Construction Permit Application

Kenai Nitrogen Operation

PREPARED FOR
Nutrien US LLC

DATE
24 July 2025

REFERENCE
0781074

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
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AUTHOR	D Guido
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SIGNATURE PAGE

Construction Permit Application

Kenai Nitrogen Operation

0781074

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CONTENTS

LIST OF TABLES

1. INTRODUCTION

Nutrien US LLC (Nutrien) is permitted to construct one ammonia plant and one urea plant (Plants 4 and 5) at the Kenai Nitrogen Operations (KNO) facility for the producing of ammonia and urea for bulk sale. The facility is a prevention of significant deterioration (PSD) major source located in an area of attainment for all pollutants.

The Alaska Department of Environmental Conservation (ADEC) requires a PSD Construction Permit Application (application) to support the extension of the commence construction date a third time since the issuance of Air Quality Construction Permit (Permit) AQ0083CPT07 on 26 March 2021. ADEC has granted Nutrien two extensions of the commenced construction date to 26 September 2025. This application is being submitted under 18 Alaska Administrative Code (AAC) 50.306 with an updated best available control technology (BACT) determination and ambient air modeling demonstration. Nutrien understands that the current permit, Permit AQ0083CPT03, Revision 1, will be revoked and a new Construction Permit will be issued for KNO.

No changes to the emission unit inventory are being made with this application, except that each of the two granulators’ stack height will be revised by a small amount. The only changes required in Permit AQ0083CPT07, Revision 1 is to incorporate these stack height changes. This application is being prepared and submitted to update the assessment of BACT and the Air Impact Assessment using updated model program code and updated meteorological data.

In support of this application, Appendix A contains the ADEC Construction Permit Form with emission calculations included as Appendix B. A revised BACT determination is provided in Section 4 and Appendix C, and the revised ambient air modeling demonstration report is contained in Section 5 and Appendix D.

2. PROJECT DESCRIPTION

Nutrien is seeking to restart one ammonia plant and one urea plant (Plants 4 and 5) located at KNO. Natural gas with steam and air is converted to produce ammonia (NH_3) and carbon dioxide (CO_2) at the ammonia plant. NH_3 and CO_2 are then used as feedstocks for the urea plant. Power and steam to operate the ammonia and urea plants are generated at the utility plant. The final products are loaded at the Product Loading Wharf for shipment.

As part of this permitting action there are no revisions to the process units, except for a small increase of 15 feet in the stack height for the granulator stacks. The new granulator stack height will be 155 feet. Specific emission factors were updated to the most current factors available from United States Environmental Protection Agency’s (USEPA’s) AP-42, including:

- EUs 11, 22 and 23 – CO and VOC factors were updated to the 2018 AP-42 factors
- EUs 65 & 66 - CO factors were updated to the 2025 AP-42 factors; annual emissions for these units are based on 168 hours per year, consistent with the current permit.

Emission calculations for Greenhouse Gasses (GHG) were updated to utilize the new global warming potential (GWP) factor for methane. All other emissions are consistent with the current permit limits and were not changed.

ADEC requires a revised BACT determination and updated ambient air modeling demonstration for a third extension of the commence construction date to ensure the project meets the current requirements and standards. Therefore, this application covers only items related to the BACT determination and the ambient air modeling demonstration.

As a result of the air impact assessment update, the height for the granulator stacks is being revised by a small amount, increasing the height by 15 feet from 140 feet to 155 feet above ground so that all model predicted impacts demonstrate compliance with applicable standards and increments.

2.1 BRIEF FACILITY/PROCESS DESCRIPTION

Air Quality Control Construction Permit AQ0083CPT07, Revision 1 permitted Nutrien to construct an agricultural fertilizer production facility. The Facility will consist of three distinct plants:

1. Plant 4 – Ammonia Plant
2. Plant 5 – Urea Plant
3. Plant 6 – Supporting Utility Plant

Each plant within the permitted Facility includes several emission units. In the synthetic ammonia production process, natural gas molecules are reduced to carbon and hydrogen. The hydrogen is then purified and reacted with nitrogen to produce ammonia. Ammonia is synthesized by reacting hydrogen with nitrogen at a molar ratio of three to one, then compressing and cooling the gas. Nitrogen is obtained from the air, while hydrogen is obtained from the catalytic steam reforming of natural gas.

Generally, there are six process steps to produce synthetic ammonia using the catalytic steam reforming process as follows:

1. Natural gas desulfurization,
2. Catalytic steam reforming,
3. CO shift,
4. CO_2 removal,
5. Methanation, and
6. Ammonia synthesis.

The synthetic ammonia produced at the Ammonia Plant is used as feedstock for the Urea Plant at the Facility and will also be sold as a product. In the Urea Plant, urea is produced by reacting ammonia and CO_2.

A further description of the facility is provided in the prior permit applications for Permits AQ0083CPT06 and AQ0083CPT07 and is included in the Technical Analysis Report for AQ0083CPT07.

3. EMISSIONS SUMMARY

This section presents a discussion of the anticipated emissions at KNO. The facility's potential to emit (PTE) has been estimated for the following regulated air pollutants: nitrogen dioxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2), filterable particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), ammonia (NH_3), lead (Pb), and greenhouse gas (GHG) based on the carbon dioxide equivalent (CO_2e).

Nutrien is proposing no changes to the emission unit emission inventory as listed in Table 1 of Permit AQ0083CPT07, Revision 1, except as noted above for updates to emission factors. A summary of the facility emissions is provided in Table 4-1 below. Changes to the emission calculations from the 2019 permit application were based upon updates from the USEPA's emission factors provided in AP-42, updates to the global warming potential of methane, and permit limitations established in Permit AQ0083CPT07, Revision 1. Detailed calculations are provided as Appendix B.

TABLE 3-1 EMISSIONS SUMMARY

Pollutant	Facility Potential to Emit (tpy)
NO_X	215.81
CO	764.48
SO_2	10.20
PM (filterable)	119.78
PM_{10}	174.26
$PM_{2.5}$	172.82
VOC	121.26
NH_3	699.01
CO_2e	2,198,069

4. BACT DETERMINATION SUMMARY

The RACT/BACT/LAER Clearinghouse (RBLC) was reviewed for any entries from permitted sources since the issuance of Permit AQ0083CPT07 on 26 March 2021. Based upon a search of the RBLC, BACT determinations made in support of Permits AQ0083CPT06 and AQ0083CPT07 remain valid as no new control technologies are available for the proposed emissions units at KNO. A full summary of recent BACT determinations is provided as Appendix C.

5. MODELING SUMMARY

An updated assessment of air impacts was conducted using the newest version of the USEPA approved model program – AERMOD (v24142).

The complete description of the updated modeling and associated results which show compliance with all applicable increments and standards are provided in Appendix D.

APPENDIX A REQUIRED FORMS

Alaska Department of Environmental Conservation
AIR QUALITY CONSTRUCTION PERMIT APPLICATION
Project Information Form

Section 1 Stationary Source Information

Stationary Source Name: Nutrien Kenai Nitrogen Operations			SIC: 2873
Project Name (if different):	Stationary Source Contact: Frederick Werth		
Source Physical Address: Mile 21 Kenai Spur Highway	City: Kenai	State: AK	Zip: 99611
	Telephone: (907) 776-8144 E-Mail Address: frederick.werth@nutrien.com		
UTM Coordinates (m) or Latitude/Longitude:	~~Northing: 22120449~~	~~Easting: 1930150~~	Zone: 6
	Latitude: 60.6750° N	Longitude: 151.3806° W	

Section 2 Legal Owner

Name: Nutrien US LLC		
Mailing Address: P.O. Box 575		
City: Kenai	State: AK	Zip: 99611
Telephone: (907) 776-8144		
E-Mail Address: frederick.werth@nutrien.com		

Section 3 Operator *(if different from owner)*

Name:		
Mailing Address:		
City:	State:	Zip:
Telephone:		
E-Mail Address:		

Section 4 Designated Agent *(for service of process)*

Name:		
Mailing Address:		
City:	State:	Zip:
Physical Address:		
City:	State:	Zip:
Telephone :		
E-Mail Address:		

Section 5 Billing Contact Person *(if different from*

Name: Frederick Werth		
Mailing Address: P.O. Box 575		
City: Kenai	State: AK	Zip: 99611
Telephone: (907) 776-8144		
E-Mail Address: ferderick.werth@nutrien.com		

Section 6 Application Contact

Name: Ted Hartman			
Mailing Address: 7540 W. 160th Street, Suite 130	City: Overland Park	State: KS	Zip: 66085
	Telephone: (913) 302-7469		
	E-Mail Address: ted.hartman@nutrien.com		

Section 7 Major Permit Classification(s)
(Check all that apply)

- ☒ 18 AAC 50.306
- ☐ 18 AAC 50.311
- ☐ 18 AAC 50.316

Section 8 Minor Permit Classification(s)
(Check all that apply)

- ☐ 18 AAC 50.502(b)(1)
- ☐ 18 AAC 50.502(b)(2)
- ☐ 18 AAC 50.502(b)(3)
- ☐ 18 AAC 50.502(b)(4)
- ☐ 18 AAC 50.502(b)(5)
- ☐ 18 AAC 50.502(b)(6)
- ☐ 18 AAC 50.502(c)(2)(A)
- ☐ 18 AAC 50.502(c)(2)(B)
- ☐ 18 AAC 50.502(c)(3)
- ☐ 18 AAC 50.508(3)
- ☐ 18 AAC 50.508(5)
- ☐ 18 AAC 50.508(6)

Section 9 Project Description

Provide/attach a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction and the desired date for permit issuance.

