

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Conditional Major, Operating
Permit: F-26-018

Kentucky Cooperage
712 East Main St.
Lebanon, KY 40033

July 30, 2026
Lauren Shackleford, Reviewer

SOURCE ID:	21-155-00001
AGENCY INTEREST:	2899
ACTIVITY:	APE20250001

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 2499, Wood Containers, NEC.

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: Marion

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead

If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☒ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No

If yes, list which pollutant(s):

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

*PTE does not include self-imposed emission limitations.

Description of Facility:

Kentucky Cooperage produces charred wood barrels for the Kentucky Bourbon industry. The facility has one natural gas-fired and two wood-fired indirect heat exchangers, woodworking operations (saws, planers, joiners, sanders, etc.), kilns, steam tunnel, barrel dryer, head and stave charring operations, and two wood waste silos.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: F-26-018

Activity: APE20250001

Application Received: November 14, 2026

Application Complete Date: January 13, 2026

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:

The application for the renewal of KY Cooperage's Conditional Major permit was received on November 14, 2025. In the application, KY Cooperage (KYC) requested the following changes to the permit:

- Update the CO and PM emission factors for EU-011, EU-012, and EU13 to reflect the results of the initial performance test conducted in 2024.
- Add natural gas combustion to EU-011.
- Remove wood combustion from EU-011 and EU-012. Process equipment associated with wood fuel combustion was never installed for EU-012 and has been replaced with natural gas-fired burners for EU-011.
- Remove process IDs 1 & 2 from EU-03C, as the transitional stage for the woodworking units has been completed.
- Combine the processes for EU-013 into a single process ID (PID 5), as the established emission factor from testing represents the combined emissions from the G5 processes.

With the changes described above, KYC has requested to remove the CO and PM₁₀ source-wide limits and implement a facility-wide NO_x limit of 90 tpy. While the facility-wide PTE for PM₁₀ and PM_{2.5} emissions now falls under the major source threshold when controls are operated, uncontrolled PM₁₀ and PM_{2.5} emissions still exceed this threshold. CO emissions also still exceed 90 tpy. Therefore, the source wide PM₁₀/PM_{2.5} and CO limits remain in the permit.

As requested by KYC, the voluntary operating limits for EU 05, EU-011, and EU-012 have been removed. The facility will continue to demonstrate compliance with the 90 tpy source wide CO and NO_x limits by calculating monthly CO and NO_x emissions and adding to the 12-month rolling total. Upon removal of voluntary operating limits, PTE for HAPs increased, and a limit of 0.598 tpy of acrolein has been added to ensure compliance with 401 KAR 63:020.

401 KAR 63:020 was not listed as a state origin requirement for EU 16 in the previous permit and was added with this permitting action.

F-26-018 Emission Summary				
Pollutant	2025 Actual (tpy)	Previous PTE F-20-032 R1 (tpy)*	Change (tpy)	Revised PTE F-26-018 (tpy)*
CO	70.83	92.65	7.17	99.82
NO _x	58.66	81.61	22.32	103.93
PT	115.47	184.25	-101.51	82.74
PM ₁₀	68.39	62.71	0.59	63.30
PM _{2.5}	52.38	113.30	-46.8	66.5
SO ₂	2.91	3.31	0.85	4.16
VOC	4.13	3.21	0.91	4.12
Lead	6.3E-06	9.46E-05	2.52E-03	2.61E-03
Greenhouse Gases (GHGs)				
Carbon Dioxide	25,341	47,655	15,636	63,291
Methane	2.46	3.12	-0.01	3.11
Nitrous Oxide	1.52	2.08	-0.76	1.32
CO ₂ Equivalent (CO ₂ e)	25,813	48,294	14,551	62,845
Hazardous Air Pollutants (HAPs)				
Acrolein	N/A	0.512	1.26E-01	6.38E-01
Benzene	4.81E-01	0.538	1.32E-01	6.70E-01
Formaldehyde	5.06E-01	0.577	1.44E-01	7.21E-01
Hydrochloric Acid	2.18	2.43	0.6	3.03
Combined HAPs:	3.26	5.30	1.36	6.66

