Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit: V-25-005
University of Kentucky
Lexington, KY 40506

May 12, 2025
Ossama Ateyeh, Reviewer

SOURCE ID:	21-067-00003
AGENCY INTEREST:	1104
ACTIVITY:	APE20240002; APE20250002

Table of Contents

SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 8221, Colleges and Universities

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: Fayette
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): Hydrochloric Acid

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

*PTE does not include self-imposed emission limitations.

Description of Facility:
The University of Kentucky (UK) is an educational institution In Lexington Kentucky, which own adjacent source, UK Good Samaritan Hospital, regulated as a single major source under the Title V permit program.(herein referred to collectively as UK) UK is classified as a Title V source due to it having potential emissions greater than a major source threshold for the following regulated air pollutants: nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter (PM). The majority of emission sources at UK are boilers and emergency generators, combusting natural gas, diesel, and coal. UK has two (2) maintenance shop paint booths, and two (2) gasoline dispensing facilities from underground storage tanks. UK also operates various insignificant activities including a cabinet shop with cyclone separator, tanks, laboratory hoods, small boilers and heaters, paint spray booths, TSD consolidation, less than 1MMBtu/hr. heaters, and a small distillery.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-25-005 Activities: APE20240002 & APE20250002

Received: October 2, 2024 and June 2, 2025

Application Complete Date(s): April 8, 2025 and August 15, 2025

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

Construction/Modification Requested? ☒Yes ☐No NSR Applicable? ☐Yes ☒No

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

Description of Action:

- APE20250004 - 502(b)(10) Change: On August 4, 2025 the applicant submitted a revision to October 10, 2023 University of Kentucky permit application that proposed to install in Pence Hall (bldg. 0041) diesel emergency generator EU92 (237 HP) Kohler 150REOZJF. However, the generator installed was 201 hp Caterpillar C15D500GC diesel fired emergency generator. No other changes except stacks information.
- APE20250002 Significant Permit Revision: The application received on June 2, 2025 is part of campus heating upgrade project to replace the existing coal-fired boilers at Central Heating with a new natural gas-fired boiler #3, with ultra-low sulfur diesel fuel as a backup fuel (EU97) at a maximum of 414 Mgallons/year to preclude significant emissions increase under 401 KAR 52:017. To support the boiler #3 and provide backup power, UK will install 500 Kw diesel fueled emergency generator engine (EU98). UK will also decommission and demolish the existing coal-fired boilers no.4 and 5 (EU13-1 and EU13-2).The existing emergency generator will be relocated and all associated coal equipment has already been removed. It has been demonstrated that the increase in emissions associated with the change will not exceed any significant emission rates as defined in 401 KAR 51:001. The results are as follows:

Table Project Emissions Increase

PSD Criteria Pollutant		NO_X	CO	PM	PM_{10}	$PM_{2.5}$	SO_2	VOC	H_2SO_4
Emissions (tpy)	EU97 (NG) (Fuel Oil)	6.025 1.35	19.34 1.14	3.93 0.68	3.93 0.68	3.93 0.68	0.15 0.06	2.84 0.07	0.0011 0.0003
	EU98	1.70	0.22	0.011	0.011	0.011	0.002	0.011	
	IA-1							0.10	
Emission Increase Total		9.075	20.70	4.62	4.62	4.62	0.212	3.02	.0015
PSD SER (tpy)		40	100	25	15	10	40	40	7
Further PSD Review		No	No	No	No	No	No	No	No

- COMB EU97 Boiler #3 NG -Fired , FO Backup, 120 MMBtu; with manufacture guarantee for NOX of 9 ppmv@3% O2 and 50 ppmv@3% O2 CO emissions, while burning natural gas and NOX emissions guarantee of 60 ppmv@3% O2 and 50 ppmv@3% O2 CO emissions, while burning No.2 fuel oil. Fuel oil combustion is limited to 414 Million gallons/year.
- EQPT EU98 Diesel-Fired Emergency Generator 500 Kw
- IA Diesel Storage Tanks

- APE20250001 - 502(b)(10) Change: On June 2, 2025 the University of Kentucky submitted an off permit change (502)(b)(10) on for the Installation of EU99, EU100, EU101 all Diesel Fired Emergency Generators, In addition to EU102 1.5 MMBtu/hr natural gas Boiler, EU103 6 of 1.6 MMBtu/hr natural gas Boilers, and two Insignificant activities to be added to AI11 Bosworth Hall (bldg. 652) .85 MMBtu, and in the Anthropology (bldg. 9854) two (2) 1.0 MMBtu/hr both natural gas fired boilers. It has been demonstrated that the increase in emissions associated with the change will not exceed any significant emission rates as defined in 401 KAR 51:001. The results are as follows

PSD Criteria Pollutant		NO_X	CO	PM	PM_{10}	$PM_{2.5}$	SO_2	VOC
Emissions (tpy)	EU99	12.23	2.36	0.14	0.14	0.14	0.01	2.7
	EU100	7.06	0.93	0.04	0.07	0.07	0.005	1.23
	EU101	1.72	0.10	0.12	0.12	0.12	0.002	0.46
	EU102	0.64	0.54	0.05	0.05	0.05	0.004	0.035
	EU103	4.12	3.50	0.31	0.31	0.31	0.02	0.23
	IA-11	0.37	0.31	0.03	0.03	0.03	0.002	0.02
	IA-11	4.12	3.50	0.31	0.31	0.31	0.25	0.23
Emission Increase Total		30.26	11.24	1.03	1.03	1.03	0.293	4.91
PSD SER (tpy)		40	100	25	15	10	40	40
Further PSD Review		No	No	No	No	No	No	No

  - EQPT EU99 3685 HP, EU100 2010 HP, and EU101 157 HP Diesel- Fired Emergency Generator
  - COMB EU102 1.5 MMBtu/hr and EU103 (6*1.6) MMBtu/hr both NG-Fired Boilers
  - IA 11 0.86 MMBtu/hr and (2*1) MMBtu/hr NG-Fired Boilers

- APE20240002 – Renewal Application: On October 2, 2024 the University of Kentucky submitted permit renewal application that included:
  - Updates to requirements from updates to NSPS IIII and JJJJ and NESHAP ZZZZ,
  - Updates to monitoring and recordkeeping requirements of NESHAP JJJJJJ and 40 CFR 60, Subpart DB that do not apply to the specified boilers;
  - Move gasoline dispensation facility emission unit from Section C to Section B with applicability of 40 CFR 63, Subpart CCCCCC
  - Remove applicability of 401 KAR 63:010 to IA-14 fermenters
  - Correct emission limits for EU72, EU80-1, EU80-2 and EU80-3
  - Update to insignificant activity IA11 list
  - Update to clarify that the cyclones are integral to EU 07 and 08
  - Incorporation of previously submitted off permit and 502(b)(10) changes into the permit.

In addition, the following off permit and 502(b)(10) changes were incorporated into the renewal permit.

- APE20220001 – Off-permit Change: Replace CEMS with PEMS on EU15 and EU16.
- APE20220003 – Off-permit Change: On January 21, 2021 the University of Kentucky submitted an off permit change for the Installation of EU88 (69 hp) diesel fired emergency generator for their research and development distilling operation.
- APE20220005 – Off-permit Change: On October 12, 2022 to install two new emergency generators EU89 (1114 HP) to be located at UK Samaritan hospital) will connect in parallel with two existing hospital generators and Installing EU90 (729 HP) natural gas fired generator to be located at Reynold's (bldg #1).

