

## DEPARTMENT OF NATURAL RESOURCES

## MISSOURI AIR CONSERVATION COMMISSION

## PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 052015-010

Project Number: 2015-02-001  
Installation Number: 095-0126

Parent Company: Corbion

Parent Company Address: 13830 Botts Road, Grandview, MO 64030-2856

Installation Name: Corbion

Installation Address: 13830 Botts Road, Grandview, MO 64030-2856

Location Information: Jackson County, S22, T47N, R33W

Application for Authority to Construct was made for:

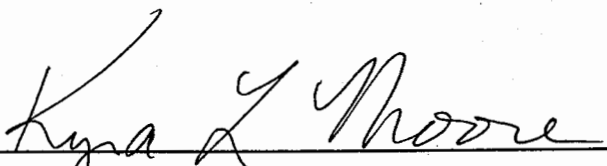
Installation of three 1500 gallon reactors (EP 003-739) and six 100 gallon holding totes (EP 003-738). This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

MAY 20 2015

EFFECTIVE DATE

  
\_\_\_\_\_  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Project No.	2015-02-001

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Corbion  
Jackson County, S22, T47N, R33W

1. Control Device Requirement-Scrubber
  - A. Corbion shall control VOC emissions from the new reactors (EP 003-739) using a packed-bed wet scrubber (CD-12).
  - B. The scrubber shall be operated and maintained in accordance with the manufacturer's specifications. The scrubber shall be equipped with a water flow meter to ensure a water flow rate equal to or greater than 20 gallons per minute is achieved. Also, a water level alarm shall be installed to notify the facility of water accumulation, which would indicate an operating malfunction. This flow meter and level alarm shall be located such that Department of Natural Resources' employees may easily observe them.
  - C. Corbion shall monitor and record the water flow rate into the scrubber at least once every 24 hours while the plant is operating. The water flow rate shall be maintained within the design conditions specified by the manufacturer's specifications or performance warranty.
  - D. Corbion shall monitor the liquid flow rate into the scrubber at least once every 24 hours while the plant is operating and maintain a liquid to gas ratio within the manufacturer's specifications.
  - E. Corbion shall maintain a copy of the scrubber manufacturer's specifications or performance warranty on site.
  - F. Corbion shall maintain an operating and maintenance log for the scrubber which shall include the following:
    - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
    - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

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#### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

2. Operational Requirement - Acids, Solvents and Other Liquid Materials
  - A. Corbion shall keep acids, solvents and other liquid materials in sealed containers whenever the materials are not in use. Corbion shall provide and maintain suitable, easily read, permanent markings on all containers of acids, solvents and other liquid materials used on site.
  
3. Operational Requirement - Combustion boilers
  - A. Combustion boilers EP 003-718 and EP 002-516, which were permitted in Construction Permit 082001-017, shall only burn natural gas. If diesel fuel oil is desired to be burned in these boilers, Corbion shall submit a written request to modify this permit to include diesel fuel combustion. The revised potential emission calculation of the boilers in this permit replaces the potential emission calculation in Construction Permit 082001-017.
  
4. Record Keeping
  - A. Corbion shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2015-02-001  
Installation ID Number: 095-0126  
Permit Number:

Corbion  
13830 Botts Road  
Grandview, MO 64030-2856

Complete Date  
of Application: January 30, 2015

Parent Company:  
Corbion  
13830 Botts Road  
Grandview, MO 64030-2856

Jackson County, S22, T47N, R33W

REVIEW SUMMARY

- Corbion has applied for authority to install three 1500 gallon reactors and six 100 gallon holding totes.
- HAP emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- A packed-bed wet scrubber (CD-12) will be used to control the VOC emissions from all three 1500 gallon reactors.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Jackson County, where part of this county is a non-attainment area for SO<sub>x</sub> and an attainment area for all other criteria pollutants. Corbion is located in the attainment area of Jackson County for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.

- Emissions testing is not required for the equipment.
- A Basic Operating Permit application is required for this installation within 30 days of commencement of operations.
- Approval of this permit is recommended with special conditions.

## INSTALLATION DESCRIPTION

Corbion makes food grade products. There are several divisions of the facility: the blend and hydrate plant, the distilled monoglyceride plant, the lactylate plant, and the distribution center.