***Note:** Includes the operation of federally enforceable control equipment.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Unit 01 & 02 - Wood Boiler #1 & #2				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
CO	Source wide 90 tpy	To preclude 401 KAR 52:020	9.24 lb/ton (AP-42, Table 1.6-2)	Monitor monthly wood usage (see comments).
NO _x	Source wide 90 tpy	To preclude 401 KAR 52:020	7.55 lb/ton (AP-42, Table 1.6-2)	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	PM ₁₀ : 0.377 lb/MMBtu, 5.81 lb/ton PM _{2.5} : 0.327 lb/MMBtu, 5.04 lb/ton (AP-42, Table 1.6-1)	Proper operation and maintenance of control equipment for applicable units.
PM	2.34 lbs/hr	401 KAR 61:015, Section 4(1)(a), referencing Appendix A, Priority II Region	0.4 lb/MMBtu, 6.16 lb/ton (AP-42, Table 1.6-1)	Compliance assumed based on AP-42 emission factors.
	40% opacity	401 KAR 61:015, Section 4(1)(c)		Weekly visual observation and U.S. EPA Reference Method 9 if emission observed.
SO ₂	8.03 lbs/MMBtu	401 KAR 61:015, Section 5(1), referencing Appendix B, Class V, Solid Fuel	0.025 lb/MMBtu, 0.385 lb/ton (AP-42, Table 1.6-2)	Compliance assumed based on AP-42 emission factors.
Initial Construction Date: 1960 Process Description: Scrap wood is supplied from the wood working operations. These boilers produce steam, which is used in the drying chamber. These two boilers share a stack. Heat Input Capacity: 12.3 MMBtu/hr, each Maximum Hourly Design Rate: 0.80 tons wood/hr Fuel: Wood Control Equipment: None Applicable Regulation: 401 KAR 61:015 , <i>Existing indirect heat exchangers</i> , applicable to each indirect heat exchanger having a heat input capacity of more than one (1) MMBtu/hr commenced before April 9, 1972. 401 KAR 63:002 , Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), <i>National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources</i> , applicable to all existing industrial biomass boilers located at an area				

Emission Unit 01 & 02 - Wood Boiler #1 & #2

source of HAPs. An affected source is an existing source if construction or reconstruction commenced on or before June 4, 2010.

Comments:

Emission factors for this unit are based on AP-42 Chapter 1.6 for dry wood and no controls and 40 CFR 98, Subpart C in the absence of site-specific emission factor data.

The hourly design rate is calculated using an HHV of 7700 Btu/lb for wood with 11% moisture content (APE20150001 Initial 401 KAR 52:030 Application):

$$\text{Hourly Rate} = \frac{12.3 \frac{\text{MMBtu}}{\text{hr}} * 10^6 \frac{\text{Btu}}{\text{MMBtu}}}{7700 \frac{\text{Btu}}{\text{lb}} * 2000 \frac{\text{lbs}}{\text{ton}}} = 0.80 \frac{\text{tons}}{\text{hr}}$$

Allowables for Marion County: Priority II; Class V are calculated using the following equations:

$$PT = 1.2825 * (12.3 * 2)^{-0.2330} = 0.608 \frac{\text{lbs}}{\text{MMBtu}}$$

$$SO_2 = 12.0284 * (12.3 * 2)^{-0.1260} = 8.034 \frac{\text{lbs}}{\text{MMBtu}}$$

Compliance with the 90 tpy source-wide CO limit for these units shall be demonstrated by calculating monthly CO emissions according to the following equation:

$$CO_{WB} = 9.24 \frac{\text{lb}}{\text{ton}} \times \text{Wood Usage} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 90 tpy source-wide NOx limit for these units shall be demonstrated by calculating monthly NOx emissions according to the following equation:

$$NOx_W = 7.55 \frac{\text{lb}}{\text{ton}} \times \text{Wood Usage} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 0.598 tpy source-wide acrolein limit for these units shall be demonstrated by calculating monthly acrolein emissions according to the following equation:

$$A_{01/02} = 0.0616 \frac{\text{lb}}{\text{ton}} \times \text{Wood Usage} \left(\frac{\text{tons}}{\text{month}} \right)$$

The energy assessment was performed on February 25, 2014 (APE202000001).

