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

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.
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.
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\(_x\) 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 rotator. The rotator 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>
<thead>
<tr>
<th>Permit Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0990-003</td>
<td>Installation of ground raw material storage tanks, mixing kettles, pumps, homogenizer, scraped surface heat exchanger, chiller, belt and roller conveyors, and scales</td>
</tr>
<tr>
<td>0896-007</td>
<td>Installation of a 800 hp boiler as a replacement for an existing 500 hp and the modification of a 600 hp boiler</td>
</tr>
<tr>
<td>082001-017</td>
<td>Installation of two boilers: one rated at 25.1 MMBtu/hr and another rated at 33.5 MMBtu/hr</td>
</tr>
</tbody>
</table>
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$_{10}$ 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 SOX potential emissions exceed 100.0 tons per year largely due to the capability to burn diesel fuel with a high SOX 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)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Regulatory De Minimis Levels</th>
<th>Boiler Potential Emissions from Construction Permit 082001-017</th>
<th>Boiler Potential Emissions Based On Natural Gas Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>25.0 N/D</td>
<td>0.48</td>
<td>0.48</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>15.0 1.2</td>
<td></td>
<td>1.91</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>10.0 N/D</td>
<td></td>
<td>1.91</td>
</tr>
<tr>
<td>SOX</td>
<td>40.0 132</td>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td>NOX</td>
<td>40.0 36.7</td>
<td></td>
<td>25.16</td>
</tr>
<tr>
<td>VOC</td>
<td>40.0 0.4</td>
<td></td>
<td>1.38</td>
</tr>
<tr>
<td>CO</td>
<td>100.0 9.2</td>
<td></td>
<td>21.14</td>
</tr>
<tr>
<td>HAPs</td>
<td>10.0/25.0 0.09</td>
<td></td>
<td>0.48</td>
</tr>
</tbody>
</table>
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 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)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>25</td>
<td>N/D</td>
<td>0.48</td>
<td>N/A</td>
<td>N/A</td>
<td>N/D</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>15</td>
<td>6.25</td>
<td>1.91</td>
<td>N/A</td>
<td>N/A</td>
<td>8.16</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>10</td>
<td>N/D</td>
<td>1.91</td>
<td>N/A</td>
<td>N/A</td>
<td>N/D</td>
</tr>
<tr>
<td>SOₓ</td>
<td>40</td>
<td>27.38</td>
<td>0.15</td>
<td>N/A</td>
<td>N/A</td>
<td>27.53</td>
</tr>
<tr>
<td>NOₓ</td>
<td>40</td>
<td>59.61</td>
<td>25.16</td>
<td>N/A</td>
<td>N/A</td>
<td>84.77</td>
</tr>
<tr>
<td>VOC</td>
<td>40</td>
<td>26.73</td>
<td>1.38</td>
<td>17.68</td>
<td>10.42</td>
<td>38.54</td>
</tr>
<tr>
<td>CO</td>
<td>100</td>
<td>14.55</td>
<td>21.14</td>
<td>N/A</td>
<td>N/A</td>
<td>35.69</td>
</tr>
<tr>
<td>HAPs</td>
<td>10.0/25.0</td>
<td>N/D</td>
<td>0.48</td>
<td>N/A</td>
<td>N/A</td>
<td>N/D</td>
</tr>
</tbody>
</table>

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

a 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.

________________________________   _________________________________
Daronn A. Williams                    Date
New Source Review Unit

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

% .......... percent
°F .......... degrees Fahrenheit
acfm ....... actual cubic feet per minute
BACT ..... Best Available Control Technology
BMPs ..... Best Management Practices
Btu........ British thermal unit
CAM ...... Compliance Assurance Monitoring
CAS ........ Chemical Abstracts Service
CEMS ..... Continuous Emission Monitor System
CFR ....... Code of Federal Regulations
CO .......... carbon monoxide
CO₂ ........ carbon dioxide
CO₂e....... carbon dioxide equivalent
COMS ..... Continuous Opacity Monitoring System
CSR ....... Code of State Regulations
dscf ...... dry standard cubic feet
EIQ ........ Emission Inventory Questionnaire
EP ........ Emission Point
EPA ...... Environmental Protection Agency
EU ........ Emission Unit
fps ......... feet per second
ft .......... feet
GACT ..... Generally Available Control Technology
GHG ...... Greenhouse Gas
gpm ........ gallons per minute
gr .......... grains
GWP ...... Global Warming Potential
HAP ........ Hazardous Air Pollutant
hr .......... hour
hp .......... horsepower
lb .......... pound
lbs/hr ...... pounds per hour
MACT ..... Maximum Achievable Control Technology
μg/m³ ...... micrograms per cubic meter
m/s ........ meters per second
Mgal ...... 1,000 gallons
MW ........ megawatt
MHDR...... maximum hourly design rate
MMBtu ..... Million British thermal units
MMCF ..... million cubic feet
MSDS ..... Material Safety Data Sheet
NAAQS ... National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NOₓ ........ nitrogen oxides
NSPS ...... New Source Performance Standards
NSR ....... New Source Review
PM .......... particulate matter
PM₁₀...... particulate matter less than 10 microns in aerodynamic diameter
PM₂.₅ ...... particulate matter less than 2.5 microns in aerodynamic diameter
ppm ...... parts per million
PSD ........ Prevention of Significant Deterioration
PTE.......... potential to emit
RACT ...... Reasonable Available Control Technology
RAL ....... Risk Assessment Level
SCC .......... Source Classification Code
scfm ....... standard cubic feet per minute
SDS .......... Safety Data Sheet
SIC ........ Standard Industrial Classification
SIP .......... State Implementation Plan
SMAL ..... Screening Model Action Levels
SO₂ ........ sulfur oxides
SOₓ ......... sulfur oxides
tph .......... tons per hour
tpy .......... tons per year
VMT ...... vehicle miles traveled
VOC .......... Volatile Organic Compound
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.oa.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: