STATE OF MISSOURI

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: 022014-007  Project Number: 2013-12-010
Installation Number: 019-0069
Parent Company: Quaker Manufacturing, LLC
Parent Company Address: 555 W. Monroe, Suite 13-03, Chicago, IL 60661-4714
Installation Name: Quaker Manufacturing, LLC
Installation Address: 4501 N Route B, Columbia, MO 65202
Location Information: Boone County, S28, T49N, R12W

Application for Authority to Construct was made for:

Addition of RCM Mini Line 5 (EP-6I) and modification of four existing RCM Mini Lines (EP-6A through EP-6D). This review was conducted in accordance with Section (6), 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.

FEB 20 2014

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 startup 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 startup 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.”

Quaker Manufacturing, LLC
Boone County, S28, T49N, R12W

1. Superseding Condition
   A. The conditions of this permit supersede Special Condition 1 in construction permit 092010-110 issued by the Air Pollution Control Program.

2. VOC Emission Limitation
   A. Quaker Manufacturing, LLC shall emit less than 250.0 tons of VOC in any consecutive 12-month period from the entire installation as defined in Table 1.

Table 1: Installation VOC Emission Points

<table>
<thead>
<tr>
<th>Emission Point</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP-01</td>
<td>Fulton boiler natural gas combustion</td>
</tr>
<tr>
<td>EP-02A, EP-02B</td>
<td>Line 1 and 2 mini cake liquid flavoring Line 1 and 2 mini cake natural gas combustion</td>
</tr>
<tr>
<td>EP-03</td>
<td>Water heaters natural gas combustion</td>
</tr>
<tr>
<td>EP-04</td>
<td>Make up air natural gas combustion</td>
</tr>
<tr>
<td>EP-05</td>
<td>Space heater natural gas combustion</td>
</tr>
<tr>
<td>EP-07</td>
<td>Parts washer</td>
</tr>
<tr>
<td>EP-08</td>
<td>Dehumidifier natural gas combustion</td>
</tr>
<tr>
<td>EP-09</td>
<td>HVAC natural gas combustion</td>
</tr>
</tbody>
</table>

B. Attachment A or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 2.A.

3. PM$_{2.5}$ Emission Limitation
   A. Quaker Manufacturing, LLC shall emit less than 19.81 tons of PM$_{2.5}$ in any consecutive 12-month period from the project as defined in Table 2.
SPECIAL CONDITIONS:
The permittee is authorized to construct and operate subject to the following special conditions:

Table 2: Project PM$_{2.5}$ Emission Points

<table>
<thead>
<tr>
<th>Emission Point</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP-6A, 6B, 6C, 6D, 6I</td>
<td>Mini cake line hoods</td>
</tr>
<tr>
<td>EP-10A, 10B, 10C, 10D</td>
<td>Room exhaust</td>
</tr>
<tr>
<td>EP-11</td>
<td>Grain receiving</td>
</tr>
<tr>
<td>EP-12</td>
<td>Paved haul roads</td>
</tr>
<tr>
<td>EP-13</td>
<td>Dry flavoring handling</td>
</tr>
</tbody>
</table>

B. Attachment B or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 3.A.

4. Capture Device Requirement – Hood
A. Quaker Manufacturing, LLC shall capture emissions from Rice Cake Machine (RCM) Mini Line 5 using hood(s).

B. Quaker Manufacturing, LLC shall minimize cross drafts by locating the emissions source and the hood(s) inside a building with four sides and a roof.

C. Quaker Manufacturing, LLC shall design and construct each hood according to the specifications of the existing RCM Mini Line 1 and 2 hoods. Design records shall be kept on site.

A. Quaker Manufacturing, LLC shall control emissions from the RCM Mini Lines using filters of at least two plies.

B. The filters shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources’ employees may easily observe them.

C. Quaker Manufacturing, LLC shall develop a written standard operating procedure to monitor pressure drop and filter condition. Normal operation and replacement parameters shall be indicated. The standard operating procedure shall be kept on site.
SPECIAL CONDITIONS:
The permittee is authorized to construct and operate subject to the following special conditions:

D. Quaker Manufacturing, LLC shall operate the filters according to the standard operating procedure. The operating pressure drop shall be maintained within the specifications of the standard operating procedure.

E. Replacement filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

F. Quaker Manufacturing, LLC shall maintain an operating and maintenance log for the filters 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.

