rolling average.*

The Lowest Achievable Emissions Rate (LAER) evaluation discussion is included in Section 4.4 of this Document. The conclusion of the LAER evaluation is a proposed solvent loss ratio (SLR) of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total). This value meets the above requirement of having an SLR not greater than 0.152 gallons of solvent per ton of soybeans processed.

The plant currently operates under a written plan for demonstrating compliance (per 40 CFR 63.2851) that includes the procedures for monitoring and recording data to calculate solvent loss. This plan will be modified to incorporate the proposed Project.

32. *The NSR approval application shall also commit to providing VOC emissions offsets from existing sources in the area impacted by the Facility at a ratio of 1.15 to 1 pursuant to COMAR 26.11.17.03(B)(3) through (5). In no case shall PAB obtain emissions offsets of less than 107 tons of VOC offsets.*

The offset requirements are discussed in Section 4.3.2 of this Document. Based on the emissions calculations conducted to determine NNSR applicability, the Project emissions increase is 93.7 TPY VOC. At the required ratio of 1.15:1, a quantity of 107.8 TPY of VOC Emission Reduction Credits (ERCs) will be needed. PAB has obtained ERCs in the quantity of 108 TPY VOC to satisfy the COMAR NNSR regulations related to offset requirements and the requirements of the Consent Decree.

33. T*he permit to construct and NSR approval applications required pursuant to Paragraph 30 shall include a toxic air pollutant compliance demonstration, developed in accordance with COMAR 26.11.15 and COMAR 26.11.16, that accounts for all operations at the Facility (including but not limited to the Emissions Units utilized in the soybean oil extraction process), analytical methods, emissions determination, and other factors changed from its most recent toxic air pollutant compliance demonstration. The demonstration shall include a proposal constituting current T-BACT.*

A toxic air pollutant (TAP) compliance demonstration has been conducted and the results are discussed in Appendix C of the Document. The results of this analysis indicate compliance with COMAR TAP requirements. In addition, as proposed as LAER (a mineral oil system and an SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total)) also is proposed to meet T-BACT requirements.

The Document contains the above components as required by the Consent Decree, as well as other data, calculations, analyses, information, and forms required for a complete PTC application. The Document includes a complete NSR applicability analysis and a complete NSR approval application for the significant increase of Project VOC emissions. The Document also includes the following Appendices:

- Appendix A: Maryland Department of the Environment Forms for an Air Permit-to-Construct Application
- Appendix B: New Source Review Emissions Calculations
- Appendix C: Toxic Air Pollutant Analysis
- Appendix D: Environmental Justice Screening Results
- Appendix E: Vendor Data

2.0 PROCESS DESCRIPTION

2.1 General Description of ZCR Facility

Constructed in the 1950s, PAB's ZCR Facility engages in activities including grain handling, soybean oil extraction, feed milling, and vegetable oil refining, as well as hatchery operations. The processing areas within the ZCR Facility include Grain Receiving, Feed Mill Equipment, Soybean Processing Plant, Vegetable Oil Refinery, and Hatcheries. Boilers in the Main Boiler Room provide steam to support various processing operations. There are also several emergency generators.

This Document requests a PTC for a Project to authorize past and proposed changes to the existing Soybean Processing Plant at the ZCR Facility. When the Project is complete, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 TPY. The specific equipment changes associated with the Project are modifications and upgrades to existing emissions units in the Soybean Processing Plant. As discussed in Section 4.2 (*NSR Applicability),* operational changes resulting in emissions increases in Grain Receiving (additional grain throughput), the Main Boiler Room (increased steam needs resulting in increased fuel use related to the increased production), and the Vegetable Oil Refinery (the refinery boiler and the Deodorizer 1 steam generator) are considered for NSR applicability, in addition to emissions increases due to changes in the Soybean Processing Plant itself.

The following is a general description of the soybean oil processing operation at the ZCR Facility. Figure 2.1 provides a process flow diagram of the soybean oil processing operation. Figure 2.2 provides a site plan. Section 2.2 describes the specific modifications and upgrades associated with the Project.

In Grain Receiving, soybeans are brought to the ZCR facility either by truck or rail and routed to storage bins. From these bins, the soybeans pass through a scalper to remove foreign material. The wet soybeans are then dried in grain dryers. The dried soybeans are stored in bins and are transported by conveyor to the Soybean Processing Plant. (Grain Receiving also handles some quantities of soybeans and other grains including corn and wheat that are not routed to the Soybean Processing Plant, but the Project only addresses the quantity of soybeans that are processed in the Soybean Processing Plant.)

The Soybean Processing Plant receives clean and dried soybeans and produces crude soybean oil, meal, and hulls from the processed soybeans. There are three major processing steps:

Soybean Preparation –The clean, dried beans are then further cleaned/scalped, cracked, dehulled, conditioned, and flaked. There are two products resulting from this process: hulls and flaked soybeans. The hulls are ground up and then stored in preparation for shipment. The flaked soybeans are transferred to the soybean oil extraction process.

Soybean Oil Extraction – Solvent that is continuously recaptured and recirculated through the process is used to extract soybean oil from the soybean flakes. The extraction process produces a soybean oil/solvent mixture, referred to as miscella, and solvent-laden flakes. The solvent in the miscella is distilled under vacuum and subsequently stripped from the oil with steam. The solvent is condensed and separated from the steam condensate and reused. Residual (non-condensable) solvent is removed by the mineral oil system. The solvent-laden flakes are routed through the DT.

Soybean Meal Processing – The solvent-laden flakes go through a DT where steam is used to evaporate the solvent from the flakes and to "toast" the flakes. The evaporated solvent is condensed and separated from the steam condensate and reused. Residual (not condensed) solvent is removed by the mineral oil system. The desolventized and toasted flakes are dried then cooled. Then, the dried flakes are ground into meal. The meal can be stored on-site in bins or in the meal shed flat storage building. Meal produced onsite can be directly conveyed to the feedmill, loaded out to truck at the soybean processing plant loadout, loaded out to trucks in from the meal shed flat storage building, or loaded to rail at the grain elevator.

2.2 Description of Project Equipment in the Soybean Processing Plant

PAB proposes to add new equipment and upgrade existing equipment to the Soybean Processing Plant. When complete, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 TPY. This section describes the proposed equipment as well as the equipment installed in the September 2017 - May 2019 timeframe.

2.2.1 Modifications to Existing Emissions Units Made in the September 2017 - May 2019 Timeframe

Paragraphs 13 and 14 of the Consent Decree identifies three existing emissions units (Emission Units SP-6, SP-7, and SP-19) in the Soybean Processing Plant that were modified. These modifications include both equipment that are directly involved in the generation of emissions, as well as process equipment that are not directly involved in the generation of emissions or increases in throughput but are part of the soybean oil extraction process.

- SP-6: Two new flaking roll feeders, two new flaking roll flakers, one replacement flaking roll blower;
- SP-7: One new secondary table, one new secondary table blower;
- SP-19: Two new cracking roll feeders, two replacement cracking rolls; and
- Additional process equipment: a replacement rotary bean conditioner, a new blower secondary fan, a replacement bean conditioner condensate pump, and a replacement water addition to the hulls mixer.

Details of equipment installed during this time period include:

- One replacement 50 hp Twin City Blower flaking roll fan [SP-6]
- Two 125 hp Roskamp flaking roll flakers [SP-6]
- Two 0.5 hp Roskamp flaking roll feeders [SP-6]
- One 1.5 hp Triple S secondary table [SP-7]
- One 10 hp Chicago Blower secondary table fan blower [SP-7]
- Two 1.5 hp Roskamp cracking roll feeders [SP-19]
- Two replacement 100 hp Roskamp cracking rolls [SP-19]
- One replacement 125 hp Louisville Dryer bean conditioner
- One 100 hp Twin City Blower secondary fan

» One replacement 5 hp Goulds bean conditioner condensate pump

» One replacement 5 hp Scott Equipment water addition to hulls mixer

All of the changes to existing emissions units that generate emissions are controlled by existing control equipment.

2.2.2 Proposed Future Modifications to Existing Emissions Unit SP-16

The proposed future modifications to the Soybean Processing Plant are related to upgrades to the extraction process (Emissions Unit SP-16). Specifically, the Project includes a major upgrade to the existing extraction system: replacing the existing 38-year-old deep bed extractor with a shallow bed extractor. The modified plant will be highly efficient and is expected to provide higher oil yields. Other new equipment associated with the extractor upgrade include a DT, a solvent storage tank, a miscella (a mixture of solvent and extracted soybean oil) tank, a mineral oil system, associated pumps, and ancillary equipment.

As will be discussed further in Section 4.4, (*LAER*), a mineral oil system is used in virtually all soybean oil extraction operations for VOC control. A mineral oil system removes solvent from the non-condensable vent gases that are introduced to the system with soybean flakes before they are discharged to atmosphere. These gasses include those from the condensers at the oil/solvent mixture distillation process, the DT, as well as gases from the solvent storage tanks. The system is comprised of a recirculating, closed loop mineral oil system in which cooled, solvent lean mineral oil is first pumped into the top of the absorption column. Gasses, rich in solvent, are drawn into the bottom of the absorption column and the solvent passes from the gasses into the mineral oil. Solvent vapors that do not get absorbed into the mineral oil are discharged from the mineral oil absorber vent. The solvent rich mineral oil from the absorber is heated in the mineral oil heater and then pumped into the stripper column where the solvent flashes off and is condensed for reuse. The solvent lean mineral oil from the stripper column is cooled in the interchanger/cooler and the process is repeated.

Grain Receiving, Main Boiler Room, and Vegetable Oil Refinery

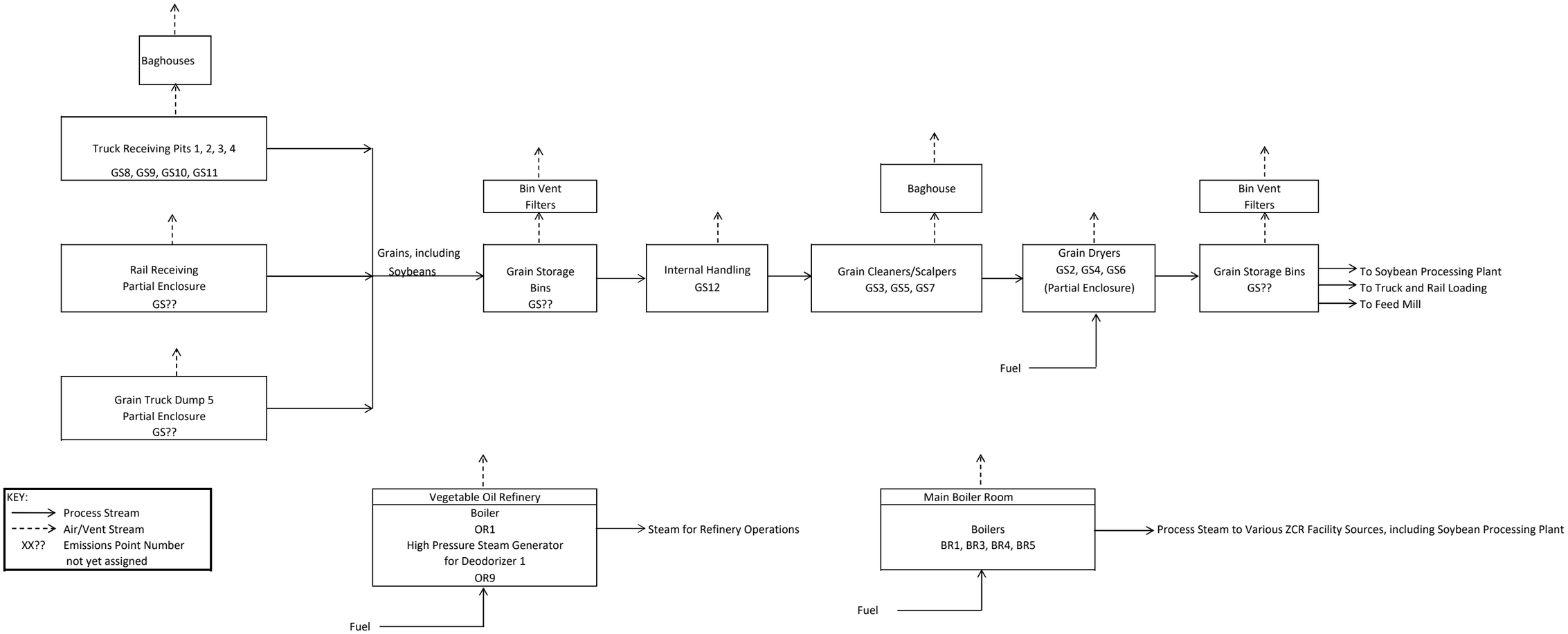
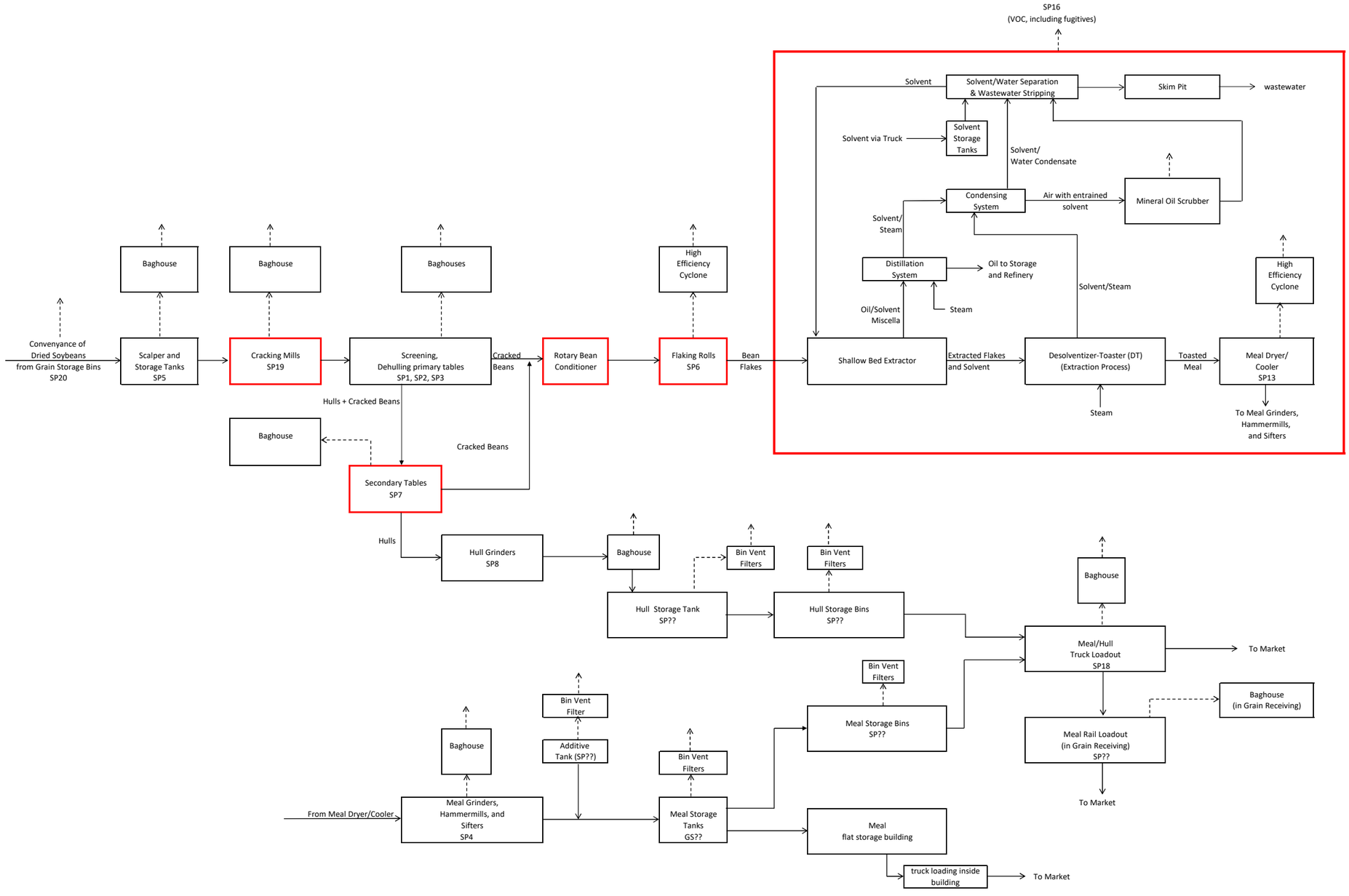


Figure 2.1 Process Flow Diagram

Soybean Processing Plant



KEY:

⟶	Process Stream
- - - ⟶	Air/Vent Stream
▭	Emission Units modified as a result of the Project
XX??	Emissions Point Number not yet assigned

Figure 2.1 (continued) Process Flow Diagram

Figure 2.2 ZCR Facility Site Plan

3.0 EMISSIONS

As described in the Introduction, the Project involves changes to existing emissions units at the ZCR Facility. When complete, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 TPY. Emissions are increased as a result of the Project in the following: Grain Receiving, the Soybean Processing Plant, the Vegetable Oil Refinery, and the Main Boiler Room. Two new emissions units were added recently (in 2022) in the Soybean Processing Plant: a tank to store meal additives and a spout for rail loading.

Emissions of VOC (except for trace amounts from fuel combustion) occur as a result of solvent loss. The Soybean Processing Plant VOC emissions are based on a proposed SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total). At full production at this proposed SLR, the annual VOC emissions, from solvent loss, is calculated as:

912,500 tons soybeans/year x 0.14 gal of solvent/ton soybean x 5.67 lb/gal solvent x 1 ton/2000 lb =362.2 TPY VOC

In addition to the emissions resulting from the solvent used in the Soybean Processing Plant, there will be increased particulate matter (PM, PM10, PM2.5) emissions from existing emissions units in the Grain Receiving and in the Soybean Processing Plant. Similarly, there will be increased fuel combustion emissions from existing emissions units in the Grain Receiving and the Main Boiler Room. Particulate matter and fuel combustion emissions are calculated based on emissions factors (along with material handled/processed and fuel used) from EPA's AP-42: Compilation of Air Emissions Factors from Stationary Sources (EPA AP-42), relevant to grain elevators, vegetable oil processing, and natural gas combustion. These emissions calculations, along with the assumptions for control efficiencies, references for emissions factors, etc. are presented in Appendix B, specifically Tables B-3 through B-6. The values shown in the columns labeled "PAE" (Projected Actual Emissions) are the annual emissions that will result once soybean throughput reaches the maximum annual (12-month rolling total) rate of 912,500 TPY.

Finally, to meet COMAR requirements, and as required by the Consent Decree, a TAP compliance demonstration is included in the PTC application. TAP emissions occur from the solvent used in the Soybean Processing Plant. Appendix C of the Document provides the TAP compliance demonstration and contains the supporting TAP emission calculations. Consistent with previous PTC applications and TAP demonstrations, the TAP components/emissions from the solvent are based on data contained in representative solvent Data Safety Sheets. The primary TAP is n-hexane, but the solvent may also contain other isomers of hexane, heptane, cyclohexane, benzene, toluene, and xylenes.

4.0 REGULATORY REQUIREMENTS

This Section provides the required analyses of Federal and State regulations applicable to MDE PTC and NSR approvals. The information contained herein satisfies the requirements of the Consent Decree which requires PAB to submit a complete air quality permit to construct application, pursuant to COMAR 26.11.02.11, a complete New Source Review ("NSR") applicability analysis and a complete NSR approval application pursuant to COMAR 26.11.17. Sub-section 4.5 provides a discussion of additional Federal regulations applicable to the Project.

4.1 New Source Review Applicability

4.1.1 Background

The ZCR Facility is located in Wicomico County, Maryland, which is classified as in attainment for all National Ambient Air Quality Standards (NAAQS). However, because Wicomico County is located in the ozone transport region, increases of VOC and/or NOx emissions are potentially subject to Nonattainment NSR (NNSR) (COMAR 26.11.17.02). The major stationary source thresholds for NNSR are 100 tons/year (TPY) NOx and 50 TPY VOC (COMAR 26.11.17.01 (B)(17)). The ZCR Facility is considered a major stationary source under the NNSR program for VOC and NOx.[1]

Pollutants for which the area is in attainment are potentially subject to the Prevention of Significant Deterioration (PSD) program (40 CFR 52.21, as required by COMAR 26.11.06.14 B(1)). The major source threshold for the ZCR Facility under the PSD program is 250 TPY of a regulated NSR pollutant (40 CFR 52.21(b)(1)). The ZCR Facility is considered a major stationary source under the PSD program for VOC.

To determine NSR (both NNSR and PSD) applicability at an existing major stationary source, a project is evaluated to determine if it is a major modification (to a major stationary source). This is a two-step process, evaluated on a pollutant-by-pollutant basis. NSR is triggered if a project results in both 1) a significant project emissions increase of a regulated NSR pollutant, and 2) a significant net emissions increase of that pollutant from the major stationary source (COMAR 26.11.17.01 (B)(16), 40 CFR 52.21(b)(2)). With regard to an emissions (or net emissions) increase, "significant" is defined in the NSR regulations (COMAR 26.11.17.01 (B)(26) and 40 CFR 52.21(b)(23)).

In the first step, both increases and decreases in the project emissions are considered. If the project does not have a significant emissions increase (in Step 1), the project is deemed to not be a major modification for that pollutant. If the project is determined to have a significant emissions increase in a given pollutant, the source either may deem the project to be a major modification or perform the Step 2 evaluation to determine if the project results in a significant net emissions increase at the major stationary source. In the second step, emissions increases and decreases attributable to other projects at the entire major stationary source within a specific time frame are considered.

For purposes of NSR applicability, a project's emissions increases generally are calculated as the difference between the Projected Actual Emissions (PAE) or the Potential to Emit Emissions

[1] Actual emissions of VOC exceed the 50 TPY major source threshold, and potential emissions of NOx exceed the 100 TPY major source threshold.

(PTE) and the Baseline Actual Emissions (BAE). The terms BAE, PTE, and PAE are described per the definitions in COMAR 26.11.17 and within 40 CFR 52.21(b).

- (BAE) (based on COMAR 26.11.17.01 (B)(3) and 40 CFR 52.21(b)(48)): the average rate, in tons per year, that the emissions unit actually emitted the pollutant during any consecutive 24-month period during the 5-year period immediately preceding the date on which a complete application is submitted. An additional condition in the BAE definition requires that the average rate be adjusted downward to exclude any noncompliant emissions that occurred while the source was operating above any emissions limitation.
- PTE (based on COMAR 26.11.17.01 (B)(21) and 40 CFR 52.21(b)(4)): the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit a pollutant, including air pollution control equipment and restrictions on the amount of material processed are treated as part of its design as long as the limitations are federally enforceable.
- PAE (based on COMAR 26.11.17.01 (B)(23) and 40 CFR 52.21(b)(41): the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit the regulated NSR pollutant; and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source.

In determining the projected actual emissions before beginning actual construction, the owner or operator of the major stationary source shall:

i. Consider all relevant information including historical operational data, the company's own representations, the company's expected business activity, the company's highest projections of business activity, the company's filings with the State or EPA, and compliance plans under the approved State Implementation Plan;

ii. Include fugitive emissions to the extent quantifiable and emissions associated with startups, shutdowns, and malfunctions; and

iii. Exclude, in calculating any increase in emissions that results from the particular project, that portion of the emissions unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions and that are also unrelated to the particular project, including any increased utilization due to product demand growth.

4.1.2 Definition of the Project

Section 2.0 provides a description (and list of equipment) of the Project. which includes changes made to the existing Soybean Processing Plant beginning in September 2017, as well as the additional proposed future changes to the Soybean Processing Plant. Once complete, soybeans can be processed at a maximum annual (12-month rolling) rate of 912,500 TPY. The September 2017 – May 2019 changes included modifications to the soybean preparation operations which affects PM emissions. The future changes include upgrades related to the extraction process which affects VOC emissions. Only emissions sources within the Soybean Processing Plant are physically modified because of the Project. For NSR applicability, other emission sources within

the ZCR Facility (upstream and downstream of the Soybean Processing Plant) that will experience a change in method of operation (due to increased throughput) are considered.

These affected emissions sources within the Soybean Processing Plant are: :

» Soybean Processing Plant

- VOC emissions from solvent loss.
- PM emissions from soybean handling operations at the Soybean Processing Plant, including loadout of meal and hulls.

The affected emissions sources upstream and downstream of the Soybean Processing Plant are:

» Main Boiler Room

- Combustion emissions associated with steam needed for the Soybean Processing Plant.

» Grain Processing and Receiving

- Combustion emissions associated with drying soybeans for the Soybean Processing Plant.
- PM emissions associated with soybeans received, handled and stored for the Soybean Processing Plant.
- PM emissions associated with soybean scalping and drying used in the Soybean Processing Plant

» Refinery

- Combustion emissions from the Refinery Boiler and Deodorizer 1 Steam Generator (any residual VOC from processing the ZCR crude oil are included in the Soybean Processing Plant solvent loss data).

4.1.3 NSR Applicability Analysis

The NSR applicability data and detailed analysis and calculations are contained in Appendix B. Key data used in the analysis are summarized in Appendix B, Table B-1. Process data are included in Appendix B, Table B-2. It should be noted that PAB uses an “accounting calendar” for tracking solvent usage, bean production, etc. Under this system, some accounting “months” have four weeks and others have five weeks. These data were normalized to actual calendar months, as relevant NSR definitions refer to data on a calendar month basis.

» Baseline Actual Emissions (BAE) - based on COMAR 26.11.17.01 (B)(3) and 40 CFR 52.21(b)(48)

BAE is based on the emissions that occurred during a 5-year period preceding the date on which an application was submitted. For this analysis, the beginning of the Project is September 2017 (the date new equipment was installed in the Soybean Processing Plant). As such, the 5-year period extends from September 2012 – August 2017. The specific 24-month baseline period selected is November 2014 – October 2016.

» Projected Actual Emissions (PAE) – based on based on COMAR 26.11.17.01 (B)(23) and 40 CFR 52.21(b)(41)

PAE emissions are based on the maximum annual (12-month rolling) rate of 912,500 TPY. VOC PAE emissions assume a proposed SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total) (per COMAR 26.11.17.01 (B)(23)(b)(i)). The PAE includes fugitive emissions, as well as emissions associated with startups, shutdowns and malfunctions (per COMAR 26.11.17.01 (B)(23)(b)(ii)). In addition, consistent with the definition of PAE (per COMAR 26.11.17.01 (B)(23)(b)(iii)) and EPA policy, PAB calculated the existing soybean processing plant's emissions due to product demand growth, that is, the throughput (and related emissions) that "could have been accommodated" (CHA) during the baseline period. PAB examined the monthly soybean production during the baseline period. The average of the two highest consecutive months (November and December 2014) production was annualized to estimate the production throughput during the baseline period that could have been accommodated. To determine a representative SLR for the baseline period, PAB calculated the 24-month average SLR of the baseline period. VOC emissions were calculated using the CHA throughput and the 24-month average SLR. PAB believes that this approach is consistent with the approach preferred by MDE and with current EPA guidance.

To determine the steam required to process the quantity of beans for the PAE, CHA, and BAE production rates, an industry process factor of 600 pounds of steam/ton soybean processed was used. (The Main Boiler Room boilers provide steam to various processes in the ZCR Facility, including the Soybean Processing Plant.) Then the fuel required to produce the needed quantity of steam was calculated for the specific boilers in the ZCR Facility Main Boiler Room. It was assumed that all of the fuel required in the refinery is used for beans processed in ZCR's Soybean Processing Plant. All of the soybeans processed in the Soybean Processing Plant are dried in the grain dryers. Combustion emissions from these combustion sources were then calculated using standard EPA AP-42 factors for natural gas combustion. The combustion source assumptions and emissions calculations are provided in Tables B-3 and B-5 of Appendix B.

Process particulate matter (PM, PM10, and PM2.5) emissions from the Project occur from the Grain Receiving and the Soybean Processing Plant areas at the ZCR Facility. For the Grain Receiving sources, emissions for PAE, CHA, and BAE were quantified based on the quantity of soybeans processed in the Soybean Processing Plant (not the entire quantity of grain received and handled at the ZCR Facility). The emissions factors used for the Grain Receiving sources and for the Soybean Processing Plant sources are all "throughput-based" (i.e., the emission factors are in units of pounds/ton of material). As such the PM emissions are proportionate to the throughput. The PM emissions were calculated using standard EPA AP-42 material handling emissions factors. The Grain Receiving and Soybean Processing Plant production rates and emissions calculations, along with the specific emission factors and control efficiency assumptions, are provided in Tables B-4 and B-6 of Appendix B.

Two sources were permitted and added in 2022: A clay tank containing a meal additive for flowability, and a spout to load meal to rail from a storage silo. Because these two sources were not in operation during the baseline period, they are considered "new", and emissions are based on their future throughput (i.e., the PTE). For these two sources, their BAE is zero.

Once emissions for existing emissions units were calculated for the BAE, PAE, CHA, the Project emissions increase were calculated. The demand growth portion is the difference between the CHA and BAE. The Project emissions increase was calculated as follows:

Emissions Increase = PAE – BAE – Demand Growth

Table 4.1 presents a summary of the NSR analysis (this table is identical to Appendix B Table B-7).

The NSR applicability analysis concludes the Project has a significant emissions increase for VOC (Step 1), but Project emissions increases of other regulated NSR pollutants are less than their NSR SERs. For VOC emissions, PAB has elected not to complete Step 2 of the NNSR applicability analysis, but rather deems the Project to be a major modification under the NNSR program for VOC emissions (85 FR 74892-74893).