- APE20230002 – Off-permit change: On April 14, 2023 the University of Kentucky submitted the results of the Operation Monitoring Plan to Predict Nitrogen Oxides Emissions for Boilers 2 and 3 Central Utility Plant Boilers 2 and 3, permitted as emission units EU15 and EU16.
- APE20230004 – Off-permit change: On June 12,2023, UK submitted permit application to install diesel fired emergency generators at Sanders Brown.
- APE20230007 – Off-permit change: On July 27, 2023, the University of Kentucky submitted permit application to install diesel fired emergency generators at Pence Hall.
- APE20230009 (off permit changes): As part of University modernization project, three additional projects were proposed after the application submittals filed under APE20230007 and APE20230009. The University combined the five projects to determine the emissions impact and request the original applications submitted (APE20230004 and APE20230007) be replaced with this updated application. Changes included
  1. Sander Brown (bldg. 0230) Remove EU54-07 (434 hp)diesel fired emergency generator and replace with EU91 (903 hp) diesel fired emergency generator.
  2. Pence Hall (bldg. 0041) Install EU92 (237 HP) diesel fired emergency generator
  3. Memorial Coliseum (bldg. 0019) remove EU59-13 (94hp) diesel fired emergency generator and replace with EU93 (757 hp) diesel fired emergency generator
  4. Parking Structure #8 Install EU94 (762 hp).diesel fired emergency generator and removed EU69 (755 hp)
  5. Bosworth Hall (bldg. 0652) remove EU57-11 boiler (1.3 MMBtu/hr) and Install Insignificant activity AI11(0.85 MMBtu/hr)

V-25-005 Emission Summary				
Pollutant	2023 Actual (tpy)	Previous PTE V-18-052 R1 (tpy)	Change (tpy)	Revised PTE V-25-005 (tpy)
CO	32.24	526.5	-53.05	473.45
NO_X	44.48	1,494	-204.48	1,289.52
PT	4.15	375.9	-154.05	221.85
PM_{10}	4.13	375.5	-154.05	221.85
$PM_{2.5}$	3.65	375.4	-154.4	221.0
SO_2	0.44	1,739.9	--959.67	780.23
VOC	2.93	69.2	+8.58	77.78
H2SO4				0.0015
Lead	0.0003	0.09	-0.026	0.064
Greenhouse Gases (GHGs)				
Carbon Dioxide	75,364	7,547,451	-3,713,952	3,833,499
Methane	1.54	142	-69.37	72.63
Nitrous Oxide	1.38	134	-68.9	65.10
CO_2 Equivalent (CO_2e)		7,590,996	-3,736,287	3,854,709
Hazardous Air Pollutants (HAPs)				
Benzene	0.05	0.158	-0.028	0.13
Cyanide, Total (as Cn)	0.0	0.142	-0.082	0.06
Formaldehyde	0.04	1.130	+0.11	1.24
Hexane; N-Hexane	7.80	7.81	+1.16	8.91
Hydrochloric Acid	60.6	60.70	-19.47	41.22/ 9.0 [a]
Hydrofluoric Acid	8.53	8.53	-4.74	3.79
Toluene	0.02	0.21	0	0.21

Xylenes (Total)	0.011	0.01	0	0.01
Combined HAPs:		79.40	-23.28	56.06 / 22.5 [a]

[a]To preclude 40 CFR 63, Subpart DDDDD, the permittee has taken source-wide limits not to exceed 9.0 tpy for HCl and a 22.5 tpy limit for total HAPs.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

EUs 01 and 02

Emission Units EU01 and EU02 Dual Fuel-Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.10 lbs/MMBtu	401 KAR 59:015, Section 4(1)(c)	**Natural gas** 5 lb/MMscf **Ultra Low Sulfur Fuel oil** 4.2 lb/1000gallons Basis: Manufacturer Specifications	Assumed based upon manufacturer specifications; AP-42 emission factors; or stack test for natural gas and Ultra Low Sulfur fuel oil
	20% opacity	401 KAR 59:015, Section 4(2) 40 CFR 60.43b(f)		Assumed while combusting natural gas. Ultra Low Sulfur fuel oil by US EPA Method 9 test
SO_2	0.80 lbs/MMBtu	401 KAR 59:015, Section 5(1)	**Natural gas** 0.6 lb/MMscf Basis: AP-42, Table 1.4-2 **Ultra Low SulferFuel oil** 0.08 lb/1000 gallons Basis: Manufacturer Specifications	Assumed while combusting natural gas; Ultra Low Sulfur fuel oil compliance is by fuel certification.
NOx	0.20 lb/MMBtu	40 CFR 60.44b(a) and (i)	**Natural gas** 35.9 lb/MMscf **Ultra Low SulferFuel oil** 17.7 lb/1000 gallons Basis: Manufacturer Specifications	NOx CEMS

Emission Units EU01 and EU02 Dual Fuel-Fired Indirect Heat Exchanger

Initial Construction Date: 2017

Process Description:
Dual-fired boilers used to provide hot water and heat to various buildings.
Fuels: Natural Gas & Ultra Low Sulfur Fuel Oil
Control: Low NO_x burners
Maximum Continuous Rating: 127 MMBtu/hr

Applicable Regulations:
401 KAR 59:015 New indirect heat exchangers

401 KAR 60:005, Section 2(2)(c) 40 C.F.R. 60.40b through 60.49b (Subpart Db), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Comments:
Emission factors are from AP-42 1.4, AP-42 1.3 and manufacturer specifications.

On May 25, 2021, UK submitted an addendum to show that the 48 hour limit placed on fuel oil (APE20150005 minor revision application that replaced EUs 01 and 02) was not to preclude PSD. The Division concurs.

APE20210002 minor revision removes the 48 hour fuel oil limit, causing 40 CFR 63, Subpart JJJJJJ to be applicable. These units are now required to have a biennial tune-up.

EU 97 Dual Fuel-Fired Indirect Heat Exchanger and 02

Emission Units EU97 Dual Fuel-Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.10 lbs/MMBtu	401 KAR 59:015, Section 4(1)(c)	**Natural gas** 7.6 lb/MMscf **Ultra Low Sulfur fuel oil** 3.3 lb/1000gallons Basis: Manufacturer Specifications	Assumed based upon manufacturer specifications; AP-42 emission factors; or stack test for natural gas and fuel oil
	20% opacity	401 KAR 59:015, Section 4(2) 40 CFR 60.43b(f)		Assumed while combusting natural gas. Ultra Low Sulfur fuel oil is by US EPA Method 9 test
SO_2	0.80 lbs/MMBtu	401 KAR 59:015, Section 5(1)	**Natural gas** 0.29 lb/MMscf Basis: Manufacturer Specifications **Ultra Low Sulfur fuel oil** 0.29 lb/1000 gallons Basis: Manufacturer Specifications	Assumed while combusting natural gas; Ultra Low Sulfur fuel oil compliance is by fuel certification.
NOx	0.20 lb/MMBtu	40 CFR 60.44b(a) and (i)	**Natural gas** 11.66 lb/MMscf **Ultra Low Sulfur fuel oil** 6.55 lb/1000 gallons Basis: Manufacturer Specifications	NOx CEMS

Initial Construction Date: 11/2025

Process Description:
Central Heating Plant Boiler #3 Dual-fired boilers 120.3 MMBtu/hr
Fuels: Natural Gas & Ultra Low Sulfur Fuel Oil
Control: Manufacturer's guaranteed emission rates for NO_x based on burners design **Ultra Low NOx Burner**

Applicable Regulations:
401 KAR 59:015 New indirect heat exchangers

Emission Units EU97 Dual Fuel-Fired Indirect Heat Exchanger
401 KAR 60:005, Section 2(2)(c) 40 C.F.R. 60.40b through 60.49b (Subpart Db), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units 401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources **Comments:** To preclude the applicability of the PM emission limitation in 40 CFR 63, Subpart JJJJJJ, Table 1, the boilers shall combust only ultra-low-sulfur liquid fuel (distillate oil with less than 15 ppm sulfur) [40 CFR 63.11210(f)] Emission factors are from AP-42 1.4, AP-42 1.3 and manufacturer specifications. This is replacing Coal Boiler 13-1 and 13-2 As part of campus heating upgrade project. To preclude the applicability of 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (PSD), emission unit EU97 The applicant requested restricting the amount of backup ULSD allowed to be fired in the boiler emission unit EU97 shall combust no more than 413,000 gallon Ultra Low Sulfur fuel oil per year on 12 month rolling total an 8760 hours of usage will cause $PM_{2.5}$ emission would exceed the SER of 10 tpy using AP-42 emission factors if ULSD was fired exclusively.

EUs 15 and 16

Emission Units 15 and 16 Dual Fuel-Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.10 lbs/MMBtu	401 KAR 59:015, Section 4(1)(c)	**Natural gas** 7.14 lb/MMscf Basis: Manufacturer Specifications **Ultra Low Sulfur Fuel oil** EU 15 = 1.85 lb/1000gallons EU 16 = 1.42 lb/1000gallons Basis: 2013 Stack Test	Assumed based upon manufacturer specifications; AP-42 emission factors; or stack test for natural gas and fuel oil
	20% opacity	401 KAR 59:015, Section 4(2) 40 CFR 60.43b(f)		Assumed while combusting natural gas. Fuel oil is by US EPA Method 9 test
SO_2	0.80 lbs/MMBtu	401 KAR 59:015, Section 5(1)	**Natural gas** 0.6 lb/MMscf Basis: AP-42, Table 1.4-2 **Ultra Low Sulfur fuel oil** 0.21 lb/1000gallons Basis: AP-42, Table 1.3-1	Assumed while combusting natural gas; Ultra Low Sulfur fuel oil compliance is by fuel certification.
NOx	0.20 lb/MMBtu	40 CFR 60.44b(a) and (i)	**Natural gas** 10.25 lb/MMscf Basis: Manufacturer Specifications **Ultra Low Sulfur fuel oil** EU 15 = 9.23 lb/1000 gallons EU 16 = 10.23 lb/1000 gallons Basis: 2013 Stack Test	NOx CEMS

Initial Construction Dates: EU 15: 2007 & EU 16: 2009

Process Description:
Dual-fired boilers used to provide hot water and heat to various buildings.
Fuels: Natural Gas & Ultra Low Sulfur Fuel Oil
Control: Ultra Low NO_x burners

KYEIS Designation 15: EU 15: Central Utility Plant Boiler #2; Maximum Continuous Rating: 150 MMBtu/hr

KYEIS Designation 16: EU 16: Central Utility Plant Boiler #3; Maximum Continuous Rating: 150 MMBtu/hr

Emission Units 15 and 16 Dual Fuel-Fired Indirect Heat Exchanger

Applicable Regulations:
401 KAR 59:015 New indirect heat exchangers

401 KAR 60:005, Section 2(2)(c) 40 C.F.R. 60.40b through 60.49b (Subpart Db), Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Precluded Regulation:
401 KAR 51:017, Prevention of significant deterioration of air quality, precluded for EUs 15 & 16.

Comments:
Emission factors are from AP-42 1.4, AP-42 1.3, manufacturer specifications and most recently approved stack test.

To preclude 40 CFR 60.42b and 40 CFR 60.43b, the natural gas and fuel oil shall contain no more than 0.30 weight percent sulfur.

To preclude 401 KAR 51:017 applicability:

1. Sulfur weight percent in the fuel shall not exceed 0.3 percent for fuel oil and 2.0 grains/SCF for natural gas.
2. Combined NO_x emissions from EUs 15, 16, and 60-67 shall not exceed 36 tons during any 12 consecutive months.
3. Combined SO_2 emissions from EUs 15, 16, and 60-67 shall not exceed 36 tons during any 12 consecutive months.
4. Combined CO emissions from EUs 15, 16, and 60-67 shall not exceed 90 tons during any 12 consecutive months.

See **Section 4, Table A - Group Requirements**.

APE20210002 **minor revision removes the 48 hour fuel oil limit, causing** 40 CFR 63, Subpart JJJJJJ to be applicable. These units are now required to have a biennial tune-up and a one-time energy assessment.

EUs 09, 10 and 82

Emission Units 09, 10 and 82 Dual Fuel-Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	EU 09 & 10: 0.29 lb/MMBtu EU 82: 0.53 lb/MMBtu	401 KAR 61:015, Section 4(1)(a)	**Natural gas:** 7.6 lb/MMscf Basis: AP-42, Table 1.4-2 **Fuel oil:** 3.3 lb/1000 gallons Basis: AP-42, Table 1.3-1	Assumed based upon AP-42 emission factors for natural gas and fuel oil
	20% opacity	401 KAR 61:015, Section 4(1)(b)		Assumed based upon natural gas combustion; Fuel oil is by US EPA Method 9 test
SO_2	EU 09 & 10: 4.0 lb/MMBtu EU 82: 4.97 lb/MMBtu	401 KAR 61:015, Section 5(1)	**Natural gas:** 0.6 lb/MMscf Basis: AP-42, Table 1.4-2 **Fuel oil:** 0.21 lb/1000 gallons Basis: AP-42, Table 1.3-1	Assumed based upon AP-42 emission factors for natural gas and fuel oil

Initial Construction Date: Before 1970

Process Description:
Dual fuel-fired boilers used to provide hot water and heat to various buildings.
Fuels: Natural Gas and Ultra Low Sulfur Fuel Oil

KYEIS Designation 09: EU 09: Medical Center Boiler #03; Maximum Continuous Rating: 144 MMBtu/hr
KYEIS Designation 10: EU 10: Medical Center Boiler #04; Maximum Continuous Rating: 144 MMBtu/hr
KYEIS Designation 82: EU 82: Samaritan 03; Maximum Continuous Rating: 20.9 MMBtu/hr

Applicable Regulation:
401 KAR 61:015, Existing indirect heat exchangers

401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Comments:
Emission factors are from AP-42 Chapters 1.3 and 1.4.

These units were constructed before 1970 and are therefore exempt from PSD applicability.

APE20210002 minor revision removes the 48 hour fuel oil limit, causing 40 CFR 63, Subpart JJJJJJ to be applicable. These units are now required to have a biennial tune-up and a one-time energy assessment.

EUs 20-21 and 57

Emission Units 20-21 and 57 Natural Gas Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	EU 20-21: 0.26 lb/MMBtu EU 57: 0.10 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	7.6 lb/MMscf Basis: AP-42, Table 1.4-2	Assumed based upon AP-42 emission factors for natural gas
	20% opacity	401 KAR 59:015, Section 4(2)		
SO_2	0.80 lb/MMBtu	401 KAR 59:015, Section 5(1)	0.6 lb/MMscf Basis: AP-42, Table 1.4-2	Assumed based upon natural gas combustion

Process Description
Natural gas-fired boilers used to provide hot water and heat to various buildings.

Emission Unit	Make and Model	Unit bldg	Max. Rating MMBtu/hr	Construction Commenced
EU 20-21	Kewanee L3W-60-G94677	Bruce Poundstone bldg. 275	2*2.5	1987
EU57-1	Weil-McLain K12	Eng. Transportation bldg. 20	2.31	1981
EU57-2 thru EU57- 5	Johnson Air AR-105GP & 85DP-Weil-McLain LGB-7 & LGB-16	Nutter Field House bldg. 285	3*2.14 1*1.95	1993
EU57-6		410 Rose Lane bldg. 507	2.06	1999
EU57-7 EU57-8	Applied Air DFC-218-HRS-75/25	Boone Tennis Center bldg. 0213	2*1.38	1986
EU57-9 EU57-10	Lochinvar CHN1440	Building 200 bldg. 655	2*1.44	1997

Applicable Regulation:
401 KAR 59:015, New indirect heat exchangers

Comments:

Emission factors are from AP-42, Chapter 1.4.

401 KAR 63:002, 40 CFR 63, Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers: Area Sources. This regulation does not apply to natural gas-fired boilers [40 CFR 63.11195(e)].

Emission Units 87, EU102, and EU103

Emission Units 87, EU102, and EU103 Natural Gas Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.10 lb/MMBtu	401 KAR 59:015, Section 4(1)(b)	7.6 lb/MMscf Basis: AP-42, Table 1.4-2	Assumed while combusting natural gas
	20% opacity	401 KAR 59:015, Section 4(2)		
SO_2	0.8 lb/MMBtu	401 KAR 59:015, Section 5(1)(b)1.	0.6 lb/MMscf Basis: AP-42, Table 1.4-2	

Process Description:

Emission Unit	Make and Model	Unit bldg	Max. Rating MMBtu/hr	Construction Commenced
87	Sellers J091720-1	James B. Beam Institute of Kentucky Spirits	2.929	5/28/2021
EU102	Bell & Gossett SU66-2	Barnhart bldg. 276	1.5	2/2/2025
EU103	Shell and Tube PVI Industries	Craft Football Training bldg. 280	6* 1.6	5/28/2025

Applicable Regulation:
401 KAR 59:015, New indirect heat exchangers

Comments:
Natural Gas Fuel with Emission factors are from AP-42, Chapter 1.4.

EUs 22-48

Emission Units 22-48 Twelve Natural Gas Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	0.29 lb/MMBtu	401 KAR 61:015, Section 4(1)(a)	7.6 lb/MMscf Basis: AP-42, Table 1.4-2	Assumed based upon AP-42 emission factors for natural gas
	40% opacity	401 KAR 61:015, Section 4(1)(b)		
SO_2	4.0 lb/MMBtu	401 KAR 61:015, Section 5(1)	0.6 lb/MMscf Basis: AP-42, Table 1.4-2	Assumed based upon natural gas combustion

Process Description:
Natural gas boilers used for to provide hot water and heat to various buildings.

Emission Unit	Make and Model	Unit bldg	Max. Rating MMBtu/hr	Construction Commenced
EU22 EU23	Weil-McLain J-11 16643 & 44	Shawneetown Bldg A bldg 189	2*1.25	Pre 1956
EU24 EU25	Weil-McLain J-11 16645 & 46	Shawneetown Bldg B bldg 190	2*1.25	Pre 1956
EU26 EU27	Weil-McLain J-11 16653 & 54	Shawneetown Bldg C bldg 194	2*1.25	Pre 1956
EU28 EU29	Weil-McLain J-11 16655 & 56	Shawneetown Bldg D bldg 191	2*1.25	Pre 1956
EU30 EU31	Weil-McLain J-11 16657 & 58	Shawneetown Bldg E bldg 193	2*1.25	Pre 1956
EU32 EU33	Weil-McLain J-11 16659 & 60	Shawneetown Bldg F bldg 192	2*1.25	Pre 1956

Applicable Regulation:
401 KAR 61:015, Existing indirect heat exchangers

Emission Units 22-48 Twelve Natural Gas Fired Indirect Heat Exchanger
Comments: Emission factors are from AP-42, Chapter 1.4. 401 KAR 63:002, 40 CFR 63, Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers: Area Sources. This regulation does not apply to natural gas-fired boilers [40 CFR 63.11195(e)].

EUs 51, 83 and 84

Emission Unit 51, 83 and 84 Dual Fuel-Fired Indirect Heat Exchanger				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	EU 51: 0.10 lb/MMBtu EU 83 & 84: 0.39 lb/MMBtu	401 KAR 59:015, Section 4(1)(c)	**Natural gas:** 7.6 lb/MMscf Basis: AP-42, Table 1.4-2 **Fuel oil:** 3.3 lb/1000 gallons Basis: AP-42, Table 1.3-1	Assumed based upon manufacturer specifications, or AP-42 emission factors for natural gas and fuel oil
	20% opacity	401 KAR 59:015, Section 4(2) & 40 CFR 60.43c(c) and (d)		Assumed based upon natural gas combustion. Fuel oil is by US EPA Method 9 test
SO_2	EU 51: 0.8 lb/MMBtu EU 83 & 84 4.97 lb/MMBtu	401 KAR 59:015, Section 5(1)	**Natural gas:** 0.6 lb/ton Basis: AP-42, Table 1.4-2 **Fuel oil:** 0.21 lb/1000 gallons Basis: AP-42, Table 1.3-1	Assumed based upon natural gas combustion. Fuel oil compliance is by fuel certification.

Initial Construction Dates: EU 51: 2004, EU 83 & 84: 2006

Process Description:

Dual fuel-fired boilers used to provide hot water and heat to various buildings.
Fuels: Natural Gas & Ultra Low Sulfur Fuel Oil
Control: Low NO_x Burner on EU 51

KYEIS Designation: 51-52: EUST-51: EU 51: Central Utility Plant Boiler #1;
Maximum Continuous Rating: 72.3 MMBtu/hr
KYEIS Designation 83: EU 83: Samaritan Hospital Boiler #S1;
Maximum Continuous Rating: 12.0 MMBtu/hr
KYEIS Designation 84: EU 84: Samaritan Hospital Boiler #S2;
Maximum Continuous Rating: 12.0 MMBtu/hr

Applicable Regulations:

401 KAR 59:015 New indirect heat exchangers

401 KAR 60:005, Section 2(2)(d) 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources.

Precluded Regulation:

401 KAR 51:017, Prevention of significant deterioration of air quality. For EU 51, the permittee has elected to accept voluntary federally enforceable operating and emission limitations to preclude applicability of these standards.

Emission Unit 51, 83 and 84 Dual Fuel-Fired Indirect Heat Exchanger
Comments: Emission factors are from AP-42, Chapters 1.3 and 1.4. For EU 51 to preclude 401 KAR 51:017 applicability: 1. Combined NO_x emissions from EUs 51 and 53 shall not exceed 30 tons during any 12 consecutive months. 2. Combined SO_2 emissions from EUs 51 and 53 shall not exceed 26 tons during any 12 consecutive months. 3. Combined CO emissions from EUs 51 and 53 shall not exceed 32 tons during any 12 consecutive months. APE20210002 minor revision removes the 48 hour fuel oil limit, causing 40 CFR 63, Subpart JJJJJJ to be applicable. These units are now required to have a biennial tune-up and a one-time energy assessment.

Emission Units 07 and 08 Us 07 and 08

Emission Units 07 and 08 Two Coal-Fired Indirect Heat Exchangers				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	1.09 lb/MMBtu	401 KAR 61:015, Section 4(1)(a)	Controlled: EU 07 = 6.46 lb/ton EU 08 = 4.07 lb/ton Basis: 2020 Stack test	Stack test
	40% opacity	401 KAR 61:015, Section 4(1)(c)		Weekly EPA method 9
SO_2	6.0 lb/MMBtu	401 KAR 61:015, Section 5(1)	30.4 lb/ton Basis: AP-42, Table 1.1-3	AP 42 emission factor
Hg	2.2E-05 lb/MMBtu	40 CFR 63.11201(a),	EU 07 = 2.3 x 10-5 lb/ton EU 08 = 2.8 x 10-5 lb/ton Basis: 2020 Stack test	Stack test
CO	420 ppm by volume on a dry basis @ 3% oxygen	40 CFR 63.11210(b)	EU 07 = 1.83 lb/ton EU 08 = 1.02 lb/ton Basis: 2020 Stack test	Stack test

Initial Construction Date: before 1958

Process Description:
Coal boilers used to provide hot water and heat to various buildings.
Control: Cyclone integral to operation
KYEIS Designation 07: EU 07: Medical Center Boiler #1;
Maximum Continuous Rating: 75.0 MMBtu/hr
KYEIS Designation 08: EU 08: Medical Center Boiler #2;
Maximum Continuous Rating: 75.0 MMBtu/hr

Applicable Regulation:
401 KAR 61:015, Existing indirect heat exchangers

401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

Non-applicable Regulation:
None

Precluded Regulations:
401 KAR 63:002, Section 2(4)(iiii) 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD), National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Comments:
Emission factors are from AP-42, Chapter 1.1 and stack testing. These boilers are coal fired and each have a cyclone to control PM to meet the 401 KAR 61:015 emission standards for particulate matter. Stack test emission factors are used to calculate the actual emissions, not potential emissions.

Emission Units 49 and 50

Emission Units 49 and 50 Paint Booths				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM	E=2.34 lb/hr, P≤0.50	401 KAR 59:010, Section 3(2)	5.6 lb/ton Basis: Engineering Estimate	Maintain the unit with manufacturer's recommendation
	20% opacity	401 KAR 59:010, Section 3(1)(a)		
E(emission rate in lb/hr) and P(process rate in tons/hr)				

Initial Construction Date: 3/1/1988

Process Description:
Maintenance Shop Paint Spray booths; maximum operating rate: 2.0 gallons/hr, each
Located indoors and controlled by fabric filters with 99% collection efficiency

Applicable Regulation:
401 KAR 59:010, New process operations

Comments:
EU 49-50 emission factors are from MSDS sheets and renewal application APE20170002

Emission Units 53, 54, 55, 56, 59, 63, 64, 65 and 66U53, 54, 55, 56, 59, 63, 64, 65 and 66

Emission Units 53, 54, 55, 56, 59, 63, 64, 65 and 66:
Fifty- Seven Diesel-Fired Emergency Generators

Description:

Emission Unit	Location	Manufacturer and Model No.	Maximum Engine Rating	Construction Commenced
53-01	CUP bldg.518	Cat. SR43516BDITA	2885	2004
54-01	MCHC - Campus bldg.85	Caterpillar SR4	749	pre-2005
54-02	UK Hospital - Chandler bldg. 293	Caterpillar 3512STD	1592	pre-2005
54-03	Bosomworth bldg. 305	Caterpillar SR-4	1332	1993
54-04	Ben Roach Cancer bldg. 93	Caterpillar SR4	750	pre-2005
54-05	Combs Building bldg. 96	Caterpillar 3412C	679	pre-2005
54-06	KY Clinic bldg. 284	Caterpillar SR4-3412	749	pre-2005
55-01	Plant Science bldg. 312	Caterpillar SR-4B	1502	pre-2005
55-02	W.T. Young bldg. 456	Caterpillar SR4	1482	pre-2005
55-03	ASTECC bldg. 286	Kohler 800ROZD71	1232	pre-2005
55-04	Central Heating bldg. 4	Kohler 30R82	752	pre-2005
55-05	MCHC Hospital #1 bldg. 85	Caterpillar SR4B	2385	pre-2005
55-06	Chemistry - Physics bldg. 55	Onan 300ROZ81	800	pre-2005
55-07	Patterson Tower bldg. 27	Cummins NUTTA-855-GS2	555	pre-2005
55-08	Anderson Eng bldg. 503	Caterpillar SR48	562	pre-2005
55-09	Robotics bldg. 108	Magnamax 57IRSL3024A-F312W	455	pre-2005
56-01	Multi Dis Science bldg. 82	Caterpillar 3406DI	429	pre-2004
56-02	Dental Science bldg. 297	Caterpillar 3406	449	pre-2004
56-04	MRISC - PAV WH bldg. 98	Caterpillar 3306	335	pre-2004
56-05	UK - Chandler bldg. 293	Generac 3286A-1266A	330	pre-2004
56-06	College of Nursing bldg. 232	Caterpillar 3306 PG	227	pre-2004
56-07	Research Bldg #1 bldg. 3	Kohler 30R82	39	1996
59-01	Ag Science North bldg. 91	Onan 300DFCB	472	pre-2004
59-03	Gluck Equine bldg. 99	Caterpillar SR-4	472	pre-2004
59-04	Chemistry - Physics bldg. 55	Onan 300ROZ81	472	pre-2004
59-05	Funkhouser bldg. 54	Kohler 200R0ZD81	315	pre-2004
59-06	Bradley Hall bldg. 58	Kohler 200R0ZD81	315	pre-2004
59-07	Garrigus bldg. 215	Kohler 115R7852329A29	230	pre-2004
59-09	Bruce Poundstone bldg. 275	Kohler 100RZ281	157	pre-2004
59-10	EJ Nutter Training Center bldg. 277	Kohler 4BT3.9/GC	79	pre-2004
59-11	Seaton bldg. 219	Onan 45-ODEF-15R/11164F	71	pre-2004
59-16	Mines & Minerals bldg. 107	Caterpillar SR-4	275	pre-2004
59-17	Fine Arts Guignol bldg. 22	Katolight D45FPH4	71	pre-2004
59-21	KY Tobacco Research bldg. 236	Mecon 500FDF4656AA-M315W	448	pre-2004

Emission Units 53, 54, 55, 56, 59, 63, 64, 65 and 66: Fifty- Seven Diesel-Fired Emergency Generators				
59-23	Kroger Field-North bldg. 222	Kohler 23RE0ZD	378	pre-2004
59-24	Gray Design bldg. 101	Delco-AC 15278KO	220	pre-2004
59-25	Safety & Security bldg. 23	Onan DGDB-3375637	157	pre-2004
59-26	441 Penn bldg. 505	Onan DEDB-4960835	157	pre-2004
59-28	Singletary Center bldg. 241	Kohler 100R0Z81	157	pre-2004
59-29	Dickey Hall bldg. 17	Kohler 80R0ZJ81	126	pre-2004
59-30	Hardymon bldg. 495	KOHLER 60ROZJ	98	pre-2004
59-31	Indoor Track & Field bldg. 746	KOHLER 60REOZJ	96	pre-2004
59-32	Stuckert Career Center bldg. 494	Spectrum 6008	94	pre-2004
59-35	410 Rose Lane bldg. 507	Kohler 40ROZJ81	63	pre-2004
59-37	Johnson Center bldg. 220	Onan DGBB-495597	55	pre-2004
59-38	Little Fine Arts bldg. 224	Kohler 30R022 81	52	pre-2004
59-40	Bradley Hall bldg. 58	Generac 96A07003-5	39	pre-2004
59-41	Parking #1 bldg. 197	Kohler 20ROZJ61	39	pre-2004
59-43	Boone Faculty Club bldg. 14	Kohler 15RMOY81	24	pre-2004
59-45	Eng Annex bldg. 38	Kohler 8.5RM081	13	pre-2004
59-48	Parking #7 bldg. 572	Winco S100ADS-4R/A	157	pre-2004
59-57	Oldham Court bldg. 353	Generac SD050	80	2007
59-58	Grehan bldg.42	Kohler 200REOZJF	315	2019
60-01	MCHC Hospital #4 bldg. 85	Cat. SR4B-GD3516B	3286	2007
61-01	MCHC Hospital #3 bldg. 85	Cat. SR4B-GD3516B	3286	2007
62-01	MCHC Hospital #2 bldg. 85	Cat. SR4B-GD3516B	3286	2007
63-01	Roselle Hall bldg. 568	Cat. SR43306B	390	2005
64-01	Baldwin Hall bldg. 566	Caterpillar 3306B	390	2005
65-01	Joe Craft Center bldg. 604	Cummins 150DGFA	277	2006
66-01	Parking #7 bldg. 572	Olympian D100P1	166	2005

Applicable Regulation
N/A

Precluded Regulations:
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

401 KAR 51:017, Prevention of significant deterioration of air quality for EUs 51, 53, 63, 64, 65, 66

Emission Units 53, 54, 55, 56, 59, 63, 64, 65 and 66: Fifty- Seven Diesel-Fired Emergency Generators
Comments: Emission factors are from AP-42, Chapters 3.3 and 3.4. 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 does not apply as these are existing engines at university facility.

Us 6

Emission Units 60-62, 67, 69, 70-1, 70-2, 71-1, 71-2, 75, 76, 77, 79, 81-1, 81-2, 85-1, 85-2 and 86

Emission Units 60–62, 67, 69, 70, 71, 75, 76, 77, 79, 81-1, 81-2 and 86
Eighteen Emergency Diesel-Fired Engines

Description: Backup diesel engines

Emission Unit	Location	Manufacturer and Model No.	Maximum Engine Rating	Construction Commenced
60 -62	MCHC Plant bldg. 85	Cat. SR4B-GD3516B	3 * 3,286 HP	2007
67	Central Utility Plant bldg. 518	Cat. SR4B-GD3516B	3,286 HP	2009
69	Central Utility Plant bldg. 518	Cat. 3516C-HD	3,634 HP	2017
70-1	Gatton B & E bldg. 34	Onan 300DFCB39471F	762 HP	2015
70-2	Kroger Field Stadium bldg. 222	Kohler 230RE0ZD	755 HP	2015
71-1	Football Training bldg.280	Generac SD0200KG178	320 HP	2015
71-2	KY Proud Baseball Stadium bldg. 682	Kohler 300REOZJ	463 HP	2017
75	Davis Marksbury bldg. 633	Generac SD150	229 HP	2010
76	Parking #2 bldg. 198	Generac SD400	611 HP	2011
77	Wildcat ~~Coal~~ Lodge bldg. 644	Cat. D100-6 305-0477	157 HP	2011
79	Softball Complex Fire Pump	Clarke 8100	64 HP	2013
81-1	Jacobs Science bldg. 174	Cummins 800DQCC	1200 HP	9/1/2016
81-2	Gatton Student Center bldg. 676	Cummins 2500QKAN	3640 HP	11/1/2016
85-1	Samaritan Hospital bldg. 612	Caterpillar C27 750	1125 HP	2009
85-2	Samaritan Hospital bldg. 612	Caterpillar C27 750	1125 HP	2009
86	Rosenberg Law bldg. 48	Cummins DQDAA	464 HP	2019

Applicable Regulations:

Emission Units 60–62, 67, 69, 70, 71, 75, 76, 77, 79, 81-1, 81-2 and 86 Eighteen Emergency Diesel-Fired Engines
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 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 **Precluded Regulation:** 401 KAR 51:017, Prevention of significant deterioration of air quality for EUs 60-62, 67, 68 **Comments:** Emission factors are from AP-42, Chapters 3.3 and 3.4, or manufacturer specifications. EU 60-62 and EU 67 combined shall not operate more than 500 hour per year to preclude applicability of 401 KAR 51:017.

Emission Unit Diesel Fired Emergency generators (New)

EU88, EU89,EU91,EU92,EU93 and EU94 -Diesel- Fired Emergency Generator

Emission Unit #88, 89, 91, 92, 93, 94, 98, 99, 100, and 101
Ten Diesel Fired Emergency Generators

Process Description:

Emission Unit	Location	Manufacturer and Model No.	Maximum Engine Rating	Construction Commenced
88	Still bldg. 719	Caterpillar C25	69 HP	6/1/2023
89	Samaritan Hospital bldg. 612	Caterpillar C27	1114 HP	3/1/2023
91	Sanders Brown bldg. 239	Kohler 600REOZVB	903 HP	6/1/2024
92	Pence Hall bldg. 41	Cat. C15D500GC	201 HP	4/1/2025
93	Memorial Coliseum bldg.19	Kohler 500REOZVC	757 HP	2/1/2024
94	Parking #8 bldg. 601	Cat D500 GC	762 HP	2/1/2025
98	Central Heating Plant	Caterpillar C15	670 HP	2/1/2026
99	Ag Research bldg. 364	Caterpillar 3516E	3685 HP	1/1/205
100	MD Health Ed bldg. 724	Caterpillar 3512C	2010 HP	1/1/2025
101	Barnhart bldg. 276	Kohler 500REOZVC	757 HP	1/1/2025

Applicable Regulation:
401 KAR 60:005, Section 2(2)(dddd), 40 CFR 60.4200 through 60.4219, Table 1 through 8 (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, applicable to owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006.

401 KAR 63:002, Section 2(4)(eeee), 40 CFR 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, 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.

Emission Unit 78

Emission Unit 78 - Ten Natural Gas-Fired Emergency Generators

Description:

Emission Unit	Location	Manufacturer and Model	Maximum Engine Rating	Construction Commenced
78-1	M I King bldg 39	Kohler 45R827813413	60 HP	1961
78-3	Terrell (not operative) bldg. 52	Onan 15RJC-4R8/13S	23 HP	1969
78-4	Memorial Hall bldg. 19	Kohler 7.5RMW82	12 HP	1969
78-5	Multi-Disciplinary Research #3 bldg. 216	Onan 45.0EM-15R/13D	68 HP	1971
78-6	Garrigus Bldg. bldg. 215	Kohler 150R0Z-J71	150 HP	1973
78-7	T. H. Morgan Biological bldg 225	Onan 45.0EM-15R/1562D	68 HP	1973
78-8	Oswald bldg.235 (propane)	Onan 55.0-KB-15R/16540S	83 HP	1975
78-9	IRIS bldg.564	Generac SG015-G361	23 HP	2004
78-11	Building 200 bldg. 655	Olympian 96A04626-S	38 HP	1996
78-13	Building 274 (propane)	Onan 12.55C-18R/17637AB	20 HP	Pre 2004

Applicable Regulation:
N/A

Non-applicable Regulation:
None

Precluded Regulation:
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

Comments:
Emission factors are from AP-42, Chapter 3.2.

Per Comments received on 7/21/2021, EU 78-12 was misidentified as a natural gas-fired engine instead of a diesel-fired engine and was moved to EU 56.

401 KAR 60:005, Section 2(2)(eeee) 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines does not apply as these are existing engines at university facility.

Emission Units 72, 80(1-3), and 90

Emission Units 72, 80(1-3), and 90 : Five Natural Gas-Fired Emergency Generators

Emission Units 72, 80(1-3), and 90 : Five Natural Gas-Fired Emergency Generators

Description:

Emission Unit	Location	Manufacturer and Model	Maximum Engine Rating	Construction Commenced
72	The 90 bldg. 139	Cummins 450GFGA	701 HP	2015
80-1	Building 400 bldg. 657	Generac SG0045	82 HP	2014
80-2	Agronomy Headhouse bldg. 66	Generac SG0050	85 HP	2014
80-3	Arts and Visual bldg. 90	Kohler 150RE2GC	259 HP	2015
90	Gray Design bldg. 101	Generac SG500	729 HP	11/2023

Applicable Regulations:
401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

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

Comments:
Emission factors are from AP-42, Chapter 3.2.

EMISSION UNITS EU95 AND EU96

Emission Unit #EU95 and EU96 Storage Tank Gasoline Dispensing Operations

Initial Construction : N/A

Process Descriptions:
EU95 Bldg. 490 Cooling #2 Gasoline Dispensing Facility Storage Tank 10,000 gal, hourly design rate: 0.0137 gallons/hr
EU96 Bldg.88 AG Motor Pool Gasoline Dispensing Facility Storage Tank 14,000 gal; hourly design rate: 0.137 gallons/hr

EU	Potential Gasoline Throughput	Emission Factors (AP-42, Table 5.2-7)				
		Refueling no control	Refueling Spillage	Filling Underground) Storage Tank	Underground Tank Breathing	Overall Emission Factor
	1000 gal/yr	lbs OC/1000gal				
EU95	120 gal/hr.	11	0.7	11.5	1.0	24.2
EU96	1,200 gal/hr.	11	0.7	7.3	1.0	20.0

Applicable Regulation:
401 KAR 63:002, Section 2.(4)(ddddd), 40 C.F.R. 63.11110 through 63.11132, Tables 1 through 3 (Subpart CCCCCC), National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities

Comments:
1. Maximum annual throughput corresponds to maximum monthly throughput that can be processed before exceeding the more burdensome requirements under NESHAP CCCCCC.
2. Splash filling factor is used for EU95. Submerged filling factor is used for EU96, which is subject to the submerged fill requirements under NESHAP CCCCCC.
3. TankESP (AP-42 Section 5.2-7 Specification) was used to calculate the evaporating emission from gasoline service station operation.

INSIGNIFICANT ACTIVITY

EP	Description	Generally Applicable Regulation
IA01	Fuel Oil Storage Tanks & New fuel oil storage tank located in boiler building will be 30-60 Mgal capacity for Boiler #3	N/A
IA03	Laboratory Fume Hoods	N/A
IA04	TSD Consolidation	N/A
IA05	Transportation Research Center Spray Booth (5gal/yr)	401 KAR 59:010
IA06	Arts and Visual Bldg. Paint Spray Booth (Usage less than 50 gal/yr)	401 KAR 59:010
IA07	TK-76 Fuel oil storage tank (300 gal)	N/A
IA08	Fifty-Seven hot water heaters 8.4 MMBtu/hr combined	N/A
IA09	Four gas-fired space heaters 0.54 MMbtu/hr combined	N/A
IA10	One gas-fired furnace 0.08 MMBtu/hr	N/A
IA11	Seventeen natural gas-fired indirect heat exchangers under or equal to 1 MMBtu/hr each	N/A
IA12	#2 Diesel Fuel Cylinder tank, and vehicle fulling underground (2 tanks)	N/A
IA14	Grain Handling Operations (2.1 tons/hr)	401 KAR 59:010 401 KAR 63:010
IA15	Six 500-Gallon Fermenters	N/A
IA16	Aging Facility (952 bbl/yr)	401 KAR 63:010

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS.(CONTINUED)

Testing Requirements\Results

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU07	Cyclone	PM	401 KAR 61:015, Section 4(1)	Every 4 years	Method 5	1.09 lb/MMBtu	0.28 lb/MMBtu	Stack Gas Flowrate: 20,165 dscfm	CMN20040001	3/9/2004
EU08							0.44 lb/MMBtu	Stack Gas Flowrate: 23,939 dscfm		3/10/2004
EU03			401 KAR 59:015, Section 4(1)(c)			0.20 lb/MMBtu	0.32 lb/MMBtu	Stack Gas Flowrate: 11,000 dscfm		3/11/2004
EU04							0.20 lb/MMBtu	Stack Gas Flowrate: 13,200 dscfm		3/17/2004
EU13-1	Cyclone	PM	401 KAR 59:015, Section 4(1)(c)	Every 4 years	Method 5	0.20 lb/MMBtu	0.10 lb/MMBtu	Stack Gas Flowrate: 23,160 dscfm	CMN20040002	10/20/2004
EU08	Cyclone	HCl	N/A	N/A	Method 26A	N/A	0.000495 lb/MMBtu	52,333 lb/hr steam	CMN20060001	6/27/2006
		Cl_2					0.000354 lb/MMBtu			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU13-2		HCl					0.008 lb/MMBtu	60,533 lb/hr steam		7/72006
		Cl_2					0.005 lb/MMBtu			
Boiler #5		HCl	N/A	N/A	Method 26A	N/A	0.012 lb/MMBtu	63,533 lb/hr steam	CMN20060002	7/6/2006
		Cl_2					0.008 lb/MMBtu			
EU13-2	Cyclone	PM	401 KAR 59:015, Section 4(1)(c)	Every 4 years	Method 5	0.20 lb/MMBtu	0.196 lb/MMBtu	54800 lb/hr steam flow	CMN20120001	10/9-11/2012
		HCl	N/A	N/A	Method 26A	N/A	0.033 lb/MMBtu			
		Cl_2					0.003 lb/MMBtu			
EU07	Cyclone	PM	401 KAR 61:015, Section 4(1)	Every 4 years	Method 5	1.09 lb/MMBtu	0.155 lb/MMBtu	47733 lb/hr steam flow		
		HCl	N/A	N/A	Method 26A	N/A	0.028 lb/MMBtu			
		Cl_2					0.003 lb/MMBtu			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU08	Cyclone	PM	401 KAR 61:015, Section 4(1)	Every 4 years	Method 5	1.09 lb/MMBtu	0.195 lb/MMBtu	45533 lb/hr steam flow		
		HCl	N/A	N/A	Method 26A	N/A	0.026 lb/MMBtu			
		Cl_2					0.003 lb/MMBtu			
Boiler #4 (EU13)	Cyclone	PM	401 KAR 59:015, Section 4(1)(c)	Every 4 years	5	0.2 lb/MMBtu	0.142 lb/MMBtu	N/A	CMN2013 0001	3/27-29/2013
		HCl	Source-Wide Limit	N/A	26A	N/A	0.026 lb/MMBtu			
		Cl_2	N/A		26A		0.00028 lb/MMBtu			
		NOx			7E		0.307 lb/MMBtu			
Boiler #2 (EU15)	Low NOx Burners	PM	401 KAR 59:015, Section 4(1)(c)	N/A	5	0.1 lb/MMBtu	0.013 lb/MMBtu			
		NOx	40 CFR 60.44b(h)		7E	0.2 lb/MMBtu	0.065 lb/MMBtu			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
Boiler #3 (EU16)		PM	401 KAR 59:015, Section 4(1)(c)		5	0.1 lb/MMBtu	0.01 lb/MMBtu			
		NOx	40 CFR 60.44b(h)		7E	0.2 lb/MMBtu	0.072 lb/MMBtu			
Cummins Model GTA28 Engine	N/A	NOx	40 CFR 60.4233(d) and (e) referencing Table 1 through Subpart JJJJ of Part 60].	N/A	7E	160 ppmvd @15% O_2	8.76 ppmvd @15% O_2	458.6 KW	CMN2015 0001	10/16/2015
		VOC			25A	86 ppmvd @15% O_2	35.72 ppmvd @15% O_2			
		CO			10	387 ppmvd @15% O_2	164.1 ppmvd @15% O_2			
EU 08	Cyclone	PM	401 KAR 61:015, Section 4(1)	N/A	5	1.09 lb/MMBtu	0.076 lb/MMBtu	43,500 lb/hr	CMN2017 0001	8/29-31/2017
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.032 lb/MMBtu			
		Cl_2	N/A				0.0002 lb/MMBtu			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2	130 ppm @ 3% O_2			
		Hg	40 CFR 63.11210(b)		30B	2.2E-05 lb/MMBtu	2.62E-06 lb/MMBtu			
EU 07		PM	401 KAR 61:015, Section 4(1)		5	1.09 lb/MMBtu	0.188 lb/MMBtu	44,333.3 lb/hr		
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.069 lb/MMBtu			
		Cl_2	N/A				0.00082 lb/MMBtu			
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2	89.91 ppm @ 3% O_2			
		Hg	40 CFR 63.11210(b)		30B	2.2E-05 lb/MMBtu	3.45E-06 lb/MMBtu			
EU 08	Cyclone	PM	401 KAR 61:015, Section 4(1)	N/A	5	1.09 lb/MMBtu	0.1566 lb/MMBtu	51,266.7 lb/hr	CMN20200001	8/11/2020

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.0565 lb/MMBtu			
		Cl_2	N/A				0.0004 lb/MMBtu			
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2	47.14 ppm @3% O_2			
		Hg	40 CFR 63.11210(b)		30B	2.2E-05	1.07E-06 lb/MMBtu			
EU 07		PM	401 KAR 61:015, Section 4(1)		5	1.09 lb/MMBtu	0.2485 lb/MMBtu	52,440.7 lb/hr		8/13/2020
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.0545 lb/MMBtu			
		Cl_2	N/A				0.0003 lb/MMBtu			
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2	75.24 ppm @3% O_2			
		Hg	40 CFR 63.11210(b)		30B	2.2E-05	8.94E-07 lb/MMBtu			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU 08	Cyclone	PM	401 KAR 61:015, Section 4(1)	N/A	5	1.09 lb/MMBtu	0.1566	51266.7	CMN20210002	
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.0565			
		Cl_2	N/A				0.0004			
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2		50758.3		
		Hg	40 CFR 63.11210(b)		30B	2.2E-05	2.86E-06 lb/MMBtu			
EU 13		PM	401 KAR 61:015, Section 4(1)		5	1.09 lb/MMBtu	0.1955	50758.3		8/2/2021
		HCl	40 CFR 63, Subpart DDDDD		26A	9.0 tons source-wide	0.1183			
		Cl_2	N/A				0.0018			
		CO	40 CFR 63.11210(b) and 40 CFR 63.11201(a)		10	420 ppm @ 3% O_2	8.33			

Emission Unit	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
		Hg	40 CFR 63.11210(b)		30B	2.2E-05	2.86E-06 lb/MMBtu			
EU72	None	NOx	40 CFR 60, Subpart JJJJ	Initial	7E	160.0 ppm@ 15% O2	35.6 ppmvd	680 hp	CMN20230001	3/14/2023
	None	VOC		Initial	ALT096	86.0@ 15%O2	11.40 ppmvd			
	None	CO		Initial	10	540.0@15 % O2	289.15ppmvd			

Footnotes:

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
0.3% sulfur weight for fuel oil	To preclude the applicability of 401 KAR 51:017, *Prevention of significant deterioration of air quality*	EUs 15, 16, 01, 02 & EU97
500 hours per year and no more than 413,000 gallons per year		EUs 97
2.0 grains/SCF for natural gas		EUs 15 & 16
200 hours per year and no more than 27,000 gallons of diesel per year		EUs 53
Each unit limited to 500 hours per year and fuel sulfur weight % shall not exceed 0.3%		EUs 63, 64, 65 and 66
Emission units combined limited to 500 hours per year and fuel sulfur weight % shall not exceed 0.3%		EUs 60-62 and 67
30 tpy of NOx emissions		EUs 51 and 53
26 tpy of SO_2 emissions		EUs 51 and 53
32 tpy of CO emissions		EUs 51 and 53
36 tpy of NOx emissions		EUs 15, 16, 60, 61, 62, 63, 64, 65, 66 & 67
36 tpy of SO_2 emissions		EUs 15, 16, 60, 61, 62, 63, 64, 65, 66 & 67
90 tpy of CO emissions		EUs 15, 16, 60, 61, 62, 63, 64, 65, 66 & 67
1,800 hours per 12 months rolling total		EUs 60, 61, 62, 63, 64, 65, 66 & 67
9.0 tpy HCl emissions	To preclude the applicability of 40 CFR 63 Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*	Source-wide
Change of coal supplier, fuel type or fuel mixture		EUs 07, 08
22.5 tpy Total Hazardous Air Pollutants HAP emissions		Source-wide

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 59:015, *New indirect heat exchangers*	EUs 01, 02, 15 ,16, 20, 21, 57, 51, 83, 84, 87, 97, 102, & 103
401 KAR 61:015, *Existing indirect heat exchangers*	EUs 09, 10, 82, 22-48, 07 & 08
401 KAR 63:002, Section 2(4)(jjjjj) 40 C.F.R. 63.11193 through 63.11237, Tables 1 through 8 (Subpart JJJJJJ), *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*	EUs 01, 02, 7, 8, 15, 16, 09, 10, 82, 51-52, 83, 84, 90 & 97
401 KAR 60:005, Section 2(2)(c) 40 C.F.R. 60.40b through 60.49b (Subpart Db), *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*	EUs 01, 02, 15, 16, 97
401 KAR 60:005 Section 2(2)(d) 40 C.F.R. 60.40c through 60.48c (Subpart Dc) *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.*	EUs 51-52, 83, & 84
401 KAR 59:010, *New process operations*	EUs 49, 50
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*	EUs 60-62, 67-69, 68, 70, 71, 75-77, 79, 81-01, 81-02, 85, 86, 72 80, 88, 89, 90, 91, 92, 93, 94, 98, 99, 100 & 101
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*	EUs 60-62, 67-69, 70, 71, 75-77, 79, 81 85, 88, 89, 91, 92, 93, 94, 99, 100 &101
401 KAR 60:005, Section 2(2)(eeee) 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*.	72 & 80
401 KAR 63:002 40 CFR 63 Section 2(aaaaaa) 40 CFR 63.11619 through 63.11607, Table 1(Subpart CCCCCC), National Emission Standards for Hazardous Air Pollutants for Area Source, *National Emission Standards for Hazardous Air Pollutants for Source Category Gasoline Dispensing Facilities.*	EUs 95 & 96

Table C - Summary of Precluded Regulations:

Precluded Regulations	Emission Unit
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*	EUs 53-56, 59, & 63-66
401 KAR 63:002, Section 2(4)(iiii) 40 C.F.R. 63.7480 through 63.7575, Tables 1 through 13 (Subpart DDDDD) *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*	EUs 07 & 08
401 KAR 51:017, Prevention of Significant Deterioration of Air Quality See Table A in Section 4 for individual and source-wide limits.	EUs 15, 16, 51, 53, 60, 61, 62, 63, 64, 65, 66 , 67 & EU97

Table D - Summary of Non Applicable Regulations:
N/A

Air Toxic Analysis
N/A

Single Source Determination
N/A

SECTION 5 – PERMITTING HISTORY

Permit	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
V-03-023 R1	Significant Revision	56520	07/07/04	09/20/04	Construction of new Boilers and Diesel Generators	
V-03-023 R2	Significant Revision	APE2006 0002	10/16/06	2/20/07	Construction of new Gas Fired Boilers and Diesel Generators	
V-08-014	Renewal	APE2008 0001	5/25/08	11/10/08	Construction/Opera -tion Permit	
V-08-014 R1	Minor Revision	APE 20100001	2/15/10	6/7/10	Add Emergency Generator	
V-08-014 R2	Minor Revision	APE 20110003	8/18/11	10/25/11	Add Emergency Generators	
V-13-024	Renewal	APE2013 0002	7/04/2013	9/03/14	Renewal with construction/ Operation	
V-13-024 R1	Minor Revision	APE2015 0001	5/8/15	8/28/15	Add/Remove EUs; Correct Admin. Errors	
V-13-024 R2	Minor Revision	APE2015 0005 & APE2016 0002	4/6/2016	10/21/16	Replace EU 01 and 02; Add temporary boiler, Add EU 81-Two Emergency Generators	
V-18-052	Renewal	APE2017 0002	7/12/2018	4/2/2020	Operating Permit	
V-18-052 R1	Minor Revision	APE2021 0001 & APE2021 0002	6/3/2021	10/3/2021	Remove limits to preclude 40 CFR 63, Subpart JJJJJJ from boilers; Add EU 87 distilling operations; Remove five emergency generators from EU 59; Remove of one NG emergency generator from EU 78	

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