Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Conditional Major, Operating
Permit: F-25-022
Sister Schubert's Homemade Rolls, Inc.
900 Top Quality Drive
Horse Cave, KY 42749

July 16, 2025
Ossama Ateyeh, Reviewer

SOURCE ID: 21-099-00036
AGENCY INTEREST: 82597
ACTIVITY: APE20250001

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 2051, Bread and other Bakery Products, Except Cookies and Crackers

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☒ Yes ☐ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Hart
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No
If yes, list which pollutant(s): List the pollutant(s)

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

Description of Facility:
Sister Schubert's Homemade Rolls, Inc. is a bakery in Horse Cave, KY focusing on the bread baking process it produces frozen, parbaked, packaged bread products. The facility is permitted to operate four production lines with dedicated makeup, baking, packaging, and freezing for each one.

Flour will be delivered to the bakery via truck and pneumatically unloaded into flour storage silos. Dust emissions will be minimized by a closed loop system with control provided via dust collectors. Other raw ingredients are stored in packaging in a room adjacent to the ingredient mixing area. Raw ingredients are combined in the ingredient mixing area.

Several natural gas-fired heat exchangers provide process heat to facilitate the ingredient preparation, mixing, proofing, and baking. Other natural gas-fired indirect heat exchangers provide space heat to the various preparation and office areas.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: F-25-022 Activity: APE20250001

Application Received: February 27, 2025 Application Complete Date(s): June 18, 2025

Permit Action: ☐ Initial ☒ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative

Construction/Modification Requested? ☐Yes ☒No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☐Yes ☒No

Description of Action
APE20250001: Permit Renewal with changes request

- Calculation for the PTE values have been updated to more accurately reflect actual emissions, however there is no change to the KYEIS.
- Removing EU65 a-d and EU41 a-d. The facility no longer uses Marsh Ink or specific brand of inks, makeup fluid, or clean up solvents. The inks and makeup fluid and solvents that are used at the facility are used across all lines.
- Removal of EU64 Cummins Diesel Emergency Engine.
- Addition of EU81 Sugar Silo and EU82 Truck unloading - both insignificant activates.
- Addition of EU80 Bagged flour - insignificant activity

F-25-022 Emission Summary				
Pollutant	2024 Actual (tpy)	Previous PTE F-20-004 (tpy)	Change (tpy)	PTE F-25-022 (tpy)
CO	1.97	19.0	5.0	24.0
NOx	2.49	27.4	4.1	31.5
PT	1.1	17.7	11.1	28.8
PM_{10}	0.57	7.62	9.88	17.5
$PM_{2.5}$	0.18	3.5	9.4	12.9
SO_2	0.027	0.55	-0.15	0.40
VOC	25.4	101.4	72.2	173.60*
Lead	0.00001	0.00008	.00002	0.0001
Greenhouse Gases (GHGs)				
Carbon Dioxide	2,767	24,898	8,346	33,244
Methane	0.053	0.48	0.12	0.60
Nitrous Oxide	0.051	0.45	0.15	0.60
CO_2 Equivalent (CO_2e)		25,045	8,396	33,441
Hazardous Air Pollutants (HAPs)				
Toluene	0.00002	1.76	-1.76	0.0003
Chromium, Total (as Cr)	0.009	.278	2.56	2.84
Formaldehyde	0.0012	0.013	0.0032	0.0162
Xylenes (Total)	0.00001	.0004	-0.001	0.0003
Combined HAPs:		6.4	-3.54	2.86

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Units #16-18, 20-22,30-33, & 49-52 Bread Baking Ovens Operation				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
VOC	Source wide 90 tpy	401 KAR 52:030	AP-42 Chapter 1.4-2 for Natural gas and AP-42, Chapter 9.9.6 for bread VOC emissions	Assumed based upon natural gas combustion and Bread baking process associated with low particulate matter emissions
PM	E=2.34 lb/hr, P≤0.50 E=3.59P$^{0.62}$, 0.50<P≤30 E (lb/hr) = emission rate P (ton/hr) = process rate	401 KAR 59:010, Section 3(2)	AP-42 Chapter 1.4-2	
	20% Opacity	401 KAR 59:010, Section 3(1)(a)	N/A	Qualitative visual observation of the stack every 7 oven operating days

Process Description:
Bread Baking Chamber Oven, Line 1,2,3 and 4

Emission Units	Description	Process Rate (ton/hr)	Construction Date	Product Processed
16-18	Line 1, Oven Baking Chamber	2.2	3/1/2007	Dough
20-22	Line 2, Oven Baking Chamber	1.967	3/1/2007	Dough
30-33	Line 3, Oven Baking Chamber	2.817	7/1/2010	Dough
49-52	Line 4, Oven Baking Chamber	2.808	4/1/2019	Dough