Table 4.1 NSR Applicability Analysis

Pollutant	Baseline Actual Emissions (BAE) (tpy)	Emissions, Could Have Accommodated (tpy)	Demand Growth (tpy)	Projected Actual Emissions (PAE) (tpy)	Project Emissions Increase (tpy)	NSR Significant Emissions Rates (tpy)	Triggers NSR? Yes or No
TSP							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	35.30	39.61	4.31	58.23			
Total	37.71	42.31	4.60	62.07	19.76	25	No
PM10							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	16.61	18.63	2.03	27.44			
Total	19.02	21.34	2.32	31.28	9.95	15	No
PM2.5							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	9.48	10.64	1.16	15.71			
Total	11.89	13.34	1.45	19.55	6.21	10	No
VOC							
Combustion Equipment	1.79	1.96	0.17	2.78			
Solvent Loss	241.86	269.36	27.50	362.17			
Total	243.65	271.32	27.67	364.95	93.63	40	Yes (Nonattainment NSR)
NOx (Combustion Equipment)	15.85	17.79	1.93	25.30	7.51	40	No
SO2 (Combustion Equipment)	0.19	0.21	0.02	0.30	0.09	40	No
CO (Combustion Equipment)	26.63	29.88	3.25	42.50	12.62	100	No
CO2e (Combustion Equipment)	38,043.12	42,686.19	4,643.07	60,716.82	18,030.63	75000	No

Notes: Demand Growth = BAE - Emissions, Could Have Accommodated
Project Emissions Increase = PAE - BAE- Demand Growth

4.2 PSD Requirements

As shown in Section 4.1, the Project is not a major modification to a major stationary source under the PSD program (40 CFR 52.21). However, because the projected emissions increase of PM, PM10, and PM2.5 is at least 50% of the amount that is considered a "significant emissions increase" (per 40 CFR 52.21 (b)(40)), the PSD program states that there is a "reasonable possibility" (per 40 CFR 52.21 (r)(6)(vi)) that the Project may result in a significant emissions increase of any of these pollutants. As such, PAB is required to provide documents and maintain the following before beginning construction of the Project (per 40 CFR 52.21 (r)(6)(i):

a. A description of the Project

b. Identification of the emissions unit(s) whose emissions of a regulated NSR pollutant could be affected by the project; and

c. A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including the baseline actual emissions, the projected actual emissions, the amount of emissions excluded under Paragraph (b)(41)(ii)(c) of this section and an explanation for why such amount was excluded.

The above is included in this Document. In addition, per 40 CFR 52.21 (r)(6)(iii), once construction for the Project is complete, and the Soybean Processing Plant has resumed normal operations, PAB is required to monitor the emissions of any NSR pollutant that is emitted by any emissions unit identified in 40 CFR 52.21 (r)(6)(i)(b) and calculate and maintain certain records of annual emissions. PAB commits to performing these calculations and maintaining these records. If an emissions unit exceeds the baseline emissions by a significant amount a report will be submitted to MDE per the requirements of 40 CFR 52.21 (r)(6)(v).

4.3 Nonattainment NSR Requirements

Because the Project is subject to NNSR review for VOC emissions, PAB must comply with NNSR requirements specified in COMAR 26.11.17, including the following:

1. Certify that all existing major stationary sources owned or operated by PAB, or any entity controlling, controlled by, or under common control with PAB, in Maryland are in compliance with all applicable emissions limitations or are in compliance with an approved federally enforceable plan for compliance;
2. Implement an emissions limitation that achieves the lowest achievable emissions rate for VOC Project emissions (see Section 4.4);
3. Obtain offsets for VOC at a 1:15 to 1 ratio; and
4. Provide an analysis of alternative sites, production processes and environmental control techniques that demonstrate that the benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of the modification.

4.3.1 Compliance Certification

COMAR 27.11.17.03(B)(1) requires that "the applicant certifies that all existing major stationary sources owned or operated by the applicant, or any entity controlling, controlled by, or under

common control with the applicant, in the State are in compliance with all applicable emission limitations or are in compliance with an approved federally enforceable plan for compliance."

The ZCR Facility is the only major stationary source owned by PAB in Maryland. With the exception of the Project included in this application, the ZCR Facility is in compliance with all applicable emissions limitations. With respect to the Project, Section IV, *Plan for Compliance*, of the Consent Decree constitutes a "plan for compliance". With the submittal of this PTC/NSR Approval application, PAB is satisfying Paragraphs 30-33 of Section III, *Work to be Performed*" of the Consent Decree. Paragraphs 30-33 require PAB to submit to the Department a complete air quality permit to construct, an NSR applicability analysis, and a complete NSR approval application, which includes a LAER evaluation, provision of VOC emissions offsets, and a toxic air pollutant compliance demonstration. PAB certifies that the ZCR Facility is in compliance with all applicable emission limitations and is in compliance with an approved federally enforceable plan for compliance.

4.3.2 Offset Requirement

COMAR 27.11.17.03(B)(3) requires sources located in Wicomico County must obtain VOC offsets at a ratio of 1:15 to 1. COMAR 27.11.17.03(B)(4) and (5) require that the emissions offsets provide a positive net air quality benefit in the affected area (although for VOC, atmospheric simulation modeling is not necessary), and that the emissions offsets be federally enforceable before construction is commenced. Finally, COMAR 27.11.03(B)(7) states that the total tonnage of emissions to be offset is the difference between the allowable emissions after the modification and the actual emissions before the modification (i.e., the increase in emissions for the Project).

For the Project, the increase in emissions is 93.7 TPY VOC, as shown in Table 4.1. At a 1:15 to 1 ratio, the required offsets would be:

93.7 TPY VOC x 1.15 = 107.8 TPY VOC.

Perdue has obtained 108 emissions reduction credits (ERCs) to satisfy the NNSR offset requirement, which will also satisfy the requirement in Paragraph 32 of the Consent Decree.

4.3.3 Alternatives Analysis

COMAR 26.11.17.03(B)(6) requires PAB to provide "an analysis of alternative sites, sizes, production processes, and environmental control techniques for a proposed source demonstrates that benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification".

Perdue Farms is a Maryland-based family-owned business that has had a presence in Maryland for more than 100 years. Soybean oil extraction operations began in 1961 at PAB's ZCR Facility.

The Project is a modification to the existing Soybean Processing Plant operation at the ZCR Facility which involves continuing to use much of the existing equipment and replacing and/or upgrading certain equipment. In addition to the soybean processing equipment that will continue to be used, the infrastructure and associated operations at the ZCR Facility already exist to

accommodate the additional production. Consider the infrastructure at the ZCR Facility with respect to the Project:

- the capacity of the existing unloading, loading and storage (for soybeans, meal, and soybean oil) is sufficient (no additional equipment are needed);
- the capacity of the existing Vegetable Oil Refinery is sufficient to accommodate the additional oil that will be produced (no changes to the refinery are needed);
- the capacity of the existing boilers in the Main Boiler Room is sufficient to provide steam needed for the additional production (no additional boilers are needed);
- the capacity of the existing wastewater system is sufficient to accommodate the additional wastewater needs; and
- the existing electricity and water supplies are sufficient.

Clearly modifying an existing industrial operation/site, especially in this situation with the existing infrastructure sufficient to accommodate the additional production, will have much less of an adverse environmental footprint than siting and constructing an entirely new greenfield plant.

The new/upgraded equipment are designed to be efficient and effective from an environmental perspective. As evaluated in the Section 4.4 *LAER,* the proposed SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total) is the lowest permitted SLR of any permitted modified soybean processing plant in the Country. In addition, the TAP impact analysis (see Appendix C) demonstrates that the off-property ground level impacts of TAPs are protective of community health.

There are alternative extraction technologies to solvent extraction that can be used to make soybean oil. However, these technologies consistently have been determined not to be viable for commercial operation for large scale soybean oil production and have never been required to meet BACT or LAER. Even if these technologies were viable, it is not reasonable to consider them in this case since the Project is a modification to an existing solvent extraction soybean processing plant. An environmental benefit to the current solvent extraction process is its low energy requirements, due to the hexane-based solvent's low heat of vaporization. As such, this hexane-based solvent extraction process used at the ZCR Facility is the least energy intensive commercially viable technology for large scale operations.

Perdue Farms' economic impact to Maryland is tremendous: $1.7 billion annually, and more than 2,500 direct jobs. The ZCR Facility employs more than 400 people. PAB hires skilled labor from Maryland's Eastern Shore and offers its employees competitive benefits and wages, as well as opportunities for training and further education. In addition to ZCR employees, PAB partners with more than 1500 Maryland farmers, directly, and local communities to grow, process, sell, and transport grain, oil, and feed ingredients. PAB partners with farmers to produce the highest quality specialty crops, and with buyers looking for high quality, dependable grain and oilseed products for their feed and retail products. The positive economic impact to Maryland will increase as a result of the Project.

The soybeans that are processed at the Soybean Processing Plant are sourced, in part, from local farmers in the vicinity of the ZCR Facility. The Project will provide an opportunity for these local farmers to sell even more of their soybean crops locally, which in turn reduces the distance for transporting the beans for processing. This reduces both the local farmers' expenses, as well as transportation-related emissions.

There are minimal social "costs" associated with the Project. The Project will not necessitate the construction of new community resources or infrastructure, nor will it require improvements to existing community resources or infrastructure such as schools, housing, businesses, and roads.

The benefits of the Project significantly outweigh the environmental and social costs as a result of its location, construction or modification.

4.4 Lowest Achievable Emissions Rate (LAER) Evaluation

The Project is subject to NNSR review for VOC emissions and, as such, is required to meet a LAER emissions limitation. Specifically, COMAR 26.11.17.03.B.(2) states "The proposed new major stationary source or major modification will meet an emission limitation which specifies the lowest achievable emissions rate" (LAER). In addition, Paragraph 32 of the Consent Decree states "The NSR approval application shall include an evaluation of currently available emissions controls constituting LAER technologies, as defined in COMAR 26.11.17.01B.(15). In no case shall an acceptable LAER emissions limitation be greater than an annual average solvent loss ratio of 0.152 gallons of solvent per ton of soybeans processed, as calculated on a 12-month rolling average."

LAER (per COMAR 26.11.17.01.B.(15)(a)) means for any emissions unit, the more stringent rate of emissions based on the following:

i. The most stringent emissions limitation which is contained in the implementation plan of any state for the class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that these limitations are not achievable; or

ii. The most stringent emissions limitation which is achieved in practice by the class or category of stationary sources, with this limitation, when applied to a modification, meaning the lowest achievable emissions rate for the new or modified emissions units within the stationary source.

PAB used the following resources in developing this LAER evaluation:

- The EPA RACT/BACT/LAER Clearinghouse (RBLC) database;
- EPA's data and analysis in support of the National Emission Standards for Hazardous Air Pollutants: Solvent Extraction for Vegetable Oil Production, 40 CFR Part 63 Subpart GGGG ("the Vegetable Oil MACT");
- State and Federal air permitting applications, analyses, and permit limitations for soybean processing plants;
- Data from soybean extraction equipment vendors; and
- Knowledge of existing soybean processing industry and facilities.

Regarding its approach in the LAER analysis, PAB wishes to emphasize two critical points:

First, the soybean oil extraction process (SP-16 for the ZCR Facility) is the "emissions unit", and our proposed LAER limit is based on an SLR that covers the entire solvent extraction operation. This approach is consistent with the rationale and methodology EPA and stakeholders used in

the development of the Vegetable Oil MACT. EPA selected the SLR approach because it accurately accounted for the total quantity of VOC/HAP emissions from the soybean solvent extraction process, including all sources of vented and fugitive VOC emissions, as well as any residual VOC leaving the soybean facility as part of the soybean oil or soybean meal products. According to EPA, quantifying and monitoring VOC emissions from individual sources of VOC emissions within the soybean solvent extraction process was impractical. Furthermore, EPA determined that compliance with an emission limit expressed as a facility-wide SLR can be demonstrated accurately and clearly through a review of monitoring records of solvent inventory levels/solvent loss and soybean inventory/processing rates. In addition, air permits for soybean processing plants throughout the Country contain SLR limitations as a result of Best Available Control Technology (BACT) and LAER evaluations.

Second, the Project is a modification involving replacing and upgrading some equipment to an existing soybean processing plant originally built in 1961; the Project it is not an entirely new soybean processing plant. A modified soybean processing plant cannot be expected to achieve the same SLR performance as a newly built plant. In a new soybean processing plant, all of the equipment is designed and sized for the specific desired production capacity and optimal performance. In addition, gaskets and fittings in a new plant would have lower fugitive emissions, compared to an existing operation.

For the Project, a modification to the existing Soybean Processing Plant, only some of the equipment (e.g., the extractor, the DT, the mineral oil system) are being replaced or upgraded. Other key equipment in the operation (e.g., the dryer/cooler, certain components of the distillation and solvent recovery unit operations) will remain in place. PAB asserts that LAER for a modified soybean processing operation should be the lowest SLR required for other similar existing soybean processing plants that have undergone a modification.

There have been numerous BACT and LAER analyses conducted in permit applications for new and modified soybean processing plants that evaluate the feasibility of various add-on control devices. All of these analyses reach essentially the following conclusions:

- The application of a mineral oil system to the extraction process is the add-on VOC control device used at all soybean solvent extraction facilities in the US. The industry views the mineral oil system to be both a system to recover and reuse solvent, as well as a VOC control device. Soybean plants have an incentive to reclaim as much used solvent as possible. No other add-on control systems are in use at US soybean solvent extraction facilities.
- Add-on controls for VOC emissions from the meal dryer/cooler are not feasible (A high efficiency cyclone is used for PM control.) As much solvent is evaporated and recovered as possible, prior to the dryer/cooler and is routed back to the distillation step.
- Soybean solvent extraction facilities measure VOC emissions for purposes of compliance through the use of a facility-wide VOC SLR (long-term average).

Likewise, the data collected, and analyses conducted in support of the Vegetable Oil MACT has consistently reached the same conclusions. On March 18, 2020, EPA finalized the residual risk and technology review (RTR) for the Vegetable Oil MACT and concluded that “risks due to emissions of air toxics from this source category are acceptable and that the current NESHAP provides an ample margin of safety to protect public health” and that “there are no developments in practices, processes, or control technologies that necessitate revision of the standards”. (FR 15608, 3/18/2020)

4.4.1 Evaluation of Control Technologies for Vented Sources

Absorption (Mineral Oil System) with Condenser System

For a soybean processing plant, a mineral oil system removes solvent from the non-condensable vent gasses that are introduced to the system with soybean flakes before they are discharged to atmosphere. First the vented streams (the extraction process) go through a condenser system to separate water and solvent. Then the solvent vapors are routed to the mineral oil system. The system is comprised of a recirculating, closed loop mineral oil system in which cooled, solvent lean mineral oil is first pumped into the top of the absorption column. Gasses, rich in solvent, are drawn into the bottom of the absorption column and the solvent passes from the gasses into the mineral oil. Solvent vapors that do not get absorbed into the mineral oil are discharged from the mineral oil absorber vent. The solvent rich mineral oil from the absorber is heated in the mineral oil heater and then pumped into the stripper column where the solvent flashes off and is condensed for reuse. The solvent lean mineral oil from the stripper column is cooled in the interchanger/cooler and the process is repeated.

As stated earlier, a mineral oil system is universally used in all solvent extraction soybean processing plants to control VOC and recover solvent from the extractor and the DT. As stated in the Process Description, PAB is proposing to replace the mineral oil system that controls emissions from the extraction process. The mineral oil system is proposed to achieve LAER for the Project.

There are technical feasibility issues regarding the use of a mineral oil system to control VOC emissions from the meal dryer/cooler. A mineral oil system works best on vent streams with high VOC concentrations, such as in the thousands of ppmv range. Based on the VOC emission characteristics of the meal dryer/cooler vent, the estimated total VOC concentration in the exhaust vent stream is around 100 ppmv or less. As such, a mineral oil system would not be effective in further reducing the VOC concentrations in the meal dryer/cooler vent. Furthermore, the particulate matter emissions in the meal dryer/cooler vents would get trapped in the recirculating mineral oil creating a safety hazard. The contaminated mineral oil would require extensive filtration, and the mineral oil recirculating system would experience plugging and fouling, preventing the safe operation of the equipment, and causing more frequent shutdowns of the soybean solvent extraction process. Finally, there are no known meal dryer/cooler vents in soybean processing plants that use a mineral oil system. As such, a mineral oil system is eliminated from further consideration as LAER for the meal dryer/cooler vent.

The remainder of the analysis for options for solvent recovery and add-on emissions controls systems will assess technical feasibility and, in some cases safety concerns, for two exhaust streams within the soybean processing plant: 1) the mineral oil system exhaust (also referred to as “the main vent”) which controls the extractor, DT and solvent storage tanks, and 2) the dryer/cooler exhaust.

Incineration

Incineration control devices typically use fuel to raise temperatures high enough to oxidize VOC in a waste gas stream to carbon dioxide and water. Incineration control devices are effective in destroying VOC vapors in process exhaust streams in a variety of industries.

Two types of oxidizers were evaluated: regenerative thermal oxidizers (RTOs) and catalytic oxidizers. An RTO is an incinerator with a set of refractory beds (packing) that store heat. It is

common to use three ceramic beds in an RTO. One bed is used to pre-heat the waste gas stream, one bed is used to store heat from the treated gas stream, and one bed is in a purge cycle. Pre-heating the gas stream reduces supplemental fuel requirements, as compared to an incinerator without heat exchangers. Final combustion chamber temperatures are typically in excess of 1,300 °F to ensure near complete combustion of the VOC in the incoming gas stream. In catalytic incinerators, the exhaust gas, after passing through the flame area, passes through a catalyst bed. The catalyst has the effect of increasing the oxidation reaction rate, thus enabling oxidation to occur at a lower reaction temperature than normal thermal oxidation units. Outlet temperatures for catalytic incinerators are dependent on the concentration of VOC but are typically below 1,000 °F. Commercially available RTOs or catalytic incinerators can achieve VOC destruction efficiencies that exceed 95 percent, depending on the particular installation and process being controlled.

Incineration systems cannot be used to control VOC from soybean processing plants for both technical and safety reasons. First, the exhaust from the mineral oil system includes small amounts of oil in aerosol form. The aerosol oil causes carbonization and degradation of the packing in an RTO, leading to a loss of heat transfer. The exhaust from the meal dryer/cooler includes particulate matter which would cause plugging of the heat exchange media surface, resulting in the incineration becoming ineffective.

In addition to technical problems, incineration also is not feasible due to safety concerns. The National Fire Protection Agency (NFPA) standards for solvent extraction plants require that any flame operations be located at least 100 feet from the process area. The inherent presence of fugitive hexane vapors and the presence of an open flame in an incinerator present an unacceptable risk of explosion and fire hazard. Furthermore, variations in flow and solvent concentrations during normal operation, normal shutdown procedures, process upsets, and malfunctions may result in near lower explosive limit (LEL) conditions in the vent exhaust and increase the risk of explosion.

In 2007, the Missouri Department of Natural Resources (MDNR), Air Conservation Commission issued a construction permit to Prairie Pride, Inc. (PPI) for a solvent extraction soybean processing plant. PPI proposed using a thermal oxidizer to control VOCs from the mineral oil system. However, prior to the plant's construction PPI requested the MDNR remove the RTO requirement, stating: "Since the submittal of the last application (November 2006), PPI experienced a change in the engineering firm responsible for plant design. After further discussion with current design engineers, NFPA board members and experts in the soybean processing industry, PPI was convinced that the safety hazards presented by the RTO outweigh the minimal reduction that would be achieved…"[2] MDNR issued an amended permit in June 2008 that removed the RTO requirement.

Currently, there are no incinerators in operation at any soybean processing plant in the US. Based on the above, due to technical and safety concerns, the use of an incinerator is eliminated from further consideration as LAER for the main vent and the meal dryer/cooler.

[2] "Construction Permit Amendment, Prairie Pride, Inc., Permit 022007-004," letter from Mike Van Cleave, Aquaterra Environmental Solutions, to Kendall Hale, Missouri Department of Natural Resources (September 7, 2007).

Flare

Flaring is a combustion control process for VOC in which the VOCs are ducted to a remote, usually elevated, location and burned in an open flame in the open air using a specially designed burner tip, auxiliary fuel, and steam or air to promote mixing for nearly complete (> 98%) VOC destruction. Completeness of combustion in a flare is governed by flame temperature, residence time in the combustion zone, turbulent mixing of the components to complete the oxidation reaction, and available oxygen for free radical formation. Combustion is complete if all VOCs are converted to carbon dioxide and water. The flaring process can also produce some undesirable by-products including noise, smoke, heat radiation, light, sulfur oxides (SO_X), nitrogen oxides (NO_X), carbon monoxide (CO), and an additional source of ignition where not desired.

Like incineration systems, flares are not practical, as well as not feasible for both technical and safety reasons. Regarding the meal dryer/cooler vent, PAB asserts “One operating parameter necessary for demonstrating a flare’s 98% VOC destruction efficiency is maintaining the minimum net heat content of the vent gas stream greater than 200 BTU/scf for a non-assisted flares or 300 BTU/scf for steam- or air-assisted flares. For vent gas streams with a low concentration of VOCs, supplemental fuel, most typically natural gas, must be added to the vent gas stream in order to achieve the minimum net heating value for proper combusting in the flame. The net heating value for the combined meal dryer/cooler vent is less than 1 btu/scf. Thus, one cubic foot of natural gas (assuming a net heating value of 1,000 BTU/scf) will be required for every 2-4 cubic feet of vent gas stream sent to the flare. For a meal dryer/cooler vent with a volumetric flow rate of approximately 37,000 cfm, the amount of natural gas required would range from 9,250 to 18,500 cfm or would consume more than 500 MMBTU/hr. Combusting this magnitude of natural gas would actually generate a far larger quantity of secondary emissions of NOx, CO & GHGs than the potential quantity of VOC emissions reduced from the vent gas stream itself. Other state regulators have concurred with this supplemental fuel requirement.

In terms of safety, consistent with concerns expressed for incineration system, PAB asserts that for the main vent, the volumetric flow and VOC concentration can suddenly increase during process shutdowns or upsets as vapors within solvent-laden process equipment are ventilated rapidly. The vent gas stream entering the main vent may increase suddenly from less than 20% of the LEL for hexane and approach the LEL range. The potential for sudden changes in hexane concentrations above its LEL makes the main vent as stream a greater fire and explosion hazard if being discharged to a VOC combustion control device. Other state regulators concur that a fire/explosion risk exists with these conditions.

Currently, there are no flares in operation at any soybean processing plant in the US. Based on the above, due to environmental, technical and safety concerns, the use of a flare is eliminated from further consideration as LAER for the main vent and the meal dryer/cooler.

Carbon Adsorption

Adsorption is the mechanism by which molecules of gaseous contaminants pass through a bed of solid particles (e.g., activated carbon) and migrate to the surface of the solid particles where they are held by physical attraction. This allows clean air to exit the control device with only minimal gaseous contaminants remaining. The adsorptive capacity of the solid material for the gaseous contaminants will generally increase with the gas phase concentration, molecular weight, diffusivity, polarity, and boiling point. Carbon adsorption is used to remove VOC from

relatively low to medium VOC concentration exhaust streams when a strict exhaust outlet concentration must be attained and/or recovery of the VOC is desired.

In recent years, carbon adsorption to control VOC emissions from the mineral oil system vent has been rejected in control technology analyses due to technical and safety reasons. Carbon adsorption systems were applied rather widely to the final vent emissions from solvent extraction plants in the late 1940s and early 1950s. The aerosol oil in the mineral oil scrubber exhaust and the particulate matter (PM) in the meal dryer/cooler exhausts cause fouling of the carbon bed. Also, soybeans naturally contain small amounts of sulfur compounds, which also cause fouling of the carbon bed. As a result, in the late 1950s, mineral oil scrubber systems began to replace carbon adsorption units on the main vent exhaust.

Carbon adsorbers are also not considered a feasible VOC control option for soybean processing plants because they create a risk of fire and/or explosion. The adsorption of hexane onto carbon is an exothermic reaction. Increases in the VOC concentration of the inlet stream will cause additional heat to build up in the carbon bed. Under optimum conditions, the air movement through the bed will remove the heat via convection. However, if channeling occurs in the carbon bed, or if the increase in VOC concentration is too large (as in an upset condition), the bed can overheat to the point of auto-ignition.

During an upset or when the equipment or controls fail, the vent gas stream characteristics (hexane concentration and volumetric flow rates) may suddenly and significantly change. A sudden influx of hexane solvent loading into a carbon adsorber could result in overheating the carbon bed. Under these conditions, a carbon adsorber unit becomes a potential source of ignition. The carbon adsorber unit would be directly connected to the process by ductwork, which would allow a flame path back to the process.

Carbon adsorption also has been rejected in control technology analyses for control of emissions from the meal dryer/cooler vents. As discussed previously, the meal dryer/cooler vents are generally characterized as having relatively low VOC concentrations (i.e., less than 100 ppmv) and relatively high volumetric flow rates. In order to size a carbon adsorption control system to properly account for process variations and safety concerns, the required volume of carbon for a dual-carbon bed control system would be quite large. In addition, carbon adsorption systems also have problems due to frequent carbon change-outs, and maintenance, which can affect the proper operation of the process equipment by possibly requiring more frequent process shutdowns in order to address higher maintenance requirements for carbon adsorption systems. More frequent process shutdowns will also lead to higher solvent losses from the soybean solvent extraction process.

Another technical reason for not using carbon adsorption on the meal dryer and cooler vents is rapid plugging and fouling of the carbon beds from the particulate matter from the meal dryer/cooler cyclones exhausts. The particulate matter would not only quickly block the carbon adsorption pore sites but also begin to accumulate in the void spaces of the carbon media itself, thus impeding the gas flow from the meal dryer/cooler vents through the carbon beds and rendering the application of this control technology useless.

Currently, there are no carbon adsorption systems in operation at any soybean processing plant in the US. For the technical and safety issues described above, carbon adsorption is eliminated from further consideration to achieve LAER for both the main vent as well as the meal dryer/cooler.

Biofiltration

Biofiltration technology encompasses a wide range of pollution control systems that use naturally occurring microorganisms to treat organic compounds and odorous substances such as reduced sulfur compounds. The microorganisms grow on the surface of a biofilter media such as soil or compost. Contaminated air is piped into the media where the contaminants are absorbed into the microbial film. The organism use the contaminants as a food source, destroying them in the process.

The application of biofiltration technology has been limited for hexane removal. A biofilter system continuously changes based on environmental conditions, nutrient loadings and microbial growth. Knowledge is not available to assess the long-term reliability of the system in a case such as this.

Currently, there are no biofiltration systems in operation at any soybean processing plant in the US. Since biofiltration is not a technically feasible proven control method for VOC emissions from solvent extraction plants, biofiltration has been eliminated from further consideration as LAER for the main vent and the meal dryer/cooler.

4.4.2 Evaluation of Control Technologies for Fugitive Sources

As mentioned earlier, PAB proposes to capture and control the breathing and working losses from the solvent storage tanks by venting them to the mineral oil system where the solvent can be recovered. The capture and recovery of these emissions is proposed to achieve LAER from the storage tanks.

For minimizing fugitive VOC emissions from extraction system equipment components, a variety of Leak Detection and Repair (LDAR) programs are being successfully implemented in a wide range of industries. The leak detection of an LDAR program involves routine systematic inspection of pumps, piping, duct work, enclosed conveyors, valves, flanges, seals, sight glasses and process equipment. By proactively finding solvent leaks and promptly completing repairs, fugitive emissions can be minimized. There are no known technical or safety factors that preclude the use of an LDAR program to minimize fugitive VOC emissions from extraction system equipment components.

While there are specific Federal regulatory LDAR programs for several other industries (e.g., organic chemical manufacturing plants, petroleum refineries, natural gas processing plants, etc.), EPA has not promulgated an LDAR rule that specifically applies to soybean processing plants. Consequently, PAB proposes to develop an LDAR program specific to its ZCR Soybean Processing Plant for MDE's review and approval.

4.4.3 Proposed LAER

As described in Section 2, *Process Description,* the Project includes replacing and upgrading key equipment in its Soybean Processing Plant. The new extractor is a shallow bed design, and the modified plant will be highly efficient and is expected to provide higher oil yields. The extraction process will be vented to the new mineral oil system for control of VOC emissions. In addition, PAB proposes to develop and implement an LDAR program for MDE's review and approval to reduce fugitive VOC emissions from equipment components.

As stated at the beginning of this LAER discussion, PAB proposes that LAER be established through a plant-wide SLR emission limitation (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total). The process modifications with new and upgraded equipment, along with the proposed LDAR program, will work in concert for enhanced solvent recovery, resulting in a cumulative effect of minimizing solvent loss/VOC emissions. Attempting to identify, develop, and install monitoring equipment to demonstrate compliance with VOC emissions from individual emission sources would pose a significant and unnecessary technical and operational challenge considering the inherent variations associated with the soybean solvent extraction process. Numerous operational factors can impact solvent loss performance from individual emission sources which can manifest sudden and significant changes in VOC emission rates from individual emission sources. In the end, the impact to the environment is ultimately determined by the total solvent lost/emitted which can be easily determined by a plant-wide SLR approach.

A plant-wide VOC SLR emission limit is a common sense method of quantifying total VOC emissions for compliance. Specifically, it is:

- a complete and accurate accounting of all VOC emissions;
- easily demonstrated through available documentation;
- representative of the collective performance of process equipment in minimizing VOC emissions from all emission sources, including fugitive sources;
- an accepted, proven compliance demonstration methodology consistent with that established in the Vegetable Oil MACT and AP-42; and
- a compliance demonstration methodology that is consistently and uniformly applied to soybean oil solvent extraction facilities in the United States.

As also discussed at the beginning of this section, PAB believes that modifications to existing operations cannot be expected to achieve an SLR as stringent as in a greenfield facility. In a greenfield facility, all the equipment in the entire soybean processing plant is designed and sized for the specific desired production capacity and optimal performance. Fittings in a new plant would have lower fugitive emissions, compared to an existing operation. The Soybean Processing Plant at the ZCR Facility was built in 1961. The Project involves replacing and upgrading some equipment; however, other equipment in the current operation will remain in place. It is unreasonable to expect a modified existing facility would achieve the same SLR as a new greenfield facility.

Table 4.2 provides a summary of SLR permit limitations (as well as permitted capacity information) for solvent extracted soybean processing plants that have been modified.

SLR limits for permitted modified existing facilities range from 0.14 – 0.19 gallons solvent loss/ton soybeans processed. PAB proposes that an SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total) that includes all periods of operation (normal operation, as well as startup, shutdown, and malfunction) achieves LAER for the Project. An SLR of 0.14 (gallons of solvent loss per rolling 12-month total / tons of soybeans processed per rolling 12-month total) for operations including startup, shutdown, and malfunctions is the lowest rate permitted for existing soybean processing facilities that have undergone a modification. PAB proposes that this rate be effective after all the Project upgrades and modifications are installed and shakedown is completed.