If this application includes an Owner Requested Limit or a request to revise an existing permit term or condition, describe the intent of the limit, and provide sample language for the limit, and for monitoring, record keeping, and reporting for showing compliance with the limit.

Add additional pages if necessary.

Nutrien is submitting this permit application in conjunction with a third construction extension request as required by ADEC in their letter dated 9 February 2024. Currently, Nutrien is required to commence construction by 26 September 2025.

An updated BACT determination review and ambient air modeling demonstration are included in support of this application as required by ADEC.

Changes in emissions from the 2019 application are not due to any changes in operations or in the emission unit inventory. Any changes to emissions are due to:

- Revised AP-42 emission factors for EUs 11, 22, 23, 65 and 66;
- Emission factor updates to waste heat boilers (EUs 50 through 54) and turbines (EUs 55a through 59a) to be consistent with the BACT limit as permitted in AQ00883CPT03, Revision 1; and
- The global warming potential for methane was updated.

Additionally, Table 2 under Condition 13.3 will need to be revised for a relatively small stack height increase from 140 ft to 150 ft (15 ft increase) based on the ambient air modeling demonstration.

Section 10 Certification

This certification applies to the Air Quality Control Construction Permit Application for the Nutrien Kenai Nitrogen Operations submitted to the Department on: 08/07/25 .

(Stationary Source Name)

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the **signature of a responsible official** of the firm making the application. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete."

Signature: [signature]	Date: August 7, 2025
Printed Name: Frederick Werth	Title: Plant Manager

Section 11 Attachments

☒ Attachments Included. List attachments:

Permit Narrative, Emissions Calculations, Revised BACT Determinations, and Modeling Demonstration Report

Section 12 Mailing Address

Submit the construction permit application to the Permit Intake Clerk in the Department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Permit Intake Clerk
Alaska Department of Environmental
Conservation Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-3070

APPENDIX B DETAILED EMISSIONS CALCULATIONS

Stationary Sources (Normal Operations)

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)				
			NO_x	SO_2	PM_{10}	H2SO4	Comments
22	B-502	Plants 4 and 5 Small Flare	0.1	0.0	0.0	-	No planned flaring events during normal operations; pilot emissions only
23	B-501	Plants 4 and 5 Emergency Flare	0.0	0.0	0.0	-	No planned flaring events during normal operations; pilot emissions only
11	B-609	Ammonia Tank Storage System Flare	0.1	0.0	0.0	-	No planned flaring events; pilot emissions only
12	B-201	Primary Reformer	27.0	0.8	10.1	-	
13	B-200	Startup Heater	-	-	-	-	Startup heater does not operate during normal operations
14	D-207	CO_2 Vent	-	-	-	-	
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	
16	H-269	Amine Fat Flasher Vent	-	-	-	-	
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	
19	C-200	H2 Vent Stack (dry gas vent)	-	-	-	-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stac	-	-	10.0	-	
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stac	-	-	10.0	-	
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	
38	D-511	Inerts Vent Scrubber			-	-	
39	E-535	After Condenser Exchanger	-	-	-	-	
40	E-711	Cooling tower	-	-	0.23	-	
41	D-514	Tank Scrubber	-	-	-	-	
41A	D-513	Tank Scrubber				-	
41B	F-209	MDEA Storage Tank				-	
41C	F-615	MDEA Storage Tank				-	
44	6B-708A	Package Boiler	2.4	0.1	1.8	-	
48	6B-708B	Package Boiler	2.4	0.1	1.8	-	
49	6B-708C	Package Boiler	2.4	0.1	1.8	-	
47	N/A	Urea Loading Wharf	-	-	1.1	-	
47C		Urea Warehouse/Transfer (stack)			0.08	-	
47B		Urea Warehouse/Transfer (fugitive)			0.43	-	
47D		Urea Transfer			0.09	-	
50	B-705A	Waste Heat Boiler	0.9	0.03	0.35	-	
51	B-705B	Waste Heat Boiler	0.9	0.03	0.35	-	
52	B-705C	Waste Heat Boiler	0.9	0.03	0.35	-	
53	B-705D	Waste Heat Boiler	0.9	0.03	0.35	-	
54	B-705E	Waste Heat Boiler	0.9	0.03	0.35	-	
55	GGT-744A	Solar Turbine/Generator Set	1.0	0.19	0.41	-	Solar turbines do not bypass SCR control device during normal operations
56	GGT-744B	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
57	GGT-744C	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
58	GGT-744D	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
59	GGT-744E	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
60	F-791	Deaerator Vent	-	-	-	-	
61	F-711	Degasifier Vent	-	-	-	-	
65	GM-616D	Diesel Fired Well Pump	11.9	0.8	0.8	-	
66	G-613B	Gasoline Fired Firewater Pump	0.6	2.9E-02	3.5E-02	-	Calculation adjusted to reflect anticipated operation only four hours per day
Comp	N/A	Fugitive Ammonia from Components				-	
IEU	N/A	Building Heaters/Water Heaters	0.7	4.3E-03	5.4E-02	-	
		Facility Total Potential to Emit (lb/hr)	**57.1**	**3.1**	**42.1**	**0.0**	
		Q tpy	**250.04**	**13.67**	**184.44**	**0.00**	

Location	Distance from KNO (km)	Q (t/yr)	Q/D
Tuxedni	86.8	448.1	5.2
Denali	199.3	448.1	2.2

Stationary Sources (Normal Operations with One Solar Turbine Bypassing SCR Control Device)

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)				
			NO_x	SO_2	PM_{10}	H2SO4	Comments
22	B-502	Plants 4 and 5 Small Flare	0.1	0.0	0.0	-	No planned flaring events during normal operations; pilot emissions only
23	B-501	Plants 4 and 5 Emergency Flare	0.0	0.0	0.0	-	No planned flaring events during normal operations; pilot emissions only
11	B-609	Ammonia Tank Storage System Flare	0.1	0.0	0.0	-	No planned flaring events; pilot emissions only
12	B-201	Primary Reformer	27.0	0.8	10.1	-	
13	B-200	Startup Heater	-	-	-	-	Startup heater does not operate during normal operations
14	D-207	CO_2 Vent	-	-	-	-	
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	
16	H-269	Amine Fat Flasher Vent	-	-	-	-	
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	
19	C-200	H2 Vent Stack (dry gas vent)	-	-	-		
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stac	-	-	10.0	-	
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stac	-	-	10.0	-	
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	
38	D-511	Inerts Vent Scrubber			-	-	
39	E-535	After Condenser Exchanger	-	-	-	-	
40	E-711	Cooling tower	-	-	0.23	-	
41	D-514	Tank Scrubber	-	-	-	-	
41A	D-513	Tank Scrubber				-	
41B	F-209	MDEA Storage Tank				-	
41C	F-615	MDEA Storage Tank				-	
44	6B-708A	Package Boiler	2.4	0.1	1.8	-	
48	6B-708B	Package Boiler	2.4	0.1	1.8	-	
49	6B-708C	Package Boiler	2.4	0.1	1.8	-	
47	N/A	Urea Loading Wharf	-	-	1.1	-	
47C		Urea Warehouse/Transfer (stack)			0.08	-	
47B		Urea Warehouse/Transfer (fugitive)			0.43	-	
47D		Urea Transfer			0.09	-	
50	B-705A	Waste Heat Boiler	-	0.00	0.00	-	One Waste Heat Boiler (corresponding to Solar Turbine in bypass) will not operate
51	B-705B	Waste Heat Boiler	0.9	0.03	0.35	-	
52	B-705C	Waste Heat Boiler	0.9	0.03	0.35	-	
53	B-705D	Waste Heat Boiler	0.9	0.03	0.35	-	
54	B-705E	Waste Heat Boiler	0.9	0.03	0.35	-	
55	GGT-744A	Solar Turbine/Generator Set	36.4	0.19	0.41	-	One Solar turbine bypassing SCR control device during normal operations
56	GGT-744B	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
57	GGT-744C	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
58	GGT-744D	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
59	GGT-744E	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
60	F-791	Deaerator Vent	-	-	-	-	
61	F-711	Degasifier Vent	-	-	-	-	
65	GM-616D	Diesel Fired Well Pump	11.9	0.8	0.8	-	
66	G-613B	Gasoline Fired Firewater Pump	0.6	2.9E-02	3.5E-02	-	Calculation adjusted to reflect anticipated operation only four hours per day
Comp	N/A	Fugitive Ammonia from Components					
IEU	N/A	Building Heaters/Water Heaters	0.7	4.3E-03	5.4E-02	-	
		Facility Total Potential to Emit	**91.6**	**3.1**	**41.8**	**0.0E+00**	
		Q tpy	**401.28**	**13.55**	**182.91**	**0.00**	

Location	Distance from KNO (km)	Q (t/yr)	Q/D
Tuxedni	86.8	597.7	6.9
Denali	199.3	597.7	3.0