The blend and hydrate processes are located in one building. In the blend process, monoglyceride is melted in the melt tank. It is then transferred to the blending kettle where it is mixed with oil. The product is then chilled and sent to packaging. In the hydrate process, four ingredients are mixed and cooled in a blend kettle. The product is then put into a homogenizer and votator. The votator is a scrape surface heat exchanger which cools the products to a creamy paste. Finally, the product is sent to packaging and shipping.

In the distilled monoglyceride plant, glycerin and triglyceride are mixed in a reactor which is heated with hot oil. The product is then transferred into a holding tank. The product is distilled and transferred to a finished product holding tank. Following that, the hot liquid is sprayed into a powder. This powder is then sent to packaging and shipping.

In the lactylate plant three ingredients are mixed in the reactor and heated to complete the reaction. The liquid product is moved into the hold tanks. Following that, the flaker converts the liquid product to a solid. The product is ground into a powder. The finished product is then sent to packaging and shipping.

The last division of the plant is the distribution center. In the distribution center the product from each of the plants is temporarily stored awaiting shipment to customers.

The following New Source Review permits have been issued to Corbion from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
0990-003	Installation of ground raw material storage tanks, mixing kettles, pumps, homogenizer, scraped surface heat exchanger, chiller, belt and roller conveyors, and scales
0896-007	Installation of a 800 hp boiler as a replacement for an existing 500 hp and the modification of a 600 hp boiler
082001-017	Installation of two boilers: one rated at 25.1 MMBtu/hr and another rated at 33.5 MMBtu/hr

## PROJECT DESCRIPTION

Corbion has submitted an Application for Authority to Construct to install and operate three 1500 gallon reactors (EP 003-738) and six 100 gallon totes of phosphoric acid and propionic acid for hydrate acid dosing (EP 003-739). Also during this time, Corbion will conduct a like-kind replacement on a baghouse (CD-16) due to the wear and tear of the existing baghouse and install new holding tanks of various vegetable oils and intermediate monoglycerides. This baghouse will have an equivalent PM<sub>10</sub> control efficiency of 99% as the current baghouse and it will keep the same control device number (CD-16). Emissions increases are not expected from the new baghouse or holding tanks.

The three new reactors will be used for smaller batches to minimize changeovers of the existing larger reactors. These reactors will not be using different materials. They will use the same materials as the existing reactors, which includes a glycerin product. Only VOC emissions will be emitted from the reactors. The reactors will mix glycerin and triglyceride and heat this mixture with hot oil. The addition of these reactors will not de-bottleneck the installation because all materials must go through a distillation process, which is the bottleneck of the installation. Each reactor has a three hour batch time and the materials will not be reused. As a result, the throughput of all the reactors is 1500 gallons per hour.

The existing reactors are controlled by a packed-bed wet scrubber and the new reactors will be controlled by the same control device (CD-12). The exact control efficiency of the scrubber is unknown. However, EPA estimates the minimum control efficiency for VOCs of these scrubbers to be 70%. As a result, a 70% control efficiency was used during the review of this project. Previous construction permits have not addressed this scrubber so it currently is not federally enforceable. As a result, the uncontrolled potential VOC emissions were evaluated to determine if this project warranted a construction permit. Because the gas flow rate into the scrubber is extremely low, a pressure drop across the packed bed will not be detected. As an alternative to monitoring the pressure drop, the water flow rate into the scrubber will be used to show proper operation.

Corbion will bring six 100 gallon totes of phosphoric acid and propionic acid on site. The totes arrive at the facility sealed from the supplier. Two totes are used at any one time while the others are stored for later use. These materials will be used in the hydrate process for hydrate acid dosing. Only VOC emissions will be emitted from the totes. A maximum of 16.48 gallons of phosphoric acid and propionic acid per hour will be used. This is equivalent to approximately 9 batches of hydrate acid dosing per hour.

The uncontrolled potential VOC emissions of this project is 4.04 pounds per hour (17.68 tons per year). Since this installation has received previous construction permits, the uncontrolled potential VOC emissions of this project were compared to the VOC insignificant emission exemption level of 2.75 pounds per hour (as seen in 10 CSR 10-6.061 (3)(A)3.A.) Because the uncontrolled VOC potential emissions of this project is greater than the VOC insignificant emission exemption level, a construction permit is required.