Emission Group A - Existing Silos and Stave/Heading Processes																																				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis				Compliance Method																													
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	<table><tr><td rowspan="2">EU</td><td>PT</td><td>PM₁₀</td><td>PM_{2.5}</td></tr><tr><td colspan="3">lbs/ton</td></tr><tr><td>03A-3</td><td rowspan="2">4.3</td><td rowspan="2">2.1</td><td rowspan="2">0.777</td></tr><tr><td>03C</td></tr><tr><td>03E</td><td>2.0</td><td>1.0</td><td>0.37</td></tr><tr><td>04-1</td><td rowspan="2">6.0</td><td rowspan="2">3.0</td><td rowspan="2">1.11</td></tr><tr><td>04-2</td></tr><tr><td>04-3</td><td>4.3</td><td>2.1</td><td>0.777</td></tr><tr><td>07</td><td>2.0</td><td>1.0</td><td>0.37</td></tr></table>				EU	PT	PM ₁₀	PM _{2.5}	lbs/ton			03A-3	4.3	2.1	0.777	03C	03E	2.0	1.0	0.37	04-1	6.0	3.0	1.11	04-2	04-3	4.3	2.1	0.777	07	2.0	1.0	0.37	Proper operation and maintenance of control equipment for applicable units.
EU	PT	PM ₁₀						PM _{2.5}																												
	lbs/ton																																			
03A-3	4.3	2.1					0.777																													
03C																																				
03E	2.0	1.0					0.37																													
04-1	6.0	3.0					1.11																													
04-2																																				
04-3	4.3	2.1	0.777																																	
07	2.0	1.0	0.37																																	
PM	For P ≤ 0.5, E = 2.58 For 0.5 < P ≤ 30, E = 4.10P ^{0.67} P = Process Rate (tons/hr) E = Emission Limitation (lbs/hr)	401 KAR 61:020, Section 3(2)(a)	(SCDHEC and APE20150001 application)				Monitor monthly wood usage & maintain control equipment.																													
	40% opacity	401 KAR 61:020, Section 3(1)(a)					Weekly visual observation and U.S. EPA Reference Method 9 if emissions observed.																													
Process Description: Various wood working devices are used to prepare the staves, carve the heads, and finish the barrels. The silos are used to store wood.																																				
Emission Unit	Description	Construction Commenced	Capacity (tons/hr)	Control Device		Control Efficiency																														
EU-03A-3	Stave rip saws (2)	1960	2.0	Stave Dust Collector System, Process Cyclones and Baghouses		PM = 99% PM ₁₀ = 99% PM _{2.5} = 95%																														
EU-03C-3	Heading Rip Saws (2)	1960	2.0	Heading dust collector system, process cyclones, baghouses		PM = 99% PM ₁₀ = 99% PM _{2.5} = 99%																														
EU-03E-1	Wood hog to enclose trailer	July 1969	5.3	Baghouse																																
EU-03E-2	Wood hog to silos	July 1969	5.3	Baghouse																																
EU-04-1	Barrel sander	1960	6.7	Barrel Dust Collection System Cyclone																																
EU-04-2	Head sander	1960	3.4																																	
EU-04-3	Crozier (router)	1960	6.7																																	
EU-07-1	Silo 1	1960	5.3	Baghouse		PM = 99% PM ₁₀ = 99%																														
EU-07-2	Silo 2	1960	5.3	Baghouse		PM _{2.5} = 95%																														

Emission Group A - Existing Silos and Stave/Heading Processes

Applicable Regulation:

401 KAR 61:020, *Existing process operations*, applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 61, commenced before July 2, 1975.

Comments:

Emission factors are taken from the APE20150001 application and are based on wood processing data from the South Carolina Department of Health and Environmental Control.

Emission Group B - New Stave/Heading Processes																								
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis				Compliance Method																	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	<table><tr><td>EU</td><td>PT</td><td>PM₁₀</td><td>PM_{2.5}</td></tr><tr><td colspan="4">lbs/ton</td></tr><tr><td>03B</td><td rowspan="2">4.3</td><td rowspan="2">2.1</td><td rowspan="2">0.777</td></tr><tr><td>03D</td></tr><tr><td>03F</td><td>2.0</td><td>1.0</td><td>0.37</td></tr></table> (SCDHEC and APE20150001 application)				EU	PT	PM ₁₀	PM _{2.5}	lbs/ton				03B	4.3	2.1	0.777	03D	03F	2.0	1.0	0.37	Proper operation and maintenance of control equipment for applicable units.
EU	PT	PM ₁₀					PM _{2.5}																	
lbs/ton																								
03B	4.3	2.1					0.777																	
03D																								
03F	2.0	1.0	0.37																					
PM	For P ≤ 0.5, E = 2.34 For 0.5 < P ≤ 30, E = 3.59P ^{0.62} P = Process Rate (tons/hr) E = Emission Limitation (lbs/hr)	401 KAR 59:010, Section 3(2)					Monitor monthly wood usage & maintain control equipment.																	
	20% opacity	401 KAR 59:010, Section 3(1)(a)					Weekly visual observations and U.S. EPA Reference Method 9 if emissions observed.																	
Process Description: Various wood working devices are used to prepare the staves, carve the heads, and finish the barrels.																								
Emission Unit	Description	Construction Commenced	Capacity (tons/hr)	Control Device		Control Efficiency																		
EU-03B-1	Stave Planers (2)	1998	9.8	Stave Dust Collector, System Process Cyclones, and Baghouses		PM = 99% PM ₁₀ = 99% PM _{2.5} = 95%																		
EU-03B-2	Rough Joint Machine	2011	0.62																					
EU-03D-1	Heading Planers	2006, 2024	4.28	Heading Dust Collector, System Process Cyclones, and Baghouses																				
EU-03D-2	Heading Molders (4)	2006	4.28																					
EU-03D-3	Heading Hog	2006	3.0																					
EU-03D-4	Heading Chop Saws (2)	2001	0.18																					
EU-03D-5	Grover (2)	2006	2.0																					

Emission Group B - New Stave/Heading Processes						
EU-03D-6	Heading Joiners	2024	4.28			
EU-03D-7	Heading Rounders	2024	4.28			
EU-03F-1	Enclosed Trailer Loadout	1999	5.3	Baghouse		
Applicable Regulation: 401 KAR 59:010 , <i>New process operations</i> , applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.						
Comments: Emission factors are taken from the APE20150001 application and are based on wood processing data from the South Carolina Department of Health and Environmental Control. EU-03D-7 replaced EU-03C-2 in APE20140001. The facility submitted emissions data in APE20240001 showing that EU-03D-7 has identical specifications and emissions to EU-03C-2 and does not increase emissions.						

Emission Unit EU-05 Dry Chamber				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
CO	Source wide 90 tpy	To preclude 401 KAR 52:020	84 lb/MMscf (AP-42, Table 1.4-1)	Monitor natural gas usage (see comments).
NO _x	Source wide 90 tpy	To preclude 401 KAR 52:020	100 lb/MMscf (AP-42, Table 1.4-1)	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	7.6 lb/MMscf (AP-42, Table 1.4-2)	Proper operation and maintenance of control equipment for applicable units.
PM	2.58 lb/hr	401 KAR 61:020, Section 3(2)(a)	1.9 lb/MMscf (AP-42, Table 1.4-2)	Compliance with the mass emission standard is assumed based on the PTE for the emission unit.
	40% opacity	401 KAR 61:020, Section 3(1)(a)		
Initial Construction Date: 1/1960				
Process Description: This chamber is direct-fired and is used to dry the staves. Heat Input Capacity: 32 MMBtu/hr Fuel: Natural Gas Control Equipment: None				
Applicable Regulation: 401 KAR 61:020, Existing process operations, applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 61, commenced before July 2, 1975.				
Comments: Emissions factors are based on AP-42 Chapter 1.4 and 40 CFR 98, Subpart C in the absence of site-specific emission factor data.				
Compliance with the 90 tpy source-wide CO limit for this unit shall be demonstrated by calculating monthly CO emissions according to the following equation:				
$CO_{NG} = 84 \frac{\text{lb}}{\text{MMscf}} \times NG \text{ Usage } \left(\frac{\text{MMscf}}{\text{month}} \right)$				
Compliance with the 90 tpy source-wide NO _x limit for this unit shall be demonstrated by calculating monthly NO _x emissions according to the following equation:				
$NOx_{NG} = 100 \frac{\text{lb}}{\text{MMscf}} \times NG \text{ Usage } \left(\frac{\text{MMscf}}{\text{month}} \right)$				

Emission Unit EU-011 Heading Char				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
CO	Source wide 90 tpy	To preclude 401 KAR 52:020	4.78 lb/ton (Stack Testing CMN202040001)	Monitor natural gas usage and number of barrel heads processed on a monthly basis (see comments).
NO _x	Source wide 90 tpy	To preclude 401 KAR 52:020	<u>Heading Char</u> 7.55 lb/ton (AP-42, Table 1.6-1) <u>Natural Gas</u> 100 lb/MMscf (AP-42, Table 1.4-1)	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	1.6 lb/ton (Stack Testing CMN20240001)	Proper operation and maintenance of control equipment for applicable units.
PM	2.58 lb/hr	401 KAR 61:020, Section 3(2)(a)		Compliance with the mass emission standard is assumed based on the PTE for the emission unit.
	40% opacity	401 KAR 61:020, Section 3(1)(a)		Weekly visual observation and U.S. EPA Reference Method 9 if emissions observed
Initial Construction and Modification Date: 1/1960 (NG burners added 2025)				
Process Description: Natural gas burners are used to char the heads of the barrels. Max Processing Rate: 0.2988 tons/hr (500 heads/hr) Heat Input Capacity: 1.05 MMBtu/hr Max Hourly Design Rate: 0.0010 MMscf/hr Fuel: Natural Gas Control Equipment: None				
Applicable Regulation: 401 KAR 61:020 , <i>Existing process operations</i> , applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 61, commenced before July 2, 1975.				
State-Origin Requirement: 401 KAR 63:020 , <i>Potentially hazardous matter or toxics substances</i> , applicable to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in 401 KAR 63:020				

Emission Unit EU-011 Heading Char

Section 2, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality.

Comments:

CO and PM emission factors representing combined emissions from both heading char and natural gas combustion are from stack testing performed in 2024 (CMN20240001). Greenhouse gas emission factors are from 40 CFR Part 98, Subpart C. Remaining natural gas emission factors are based on AP-42 Chapter 1.4, and heading char emission factors are based on AP-42 Chapter 1.6 in the absence of site-specific emission factor data.

Since not all wood is combusted from the barrel heads that pass through this process, a char fraction is added in calculating the hourly design rate to account for combustion of only the wood that is charred on the outer layer of the barrel heads. The charring fraction for head charring, 13.28%, is based on internal sampling and analysis from other ISC sites. The hourly design rate of heading char wood combustion (in tons/hr) is calculated using the following equation:

$$\text{Hourly Rate} = 0.1328 \frac{\text{lb wood charred}}{\text{lb wood throughput}} * \frac{500 \frac{\text{heads}}{\text{hr}} * 9 \frac{\text{lbs}}{\text{head}}}{2000 \frac{\text{lbs}}{\text{ton}}} = 0.2988 \frac{\text{tons}}{\text{hr}}$$

Compliance with the 90 tpy source-wide CO limit for this unit shall be demonstrated by calculating monthly CO emissions according to the following equation:

$$CO_{WC} = 4.78 \frac{\text{lb}}{\text{ton}} \times \text{Wood Charred} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 90 tpy source-wide NO_x limit for this unit shall be demonstrated by calculating monthly NO_x emissions according to the following equation:

$$NO_{xW} = 7.55 \frac{\text{lb}}{\text{ton}} \times \text{Wood Usage} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 0.598 tpy source-wide acrolein limit for this unit shall be demonstrated by calculating monthly acrolein emissions according to the following equation:

$$A_{011} = 0.0616 \frac{\text{lb}}{\text{ton}} \times \text{Heads Charred} \left(\frac{\text{heads}}{\text{month}} \right) \times 0.0005967 \frac{\text{tons}}{\text{head}}$$

Emission Unit EU-012 Stave Char				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
CO	Source wide 90 tpy	To preclude 401 KAR 52:020	4.78 lb/ton (Stack Testing CMN202040002)	Monitor natural gas usage and number of barrels processed on a monthly basis (see comments).
NO _x	Source wide 90 tpy	To preclude 401 KAR 52:020	<u>Heading Char</u> 7.55 lb/ton (AP-42, Table 1.6-1) <u>Natural Gas</u> 100 lb/MMscf (AP-42, Table 1.4-1)	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	1.6 lb/ton (Stack Testing CMN20240002)	Proper operation and maintenance of control equipment for applicable units.
PM	2.34 lbs/hr	401 KAR 59:010, Section 3(2)		Compliance with the mass emission standard is assumed based on the PTE for the emission unit.
	20% opacity	401 KAR 59:010, Section 3(1)(a)		Weekly visual observation and U.S. EPA Reference Method 9 if emissions observed
Initial Construction Date: 11/2017				
Process Description: Natural gas is used to char the staves of the barrels. Max Processing Rate: 0.468 tons/hr (250 barrels/hr) Heat Input Capacity: 6.0 MMBtu/hr Max Hourly Design Rate: 0.0059 MMscf/hr Fuel: Natural Gas Control Equipment: None				
Applicable Regulation: 401 KAR 59:010 , <i>New process operations</i> , applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.				
State-Origin Requirement: 401 KAR 63:020 , <i>Potentially hazardous matter or toxics substances</i> , applicable to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in 401 KAR 63:020				

Emission Unit EU-012 Stave Char

Section 2, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality.

Comments:

CO and PM emission factors representing combined emissions from both stave char and natural gas combustion are from stack testing performed in 2024 (CMN20240002). Greenhouse gas emission factors are from 40 CFR Part 98, Subpart C. Remaining natural gas emission factors are based on AP-42 Chapter 1.4, and stave char emission factors are based on AP-42 Chapter 1.6 in the absence of site-specific emission factor data.

Since not all wood is combusted from the barrel staves that pass through this process, a char fraction is added in calculating the hourly design rate to account for combustion of only the wood that is charred on the outer layer of the barrel staves. The charring fraction for stave charring, 4.16%, is based on internal sampling and analysis from other ISC sites. The hourly design rate of stave char wood combustion (in tons/hr) is calculated using the following equation:

$$\text{Hourly Rate} = 0.416 \frac{\text{lb wood charred}}{\text{lb wood throughput}} * \frac{250 \frac{\text{barrels}}{\text{hr}} * 90 \frac{\text{lbs}}{\text{barrel}}}{2000 \frac{\text{lbs}}{\text{ton}}} = 0.468 \frac{\text{tons}}{\text{hr}}$$

Compliance with the 90 tpy source-wide CO limit for this unit shall be demonstrated by calculating monthly CO emissions according to the following equation:

$$CO_{WC} = 4.78 \frac{\text{lb}}{\text{ton}} \times \text{Wood Charred} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 90 tpy source-wide NOx limit for this unit shall be demonstrated by calculating monthly NOx emissions according to the following equation:

$$NOx_W = 7.55 \frac{\text{lb}}{\text{ton}} \times \text{Wood Usage} \left(\frac{\text{tons}}{\text{month}} \right)$$

Compliance with the 0.598 tpy source-wide acrolein limit for this unit shall be demonstrated by calculating monthly acrolein emissions according to the following equation:

$$A_{011} = 0.0616 \frac{\text{lb}}{\text{ton}} \times \text{Barrels Charred} \left(\frac{\text{barrels}}{\text{month}} \right) \times 0.001827 \frac{\text{tons}}{\text{barrel}}$$

Emission Unit 13 G5 Process				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	2.67 lbs/ton (Stack Testing CMN20240003)	Proper operation and maintenance of control equipment for applicable units.
PM	For $P \leq 0.5$, E = 2.34 For $0.5 < P \leq 30$, E = $3.59P^{0.62}$ P = Process Rate (tons/hr) E = Emission Limitation (lbs/hr)	401 KAR 59:010, Section 3(2)		Compliance with the mass emission standard is assumed based on the PTE for the emission unit when properly operating the control equipment.
	20% opacity	401 KAR 59:010, Section 3(1)(a)		Weekly visual observation and U.S. EPA Reference Method 9 if emissions observed.
Initial Construction Date: 8/2018				
Process Description: Various wood working devices are used to prepare the staves, carve the heads, and finish the barrels. Equipment: Equalizers (2), Stave Planers (2), Stave G5 (24), and Grinders (2) Max Processing Rate: 10.80 tons/hr Control Equipment: CAMCORP Baghouse (99% control efficiency)				
Applicable Regulation: 401 KAR 59:010 , <i>New process operations</i> , applicable to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.				
Comments: Emission factors are from stack testing performed in 2024 (CMN20240002). The measured emission factor represents the combined emissions from each process at the emission unit, resulting in the processes being combined into a single process ID (PID 5). Compliance with the 90 tpy source-wide PM limit for this unit shall be demonstrated by properly operating and maintaining the control equipment.				

Emission Unit EU-15 Paved and Unpaved Haul Roads (T1-T11)		
Initial Construction Date: 1960 Process Description: Paved and unpaved haul roads, semis and forklifts. Maximum Operating Rate: 0.85 VMT/hr		
Process ID	Description	EF Basis
1	Paved into Plant	AP-42, 13.2.1, Eqn. 1
2	Paved into Predryers	
3	Paved from Predryers	
4	Paved to Dry Storage	
5	Paved Waste Wood Out	
6	Paved Barrels Out	
7	Paved from Dry Storage	
8	Paved to Secondary Storage	AP-42, 13.2.2, Eqns. 1a & 2
9	Unpaved to Secondary Storage	
10	Unpaved from Secondary Storage	AP-42, 13.2.1, Eqn. 1
11	Paved from Secondary Storage	
Applicable Regulation: 401 KAR 63:010 , <i>Fugitive emissions</i> , applicable to each apparatus, operation, or road the emits or could emit fugitive emissions not elsewhere subject to an opacity standard withing 401 KAR Chapters 50 through 68. Comments: Emission factors for unpaved roads include a natural mitigation factor to account for rainfall and other precipitation.		