Stationary Sources (Startup)

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)				
			NO_x	SO_2	PM_{10}	H2SO4	Comments
22	B-502	Plants 4 and 5 Small Flare	0.1	0.0	0.0	-	No planned flaring events during startup; pilot emissions only
23	B-501	Plants 4 and 5 Emergency Flare	0.0	0.0	0.0	-	No planned flaring events during startup; pilot emissions only
11	B-609	Ammonia Tank Storage System Flare	0.1	0.0	0.0	-	No planned flaring events; pilot emissions only
12	B-201	Primary Reformer	27.0	0.8	10.1	-	
13	B-200	Startup Heater	9.9	0.1	0.8	-	Startup heater included
14	D-207	CO_2 Vent	-	-	-	-	
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	
16	H-269	Amine Fat Flasher Vent	-	-	-	-	
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	
19	C-200	H2 Vent Stack (dry gas vent)	-	-	-		
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stack	-	-	10.0	-	
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stack	-	-	10.0	-	
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	
38	D-511	Inerts Vent Scrubber			-	-	
39	E-535	After Condenser Exchanger	-	-	-	-	
40	E-711	Cooling tower	-	-	0.23	-	
41	D-514	Tank Scrubber	-	-	-	-	
41A	D-513	Tank Scrubber				-	
41B	F-209	MDEA Storage Tank				-	
41C	F-615	MDEA Storage Tank				-	
44	6B-708A	Package Boiler	2.4	0.1	1.8	-	
48	6B-708B	Package Boiler	2.4	0.1	1.8	-	
49	6B-708C	Package Boiler	2.4	0.1	1.8	-	
47	N/A	Urea Loading Wharf	-	-	1.1	-	
47C		Urea Warehouse/Transfer (stack)			0.08	-	
47B		Urea Warehouse/Transfer (fugitive)			0.43	-	
47D		Urea Transfer			0.09	-	
50	B-705A	Waste Heat Boiler	0.9	0.03	0.35	-	
51	B-705B	Waste Heat Boiler	0.9	0.03	0.35	-	
52	B-705C	Waste Heat Boiler	0.9	0.03	0.35	-	
53	B-705D	Waste Heat Boiler	0.9	0.03	0.35	-	
54	B-705E	Waste Heat Boiler	0.9	0.03	0.35	-	
55	GGT-744A	Solar Turbine/Generator Set	1.0	0.19	0.41	-	No Solar Turbines bypassing SCR control device during startup
56	GGT-744B	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
57	GGT-744C	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
58	GGT-744D	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
59	GGT-744E	Solar Turbine/Generator Set	1.0	0.19	0.41	-	
60	F-791	Deaerator Vent	-	-	-	-	
61	F-711	Degasifier Vent	-	-	-	-	
65	GM-616D	Diesel Fired Well Pump	11.9	0.8	0.8	-	
66	G-613B	Gasoline Fired Firewater Pump	0.6	2.9E-02	3.5E-02	-	Calculation adjusted to reflect anticipated operation only four hours per day
Comp	N/A	Fugitive Ammonia from Components					
IEU	N/A	Building Heaters/Water Heaters	0.7	4.3E-03	5.4E-02	-	
		Facility Total Potential to Emit	**67.0**	**3.2**	**42.9**	**0.0E+00**	
		Q tpy	**293.41**	**13.93**	**187.73**	**0.00**	

Location	Distance from KNO (km)	Q (t/yr)	Q/D
Tuxedni	86.8	495.1	5.7
Denali	199.3	495.1	2.5

Stationary Sources (Turnaround)

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)				
			NO_x	SO_2	PM_{10}	H2SO4	Comments
22	B-502	Plants 4 and 5 Small Flare	0.1	0.0	0.0	-	Highest daily flaring emissions during turnaround occur from the Emergency Flare
23	B-501	Plants 4 and 5 Emergency Flare	6.8	0.0	0.0	-	Maximum daily emissions from flaring (calculation adjusted to reflect three hour duration of flaring event)
11	B-609	Ammonia Tank Storage System Flare	0.1	0.0	0.0	-	No planned flaring events; pilot emissions only
12	B-201	Primary Reformer	-	-	-	-	Reformer does not operate during turnaround
13	B-200	Startup Heater	-	-	-	-	Startup heater does not operate during turnaround
14	D-207	CO_2 Vent	-	-	-	-	
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	
16	H-269	Amine Fat Flasher Vent	-	-	-	-	
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	
19	C-200	H2 Vent Stack (dry gas vent)	-	-	-	-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stac	-	-	10.0	-	
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stac	-	-	10.0	-	
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	
38	D-511	Inerts Vent Scrubber			-	-	
39	E-535	After Condenser Exchanger	-	-	-	-	
40	E-711	Cooling tower	-	-	0.23	-	
41	D-514	Tank Scrubber	-	-	-	-	
41A	D-513	Tank Scrubber				-	
41B	F-209	MDEA Storage Tank				-	
41C	F-615	MDEA Storage Tank				-	
44	6B-708A	Package Boiler	2.4	0.1	1.8	-	
48	6B-708B	Package Boiler	2.4	0.1	1.8	-	
49	6B-708C	Package Boiler	2.4	0.1	1.8	-	
47	N/A	Urea Loading Wharf	-	-	1.1	-	
47C		Urea Warehouse/Transfer (stack)			0.08	-	
47B		Urea Warehouse/Transfer (fugitive)			0.43	-	
47D		Urea Transfer			0.09	-	
50	B-705A	Waste Heat Boiler	-	0.00	0.00	-	Waste Heat Boilers do not operate during turnaround
51	B-705B	Waste Heat Boiler	-	0.00	0.00	-	Waste Heat Boilers do not operate during turnaround
52	B-705C	Waste Heat Boiler	-	0.00	0.00	-	Waste Heat Boilers do not operate during turnaround
53	B-705D	Waste Heat Boiler	-	0.00	0.00	-	Waste Heat Boilers do not operate during turnaround
54	B-705E	Waste Heat Boiler	-	0.00	0.00	-	Waste Heat Boilers do not operate during turnaround
55	GGT-744A	Solar Turbine/Generator Set	36.4	0.19	0.41	-	One Solar turbine bypasses the SCR control device during turnaround
56	GGT-744B	Solar Turbine/Generator Set	-	-	-	-	Remaining Solar Turbines do not operate during turnaround
57	GGT-744C	Solar Turbine/Generator Set	-	-	-	-	Remaining Solar Turbines do not operate during turnaround
58	GGT-744D	Solar Turbine/Generator Set	-	-	-	-	Remaining Solar Turbines do not operate during turnaround
59	GGT-744E	Solar Turbine/Generator Set	-	-	-	-	Remaining Solar Turbines do not operate during turnaround
60	F-791	Deaerator Vent	-	-	-	-	
61	F-711	Degasifier Vent	-	-	-	-	
65	GM-616D	Diesel Fired Well Pump	11.9	0.8	0.8	-	
66	G-613B	Gasoline Fired Firewater Pump	0.6	2.9E-02	3.5E-02	-	Calculation adjusted to reflect anticipated operation only four hours per day
Comp	N/A	Fugitive Ammonia from Components				-	
IEU	N/A	Building Heaters/Water Heaters	0.7	4.3E-03	5.4E-02	-	
		Facility Total Potential to Emit (lb/hr)	**63.8**	**1.4**	**28.7**	**0.0**	
		Q tpy	**279.36**	**6.29**	**125.57**	**0.00**	

Location	Distance from KNO (km)	Q (t/yr)	Q/D
Tuxedni	86.8	411.2	4.7
Denali	199.3	411.2	2.1