However, tracking of VOC emissions is not required for this project because the project is less than the de minimis level.

During the review of this project, it was noticed that Corbion may have the incorrect operating permit. Based on their previous construction permit (Construction Permit 082001-017), their existing SO<sub>x</sub> potential emissions exceed 100.0 tons per year largely due to the capability to burn diesel fuel with a high SO<sub>x</sub> content. When an installation has a potential to emit over 100.0 tons per year (including federally enforceable control devices and bottlenecks), an Intermediate or Part 70 Operating Permit is required. However, Corbion has a Basic Operating Permit. There is no record showing that an Intermediate or Part 70 Operating Permit is not appropriate.

Construction Permit 082001-017 was issued for the installation of two duel fired boilers (EP 003-718 and EP 002-516). The potential emissions of the boilers in Construction Permit 082001-017 were based on using number 2 diesel fuel oil. However, these boilers have only burned natural gas the past several years and Corbion does not plan on burning diesel fuel oil in these boilers. Therefore, Corbion has requested that the potential emissions of these boilers be recalculated based on natural gas usage.

The potential emissions of these boilers were recalculated using only natural gas and they are significantly less than the potential emissions calculated during the review of Construction Permit 082001-017. As a result, the boiler potential emissions are significantly less. In turn, the plant-wide potential emissions are significantly less too. Assuming the boilers only combust natural gas and in conjunction of the potential emissions of this project, a basic operating permit is indeed appropriate for Corbion. A summary of the boiler emissions evaluation is found in Table 2. The revised potential emission calculation of the boilers in this permit replaces the potential emission calculation in Construction Permit 082001-017. Also, the installation-wide potential emissions have been updated and includes the revised boiler potential emissions. This is shown in Table 3.

Table 2: Boiler Emissions Evaluation (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Boiler Potential Emissions from Construction Permit 082001-017	Boiler Potential Emissions Based On Natural Gas Only
PM	25.0	N/D	0.48
PM <sub>10</sub>	15.0	1.2	1.91
PM <sub>2.5</sub>	10.0	N/D	1.91
SO <sub>x</sub>	40.0	132	0.15
NO <sub>x</sub>	40.0	36.7	25.16
VOC	40.0	0.4	1.38
CO	100.0	9.2	21.14
HAPs	10.0/25.0	0.09	0.48



## EMISSIONS/CONTROLS EVALUATION

The emissions from the reactors were calculated by using a mass balance approach. The reactors will hold a glycerin material, which contains VOCs, and it was assumed that 100% of the VOC emissions were emitted.

The emissions from the totes of phosphoric acid and propionic acid were calculated using EPA's Emission Inventory Improvement Program, Volume II: Chapter 8, Section 4.4, February 2005.

The emissions from the boilers were calculated using EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, "Natural Gas Combustion," July 1998.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Construction Permit 082001-017. Existing actual emissions were taken from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the three 1500 gallon reactors and the totes of phosphoric acid and propionic acid, assuming continuous operation (8760 hours per year).

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions From Previous Permit <sup>a</sup>	Revised Potential Emissions of Boilers	Uncontrolled Potential Emissions of the Application	Controlled Potential Emissions of the Application	New Installation Controlled Potential Emissions
PM	25	N/D	0.48	N/A	N/A	N/D
PM <sub>10</sub>	15	6.25	1.91	N/A	N/A	8.16
PM <sub>2.5</sub>	10	N/D	1.91	N/A	N/A	N/D
SO <sub>x</sub>	40	27.38	0.15	N/A	N/A	27.53
NO <sub>x</sub>	40	59.61	25.16	N/A	N/A	84.77
VOC	40	26.73	1.38	17.68	10.42	38.54
CO	100	14.55	21.14	N/A	N/A	35.69
HAPs	10.0/25.0	N/D	0.48	N/A	N/A	N/D

N/A = Not Applicable; N/D = Not Determined

<sup>a</sup> Existing Potential Emissions are from Construction Permit 082001-017

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

## APPLICABLE REQUIREMENTS

Corbion shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Daronn A. Williams  
New Source Review Unit

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated January 20, 2015, received January 30, 2015, designating Corbion as the owner and operator of the installation.

## APPENDIX A

### Abbreviations and Acronyms

<b>%</b> .....	percent	<b>m/s</b> .....	meters per second
<b>°F</b> .....	degrees Fahrenheit	<b>Mgal</b> .....	1,000 gallons
<b>acfm</b> .....	actual cubic feet per minute	<b>MW</b> .....	megawatt
<b>BACT</b> .....	Best Available Control Technology	<b>MHDR</b> .....	maximum hourly design rate
<b>BMPs</b> .....	Best Management Practices	<b>MMBtu</b> ....	Million British thermal units
<b>Btu</b> .....	British thermal unit	<b>MMCF</b> .....	million cubic feet
<b>CAM</b> .....	Compliance Assurance Monitoring	<b>MSDS</b> .....	Material Safety Data Sheet
<b>CAS</b> .....	Chemical Abstracts Service	<b>NAAQS</b> ...	National Ambient Air Quality Standards
<b>CEMS</b> .....	Continuous Emission Monitor System	<b>NESHAPs</b>	National Emissions Standards for Hazardous Air Pollutants
<b>CFR</b> .....	Code of Federal Regulations	<b>NO<sub>x</sub></b> .....	nitrogen oxides
<b>CO</b> .....	carbon monoxide	<b>NSPS</b> .....	New Source Performance Standards
<b>CO<sub>2</sub></b> .....	carbon dioxide	<b>NSR</b> .....	New Source Review
<b>CO<sub>2e</sub></b> .....	carbon dioxide equivalent	<b>PM</b> .....	particulate matter
<b>COMS</b> .....	Continuous Opacity Monitoring System	<b>PM<sub>2.5</sub></b> .....	particulate matter less than 2.5 microns in aerodynamic diameter
<b>CSR</b> .....	Code of State Regulations	<b>PM<sub>10</sub></b> .....	particulate matter less than 10 microns in aerodynamic diameter
<b>dscf</b> .....	dry standard cubic feet	<b>ppm</b> .....	parts per million
<b>EQ</b> .....	Emission Inventory Questionnaire	<b>PSD</b> .....	Prevention of Significant Deterioration
<b>EP</b> .....	Emission Point	<b>PTE</b> .....	potential to emit
<b>EPA</b> .....	Environmental Protection Agency	<b>RACT</b> .....	Reasonable Available Control Technology
<b>EU</b> .....	Emission Unit	<b>RAL</b> .....	Risk Assessment Level
<b>fps</b> .....	feet per second	<b>SCC</b> .....	Source Classification Code
<b>ft</b> .....	feet	<b>scfm</b> .....	standard cubic feet per minute
<b>GACT</b> .....	Generally Available Control Technology	<b>SDS</b> .....	Safety Data Sheet
<b>GHG</b> .....	Greenhouse Gas	<b>SIC</b> .....	Standard Industrial Classification
<b>gpm</b> .....	gallons per minute	<b>SIP</b> .....	State Implementation Plan
<b>gr</b> .....	grains	<b>SMAL</b> .....	Screening Model Action Levels
<b>GWP</b> .....	Global Warming Potential	<b>SO<sub>x</sub></b> .....	sulfur oxides
<b>HAP</b> .....	Hazardous Air Pollutant	<b>SO<sub>2</sub></b> .....	sulfur dioxide
<b>hr</b> .....	hour	<b>tph</b> .....	tons per hour
<b>hp</b> .....	horsepower	<b>tpy</b> .....	tons per year
<b>lb</b> .....	pound	<b>VMT</b> .....	vehicle miles traveled
<b>lbs/hr</b> .....	pounds per hour	<b>VOC</b> .....	Volatile Organic Compound
<b>MACT</b> .....	Maximum Achievable Control Technology		
<b>µg/m<sup>3</sup></b> .....	micrograms per cubic meter		

Mr. Johan Blonk  
Manager of Operations Development  
Corbion  
13830 Botts Road  
Grandview, MO 64030-2856

RE: New Source Review Permit - Project Number: 2015-02-001

Dear Mr. Blonk:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: [www.ao.mo.gov/ahc](http://www.ao.mo.gov/ahc).

If you have any questions regarding this permit, please do not hesitate to contact Daronn A. Williams, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:dwl

Enclosures

c: Kansas City Regional Office  
PAMS File: 2015-02-001

Permit Number: