

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: **07 2 0 1 2 - 0 0 2**

Project Number: 2011-09-055
Installation Number: 021-0109

Parent Company: Sara Lee Foods

Parent Company Address: 3500 Lacey Road, Downers Grove, IL 60515

Installation Name: Sara Lee Foods

Installation Address: 5807 Mitchell Avenue, St. Joseph, MO 64507

Location Information: Buchanan County, S18, T57N, R34W

Application for Authority to Construct was made for:

The installation of a 7,000 pounds per hour (lbs/hr) continuous cooker and two 10.2 million British Thermal Units per hour (MMBtu/hr) boiler. 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.

JUL 06 2012

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 Departments' 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

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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."

Sara Lee Foods
Buchanan County, S18, T57N, R34W

1. **Restriction of Odors**
If a continued situation of demonstrated nuisance odor exists in violation of Missouri State Rules 10 CSR 10-6.165, *Restriction of Emission of Odors*, the Director may require that Sara Lee Foods submit a corrective action plan within ten (10) days adequate to timely and significantly mitigate the odors. Sara Lee Foods shall implement any such plan immediately upon its approval by the director. Failure to either submit or implement such a plan shall be in violation of this permit.

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

Project Number: 2011-09-055
Installation ID Number: 021-0109
Permit Number:

Sara Lee Foods
5807 Mitchell Avenue
St. Joseph, MO 64507

Complete: April 17, 2012

Parent Company:
Sara Lee Foods
3500 Lacey Road
St. Joseph, MO 64507

Buchanan County, S18, T57N, R34W

REVIEW SUMMARY

- Sara Lee Foods has applied for authority to construct a 7,000 pounds per hour (lbs/hr) continuous cooker and two 10.2 million British Thermal Units per hour (MMBtu/hr) boilers.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. The HAPs of concern from this process are acetaldehyde, acrolein, formaldehyde and phenol.
- 40 CFR 60, Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units," of the New Source Performance Standards (NSPS) applies to the boilers.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACTT) Regulations apply to the proposed equipment.
- 40 CFR Part 63, Subpart JJJJJJ, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers - Area Sources," of the Maximum Achievable Control Technology (MACT) Regulations does not apply to the boilers because the boilers can be defined as a gas-fired boiler under this subpart.
- 40 CFR Part 63, Subpart DDDDD, "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters," of the Maximum Achievable Control Technology (MACT) Standards does not apply to the boilers because this facility is not a major source for HAPs.

- No air pollution control equipment is being used in association with the new equipment.
- 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 the *de minimis* levels.
- This installation is located in Buchanan 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 performed to determine the ambient impact of phenol.
- Emissions testing is not required for the equipment.
- A modification to the facility's Basic Operating Permit is required within 30 days after equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Sara Lee Foods - St. Joseph Facility is an existing installation located in Buchanan County that prepares a variety of processed meats. Some of the processed meats are smoked. The installation currently has nine batch smoked meat houses, three liquid continuous smokehouses, one natural continuous smokehouse, four natural gas fired boilers, a thermal oil heater, three water heaters, and two emergency generators.

The plant is a minor source for construction permits and received a Basic Operating Permit renewal in April, 2010. The following construction permits have been issued to Sara Lee Foods from the Air Pollution Control Program.

Table 1: Construction Permit History

Permit Number	Description
012000-009	New meat processing installation
072001-010	New smokehouses
072001-010A	Additional smokehouses
092004-010	New 12.1 MMBtu/hr dual-fueled boiler, a 6.0 MMBtu/hr dual-fueled boiler, a 100 MMBtu/hr dual-fueled boiler and a continuous liquid smokehouse
092006-010	Addition of liquid smoke capability to oven CS3
092007-006	Installation of two demand water heaters

PROJECT DESCRIPTION

Sara Lee Foods has applied for authority to construct a continuous cooker (EP-CS5) and two boilers (EP-B6 and EP-B7). The continuous cooker has a maximum hourly design rate of 7,000 lbs/hr. The cooker will use no more than 6.6 gallons per hour (gal/hr) of liquid smoke diluted with water to approximately 20 gal/hr. The usage of smoke will depend on the size of the product being prepared. The 6.6 gal/hr usage is based on producing cocktail wieners, which has the highest usage.

The boilers are identical Fulton oil system thermal boilers with a maximum design rate of 10.2 MMBtu/hr each. The boilers utilize natural gas as fuel with propane as emergency backup fuel. The continuous cooker consists of three ovens: Two identical CFS CookStar Ovens model 600-75-140 and one CFS CookStar model 1000/12-75. First, meat product is partially cooked in the first oven (600-75-140). Then the liquid smoke will be applied via a liquid bath. The product will then enter the second oven (600-75-140) for cooking before the third oven (1000/12-75) cooks the product to final temperature. The heat from the ovens is supplied by steam or oil from the boilers. There will be no control devices used to control emissions from the process.

EMISSIONS/CONTROLS EVALUATION

Combustion emissions from the boilers were calculated using emission factors from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion*, (11/98) and Section 1.5, *Liquefied Petroleum Gas Combustion*, (11/08). Because the boilers can use both natural gas and propane (liquefied petroleum gas), the higher emission factors between the two types of fuels were used.

Particulate, VOC and phenol (a HAP) emissions from the use of the liquid smoke were calculated using stack test data from a test performed in March, 2005 on another smoker unit (CS4) at the site. All of the particulates were considered particulate matter less than two-and-a-half microns in diameter (PM_{2.5}) and particulate matter less than ten microns in diameter (PM₁₀). The 2005 performance tests were based on 2.5 gallons of liquid smoke per hour and the emissions were scaled up to reflect the actual 6.6 gallons of liquid smoke used.

The unit tested in 2005 used an atomizing process where the liquid smoke is misted over the product. However, the smoker for the current project uses a drenching process where the product passes through a bath of liquid smoke. For VOCs, stack testing performed by the supplier of the smoke (Red Arrow Products, LLC) in 2003 shows that higher emissions are expected from the atomizing process. Therefore, using the VOC emissions rate from the 2005 stack test is expected to give conservative estimate of VOC emissions from this project. The VOC emissions results from the 2005 stack tests were reported "as carbon," and the emission rates were multiplied by a factor of 1.22 to change this to an "as propane" basis for use in the calculations. Because there are no VOC speciation profiles available for this process, using an "as propane" emission factor should give a reasonable estimate of emissions. Red Arrow Products, LLC did not test for phenols in its stack test but because phenols are also VOCs, it was assumed that using the emissions data from the 2005 stack test should give a conservative estimate of emissions.

For the particulates, the 2003 stack test performed by Red Arrow Products, LLC shows that emissions will be higher for a drenching process at a ratio of 1.2. The particulate emissions for this project were calculated by multiplying the results from the 2005 stack test by the same ratio.

Acetaldehyde, acrolein and formaldehyde were not tested during the 2005 stack test so the emission factors for these HAPs were derived from testing performed for a plant (Hillshire Farm and Kahn's) in Kentucky. Emission factors for these pollutants could not be taken directly from the Kentucky test because the application rate of the liquid smoke was not recorded. However, steady state operation of the equipment during testing was verified and the ratios of each HAP to total VOC were calculated. Emissions of these HAPs were calculated by multiplying the VOC emissions by the ratios. Emissions of polycyclic organic matter (POM) and heavy metal HAPs (including lead, arsenic, cadmium and mercury) were calculated using mass balances assuming that 100% are emitted. The POM and heavy metal HAPs contents were obtained from Red Arrow Products, LLC.

Emissions of all HAPs, except phenols, were insignificant compared with their respective Screen Modeling Action Levels (SMAL). For phenols, modeling was performed to determine its ambient impact and the results were compared with the significance levels (SL) of the Risk Assessment Levels (RAL). Results show that at the maximum design rate, the ambient impacts of phenols for the 24-hour and annual averaging periods are below the SL for their respective RAL and therefore, no further analysis is needed.

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year.) The following table provides an emissions summary for this project. The existing potential emissions were taken from the previous permit (no. 092007-006) issued to the installation. The existing actual emissions were taken from the 2011 Emissions Inventory Questionnaire (EIQ).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels/SMAL	Existing Potential Emissions	Existing Actual Emissions (2010 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/D	2.45	5.33	N/A
PM ₁₀	15.0	47.45	2.45	5.33	N/A
PM	25.0	N/D	N/D	5.33	N/A
SO _x	40.0	1.06	0.08	1.46	N/A
NO _x	40.0	74.14	13.51	12.69	N/A
VOC	40.0	72.53	14.05	22.60	N/A
CO	100.0	58.69	11.67	7.36	N/A
GHG Mass	0/100/250	N/D	N/D	12,206.75	N/A
CO ₂ e	75,000/100,000	N/D	N/D	12,210.66	N/A
HAPs	10.0/25.0	6.89	N/D	1.53	N/A
Phenols	0.1	N/D	N/D	0.59	N/A
Acrolein	0.4	N/D	N/D	0.007	N/A
Formaldehyde	2.0	N/D	N/D	0.72	N/A
Acetaldehyde	9.0	N/D	N/D	0.05	N/A
POM	0.1	N/D	N/D	8.23 x 10 ⁻⁶	N/A

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

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 less than their *de minimis* levels.

APPLICABLE REQUIREMENTS

Sara Lee Foods 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

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Dc

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed on phenols using the Environmental Protection Agency (EPA) modeling software AERSCREEN. After the liquid smoke is applied, two ovens (one CFS 600-75-140 and one 1000/12/-75) will finish the cooking process. Each oven has two identical stacks. Emissions were modeled as if all of the phenol emissions were emitted from one of the two stacks. The stack parameters used are given below.

Table 3: Stack Parameters

Stack No.	Height (ft)	Diameter (in)	Temperature (°F)	Flowrate (ft/s)
1	47	11.76	392	46.4
2	47	16.56	392	46.4

The modeling results show that the ambient impact will be less than SL, which is 4% of the RAL. Therefore, no more action is necessary. If the ambient impact had been greater than the SL, the facility would have had to model the entire facility for phenols.

Table 4: Ambient Impact Results

Stack No.	Modeled Impact	RAL ($\mu\text{g}/\text{m}^3$)	SL ($\mu\text{g}/\text{m}^3$)	Time Period
1	0.86	45	1.8	24-hour
1	0.15	9.5	0.38	Annual
2	0.71	45	1.8	24-hour
2	0.12	9.5	0.38	Annual

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.

Chia-Wei Young
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 19, 2011, received September 22, 2011, designating Sara Lee Foods as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Kansas City Regional Office Site Survey, dated October 14, 2011.

Mr. Brent Bliss
Plant Manager
Sara Lee Foods
5807 Mitchell Avenue
St. Joseph, MO 64507

RE: New Source Review Permit - Project Number: 2011-09-055

Dear Mr. Bliss:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, 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 Chia-Wei Young at the department's 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:cyl

Enclosures

c: Kansas City Regional Office
PAMS File: 2011-09-055

Permit Number