Stationary Sources

Source ID	Tag Number	Source Description	Potential to Emit (tpy)												
			NO_x	CO	SO_2	PM (filterable)	PM_{10}	$PM_{2.5}$	VOC	NH_3	Pb	CO_2	CH_4	N_2O	CO_2e
22	B-502	Plants 4 and 5 Small Flare	0.38	1.70	3.22E-03	0.01	0.04	0.04	3.61	0.03	-	644.99	0.01	1.22E-03	645.69
23	B-501	Plants 4 and 5 Emergency Flare	0.20	0.54	1.03E-03	0.00	0.01	0.01	1.16	0.23	-	206.40	3.89E-03	3.89E-04	206.62
11	B-609	Ammonia Tank Storage System Flare	0.37	1.70	3.22E-03	0.01	0.04	0.04	3.61	0.00		644.99	0.01	1.22E-03	12.00
12	B-201	Primary Reformer	118.26	251.88	3.48	11.01	44.06	44.06	31.88	0.00	2.9E-03	695,647	13.33	12.75	699,821
13	B-200	Startup Heater	0.99	0.83	0.01	0.02	0.08	0.08	0.05	0.00	5.0E-06	1,188	0.02	0.02	1,195
14	D-207	CO_2 Vent	-	12.7	-	-	-	-	49.93	25.55	-	845,486	-	-	845,486
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	-	-	1.0E-02	0.00	-	0.00	-	-	0.00
16	H-269	Amine Fat Flasher Vent	-	4.6	-	-	-	-	0.96	2.10	-	13,739	-		13,739
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	-	-	0.24	0.06	-	0.00	-	-	0.00
19	C-200	H2 Vent Stack (dry gas vent)	-	126.9	-	-	-	-	-	50.04	-			-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stack	-	-	-	43.80	43.80	43.80	1.75	200.75	-	-	-	-	-
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stack	-	-	-	43.80	43.80	43.80	1.75	200.75	-	-	-	-	-
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	-	-	0.10	91.10	-	73.00	-	-	73.00
38	D-511	Inerts Vent Scrubber				-	-	-	0.12	49.28		547.50	-	-	547.50
39	E-535	After Condenser Exchanger	-	-	-	-	-	-	-	0.00	-	0.00	-	-	0.00
40	E-711	Cooling tower	-	-	-	3.29	0.99	5.8E-03	-	2.92	-		-	-	0.00
41	D-514	Tank Scrubber	-	-	-	-	-	-	-	0.44	-	0.00	-	-	0.00
41A	D-513	Tank Scrubber							1.7E-04	0.88					
41B	F-209	MDEA Storage Tank							3.0E-05						
41C	F-615	MDEA Storage Tank							5.0E-06						
44a	6B-708C	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
48a	6B-708B	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
49a	6B-708A	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
47	N/A	Urea Loading Wharf	-	-	-	0.55	0.47	0.16	-	0.00	-	0.00	-	-	0.00
47A		Urea Transfer				*	*	*							
47C		Urea Warehouse/Transfer (stack)				0.04	0.04	0.01							
47B		Urea Warehouse/Transfer (fugitive)				0.22	0.19	0.07							
47D		Urea Transfer				0.04	0.04	0.01							
50	B-705A	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
51	B-705B	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
52	B-705C	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
53	B-705D	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
54	B-705E	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,222
55a	GGT-744A	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
56a	GGT-744B	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
57a	GGT-744C	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
58a	GGT-744D	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
59a	GGT-744E	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
60	F-791	Deaerator Vent	-	-	-	-	-	-	-	7.67	-	0.00	-	-	0.00
61	F-711	Degasifier Vent	-	-	-	-	-	-	-	0.12	-	0.00	-	-	0.00
65	GM-616D	Diesel Fired Well Pump	1.00	0.22	0.07	0.07	0.07	0.07	0.08	-	-	37.20	-	-	37.20
66	G-613B	Gasoline Fired Firewater Pump	0.29	0.17	1.5E-02	1.8E-02	1.8E-02	1.8E-02	0.53	-	-	27.17	-	-	27.17
Comp	N/A	Fugitive Ammonia from Components								2.18					
IEU	N/A	Building Heaters/Water Heaters	2.94	1.25	0.02	0.06	0.24	0.24	0.17	-	1.6E-05	3,751	0.07	0.07	3,773
		Facility Total Potential to Emit	**215.81**	**764.48**	**10.20**	**119.78**	**174.26**	**172.82**	**121.26**	**699.01**	**5.0E-03**	**2,191,600**	**33.41**	**20.70**	**2,198,069**

Stationary Sources

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)												
			NO_x	CO	SO_2	PM (filterable)	PM_{10}	$PM_{2.5}$	VOC	NH_3	Pb	CO_2	CH_4	N_2O	CO_2e
22	B-502	Plants 4 and 5 Small Flare	2.2	0.4	0.0	0.0	0.0	0.0	0.8	6.0	-	147.26	2.78E-03	2.78E-04	147.42
23	B-501	Plants 4 and 5 Emergency Flare	54.0	0.1	0.0	0.0	0.0	0.0	0.3	150.0	-	47.12	8.89E-04	8.89E-05	47.17
11	B-609	Ammonia Tank Storage System Flare	0.1	0.4	0.0	0.0	0.0	0.0	0.8	-		147.42	0.00	2.78E-04	147.42
12	B-201	Primary Reformer	27.0	57.5	0.8	2.5	10.1	10.1	7.3	-	6.6E-04	1.59E+05	3.04E+00	2.91E+00	1.60E+05
13	B-200	Startup Heater	9.9	8.3	0.1	0.2	0.8	0.8	0.5	-	5.0E-05	11,882.35	0.23	0.22	11,953.65
14	D-207	CO_2 Vent	-	2.9	-	-	-	-	11.4	5.8	-	193,033.36	-	-	193,033.36
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	-	-	-	-	-	-	-	-	-
16	H-269	Amine Fat Flasher Vent	-	1.1	-	-	-	-	0.22	0.48	-	-	-		-
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	-	-	0.05	0.01	-	-	-	-	-
19	C-200	H2 Vent Stack (dry gas vent)	-	1,268.5	-	-	-	-	0.00	41.70	-			-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stack	-	-	-	10.0	10.0	10.0	0.40	45.83	-	-	-	-	-
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stack	-	-	-	10.0	10.0	10.0	0.40	45.83	-	-	-	-	-
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	-	-	0.02	20.80	-	16.67	-	-	16.67
38	D-511	Inerts Vent Scrubber				-	-	-	0.03	11.25		125.00	-	-	125.00
39	E-535	After Condenser Exchanger	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-
40	E-711	Cooling tower	-	-	-	0.75	0.23	1.3E-03	0.00	0.67	-	-	-	-	-
41	D-514	Tank Scrubber	-	-	-	-	-	-	0.00	0.10	-	-	-	-	-
41A	D-513	Tank Scrubber								0.20					
41B	F-209	MDEA Storage Tank													
41C	F-615	MDEA Storage Tank													
44	6B-708A	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
48	6B-708B	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
49	6B-708C	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
47	N/A	Urea Loading Wharf	-	-	-	1.3	1.1	0.4	0.00	0.00	-	-	-	-	-
47A		Urea Transfer				*	*	*							
47C		Urea Warehouse/Transfer (stack)				0.10	0.08	0.03							
47B		Urea Warehouse/Transfer (fugitive)				0.50	0.43	0.15							
47D		Urea Transfer				0.10	0.09	0.03							
50	B-705A	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
51	B-705B	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
52	B-705C	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
53	B-705D	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
54	B-705E	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.20
55	GGT-744A	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
56	GGT-744B	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
57	GGT-744C	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
58	GGT-744D	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
59	GGT-744E	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
60	F-791	Deaerator Vent	-	-	-	-	-	-	0.00	1.75	-	-	-	-	-
61	F-711	Degasifier Vent	-	-	-	-	-	-	0.00	0.03	-	-	-	-	-
65	GM-616D	Diesel Fired Well Pump	11.9	2.6	0.8	0.8	0.8	0.8	0.97	0.00	-	442.80	-	-	442.80
66	G-613B	Gasoline Fired Firewater Pump	3.4	2.1	1.8E-01	2.1E-01	2.1E-01	2.1E-01	0.21	0.00	-	323.40	-	-	323.40
Comp	N/A	Fugitive Ammonia from Components								0.50					
IEU	N/A	Building Heaters/Water Heaters	0.7	2.9E-01	4.3E-03	1.4E-02	5.4E-02	5.4E-02	3.9E-02	-	3.6E-06	856.35	0.02	0.02	861.44
		Facility Total Potential to Emit (lb/hr)	**126.0**	**1,426.8**	**3.3**	**30.3**	**43.0**	**41.7**	**29.3**	**345.8**	**0.0012**	**509,591**	**7.85**	**4.94**	**511,282**

Table 4-2 Summary of Potential to Emit of Hazardous Air Pollutants

Source ID	Source Description	Acetaldehyde	Acrolein	Arsenic	Benzene	Bis(2-ethylhexyl)phthalate	1,3-Butadiene	Cadmium	Chromium	Cobalt	Dichlorobenzene	Ethylbenzene	Formaldehyde	n-Hexane	Lead	Manganese	Methanol	Naphthalene	Nickel	PAH	Phenol	Propylene Oxide	Toluene	Xylenes
12	Primary Reformer	-	-	-	1.2E-02	-	-	-	-	-	7.0E-03		4.3E-01	10.4	2.9E-03	-	-	3.5E-03	-	5.0E-04	-	-	2.0E-02	-
13	Startup Heater	-	-	-	2.1E-05	-	-	-	-	-	1.2E-05		7.4E-04	0.0	5.0E-06	-	-	6.0E-06	-	8.6E-07	-	-	3.4E-05	-
14	CO_2 Vent	-	-	-	-	-	-	-	-	-	-	-	-	-	-		49.9	-	-	-	-	-	-	-
16	Amine Fat Flasher Vent	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1.0	-	-	-	-	-	-	-
35	Granulator A/B Scrubber Exhaust																1.8							
36	Granulator C/D Scrubber Exhaust																1.8							
37	Atmospheric Absorber Final Scrubber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-
38	Inerts Vent Scrubber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-
44	Package Boiler				2.2E-03						1.3E-03		0.1	1.9	5.2E-04			6.4E-04		9.0E-05			3.5E-03	
48	Package Boiler				2.2E-03						1.3E-03		0.1	1.9	5.2E-04			6.4E-04		9.0E-05			3.5E-03	
49	Package Boiler				2.2E-03						1.3E-03		0.1	1.9	5.2E-04			6.4E-04		9.0E-05			3.5E-03	
50	Waste Heat Boiler	-	-	-	4.2E-04	-	-	-	-	-	2.4E-04	-	1.5E-02	0.4	1.0E-04	-	-	1.2E-04	-	1.7E-05	-	-	6.8E-04	-
51	Waste Heat Boiler	-	-	-	4.2E-04	-	-	-	-	-	2.4E-04	-	1.5E-02	0.4	1.0E-04	-	-	1.2E-04	-	1.7E-05	-	-	6.8E-04	-
52	Waste Heat Boiler	-	-	-	4.2E-04	-	-	-	-	-	2.4E-04	-	1.5E-02	0.4	1.0E-04	-	-	1.2E-04	-	1.7E-05	-	-	6.8E-04	-
53	Waste Heat Boiler	-	-	-	4.2E-04	-	-	-	-	-	2.4E-04	-	1.5E-02	0.4	1.0E-04	-	-	1.2E-04	-	1.7E-05	-	-	6.8E-04	-
54	Waste Heat Boiler	-	-	-	4.2E-04	-	-	-	-	-	2.4E-04	-	1.5E-02	0.4	1.0E-04	-	-	1.2E-04	-	1.7E-05	-	-	6.8E-04	-
55	Solar Turbine/Generator Set	9.7E-03	1.6E-03	-	2.9E-03	-	1.0E-04	-	-	-	-	7.8E-03	1.7E-01	-	-	-	-	3.2E-04	-	5.3E-04	-	7.0E-03	3.2E-02	1.6E-02
56	Solar Turbine/Generator Set	9.7E-03	1.6E-03	-	2.9E-03	-	1.0E-04	-	-	-	-	7.8E-03	1.7E-01	-	-	-	-	3.2E-04	-	5.3E-04	-	7.0E-03	3.2E-02	1.6E-02
57	Solar Turbine/Generator Set	9.7E-03	1.6E-03	-	2.9E-03	-	1.0E-04	-	-	-	-	7.8E-03	1.7E-01	-	-	-	-	3.2E-04	-	5.3E-04	-	7.0E-03	3.2E-02	1.6E-02
58	Solar Turbine/Generator Set	9.7E-03	1.6E-03	-	2.9E-03	-	1.0E-04	-	-	-	-	7.8E-03	1.7E-01	-	-	-	-	3.2E-04	-	5.3E-04	-	7.0E-03	3.2E-02	1.6E-02
59	Solar Turbine/Generator Set	9.7E-03	1.6E-03	-	2.9E-03	-	1.0E-04	-	-	-	-	7.8E-03	1.7E-01	-	-	-	-	3.2E-04	-	5.3E-04	-	7.0E-03	3.2E-02	1.6E-02
65	Diesel Fired Well Pump	1.7E-04	2.1E-05		2.1E-04		8.9E-06	-	-	-	-	-	2.7E-04		-	-	-	1.9E-05	-	1.9E-05	-	-	9.3E-05	6.5E-05
IEU	4 Buildingt Heaters	-	-	-	2.6E-04	-	-	-	-	-	1.5E-04	-	9.4E-03	5.6E-02	1.6E-05	-	-	7.6E-05	-	1.1E-05	-	-	4.3E-04	-
Facility Total Potential to Emit		4.9E-02	7.8E-03	0.0E+00	3.6E-02	0.0E+00	5.3E-04	0.0E+00	0.0E+00	0.0E+00	1.2E-02	3.9E-02	1.6	**17.9**	5.0E-03	0.0E+00	**54.6**	7.7E-03	0.0E+00	3.6E-03	0.0E+00	3.5E-02	0.2	7.8E-02

Total **74.7**

Stack ID **11**
Tag Numbers **B-609**
Source Name **Ammonia Tank Storage System Flare**

Operating Parameters			Note
Heat Input	1.25	(MMBtu/hr)	1
Ammonia Throughput	0	(lb/hr)	13
	0	(tpy)	13
Thermal Conversion	0.5%	(mol NOx/NH3)	2
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
NOx (from pilot)	0.068	(lb/MMBtu)	0.09	0.4	3
NOx (from NH_3)	0.01	(lb NO_x/lb NH_3)	0.00E+00	0.00E+00	4
NOx (total)			0.085	0.37	
CO	0.31	(lb/MMBtu)	0.39	1.70	3
SO_2	0.6	(lb/MMscf)	7.4E-04	3.2E-03	5
PM	1.9	lb/MMscf	2.3E-03	1.0E-02	9
PM_{10} (total)	7.6	lb/MMscf	0.0093	0.041	9
PM2.5 (total)	7.6	lb/MMscf	0.0093	0.041	9
VOC	0.66	(lb/MMBtu)	0.83	3.61	3, 7
CO2	120,162	lb/MMscf	147.3	644.99	10
CH4	2.266	lb/MMscf	2.78E-03	1.22E-02	11
N2O	0.2266	lb/MMscf	2.78E-04	1.22E-03	11
CO2e			147.4	645.7	12
NH_3	99.5%	(% Control)	0.00E+00	0.00E+00	8

Notes:
(1) Design Data, for pilot only
(2) Based on memorandum from Zeeco, Inc. dated April 19, 1988
(3) USEPA AP-42 Chapter 13.5 Industrial Flares, Table 13.5-1 and 13.5-2, February 2018
(4) EF (lb NOx/lb NH3) = 0.005 mol NOx/mol NH3 * (MW NO2/MW NH3)
(5) USEPA AP-42 Chapter 1.4, table 1.4-2
(6) Non-smoking flare
(7) Assumes 100% total hydrocarbons as VOC
(8) Manufacturer Specificaton; E (lb/hr) = Throughput * (1 - Control)
(9) AP-42, Chapter 1.4, Table 1.4-2
(10) Part 98, Table C-1
(11) Part 98, Table C-2
(12) GWP CH4 = 25; GWP N2O = 298
(13) Estimated worst-case hourly and annual planned venting (note: planned flaring will occur with initial commissioning of ammonia storage tanks and decommissioning of ammonia storage tanks in the future.

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 0 (lb/day ammonia vented) = 0

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	0.1	0	0	0.0
PM10	no change			
SO2	no change			

Stack ID **12**
Tag Number **B-201**
Source Name **Primary Reformer**

Operating Parameters			Note
Heat Input	1350.0	(MMBtu/hr)	1
Fuel Heating Value	1020	(Btu/scf)	1
Maximum Fuel Usage	1.32	(MMscf/hr)	
Process Throughput	90	(tph)	1
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			(lb/hr)	(tpy)	
NO_x	0.02	lb/mmBtu	27.0	118.3	2
CO	43.45	(lb/MMscf)	57.5	251.9	6
SO_2	0.6	(lb/MMscf)	0.8	3.5	4
PM (filterable)	1.9	(lb/MMscf)	2.5	11.0	4
PM_{10} (total)	7.6	(lb/MMscf)	10.1	44.1	4
$PM_{2.5}$ (total)	7.6	(lb/MMscf)	10.1	44.1	4
VOC	5.5	(lb/MMscf)	7.3	31.9	4
Lead	0.0005	(lb/MMscf)	6.6E-04	2.9E-03	4
Ammonia					7
CO_2	120000	(lb/MMscf)	1.59E+05	695,647	4
CH_4	2.3	(lb/MMscf)	3.04E+00	13.3	4
N_2O	2.2	(lb/MMscf)	2.91E+00	12.8	4
CO_2e		(lb/MMscf)	1.60E+05	699,821	5

Notes:
(1) Design Data
(2) NOx BACT (BACT = 17 ppm @ 3% O2)
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-1, July 1998
(4) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-2, July 1998
(5) 40 CFR Part 98 Table A-1 Global Warming Potentials
(6) CO BACT (OVR Permit Limit)
(7) BACT = 10 ppm ammonia slip

Stack ID **13**
Tag Number **B-200**
Source Name **Startup Heater**

Operating Parameters			**Note**
Heat Input	101.0	(MMBtu/hr)	1
Fuel Heating Value	1,020	(Btu/scf)	1
Maximum Fuel Usage	0.10	(MMscf/hr)	
Operating Time:	12	(hr/startup)	1
	4	(startups/year)	1
	200	(hr/year)	2

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**(tpy)**	**Note**
NO_x	100	(lb/MMscf)	9.9	0.99	3
CO	84	(lb/MMscf)	8.3	0.83	3
SO_2	0.6	(lb/MMscf)	5.9E-02	0.006	4
PM (filterable)	1.9	(lb/MMscf)	0.19	1.9E-02	4
PM_{10} (total)	7.6	(lb/MMscf)	0.75	7.5E-02	4
$PM_{2.5}$ (total)	7.6	(lb/MMscf)	0.75	7.5E-02	4
VOC	5.5	(lb/MMscf)	0.54	5.4E-02	4
Lead	0.0005	(lb/MMscf)	5.0E-05	5.0E-06	4
CO_2	120,000	(lb/MMscf)	11,882	1,188	4
CH_4	2.3	(lb/MMscf)	0.23	0.02	4
N_2O (Uncontrolled)	2.2	(lb/MMscf)	0.22	0.02	4
CO_2e		(lb/MMscf)	11,954	1,195	5

Notes:
(1) Design Data
(2) conservative proposed limit of maximum hours to be operated
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-1, July 1998
(4) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-2, July 1998
(5) 40 CFR Part 98 Table A-1 Global Warming Potentials