Table 4.2 Summary of VOC Emission Limits for Permitted Modified Existing Soybean Processing Plants

Proposed LAER for ZCR Soybean Processing Plant Modification: 0.14 SLR, all periods including SSM

Company/Facility Name	City	State	RBLC ID/Information Source	Permit No.	Permit Date	Permit Basis	New, Modification, or Other	Notes	SLR (gal/ton)
Cargill, Inc.	Fayetteville	NC	NA	03903T52	5/8/2024	Title V	Modification	SLR applies at all times including SSM; 4350 TPD throughput	0.140
Cargill, Inc.	Lafayette	IN	IN-0366	157-46870-00038	11/13/2023	Title V	Request for more lenient SLR	Proposed increasing SLR from 0.14 to 0.16 during all times, including SSM. Cargill argued that plants with SLRs < 0.16 were mostly greenfield facilities. State agreed to increase SLR to 0.16 (applies at all times, including SSM). Throughput limit 1,150,000 TPY soybeans.	0.160
Ag Processing	Sergeant Bluff	IA	IA-0103	03-A-080-P1	5/18/2022	BACT-PSD	Modification	Relieved a previous synthetic minor limit on VOC emissions. 4000 TPD throughput. SLR limit does not include malfunctions.	0.145
Bunge North America	Morristown	IN	IN-0329	145-43100-00035	9/13/2021	BACT-PSD	Modification	Permit combined two soybean plants, increased conveyance capacity. Former SLR was 0.19. New limit applies at all times, including SSM; throughput limit: 2,181,352 TPY soybeans	0.160
Cargill, Inc.	Sedgwick County	KS	KS-0043	CSD00083	1/31/2021	PSD-BACT	Modification	Soybean and biodiesel plant; production of 108,000 bushels soybeans/day (-3,240 TPD)	0.140
Cargill, Inc.	Shelby	OH	OH-0384	P0127583	7/17/2020	BACT-PSD	Modification	4932 TPD throughput	0.140
Bunge North America	Decatur	AL	NA	Title V Operating Permit No. 712-006	7/7/2020	Title V	Consent Decree	Consent Decree states the solvent loss factor for soybean oil extraction shall be 0.19 gallons of solvent lost/ ton of oilseed processed. 61,425,000 bushels soybeans/year. (~5049 TPD)	0.190
Cargill, Inc.	Sioux City	IA	IA-0115	99-TV-0134R4	1/12/2020	BACT-PSD	Modification	Project to increase production to 1,916,250 TPY soybeans; SLR applies at all times including SSM	0.140
CHS Oilseed Processing	Fairmont	MN	MN-0094	0910005-101	8/22/2019	PSD	Modification	Replacing components of an existing soybean processing plant; 7,200 TPD soybeans	0.161
Perdue AgriBusiness	Chesapeake	VA	VA-0327	60277	11/2/2017	PSD - BACT	Modification	0.175 SLR until new extractor was installed; then 0.152 SLR with new extractor. SLR limits include SSM. LDAR requirements. Throughput limit of 1,095,000 TPY soybeans	0.152
Archer Daniels Midland	Quincy	IL	IL-0125	17010026	6/30/2017	BACT-PSD	Modification	Production of 47,500,000 bushels soybeans/year (-3,904 TPD)	0.175
Cargill, Inc.	Raleigh	NC	NCDENR - Title V Operating Permit	Title V Operating Permit No. 03840T41	9/30/2015	Title V	Consent Decree	Consent Decree 05-2037-JRM-FLN. 1,100,000 TPY soybeans. Throughput of 3014 TPD	0.190
Archer Daniels Midland	Des Moines	IA	IA-0111	07-A-1078-P1	9/25/2015	BACT-PSD	Modification	Increase soybean processing capacity, 1,971,000 TPY soybeans. Limit applies at all times including SSM. Previously, under consent decree with an SLR limit of 0.1712.	0.140
Cargill, Inc.	Fayetteville	NC	NCDENR - Title V Operating Permit	Title V Operating Permit No. 03903T39	9/4/2015	Title V	Consent Decree	Consent Decree 05-2037-JRM-FLN. 1,204,499 TPY soybeans (3300 TPD)	0.190
Ag Processing	Saint Joseph	MO	MO DNR	072015-015	7/27/2015	PSD (not BACT for VOC)	Modification	Application to increase soybean production from 1,314,000 tpy to 1,478,250 tpy. While the VOC emissions increase associated with this project exceeded the PSD significance threshold, a BACT review was not warranted as there was no new equipment and no physical changes to existing equipment associated with this project. The previously determined VOC BACT emission limit remaied valid for this project. Also an LDAR program.	0.145
Archer Daniels Midland	Kershaw	SC	SCDHEC - Draft Title V Operating Permit	Title V Operating Permit No. TV-1460- 0015	1/1/2015	Title V	Consent Decree	Per Consent Decree SLR of 0.18 gallons of hexane/ ton of soybeans processed including start up and shutdown. Malfunction is excluded.	0.180
Consolidated Grain and Barge Co.	Mount Vernon	IN	IN-0209	129-34318-00035	11/10/2014	Other Case-by-Case	Modification	State BACT. Soybean production limited to 1,095,000 TPY soybean. Argued 0.14 was not achievable for an older plant. Throughput limit of 1,095,000 TPY soybeans.	0.190
Louis Dreyfus Agricultural Industries, Inc.	Claypool	IN	IN-0150	085-31960-00102	9/21/2012	Other Case-by-Case	Requested SLR change	State BACT. LDAR for fugitives. Production limited to 2,251,836 TPY soybeans. Previously had SLR of 0.134, but petitioned state for higher limit because of difficulty meeting the lower SLR	0.141
Archer Daniels Midland	Mexico	MO	MO-0082	102010-003	10/5/2010	BACT-PSD	Modification	Capacity increased to 2,100 tons of soybeans/day. LDAR program. The SLR limit of 0.15 does not apply to malfunction periods. The SLR limit of 0.171 applies during all operations including SSM	0.15/0.171

4.5 Other Applicable Federal Regulations

A Part 70 (Title V) Permit is required for major sources (COMAR 26.11.03.01 A). In Wicomico County, the major source thresholds for triggering Part 70 permitting requirements are 50 TPY for VOC, 100 TPY for NOx, 100 TPY for any other criteria pollutant, and 10 TPY for a single hazardous air pollutant (HAP) or 25 TPY for total HAPs. Actual emissions of VOC, HAP, and PM_{10} and potential emissions of NOx from the ZCR facility are greater than the major source thresholds for each of these pollutants. As a result, PAB was issued and currently operates under Part 70 Operating Permit 24-045-0042. The current permit was issued on July 1, 2015. A timely application for permit renewal was submitted and MDE issued a permit application administrative completeness determination on July 12, 2019. According to COMAR 26.11.03.17.B, the Project will require a significant permit modification to the ZCR Facility's Part 70 Permit. As such, PAB will submit a complete application for a significant modification to Operating Permit 24-045-0042 per COMAR 26.11.03.17.sD. PAB understands that this application must be submitted before moving forward with the proposed future changes (per COMAR 26.11.17.F(2)).

National Emissions Standards for Hazardous Air Pollutants (NESHAPs) have been established in 40 Code CFR, Parts 61 and 63 to control the emissions of Hazardous Air Pollutants (HAPs). NESHAP regulations codified in 40 CFR 63 established Maximum Achievable Control Technology (MACT) standards for specific types of equipment at qualifying facilities. MACT regulations apply to facilities that are major or area sources of HAPs. The ZCR Facility is subject to 40 CFR 63, Subpart GGGG (NESHAPS: Solvent Extraction for Vegetable Oil Production). The Project described in the Document is considered a "significant modification"(see 40 CFR 63.2833(c)) for the process covered by Subpart GGGG (examples of significant modifications are contained in its definition in 40 CFR 63.2872[3])The Project was also evaluated to determine if it should be considered "reconstruction of a source" per 40 CFR 63.2833(b). This analysis involved determining if the fixed capital cost of the new and modified components of the Project exceeded 50% of the fixed capital cost for constructing a new vegetable oil production process (as defined in 40 CFR 63.2872)[4] The Project is not a reconstruction under 40 CFR 63, Subpart GGGG.

40 CFR 63, Subpart DDDDD (NESHAPS for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (operated at facilities that are major sources of HAP)) applies to the four boilers in the Main Boiler Room at the ZCR Facility. BR-1, BR-3, and BR-4 are considered existing sources; BR-5 is considered a new source. The change in operation of

[3] 40 CFR 63.2872 states that examples of significant modifications include replacement of or major changes to solvent recovery equipment such as extractors, desolventizer-toasters/dryer-coolers, flash desolventizers, and distillation equipment associated with the mineral oil system, and equipment affecting desolventizing efficiency and steady-state operation of your vegetable oil production process such as flaking mills, oilseed heating and conditioning equipment, and cracking mills.

[4] 40 CFR 63.2872 defines "vegetable oil production process" as 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).

these boilers resulting from the Project involves an increased amount of fuel to accommodate the higher soybean throughput rate. This increased fuel usage does not affect the current status of these boilers under Subpart DDDDD.

BR-1, BR-3, BR-4 and BR-5 are also subject to New Source Performance Standards (NSPS), 40 CFR 60 Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units). This increased fuel usage does not affect the current status or result in any new requirements for these boilers under Subpart Dc.

40 CFR 60 Subpart DD (Standards of Performance for Grain Elevators) currently applies to two emissions units in the Soybean Processing Plant at the ZCR Facility: SP-5 (Whole Bean Cleaner (Scalper) and SP-20 (Raw Dry Soybean Conveyances). The additional equipment that either has been or will be installed at the Soybean Processing Plant is not considered "grain handling equipment" and will not be subject to 40 CFR 60 Subpart DD. Several of the sources in Grain Receiving are subject to NSPS, Subpart DD. While several Grain Receiving sources will experience additional throughput as a result of the Project, there is no capital expenditure required to accommodate the additional throughput. As such, none of the units will be modified per 40 CFR 60.14(e)(2).[5]; as such, no additional Grain Receiving sources will become subject to Subpart DD as a result of the Project.

Finally, 40 CFR 60 Subpart Kb, (Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After July 23, 1984) was evaluated for applicability for the proposed future new solvent storage tank. The tank is exempt from NSPS, Subpart Kb however per 40 CFR 60.110b(d)(8).

[5] Per 40 CFR 60.14(e)(2) "an increase in production rate of an existing facility, if that increase can be accomplished without a capital expenditure on that facility" is not considered a modification.

APPENDIX A MARYLAND DEPARTMENT OF THE ENVIRONMENT FORMS FOR AN AIR PERMIT-TO-CONSTRUCT APPLICATION

AIR QUALITY PERMIT TO CONSTRUCT APPLICATION CHECKLIST

OWNER OF EQUIPMENT/PROCESS	
COMPANY NAME:	Perdue Agribusiness LLC
COMPANY ADDRESS:	6906 Zion Church Road, Salisbury, MD 21804
LOCATION OF EQUIPMENT/PROCESS	
PREMISES NAME:	Perdue Agribusiness LLC
PREMISES ADDRESS:	same as above
CONTACT INFORMATION FOR THIS PERMIT APPLICATION	
CONTACT NAME:	Jaclyn Mays
JOB TITLE:	Director Environmental Compliance & Services
PHONE NUMBER:	410-341-2055
EMAIL ADDRESS:	Jaclyn.Mays@perdue.com
DESCRIPTION OF EQUIPMENT OR PROCESS	
Soybean Processing Plant upgrade and expansion to process 2500 tons soybeans/day	

Application is hereby made to the Department of the Environment for a Permit to Construct for the following equipment or process as required by the State of Maryland Air Quality Regulation, COMAR 26.11.02.09.

Check each item that you have submitted as part of your application package.

☒ Application package cover letter describing the proposed project

☒ Complete application forms (Note the number of forms included or NA if not applicable.)

No. 1 Form 5
No. 1 Form 5T
No. 3 Form 5EP
No. 1 Form 6
No. NA Form 10
No. NA Form 11
No. NA Form 41
No. NA Form 42
No. NA Form 44

☒ Vendor/manufacturer specifications/guarantees

☒ Evidence of Workman's Compensation Insurance

☒ Process flow diagrams with emission points

☒ Site plan including the location of the proposed source and property boundary

☒ Material balance data and all emissions calculations

☐ Material Safety Data Sheets (MSDS) or equivalent information for materials processed and manufactured.

☐ Certificate of Public Convenience and Necessity (CPCN) waiver documentation from the Public Service Commission (1)

☒ Documentation that the proposed installation complies with local zoning and land use requirements (2)

(1) Required for emergency and non-emergency generators installed on or after October 1, 2001 and rated at 2001 kW or more.

(2) Required for applications subject to Expanded Public Participation Requirements.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 01/03/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER MARSH USA LLC. 1050 CONNECTICUT AVENUE, SUITE 700 WASHINGTON, DC 20036-5386 Attn: CSS - TEL: 202 263 7600 CN108313099-*STND-XSWC-24-25	**CONTACT NAME:** **PHONE (A/C, No, Ext):** **FAX (A/C, No):** **E-MAIL ADDRESS:**
INSURED PERDUE FOODS LLC AND ITS SUBSIDIARIES 31149 OLD OCEAN CITY RD. PO BOX 1537 SALISBURY, MD 21802-1537	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** Old Republic Insurance Company — 24147 **INSURER B :** N/A — N/A **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** CLE-006908651-04 **REVISION NUMBER:** 3

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:			MWZY31817424	01/01/2024	01/01/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 2,000,000 $ 1,000,000 $ 10,000 $ 2,000,000 $ 3,000,000 $ 3,000,000
A	**AUTOMOBILE LIABILITY** X ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			MWTB31817524	01/01/2024	01/01/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 5,000,000 $ $ $
	[ ] **UMBRELLA LIAB** [ ] OCCUR [ ] **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $						EACH OCCURRENCE AGGREGATE	$ $
A A	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N: N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		MWC31817224 (AOS) MWC31817224 (WI)	01/01/2024 01/01/2024	01/01/2025 01/01/2025	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 2,000,000 $ 2,000,000 $ 2,000,000
A	Excess Workers Compensation Statutory Limits			MWXS31817324 (VA,IN,KY,MD,SC.WA)	01/01/2024	01/01/2025	Each Accident Disease-EA Emp/Policy Lmt	2,000,000 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Evidence of Insurance

CERTIFICATE HOLDER

PERDUE FOODS LLC and its subsidiaries
31149 Old Ocean City Road
Salisbury, MD 21804

CANCELLATION

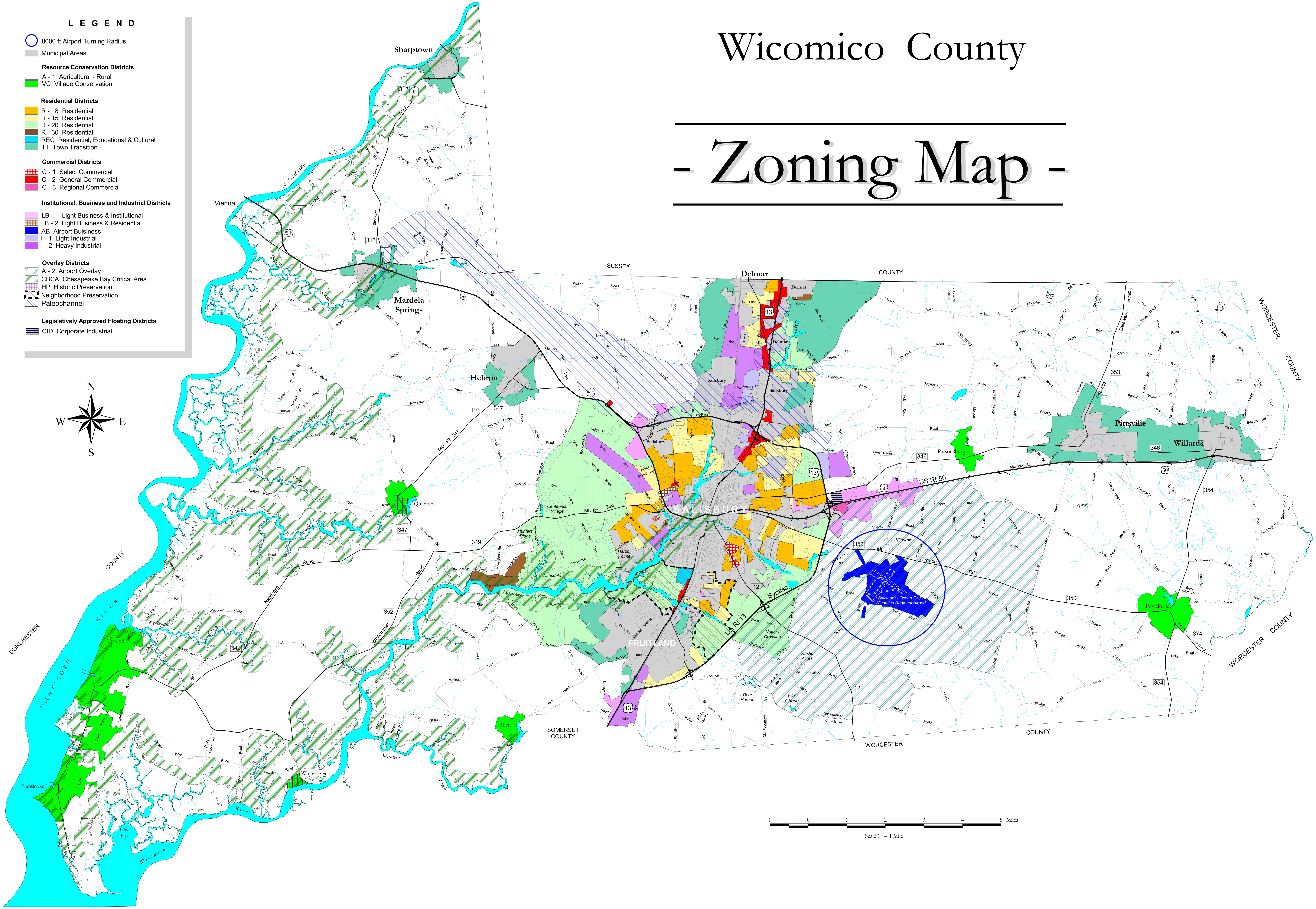
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Marsh USA LLC

Wicomico County

- Zoning Map -



Wicomico County Planning Office
Reflects Municipal Annexations through 1/22/09

Adopted July 20, 2004
Map Amended - March 15, 2005

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Blvd ▪ Baltimore, Maryland 21230
(410) 537-3230 ▪1-800-633-6101 ▪ www.mde.state.md.us

Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☑ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name
Perdue AgriBusiness LLC

Mailing Address
6906 Zion Church Road
Street Address

Salisbury | MD | 21804
City | State | Zip

Telephone Number
(410) 341-2055

Signature

Jaclyn Mays, Director Environmental Compliance & Services | 9/26/24
Print Name and Title | Date

DO NOT WRITE IN THIS BLOCK
2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)
Registration Class (7) | Equipment No. (8-11)
Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

Street Number and Street Name

City/Town | State | Zip | ( ) Telephone Number

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status	New Construction Begun (MM/YY)	New Construction Completed (MM/YY)	Existing Initial Operation (MM/YY)
B	0917		
15	16-19	20-23	20-23

4. Describe this Equipment: Make, Model, Features, Manufacturer (include Maximum Hourly Input Rate, etc.)
Soybean Processing Plant upgrade and expansion to process 2500 tons soybeans/day
(See Section 2, Process Description of Application Document)

5. Workmen's Compensation Coverage MWC31817224 (AOS) | 01-01/2025
Binder/Policy Number | Expiration Date
Company Marsh USA, LLC
NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time _____
See Process Description and Process Flow Diagram, Section 2 of Application Document

6B. Number of Stack/Emission Points Associated with this Equipment 1

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name Josh Deshaney Title Project Manager

Company A-Lert Construction Service

Mailing Address/Street 1990 Industrial Pike Road

City/Town Gastonia State NC Telephone (573) 366-7855

8. Major Activity, Product or Service of Company at this Location

Grain receiving, drying, cleaning, and storage - SIC No. 5153
Production of animal feeds and feedmills - SIC No. 2048
Grain processing and vegetable oil extraction using hexane solvent- SIC No. 2075
Vegetable oil refining - SIC No. 2079

9. Control Devices Associated with this Equipment

None ☐ 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
☐	☐	☐	☐	☐	☐	☐	☐
24-1	24-2	24-3	24-4	24-5	24-6	24-7	24-8

Other

☒ Describe Mineral Oil System (See Process Description in Section 2)

24-9

10. Annual Fuel Consumption for this Equipment N/A

OIL-1000 GALLONS	SULFUR %	GRADE	NATURAL GAS-1000 FT^3	LP GAS-100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL- TONS	SULFUR %	ASH%	WOOD-TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS ☐ ANNUAL AMOUNT CONSUMED

(Specify Type) 66-1 (Specify Units of Measure)

OTHER FUEL ☐ ANNUAL AMOUNT CONSUMED

(Specify Type) 66-2 (Specify Units of Measure)

1= Coke 2= COG 3=BFG 4=Other

11. Operating Schedule (for this Equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per Year
✓	☐		☐	24	7	365
67-1	67-2	68-69		70-71	72	73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
✓					
76	77-78	79-80	81-82	83-84	

12. Equivalent Stack Information- is Exhaust through Doors, Windows, etc. Only? (Y/N) N (85)

Mineral Oil Stack is the only new stack

If not, then	Height Avove Ground (FT)	Inside Diameter at Top (FT)	Exit Temperature (°F)	Exit Velocity (FT/SEC)
	87	0.5	90	26
	86-88	89-91	92-95	96-98

NOTE: Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

See Process Description, Section 2

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? N (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Soybeans		104.17	tons	912,500	tons
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. Meal		78.13	tons	684,375	tons
2. Hulls		6.25	tons	54,750	tons
3. Crude Soybean Oil		19.79	tons	178,375	tons
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams- Solid and Liquid N/A

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

See Appendix B. Operating Day = TPY/365

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
99-104	105-110	111-116

Carbon Monoxide	Volatile Organic Compounds	PM-10
177-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

See Appendix B. Operating Day = TPY/365

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
135-139	140-144	145-149

Carbon Monoxide	Volatile Organic Compounds	PM-10
150-154	155-159	160-164

Method Used to Determine Emissions (1= Estimate 2= Emission Factor 3= Stack Test 4= Other)

TSP	SOX	NOX	CO	VOC	PM10
2	2	2	2	4	2
165	166	167	168	169	170

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local _____ **Date Rec'd. State** _____ **Return to Local Jurisdiction** **Date**_____ **By**_____

Reviewed by Local Jurisdiction Date_____ By_____ **Reviewed by State** Date_____ By_____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. Annual Operating Rate (186-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238) **Action** (239) A: Add C: Change

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Perdue AgriBusiness LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
Mineral Oil System Main Stack/SP-16 (SRB_MAIN)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Stack venting gasses from the extractor, desolventizing toaster and hexane solvent storage tanks controlled by the Mineral Oil System

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:		Winter Percent	
Hours per day:		Spring Percent	
Days per week:		Summer Percent	
Weeks per year:		Fall Percent	

4. Emission Point Information

Height above ground (ft):	87	Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):	9				
Exit temperature (ºF):	90	Inside diameter at top of round stack (ft):		0.5	
Exit velocity (ft/min):	1586	Distance from emission point to nearest property line (ft):		814	
Exhaust gas volumetric flow rate (acfm):	311.3	Building dimensions if emission point is located on building (ft)	Height 78	Length 133	Width 51

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☐ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☒ Other No. _____
  Specify: Mineral Oil System

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)				
Particulate Matter (filterable as PM2.5)				
Particulate Matter (condensables)				
Volatile Organic Compounds (VOC)		See Appendix C	(lb/hr X 24)	See Appendix C
Oxides of Sulfur (SOx)				
Oxides of Nitrogen (NOx)				
Carbon Monoxide (CO)				
Lead (Pb)				
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
See Appendix C				
(HAPs are n-Hexane, Benzene, Toluene		See Appendix C	(lb/hr X 24)	See Appendix C
and Xylene)				

(Attach additional sheets as necessary.)

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Perdue AgriBusiness LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
Extractor building fugitive emissions (FUG1 through FUG8))

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Fugitive VOC emissions from extractor building

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:		Winter Percent	
Hours per day:		Spring Percent	
Days per week:		Summer Percent	
Weeks per year:		Fall Percent	

4. Emission Point Information (Fugitive emissions not stack emissions)

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):		~814	
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height: 78	Length: 133	Width: 51

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

- ☒ None
- ☐ Baghouse No. _____
- ☐ Cyclone No. _____
- ☐ Elec. Precipitator (ESP) No. _____
- ☐ Dust Suppression System No. _____
- ☐ Venturi Scrubber No. _____
- ☐ Spray Tower/Packed Bed No. _____
- ☐ Carbon Adsorber No. _____
  - ☐ Cartridge/Canister
  - ☐ Regenerative
- ☐ Thermal Oxidizer No. _____
  - ☐ Regenerative
- ☐ Catalytic Oxidizer No. _____
- ☐ Nitrogen Oxides Reduction No. _____
  - ☐ Selective ☐ Non-Selective
  - ☐ Catalytic ☐ Non-Catalytic
- ☐ Other No. _____
  Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)				
Particulate Matter (filterable as PM2.5)				
Particulate Matter (condensables)				
Volatile Organic Compounds (VOC)	See Appendix C	See Appendix C	(lb/hr X 24)	See Appendix C
Oxides of Sulfur (SOx)				
Oxides of Nitrogen (NOx)				
Carbon Monoxide (CO)				
Lead (Pb)				
Greenhouse Gases (GHG)	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				
List individual federal Hazardous Air Pollutants (HAP) below:	**At Design Capacity (lb/hr)**	**At Projected Operations**		
		(lb/hr)	**(lb/day)**	**(ton/yr)**
See Appendix C				
(HAPs are n-Hexane, Benzene, Toluene		See Appendix C	(lb/hr X 24)	See Appendix C
and Xylene)				

(Attach additional sheets as necessary.)

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FORM 5EP: Emission Point Data

Complete one (1) Form 5EP for EACH emission point (stack or fugitive emissions) related to the proposed installation.

Applicant Name: Perdue AgriBusiness LLC

1. Emission Point Identification Name/Number

List the applicant assigned name/number for this emission point and use this value on the attached required plot plan:
Skim Pit fugitive emissions (WW)

2. Emission Point Description

Describe the emission point including all associated equipment and control devices:
Fugitive VOC emissions from skim pit

3. Emissions Schedule for the Emission Point

Continuous or Intermittent (C/I)?	C	**Seasonal Variation** Check box if none: ☒ Otherwise estimate seasonal variation:	
Minutes per hour:		Winter Percent	
Hours per day:		Spring Percent	
Days per week:		Summer Percent	
Weeks per year:		Fall Percent	

4. Emission Point Information (Fugitive emissions not stack emissions)

Height above ground (ft):		Length and width dimensions at top of rectangular stack (ft):	Length:	Width:	
Height above structures (ft):					
Exit temperature (ºF):		Inside diameter at top of round stack (ft):			
Exit velocity (ft/min):		Distance from emission point to nearest property line (ft):		~760	
Exhaust gas volumetric flow rate (acfm):		Building dimensions if emission point is located on building (ft)	Height	Length	Width

5. Control Devices Associated with the Emission Point

Identify each control device associated with the emission point and indicate the number of devices. ***A Form 6 is also required for each control device***. If none check none:

☒ None

☐ Baghouse No. _____

☐ Cyclone No. _____

☐ Elec. Precipitator (ESP) No. _____

☐ Dust Suppression System No. _____

☐ Venturi Scrubber No. _____

☐ Spray Tower/Packed Bed No. _____

☐ Carbon Adsorber No. _____

- ☐ Cartridge/Canister
- ☐ Regenerative

☐ Thermal Oxidizer No. _____

- ☐ Regenerative

☐ Catalytic Oxidizer No. _____

☐ Nitrogen Oxides Reduction No. _____

- ☐ Selective ☐ Non-Selective
- ☐ Catalytic ☐ Non-Catalytic

☐ Other No. _____
Specify:

FORM 5EP: Emission Point Data

6. Estimated Emissions from the Emission Point

Criteria Pollutants	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Particulate Matter (filterable as PM10)				
Particulate Matter (filterable as PM2.5)				
Particulate Matter (condensables)				
Volatile Organic Compounds (VOC)		See Appendix C	(lb/hr X 24)	See Appendix C
Oxides of Sulfur (SOx)				
Oxides of Nitrogen (NOx)				
Carbon Monoxide (CO)				
Lead (Pb)				

Greenhouse Gases (GHG)	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
Carbon Dioxide (CO_2)				
Methane (CH_4)				
Nitrous Oxide (N_2O)				
Hydrofluorocarbons (HFCs)				
Perfluorocarbons (PFCs)				
Sulfur Hexafluoride (SF6)				
Total GHG (as CO_2e)				

List individual federal Hazardous Air Pollutants (HAP) below:	At Design Capacity (lb/hr)	At Projected Operations		
		(lb/hr)	(lb/day)	(ton/yr)
See Appendix C				
(HAPs are n-Hexane, Benzene, Toluene		See Appendix C	(lb/hr X 24)	See Appendix C
and Xylene)				

(Attach additional sheets as necessary.)

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FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Applicant Name: Perdue AgriBusiness LLC

Step 1: Quantify premises-wide emissions of Toxic Air Pollutants (TAP) from new and existing installations in accordance with COMAR 26.11.15.04. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Class I or Class II?	Screening Levels (µg/m^3)			Estimated Premises Wide Emissions of TAP			
						Actual Total Existing TAP Emissions	Projected TAP Emissions from Proposed Installation	Premises Wide Total TAP Emissions	
			1-hour	8-hour	Annual	(lb/hr)	(lb/hr)	(lb/hr)	(lb/yr)
ex. ethanol	*64175*	*II*	*18843*	*3769*	*N/A*	*0.60*	*0.15*	*0.75*	*1500*
ex. benzene	*71432*	*I*	*80*	*16*	*0.13*	*0.5*	*0.75*	*1.00*	*400*
See Appendix C									

(attach additional sheets as necessary.)