6. Operational Requirement – Liquid Flavorings
Quaker Manufacturing, LLC shall keep the liquid flavorings in sealed containers whenever the materials are not in use. Quaker Manufacturing, LLC shall provide and maintain suitable, easily read, permanent markings on all liquid flavorings used with this equipment.

A. Before using an alternative flavoring at EP-02A or EP-02B Mini Cake Flavoring that differs from a material listed in Table 3, Quaker Manufacturing, LLC shall calculate the potential VOC emissions from the alternative flavoring.

<table>
<thead>
<tr>
<th>Table 3: Project VOC Flavorings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavor</td>
</tr>
<tr>
<td>Givaudan Apple Cinnamon 344215</td>
</tr>
<tr>
<td>Givaudan Caramel XO-868-948-7</td>
</tr>
<tr>
<td>Givaudan Brown Sugar 676138</td>
</tr>
</tbody>
</table>

B. Quaker Manufacturing, LLC shall seek approval from the Air Pollution Control Program New Source Review Unit before use of the alternative flavoring if the VOC emissions from the alternative flavoring exceed 266.90 tpy.

C. Attachment C or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to show compliance with Special Condition 7.A. and 7.B.
SPECIAL CONDITIONS:

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

8. Record Keeping and Reporting Requirements
   A. Quaker Manufacturing, LLC 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 MSDS for all materials used.

   B. Quaker Manufacturing, LLC shall report to the Air Pollution Control Program’s Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.
REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW
Project Number: 2013-12-010
Installation ID Number: 019-0069
Permit Number:

Quaker Manufacturing, LLC
4501 N Route B
Columbia, MO 65202

Complete: December 10, 2013

Parent Company:
Quaker Manufacturing, LLC
555 W. Monroe, Suite 13-03
Chicago, IL 60661-4714

Boone County, S28, T49N, R12W

REVIEW SUMMARY


- HAP emissions are not expected from the project emission units.

- None of the New Source Performance Standards (NSPS) under 40 CFR 60 apply to project emission units.

- None of the NESHAPs under 40 CFR 61 apply to the project emission units.

- None of the MACTs under 40 CFR 63 apply to the project emission units.

- Exhaust filters are being used to control PM, PM$_{10}$, and PM$_{2.5}$ emissions from the RCM Mini Lines.

- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of PM$_{2.5}$ from the project are conditioned to a de minimis increase. Potential emissions of VOC from the installation are conditioned below the NSR major source level.

- This installation is located in Boone County, an attainment area 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 PM$_{10}$ and PM$_{2.5}$ from the project are de minimis. Although potential VOC emissions exceed de minimis, no model is readily available which can accurately predict ambient ozone concentrations caused by this installation's VOC emissions.

• Emission testing is not required for the equipment.

• Submittal of an application to amend the intermediate operating permit is required for this installation within 90 days of equipment startup.

• Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Quaker Manufacturing, LLC processes raw corn and rice cereal grain into cakes using rice cake machines (RCM). The rice cakes are then coated with liquid flavoring, baked, cooled, and packaged before being shipped. The installation is a minor VOC, PM$_{10}$ and PM$_{2.5}$ source under construction permits and an intermediate VOC source under operating permits. The following NSR permits have been issued to Quaker Manufacturing, LLC from the Air Pollution Control Program.

Table 4: Permit History

<table>
<thead>
<tr>
<th>Permit Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1294-002</td>
<td>Rice cake production installation</td>
</tr>
<tr>
<td>0596-005</td>
<td>Natural gas fired ovens, remove throughput limit</td>
</tr>
<tr>
<td>0596-005A</td>
<td>VOC emissions from flavorings</td>
</tr>
<tr>
<td>092010-110</td>
<td>Production increase by adding RCM heads; incorporate PM$_{10}$ stack test</td>
</tr>
</tbody>
</table>

PROJECT DESCRIPTION

Quaker Manufacturing, LLC proposes to install a new RCM mini cake line and increase throughput on four existing RCM mini cake lines. The new line will be equipped with hoods routed to exhaust filters (EP-6I), while the new general room exhaust (EP-10D) is not equipped with a control device. The new line will apply dry, non-VOC flavoring. The line is physically unable to apply VOC flavoring at this time. To apply VOC flavoring to the rice cakes produced on RCM Mini Line 5, Quaker would need to install liquid flavoring equipment and a curing oven. The new line will be fed using a new grain tempering, pneumatic transfer, and bin system, similar in design to the existing lines’ system. Existing ovens will be used to bake the formed cakes.

Existing mini cake lines will be modified by allowing each head (2 per RCM) to manufacture one additional cake (from 7 to 8) per cycle. Corresponding with increased mini cake production, the existing lines will see an increase in potential liquid VOC flavoring usage. Existing flavorings will be used, and new liquid flavorings were not evaluated for this project. The four existing lines will continue to be controlled by existing hoods and filters (EP-6A through EP-6D), while general room exhaust (EP-10A through EP-10C) remains uncontrolled. Natural gas MHDR at the existing ovens will not increase. A summary of the lines’ capability is provided in Table 5 and Table 6.
Mini cake mass will remain unchanged at 1.35 grams.

Table 5: Existing Mini Cake Production

<table>
<thead>
<tr>
<th>Emission Point</th>
<th>Description</th>
<th>Existing Mini RCM</th>
<th>Existing Production (cakes/RCM)</th>
<th>Cycle Time (sec)</th>
<th>Existing MHDR (lb/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A</td>
<td>RCM Mini Line 1 East Hood</td>
<td>30</td>
<td>14</td>
<td>5.3</td>
<td>849.07</td>
</tr>
<tr>
<td>6B</td>
<td>RCM Mini Line 1 West Hood</td>
<td>30</td>
<td>14</td>
<td>5.3</td>
<td>849.07</td>
</tr>
<tr>
<td>6C</td>
<td>RCM Mini Line 2 East Hood</td>
<td>30</td>
<td>14</td>
<td>5.3</td>
<td>849.07</td>
</tr>
<tr>
<td>6D</td>
<td>RCM Mini Line 2 West Hood</td>
<td>30</td>
<td>14</td>
<td>5.3</td>
<td>849.07</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>120</td>
<td></td>
<td></td>
<td>3,396.28</td>
</tr>
</tbody>
</table>

Table 6: Proposed Mini Cake Production

<table>
<thead>
<tr>
<th>Emission Point</th>
<th>Description</th>
<th>Proposed RCM</th>
<th>Proposed Production (cakes/RCM)</th>
<th>Cycle Time (sec)</th>
<th>Proposed MHDR (lb/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A</td>
<td>RCM Mini Line 1 East Hood</td>
<td>30</td>
<td>16</td>
<td>5.3</td>
<td>970.37</td>
</tr>
<tr>
<td>6B</td>
<td>RCM Mini Line 1 West Hood</td>
<td>32</td>
<td>16</td>
<td>5.3</td>
<td>1,035.06</td>
</tr>
<tr>
<td>6C</td>
<td>RCM Mini Line 2 East Hood</td>
<td>32</td>
<td>16</td>
<td>5.3</td>
<td>1,035.06</td>
</tr>
<tr>
<td>6D</td>
<td>RCM Mini Line 2 West Hood</td>
<td>32</td>
<td>16</td>
<td>5.3</td>
<td>1,035.06</td>
</tr>
<tr>
<td>6I</td>
<td>RCM Mini Line 5 Hood</td>
<td>33</td>
<td>16</td>
<td>7</td>
<td>808.18</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>159</td>
<td></td>
<td></td>
<td>4,883.72</td>
</tr>
</tbody>
</table>

EMISSIONS/CONTROLS EVALUATION

The emission factors used to calculate the potential emissions increase from grain transfer, popping, rice cake forming, and ovens were obtained from PM\textsubscript{10} emission testing performed at the installation on March 17-18, 2010. The factors were used to calculate the increase at the modified lines and the potential emissions of the new line. The new line’s construction and operation will be similar to the existing tested lines, therefore no new testing is required. Also, the modified lines will be similar to the existing lines, therefore no new testing is required. The hood and filter capture and control efficiency were not calculated for this project as the construction and operation of the new/modified lines and control devices will be similar to the existing tested lines. PM and PM\textsubscript{2.5} emission factors were assumed the same as PM\textsubscript{10}.

The emission factors used to calculate the grain receiving emissions were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 9.9.1, *Grain Elevators & Processes*, May 2003. Grain receiving was previously not included in the installation’s potential emissions, therefore this project conservatively included the total grain receiving calculated from the mini and large cake MHDR. Grain is received in one ton super sacks, and the hopper bottom truck emission factors were used. There are no add-on emission control devices.

The emission factors used to calculate the new dry flavoring handling were obtained from AP-42, Section 11.12, *Concrete Batching*, June 2006. The emission factors for uncontrolled pneumatic cement loading were selected. AP-42 does not contain a PM\textsubscript{2.5} emission factor for this process, but cement particle size distribution averages 25% as 2.5 microns or smaller. Therefore the PM emission factor was multiplied by 25% to obtain the PM\textsubscript{2.5} emission factor. Emissions were calculated using a flavoring
application rate provided by the installation, and the conservative assumption that dry flavoring could be applied to all mini cakes. This allows greater production flexibility without the need for a future permitting determination to use dry flavoring on all mini cakes, as long as the cake MHDR doesn't increase above the amount in Table 6. The conservative assumption results in flavoring PM$_{2.5}$ emissions of only 0.03 tpy.

Potential emissions from receiving raw material and shipping product were calculated using AP-42, Section 13.2.1, *Paved Roads*, January 2011. Haul roads were not previously included in the installation's potential emissions, therefore this project conservatively included the total haul roads. The result is 0.01 tpy of PM$_{2.5}$.

The increase in potential VOC emissions from liquid flavoring at the existing mini lines was calculated using mass balance. There are no VOC control devices. The VOC content of each of three flavorings was calculated based upon the respective maximum weight range of each ingredient list on the MSDS. The manufacturer provided VOC content was not used as it was not consistent with the VOC definition. The highest VOC content of 89 weight % was conservatively used for all production, therefore there are no individual limits on different liquid flavorings. Using potential emissions minus baseline actual emissions, the project VOC potential emissions are 246.44 tpy. The potentials themselves are 266.90 tpy. Baseline actual VOC emissions from the mini line flavoring were obtained from the installation's 2011-2012 EIQ. New flavorings being considered after this permit’s issuance may be allowed per Special Condition 7.

The following table provides an emissions summary for this project. Existing potential emissions were cited from operating permit OP2011-012. Existing actual emissions were cited from the installation’s 2012 EIQ. As the project involves new emission units, an increase at existing units, and the unconditioned project PM$_{2.5}$ potential emissions exceed de minimis, the project emission limit was set as a de minimis increase above baseline actual emissions of the existing/modified units. Baseline actual PM$_{2.5}$ emissions from the mini line ovens, RCM hoods, and room exhaust were obtained from the installation’s 2011-2012 EIQ. Baseline actual PM$_{2.5}$ emissions for these units is 9.81 tpy. The project PM$_{2.5}$ emission limit is therefore 19.81 tpy. Unconditioned PM and PM$_{10}$ emissions were 13.98 and 13.31 tpy, less than de minimis respectively. The new installation conditioned potential represents the restatement of the 250 tpy VOC limit upon the newly defined installation to remain a NSR minor VOC source.
Table 7: Emissions Summary (tpy)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>25.0</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>N/A</td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>15.0</td>
<td>21.65</td>
<td>15.50</td>
<td>N/D</td>
<td>N/A</td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>10.0</td>
<td>15.45</td>
<td>15.50</td>
<td>&lt; 19.81</td>
<td>N/A</td>
</tr>
<tr>
<td>SO\textsubscript{x}</td>
<td>40.0</td>
<td>0.22</td>
<td>6.4E-03</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>NO\textsubscript{x}</td>
<td>40.0</td>
<td>36.38</td>
<td>1.09</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>VOC</td>
<td>40.0</td>
<td>1&lt; 250.0</td>
<td>49.43</td>
<td>246.44</td>
<td>1&lt; 250.0</td>
</tr>
<tr>
<td>CO</td>
<td>100.0</td>
<td>30.57</td>
<td>0.92</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>GHG (CO\textsubscript{2}e)</td>
<td>75,000 / 100,000</td>
<td>27,130.74</td>
<td>N/D</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>GHG (mass)</td>
<td>0.0 / 100.0 / 250.0</td>
<td>N/D</td>
<td>N/D</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>HAPs</td>
<td>10.0 / 25.0</td>
<td>0.65</td>
<td>0.02</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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

1 The installation VOC emissions are limited to less than 100.0 tons in operating permit OP2011-012 to avoid being a major source for operating permit applicability. The limit will need to be restated in an operating permit in order to remain an intermediate VOC source.

2 Actual PM\textsubscript{2.5} exceeds potential PM\textsubscript{2.5} because the EIQ conservatively assumed all PM\textsubscript{10} as PM\textsubscript{2.5}, whereas the operating permit did not.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of PM\textsubscript{2.5} from the project are conditioned to a de minimis increase. Potential emissions of VOC from the installation are conditioned below the NSR major source level.

APPLICABLE REQUIREMENTS

Quaker Manufacturing, LLC 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. For a complete list of applicable requirements for your installation, please consult your operating permit.

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

SPECIFIC REQUIREMENTS
• Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400 applies to EP-6A through EP-6D and EP-6I. These points emit PM potentially exceeding 0.5 lb/hr. The filters’ control efficiency has not been determined. The emission points are in compliance according to (3)(A)1.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, Construction Permits Required, I recommend this permit be granted with special conditions.

David Little
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

• The Application for Authority to Construct form, dated December 6, 2013, received December 10, 2013, designating Quaker Manufacturing, LLC as the owner and operator of the installation.

**Attachment A – Installation-Wide VOC Compliance Worksheet**

Quaker Manufacturing, LLC  
Boone County  
Project: 2013-12-010  
Facility ID: 019-0069  
Permit:  

This sheet covers the month of ______________ in the year ______________. Copy this sheet as needed.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission Point ID, Description</td>
<td>Material (Manufacturer, Product Name)</td>
<td>Material Usage (gal)</td>
<td>Density (lb/gal)</td>
<td>VOC Content (Weight %)</td>
<td>VOC Emissions (tons)</td>
</tr>
<tr>
<td>G</td>
<td>H</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Gas Usage (100 cf)</td>
<td>Natural Gas Combustion VOC Emission Factor (lb/mmcf)</td>
<td>VOC Emissions (tons)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**A.** Record the emission point and description where the material was used.  
**B.** Record the material name.  
**C.** Record the material usage. Convert all usage to gallons. The usage for the parts washer is the difference between the purchased solvent and reclaimed solvent.  
**D.** Record the material density.  
**E.** Record the material’s VOC weight %.  
**F.** Calculate the VOC emissions. F = C x D x E x 0.0005. Avoid rounding to zero by recording the value using scientific notation.  
**G.** Record the natural gas usage per 100 cubic feet.  
**H.** VOC emission factor from the EPA document AP-42 Chapter 1.4 *Natural Gas Combustion.*  
**I.** Calculate the VOC emissions from natural gas combustion. I = G x H x 5E-08. Record the value using scientific notation.  
**J.** Calculate the VOC emissions for this month by summing all (F) and (I). Also record this value on Attachment A-1 column B.
### Attachment A-1 – Installation-Wide VOC Compliance Worksheet

**Quaker Manufacturing, LLC**  
Boone County  
**Project: 2013-12-010**  
**Facility ID: 019-0069**  
**Permit:**

This sheet covers the period of **(month, year)** to **(month, year)**. Copy this sheet as needed.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Month, Year</strong></td>
<td><strong>VOC Emissions (tons)</strong></td>
<td><strong>Previous Month's 12-Month VOC Emissions (E) (tons)</strong></td>
<td><strong>Previous Year's VOC Emissions from this Month (B) (tons)</strong></td>
<td><strong>12-Month VOC Emissions (tons)</strong></td>
</tr>
<tr>
<td>Example May 2014</td>
<td>0.21</td>
<td>2.76</td>
<td>0.14</td>
<td>2.83</td>
</tr>
<tr>
<td>Example June 2014</td>
<td>0.18</td>
<td>2.83</td>
<td>0.22</td>
<td>2.79</td>
</tr>
<tr>
<td>Example July 2014</td>
<td>0.17</td>
<td>2.79</td>
<td>0.19</td>
<td>2.77</td>
</tr>
</tbody>
</table>

A. Record the current month and year.
B. VOC emissions from the current month’s Attachment A, column J.
C. Record the 12-month VOC emissions, E, from last month’s Attachment A-1.
D. Record the VOC emissions, B, from this month in the previous year’s Attachment A-1.
E. Calculate the new 12-month VOC emissions. \( E = B + C - D \). A value less than 250.0 tons indicates compliance.
### Attachment B – Project PM$_{2.5}$ Compliance Worksheet

Quaker Manufacturing, LLC  
Boone County  
Project: 2013-12-010  
Facility ID: 019-0069  
Permit: __________