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 24

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	9.9	237.65	43.37	42.4
PM10	0.8	18.06	3.30	3.2
SO2	5.9E-02	1.43	0.26	0.254

Stack ID **14**
Tag Number **D-207**
Source Name **CO2 Vent**

Operating Parameters			Note
Process Throughput	90.0	(tph)	1
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
CO (max)	2.9	(lb/hr)	2.9	12.7	
CO (typical)	1.0	(lb/hr)	1.0	4.4	
VOC	0.1	(lb/ton)	11.4	49.9	4
NH_3	0.07	(tpd)	5.8	25.6	2
MeOH	11.4	(lb/hr)	11.4	49.9	3
CO2 (urea operating)	73,589	(lb/hr)	73,589	322,321	
$CO_{2\ (Urea\ not\ operating)}$	193,033	(lb/hr)	193,033	845,486	5

Notes:
(1) Design Data
(2) Appendix A, Title V Application, 5/14/99
(3) Engineering Estimate from Process Heat and Material Balance, #R4Y-2410; reflects maximum emissions (ammonia plant operating at maximum capacity and urea plant not operating)
(4) Assume VOC emission is equal to methanol emission
(5) Expected CO2 emissions = 417625.7 t/yr, assuming one 30 day Plant 5 outage in addition to 90% Plant 5 OSI, 100% OSI in Plant 4

Stack ID **15**
Tag Number **H-205**
Source Name **Organic Sulfur Removal Unit Vent**

Operating Parameters			Note
Throughput	1	(regeneration/wk)	1
Operating Time:	24	(maximum hr/regeneration)	1
	1,248	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			(lb/hr)	(tpy)	
VOC	0.01	(t/yr)		1.0E-02	2

Notes:
(1) Design Data
(2) Appendix A, Title V Application, 5/14/99 (requested limit)
(3) No SO_2 expected from this vent

Stack ID 16
Tag Number H-269
Source Name Amine Fat Flasher Vent

Operating Parameters			Note
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
CO	1.05	(lb/hr)	1.1	4.6	2
VOC	0.22	(lb/hr)	0.2	1.0	3
NH_3	0.48	(lb/hr)	0.5	2.1	2
MeOH	0.22	(lb/hr)	0.2	1.0	3
CO_2				13,739	4
Methane					
CO_2e				13,739	4

Notes:
(1) Design Data
(2) Engineering Estimate from Process Heat and Material Balance # R4Y-2410
(3) Based on lab samples
(4) One-day maximum rate * 365 days

Stack ID **17**
Tag Number **F-263**
Source Name **PC Stripper Surge Tank Vent**

Operating Parameters			Note
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
NH_3	0.31	(lb/day)	0.01	0.06	2
VOC	1.30	(lb/day)	0.05	0.24	3
MeOH	1.30	(lb/day)	0.05	0.24	2

Notes:
(1) Design Data
(2) Engineering Estimate from Process and Material Balance # 4940-120-XD-YI
(3) VOC assumed equal to methanol emissions

Stack ID **19**
Tag Number **C-200**
Source Name **H2 Vent Stack (dry gas vent)**

Operating Parameters			Note
Operating Time:	12	(hr/startup) - typical	1
	4	(startups/yr)	1
	200	hrs/yr	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
CO	15,222	lb/startup	1,268.5	126.9	2
NH_3	41.7	(lb/hr)	41.7	50.0	3

Notes:
(1) Design Data; vents during a startup and shutdown only
(2) 15222 lb CO/startup (engineering analysis)
(3) Computer Modeling, Simulation Sciences Computer model (Pro II version 5.5)

Stack ID **22**
Tag Numbers **B-502**
Source Name **Plants 4 and 5 Small Flare**

Operating Parameters			Note
Heat Input	1.25	(MMBtu/hr)	1
Fuel Heating Value	1,020	(Btu/scf)	1
Methane	150.00	scfh	1,14
Ammonia Throughput	1,200	(lb/hr)	1
	6	(tpy)	
Operating Time:	24	(hr/day)	1,2
	8,760	(hr/year)	1,2

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	(tpy)	Note
NOx (from CH_4)	0.07	(lb/MMBtu)	0.085	0.372	3
NOx (from NH_3)	1.80	(lb NO_x/1000 lb NH_3)	2.160	0.011	4
NOx (total)			2.245	0.384	
CO	0.31	(lb/MMBtu)	0.388	1.697	3
SO_2	0.6	(lb/MMscf)	7.4E-04	3.2E-03	11
PM (filterable)	1.9	(lb/MMscf)	0.0023	0.0102	11
PM_{10} (total)	7.6	(lb/MMscf)	0.0093	0.0408	11
$PM_{2.5}$ (total)	7.6	(lb/MMscf)	0.0093	0.0408	11
VOC	0.66	(lb/MMBtu)	0.8	3.6	3,6
NH_3	99.5%	(% Control)	6.00	3.1E-02	7
CO_2	120,162	lb/MMscf	147.26	645.0	12
CH_4	2.27	lb/MMscf	2.78E-03	1.22E-02	13
N2O	0.23	lb/MMscf	2.78E-04	1.22E-03	13
CO_2e			147.42	645.7	14

Notes:
(1) Design Data (PFD R4Y-2430)
(2) Operating time for pilot only
(3) USEPA AP-42 Chapter 13.5 Industrial Flares, Tables 13.5-1 and 13.5-2, February 2018
(4) EF (lb NOx/lb NH3) = 43.2 lb/day NOx from combustion of 1000 lb/hr NH3, John Zink memorandum dated June 1, 1995
(5) Non-smoking flare
(6) Assumes 100% total hydrocarbons as VOC
(7) Manufacturer Specificaton; E (lb/hr) = Throughput * (1 - Control)
(8) density of methane according to perry's handbook is 0.0448 lb/cf
(9) Assumed complete combustion of methane
(10) USEPA AP-42 Chapter 13.5 Industrial Flares, Table 13.5-2
(11) USEPA AP-42 Chapter 1.4, Table 1.4-2
(12) Part 98, Table C-1
(13) Part 98, Table C-2
(14) GWP CH4 = 25; GWP N2O = 298
(15) assuming purge gas is combusted

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 6 (lb/day ammonia vented) = 7200

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	2.2	13.47	2.45828	2.1
PM10	no change			
SO2	no change			

Stack ID **23**
Tag Numbers **B-501**
Source Name **Plants 4 and 5 Emergency Flare**

Operating Parameters			**Note**
Heat Input	0.40	(MMBtu/hr)	1
Fuel Heating Value	1,020	(Btu/scf)	1
Methane	100.00	scfh	1,15
Ammonia Throughput	30,000	(lb/hr)	1
	45	(tpy)	
Operating Time:	24	(hr/day)	1,2
	8,760	(hr/year)	1,2

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**Emission Rate (tpy)**	**Note**
NOx (from CH_4)	0.07	(lb/MMBtu)	0.027	1.2E-01	3
NOx (from NH_3)	1.80	(lb NO_x/1000 lb NH_3)	54.0	8.1E-02	4
NOx (total)			54.0	0.200	
CO	0.31	(lb/MMBtu)	0.124	5.4E-01	3
SO_2	0.6	(lb/MMscf)	2.4E-04	1.0E-03	11
PM (filterable)	1.9	(lb/MMscf)	0.0007	0.0033	11
PM_{10} (total)	7.6	(lb/MMscf)	0.0030	0.0131	11
$PM_{2.5}$ (total)	7.6	(lb/MMscf)	0.0030	0.0131	11
VOC	0.66	(lb/MMBtu)	2.6E-01	1.2E+00	3,6
NH_3	99.5%	(% Control)	150.00	2.3E-01	7
CO_2	120,162	lb/MMscf	47.12	206.4	12
CH_4	2.27	lb/MMscf	8.89E-04	3.89E-03	13
N2O	0.23	lb/MMscf	8.89E-05	3.89E-04	13
CO_2e			47.17	206.6	14

Notes:
(1) Design Data (PFD R4Y-2430)
(2) Operating time for pilot only
(3) USEPA AP-42 Chapter 13.5 Industrial Flares, Table 13.5-2 and 13.5-2, February 2018
(4) EF (lb NOx/lb NH3) = 43.2 lb/day NOx from combustion of 1,000 lb/hr NH3, John Zink memorandum dated June 1, 1995
(5) Non-smoking flare
(6) Assumes 100% total hydrocarbons as VOC
(7) Manufacturer Specificaton; E (lb/hr) = Throughput * (1 - Control)
(8) density of methane according to perry's handbook is 0.0448 lb/cf
(9) Assumed complete combustion of methane
(10) USEPA AP-42 Chapter 13.5 Industrial Flares, Table 13.5-2
(11) USEPA AP-42 Chapter 1.4, Table 1.4-2
(12) Part 98, Table C-1
(13) Part 98, Table C-2
(14) GWP CH4 = 25; GWP N2O = 298
(15) assuming purge gas is burned

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 3 (lb/day ammonia vented) = 90000

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	54.0	162.082	29.5799	29.4
PM10	no change			
SO2	no change			

Emissions from Tank Flare Planned Venting Activities

Description of Activity	Emissions (lb/hr)	Duration (hr)	Event Emissions (lb/event)	Frequency
No planned venting activities				