Note: Screening levels can be obtained from the Department's website (http://www.mde.maryland.gov) or by calling the Department.

Step 2: Determine which TAPs are exempt from further review. A TAP that meets either of the following Class I or Class II small quantity emitter exemptions is exempt from further TAP compliance demonstration requirements under Step 3 and Step 4.

Class II TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(a))
A Class II TAP is exempt from Step 3 and Step 4 if the Class II TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour, and any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3.

Class I TAP Small Quantity Emitter Exemption Requirements (COMAR 26.11.15.03B(3)(b))
A Class I TAP is exempt from Step 3 and Step 4 if the Class I TAP meets the following requirements: Premises wide emissions of the TAP shall not exceed 0.5 pounds per hour and 350 pounds per year, any applicable 1-hour or 8-hour screening level for the TAP must be greater than 200 µg/m^3, and any applicable annual screening level for the TAP must be greater than 1 µg/m^3.

If a TAP meets either the Class I or Class II TAP Small Quantity Emitter Exemption Requirements, no further review under Step 3 and Step 4 are required for that specific TAP.

FORM 5T: Toxic Air Pollutant (TAP) Emissions Summary and Compliance Demonstration

Step 3: Best Available Control Technology for Toxics Requirement (T-BACT, COMAR 26.11.15.05)
In the following table, list all TAP emission reduction options considered when determining T-BACT for the proposed installation. The options should be listed in order beginning with the most effective control strategy to the least effective strategy. Attach supporting documentation as necessary.

Target Pollutants	Emission Control Option	% Emission Reduction	Costs		T-BACT Option Selected? (yes/no)
			Capital	Annual Operating	
ex. ethanol and benzene	*Thermal Oxidizer*	*99*	*$50,000*	*$100,000*	*no*
ex. ethanol and benzene	*Low VOC materials*	*80*	*0*	*$100.000*	*yes*
TAPs (See Appendix C)	Mineral Oil System				

(attach additional sheets as necessary)

Step 4: Demonstrating Compliance with the Ambient Impact Requirement (COMAR 26.11.15.06)
Each TAP not exempt in Step 2 must be individually evaluated to determine that the emissions of the TAP will not adversely impact public health. The evaluation consists of a series of increasingly non-conservative (and increasingly rigorous) tests. Once a TAP passes a test in the evaluation, no further analysis is required for that TAP. "Demonstrating Compliance with the Ambient Impact Requirement under the Toxic Air Pollutant (TAP) Regulations (COMAR 26.11.15.06)" provides guidance on conducting the evaluation. Summarize your results in the following table. Attach supporting documentation as necessary.

Toxic Air Pollutant (TAP)	CAS Number	Screening Levels ($\mu g/m^3$)			Premises Wide Total TAP Emissions		Allowable Emissions Rate (AER) per COMAR 26.11.16.02A		Off-site Concentrations per Screening Analysis ($\mu g/m^3$)			Compliance Method Used?
		1-hour	8-hour	Annual	(lb/hr)	(lb/yr)	(lb/hr)	(lb/yr)	1-hour	8-hour	Annual	AER or Screen
ex. ethanol	*64175*	*18843*	*3769*	*N/A*	*0.75*	*1500*	*0.89*	*N/A*	*N/A*	*N/A*	*N/A*	*AER*
ex. benzene	*71432*	*80*	*16*	*0.13*	*1.00*	*400*	*0.04*	*36.52*	*1.5*	*1.05*	*0.12*	*Screen*
See Appendix C												

(attach additional sheets as necessary)

If compliance with the ambient impact requirement cannot be met using the allowable emissions rate method or the screening analysis method, refined dispersion modeling techniques may be required. Please consult with the Department's Air Quality Permit Program prior to conducting dispersion modeling methods to demonstrate compliance.

MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Air and Radiation Management Administration ▪ Air Quality Permits Program

APPLICATION FOR PERMIT TO CONSTRUCT
GAS CLEANING OR EMISSION CONTROL EQUIPMENT

1. Owner of Installation	Telephone No.		Date of Application
Perdue Agribusiness LLC	410-341-2055		9/24/24
2. Mailing Address	**City**	**Zip Code**	**County**
6906 Zion Church Road	Salisbury	21804	Wicomico
3. Equipment Location	**City/Town or P.O.**		**County**
Same as Mailing Address			
4. Signature of Owner or Operator	**Title**		**Print or Type Name**
	Director Environmental Compliance & Services		Jaclyn Mays

5. Application Type: **Alteration** ☐ **New Construction** ☑

6. Date Construction is to Start: **Completion Date (Estimate):**

7. Type of Gas Cleaning or Emission Control Equipment:

Simple Cyclone ☐ **Multiple Cyclone** ☐ **Afterburner** ☐ **Electrostatic Precipitator** ☐

Scrubber ☐ _____ (type) **Other** ☑ Mineral Oil System (type)

8. Gas Cleaning Equipment Manufacturer **Model No.** **Collection Efficiency (Design Criteria)**

Crown Americas - Crown Iron Works

9. Type of Equipment which Control Equipment is to Service:

Vent gasses from extractor system, desolventizer toaster and hexane solvent storage tanks

10. Stack Test to be Conducted:

Yes ☐ **No** ☑ _____ (Stack Test to be Conducted By) _____ (Date)

11. Cost of Equipment _____

Estimated Erection Cost _____

12. The Following Shall Be Design Criteria:

	INLET	OUTLET
Gas Flow Rate	_____ ACFM*	311 ACFM*
Gas Temperature	_____ °F	90 °F
Gas Pressure	_____ INCHES W.G.	_____ INCHES W.G.
	PRESSURE DROP _____	
Dust Loading	_____ GRAINS/ACFD**	_____ GRAINS/ACFD**
Moisture Content OR Wet Bulb Temperature	_____ % _____ °F	_____ % _____ °F
Liquid Flow Rate (Wet Scrubber)	_____ GALLONS/MINUTE	

(WHEN SCRUBBER LIQUID OTHER THAN WATER INDICATE COMPOSITION OF SCRUBBING MEDIUM IN WEIGHT %)

*= ACTUAL CUBIC FEET PER MINUTE **= ACTUAL CUBIC FEET DRY

WHEN APPLICATION INVOLVES THE REDUCTION OF GASEOUS POLLUTANTS, PROVIDE THE CONCENTRATION OF EACH POLLUTANT IN THE GAS STREAM IN VOLUME PERCENT. INCLUDE THE COMPOSITION OF THE GASES ENTERING THE CLEANING DEVICE AND THE COMPOSITION OF EXHAUSTED GASES BEING DISCHARGED INTO THE ATMOSPHERE. USE AVAILABLE SPACE IN ITEM 15 ON PAGE 3.

13. Particle Size Analysis

Size of Dust Particles Entering Cleaning Unit	% of Total Dust	% to be Collected
0 to 10 Microns	_____	_____
10 to 44 Microns	_____	_____
Larger than 44 Microns	_____	_____

14. For Afterburner Construction Only:

Volume of Contaminated Air _____ CFM (DO NOT INCLUDE COMBUSTION AIR)

Gas Inlet Temperature _____ °F

Capacity of Afterburner _____ BTU/HR

Diameter (or area) of Afterburner Throat_____

Combustion Chamber_____ _____ Operating Temperature at Afterburner _____ °F
(diameter) (length)

Retention Time of Gases _____

15. Show Location of Dust Cleaning Equipment in the System. Draw or Sketch Flow Diagram Showing Emission Path from Source to Exhaust Point to Atmosphere.

See the Process Flow Diagram in Section 2

Date Received: Local _____ _____ State _____

Acknowledgement Date: _____

By _____

Reviewed By:

Local _____

State _____

Returned to Local:

Date_____

By _____

Application Returned to Applicant:

Date_____

By _____

REGISTRATION NUMBER OF ASSOCIATED EQUIPMENT: ☐ ☐☐☐☐

PREMISES NUMBER: ☐☐ ☐☐☐☐

Emission Calculations Revised By _____ Date _____

APPENDIX B NEW SOURCE REVIEW EMISSIONS CALCULATIONS

Table B-1, Key Data

Description	Data (Adj for Calendar Mos)	Notes
5-year period prior to Project 1		Sep 2012-Aug 2017
Data for Baseline Actual Emissions (BAE), without "could have accomodated" (CHA)		
Baseline Period for BAE		Nov 2014-Oct 2016
Bean Throughput for BAE, TPY	554,349.90	
BAE Solvent Loss VOC Emissions, TPY	241.86	Actual emissions from baseline period, annualized
CHA Data		
Baseline period for CHA		Nov 2014-Oct 2016
Bean throughput, based on average of Nov and Dec 2014 bean production, annualized, TPY	622,006.93	From 24-month baseline period, averaged two consecutive months (Nov and Dec 2014) and annualized (multipled by 12)
Baseline bean throughput for CHA analysis, average TPD	1,704.13	
SLR, average from Nov 2014-Oct 2016, gal/ton	0.153	Averaged SLR values from 24-month baseline period
CHA VOC emissions, (solvent loss), TPY	269.36	Calculated using CHA throughput and average SLR value from baseline
Projected Actual Emissions (PAE) Data		
Future Bean Throughput, average TPD	2,500	
Future Bean Throughput, TPY	912,500.00	Proposed annnual throughput
Future SLR, gal/ton	0.14	Proposed as LAER
PAE Solvent Loss VOC Emissions, TPY	362.17	Calculated using proposed future throughput and SLR

Table B-2, Process Data

Solvent
Notes: density 5.67 lbs/gal
"Adj" in the column headings refers to an adjustment to the "accounting calendar" used by Perdue to monthly calendar used in the NSR regulations

Calendar Month	Beans Processed per Calendar Month (adj) (tons/ mon, adj)	Average Beans Processed based on 2 Calendar Months (adj) (avg tons/ months,	Beans Processed, Rolling 24 months (adj) (tons/ 24 mon)	Beans Processed, 12 months rolling (adj) (tons/rolling 12 mon)	Beans Processed 24/2 (adj) (tons/ 12 mon)	Solvent Loss per Calendar Month (adj) (avg gal/ mon)	Solvent Loss Ratio per Calendar Month (adj) (gal/ton)	24-month Average Beans Processed (adj) (tons/mon)	Solvent loss ratio, (adj) 24-mon average (gal/ton)	Solvent loss ratio, 12-mon rolling (adj) (gal/ton)	Solvent loss (adj) (lb/mon, adj)	VOC Emissions, Rolling 24-months (adj) (tons/ 24 mon)	VOC Emissions, rolling 24/2 (adj) (tons/ 12 mon)	VOC Emissions, per rolling 12-mon (adj) (tons/ 12 mon)
Sep-12	41,840		1,010,586	505,249	505,293	7,407	0.177	42,107.759	0.158	0.175	41,996	451.5	225.7	250.9
Oct-12	40,596		1,009,549	504,531	504,775	11,069	0.273	42,064.544	0.160	0.175	62,760	458.8	229.4	249.9
Nov-12	33,284		999,743	496,034	499,872	12,005	0.361	41,655.972	0.168	0.187	68,070	470.9	235.5	258.3
Dec-12	53,692		1,009,631	505,554	504,816	13,694	0.255	42,067.968	0.172	0.186	77,646	490.0	245.0	263.8
Jan-13	42,714		1,009,318	508,678	504,659	10,473	0.245	42,054.904	0.176	0.187	59,380	500.4	250.2	267.9
Feb-13	38,572		1,014,171	507,127	507,085	8,918	0.231	42,257.112	0.180	0.196	50,565	512.5	256.3	278.1
Mar-13	42,758		1,013,340	507,024	506,670	8,763	0.205	42,222.514	0.182	0.201	49,686	518.4	259.2	286.4
Apr-13	42,081		1,011,838	506,534	505,919	8,427	0.200	42,159.907	0.186	0.208	47,779	529.1	264.6	295.1
May-13	4,743		973,220	467,481	486,610	720	0.152	40,550.813	0.188	0.212	4,082	518.8	259.4	284.4
Jun-13	13,964		945,527	440,716	472,764	2,394	0.171	39,396.977	0.191	0.218	13,574	515.5	257.7	280.3
Jul-13	43,074		946,009	440,501	473,005	4,698	0.109	39,417.057	0.191	0.213	26,637	515.9	258.0	273.1
Aug-13	45,587		949,377	442,906	474,689	5,551	0.122	39,557.378	0.191	0.208	31,475	515.5	257.7	266.8
Sep-13	43,862		950,176	444,927	475,088	5,488	0.125	39,590.682	0.190	0.204	31,116	512.3	256.1	261.4
Oct-13	46,438		955,300	450,769	477,650	9,536	0.205	39,804.176	0.187	0.198	54,067	507.0	253.5	257.0
Nov-13	44,488		958,008	461,973	479,004	6,050	0.136	39,916.989	0.183	0.180	34,306	498.4	249.2	240.2
Dec-13	47,349		961,184	455,631	480,592	9,573	0.202	40,049.338	0.181	0.175	54,282	492.2	246.1	228.5
Jan-14	46,138		967,732	459,054	483,866	8,187	0.177	40,322.175	0.179	0.170	46,418	489.9	245.0	222.0
Feb-14	43,209		970,818	463,691	485,409	6,710	0.155	40,450.735	0.180	0.163	38,046	493.9	246.9	215.7
Mar-14	43,990		971,947	464,923	485,973	6,001	0.136	40,497.788	0.180	0.158	34,024	494.3	247.2	207.9
Apr-14	47,895		977,271	470,737	488,635	5,808	0.121	40,719.610	0.179	0.151	32,931	495.5	247.8	200.5
May-14	47,565		981,040	513,559	490,520	6,279	0.132	40,876.686	0.181	0.149	35,600	500.7	250.3	216.2
Jun-14	45,639		985,950	545,234	492,975	5,461	0.120	41,081.239	0.182	0.145	30,964	505.2	252.6	224.9
Jul-14	46,233		988,894	548,393	494,447	5,467	0.118	41,203.916	0.180	0.146	30,996	500.2	250.1	227.1
Aug-14	44,646		990,358	547,452	495,179	6,503	0.146	41,264.898	0.178	0.148	36,874	496.6	248.3	229.8
Sep-14	43,650		992,167	547,240	496,084	7,336	0.168	41,340.300	0.178	0.151	41,596	496.4	248.2	235.1
Oct-14	41,685	42,668	993,257	542,487	496,628	7,543	0.181	41,385.693	0.174	0.149	42,767	486.4	243.2	229.4
Nov-14	51,069	46,377	1,011,041	549,068	505,521	10,160	0.1990	42,126.720	0.167	0.155	57,609	481.2	240.6	241.1
Dec-14	52,599	51,834	1,009,949	554,318	504,974	9,029	0.1717	42,081.188	0.164	0.152	51,193	468.0	234.0	239.5
Jan-15	54,674	53,637	1,021,908	562,854	510,954	8,168	0.149	42,579.513	0.160	0.150	46,313	461.4	230.7	239.5
Feb-15	41,651	48,163	1,024,987	561,296	512,494	9,003	0.216	42,707.805	0.159	0.155	51,047	461.7	230.8	246.0
Mar-15	48,887	45,269	1,031,116	566,193	515,558	5,977	0.122	42,963.186	0.156	0.154	33,892	453.8	226.9	245.9
Apr-15	46,443	47,665	1,035,478	564,740	517,739	4,727	0.102	43,144.900	0.152	0.152	26,803	443.3	221.7	242.8
May-15	47,409	46,926	1,078,144	564,584	539,072	6,808	0.144	44,922.649	0.151	0.153	38,600	460.6	230.3	244.3
Jun-15	44,729	46,069	1,108,909	563,675	554,454	4,940	0.110	46,204.521	0.149	0.152	28,012	467.8	233.9	242.9

Table B-2, Process Data

Notes: Solvent density 5.67 lbs/gal

"Adj" in the column headings refers to an adjustment to the "accounting calendar" used by Perdue to monthly calendar used in the NSR regulations

Calendar Month	Beans Processed per Calendar Month (adj) (tons/ mon, adj)	Average Beans Processed based on 2 Calendar Months (adj) (avg tons/ months,	Beans Processed, Rolling 24 months (adj) (tons/ 24 mon)	Beans Processed, 12 months rolling (adj) (tons/rolling 12 mon)	Beans Processed 24/2 (adj) (tons/ 12 mon)	Solvent Loss per Calendar Month (adj) (avg gal/ mon)	Solvent Loss Ratio per Calendar Month (adj) (gal/ton)	24-month Average Beans Processed (adj) (tons/mon)	Solvent loss ratio, (adj) 24-mon average (gal/ton)	Solvent loss ratio, 12-mon rolling (adj) (gal/ton)	Solvent loss (adj) (lb/mon, adj)	VOC Emissions, Rolling 24-months (adj) (tons/ 24 mon)	VOC Emissions, rolling 24/2 (adj) (tons/ 12 mon)	VOC Emissions, per rolling 12-mon (adj) (tons/ 12 mon)
Jul-15	23,338	34,034	1,089,173	540,780	544,586	2,767	0.119	45,382.198	0.149	0.152	15,686	462.3	231.2	235.2
Aug-15	46,071	34,705	1,089,657	542,205	544,829	5,860	0.127	45,402.388	0.149	0.151	33,226	463.2	231.6	233.4
Sep-15	45,691	45,881	1,091,486	544,246	545,743	5,484	0.120	45,478.594	0.149	0.147	31,092	463.2	231.6	228.1
Oct-15	47,131	46,411	1,092,179	549,692	546,089	8,598	0.182	45,507.453	0.148	0.147	48,749	460.5	230.3	231.1
Nov-15	44,391	45,761	1,092,082	543,015	546,041	10,779	0.243	45,503.435	0.153	0.151	61,115	473.9	237.0	232.9
Dec-15	50,683	47,537	1,095,416	541,098	547,708	9,416	0.186	45,642.336	0.152	0.152	53,390	473.5	236.7	234.0
Jan-16	47,159	48,921	1,096,437	533,583	548,219	8,972	0.190	45,684.887	0.152	0.155	50,873	475.7	237.8	236.2
Feb-16	39,996	43,578	1,093,224	531,928	546,612	6,903	0.173	45,551.019	0.153	0.151	39,140	476.2	238.1	230.3
Mar-16	45,457	42,727	1,094,691	528,498	547,346	6,343	0.140	45,612.143	0.153	0.153	35,964	477.2	238.6	231.3
Apr-16	44,229	44,843	1,091,025	526,284	545,512	5,180	0.117	45,459.357	0.153	0.154	29,369	475.4	237.7	232.6
May-16	41,302	42,765	1,084,761	520,177	542,381	2,941	0.071	45,198.394	0.151	0.148	16,673	466.0	233.0	221.6
Jun-16	49,821	45,562	1,088,944	525,270	544,472	7,187	0.144	45,372.680	0.152	0.151	40,751	470.9	235.4	228.0
Jul-16	50,049	49,935	1,092,760	551,980	546,380	5,372	0.107	45,531.666	0.151	0.150	30,458	470.6	235.3	235.4
Aug-16	46,736	48,392	1,094,850	552,645	547,425	7,394	0.158	45,618.761	0.152	0.153	41,921	473.1	236.6	239.7
Sep-16	49,029	47,882	1,100,229	555,982	550,114	7,346	0.150	45,842.868	0.151	0.155	41,650	473.1	236.6	245.0
Oct-16	50,156	49,592	1,108,700	559,008	554,350	11,273	0.225	46,195.825	0.153	0.159	63,920	483.7	241.9	252.6
Nov-16	47,034	48,595	1,104,665	561,650	552,332	9,297	0.198	46,027.700	0.153	0.155	52,713	481.3	240.6	248.4
Dec-16	45,498	46,266	1,097,564	556,465	548,782	7,266	0.160	45,731.816	0.152	0.153	41,199	476.3	238.1	242.3
Jan-17	46,585	46,042	1,089,474	555,892	544,737	7,884	0.169	45,394.765	0.153	0.151	44,701	475.5	237.7	239.2
Feb-17	44,411	45,498	1,092,234	560,306	546,117	6,802	0.153	45,509.765	0.150	0.149	38,567	469.2	234.6	238.9
Mar-17	48,478	46,445	1,091,826	563,328	545,913	5,870	0.121	45,492.743	0.150	0.148	33,283	468.9	234.5	237.6
Apr-17	47,965	48,222	1,093,348	567,064	546,674	6,137	0.128	45,556.171	0.151	0.149	34,798	472.9	236.5	240.3
May-17	48,886	48,425	1,094,825	574,648	547,413	6,574	0.134	45,617.710	0.151	0.154	37,276	472.3	236.1	250.6
Jun-17	46,589	47,737	1,096,685	571,415	548,343	4,632	0.099	45,695.210	0.151	0.150	26,262	471.4	235.7	243.4
Jul-17	47,876	47,233	1,121,223	569,243	560,612	5,534	0.116	46,717.630	0.150	0.151	31,377	479.2	239.6	243.8
Aug-17	43,523	45,700	1,118,675	566,030	559,337	5,474	0.126	46,611.452	0.150	0.148	31,036	478.1	239.1	238.4
Sep-17	12,721	28,122	1,085,705	529,722	542,852	1,753	0.138	45,237.699	0.151	0.147	9,940	467.6	233.8	222.5

Table B-3, Combustion Unit Fuel Use

Scenario	Annual SB Throughput (tpy)	Steam Requirements (lb steam/yr)	Fuel (Boiler) Requirements (MMBtu/yr)	Natural Gas (Boiler) Requirements (MMscf/yr)	Portion of 2021 Throughput (%)
Steam Plant Data for CY 2021 Annual Bean Throughput	593,476	356,085,416	421,355	405.15	100.0%
Steam Plant Data for Baseline Bean Throughput	554,350	332,609,941	393,576	378.44	93.4%
Steam Plant Data for CHA Bean Throughput	622,007	373,204,157	441,611	424.63	104.8%
Steam Plant Data for Future Bean Throughput Limit	912,500	547,500,000	647,855	622.94	153.8%

Emissions Point	Description	Fuel	2021 Actual Fuel Usage (MMscf/yr)	Portion of Total Fuel (%)	Fuel Usage Required for 2021 Crush Plant Production (MMcf/yr)	Steam Plant Data for Baseline Bean Throughput (MMcf/yr)	Steam Plant Data for CHA Bean Throughput (MMcf/yr)	Steam Plant Data for Future Bean Throughput Limit (MMcf/yr)
Main Boiler Room								
BR1	33 mmbtu/hr boiler located at main boiler room	Gas	86.02	18.11%	73.38	68.54	76.91	112.83
BR3	33 mmbtu/hr boiler located at main boiler room	Gas	110.48	23.26%	94.25	88.04	98.78	144.91
BR4	33 mmbtu/hr boiler located at main boiler room	Gas	103.51	21.79%	88.30	82.48	92.54	135.76
BR5	33 mmbtu/hr boiler located at main boiler room	Gas	174.92	36.83%	149.22	139.38	156.40	229.44
	Total Gas		474.93		405.15	378.44	424.63	622.94
Vegetable Oil Refinery					-			
OR1	29 mmbtu/hr boiler located at vegetable oil refinery	Gas	179.52		179.52	167.68	188.15	244.27
OR9	5.85 mmbtu/hr high pressure steam generator for Deoderizer 1	Gas	13.17		13.17	12.30	13.80	20.25
Grain Receiving (Drying)								
GS1	Natural Gas Zimmerman Grain Dryer	Gas	1.40	0.00%	0.00	0.00	0.00	0.00
GS2	Grain Dryers 4 and 5	Gas	26.58	31.18%	25.24	23.58	26.46	38.81
GS4	Grain Dryers 2 and 3	Gas	17.75	20.82%	16.86	15.75	17.67	25.92
GS6	Grain Dryers 6 and 7	Gas	40.93	48.00%	38.86	36.30	40.73	59.76
	Total Fuel Used in Dryers		86.67		80.97	75.63	84.86	124.49
	Fuel used in dryers for crush plant		80.97					

Notes:
Steam requirements (Boiler Plant)
600 lb steam per ton soybean processed (plant process data)
32.659 MMBtu/hr yields 26700 lb steam/hr (Cleaver Brooks data for 800 hp boiler)
0.00118 MMBtu/lb steam
Refinery Plant Assumptions: Assume refinery boiler will operate at capacity (29 MMBtuhr * 8760 hrs/yr) after Modification
Grain Dryer Assumptions: All soybeans processedin SB plant are dried
Heating value of natural gas fuel 1040 BTU/scf
The Zimmerman Grain Dryer is not used for drying soybeans.

Table B-4, Grain Throughput Data

	Annual Throughput, tpy	Adjustment to 2021 throughput
CY 2021 Annual Bean Throughput	593,476	100.0%
Baseline Bean throughput	554,350	93.4%
CHA Bean throughput	622,007	104.8%
Future Bean Throughput Limit	912,500	153.8%

Emissions Point	Description	2021 Actual Throughput (tpy)	Portion of Grain Dried through Each Dryer, Receiving Location (%)	CY 2021 Annual Bean Throughput (tpy)	Baseline Bean throughput (tpy)	CHA Bean throughput (tpy)	Future Bean Throughput Limit (tpy)
Grain Processed through Drying and Scalping							
GS2	Grain Dryer for Dryers 4, 5, partial enclosure	237,008	38.22%	226,830	211,876	237,735	348,764
GS3	Grain Scalper for Dryers 4, 5 baghouse	237,008	38.22%	226,830	211,876	237,735	348,764
GS4	Grain Dryers, 2, 3, partial enclosure	142,263	22.94%	136,154	127,178	142,700	209,344
GS5	Grain scalpers for Dryers 2, 3 with baghouse	142,263	22.94%	136,154	127,178	142,700	209,344
GS6(NSPS)	Grain Dryers, 6, 7, partial enclosure	240,833	38.84%	230,491	215,296	241,572	354,393
GS7	Grain Scalpers for Dryers 6, 7 with baghouse	240,833	38.84%	230,491	215,296	241,572	354,393
	Total Grain Drying Throughput	**635,234**					
	% Adjustment for Grain to SB Plant (2021)	**93.43%**	1.00	593,475.69	554,349.90	622,006.93	912,500.00
Emissions Point	**Description**	**2021 Actual Throughput (tpy)**	**Portion of Grain Dried through Each Dryer, Receiving Location (%)**	**CY 2021 Annual Bean Throughput (tpy)**	**Baseline Bean throughput (tpy)**	**CHA Bean throughput (tpy)**	**Future Bean Throughput Limit (tpy)**
Grain Receiving							
GS8	Grain Truck Receiving Pit No. 3 w/baghouse	164,727	20.32%	120,601	112,650	126,399	185,431
GS9	Grain Truck Receiving Pit No. 4 w/baghouse	164,727	20.32%	120,601	112,650	126,399	185,431
GS10	Grain Truck Receiving Pit No. 2 w/baghouse	164,727	20.32%	120,601	112,650	126,399	185,431
GS11	Grain Truck Receiving Pit No. 1 w/baghouse	164,727	20.32%	120,601	112,650	126,399	185,431
GS13	Grain Loadout Chute by Truck Dumps 1 and 2		0.00%	0	0	0	0
GS14	Grain Loadout Chute by Truck Dumps 3 and 4		0.00%	0	0	0	0
GS15	Grain Loadout Chute from Tank 7c		0.00%	0	0	0	0
GS16	Grain Loadout Rail Chute		0.00%	0	0	0	0
GS-??	Rail receiving of Grain	95,954	11.84%	70,250	65,619	73,628	108,014
GS-??	Soybean Meal Loadout Spout to Rail	0	0.00%	0	0	0	0
GS-??	Grain Truck Dump 5	55,756	6.88%	40,820	38,129	42,783	62,764
	Total Grain Received	**810,619**					
	% Adjustment for Grain Received to SB Plant (2021)	**73.21%**					
Grain Handling							
GS12	Grain Handling System (bucket elevators, conveyor belts, oil spray)	752,263	100%	593,476	554,350	622,007	912,500
	% Grain Handling Adjustment to SB Plant (2021)	**78.89%**					

Table B-5, Combustion Emissions

Emissions Point	Description	Fuel Usage			PM/TSP			PM10			PM2.5		
		Baseline Annual (MMcf)	CHA Annual (MMcf)	Future Annual (MMcf)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)
Main Boiler Room													
BR1	33 mmbtu/hr boiler located at main boiler room	68.54	76.91	112.83	0.26	0.29	0.43	0.26	0.29	0.43	0.26	0.29	0.43
BR3	33 mmbtu/hr boiler located at main boiler room	88.04	98.78	144.91	0.33	0.38	0.55	0.33	0.38	0.55	0.33	0.38	0.55
BR4	33 mmbtu/hr boiler located at main boiler room	82.48	92.54	135.76	0.31	0.35	0.52	0.31	0.35	0.52	0.31	0.35	0.52
BR5	33 mmbtu/hr boiler located at main boiler room	139.38	156.40	229.44	0.53	0.59	0.87	0.53	0.59	0.87	0.53	0.59	0.87
OR1	29 mmbtu/hr boiler located at vegetable oil refinery	167.68	188.15	244.27	0.64	0.71	0.93	0.64	0.71	0.93	0.64	0.71	0.93
OR9	5.85 mmbtu/hr high pressure steam generator for Deoderizer 1	12.30	13.80	20.25	0.05	0.05	0.08	0.05	0.05	0.08	0.05	0.05	0.08
Grain Handling													
GS2	Grain Dryer for Dryers 4, 5, partial enclosure	23.58	26.46	38.81	0.09	0.10	0.15	0.09	0.10	0.15	0.09	0.10	0.15
GS4	Grain Dryers, 2, 3, partial enclosure	15.75	17.67	25.92	0.06	0.07	0.10	0.06	0.07	0.10	0.06	0.07	0.10
GS6(NSPS)	Grain Dryers, 6, 7, partial enclosure	36.30	40.73	59.76	0.14	0.15	0.23	0.14	0.15	0.23	0.14	0.15	0.23
	TOTALS				2.41	2.70	3.85	2.41	2.70	3.85	2.41	2.70	3.85