This sheet covers the period of _______ to _______. Copy this sheet as needed.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Month, Year</strong></td>
<td><strong>Grain Received (tons)</strong></td>
<td><strong>Grain Receiving Emission Factor (lb/ton)</strong></td>
<td><strong>Mini Cakes Produced (tons)</strong></td>
<td><strong>Mini Line Hood, Room Exhaust, Oven, and Haul Road Composite Emission Factor (lb/ton)</strong></td>
<td><strong>Dry Flavoring Received (tons)</strong></td>
<td><strong>Dry Flavoring Emission Factor (lb/ton)</strong></td>
<td><strong>PM$_{2.5}$ Emissions (tons)</strong></td>
<td><strong>Previous Month's 12-Month PM$_{2.5}$ Emissions (K)</strong></td>
<td><strong>Previous Year's PM$_{2.5}$ Emissions from this Month (H)</strong></td>
<td><strong>12-Month PM$_{2.5}$ Emissions (tons)</strong></td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>160.81</td>
<td>0.0013</td>
<td>200.37</td>
<td>1.7197</td>
<td>5.94</td>
<td>0.1825</td>
<td>0.17</td>
<td>2.18</td>
<td>0.14</td>
<td>2.21</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>185.45</td>
<td>0.0013</td>
<td>211.89</td>
<td>1.7197</td>
<td>6.52</td>
<td>0.1825</td>
<td>0.18</td>
<td>2.21</td>
<td>0.19</td>
<td>2.20</td>
</tr>
</tbody>
</table>

A. Record the current month and year.  
B. Record the amount grain received this month.  
C. Grain receiving emission factor from AP-42, Section 9.9.1, *Grain Elevators and Processes*, hopper bottom receiving.  
D. Record the amount of mini cakes produced this month.  
E. Composite emission factor, summation of 1.1343, 0.5302, 0.0543, and 0.0009 lb/ton of cakes respectively.  
F. Record the amount of dry flavoring received this month.  
G. Dry flavoring emission factor from AP-42, Section 11.12, *Concrete Batching*, uncontrolled cement transfer.  
H. Calculate the PM$_{2.5}$ emissions.  $H = \frac{(B \times C + D \times E + F \times G)}{2,000}$  
I. Record the 12-month PM$_{2.5}$ emissions from the previous month.  
J. Record this month's PM$_{2.5}$ emissions from the same month last year.  
K. Calculate the 12-month PM$_{2.5}$ emissions.  $K = H - I$. A value less than 19.81 tons indicates compliance.

Quaker Manufacturing, LLC  
Boone County  
Project: 2013-12-010  
Facility ID: 019-0069  
Permit: __________

Date ___________ Copy this sheet as needed.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavor Name</td>
<td>Flavoring Rate (lb/1,000 cakes)</td>
<td>Cake MHDR (1,000 cakes/hr)</td>
<td>Flavored Rate (lb/hr)</td>
<td>Flavored VOC (weight %)</td>
<td>Flavored VOC PTE (tpy)</td>
</tr>
<tr>
<td>(Example) ABC Brand, Flavor XYZ</td>
<td>0.05</td>
<td>1,369.36</td>
<td>68.47</td>
<td>36.61%</td>
<td>109.79</td>
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<td></td>
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<td>1,369.36</td>
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<td>1,369.36</td>
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</tbody>
</table>

A. Record the new flavor name.  
B. Record the flavoring application rate.  
C. Mini Cake MHDR total from lines EP-6A through EP-6D. If the MHDR will exceed this value seek approval from the Air Pollution Control Program New Source Review Unit before using this flavoring.  
D. Calculate the flavoring rate.  D = B x C  
E. Record or calculate the flavoring’s VOC content using the sum of the maximum individual VOC ingredient weight % from the MSDS.  
F. Calculate the flavoring VOC PTE.  F = D x E x 8,760 / 2,000. Seek approval from the Air Pollution Control Program New Source Review Unit if the VOC PTE exceeds 266.90 tpy.
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
SIC ...... Standard Industrial Classification
SIP ...... State Implementation Plan
SMAL .... Screening Model Action Levels
SOₓ ........ sulfur oxides
SO₂ ....... sulfur dioxide
tph .......... tons per hour
tpy .......... tons per year
VMT ...... vehicle miles traveled
VOC ...... Volatile Organic Compound
Mr. Ray Patterson  
HSE Manager  
Quaker Manufacturing, LLC  
4501 N Route B  
Columbia, MO 65202  

RE: New Source Review Permit - Project Number: 2013-12-010  

Dear Mr. Patterson:  

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 have any questions regarding this permit, please do not hesitate to contact David Little, at the Department of Natural Resources’ Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief  

SH:dlk  

Enclosures  

c: Northeast Regional Office  
PAMS File: 2013-12-010