Emissions from Small Flare Planned Venting Activities

Description of Activity	emissions (lb/hr)	duration (hr)	Event Emissions (lb/event)	Frequency	Sequence during Turnaround
Synthesis Loop Depressurization	690	4	2,760	Once/4 years	Day 2
Refrigeration System Shutdown	1,200	4	4,800	Once/4 years	Day 3-4
Drain Underground Ammonia Tank	7.5	4	30	Once/4 years	Day 7
Refrigeration System Startup	150	4	600	Once/4 years	Day 20
PRU System Startup	720	6	4,320	Once/4 years	Day 21
Total			12,510		

Emissions from Emergency Flare Planned Venting Activities

Description of Activity	Emissions (lb/hr)	Duration (hr)	Event Emissions (lb/event)	Frequency	Sequence during Turnaround
Reactor Draining	30,000	3	90,000	Once/4 years	Day 1
Total			90,000		

All information confirmed in e-mail from J. Pault dated 12/17/2013

Stack ID 35
Tag Number C-560A
Source Name Granulator A/B Scrubber Exhaust Vent Stack
(includes rotary granulators, shaker screens, crushers, and transfer points)

Operating Parameters			Note
Process Throughput	50.0	(tph)	1
Scrubber VOC control Eff	90.0	%	
UF-85 usage	400.0	lb/hr	5
Operating Time:	24	(hr/day)	1
	8760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
PM	0.20	(lb/ton)	10.0	43.8	2
PM_{10}	0.20	(lb/ton)	10.0	43.8	2
$PM_{2.5}$	0.20	lb/ton	10.0	43.8	2, 4
VOC	0.01	lb/lb UF-85	0.40	1.75	5,6
Methanol	0.01	lb/lb UF-85	0.40	1.75	5,6
NH_3	0.55	(tpd)	45.8	200.8	3

Notes:
(1) Design Data
(2) BACT
(3) Appendix A, Title V Application, 5/14/99
(4) PM2.5 assumed equal to PM10
(5) Total UF-85 addition to urea feed = 800 lb/hr; UF-85 methanol content ranges between 0.1 and 1%
(6) assumes 90% control of Methanol/VOC emissions

Methanol Concentration in Exhaust (accounting for control)

0.40	lb/hr
12.05	cf/lb @ 70°F
4.82	cf/hr CH3OH
100,156	acfm 10/12/93 Stack Test
576.8	deg R, stack temp 10/12/93 Stack Test
92030	scfm @ 70°F
0.87	ppmv methanol based on above emission rate and air flow rate

Stack ID **36**
Tag Number **C-560B**
Source Name **Granulator C/D Scrubber Exhaust Vent Stack**
(includes rotary granulators, shaker screens, crushers, and transfer points)

Operating Parameters			Note
Process Throughput	50.0	(tph)	1
Scrubber VOC Control Eff	90.0	%	
UF-85 usage	400.0	lb/hr	5
Operating Time:	24	(hr/day)	1
	8760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
PM	0.20	(lb/ton)	10.0	43.8	2
PM_{10}	0.20	(lb/ton)	10.0	43.8	2
$PM_{2.5}$	0.20	lb/ton	10.0	43.8	2, 4
VOC	0.01	lb/lb UF-85	0.40	1.75	5,6
Methanol	0.01	lb/lb UF-85	0.40	1.75	5,6
NH_3	0.55	(tpd)	45.8	200.8	3

Notes:
(1) Design Data
(2) BACT
(3) Appendix A, Title V Application, 5/14/99
(4) PM2.5 assumed equal to PM10
(5) Total UF-85 addition to urea feed = 800 lb/hr; UF-85 methanol content ranges between 0.1 and 1%
(6) assumes 90% control of Methanol/VOC emissions

Methanol Concentration in Exhaust (accounting for control)

0.40 lb/hr
12.05 cf/lb @ 70°F
4.82 cf/hr CH3OH

100,156 acfm 10/12/93 Stack Test
576.8 deg R, stack temp 10/12/93 Stack Test
92030 scfm @ 70°F

0.87 ppmv methanol based on above emission rate and air flow rate

Stack ID **37**
Tag Number **D- 515**
Source Name **Atmospheric Absorber Final Scrubber**

Operating Parameters			Note
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
VOC	0.022	(lb/hr)	0.022	0.1	2
NH_3	20.80	(lb/hr)	20.8	91.1	3
MeOH	0.02	(lb/hr)	0.022	0.1	4
CO_2	0.20	tpd	16.7	73.0	5

Notes:
(1) Design Data
(2) Engineering estimate based on monthly laboratory analysis and mass balance, R5I-5035
(3) normal ammonia emission rate is 2 lbs/hr and high ammonia emission rate is 3 lbs/hr
(4) Assumes MeOH as 100% VOC
(5) historic sampling showed values between zero and 0.2 tpd

Stack ID **38**
Tag Number **D-511**
Source Name **Inerts Vent Scrubber**

Operating Parameters			Note
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			(lb/hr)	(tpy)	
VOC	0.028	(lb/hr)	0.03	0.1	2
NH_3	0.135	(tpd)	11.3	49.3	3
MeOH	0.028	(lb/hr)	0.03	0.1	4
CO_2	1.5	tpd	125.00	547.5	4

Notes:
(1) Design Data
(2) Engineering estimate based on laboratory analysis and mass balance, R5Y-2505
(3) This source is listed as a Routine and Continuous CERCLA source for NH3 with an upper bound of 270 lb/day
(4) Assumes MeOH as 100% VOC

Stack ID **39**
Tag Number **E-535**
Source Name **After Condenser Exchanger**

Operating Parameters			Note
Operating Time:	0	(hr/day)	1
	0	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
NH_3	120	(lb/day)	0.00E+00	0.00E+00	2

Notes:
(1) Design Data (during normal operations, unit vents to scrubber and through stack 41A
(2) Uncontrolled emission rate; unit normally vents through scrubber and out stack 41A

Stack ID 40
Tag Number E-711
Source Name Cooling tower

Operating Parameters			Note
Water Circulation Rate of all cells (R)	15,000	gpm	1
Total Liquid Drift (S)	0.002	%	1
Density of Water (D)	8.3453	lb/gal	
Expected TDS/TSS of Circulated Water (C)	5,000	ppmw	1
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
PM	8.35E-04	lb/10^3 gal	0.75	3.29	2
PM10	29.97	% of PM	0.23	0.99	4
PM2.5	0.18	% of PM	1.33E-03	5.81E-03	4
NH_3	16	(lb/day)	0.7	2.9	3

Notes:
(1) Design data, Model # 674-4-02 Marley Class 600 Cross-Flow 2 Cell; Drift rate reflects BACT
(2) USEPA AP-42, Chapter 13.4 *Wet Cooling Towers*, Table 13.4-1 [EF (lb/1,000 gal) = 1,000*D*(S/100)*(C/1,000,000)]
(3) Engineering estimate based on free NH3 and laboratory analysis of pH
(4) Calculating Realistic PM10 Emissions from Cooling Towers, Joel Reisman and Gordon Frisbie, Environmental Progress (Vol 21, No 2), July 2002 (calculations on next sheet)

INPUT MAXIMUM TDS CONCENTRATION

Max TDS = 5,000 ppmw

EPRI Droplet Diameter (µm)	Droplet Volume (μm^3)	Droplet Mass (µg)	Particle Mass (solids) (µg)	Solid Particle Volumne (μm^3)	Solid Particle Diameter (µm)	EPRI % Mass Smaller
10	524	5.24E-04	2.62E-06	1.19	1.315	0.000
				Interpolation --->	**2.500**	**0.177**
20	4,189	4.19E-03	2.09E-05	9.52	2.630	0.196
30	14,137	1.41E-02	7.07E-05	32.13	3.944	0.226
40	33,510	3.35E-02	1.68E-04	76.16	5.259	0.514
50	65,450	6.54E-02	3.27E-04	148.75	6.574	1.816
60	113,097	1.13E-01	5.65E-04	257.04	7.889	5.702
70	179,594	1.80E-01	8.98E-04	408.17	9.203	21.348
				Interpolation --->	**10.000**	**29.971**
90	381,704	3.82E-01	1.91E-03	867.51	11.833	49.812
110	696,910	6.97E-01	3.48E-03	1,583.89	14.462	70.509
130	1,150,347	1.15E+00	5.75E-03	2,614.42	17.092	82.023
150	1,767,146	1.77E+00	8.84E-03	4,016.24	19.722	88.012
180	3,053,628	3.05E+00	1.53E-02	6,940.06	23.666	91.032
210	4,849,048	4.85E+00	2.42E-02	11,020.56	27.610	92.468
240	7,238,229	7.24E+00	3.62E-02	16,450.52	31.554	94.091
270	10,305,995	1.03E+01	5.15E-02	23,422.72	35.499	94.689
300	14,137,167	1.41E+01	7.07E-02	32,129.92	39.443	96.288
350	22,449,298	2.24E+01	1.12E-01	51,021.13	46.017	97.011
400	33,510,322	3.35E+01	1.68E-01	76,159.82	52.591	98.34
450	47,712,938	4.77E+01	2.39E-01	108,438.50	59.165	99.071
500	65,449,847	6.54E+01	3.27E-01	148,749.65	65.738	99.071
600	113,097,336	1.13E+02	5.65E-01	257,039.40	78.886	100.000