Emissions Point	Description	Fuel Usage			NOx			CO		
		Baseline Annual (MMcf)	CHA Annual (MMcf)	Future Annual (MMcf)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)
Main Boiler Room										
BR1	33 mmbtu/hr boiler located at main boiler room	68.54	76.91	112.83	1.71	1.92	2.82	2.88	3.23	4.74
BR3	33 mmbtu/hr boiler located at main boiler room	88.04	98.78	144.91	2.20	2.47	3.62	3.70	4.15	6.09
BR4	33 mmbtu/hr boiler located at main boiler room	82.48	92.54	135.76	2.06	2.31	3.39	3.46	3.89	5.70
BR5	33 mmbtu/hr boiler located at main boiler room	139.38	156.40	229.44	3.48	3.91	5.74	5.85	6.57	9.64
OR1	29 mmbtu/hr boiler located at vegetable oil refinery	167.68	188.15	244.27	4.19	4.70	6.11	7.04	7.90	10.26
OR9	5.85 mmbtu/hr high pressure steam generator for Deodorizer 1	12.30	13.80	20.25	0.31	0.35	0.51	0.52	0.58	0.85
Grain Handling										
GS2	Grain Dryers, 4, 5, partial enclosure	23.58	26.46	38.81	0.59	0.66	0.97	0.99	1.11	1.63
GS4	Grain Dryers, 2, 3, partial enclosure	15.75	17.67	25.92	0.39	0.44	0.65	0.66	0.74	1.09
GS6(NSPS)	Grain Dryers, 6, 7, partial enclosure	36.30	40.73	59.76	0.91	1.02	1.49	1.52	1.71	2.51
	TOTALS				15.85	17.79	25.30	26.63	29.88	42.50

Table B-5, Combustion Emissions

Emissions Point	Description	Fuel Usage			SO2			CO2		
		Baseline Annual (MMcf)	CHA Annual (MMcf)	Future Annual (MMcf)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)
Main Boiler Room										
BR1	33 mmbtu/hr boiler located at main boiler room	68.54	76.91	112.83	0.02	0.02	0.03	4,112.55	4,614.48	6,769.56
BR3	33 mmbtu/hr boiler located at main boiler room	88.04	98.78	144.91	0.03	0.03	0.04	5,282.14	5,926.81	8,694.78
BR4	33 mmbtu/hr boiler located at main boiler room	82.48	92.54	135.76	0.02	0.03	0.04	4,948.61	5,552.58	8,145.77
BR5	33 mmbtu/hr boiler located at main boiler room	139.38	156.40	229.44	0.04	0.05	0.07	8,363.03	9,383.72	13,766.16
OR1	29 mmbtu/hr boiler located at vegetable oil refinery	167.68	188.15	244.27	0.05	0.06	0.07	10,060.95	11,288.87	14,656.15
OR9	5.85 mmbtu/hr high pressure steam generator for Deoderizer 1	12.30	13.80	20.25	0.00	0.00	0.01	738.03	828.11	1,214.86
Grain Handling										
GS2	Grain Dryers, 4, 5, partial enclosure	23.58	26.46	38.81	0.01	0.01	0.01	1,414.80	1,587.47	2,328.86
GS4	Grain Dryers, 2, 3, partial enclosure	15.75	17.67	25.92	0.00	0.01	0.01	944.87	1,060.19	1,555.32
GS6(NSPS)	Grain Dryers, 6, 7, partial enclosure	36.30	40.73	59.76	0.01	0.01	0.02	2,178.13	2,443.97	3,585.37
	TOTALS				0.19	0.21	0.30	38,043.12	42,686.19	60,716.82

Emissions Point	Description	Fuel Usage			VOC		
		Baseline Annual (MMcf)	CHA Annual (MMcf)	Future Annual (MMcf)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)
Main Boiler Room							
BR1	33 mmbtu/hr boiler located at main boiler room	68.54	76.91	112.83	0.19	0.21	0.31
BR3	33 mmbtu/hr boiler located at main boiler room	88.04	98.78	144.91	0.24	0.27	0.40
BR4	33 mmbtu/hr boiler located at main boiler room	82.48	92.54	135.76	0.23	0.25	0.37
BR5	33 mmbtu/hr boiler located at main boiler room	156.40	156.40	229.44	0.43	0.43	0.63
OR1	29 mmbtu/hr boiler located at vegetable oil refinery	167.68	188.15	244.27	0.46	0.52	0.67
OR9	5.85 mmbtu/hr high pressure steam generator for Deodorizer 1	12.30	13.80	20.25	0.03	0.04	0.06
Grain Handling							
GS2	Grain Dryers, 4, 5, partial enclosure	23.58	26.46	38.81	0.06	0.07	0.11
GS4	Grain Dryers, 2, 3, partial enclosure	15.75	17.67	25.92	0.04	0.05	0.07
GS6(NSPS)	Grain Dryers, 6, 7, partial enclosure	36.30	40.73	59.76	0.10	0.11	0.16
	TOTALS				1.79	1.96	2.78

Table B-5, Combustion Emissions
Combustion Source Emission Factors

Pollutant	Fuel	Factor	Units
TSP	natural gas	7.6	lb/MMcf
PM_{10}	natural gas	7.6	lb/MMcf
$PM_{2.5}$	natural gas	7.6	lb/MMcf
NOx	natural gas	50	lb/MMcf
CO	natural gas	84	lb/MMcf
VOC	natural gas	5.5	lb/MMcf
SO_2	natural gas	0.6	lb/MMcf
CO_2	natural gas	120,000	lb/MMcf

Table B-6, Process PM Emissions 3

Emissions Point[8]	Description	Throughput				PM/TSP				PM10[2]				PM2.5[2]				Reference/Notes on EF
		Baseline Annual[1] (tpy)	CHA Annual (tpy)	Future Annual (tpy)	Control Efficiency[4] (as used in calculations), Fraction Emitted	Emissions Factor (EF)[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	EF[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	EF[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	
Soybean Processing Plant																		
SP-??	Soybean meal/hulls storage tanks with bin vent filters[3]	449,023	503,826	739,125	0.010	0.025	0.056	0.063	0.092	0.006	0.014	0.016	0.023	0.001	0.002	0.003	0.004	AP-42, 9.9.1-1, Storage bin(vent), no controls
SP-??	Soybean meal/hulls storage bins with bin vent filters[3]	449,023	503,826	739,125	0.010	0.025	0.056	0.063	0.092	0.006	0.014	0.016	0.023	0.001	0.002	0.003	0.004	AP-42, 9.9.1-1, Storage bin(vent), no controls
SP-??	Additive (clay) Tank with 3 cartridge style bin vents[6]	0	0	3,422	1.000	0.010	0.000	0.000	0.017	0.002	0.000	0.000	0.003	0.001	0.000	0.000	0.001	Ap-42, 11.19.2-4, EF used as is
SP-??	Meal loadout spout to rail, routed to baghouse[7]	0	0	912,500	0.001	0.270	0.000	0.000	0.123	0.270	0.000	0.000	0.123	0.270	0.000	0.000	0.123	AP-42, 9.11.1-1, Meal loadout, no controls
SP1	Equipment aeration w baghouse (2 shaker screens, cracking and dehulling, tables 5,6)	184,783	207,336	304,167	0.001	0.750	0.069	0.078	0.114	0.190	0.018	0.020	0.029	0.030	0.003	0.003	0.005	AP-42, 9.9.1-1, Grain Cleaning, internal vibrating / cyclone
SP2	Equipment aeration w baghouse (2 shaker screens, cracking and dehulling, tables 3,4)	184,783	207,336	304,167	0.001	0.750	0.069	0.078	0.114	0.190	0.018	0.020	0.029	0.030	0.003	0.003	0.005	AP-42, 9.9.1-1, Grain Cleaning, internal vibrating / cyclone
SP3	Equipment aeration w baghouse (2 shaker screens, cracking and dehulling, tables 1,2)	184,783	207,336	304,167	0.001	0.750	0.069	0.078	0.114	0.190	0.018	0.020	0.029	0.030	0.003	0.003	0.005	AP-42, 9.9.1-1, Grain Cleaning, internal vibrating / cyclone
SP4	2 meal grinders, hammermills, sifters w/baghouse	554,350	622,007	912,500	0.001	3.400	0.942	1.057	1.551	3.400	0.942	1.057	1.551	3.400	0.942	1.057	1.551	AP-42, 9.11.1-1, meal grind/sizing with cyclone" from 9.11.1-1
SP5	Scalper and storage tanks w/baghouse	554,350	622,007	912,500	0.001	0.775	0.215	0.241	0.354	0.200	0.055	0.062	0.091	0.080	0.022	0.025	0.037	AP-42, 9.9.1-1, Storage bin (vent) (no controls)[0.025/0.0063/00011] + 9.9.1-1, Grain Cleaning (cyclone controls) [0.075/0.019/0.0032]
SP6	8 flaking rolls, w/high efficiency cyclone	554,350	622,007	912,500	0.050	0.370	5.128	5.754	8.441	0.185	2.564	2.877	4.220	0.185	2.564	2.877	4.220	AP-42, 9.11.1-1, Flaking rolls with cyclone; Footnote (g) for Table 9.9.1-2, Animal Feed Mills, Flaker - PM10 = 0.5 PM; PM2.5 conservatively = PM10
SP7	3 fluidized bed separators aspirating secondary table w/baghouse	554,350	622,007	912,500	0.001	0.370	0.103	0.115	0.169	0.370	0.103	0.115	0.169	0.370	0.103	0.115	0.169	AP-42, 9.11.1-1, Flaking rolls with cyclone
SP8	2 hull grinders w/baghouse	554,350	622,007	912,500	0.001	2.000	0.554	0.622	0.913	2.000	0.554	0.622	0.913	2.000	0.554	0.622	0.913	AP-42, 9.11.1-1, Hull grinding, with cyclone.
SP13	Dryer Cooler w/ 3 cyclones	554,350	622,007	912,500	1.000	0.014	3.783	4.245	6.228	0.012	3.368	3.779	5.543	0.010	2.869	3.219	4.722	Based on Perdue Chesapeake facility stack tests + 50% buffer
SP16	Soybean Extraction w Mineral oil system (no PM)	554,350	622,007	912,500			0.000	0.000	0.000		0.000	0.000	0.000		0.000	0.000	0.000	
SP18	Truck Meal/Hull Loadout w/baghouse	554,350	622,007	739,125	0.001	0.270	0.075	0.084	0.100	0.270	0.075	0.084	0.100	0.270	0.075	0.084	0.100	AP-42, 9.11.1-1, Meal loadout, no controls
SP19	3 Cracking Mills w/baghouse	554,350	622,007	912,500	0.001	3.600	0.998	1.120	1.643	3.600	0.998	1.120	1.643	3.600	0.998	1.120	1.643	AP-42, 9.11.1-1 , Cracking/dehulling with cyclone
SP20	Raw Dried Soybean conveyance, enclosed and underground	554,350	622,007	912,500	0.100	0.061	1.691	1.897	2.783	0.034	0.942	1.057	1.551	0.006	0.161	0.180	0.265	AP-42, 9.9.1-1, Headhouse and grain handling, no controls

Table B-6, Process PM Emissions 3

Emissions Point[8]	Description	Throughput				PM/TSP				PM10[2]				PM2.5[2]				Reference/Notes on EF
		Baseline Annual[1] (tpy)	CHA Annual (tpy)	Future Annual (tpy)	Control Efficiency[4] (as used in calculations), Fraction Emitted	Emissions Factor (EF)[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	EF[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	EF[5] (lb/ton)	BAE (tpy)	CHA Emissions (tpy)	PAE (tpy)	
Grain Handling[2]																		
GS2	Grain Dryer for Dryers 4, 5, partial enclosure	211,876	237,735	348,764	0.250	0.220	5.827	6.538	9.591	0.055	1.457	1.634	2.398	0.009	0.249	0.279	0.410	AP-42, 9.9.1-1, grain drying, column drying
GS3	Grain Scalper for Dryers 4, 5 baghouse	211,876	237,735	348,764	0.001	0.750	0.079	0.089	0.131	0.190	0.020	0.023	0.033	0.032	0.003	0.004	0.006	AP-42, 9.9.1-1, with cyclone
GS4	Grain Dryers, 2, 3, partial enclosure	127,178	142,700	209,344	0.250	0.220	3.497	3.924	5.757	0.055	0.874	0.981	1.439	0.009	0.149	0.168	0.246	AP-42, 9.9.1-1, with cyclone
GS5	Grain scalpers for Dryers 2, 3 with baghouse	127,178	142,700	209,344	0.001	0.750	0.048	0.054	0.079	0.190	0.012	0.014	0.020	0.032	0.002	0.002	0.003	AP-42, 9.9.1-1, with cyclone
GS6	Grain Dryers, 6, 7, partial enclosure	215,296	241,572	354,393	0.250	0.220	5.921	6.643	9.746	0.055	1.480	1.661	2.436	0.009	0.253	0.284	0.416	AP-42, 9.9.1-1, grain drying, column drying
GS7	Grain Scalpers for Dryers 6, 7 with baghouse	215,296	241,572	354,393	0.001	0.750	0.081	0.091	0.133	0.190	0.020	0.023	0.034	0.032	0.003	0.004	0.006	AP-42, 9.9.1-1, with cyclone
GS8	Grain Truck Receiving Pit No. 3 w/baghouse	112,650	126,399	185,431	0.001	0.180	0.010	0.011	0.017	0.059	0.003	0.004	0.005	0.010	0.001	0.001	0.001	AP-42, 9.9.1-1, Grain receiving, straight truck
GS9	Grain Truck Receiving Pit No. 4 w/baghouse	112,650	126,399	185,431	0.001	0.180	0.010	0.011	0.017	0.059	0.003	0.004	0.005	0.010	0.001	0.001	0.001	AP-42, 9.9.1-1, Grain receiving, straight truck
GS10	Grain Truck Receiving Pit No. 2 w/baghouse	112,650	126,399	185,431	0.001	0.180	0.010	0.011	0.017	0.059	0.003	0.004	0.005	0.010	0.001	0.001	0.001	AP-42, 9.9.1-1, Grain receiving, straight truck
GS11	Grain Truck Receiving Pit No. 1 w/baghouse	112,650	126,399	185,431	0.001	0.180	0.010	0.011	0.017	0.059	0.003	0.004	0.005	0.010	0.001	0.001	0.001	AP-42, 9.9.1-1, Grain receiving, straight truck
GS12	Grain Handling System (bucket elevators, conveyor belts, oil spray) - 3 x throughput	1,663,050	1,866,021	2,737,500	0.100	0.061	5.072	5.691	8.349	0.034	2.827	3.172	4.654	0.006	0.482	0.541	0.794	AP-42, 9.9.1-1, Headhouse and grain handling, no controls
GS-??	Grain bins with bin vent filters	554,350	622,007	912,500	0.010	0.025	0.069	0.078	0.114	0.006	0.017	0.020	0.029	0.001	0.003	0.003	0.005	AP-42, 9.9.1-1, Storage bin(vent), no controls
GS-??	Rail receiving of Grain	65,619	73,628	108,014	0.500	0.032	0.525	0.589	0.864	0.008	0.128	0.144	0.211	0.001	0.021	0.024	0.035	AP-42, 9.9.1-1, Grain receiving, railcar
GS-??	Grain Truck Dump 5	38,129	42,783	62,764	0.500	0.035	0.334	0.374	0.549	0.008	0.074	0.083	0.122	0.001	0.012	0.014	0.020	AP-42, 9.9.1-1, Grain receiving, hopper truck
	TOTALS						35.302	39.611	58.227		16.606	18.633	27.438		9.482	10.640	15.709	

Notes: [1] BAE, 24-mon period ending Oct 2016

[2] For sources controlled by baghouses, PM2.5=PM10=PM/TSP (unless specific EFs for PM10 and PM2.5 are provided; For uncontrolled and cyclone-controlled sources, PM10=0.25 TSP; PM2.5=0.17 PM10 (footntes, g and h in AP-42, Table 9.9.1-1) (unless otherwise referenced)

[3] Meal and hulls assumed to be 75% and 6%, respectively, of soybeans

[4] Assumed control efficiencies - Baghouses: 99.9%; bin vent filters: 99%; cyclone: 90%; high efficiency cyclone: 95%; enclosed/undergound conveyors: 90%

[5] When emission factors included emission control equipment, an uncontrolled emissions factor was back-calculated

[6] Clay tank permitted in 2022. Maximum amount of clay is 0.5% (wt) of meal. Future emissions are actually PTE, BAE = zero.

[7] Rail loadout spout permitted in 2022. Conservatively BAE and CHA are zero. Future emissions are actually PTE, very conservatively assuming all meal goes out through spout.

[8] XX-?? refers to Emissions Point Numbers that are not yet assigned

Pollutant	Baseline Actual Emissions (BAE) (tpy)	Emissions, Could Have Accommodated (tpy)	Demand Growth (tpy)	Projected Actual Emissions (PAE) (tpy)	Project Emissions Increase (tpy)	NSR Significant Emissions Rates (tpy)	Triggers NSR? Yes or No
TSP							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	35.30	39.61	4.31	58.23			
Total	37.71	42.31	4.60	62.07	19.76	25	No
PM10							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	16.61	18.63	2.03	27.44			
Total	19.02	21.34	2.32	31.28	9.95	15	No
PM2.5							
Combustion Equipment	2.41	2.70	0.29	3.85			
Process Data	9.48	10.64	1.16	15.71			
Total	11.89	13.34	1.45	19.55	6.21	10	No
VOC							
Combustion Equipment	1.79	1.96	0.17	2.78			
Solvent Loss	241.86	269.36	27.50	362.17			
Total	243.65	271.32	27.67	364.95	93.63	40	Yes (Nonattainment NSR)
NOx (Combustion Equipment)	15.85	17.79	1.93	25.30	7.51	40	No
SO2 (Combustion Equipment)	0.19	0.21	0.02	0.30	0.09	40	No
CO (Combustion Equipment)	26.63	29.88	3.25	42.50	12.62	100	No
CO2e (Combustion Equipment)	38,043.12	42,686.19	4,643.07	60,716.82	18,030.63	75000	No

Notes:

Demand Growth = BAE - Emissions, Could Have Accommodated

Project Emissions Increase = PAE - BAE- Demand Growth

APPENDIX C TOXIC AIR POLLUTANT ANALYSIS

1.0 MARYLAND TAP ANALYSIS

The Project is subject to the Maryland toxic air pollutant (TAP) requirements because TAPs will discharge into the ambient air, and the Project is required to obtain a PTC under COMAR 26.11.02.09 (pursuant to COMAR 26.11.15.03(A)(1)).

COMAR 26.11.15.06 requires a demonstration that TAP emissions will not unreasonably endanger human health. PAB is demonstrating compliance with this ambient impact requirement using a screening analysis as specified under COMAR 26.11.15.07. According to COMAR 26.11.16.02(A), such a demonstration is made by showing that TAP emissions from the premises will not cause increases in ambient levels that exceed the applicable risk-based screening level for a Class I TAP and the applicable TLV-/threshold-based screening level for a Class II TAP (MDE Screening Levels).

1.1 TAP Emissions

Calculations of premise-wide TAP emissions are given in the Attachment.

1.2 TAPS Compliance Screening Analysis

The TAPs compliance screening analysis is performed in two phases; initial screening and refined screening. For the initial screening, estimates of TAP emissions are compared to the conservative Allowable Emission Rates (AERs) consistent with the Table provided under COMAR 26.11.16.02(A)(4) (MDE AER). For TAPs that do not pass this very conservative, initial screening compliance demonstration, a refined screening approach is used to demonstrate compliance. In this refined screening, offsite ground-level impacts of expected TAP emissions estimated using refined air quality modeling, consistent with COMAR 26.11.16.02(A)(3) (and COMAR 26.11.16.02(C)(1)), are directly compared to the applicable MDE Screening Levels.

1.2.1 Initial Screening

MDE-Based AER

The MDE AERs given in the Table under COMAR 26.11.16.02(A)(4), for non-stack or downwash sources, can be generalized as follows:

Short-term (1-hr/8-hr) AER (lb/hr) = SL/279

Long-term (annual) AER (lb/yr) = SL/0.00274

where SL is the applicable MDE Screening Level ($\mu g/m^3$).

This is based on discussions in "An Example of Demonstrating Compliance with Ambient Impact Requirement. (COMAR 26.11.15.06) – Fact Sheet" on MDE's website.

Initial Screening Compliance Demonstration

The initial screening uses estimates of facility TAP emissions and compares them to the applicable MDE-based AERs to demonstrate compliance. Seven TAPs were evaluated. Table 1 compares the premise-wide TAP emissions with the applicable MDE AERs. As shown in Table 1, this conservative approach demonstrates compliance for four of the seven TAPs of concern. Then, a refined screening is used to assess compliance for the remaining three TAPs.

TABLE 1. MDE-BASED AER TAP COMPLIANCE INITIAL SCREENING

SUBSTANCE	CAS NUMBER	MDE SCREENING LEVEL			TAP EMISSIONS		MDE AER			COMPLIANCE*		
		1-hr	8-hr	Annual	Hourly	Annual	1-hr	8-hr	Annual	1-hr	8-hr	Annual
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(lb/hr)	(lb/yr)	(lb/hr)	(lb/hr)	(lb/yr)			
n-Hexane	110-54-3		1762.3722		63.61			6.31			No	
Hexane, other isomers		35247.4438	17623.7219		50.92		126.19	63.09		Yes	Yes	
Heptane	142-82-5	20490.7975	16392.6380		2.64		73.36	58.69		Yes	Yes	
Cyclohexane	110-82-7		3442.1268		21.97			12.32			No	
Benzene	71-43-2	79.8671	15.9734	0.13	0.04	384.86	0.29	0.06	47.45	Yes	Yes	No
Toluene	108-88-3		753.6196		0.26			2.70			Yes	
Xylene	1330-20-7	6512.8834	4341.9223		0.26		23.32	15.54		Yes	Yes	

* Note: TAP compliance not demonstrated by the very conservative initial screening is demonstrated by the refined screening under section 1.2.2

1.2.2 Refined Screening

A refined approach is used to demonstrate compliance for the three TAPs (n-hexane, cyclohexane and benzene [annual]) that did not pass the initial screening. Refined air quality modeling was performed to estimate offsite ground-level impacts of expected, premise-wide TAP emissions, and the impact results are directly compared to the applicable MDE Screening Levels.

Refined Air Quality Modeling

The United States Environmental Protection Agency's (USEPA) guidance given in Appendix W to 40 C.F.R. 51 was followed in the performance of this refined air quality modeling.

- Air quality model

The refined modeling was conducted using the USEPA air quality model (AERMOD) (version 23132) using Providence/ORIS BEEST Suite (version 12.10) as the user interface. The standard regulatory default option was invoked in AERMOD. In addition, the adjusted u* regulatory option was invoked.

- Model receptors

Concentrations were projected at ground-level locations on the ZCR Facility property line and at locations off site. A total of over 6,300 model receptors were used. Receptors were placed along the property line at 25-meter (m) spacing. Also, receptors were placed in a Cartesian grid at 25-m spacing out to 200 m; at 100-m spacing out to 1 kilometer (km); at 500-m spacing out to 5 km; and 1,000-m spacing out to 30 km from the facility.

Ground elevations (as well as hill-height scaling factors used by AERMOD) of each receptor were obtained using AERMAP (version 18081), AERMOD's terrain preprocessor. Digital elevations from the National Elevation Dataset for the modeling domain were input to AERMAP.

- Rural/urban classification

The land use procedure given in Section 7.2.3 c of Appendix W to 40 CFR 51 was followed to classify the land use surrounding the stack as rural or urban. Land use data within a 3-km circle of the facility were reviewed, and the area is classified as rural because less than 50% of the land use types in the area are urban types.

- Meteorological data

The most recent five consecutive years (2019 through 2023) of AERMOD-ready representative meteorological input data were obtained from the Maryland Department of the Environment (specifically, the SFC and PFL files provided by MDE's LiAn Zhuang (email dated 5/24/24)). The surface meteorological data (Automated Surface Observing System data) were collected at Salisbury-Ocean City-Wicomico Regional Airport, Wicomico County, Maryland (WBAN 93720), and the upper air meteorological data were collected at Wallops Flight Facility, Virginia (WBAN 93739). MDE used AERSURFACE version 20060) to determine representative surface characteristics and AERMET (version 23132) to process the meteorological data. The adjusted u* regulatory option was invoked in AERMET.

- Structure downwash

Direction-specific building dimensions of adjacent buildings/structures/tanks were generated using BPIPPRM (version 04274) and input to AERMOD to address the potential structure wake effects on stack plumes.

- Stack characteristics

Tables 2 and 3 present characteristics of modeled TAP sources input to the refined AERMOD.

The following presents additional information on the characteristics of several sources and how they are modeled:

Stack DCC_MEAL – The process gasses from the meal dryer and cooler vent through this stack. The stack is a circular, horizontal vent. This stack is modeled using the POINTHOR source type in AERMOD.

Stacks DEODR_1 and DEODR_2 – Gasses from Deodorizer #1 and Deodorizer #2, at the Vegetable Oil Refinery, vent through these stacks, respectively. The DEODR_1 outlet vents close to the ground, while the DEODR_2 outlet vents near the top of Deodorizer #2 tower structure. However, both vents have a downward release. The exit velocity of each of these sources in the model is set to a negligible value to prevent source plume momentum.

Stacks FUG1 through FUG8 - The updated extractor building has no wall on the lowest 10 ft of the building, all around the perimeter of the building. Fugitive VOC emissions from inside the building are modeled with eight point sources evenly spaced along the perimeter of the building. The release height of each of these point sources in the model is set to half the height of the opening along the perimeter of the building. Also, the exit diameter and velocity and exit temperature of each of these point sources in the model are set to negligible values and ambient temperature, respectively, to prevent the fugitive point source plumes from having any buoyancy or momentum.

TABLE 2. CHARACTERISTICS OF MODELED TAP STACKS/POINT SOURCES

STACK ID	LOCATION		BASE ELEV.	STACK HEIGHT	STACK DIAMETER	STACK EXIT VELOCITY	STACK EXIT TEMP.
	UTM E (m)	UTM N (m)	(m)	(m)	(m)	(m/s)	(K)
SRB_MAIN	453742.9	4248520.1	14.3	26.52	0.15	8.06	305.37
DCC_MEAL	453760.3	4248501.4	14.4	10.93	1.02	21.68	322.00
CM_1	453794.5	4248256.2	14.1	21.00	0.80	19.66	316.00
CM_2	453788.4	4248264.4	14.1	21.00	1.00	20.79	316.00
CM_3	453812.6	4248262.8	14.1	21.00	1.00	9.09	316.00
CM_SILO1	453726.6	4248516.6	14.2	21.00	0.001	0.001	316.00
CM_SILO2	453726.6	4248509.7	14.3	21.00	0.001	0.001	316.00
CM_SILO3	453726.9	4248502.0	14.3	21.00	0.001	0.001	316.00
CM_SILO4	453727.2	4248491.4	14.4	21.00	0.001	0.001	316.00
CM_SILO5	453727.8	4248484.4	14.4	21.00	0.001	0.001	316.00
TKCO2	453307.0	4248256.8	14.0	8.80	0.001	0.001	amb
TKCO3	453336.7	4248242.1	13.9	10.70	0.001	0.001	amb
TKCO4	453346.9	4248242.5	13.9	10.70	0.001	0.001	amb
TKCO5	453357.1	4248242.8	13.8	10.70	0.001	0.001	amb
TKCO6	453366.9	4248243.1	13.7	10.70	0.001	0.001	amb
TKCO7	453377.1	4248243.0	13.5	13.40	0.001	0.001	amb
TKCO8	453387.2	4248243.5	13.3	13.40	0.001	0.001	amb

STACK ID	LOCATION		BASE ELEV.	STACK HEIGHT	STACK DIAMETER	STACK EXIT VELOCITY	STACK EXIT TEMP.
	UTM E (m)	UTM N (m)	(m)	(m)	(m)	(m/s)	(K)
TKCO9	453365.4	4248255.2	13.7	13.40	0.001	0.001	amb
TKCO10	453376.3	4248255.2	13.5	13.40	0.001	0.001	amb
TKCO11	453387.4	4248255.6	13.3	13.40	0.001	0.001	amb
TKCO22	453314.5	4248257.4	14.0	8.80	0.001	0.001	amb
DEODR_1	453312.5	4248270.8	14.1	0.90	0.001	0.001	311.00
DEODR_2	453269.6	4248287.0	14.3	44.20	0.001	0.001	311.00
FUG1	453739.8	4248505.4	14.3	1.52	0.001	0.001	amb
FUG2	453731.9	4248511.4	14.3	1.52	0.001	0.001	amb
FUG3	453734.4	4248525.5	14.2	1.52	0.001	0.001	amb
FUG4	453733.9	4248539.5	14.1	1.52	0.001	0.001	amb
FUG5	453738.4	4248545.9	14.0	1.52	0.001	0.001	amb
FUG6	453743.3	4248539.8	14.0	1.52	0.001	0.001	amb
FUG7	453746.8	4248525.9	14.2	1.52	0.001	0.001	amb
FUG8	453747.3	4248511.9	14.3	1.52	0.001	0.001	amb

TABLE 3. CHARACTERISTICS OF MODELED TAP AREA SOURCE

SOURCE ID	COORDINATE OF SW CORNER		BASE ELEV.	RELEASE HEIGHT	AREA E DIMEN.	AREA N DIMEN.	AREA ORIENT.	INITIAL $SIGMA_Z$
	UTM E (m)	UTM N (m)	(m)	(m)	(m)	(m)	(deg)	(m)
WW	453745.5	4248535.2	14.1	0.30	6.30	10.42	358.00	0.00

Figure 1 shows the locations of the modeled sources.