Applicable Regulation:

401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

Comments:
The actual VOC Emission factor from baking dough is determined from U.S. EPA recommendation for estimating VOC emissions from bread baking using the following equation:

$$\text{VOC E.F.} = 0.95Y_i + 0.195t_1 - 0.51S - 0.86t_s + 1.90$$

Where ,
VOC E.F. = Emission factor in pounds of VOC per Ton of dough baked
Y_I = Initial baker's percent of yeast to the nearest tenth of a percent

Emission Units #16-18, 20-22,30-33, & 49-52 Bread Baking Ovens Operation

t_I = Total yeast action time in hours the nearest tenth of an hour
(Fermentation time + Floor time + proof time)
S = Final (Spike) baker's percent of yeast to the nearest tenth of a percent
t_s = Spiking time in hours to the nearest tenth of an hour
(Floor time + Final proof time)

The VOC emissions shall be calculated as follows:

$$VOC\ emissions\ \left(\frac{tons}{month}\right) = [VOC\ E.F.\left(\frac{lb}{ton}\right) x\ P\left(\frac{tons}{month}\right) x \frac{1}{2000}(\frac{ton}{lbs}) +\ Oven\ VOC$$

Where:
P = Tons of bread product processed per month by the unit

$$Oven\ VOC = 5.5\ \left(\frac{lb}{MMscf}\right)\ x\ NG\ usage\ at\ oven\ \left(\frac{MMscf}{month}\right)\ x \frac{1}{2000}(\frac{ton}{lbs})$$

Where:
5.5 lb/MMscf = VOC emission factor from AP 42 Table 1.4-2
NG usage = Total monthly natural gas usage for the unit

All products are made using a no-time dough process utilizing the same general process. Flour & water are mixed with all the remaining minor ingredients at the mixing bowls such as sugar, shortening and/or butter, salt, yeast, and eggs. After mixing, the dough is processed on typical bakery sheeting lines to prepare them for proofing. From the onset of mixing until it enters the proofer, the makeup process ranges between 15-25 minutes. Proofers are different on the different line and generally range between 70-90 minutes. Yeast is primarily active in the proofer. All baking processes are less than 15 minutes for the types of products, and product temperatures are validated to achieve lethal levels for yeast. Dedicated cooling spirals reduce product temperature before freezing and packaging. The overall time can vary with each product, but in general the time from mixing until product is palletized and transferred to the warehouse freezer is around 3 hours. Finished products are stored and shipped frozen for both retail and foodservice customers."

Emission Unit # 19, 23, 34-35, 36 & 53-54 Gas Fired Indirect Heat Exchangers					
Pollutant		**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	19-23	0.56 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	PT: 7.6 lb/MMscf PM_{10}: 5.7 lb/MMscf $PM_{2.5}$: 1.9 lb/MMscf (AP 42 Table 1.4-2)	Assumed based upon natural gas combustion
	34-35, & 36	0.55 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)		
	53-54	0.50 lb/MMBtu			
Opacity		20% opacity	401 KAR 59:015, Section 4(2)	N/A	
SO_2	19,23	3.0 lbs/MMBtu	401 KAR 59:015, Section 5(1)(a)(1)	0.6 lb/MMscf (AP 42 Table 1.4-2)	
	34-35, & 36	2.86 lbs/MMBtu	401 KAR 59:015, Section 5(1)(c)(1)		
	53-54	2.5 lbs/MMBtu			

Process Description:
Seven Natural Gas-Fired Indirect Heat Exchangers

Emission Unit	Description	Construction Commenced	Rated Capacity (MMBtu/hr)
19	Line 1, Oven Burner Chamber – 1 Burner	2007	2.5
23	Line 2, Oven Burner Chamber – 1 Burner	2007	2.5
34, 35	Line 3, Oven Burner Chamber – 2 Burners	2010	5.0
36	Line 3, Proofer Process Heat Supply	2010	1.2
53-54	Line 4, Oven Burner Chambers – 2 Burners	2019	4.4

Applicable Regulation:

401 KAR 59:015, New Indirect Heat Exchangers, applicable to indirect heat exchangers having a heat input capacity greater than one (1) million BTU per hour (MMBtu/hr) commenced on or after April 9, 1972 (401 KAR 59:015, Section 2(1)).