Emission Unit 16 Natural Gas-Fired Boiler				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
CO	Source wide 90 tpy	To preclude 401 KAR 52:020	84 lb/MMscf (AP-42, Table 1.4-1)	Monitor monthly natural gas usage (see comments).
NOx	Source wide 90 tpy	To preclude 401 KAR 52:020	100 lb/MMscf (AP-42, Table 1.4-1)	
PM ₁₀ /PM _{2.5}	Source wide 90 tpy	To preclude 401 KAR 52:020	7.6 lb/MMscf (AP-42, Table 1.4-2)	Proper operation and maintenance of control equipment for applicable units.
PM	0.39 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	1.9 lb/MMscf (AP-42, Table 1.4-2)	Assumed based upon natural gas combustion.
	20% opacity	401 KAR 59:015, Section 4(2)		
SO ₂	2.21 lbs/MMBtu	401 KAR 59:015, Section 5(1)	0.6 lb/MMscf (AP-42, Table 1.4-2)	
Initial Construction Date: 8/27/2018				
Process Description: Equipment: Johnson Boiler, Model PFTA-500-3 Heat Input Capacity: 21.0 MMBtu/hr Fuel: Natural Gas Control Equipment: None				
Applicable Regulation: 401 KAR 59:015, <i>New indirect heat exchangers</i> , applicable to each indirect heat exchanger having a heat input capacity greater than one (1) million BTU per hour (MMBtu/hr) commenced on or after April 9, 1972. 401 KAR 60:005, Section 2(2)(d), 40 CFR 60.40c through 60.48c (Subpart Dc), <i>Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</i> , applicable to each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h).				
State-Origin Requirement: 401 KAR 63:020, <i>Potentially hazardous matter or toxic substances</i> , applicable to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in 401 KAR 63:020 Section 2, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality.				
Comments: Emission factors for this unit are based on AP-42 Chapter 1.4 with no controls and 40 CFR 98, Subpart C in the absence of site-specific emission factor data. Compliance with the 90 tpy source-wide CO limit for				

Emission Unit 16 Natural Gas-Fired Boiler

this unit shall be demonstrated by calculating monthly CO emissions according to the following equation:

$$CO_{NG} = 84 \frac{\text{lb}}{\text{MMscf}} \times NG \text{ Usage } \left(\frac{\text{MMscf}}{\text{month}} \right)$$

Compliance with the 90 tpy source-wide NOx limit for this unit shall be demonstrated by calculating monthly NOx emissions according to the following equation:

$$NOx_{NG} = 100 \frac{\text{lb}}{\text{MMscf}} \times NG \text{ Usage } \left(\frac{\text{MMscf}}{\text{month}} \right)$$

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
EU-011	None	CO	401 KAR 61:020, 401 KAR 50:045	Initial	Method 10	9.24 lbs/ton	56.89* tons/yr	544 heads/hr	CMN20240001	5/2/2024
EU-012	None	PM	401 KAR 59:010, 401 KAR 50:045	Initial	Methods 5/202	2.34 lbs/hr	0.27 lb/hr	228 barrels/hr	CMN20240002	5/1/2024
		CO			Method 10	90 tpy	8.44 tpy			
EU-013-1	CAMCORP Baghouse	PM	401 KAR 59:010, 401 KAR 50:045	Initial	Method 5	22.53 lbs/hr	0.28** lb/hr	266.67 barrels/hr	CMN20240003	4/30/2024
EU-013-2						22.17 lbs/hr				
EU-013-3						20.67 lbs/hr				
EU-013-4						3.67 lbs/hr				

Footnotes:

*EU-011 was still wood-fired at the time of testing. Natural gas burners have since replaced the wood burning capability.

**The EU 13 permit limit in lbs/hr was obtained from the 401 KAR 59:010 emission limitation equation. EU-013 processes have since been combined into process ID 5 as the emission factor determined from the test represents the combined processes.

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
90 tpy of CO emissions	To preclude 401 KAR 52:020 , <i>Title V permits</i> .	Source-wide
90 tpy of NO _x emissions	To preclude 401 KAR 52:020 , <i>Title V permits</i> .	Source-wide
90 tpy of PM ₁₀ /PM _{2.5} emissions	To preclude 401 KAR 52:020 , <i>Title V permits</i> .	Source-wide
0.598 tpy of acrolein emissions	401 KAR 63:020 , <i>Potentially hazardous matter or toxic substances</i> .	Source-wide

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 59:010 , <i>New process operations</i> .	EU 03B, 03D, 03F, 012, & 13
401 KAR 59:015 , <i>New indirect heat exchangers</i> .	EU 16
401 KAR 61:015 , <i>Existing indirect heat exchangers</i> .	EU 01, 02
401 KAR 61:020 , <i>Existing process operations</i> .	EU 03A, 03C, 03E, 04, 05, 07, & 011
401 KAR 63:010 , <i>Fugitive emissions</i> .	EU 15
401 KAR 63:020 , <i>Potentially hazardous matter or toxic substances</i> .	EU 011, 012, & 16
401 KAR 60:005 , Section 2(2)(d) 40 C.F.R. 60.40c through 60.48c (Subpart Dc) <i>Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</i> .	EU 16
401 KAR 63:002 , Section 2(2)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), <i>National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources</i> .	EU 01, 02

Table C - Summary of Precluded Regulations:

N/A

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS (CONTINUED)

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 AERMOD on May 15, 2026 of potentially hazardous matter or toxic substances (1,2-Dibromoethane, Acrolein, Arsenic, Benzene, Cobalt, Formaldehyde, Manganese) that may be emitted by the facility based upon the process rates, material formulations, stack heights 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
O-91-044 R1	Operating	N/A	N/A	6/8/1995	N/A	N/A
O-91-044 R2	Operating	N/A	N/A	8/4/1998	N/A	N/A
S-05-083	Initial	APE20050001	4/6/2005	6/17/2005	Initial operating permit	N/A
F-15-023	Initial	APE20150001	6/4/2015	10/16/2015	Initial conditional major permit	N/A
F-15-023 R1	Minor Revision	APE20160003	9/13/2016	11/11/2016	Update Section D	N/A
F-15-023 R2	Minor Revision	APE20170001	10/31/2017	12/13/2017	Replace 4 NG Stave Chars w/ 6 Stave Chars	N/A
F-15-023 R3	Significant Revision	APE20180003	10/4/2018	1/26/2019	Install G5 Process & add 21.0 MMBtu/hr NG boiler	N/A
F-20-032	Renewal	APE20200001	7/7/2020	5/16/2021	Renewal; remove EU-03A-1 & EU-03A-2, modify EU 13	N/A
F-20-032 R1	Minor Revision	APE20240001	10/13/2024	3/14/2025	Removed EU-03C-1, EU-03C-2; added EU-03D-6, EU-03D-7; modified EU-03D-1	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
EF	– Emission Factor
ESP	– Electrostatic Precipitator
EU	– Emission Unit
GHG	– Greenhouse Gas
HAP	– Hazardous Air Pollutant
HF	– Hydrogen Fluoride (Gaseous)
ISC	– Independent Stave Company, LLC
KYC	– Kentucky Cooperage
MSDS	– Material Safety Data Sheets
MMBtu	– Million British thermal units
mmHg	– Millimeter of mercury column height
NAAQS	– National Ambient Air Quality Standards
NESHAP	– National Emissions Standards for Hazardous Air Pollutants
NG	– Natural Gas
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)
VE	– Visible Emission
VMT	– Vehicle Miles Traveled
VOC	– Volatile Organic Compounds

APPENDIX B – INDIRECT HEAT EXCHANGER EMISSIONS LIMITATIONS

EU	Fuel	Capacity (MMBtu/hr)	Construction Date	Notes/ Removal Date	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)
01	Wood	12.3	1960	N/A	401 KAR 61:015	24.6	401 KAR 61:015	24.6
02	Wood	12.3	1960	N/A	401 KAR 61:015	24.6	401 KAR 61:015	24.6
16	Natural Gas	21.0	2018	N/A	401 KAR 59:015 Section 4(1)(c)	45.6	401 KAR 59:015 Section 5(1)(c)2.	21.0

Footnote: Total Heat Input Capacity for EU 16 emission limits includes only the EU 16 capacity, as it is the only gas-fueled boiler.