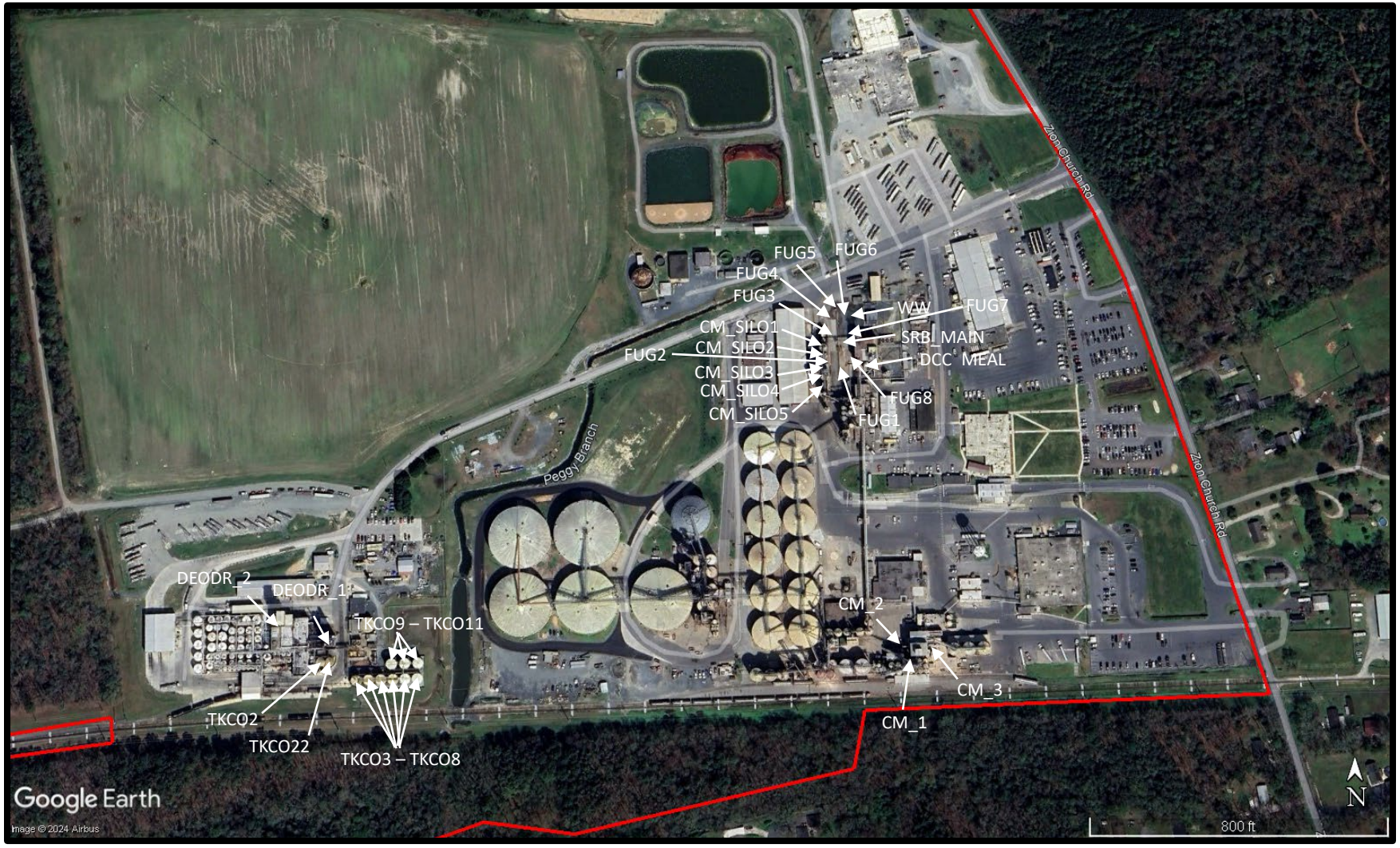


Figure 1. Locations of Modeled Sources

Refined Screening Compliance Demonstration

Table 4 presents the refined modeling results (projected maximum offsite concentrations) for the premise-wide, multi-stack analysis. This table also compares the projected maximum offsite TAP impacts with the applicable MDE Screening Levels and demonstrates compliance (i.e., maximum offsite concentrations do not exceed MDE Screening Levels).

TABLE 4. REFINED MODELING TAP COMPLIANCE - COMPARISON BETWEEN MAXIMUM MODELED TAP CONCENTRATION AND MDE SCREENING LEVEL

TAP	CAS #	MAXIMUM MODELED CONCENTRATION		MDE SCREENING LEVEL		COMPLIANCE	
		8-hr	Annual	8-hr	Annual	8-hr	Annual
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)		
n-hexane	110-54-3	1621.64		1762.3722		Yes	
cyclohexane	110-82-7	546.76		3442.1268		Yes	
benzene	71-43-2		0.03		0.13		Yes

ATTACHMENT

PLANT-WIDE TAP EMISSIONS

Summary of Plant-Wide TAP Emissions

Emission Source	ID	VOC		n-Hexane [110-54-3]		Hexane Isomers		Heptane [142-82-5]		Cyclohexane [110-82-7]		Benzene [71-43-2]		Toluene [108-88-3]		Xylene [1330-20-7]	
		(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)
Mineral Oil Scrubber Main (Final) Vent	SRB_MAIN	15.39	3.51	11.54	2.63	9.23	2.11	0.46	0.11	3.85	0.88	0.008	0.002	0.046	0.011	0.046	0.011
Dryer/Cooler Cyclone Stack	DCC_MEAL	149.88	34.22	112.41	25.66	89.93	20.53	4.50	1.03	37.47	8.55	0.075	0.017	0.45	0.103	0.45	0.103
Crude Meal Processing	CM_1	15.07	3.44	11.31	2.58	9.04	2.07	0.45	0.10	3.77	0.86	0.008	0.002	0.045	0.010	0.045	0.010
	CM_2	15.07	3.44	11.31	2.58	9.04	2.07	0.45	0.10	3.77	0.86	0.008	0.002	0.045	0.010	0.045	0.010
	CM_3	15.07	3.44	11.31	2.58	9.04	2.07	0.45	0.10	3.77	0.86	0.008	0.002	0.045	0.010	0.045	0.010
Crude Meal Silos	CM_SILO1	23.26	5.31	17.44	3.98	13.95	3.19	0.70	0.16	5.81	1.33	0.012	0.003	0.07	0.016	0.07	0.016
	CM_SILO2	23.26	5.31	17.44	3.98	13.95	3.19	0.70	0.16	5.81	1.33	0.012	0.003	0.07	0.016	0.07	0.016
	CM_SILO3	23.26	5.31	17.44	3.98	13.95	3.19	0.70	0.16	5.81	1.33	0.012	0.003	0.07	0.016	0.07	0.016
	CM_SILO4	23.26	5.31	17.44	3.98	13.95	3.19	0.70	0.16	5.81	1.33	0.012	0.003	0.07	0.016	0.07	0.016
	CM_SILO5	23.26	5.31	17.44	3.98	13.95	3.19	0.70	0.16	5.81	1.33	0.012	0.003	0.07	0.016	0.07	0.016
Crude Oil Storage	TKCO3			8.09E-04	1.85E-04	6.47E-04	1.48E-04	9.87E-06	2.25E-06	1.74E-04	3.98E-05	3.40E-07	7.76E-08	6.15E-07	1.40E-07	1.70E-07	3.88E-08
	TKCO4			8.09E-04	1.85E-04	6.47E-04	1.48E-04	9.87E-06	2.25E-06	1.74E-04	3.98E-05	3.40E-07	7.76E-08	6.15E-07	1.40E-07	1.70E-07	3.88E-08
	TKCO5			8.09E-04	1.85E-04	6.47E-04	1.48E-04	9.87E-06	2.25E-06	1.74E-04	3.98E-05	3.40E-07	7.76E-08	6.15E-07	1.40E-07	1.70E-07	3.88E-08
	TKCO6			8.09E-04	1.85E-04	6.47E-04	1.48E-04	9.87E-06	2.25E-06	1.74E-04	3.98E-05	3.40E-07	7.76E-08	6.15E-07	1.40E-07	1.70E-07	3.88E-08
	TKCO7			1.02E-03	2.33E-04	8.17E-04	1.86E-04	1.25E-05	2.84E-06	2.20E-04	5.02E-05	4.30E-07	9.82E-08	7.80E-07	1.78E-07	2.20E-07	5.02E-08
	TKCO8			1.02E-03	2.33E-04	8.17E-04	1.86E-04	1.25E-05	2.84E-06	2.20E-04	5.02E-05	4.30E-07	9.82E-08	7.80E-07	1.78E-07	2.20E-07	5.02E-08
	TKCO9			1.02E-03	2.33E-04	8.17E-04	1.86E-04	1.25E-05	2.84E-06	2.20E-04	5.02E-05	4.30E-07	9.82E-08	7.80E-07	1.78E-07	2.20E-07	5.02E-08
	TKCO10			1.02E-03	2.33E-04	8.17E-04	1.86E-04	1.25E-05	2.84E-06	2.20E-04	5.02E-05	4.30E-07	9.82E-08	7.80E-07	1.78E-07	2.20E-07	5.02E-08
	TKCO11			1.02E-03	2.33E-04	8.17E-04	1.86E-04	1.25E-05	2.84E-06	2.20E-04	5.02E-05	4.30E-07	9.82E-08	7.80E-07	1.78E-07	2.20E-07	5.02E-08
	TKCO2			4.49E-04	1.03E-04	3.59E-04	8.20E-05	5.48E-06	1.25E-06	9.67E-05	2.21E-05	1.90E-07	4.34E-08	3.40E-07	7.76E-08	9.50E-08	2.17E-08
	TKCO22			4.49E-04	1.03E-04	3.59E-04	8.20E-05	5.48E-06	1.25E-06	9.67E-05	2.21E-05	1.90E-07	4.34E-08	3.40E-07	7.76E-08	9.50E-08	2.17E-08
Deodorizer #1	DEODR_1	12.11	2.77	4.31	0.98	3.52	0.80	0.36	0.083	3.03	0.69	0.006	0.001	0.036	0.008	0.036	0.008
Deodorizer #2	DEODR_2	12.60	2.88	4.18	0.95	3.42	0.78	0.38	0.09	3.15	0.72	0.006	0.001	0.038	0.009	0.038	0.009
Fugitive Vents	FUG1	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG2	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG3	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG4	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG5	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG6	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG7	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
	FUG8	4.15	0.95	3.11	0.71	2.49	0.57	0.12	0.028	1.04	0.24	0.002	0.000	0.012	0.003	0.012	0.003
Wastewater	WW	0.20	0.046	0.15	0.035	0.12	0.028	0.006	0.001	0.051	0.012	0.000	0.000	0.001	0.000	0.001	0.000
		384.85		278.60	63.61	223.04	50.92	11.55	2.64	96.22	21.97	0.19	0.04	1.15	0.26	1.15	0.26

Notes

- VOC emissions (tpy), except D1 and D2, are equal to Redistributed ZCR VOC emissions
- D1 VOC emissions (tpy) is equal to Redistributed ZCR VOC emissions + (350.4 MMlb non-local oil processed/yr X 34.7 ppm hexane (average non-local) / 2000 lb/ton / 0.65 hexane/VOC)
- D2 VOC emissions (tpy) is equal to 438 MMlb non-local oil processed/yr X 34.7 ppm hexane (average non-local) / 2000 lb/ton / 0.65 hexane/VOC
- 0.65 hexane/VOC is average hexane content of solvent (VOC); see Summary of Hexane Solvent Component Weight Percent
- TAP emissions (tpy), except storage tanks, are equal to VOC emissions (tpy) * maximum TAP content (weight %) of extraction solvents used (from Summary of Hexane Solvent Component Weight Percent)
- For sources DEODR_1 and DEODR_2, more representative n-hexane and hexane isomers emissions are calculated using the average "hexane" content of crude oil not produced onsite [34.7 ppm] (see Summary of Hexane Content of Crude Oils), and the applicable average hexane isomer fraction of total hexanes [0.55 for n-hexane and 0.45 for hexane isomers] indicated in commonly used extraction solvents

HEXANE CONTENT OF CRUDE OILS AND HEXANE SOLVENT TAP DATA

Summary of Hexane Content of Crude Oils

Location	Hexane Content (ppm)
ZCR	10
Non-ZCR	34.70

Summary of Hexane Solvent Component Weight Percent

Statistic	Component/CAS # (Weight %)						
	n-Hexane	Hexanes, Other Isomers	Heptane, All Isomers	Cyclohexane	Benzene	Toluene	Xylenes
	110-54-3	Mixture	Mixture	110-82-7	71-43-2	108-88-3	1330-20-7
Highest (Maximum weight %)	75	60	3	25	0.05	0.3	0.3
Average (Maximum weight %)	65	60	3	10.75	0.03	0.11	0.3
Based on representative hexane solvent products							

MODEL PLANT DATA (AND EMISSIONS REDISTRIBUTION)

Solvent VOC Emissions Distribution (Model MACT Plant)

Based on 12/20/2000 Memo entitled "Final Process and Emission Characteristics of Vegetable Oil Production Model Plants";
A-97-59 IV-B-6

Emissions Calculation Inputs

Operation	330	dy/yr
Soybeans proceesed	2200	ton bean/day
Meal produced	79.2	ton meal/100 ton bean
Oil produced	17.8	ton oil/100 ton bean

Main Vent

Flow rate	100	acfm
Hexane LEL	1.2	%, v
Solvent Conc.	20	% of LEL
Density solvent vapor	0.2148	lb/ft3

Dryer Vent

Residual solvent in meal entering dryer	500	ppmw		
Solvent lost through vent	150	ppmw	30 %	of residual in input meal to dryer

Cooler Vent

Solvent lost through vent	75	ppmw	15 %	of residual in input meal to dryer
Residual solvent in meal leaving Cooler	275	ppmw	55 %	of residual in input meal to dryer

Crude Oil

Residual solvent in Crude Oil	400	ppmw

Wastewater

Flow rate	10	gal/min
Solvent conc.	10	ppmw
Density	8.33	lb/gal
Fe	1	

Solvent Storage Tank

Assume one uncontrolled tank

Solvent VOC Emissions

Model Plant

Source	Emissions (tpy)	Fraction of Totals
Main Vent	12.25	0.03
Dryer Vent	86.25	0.21
Cooler Vent	43.12	0.11
Crude Meal	158.12	0.39
Crude Oil	51.69	0.13
Equipment Leaks	32.47	0.08
Storage Tanks	3.9	0.01
Wastewater	0.20	0.00
Startup/Shutdown	19	0.05
Total	**407.00**	**1**

Solvent VOC Emissions Distribution
(Redistribution of Model MACT Plant)

Redistributions Emissions Calculation Inputs

Controlled Hexane Storage Tanks to Main Vent

Asume 3 solvent storage tanks

Assumed control efficiency		
CE	90	%
Controlled emissions	1.17	tpy

Distribute Startup/Shutdown (SS) emissions to Main, Dryer and Cooler Vents

Total Emissions from Main, Dryer and Cooler Vents	141.62	tpy

SS Distribution

Main	1.64	tpy
Dryer	11.57	tpy
Cooler	5.79	tpy

Crude Oil

Assume 10 ppm hexane in crude oil at ZCR; assume hexane is 65%w of extraction solvent

Residual Solvent in Crude Oil	15.38	ppmw

Solvent VOC Emissions

Redistribution

ZCR Solvent Loss Project (2500 tpd beans @ 0.14 gal/ton SLR)	127750	gal/yr	Annualized
Solvent density	5.67	lb/gal	
	362.17	tpy	

Source	Emissions (tpy)	Fraction	ZCR VOC (tpy)
Main Vent	15.06	0.04	15.39
Dryer Vent	97.82	0.28	99.92
Cooler Vent	48.91	0.14	49.96
Crude Meal	158.12	0.45	161.51
Crude Oil	1.99	0.01	2.03
Equipment Leaks	32.47	0.09	33.16
Storage Tanks	0	0	0
Wastewater	0.20	0.00	0.20
Startup/Shutdown			
Total	**354.57**	**1**	**362.17**

Model MACT Plant Equipment Leaks

Component	Count	SOCMI EF (kg/hr/comp)	Operation (hr)	Solvent Emissions (tpy)
Gas Valves	20	0.00597	7920	1.04
Light Liquid Valves	260	0.00403	7920	9.15
Pumps	15	0.0199	7920	2.61
Compressors	0	0	7920	0.00
Relief Valves	4	0.104	7920	3.63
Connectors	990	0.00183	7920	15.82
Open Lines	15	0.0017	7920	0.22
Total	1304			32.47

OIL STORAGE TANK CALCULATIONS

Storage Tank Throughputs

Soybean oil density	7.66	lb/gal
Total oil throughput	1138.8	MM lb/yr
	148.6684073	MM gal/yr
	19.8740739	MM ft^3 /yr

Tank Type	Height (ft)	Diam (ft)	Tank Geo. Volume (ft^3)	No. of tanks	Total Tanks Geo. Volume (ft^3)	Volume Fraction
Tank A	35	28	21551.3	4	86205.30	0.35
Tank B	44	28	27093.1	5	135465.48	0.55
Tank D	29	23	12048.8	2	24097.59	0.10
				Total	245768.36	1

Tank Type	Oil Thruput		No. of tanks	Oil Thruput per Tank	
	(MM ft^3/yr)	(MM gal/yr)		(MM gal/yr)	(bbl/yr)
Tank A	6.971	52.147	4	13.037	310396.92
Tank B	10.954	81.945	5	16.389	390213.28
Tank D	1.949	14.577	2	7.288	173534.96
Total	19.874	148.668			

Emissions per Tank Type

		From:	to:				
		Hourly	Annual				
		Projected Emissions					
Emission Point	**Air Contaminant**	**lb/hr**	**TPY**	**Mixture**	**Component**	**Vapor Mass Percent (%)**	**lb/yr**
Tank A	VOC		0.0386	Soybean Oil Mix	Soybean oil	95.75%	73.87696
				Soybean Oil Mix	Benzene	0.00%	0.00068
				Soybean Oil Mix	Cyclohexane	0.45%	0.34858
				Soybean Oil Mix	Hexane (n)	2.10%	1.61791
				Soybean Oil Mix	Hexane Isomers	1.68%	1.29433
				Soybean Oil Mix	Heptane	0.03%	0.01974
				Soybean Oil Mix	Toluene	0.00%	0.00123
				Soybean Oil Mix	Xylene (mix)	0.00%	0.00034
Tank B	VOC		0.0487	Soybean Oil Mix	Soybean oil	95.75%	93.22208
				Soybean Oil Mix	Benzene	0.00%	0.00086
				Soybean Oil Mix	Cyclohexane	0.45%	0.43985
				Soybean Oil Mix	Hexane (n)	2.10%	2.04157
				Soybean Oil Mix	Hexane Isomers	1.68%	1.63326
				Soybean Oil Mix	Heptane	0.03%	0.02490
				Soybean Oil Mix	Toluene	0.00%	0.00156
				Soybean Oil Mix	Xylene (mix)	0.00%	0.00044
Tank D	VOC		0.0214	Soybean Oil Mix	Soybean oil	95.75%	41.00394
				Soybean Oil Mix	Benzene	0.00%	0.00038
				Soybean Oil Mix	Cyclohexane	0.45%	0.19347
				Soybean Oil Mix	Hexane (n)	2.10%	0.89799
				Soybean Oil Mix	Hexane Isomers	1.68%	0.71839
				Soybean Oil Mix	Heptane	0.03%	0.01095
				Soybean Oil Mix	Toluene	0.00%	0.00068
				Soybean Oil Mix	Xylene (mix)	0.00%	0.00019

Equations for Calculating Emissions from Fixed Roof Tanks

[1] Reference 1: AP-42, Fifth Edition, Volume 1, Chapter 7.1 Organic Liquid Storage Tanks - March 2020

Total Loss from a Fixed Roof Tank (Equation 1-1):

$$L_T = L_S + L_W$$

where: L_T = total routine loss

L_S = standing loss

L_W = working loss

Standing Loss from a Fixed Roof Tank (Equation 1-2):

$$L_S = n_d V_V W_V K_E K_S$$

where: L_S = standing loss

n_d = number of days

V_V = vapor space volume = $(\pi/4) * D^2 * H_{VO}$

D = tank diameter

H_{VO} = vapor space outage

W_V = vapor density = $(M_V * P_{VA}) / (R * T_V)$

M_V = vapor molecular weight

P_{VA} = vapor pressure at average daily liquid surface temperature = exp [A - (B / T_{LA})] for petroleum liquids or log P_{VA} = A - (B / (T_{LA} + C))

R = ideal gas constant = 10.731 (psia ft^3) / (lb-mole °R)"

T_V = average vapor temperature = $((2.2 * (H_S / D) + 1.1) * T_{AA} + (0.8 * T_B) + (0.021 * \alpha_R * I) + (0.013 * (H_S/D) * \alpha_S * I)) / ((2.2 * (H_S / D)) + 1.9)$

H_S = tank shell height (H_S / D assumed = 0.5 for horizontal tanks)

T_{AA} = average daily ambient temperature = (T_{AX} + T_{AN}) / 2

T_B = liquid bulk temperature = T_{AA} + 0.003 * α_S * I

α_R = tank roof surface solar absorptance

I = average daily total solar insolation factor

α_S = tank shell surface solar absorptance

K_E = vapor space expansion factor = $\Delta T_V / T_{LA}$ + (ΔP_V - ΔP_B) / (P_A - P_{VA}) > 0

ΔT_V = average daily vapor temperature range = $(1 - (0.8 / (2.2 * (H_s / D) + 1.9))) * \Delta T_A + ((0.042 * \alpha_R * I + 0.026 * (H_s / D) * \alpha_S * I) / (2.2 * (H_S / D) + 1$

ΔT_A = average daily ambient temperature range = T_{AX} - T_{AN}

T_{AX} = average daily maximum ambient temperature

T_{AN} = average daily minimum ambient temperature

T_{LA} = average daily average liquid surface temperature = $(0.5 - (0.8 / (4.4 * (H_S / D) + 3.8))) * T_{AA} + (0.5 + (0.8 / (4.4 * (H_S / D) + 3.8))) * T_B$ + $(0.021 * \alpha_R * I + 0.013 * (H_S / D) * \alpha_S * I) / (4.4 * (H_S / D) + 3.8)$

ΔP_V = average daily vapor pressure range = P_{VX} - P_{VN}

P_{VX} = vapor pressure at T_{LX}

T_{LX} = daily maximum liquid surface temperature = T_{LA} + 0.25 * ΔT_V

P_{VN} = vapor pressure at T_{LN}

T_{LN} = daily minimum liquid surface temperature = T_{LA} - 0.25 * ΔT_V

ΔP_B = breather vent pressure setting range = P_{BP} - P_{BV}

P_{BP} = breather vent pressure setting

P_{BV} = breather vent vacuum setting

P_A = atmospheric pressure

K_S = vented vapor saturation factor = $1 / (1+ (0.053 * P_{VA} * H_{VO}))$

Equations for Calculating Emissions from Fixed Roof Tanks

Working Loss from a Fixed Roof Tank (Equation 1-29):

$$L_W = V_Q K_N K_P W_V K_B$$

where: L_W = working loss

V_Q = net working loss throughput = 5.614 * Q

Q = net throughput

K_N = working loss turnover factor

For annual turnovers (N) > 36, = (180 + N) / 6 N

For annual turnovers (N) ≤ 36, = 1

$N = (5.614 * Q / (\pi / 4 * D^2)) / (H_{LX} - H_{LN})$

H_{LX} = maximum liquid height = (H_S -1) for VFR or (π / 4 * D) for HFR

H_{LN} = minimum liquid height = (1) for VFR or (0) for HFR

K_P = working loss product factor

For crude oils, = 0.75

For all other organic liquids, = 1

K_B = vent setting correction factor = $(((P_1 + P_A) / K_N) - P_{VA}) / (P_{BP} + P_A - P_{VA})$

If $K_N * (P_{BP} + P_A) / (P_1 + P_A) > 1$, otherwise = 1

P_1 = pressure of the vapor space at normal operating conditions = 0 for atmospheric tank

[2] Reference 2: TCEQ Air Permit Reviewer Reference Guide APDG 6250 - Estimating Short Term Emission Rates from Tanks - February 2018

Data Used for Tank Calculations

		Data to Be Entered for Calculation:					Data Looked Up on Product Data Sheet:						Data Looked Up on Met Data Sheet:				
Date	Tank ID	Product	Net Throughput Q (bbl)	Number of Days n_d (days)	Vapor Balance and/or Flash?	Capture Efficiency (%)	Vapor Molecular Weight M_V (lb/lb-mol)	Calculation Type	Antoine's A (unitless)	Antoine's B (°R or °C)	Antoine's C (°C)	Working Loss Product Factor K_P (unitless)	Month for Met Data	Daily Ambient Minimum Temperature T_{AN} (°F)	Daily Ambient Maximum Temperature T_{AX} (°F)	Solar Insolation Factor I (BTU/ ft^2 day)	Atmospheric Pressure Pa (psia)
												[1] Eq.1-35		[1] Table 7.1-7	[1] Table 7.1-7	[1] Table 7.1-7	
Annual	Tank A	Soybean Oil Mix	310,397	365	No	0.00%	221.53	Antoine's	7.58	2190.51	239.76	1.00	Annual	46.4	65.0	1,274	14.62
Annual	Tank B	Soybean Oil Mix	390,213	365	No	0.00%	221.53	Antoine's	7.58	2190.51	239.76	1.00	Annual	46.4	65.0	1,274	14.62
Annual	Tank D	Soybean Oil Mix	173,535	365	No	0.00%	221.53	Antoine's	7.58	2190.51	239.76	1.00	Annual	46.4	65.0	1,274	14.62

Data Used for Tank Calculations

		Data Looked Up on Tank Data Sheet:										
Date	**Tank ID**	**Roof Type**	**Maximum Filling Rate F_{RM} (gal/hr)**	**Tank Roof Solar Absorptance α_R (unitless)**	**Tank Shell Solar Absorptance α_S (unitless)**	**VFR Diameter D (ft)**	**VFR Shell Height H_S (ft)**	**HFR Diameter D (ft)**	**Breather Vent Pressure P_{BP} (psig)**	**Breather Vent Vacuum P_{BV} (psig)**	**Vapor Space Outage H_{VO} (ft)**	**HFR Effective Diameter D_E (ft)**
				[1] Table 7.1-6	[1] Table 7.1-6						[1] Eq. 1-16	
Annual	Tank A	VFR	0	0.42	0.42	28.0	35.0		0.03	-0.03	17.79	
Annual	Tank B	VFR	0	0.42	0.42	28.0	44.0		0.03	-0.03	22.29	
Annual	Tank D	VFR	0	0.42	0.42	23.0	29.0		0.03	-0.03	14.74	

VOC Emissions from Storage Tanks

		Tank Emissions Calculation												
Date	**Tank ID**	**Vapor Space Volume V_V (ft^3)**	**Daily Avg. Ambient Temperature T_{AA} (°R)**	**Liquid Bulk Temperature T_B (°R)**	**Daily Avg. Liquid Surface Temperature T_{LA} (°R)**	**True Vapor Pressure @ T_{LA} P_{VA} (psia)**	**Average Vapor Temperature T_V (°R)**	**Vapor Density W_V (lb/ft^3)**	**Daily Ambient Temperature Range ΔT_A (°R)**	**Daily Vapor Temperature Range ΔT_V (°R)**	**Daily Max. Liquid Surface Temperature T_{LX} (°R)**	**Daily Min. Liquid Surface Temperature T_{LN} (°R)**	**True Vapor Pressure @ T_{LX} P_{VX} (psia)**	**True Vapor Pressure @ T_{LN} P_{VN} (psia)**
		[1] Eq.1-3	[1] Eq. 1-30	[1] Eq. 1-31	[1] Eq. 1-27	[1] Eq. 1-25, 26	[1] Eq. 1-32	[1] Eq. 1-22	[1] Eq. 1-11	[1] Eq. 1-6	[1] Fg. 1-17	[1] Fg. 1-17	[1] Eq. 1-25, 26	[1] Eq. 1-25, 26
Annual	Tank A	10,955	515.4	517.0	518.5	0.00	519.9	0.0001	18.6	24.0	524.4	512.5	0.00	0.00
Annual	Tank B	13,726	515.4	517.0	518.4	0.00	519.7	0.0001	18.6	24.1	524.4	512.3	0.00	0.00
Annual	Tank D	6,124	515.4	517.0	518.5	0.00	519.9	0.0001	18.6	24.0	524.4	512.5	0.00	0.00

VOC Emissions from Storage Tanks

		Tank Emissions Calculation												
Date	**Tank ID**	**Daily Vapor Pressure Range ΔP_V (psia)**	**Breather Vent Pressure Setting Range ΔP_B (psia)**	**Vapor Space Expansion Factor K_E (unitless)**	**Vented Vapor Saturation Factor K_S (unitless)**	**Standing Storage Loss L_S (ton)**	**Net Working Loss Throughput V_Q (ft^3)**	**Maximum Liquid Height H_{LX} (ft)**	**Minimum Liquid Height H_{LN} (ft)**	**Turnovers N (unitless)**	**Working Loss Turnover Factor K_N (unitless)**	**Vent Setting Correction Factor K_B (unitless)**	**Working Loss L_W (ton)**	**Total Loss L_T (ton)**
		[1] Eq. 1-9	[1] Eq. 1-10	[1] Eq. 1-5	[1] Eq. 1-21	[1] Eq. 1-2	[1] Eq. 1-39	[1] Eq. 1-37	[1] Eq. 1-37	[1] Eq. 1-35	[1] Eq. 1-35	[1] Eq. 1-40, 41	[1] Eq. 1-35	[1] Eq. 1-1
Annual	Tank A	0.00	0.06	0.0422	0.9983	0.01	1,742,568	34.0	1.0	85.8	0.5165	1.0000	0.03	0.04
Annual	Tank B	0.00	0.06	0.0424	0.9979	0.01	2,190,657	43.0	1.0	84.7	0.5208	1.0000	0.04	0.05
Annual	Tank D	0.00	0.06	0.0422	0.9986	0.00	974,225	28.0	1.0	86.8	0.5121	1.0000	0.02	0.02

Product Data

[1] Reference 1: AP-42, Fifth Edition, Volume 1, Chapter 7.1 Organic Liquid Storage Tanks - March 2020
[2] Reference 2: Manual of Petroleum Measurement Standards, Chapter 19.4 - November 2013

Conversion of RVP to Antoine Coefficients (Figure 7.1-16):

$A = 12.82 - 0.9672 * \ln(RVP)$

$B = 7261 - 1216 * \ln(RVP)$

where: RVP = stock Reid vapor pressure (psi)
ln = natural logarithm function

Conversion of RVP+S to Antoine Coefficients (Figure 7.1-15):

$A = 15.64 - 1.854 * S^{0.5} - (0.8742 - 0.3280 * S^{0.5}) * \ln(RVP)$

$B = 8742 - 1042 * S^{0.5} - (1049 - 179.4 * S^{0.5}) * \ln(RVP)$

where: RVP = stock Reid vapor pressure (psi)
ln = natural logarithm function
S = stock ASTM-D86 distillation slope at 10 volume percent evaporation (°F/vol%)

Calculation of Working Loss Product Factor K_P (Equation 1-35):

$K_P = 0.75$ for crude oils
$K_P = 1$ for all other organic liquids
(used with fixed roof tanks)

Calculation of Product Factor K_C (Equation 2-3):

$K_C = 0.4$ for crude oils
$K_C = 1$ for all other organic liquids
(used with floating roof tanks)

Data to Be Entered for All Products																Calculated Product Properties				
Product Code	CAS No.	Classification	Vapor Molecular Weight M_V (lb/lb-mol)	Liquid Density W_L (lb/gal)	Calculation Type	RVP (psia)	S-Value (unitless)	Antoine's A_1 (unitless)	Antoine's B_1 (°R or °C)	Antoine's C_1 (°C)	Antoine's Temperature Range T_{min} (°R)	Antoine's Temperature Range T_{max} (°R)	Liquid Molecular Weight M_L (lb/lb-mol)	Reference	Other Names	Antoine's A (unitless)	Antoine's B (°R or °C)	Antoine's C (°C)	Product Factor K_C (unitless)	Working Loss Product Factor K_P (unitless)
													(if different from vapor)			[1] Figure 7.1-15, 16			[1] Eq. 2-3	[1] Eq. 1-35
Empty	N/A	VOC Non-Emitted	0.00	0.00	Non-volatile									None		0.0	0.0	0.0	1.00	1.00
Benzene	71-43-2	VOC HAP	78.11	7.32	Antoine's			6.9	1,211.0	220.8	505.7	676.7		[1] Table 7.1-3		6.9	1,211.0	220.8	1.00	1.00
Cyclohexane	110-82-7	VOC	84.16	6.47	Antoine's			6.8	1,203.5	222.9	527.7	638.7		[1] Table 7.1-3		6.8	1,203.5	222.9	1.00	1.00
Hexane (n)	110-54-3	VOC HAP	86.18	5.48	Antoine's			6.9	1,171.5	224.4	514.7	616.7		[1] Table 7.1-3		6.9	1,171.5	224.4	1.00	1.00
Hexane Isomers		VOC	86.18	5.48	Antoine's			6.9	1,171.5	224.4	514.7	616.7		[1] Table 7.1-3		6.9	1,171.5	224.4	1.00	1.00
Heptane	142-82-5	VOC	100.20	5.71	Antoine's			6.9	1,268.6	217.0	538.7	670.7		[1] Table 7.1-3		6.9	1,268.6	217.0	1.00	1.00
Soybean oil	8001-22-7	VOC	238.20	7.69	Antoine's			6.7	1,659.3	199.1				Yaws - based on 1,4-difluoroundecane		6.7	1,659.3	199.1	1.00	1.00
Toluene	108-88-3	VOC HAP	92.14	7.24	Antoine's			7.0	1,377.6	222.6	491.7	581.7		[1] Table 7.1-3		7.0	1,377.6	222.6	1.00	1.00
Xylene (m)	108-38-3	VOC HAP	106.17	7.21	Antoine's			7.0	1,462.3	215.1	541.7	790.7		[1] Table 7.1-3	1,3-Dimethyl Benzene	7.0	1,462.3	215.1	1.00	1.00
Xylene (mix)	1330-20-7	VOC HAP	106.17	7.25	Antoine's			7.0	1,470.5	215.5	549.7	790.7		[1] Based on Table 7.1-3		7.0	1,470.5	215.5	1.00	1.00
Xylene (o)	95-47-6	VOC HAP	106.17	7.36	Antoine's			7.0	1,474.7	213.7	549.7	801.7		[1] Table 7.1-3	1,2-Dimethyl Benzene	7.0	1,474.7	213.7	1.00	1.00
Xylene (p)	106-42-3	VOC HAP	106.17	7.19	Antoine's			7.0	1,474.4	217.8	515.7	814.7		[1] Table 7.1-3	1,4-Dimethyl Benzene	7.0	1,474.4	217.8	1.00	1.00

Mixture Code	CAS No.	Classification	Vapor Molecular Weight M_V (lb/lb-mol)	Liquid Density W_L (lb/gal)	Calculation Type	RVP (psia)	S-Value (unitless)	Antoine's A_1 (unitless)	Antoine's B_1 (°R or °C)	Antoine's C_1 (°C)	Antoine's Temperature Range T_{min} (°R)	Antoine's Temperature Range T_{max} (°R)	Liquid Molecular Weight M_L (lb/lb-mol)	Reference	Other Names	Antoine's A (unitless)	Antoine's B (°R or °C)	Antoine's C (°C)	Product Factor K_C (unitless)	Working Loss Product Factor K_P (unitless)
			Calculated on Mixture Data tab					Calculated on Mixture Data tab												
Soybean Oil Mix	Mix	Mix	221.53	7.69	Antoine's			7.6	2,190.5	239.8			238.17	Calculated		7.6	2,190.5	239.8	1.00	1.00

Mixture Data

[1] Raoult's law - The partial vapor pressure of each component of an ideal mixture of liquids is equal to the vapor pressure of the pure component multiplied by its mole fraction in the mixture.

											Calculate Properties in Increments of:		10	°F
											Temperature for Speciation:		80	°F
Data to Be Entered for Calculation: (Enter either weight percent or volume percent)				Data Looked Up on Product Data Sheet:							Mixture Properties at Various Temperatures Calculations -->			
Mixture	Component	Liquid Content (Weight %)	Liquid Content (Volume %)	Classification	Calculation Type	Liquid Molecular Weight M_L (lb/lb-mol)	Liquid Density W_L (lb/gal)	Antoine's A (unitless)	Antoine's B (°R or °C)	Antoine's C (°C)	Liquid Moles (mol)	Liquid Mole Percent	Liquid Molecular Weight Contribution (lb/lb-mol)	Liquid Density Contribution (lb/gal)
Soybean Oil Mix	Soybean oil	99.99%		VOC	Antoine's	238.20	7.69	6.65	1,659	199.07	4.20E-03	99.98%	238.16	7.68
Soybean Oil Mix	Benzene	0.000002%		VOC HAP	Antoine's	78.11	7.32	6.91	1,211	220.79	2.31E-10	0.00%	0.00	0.00
Soybean Oil Mix	Cyclohexane	0.000903%		VOC	Antoine's	84.16	6.47	6.85	1,204	222.86	1.07E-07	0.00%	0.00	0.00
Soybean Oil Mix	Hexane (n)	0.002710%		VOC HAP	Antoine's	86.18	5.48	6.88	1,172	224.37	3.14E-07	0.01%	0.01	0.00
Soybean Oil Mix	Hexane Isomers	0.002168%		VOC	Antoine's	86.18	5.48	6.88	1,172	224.37	2.52E-07	0.01%	0.01	0.00
Soybean Oil Mix	Heptane	0.000108%		VOC	Antoine's	100.20	5.71	6.90	1,269	216.95	1.08E-08	0.00%	0.00	0.00
Soybean Oil Mix	Toluene	0.000011%		VOC HAP	Antoine's	92.14	7.24	7.02	1,378	222.64	1.18E-09	0.00%	0.00	0.00
Soybean Oil Mix	Xylene (mix)	0.000011%		VOC HAP	Antoine's	106.17	7.25	7.01	1,470	215.52	1.02E-09	0.00%	0.00	0.00

Mixture Data

														Properties Used for Speciation										
		40	°F		50	°F		60	°F		70	°F		80	°F					90	°F		100	°F	
Data to Be Entered for Calculation: (Enter either weight percent or volum		500	°R		510	°R		520	°R		530	°R		540	°R					550	°R		560	°R	
Mixture	Component	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Mole Percent (%)	Vapor Molecular Weight (lb/mol)	Vapor Mass Percent (%)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)
Soybean Oil Mix	Soybean oil	6.13E-04	0.001	0.001	1.01E-03	0.001	0.001	1.62E-03	0.002	0.002	2.54E-03	0.003	0.003	3.89E-03	0.004	0.004	89.05%	212.103	95.75%	5.84E-03	0.006	0.006	8.61E-03	0.009	0.009
Soybean Oil Mix	Benzene	6.54E-01	0.000	0.001	8.81E-01	0.000	0.001	1.17E+00	0.000	0.002	1.53E+00	0.000	0.003	1.99E+00	0.000	0.004	0.00%	0.002	0.00%	2.55E+00	0.000	0.006	3.23E+00	0.000	0.009
Soybean Oil Mix	Cyclohexane	6.86E-01	0.000	0.001	9.18E-01	0.000	0.001	1.21E+00	0.000	0.002	1.58E+00	0.000	0.003	2.03E+00	0.000	0.004	1.19%	1.001	0.45%	2.59E+00	0.000	0.006	3.26E+00	0.000	0.009
Soybean Oil Mix	Hexane (n)	1.11E+00	0.000	0.001	1.46E+00	0.000	0.001	1.91E+00	0.000	0.002	2.47E+00	0.000	0.003	3.15E+00	0.000	0.004	5.39%	4.645	2.10%	3.97E+00	0.000	0.006	4.96E+00	0.000	0.009
Soybean Oil Mix	Hexane Isomers	1.11E+00	0.000	0.001	1.46E+00	0.000	0.001	1.91E+00	0.000	0.002	2.47E+00	0.000	0.003	3.15E+00	0.000	0.004	4.31%	3.716	1.68%	3.97E+00	0.000	0.006	4.96E+00	0.000	0.009
Soybean Oil Mix	Heptane	2.88E-01	0.000	0.001	3.98E-01	0.000	0.001	5.41E-01	0.000	0.002	7.25E-01	0.000	0.003	9.59E-01	0.000	0.004	0.06%	0.057	0.03%	1.25E+00	0.000	0.006	1.62E+00	0.000	0.009
Soybean Oil Mix	Toluene	1.72E-01	0.000	0.001	2.41E-01	0.000	0.001	3.31E-01	0.000	0.002	4.48E-01	0.000	0.003	5.99E-01	0.000	0.004	0.00%	0.004	0.00%	7.91E-01	0.000	0.006	1.03E+00	0.000	0.009
Soybean Oil Mix	Xylene (mix)	4.08E-02	0.000	0.001	5.96E-02	0.000	0.001	8.56E-02	0.000	0.002	1.21E-01	0.000	0.003	1.68E-01	0.000	0.004	0.00%	0.001	0.00%	2.29E-01	0.000	0.006	3.10E-01	0.000	0.009

		110 °F			120 °F			130 °F			140 °F			150 °F			160 °F			170 °F			180 °F			190 °F		
Data to Be Entered for Calculation: (Enter either weight percent or volum		570 °R			580 °R			590 °R			600 °R			610 °R			620 °R			630 °R			640 °R			650 °R		
Mixture	**Component**	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)	Vapor Pressure (psia)	Partial Pressure (psia)	Mixture Vapor Pressure (psia)
Soybean Oil Mix	Soybean oil	1.25E-02	0.012	0.013	1.77E-02	0.018	0.019	2.49E-02	0.025	0.026	3.44E-02	0.034	0.036	4.68E-02	0.047	0.049	6.30E-02	0.063	0.065	8.38E-02	0.084	0.087	1.10E-01	0.110	0.114	1.43E-01	0.143	0.147
Soybean Oil Mix	Benzene	4.05E+00	0.000	0.013	5.03E+00	0.000	0.019	6.20E+00	0.000	0.026	7.58E+00	0.000	0.036	9.19E+00	0.000	0.049	1.11E+01	0.000	0.065	1.32E+01	0.000	0.087	1.57E+01	0.000	0.114	1.85E+01	0.000	0.147
Soybean Oil Mix	Cyclohexane	4.08E+00	0.000	0.013	5.04E+00	0.000	0.019	6.18E+00	0.000	0.026	7.53E+00	0.000	0.036	9.09E+00	0.000	0.049	1.09E+01	0.000	0.065	1.30E+01	0.000	0.087	1.54E+01	0.000	0.114	1.81E+01	0.000	0.147
Soybean Oil Mix	Hexane (n)	6.14E+00	0.000	0.013	7.54E+00	0.001	0.019	9.18E+00	0.001	0.026	1.11E+01	0.001	0.036	1.33E+01	0.001	0.049	1.58E+01	0.001	0.065	1.87E+01	0.001	0.087	2.20E+01	0.002	0.114	2.58E+01	0.002	0.147
Soybean Oil Mix	Hexane Isomers	6.14E+00	0.000	0.013	7.54E+00	0.000	0.019	9.18E+00	0.001	0.026	1.11E+01	0.001	0.036	1.33E+01	0.001	0.049	1.58E+01	0.001	0.065	1.87E+01	0.001	0.087	2.20E+01	0.001	0.114	2.58E+01	0.002	0.147
Soybean Oil Mix	Heptane	2.07E+00	0.000	0.013	2.61E+00	0.000	0.019	3.27E+00	0.000	0.026	4.06E+00	0.000	0.036	5.00E+00	0.000	0.049	6.10E+00	0.000	0.065	7.39E+00	0.000	0.087	8.89E+00	0.000	0.114	1.06E+01	0.000	0.147
Soybean Oil Mix	Toluene	1.33E+00	0.000	0.013	1.70E+00	0.000	0.019	2.15E+00	0.000	0.026	2.69E+00	0.000	0.036	3.34E+00	0.000	0.049	4.11E+00	0.000	0.065	5.02E+00	0.000	0.087	6.09E+00	0.000	0.114	7.34E+00	0.000	0.147
Soybean Oil Mix	Xylene (mix)	4.12E-01	0.000	0.013	5.43E-01	0.000	0.019	7.07E-01	0.000	0.026	9.10E-01	0.000	0.036	1.16E+00	0.000	0.049	1.47E+00	0.000	0.065	1.83E+00	0.000	0.087	2.28E+00	0.000	0.114	2.80E+00	0.000	0.147

Mixture Data

Data to Be Entered for Calculation: (Enter either weight percent or volum		Batch Characteristics at Temperature:							
		40	50	60	70	80	90	100	°F
		500	510	520	530	540	550	560	°R
Mixture	Component	y = Log (VP)	y = Log (VP)	y = Log (VP)	y = Log (VP)	y = Log (VP)	y = Log (VP)	y = Log (VP)	
Soybean Oil Mix	Soybean oil	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Benzene	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Cyclohexane	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Hexane (n)	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Hexane Isomers	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Heptane	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Toluene	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	
Soybean Oil Mix	Xylene (mix)	-1.39	-1.20	-1.01	-0.82	-0.65	-0.48	-0.31	

		Batch Characteristics at Temperature:							
		40	50	60	70	80	90	100	°F
		500	510	520	530	540	550	560	°R
New Block Designator		x1 = 1 / T	x1 = 1 / T	x1 = 1 / T	x1 = 1 / T	x1 = 1 / T	x1 = 1 / T	x1 = 1 / T	
Yes	x1 = 1 / T	0.225	0.100	0.064	0.047	0.038	0.031	0.026	
No	x2 = Log (VP) / T	-0.314	-0.120	-0.065	-0.039	-0.024	-0.015	-0.008	
No	x2 = Log (VP) / T								
No	x2 = Log (VP) / T								
No	x2 = Log (VP) / T								
No	x2 = Log (VP) / T								
No	x2 = Log (VP) / T								
No	x2 = Log (VP) / T								

Uses Excel LINEST function to calculate curve fit parameters

m2	m1	b	Antoine's A_1 (unitless)	Antoine's B_1 (°R or °C)	Antoine's C_1 (°C)
-239.76	-374.17	7.58	7.58	2190.51	239.76

Meteorological Data

[1] Reference 1: AP-42, Fifth Edition, Volume 1, Chapter 7.1 Organic Liquid Storage Tanks - March 2020

Select Location:	Baltimore , MD

Location	Month	Days / Month	Month Code	Daily Ambient Minimum Temperature T_{AN} (°F)	Daily Ambient Maximum Temperature T_{AX} (°F)	Solar Insolation Factor I (BTU/ ft^2 day)	Average Wind Speed v (mph)	Atmospheric Pressure Pa (psia)
Baltimore , MD	JAN	31	1	26.6	42.2	653.0	7.8	14.6
Baltimore , MD	FEB	29	2	27.4	44.7	929.0	8.3	14.6
Baltimore , MD	MAR	31	3	34.8	53.5	1,231.0	8.7	14.6
Baltimore , MD	APR	30	4	44.3	65.1	1,555.0	8.3	14.6
Baltimore , MD	MAY	31	5	53.2	73.9	1,774.0	7.2	14.6
Baltimore , MD	JUN	30	6	63.1	82.8	1,918.0	6.5	14.6
Baltimore , MD	JUL	31	7	68.0	86.9	1,866.0	6.0	14.6
Baltimore , MD	AUG	31	8	66.6	85.3	1,681.0	5.6	14.6
Baltimore , MD	SEP	30	9	59.1	78.0	1,350.0	6.3	14.6
Baltimore , MD	OCT	31	10	46.6	66.7	1,036.0	6.3	14.6
Baltimore , MD	NOV	30	11	37.7	56.2	709.0	6.9	14.6
Baltimore , MD	DEC	31	12	29.6	45.5	580.0	7.4	14.6
Baltimore , MD	YEAR	365	Annual	46.4	65.0	1,274.0	7.2	14.6
			Maximum	68.0	86.9	1,918	8.7	14.6
			Hourly		95.0	1,918	8.7	14.6

Tank Data

[1] Reference 1: AP-42, Fifth Edition, Volume 1, Chapter 7.1 Organic Liquid Storage Tanks - March 2020

Effective Tank Diameter (Equation 1-14):

$D_E = ((L * D) / (\pi / 4))^{0.5}$

where: D_E = effective tank diameter
L = length of horizontal tank
D = diameter of a vertical cross-section of the horizontal tank

VFR Vapor Space Outage (Equation 1-16):

$H_{VO} = H_S - H_L + H_{RO}$

where: H_{VO} = vapor space outage
H_S = tank shell height
H_L = liquid height = 0.5 * H_S
H_{RO} = roof outage

HFR Vapor Space Outage (Equation 1-15):

$H_{VO} = (\pi / 4) * D / 2$

where: H_{VO} = vapor space outage

Roof Outage (Equation 1-17, 18, 19, 20):

$H_{RO} = H_R / 3$

where: H_{RO} = roof outage
H_R for cone roof = 0.0625 * D / 2
H_R for dome roof = 0.268 * D / 2

Data to Be Entered for All Tanks								Calculated for All Tanks		Data to Be Entered for Fixed Roof Tanks							Calculated for Fixed Roof Tanks			
Tank ID	Roof Type	Working Capacity (bbl)	Maximum Filling Rate F_{RM} (gal/hr)	Tank Roof Paint Color & Shade	Tank Roof Paint Condition	Tank Shell Paint Color & Shade	Tank Shell Paint Condition	Tank Roof Solar Absorptance α_R (unitless)	Tank Shell Solar Absorptance α_S (unitless)	VFR Diameter D (ft)	VFR Shell Height H_S (ft)	VFR Roof Type	HFR Diameter D (ft)	HFR Shell Length (ft)	Breather Vent Pressure P_{BP} (psig)	Breather Vent Vacuum P_{BV} (psig)	Average Liquid Height H_L (ft)	Roof Outage H_{RO} (ft)	Vapor Space Outage H_{VO} (ft)	HFR Effective Diameter D_E (ft)
								[1] Table 7.1-6	[1] Table 7.1-6								$H_S/2$ (VFR)	[1] Eq. 1-17, 18, 19, 20	[1] Eq. 1-15, 16	[1] Eq. 1-14
Tank A	VFR	3,838		Beige/Cream	Average	Beige/Cream	Average	0.42	0.42	28.0	35.0	Cone			0.03	-0.03	17.50	0.29	17.79	0.00
Tank B	VFR	4,825		Beige/Cream	Average	Beige/Cream	Average	0.42	0.42	28.0	44.0	Cone			0.03	-0.03	22.00	0.29	22.29	0.00
Tank D	VFR	2,146		Beige/Cream	Average	Beige/Cream	Average	0.42	0.42	23.0	29.0	Cone			0.03	-0.03	14.50	0.24	14.74	0.00

AP-42 Table 7.1-6 Paint Solar Absorptance

	Reflective Condition		
Surface Color / Shade	**New**	**Average**	**Aged**
White	0.17	0.25	0.34
Aluminum Specular	0.39	0.44	0.49
Aluminum Diffuse	0.60	0.64	0.68
Beige/Cream	0.35	0.42	0.49
Black	0.97	0.97	0.97
Brown	0.58	0.62	0.67
Gray Light	0.54	0.58	0.63
Gray Medium	0.68	0.71	0.74
Green Dark	0.89	0.90	0.91
Red Primer	0.89	0.90	0.91
Rust	0.38	0.44	0.50
Tan	0.43	0.49	0.55
Aluminum Unpainted	0.10	0.12	0.15

AP-42 Table 7.1-7. Meteorological Data(T_{AX}, T_{AN}, V, I, P_A) for Selected U.S. Locations

Location	Month Code	Daily Ambient Minimum Temperature (T_{AN}) (°F)	Daily Ambient Maximum Temperature (T_{AX}) (°F)	Solar Insolation Factor (I) (BTU/ ft^2 day)	Average Wind Speed (v) (mph)	Atmospheric Pressure (psia)
Baltimore , MD	1	26.6	42.2	653	7.8	14.6
Baltimore , MD	2	27.4	44.7	929	8.3	14.6
Baltimore , MD	3	34.8	53.5	1,231	8.7	14.6
Baltimore , MD	4	44.3	65.1	1,555	8.3	14.6
Baltimore , MD	5	53.2	73.9	1,774	7.2	14.6
Baltimore , MD	6	63.1	82.8	1,918	6.5	14.6
Baltimore , MD	7	68.0	86.9	1,866	6.0	14.6
Baltimore , MD	8	66.6	85.3	1,681	5.6	14.6
Baltimore , MD	9	59.1	78.0	1,350	6.3	14.6
Baltimore , MD	10	46.6	66.7	1,036	6.3	14.6
Baltimore , MD	11	37.7	56.2	709	6.9	14.6
Baltimore , MD	12	29.6	45.5	580	7.4	14.6
Baltimore , MD	Annual	46.4	65.0	1,274	7.2	14.6

Reference Tables

Unit Conversion

Units to be converted	Formula Used	Constants to link to	
from °R to °C	[°C] = ([°R] − 491.67) × 5⁄9	491.67	5/9
from °C to °F	[°F] = [°C] × 9⁄5 + 32	9/5	32
from °F to °R	[°R] = [°F] + 459.67	459.67	
from psig to psia	[psia] = [psig] + 14.7	14.7	
from gallons (gal) to barrels (bbl)	[bbl] = [gal] / 42	42	

Constants

Name	Value	Units
Ideal Gas Constant	10.731	psia·ft^3 / lb-mole·R

AP-42 Table 5.2-1. Saturation (S) Factors for Calculating Petroleum Liquid Loading Losses

Cargo Carrier	Mode of Operation	S Factor
Truck/Rail	Submerged loading of a clean cargo tank	0.5
Truck/Rail	Submerged loading: dedicated normal service	0.6
Truck/Rail	Submerged loading: dedicated vapor balance service	1.00
Truck/Rail	Splash loading of a clean cargo tank	1.45
Truck/Rail	Splash loading: dedicated normal service	1.45
Truck/Rail	Splash loading: dedicated vapor balance service	1.0
Marine	Submerged loading: ships	0.2
Marine	Submerged loading: barges	0.5

Maryland
Department of
the Environment

The Applicant's Guide to Environmental Justice and Permitting

What You Need to Know

This fact sheet is designed to provide guidance to applicants on incorporating environmental justice screening requirements pursuant to House Bill 1200, effective October 1, 2022.

What is Environmental Justice?

The concept behind the term environmental justice (EJ) is that regardless of race, color, national origin, or income, all Maryland residents and communities should have an equal opportunity to enjoy an enhanced quality of life. How to assess whether equal protection is being applied is the challenge.

Communities surrounded by a disproportionate number of polluting facilities puts residents at a higher risk for health problems from environmental exposures. It is important that residents who may be adversely affected by a proposed source be aware of the current environmental issues in their community in order to have meaningful involvement in the permitting process. Resources may be available from government and private entities to ensure that community health is not negatively impacted by a new source located in the community.

Extensive research has documented that health disparities exist between demographic groups in the United States, such as differences in mortality and morbidity associated with factors that include race/ethnicity, income, and educational attainment. House Bill 1200 adds to MDE's work incorporating diversity, equity and inclusion into our mission to help overburdened and underserved communities with environmental issues.

What is House Bill 1200 and what does it require?

Effective October 1, 2022, House Bill 1200 requires a person applying for a permit from the Department under §1-601 of the Environment Article of the Annotated Code of Maryland or any permit requiring public notice and participation to include in the application an EJ Score for the census tract where the applicant is seeking the permit; requiring the Department, on receiving a certain permit application to review the EJ Score; and requiring notices to include information related to EJ Scores and generally relating to environmental permits and environmental justice screenings.

What is a "Maryland EJ Tool"?

The term "Maryland EJ Tool" means a publicly available state mapping tool that allows users to: (1) explore layers of environmental justice concern; (2) determine an overall EJ score for census tracts in the state; and (3) view additional context layers relevant to an area. The MDE EJ Screening Tool is considered a Maryland EJ Tool.

What is an "EJ Score"?

The term "EJ Score" means an overall evaluation of an area's environment and environmental justice indicators, as defined by MDE in regulation, including: (1) pollution burden exposure; (2) pollution burden environmental effects; (3) sensitive populations; and (4) socioeconomic factors.

The MDE EJ Screening Tool considers three demographic indicators, minority population above 50%, poverty rate above 25% and limited English proficiency above 15%, to identify underserved communities, and multiple environmental health indicators to identify overburdened communities. The tool uses these indicators to calculate a

Final EJ Score Percentile, statewide. It is that score, linked to the census tract where the project is to be located, that needs to be reported to MDE as part of your permit application.

What does the application require?

The link for the MDE EJ Screening Tool is located on the Department's website, www.mde.maryland.gov. Click on the Environmental Justice header at the top of the Department's home page, then select EJ Screening Tool from the menu on the left. Click on Launch the EJ Screening Tool. After you open the tool, click okay on the opening screen. At the top right, please click the first button for the MDE Screening Report. Input the address of the proposed installation in the address bar. Click on the Report button. Once the report has been generated select the print icon and save it in a .pdf format.

The applicant needs to include the MDE Screening Report with the EJ Score from the MDE EJ Screening Tool as part of the permit application upon submission. An application will not be considered complete without the report.

The applicant is encouraged to provide the Department with a discussion about the environmental exposures in the community. This will provide pertinent information about how the applicant should proceed with engaging with the community. Residents of a community with a high indicator score and a high degree of environmental exposure should be afforded broader opportunities to participate in the permit process and understand the impacts a project seeking permit approval may have on them.

Questions

For air quality permits, please call 410-537-3230.
For water permits, please call 410-537-4145.
For land permits pertaining to Solid Waste, please call 410-537-3098. For land permits pertaining to Oil Control, please call 410-537-3483.
For land permits pertaining to Animal Feeding Operations, please call 410-537-4423.
For land permits pertaining to Biosolids, please call 410-537-3403.

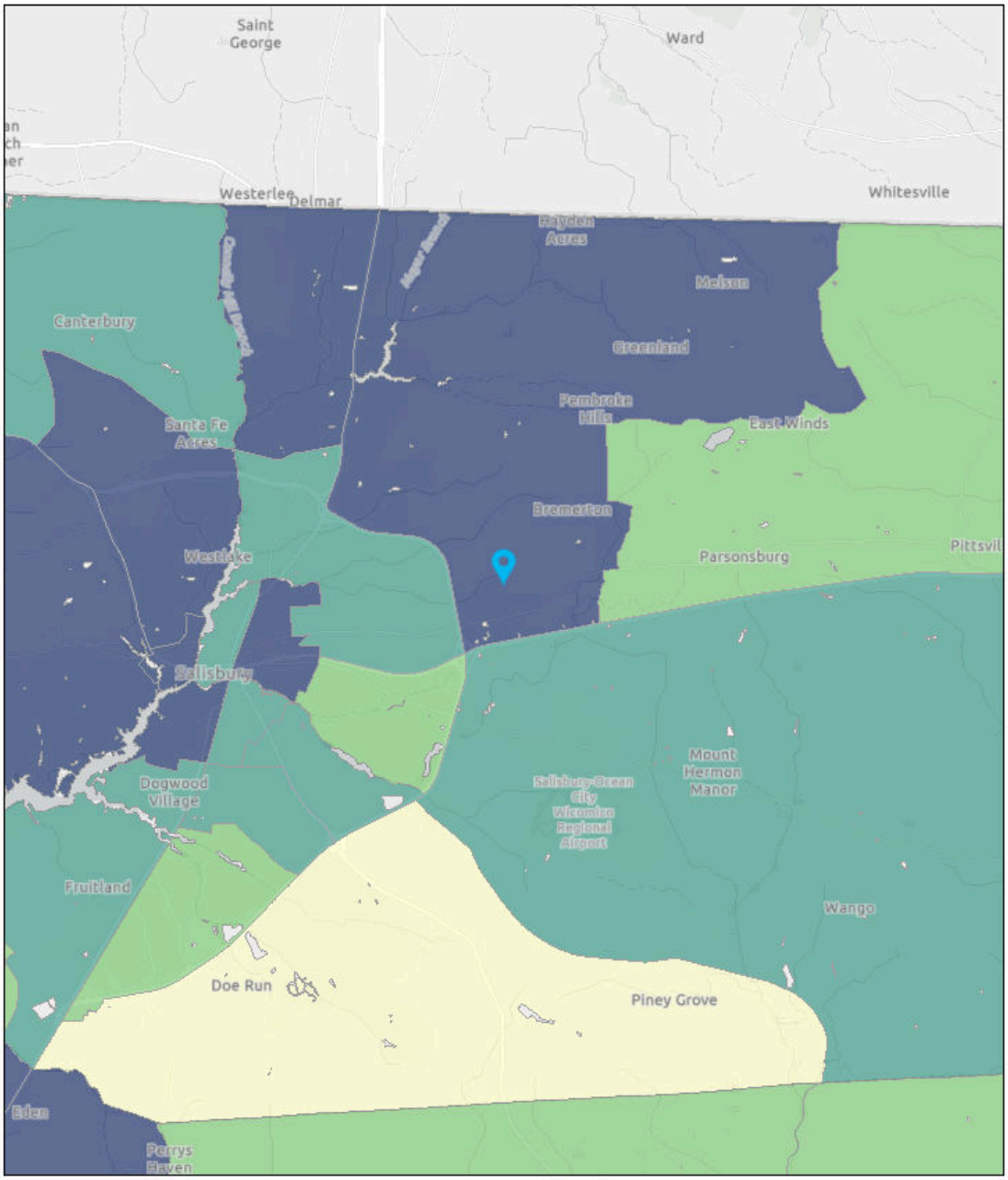
APPENDIX D ENVIRONMENTAL JUSTICE SCREENING RESULTS

MDE Screening Report

Area of Interest (AOI) Information

Aug 21 2024 14:38:04 Eastern Daylight Time

A4 Portrait



1:144,448

0 1 2 4 mi

0 1.5 3 6 km

MDE Final EJ Score (%ile score)

- 0% - 24.9th %ile
- 25% - 49.9th %ile
- 50% - 74.9th %ile
- 75% - 100th %ile

MDE, OS, OIMT, City of Salisbury, VGIN, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS

Summary

Name	Count	Area(mi²)	Length(mi)
MDE Final EJ Score (%ile score)	1	N/A	N/A
Overburdened Communities Combined Score	1	N/A	N/A
Overburdened Pollution Environmental Score (%ile score)	1	N/A	N/A
Overburdened Exposure Score (%ile score)	1	N/A	N/A
Overburdened Sensitive Population (%ile score)	1	N/A	N/A
Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)	1	N/A	N/A
Air Emissions Facilities	0	N/A	N/A
Sulfur Dioxide (2010)	0	N/A	N/A
Ozone (2015)	1	N/A	N/A
Fine Particles (2012)	1	N/A	N/A
Biosolids FY 2020 and Current Permit Details	0	N/A	N/A
Biosolids FY2010 - 2014 Permit Details	0	N/A	N/A
Biosolids FY2009 Expired Permit Details	0	N/A	N/A
Biosolids FY 2020 and Current Permits Distribution By Acreage	1	N/A	N/A
Biosolids FY2015 - 2019 Permits Distribution By Acreage	1	N/A	N/A
Biosolids FY2010 - 2014 Permits Distribution By Acreage	1	N/A	N/A
Biosolids FY2009 Permits Expired Distribution By Acreage	1	N/A	N/A
Biosolids FY 2020 and Current Permit Distribution By Percent Coverage	1	N/A	N/A
Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage	1	N/A	N/A
Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage	1	N/A	N/A
Biosolids FY2009 Expired Permit Distribution By Percent Coverage	1	N/A	N/A
Concentrated Animal Feeding Operations (CAFOs)	0	N/A	N/A
Composting Facilities	0	N/A	N/A
Food Scrap Acceptors	0	N/A	N/A
Landfills	0	N/A	N/A
Correctional Facilities	0	N/A	N/A
Industrial Food Suppliers	0	N/A	N/A

Residential Colleges	0	N/A	N/A
Non-Residential Colleges	0	N/A	N/A
Hospitals	0	N/A	N/A
High Schools	0	N/A	N/A
Grocery Stores	0	N/A	N/A
10 Miles from Landfill	3	N/A	N/A
10 Miles from Composting Facility	0	N/A	N/A
General Composting Facilities Tier 2 (MD)	0	N/A	N/A
Commercial Anaerobic Digester (MD)	0	N/A	N/A
Out of State Facilities	0	N/A	N/A
30 mile buffer (Maryland)	1	N/A	N/A
30 Mile Buffer (Out of State)	1	N/A	N/A
Land Restoration Facilities	0	N/A	N/A
Determinations (points)	0	N/A	N/A
Determinations (areas)	0	N/A	N/A
Entities	0	N/A	N/A
Active Coal Mine Sites	0	N/A	N/A
Historic Mine Facilities	0	N/A	N/A
All Permitted Solid Waste Acceptance Facilities	0	N/A	N/A
Municipal Solid Waste Acceptance Facilities	0	N/A	N/A
Maryland Dam Locations	0	N/A	N/A
Maryland Pond Locations	0	N/A	N/A
Surface Water Intakes	0	N/A	N/A
Wastewater Discharge Facilities	0	N/A	N/A
Drinking Water	0	N/A	N/A
Clean Water	0	N/A	N/A

MDE Final EJ Score (%ile score)

#	Census tract identifier	Geographic Area Name	Total Population	Final EJ Score Percent (for this tract)	Final EJ Score Percentile (Distribution across Maryland)	Area(mi²)
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	7483	35.88	81.00	N/A

Overburdened Communities Combined Score

#	GEOID20	Geographic_Area_Name	TotalPop	Overburd_Exposure_Percent	Overburd_Exposure_Percentile
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	7,483	41.43	21.05

#	Overburd_Poll_Enviro_Percent	Overburd_Poll_Enviro_Percentile	Sensitive_Population_Percent	Sensitive_Population_Percentile	OverburdenedAllPercent	OverburdenedAllPercentile	Area(mi²)
1	13.50	78.13	84.64	96.17	89.88	94.46	N/A

Overburdened Pollution Environmental Score (%ile score)

#	GEOID20	Geographic_Area_Name	RentalsOccupiedPre79Percent	Percentile	PercentRMP
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	6.69	54.82	4.35

#	PercentRMPEJ	PercentHazWaste	PercentHazWasteEJ	PercentSuperFundNPL	PercentSuperFundNPLEJ
1	19.23	12.81	31.73	2.91	15.51

#	PercentHazWW	PercentHazWWEJ	BrownFPercent	Percentile_1	PercentPowerPlants
1	26.78	37.69	0.00	0.00	9.09

#	Percentile_12	PercentCAFOS	Percentile_12_13	PercentActiveMines	Percentile_12_13_14
1	95.42	36.09	99.25	0.00	0.00

#	PollutionEnvironmentalPercent	PollnEnvironmentalPercentile	Area(mi²)
1	13.50	78.13	N/A

Overburdened Exposure Score (%ile score)

#	GEOID20	Geographic_Area_Name	Total_Pop	PercentNATA_Cancer	Percentile_NATA_Cancer
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	7,483.00	80.00	38.71

#	PercentNATA_Resp_HI	Percentile_NATA_Resp_HI	PercentNATA_Diesel	Percentile_NATA_Diesel	PercentNATA_PM25
1	60.00	21.89	11.18	8.03	78.72

#	PercentileNATA_PM25	PercentOzone	PercentileOzone	PercentTraffic	PercentileTraffic
1	8.33	88.80	18.59	2.17	17.85

#	PercentTRI	PercentileTRI	PercentHazWasteLF	Percentile_HazWasteLF	PollutionExposurePercent	PollutionExposurePercentile	Area(mi²)
1	10.53	91.73	0.00	0.00	41.43	21.05	N/A

Overburdened Sensitive Population (%ile score)

#	GEOID20	Geographic_Area_Name	PerAstma	PercentileAst	PerMyo
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	94.90	99.25	94.30

#	PercentileMyo	PerLow	PercentileLow	PercentBroad	PercentileBroad
1	99.11	59.00	92.96	9.65	86.26

#	PercentSens	PercentileSens	Area(mi²)
1	64.46	94.40	N/A

Socioeconomic/Demographic Score 2020 (Percentile score) (Underserved Community)

#	Census tract identifier	Geographic Area Name	Total Population	Percent Poverty	Percent Minority
1	24045010603	Census Tract 106.03, Wicomico County, Maryland	7,483	33.97	33.10

#	Percent Limited English Proficiency	Demographic Score (Percent for this tract)	Demographic Score (Percentile Distribution acoss Maryland)	Area(mi²)
1	5.29	24.12	52.57	N/A

Ozone (2015)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10
1	24	045	01668606	24045	Wicomico

#	Ozone NAA Area	8-Hr Ozone (2015) Designation	8-HR Ozone (2015) Classification	8-Hr Ozone (2015) Status	Area(mi²)
1	*No Data*	Attainment/Unclassifiable	*No Data*	*No Data*	N/A

Fine Particles (2012)

#	STATEFP10	COUNTYFP10	COUNTYNS10	GEOID10	NAME10	PM2.5 (2012) Status	Area(mi²)
1	24	045	01668606	24045	Wicomico	Attainment/Unclassifiable	N/A

Biosolids FY 2020 and Current Permits Distribution By Acreage

#	County Name	FY2020andAfter	Area(mi²)
1	Wicomico	7.10	N/A

Biosolids FY2015 - 2019 Permits Distribution By Acreage

#	County Name	FY2015to2019	Area(mi²)
1	Wicomico	*No Data*	N/A

Biosolids FY2010 - 2014 Permits Distribution By Acreage

#	County Name	FY2010to2014	Area(mi²)
1	Wicomico	*No Data*	N/A

Biosolids FY2009 Permits Expired Distribution By Acreage

#	County Name	FY2009	Area(mi²)
1	Wicomico	*No Data*	N/A

Biosolids FY 2020 and Current Permit Distribution By Percent Coverage

#	County Name	FY2020andAfter	Area(mi²)
1	Wicomico	7.10	N/A

Biosolids FY2015 - 2019 Permit Distribution By Percent Coverage

#	County Name	FY2015to2019	Area(mi²)
1	Wicomico	*No Data*	N/A

Biosolids FY2010 - 2014 Permit Distribution By Percent Coverage

#	County Name	FY2010to2014	Area(mi²)
1	Wicomico	*No Data*	N/A

Biosolids FY2009 Expired Permit Distribution By Percent Coverage

#	County Name	FY2009	Area(mi²)
1	Wicomico	*No Data*	N/A

10 Miles from Landfill

#	County	Type	Facility_N	ADDRESS	FILL
1	WICOMICO	WPF	Bennett ProcessingFacility	513 South Camden Ave., Fruitland MD 21826.	5.5
2	WICOMICO	WMF	Newland Park MunicipalLandfill	7161 Brick Kiln Rd, Salisbury MD 21801.	60
3	WICOMICO	WPM	Peninsula Medical WastePF	100 East Carroll St., Salisbury MD 21801	-

#	SITE__ACRE	AI_No_	Owner_Type	MD_GRID__E	PERMITNUMB	EXPIRATION	Area(mi²)
1	14.30	36,684.00	PRI	0802 /220	2011-WPF-0658	1/4/2017, 7:00 PM	N/A
2	125.00	29,763.00	CTY	1180 /200	2015-WMF-0283	7/15/2020, 8:00 PM	N/A
3	23.00	19,056.00	PRI	1201 /186	2011-WPM-0505	2/10/2018, 7:00 PM	N/A

30 mile buffer (Maryland)

#	Facility_Name_1	Facility_Contact_1	Contact_Phone	Contact_Email_1	Contact_2
1	Ocean Compost	Garvey Heiderman	443-783-4835	gogreenoccampaign@gmail.com	*No Data*

#	Contact_2_Phone	Contact_2_Email	URL	Area(mi²)
1	*No Data*	*No Data*	https://www.gogreenwithoc.org/	N/A

30 Mile Buffer (Out of State)

#	FacilityName	Contact	Area(mi²)
1	Blue Hen Organics	http://www.bluehenorganics.com/	N/A

APPENDIX E VENDOR DATA

MINERAL OIL ABSORPTION SYSTEM (MOS)

MINERAL OIL ABSORPTION SYSTEM

SOLVENT AIR SEPARATION SYSTEM

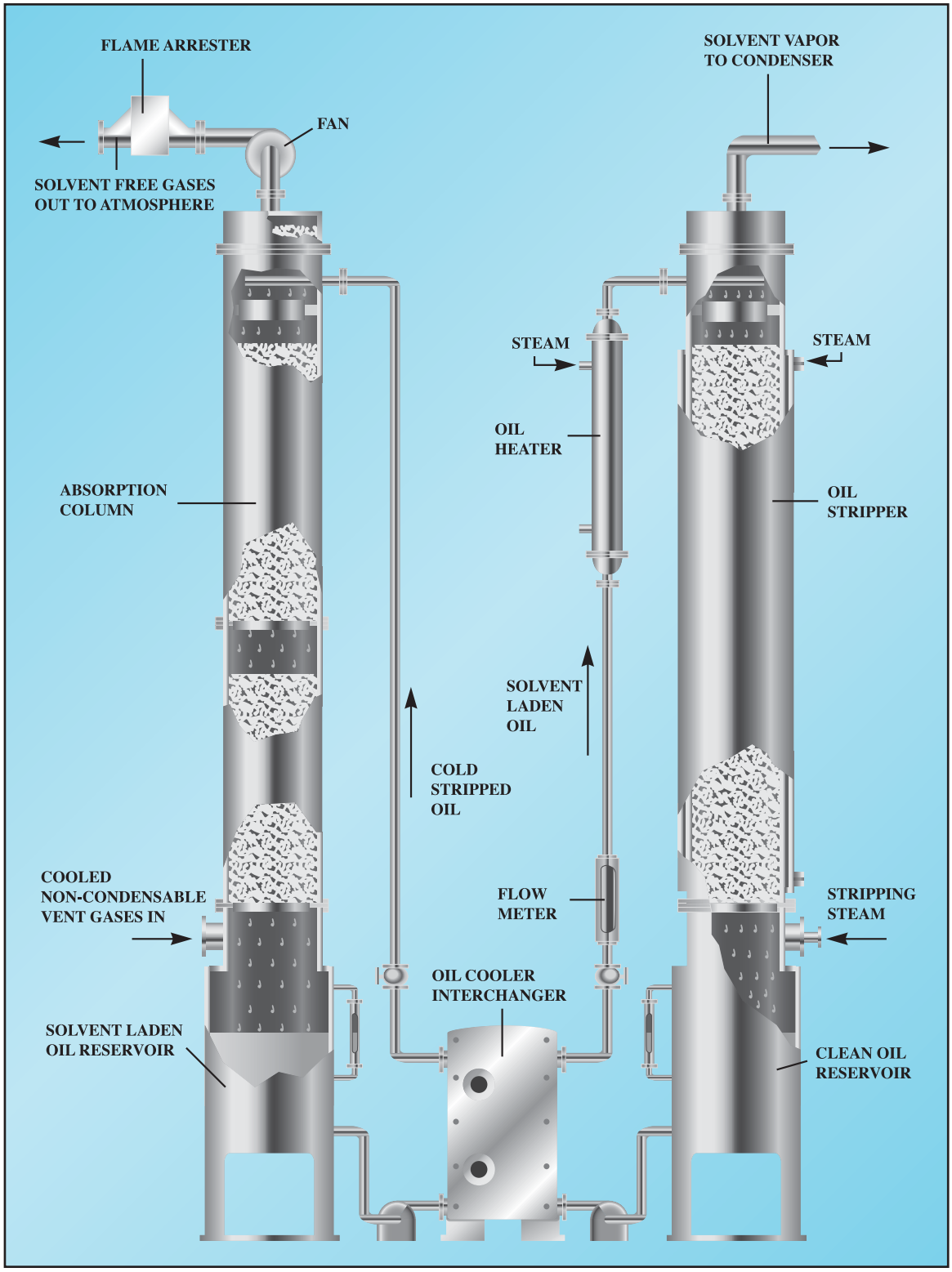
Various methods of solvent recovery, including refrigeration and absorption, have been used to recover solvent vapors from exhaust gases. The mineral oil absorption system has proven time and time again to be the safest and most economical system.

Since 1948, oilseed extraction plants fabricated by Crown Iron Works Company have successfully used a mineral oil absorption system called the Crown Solvent-Air Separator. This system uses cold mineral oil to absorb solvent from vent gases. As an option for warm climates, chiller systems can be furnished.

The Solvent Air Separation System, also known as the Mineral Oil System (MOS), removes solvent from vent gasses before discharging out to the atmosphere. Non-condensable gases enter the mineral oil absorber at the bottom and rise through the tower packing. The non-condensable gasses are flowing counter-currently to the cold mineral oil admitted at the top. The solvent is subsequently absorbed by the mineral oil, and desolventized gasses are drawn off through a demister at the top.

Air is drawn through a fan and vented through a flame arrester well below lower explosive limits. The solvent-laden mineral oil collected at the bottom of the absorption column is pumped through a heat exchanger, then to the Mineral Oil Heater, and finally to the top of the Mineral Oil Stripper. Here the solvent is removed from the mineral oil by live steam evaporation as the mineral oil trickles down through the tower packing. The solvent vapors drawn off at the top of the stripping column travel back to the evaporator condenser (or in some cases the vent condenser). Solvent-free mineral oil collected at the bottom of the mineral oil stripper is recycled through the Mineral Oil Interchanger/Cooler, then back to the absorption column where the cycle is repeated.

P.O. Box 1364 Minneapolis, MN 55440-1364 USA
Telephone: +1-651-639-8900 Fax: +1-651-639-8051
www.crowniron.com



Crown Iron Works Company
P.O. Box 1364
Minneapolis, MN 55440 USA
Telephone: +1-651-639-8900 Fax: +1-651-639-8051
sales@crowniron.com
www.crowniron.com

Europa Crown Ltd.
Waterside Park, Livingstone Road
Hessle, East Yorkshire, HU13 0EG England
Telephone: +44-1482-640099 Fax: +44-1482-649194
sales@europacrown.com
www.europacrown.com

OFFICES:
ARGENTINA, BRAZIL, CHINA, HONDURAS, INDIA, MEXICO, RUSSIA, AND UKRAINE

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Wicomico County, Maryland

Department of Planning, Zoning & Community Development

BUILDING DIVISION

Government Office Building
125 N. Division St., Room 201
Salisbury, Maryland 21801
(410)548-4810 fax (410)548-4941
permits@wicomicocounty.org

Lori A. Carter
Director

Chief Building Inspector

2015 IBC*IRC*IECC

BUILDING PERMIT NO.
30572

Application No. 6737

DATE ISSUED: 07/21/2023

Building Address (House No., Street, Town or Area)
6906 ZION CHURCH ROAD
WICOMICO COUNTY MD

Subdivision & Section No.			Account ID	Land Area
NSLP			2305064899	10.4250 AC
Map	**Grid**	**Parcel No.**	**Block**	**Lot**
0039	0003	0490		1

Applicants Name & Address — Phone No.
PERDUE FOODS LLC
31149 OLD OCEAN CITY RD
SALISBURY, MD 21804-1806

Owners Name & Address — Phone No.
PERDUE FOODS LLC
31149 OLD OCEAN CITY RD
SALISBURY, MD 21804-1806

Contractor/Builder's Name & Address — Phone No.
A-LERT CONSTRUCTION SERVICES — 573-366-7855
1990 INDUSTRIAL PIKE ROAD
GASTONIA, NC 28052 M.H.B.R. / M.H.I.C. #

Application is hereby made for a permit to **ERECT, ALTER, EXTEND, MOVE,** the **PERMANENT,** or **TEMPORARY** structure described.

NOTE: Construction must begin within 6 months of issuance and be completed within 3 years.

Exceptions: **Carports, Decks, Demolition and Disposal, Pools, Portable Sheds, & Solar Panels,** Work must be completed within **six (6) months** of the issuance of this permit.

All Electrical, Plumbing, Fire Safety or Other Final Inspections are to be completed and submitted to the Building Inspector before a Certificate of Occupancy will be issued.

Moving / 2nd Dwelling Removal / Other Notes.

Applicant's Initials JL

Description of Work: EXTRACTOR REPLACEMENT — Width/Depth — Stories: 0.0

Intended Use of Structure: EXTRACTOR REPLACEMENT

Acknowledgment of Required Inspections.

Please review carefully the stages of construction that have been identified for required inspections on the Required Inspections Sheet. Note: The County reserves the right to impose fines on the permit holder for any MISSED INSPECTIONS. Please call for all inspections highlighted or circled on the Required Inspections Sheet.

Applicant's Initials JL

UTILITIES			PERMIT FEES		
WATER	SEWER	GAS	Estimated Construction Cost / Contract Amount		$ 12600000
			ELECTRICAL PERMIT	PERMIT	$ 14830.00
			MECHANICAL PERMIT NO.	MHBFUND	$
			PLUMBING PERMIT NO.	CBCA	$
			COMMERCIAL PERMIT NO.	Forest	$
			FLOOD PLAIN PERMIT NO.	Floodplain	$
			FIRE PROJECT NO.	Other	$
				Total Permit Fee	$ 14830.00

I have carefully examined and read the above application and know the same is true and correct, and that in doing this work, all provisions of Wicomico County Ordinances and other applicable Federal, State and Local Laws will be complied with, whether herein specified or not.

Applicant's Signature — Date 7/21/2023

Zoning: I-2 — Special Exception No.:

CONDITIONS / RESTRICTIONS / NOTES

0.00 ' Front setback to property line. 0.00 ' Side & 0.00 ' Rear setbacks to property line.

Do not encroach (the checked applicable items) as shown on plat, aerial map or other site plan:

☐ Septic Area ☐ _____ ' Septic Area Buffer
☐ Non-Tidal Wetlands ☐ 25' Non-Tidal Wetlands Buffer
☐ Forest Conservation Area
☐ Chesapeake Bay Critical Area Buffer
☐ _____ ' Drainage and/or Maintenance Easement
☐ _____ ' _____ Easement of Right of Way
☐ 100 Year Flood Plain

Where Curb & Gutter does not exist, the owner/developer is responsible for the entrance structure, which must be approved by the Roads Division. Tel. 410-548-4872

AGENCY	APPROVAL DATE
PLAN SUBMITTAL	07/26/2023
BUILDING STORMWATER MGT	07/17/2023
FIRE SAFETY PLAN REVIEW	07/19/2023
BUILDING SITE PLAN	07/19/2023
ZONING ADMINSTRATOR	05/18/2023

Courtney Cle — Approval — Date 7/21/23

Permit # 30572 MAP 0039 PARCEL 0490

ADDRESS 6906 ZION CHURCH ROAD WICOMICO COUNTY

DISCLAIMER

Non-Tidal Wetlands in Wicomico County

The Nontidal Wetlands Act of Maryland, adopted in 1989, prohibits the alteration of nontidal wetlands and their regulated 25 foot buffers without prior authorization from the State of Maryland. The Nontidal Wetlands Protection Act is designed to conserve a dwindling, valuable natural resource through avoidance and minimization on unnecessary impacts and permitting wise uses. Maryland's regulatory review and authorization process for nontidal wetlands began in January of 1991 and is administered by the Maryland Department of the Environment (MDE) through a State Programmatic General Permit (MDSPGP) from the U.S, Army Corps of Engineers. The MDSPGP gives MDE the regulatory authority to review and authorize various types of projects without separate federal approvals and duplicative reviews.

The cutting or clearing of vegetation, excavation, filling, grading and building of structures are regulated activities in nontidal wetlands and their regulated 25 foot buffers. If you are aware that nontidal wetlands exist on your property and propose to disturb them, authorization from MDE may be necessary. For proposed projects in Wicomico County that may disturb nontidal wetlands and their buffers, **Please contact the Nontidal Wetlands & Waterways Division at 410-713-3685.** If you are uncertain as to whether or not nontidal wetlands exist on your property, please contact MDE's Nontidal Wetlands and Waterways Division for assistance. An environmental consultants list for the area may also be obtained.

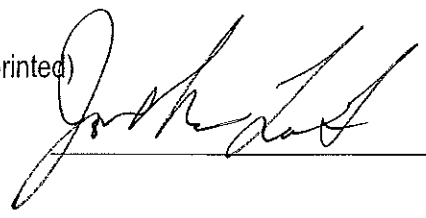
If you wish to receive verification of an existing nontidal wetlands delineation performed by an environmental consultant or yourself, you can contact the Baltimore District of the **U.S. Army Corps of Engineers at 410-962-4500.**

Other Useful Contacts:

MDE Nontidal Wetlands Division	410-901-4020 or 410-631-8075
MDE Compliance Program	410-901-4020

www.mde.state.md.us

Owner/Contractor (printed)

Owner's Signature  Date 7/21/2023

REQUIRED BUILDING INSPECTIONS

WICOMICO COUNTY BUILDING INSPECTOR
Government Office Building, Room 201
Salisbury, Maryland 21801
Phone: 410-548-4810

This Office requests 24 hour notice for all inspections. It is the responsibility of the owner or his representative to call for the following inspections as indicated:

1. **FOOTING INSPECTION**: Due after trenches are excavated with grade stobs and reinforcement is in place.
2. **SLAB INSPECTION**: Due after vapor barriers are in place, reinforcements and/or welded wire fabric is installed, and compaction is complete.
3. **FOUNDATION INSPECTION**: Due after footings, piers, and foundation walls are complete with bolts and/or straps, vents in place, floor joists installed and prior to backfilling foundation and the installation of decking materials.
4. **FRAMING INSPECTION**: Due after all exterior sheathing, all framing, fire blocking and bracing is to be in place and the rough electrical, plumbing, HVAC ducts are completed, inspected and approved.
5. **AIR BARRIER INSPECTION**: Due prior to siding installation.
6. **INSULATION INSPECTION**: Due prior to wallboard installation.
7. **FINAL INSPECTION**: Due after all tradesmen have their final inspections approved.
8. **OTHER INSPECTION**: _____

CERTIFICATE OF OCCUPANCY is required to be issued by Wicomico County for the following: one and two family dwellings, townhouses not more than three stories in height, modular and mobile homes, residential additions, and detached structures 120 square feet or greater and all commercial buildings, commercial renovations or changes of use as regulated by adopted codes. **The Certificate of Occupancy** shall be obtained by the permit holder before the above mentioned structures can be legally occupied or placed into use. **The Certificate of Occupancy can be issued only after this Department** has approved all required inspections, receives Health Department approval, Electrical Inspection approval, and any other applicable approvals and has the property address properly displayed.

WORK SHALL NOT BE DONE ON ANY PART OF A BUILDING OR STRUCTURE BEYOND THE POINT INDICATED IN EACH SUCCESSIVE INSPECTION WITHOUT FIRST OBTAINING THE APPROVAL OF THE BUILDING OFFICIAL. IF THE WORK IS CONTINUED WITHOUT THE PROPER INSPECTIONS AND APPROVAL OF THE BUILDING OFFICIAL, THE BUILDING INSPECTOR CAN REQUIRE THE REMOVAL OF ANY PARTS OF THE DRYWALL, ETC. TO EXPOSE ANY PARTS OF THE FRAMED STRUCTURE FOR INSPECTION AT THE ENTIRE COST OF THE OWNER / BUILDER.

ALL CONSTRUCTION MUST CONFORM TO THE CURRENT EDITION OF THE INTERNATIONAL BUILDING AND RESIDENTIAL CODE, LOCAL ORDINANCES AND ZONING REGULATIONS OF WICOMICO COUNTY, MARYLAND.

PERDUE FOODS LLC A-LERT CONSTRUCTION SERVICES
Owner / Builder

30572
Building Permit No.

07/21/2023
Date

PERMITS/INSP PAYMENT RECPT#: 1531653
WICOMICO COUNTY, MD
125 NORTH DIVISION STREET
GOVERNMENT BUILDING, ROOM 102
SALISBURY MD 21801

DATE: 07/21/23 TIME: 14:32
CLERK: 4797cculv DEPT:
CUSTOMER#: 321574
A-LERT CONSTRUCTION SERVICES
COMMENT:

CHG: PI	BUILDING PERMIT	14830.00

REVENUE:

1	01A0413	446020	14830.00
	BUILDING & EQUIP		

CASH:

0000	100000	14830.00

AMOUNT PAID: 14830.00

PAID BY: PERDUE FARMS INC
PAYMENT METH: CHECK
20012225
REFERENCE:

AMT TENDERED: 14830.00
AMT APPLIED: 14830.00
CHANGE: .00

Wicomico County, Maryland Department of Public Works
Stormwater Management Exemption Form

SWM Exemption #:			Date of Exemption: 7/17/2023
Property Owner: Perdue Agribusiness LLC			Building Permit #: App # 6737
Project Owner Address: 31149 Old Ocean City Rd., Salisbury, MD 21804			
Owner's Phone Number: 443 523 2498			
Owner's E-Mail: john.littleton@perdue.com			
Project Location: Morris Leonard Rd.			
Tax Map No.: 30	Parcel No.: 87	Lot No.: 4	Total Parcel/Lot Area: 137.95 A
Name of Developer/Agent: A-Lert Construction Services			
Developer/Agent Address: 1990 Industrial Park Rd., Gastonia, NC 28052			
Developer/Agent's Phone Number: 573 366 7855			
Developer/Agent's E-Mail: alert203@outlook.com			
Existing Impervious Surface Type: buildings, concrete			Proposed Impervious Surface Type: building (extractor)
Existing Impervious Surface Area: (Acres or Square Feet): 860,000 sf			Proposed Impervious Surface Area: (Acres or Square Feet): ø
Net Impervious Surface (Acres or Square Feet): 860,000 sf			Percent Increase in: Impervious Surface Area: 14.3% total

This property is exempt from the stormwater management ordinance based on information provided by the owner/developer in that it meets the following conditions:

1.	☐	The proposed development is located on a parcel of land that has pre-existing stormwater management that is designed to accept the increase in impervious area.
2.	☑	The proposed development is being constructed over area that is already impervious (asphalt, concrete, gravel, etc.).
3.	☐	The proposed development does not cover over 5,000 square feet of accumulated impervious area on the parcel of land since the County's Stormwater Program began in 1984. Note: Impervious area which has existed on a parcel of land prior to 1984 is exempt.
4.	☐	The activity is defined as "Agricultural Land Management", meaning those methods and procedures used in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.

Comments: Proposal is over existing concrete.	
Reviewed By: [signature]	Date: 7/17/2023