Comments:
1MMSCF = 1,020 MMBtu

Emission Unit 41 a, b and c Ink Jet Stencil				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
VOC	Source wide 90 tpy	401 KAR 52:030	Material Balance & MSDS	Monitoring and Recordkeeping
PM	E=2.34 lb/hr, P≤0.50 E=3.59P$^{0.62}$, 0.50<P≤30 E (lb/hr) = emission rate P (ton/hr) = process rate	401 KAR 59:010, Section 3(2)	PM, PM$_{10}$, PM$_{2.5}$ 1.43 lb/gal	Monitoring and Recordkeeping
	20% Opacity	401 KAR 59:010, Section 3(1)(a)		Assumed in compliance based on MSDS sheets

Process Description:

Emission Units	Description	Line	Construction Commenced	Process Rate (gallons/hr)	VOC Emission Factors
41a	Inks and Ink Additives	1-4	2025	0.08425	8.262
41a	Inks and Ink Additives	1-4	2025	0.08425	6.897
41a	Inks and Ink Additives	1-4	2025	0.08425	6.030
41a	Inks and Ink Additives	1-4	2025	0.08425	6.168
41b	Make-up Fluids	1-4	2025	0.08425	6.667
41c	Solvents and Additives	1-4	2025	0.00122	6.727
41c	Solvents and Additives	1-4	2025	0.00122	8.420
41c	Solvents and Additives	1-4	2025	0.00122	6.676

Applicable Regulation:

401 KAR 59:010, This regulation is applicable to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates, commenced on or after July 2, 1975.

401 KAR 63:020**,** Potentially hazardous matter or toxic substances

Comments:
According to MSDS used in the calculation for the Ink Jet Stencil Lines 1 to 4 there are no HAPs or toxic substances for which a concentration exists above the EPA's RSL listed. The Chromium Total as (Cr) was included in the calculation and SCREEN VIEW was performed but that has no RSL threshold value either. The applicant Requested that EU41a-d and EU65a-d emission units in the previous permit be combined into "EU 41a Inks", "EU 41b Make-Up Fluids", and "EU 41c Solvents and Additives" to cover and more accurately reflect and track current Line The facility no longer uses one specific brand of inks, make-up fluids, or clean-up solvents. The facility also no longer uses Marsh Ink and does not plan to in the future. The inks, make-up fluids, and solvents that are used at the facility in ink jet stenciling are used across all Lines, 1-4.

Various Direct Heat Exchangers and Water Heaters

Process Description

Various space heaters indirect and direct Heat Exchangers and Water Heaters.

Emission Unit	Description	Fuel Input	Construction Commenced
04	Mix/Sheet/Butter Area Heater	1.440	2007
05	QA/Production Line Area Heater	0.040	2007
06	Area Heater Unit	0.262	2007
07	Maintenance Shop Area Heater	0.275	2007
08	Area Heater Unit	0.258	2007
09	Line 2 Proofer/Oven Area Heater	3.189	2007
10	Line 1 Oven Area Heater	3.189	2007
11	Area Heater Unit	0.124	2007
12-13	Line one (1) Proofer Process Heater	0.4	2007
14-15	Proofer Process Heater	0.6	2007
24-25	Two Water Heaters #1 and #2	1.98	2011
26	Mechanical Room Area Heater	0.400	2007
27	Receiving Dock Area Heater	0.400	2007
37	Line 3 QA/Office Area Heater	0.040	2010
38	Line 3 Packaging Area Heater	0.325	2010
39	Line 3 Proofer/Oven Area Heater	5.400	2010
40	Line 3 Packaging Area Heater	0.150	2010
42	Line 3 Sheeting Area Heater	0.913	2011
43-44	Water Heaters #3 and #4	0.985 each	2011
47	Chick – fill-A Area Heater	0.150	2019
55-56	Line 4 Proofer Process Heater	0.6	2011
57	Line 4 Mixing Area Heater	1.588	2019
58-61	Line 4 Ceiling Area Heaters	0.78/ or 0.180 each	2019
62-63	Water Heaters #5 and #6	0.99 each	2019
66	Line 4 Lab/Office Area Heater	0.040	2019
67	Line 4 Shipping/Office Area Heater	0.040	2019
68	Line 4 Electrical Room Area Heater	0.180	2019
69-72	Line 5 Ceiling Area Heaters	0.72	2019
73	Line 4 Training Area Heater	0.067	2019
74	Line 4 Ammonia Area Heater	0.150	2019
76	Line 4 Packaging Area Heater	5.494	0.238
77	Line 4 Silo Area Heater	0.30	0.30

1 MMSCF = 1,020 MMBtu
Emission Factors from AP-42, Table 1.4-2

Emission Unit #45 & 47 Diesel Fired Emergency Engine				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
NO_X	4.0 g/kW-hr	40 CFR 60.4205(b)	604.17 lb/Mgal	Purchasing, operating, and maintaining the engine according to manufacturer's emission-related written instructions and 60.4211 (a) and (b)
CO	3.5 g/kW-hr	40 CFR 60.4205(b)	130.15 lb/Mgal	
PM	0.2 g/kW-hr	40 CFR 60.4205(b)	42.47 lb/Mgal	

Process Description: power generation in case of an emergency

Emission Units:	Description:	Construction Commenced:	Fuel Input (1000 gal/hr):	Power Output (hp):
45	Cummins DSHAF	2007	0.0097	364
46	Cummins DSHAC	2011	0.0164	364

Applicable Regulation:
401 KAR 60:005 Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is applicable to stationary CI ICE that commence construction after July 11, 2005.

401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is applicable to stationary RICE at a major or area source of HAP emissions.

Comments:
The permittee shall maintain records of the hours of operation and the amount of fuel combusted (in gal) on a monthly basis.

Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
16-18		VOC	Preclude 401 KAR 52:020	Initial	Method 25A	90 tpy	3.61 lb/hr	2.31 ton/hr bread	CMN20110001	8/10/2011

Footnotes:

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
90 tpy of VOC emissions based on consecutive twelve month rolling total.	To preclude the applicability of 401 KAR 52:020, *Title V Permits*	Source-wide

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 59:010 *New Process Operations*	16-18, 20-22, 30-33, 41, 49-52
401 KAR 59:015 *New Indirect Heat Exchangers*	19, 23, 34-35, 36, 53,54
401 KAR 60:005 Section 2(2) (dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII) *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*	45 & 46
401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ) *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.*	45 & 46

Table C - Summary of Precluded Regulations:

N/A

Table D - Summary of Non Applicable Regulations:

N/A

Air Toxic Analysis

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*
The Division for Air Quality (Division) has performed modeling using SCREEN View on July 28, 2025 of potentially hazardous matter or toxic substances (Chromium, Total) that may be emitted by the facility based upon the process rates, and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

Single Source Determination
N/A

SECTION 5 – PERMITTING HISTORY

Permit	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
S-07-019	Initial	APE20060001	1/24/07	2/14/07	Minor Source Initial Construction	N/A
F-10-033	Initial	APE20100001	7/23/10	10/12/10	Conditional Major Initial	N/A
F-10-033 R1	Minor Revision	APE20110001	7/23/10	4/11/11	Corrected capacities of units 37, 38, 39, 40, added two emergency generators, added heaters units 41, 42, 43	N/A
F-15-026	Renewal	APE20150001	7/2/2015	10/16/2015	Renewal	N/A
F-15-026 R1	Admin Amend	APE20180001	6/1/2018	8/24/2018	Administrative Amendment; Added an Insignificant Activity	N/A
F-15-026 R2	Minor Revision	APE20180003	9/23/2018	11/3/2019	Added 4th Line	N/A
F-20-004	Renewal	APE20200001	2/13/2020	8/2/2020	Renewal	N/A

SECTION 6 – PERMIT APPLICATION HISTORY

None

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS – Ambient Air Quality Standards
BACT – Best Available Control Technology
Btu – British thermal unit
CAM – Compliance Assurance Monitoring
CO – Carbon Monoxide
Division – Kentucky Division for Air Quality
ESP – Electrostatic Precipitator
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HF – Hydrogen Fluoride (Gaseous)
MSDS – Material Safety Data Sheets
mmHg – Millimeter of mercury column height
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NO_x – Nitrogen Oxides
NSR – New Source Review
PM – Particulate Matter
PM_{10} – Particulate Matter equal to or smaller than 10 micrometers
$PM_{2.5}$ – Particulate Matter equal to or smaller than 2.5 micrometers
PSD – Prevention of Significant Deterioration
PTE – Potential to Emit
SO_2 – Sulfur Dioxide
TF – Total Fluoride (Particulate & Gaseous)
VOC – Volatile Organic Compounds

APPENDIX B – INDIRECT HEAT EXCHANGER EMISSIONS LIMITATIONS

Summary of All Affected Facilities Used to Determine 401 KAR 59:015 Emission Limits								
EU	Fuel(s)	Capacity (MMBtu/ hr)	Constructed	Basis for PM Limit	Total Heat Input Capacity for PM Limit (MMBtu/hr)	Basis for SO_2 Limit	Total Heat Input Capacity for SO_2 Limit (MMBtu/hr)	Notes
19	Natural Gas	2.5	2007	401 KAR 59:015 Section 4(1)(a) and 4(1)(c)	5.0	401 KAR 59:015, Section 5(1)(a)(1) and 5(1)(c)(1)	5.0	
23		2.5	2007		5.0		5.0	
34-35		5.0	2010		11.2		11.2	
36		1.2	2010		11.2		11.2	
53-54		4.4	2019		15.6		15.6	