0.177 % of PM is PM2.5

29.971 % of PM is PM10

Calculations based on approach presented in: Calculating Realistic PM10 Emissions from Cooling Towers
Joel Reisman and Gordon Frisbie, Environmental Progress (Vol 21, No 2), July 2002

Stack ID **41**
Tag Number **D-514**
Source Name **Tank Scrubber**

Operating Parameters			Note
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
NH_3	0.10	lb/hr	0.10	0.4	2

Notes:
(1) Design Data
(2) Engineering estimate from Process Material and Energy Balance F-1002

Stack ID **41A**
Tag Number **D-513**
Source Name **Tank Scrubber**

Operating Parameters			**Note**
Scrubber VOC Control Eff	90	%	
Scrubber Ammonia Control Eff	96	%	
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**Emission Rate (tpy)**	**Note**
VOC			0.00004	0.0002	2
Ammonia	120	lb/day	0.20	0.876	3

Notes:
(1) Design Data
(2) TANKS
(3) Uncontrolled ammonia emissions from E-535 (design data)

Stack ID **41B**
Tag Number **F-209**
Source Name **MDEA Storage Tank**

Operating Parameters			Note
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
VOC			6.85E-06	3.00E-05	2

Notes:
(1) Design Data
(2) TANKS

Stack ID **41C**
Tag Number **F-615**
Source Name **MDEA Storage Tank**

Operating Parameters			**Note**
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**Emission Rate (tpy)**	**Note**
VOC			1.14E-06	5.00E-06	2

Notes:
(1) Design Data
(2) TANKS

Stack ID 44
Tag Number 6B-708C
Source Name Tank Scrubber

Operating Parameters			Note
Heat Input	243.0	(MMBtu/hr)	1
Fuel Heating Value	1,020	(Btu/scf)	1
Maximum Fuel Usage	0.24	(MMscf/hr)	
	2,087	(MMscf/yr)	
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			(lb/hr)	(tpy)	
NO_x	0.01	lb/MMBtu	2.4	10.6	6
CO	0.037	lb/MMBtu	9.0	39.4	7
SO_2	0.600	lb/MMscf	1.4E-01	0.6	3
PM (Filterable)	1.9	lb/MMscf	0.5	2.0	3
PM_{10} (total)	7.6	lb/MMscf	1.8	7.9	3
$PM_{2.5}$ (total)	7.6	lb/MMscf	1.8	7.9	3
VOC	5.5	lb/MMscf	1.3	5.7	3
Lead	0.0005	lb/MMscf	1.2E-04	5.2E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	28,588	125,216	3
N_2O (low NOx burner)	0.64	lb/MMscf	0.15	0.67	3
Methane	2.3	lb/MMscf	0.55	2.40	3
CO_2e	60.12	ton/MMscf	28,649	125,483	4

Notes:
(1) Design Data
(2) BACT
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT assumed to be equal to 0.01 lb/mmBtu for new boiler with SCR
(7) BACT assumed to be equal to 50 ppm @ 3% O2, or approximately 0.037 lb/mmBtu

Stack ID **47**
Tag Number **N/A**
Source Name **Urea Loading Wharf**

Operating Parameters			**Note**
Process Throughput	1,000	tph	1
Control Efficiency	87.5	%	5
Operating Time:	24	hr/day	1
	8,760	hr/year	1, 4

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**Emission Rate (tpy)**	**Note**
PM	0.010	lb/ton	1.250	0.5	2
PM_{10}	0.0085	lb/ton	1.063	0.5	2
$PM_{2.5}$	0.003	lb/ton	0.375	0.2	3

Notes:
(1) Design Data
(2) Uncontrolled emission factor for Urea production, FIRE factors, SCC 30104007, with 50% control adjustment for cooler addition; annual emissions limited by urea plant capacity
(3) EPA Particulate Calculator for SCC 30104007; annual emissions limited by urea plant capacity
(4) Annual capacity capped by capacity of urea granulation plant (100 t/hr)
(5) Reduction in PM emissions achieved due to emissions being generated inside a ship's hold; based on Texas Commission on Environmental Quality document "Rock Crushing Plants", Table 7 which provides 90% control of PM emissions for a full enclosure (reduced credit of 50% used recognizing ship hold is not a full enclosure); control efficiency of 75% applied for use of telescoping chutes based on EPA document "Stationary Source Control Techniques Document for Fine Particulate Matter".

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 24 (tons/day urea loaded) = 24000

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	no change			
PM10	1.1	25.5	4.6538	4.2
SO2	no change			

Stack ID **47a**
Tag Number
Source Name **Urea Transfer (transfer before Urea Warehouse from conveyor P701 to conveyor P702)***

Operating Parameters			**Note**
Process Throughput	100.0	tph	1
Capture Efficiency	100%		
Control Efficiency	99%		
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate (lb/hr)**	**(tpy)**	**Note**
PM	0.020	lb/ton	*	*	2
PM_{10}	0.017	lb/ton	*	*	2
$PM_{2.5}$	0.006	lb/ton	*	*	3

Notes:
(1) Design Data
(2) Uncontrolled emission factor for Urea production, FIRE factors, SCC 30104007, with 50% control adjustment for cooler addition; annual emissions limited by urea plant capacity
(3) EPA Particulate Calculator, SCC 30104007
* Transfer point will be routed to existing dust collector identified as 47C; this will not be a separate emission point

Stack ID **47B and 47C**
Tag Number **NA**
Source Name **Urea Warehouse and Urea Transfer (Transfer from Conveyor P701 to P702, transfer from warehouse to Conveyor P705, and transfer from Conveyor P705 to Conveyor P800)**

Operating Parameters			Note
Process Throughput (Max Hourly)	1,000	tph	1
Process Throughput (Max Annual)	876,000	tpy	
Capture Efficiency	95%		
Control Efficiency	99%		
Operating Time:	24	hr/day	1
	8,760	hr/year	1, 4

Stack Emissions (ID 47C)

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
PM	0.010	lb/ton	0.10	0.042	2, 4
PM_{10}	0.0085	lb/ton	0.08	0.035	2, 4
$PM_{2.5}$	0.003	lb/ton	0.029	0.012	3, 4

Notes:
(1) Design Data
(2) Uncontrolled emission factor for Urea production, FIRE factors, SCC 30104007,
(3) EPA Particulate Calculator, SCC 30104007
(4) Annual emissions capped at capacity of urea granulation plant (100 tons/hr)

Fugitive Emissions (ID 47B)

Pollutant	Emission Factor	Unit	Emission Rate (lb/hr)	Emission Rate (tpy)	Note
PM	0.010	lb/ton	0.50	0.22	2, 4
PM_{10}	0.0085	lb/ton	0.43	0.19	2, 4
$PM_{2.5}$	0.003	lb/ton	0.15	0.066	3, 4

Notes:
(1) Design Data
(2) Uncontrolled emission factor for Urea production, FIRE factors, SCC 30104007, with 50% control adjustment for cooler addition; annual emissions limited by urea plant capacity
(3) EPA Particulate Calculator, SCC 30104007
(4) Annual emissions capped at capacity of urea granulation plant (100 tons/hr)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 24   tons/day urea handled/transferred = 24000

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	no change			
PM10 (stack 47C)	0.1	1.938	0.353685	0.3
PM10 (fugitive 47B)	0.4	10.2	1.8615	1.7
SO2	no change			

Stack ID **47D**
Tag Number
Source Name **Urea Transfer (transfer from conveyor P800 to P810)**

Operating Parameters			Note
Process Throughput	1,000	tph	1
Capture Efficiency	100%		
Control Efficiency	99%		
Operating Time:	24	hr/day	1
	8,760	hr/year	1, 4

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
PM	0.010	lb/ton	0.10	0.044	2, 4
PM_{10}	0.0085	lb/ton	0.085	0.037	2, 4
$PM_{2.5}$	0.003	lb/ton	0.030	0.013	3, 4

Notes:
(1) Design Data
(2) Uncontrolled emission factor for Urea production, FIRE factors, SCC 30104007, with 50% control adjustment for cooler addition; annual emissions limited by urea plant capacity
(3) EPA Particulate Calculator, SCC 30104007
(4) Maximum annual capacity capped at capacity of urea granulation plant (100 tons/hour)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day operated = 24 tons/day urea handled/transferred = 24000

	lbhr	lb/d	t/yr	t/yr increase over baseline
NOx	no change			
PM10	0.1	2.04	0.3723	0.34
SO2	no change			

Stack ID **48**
Tag Number **6B-708B**
Source Name **Package Boiler**

Operating Parameters			Note
Heat Input	243.0	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.24	MMscf/hr	
	2,087	MMscf/yr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.01	lb/MMBtu	2.4	10.6	2,6
CO	0.037	lb/MMBtu	9.0	39.4	2,7
SO_2	0.6	lb/MMscf	1.4E-01	0.6	3
PM (Filterable)	1.9	lb/MMscf	0.5	2.0	3
PM_{10} (total)	7.6	lb/MMscf	1.8	7.9	3
$PM_{2.5}$ (total)	7.6	lb/MMscf	1.8	7.9	3
VOC	5.5	lb/MMscf	1.3	5.7	3
Lead	0.0005	lb/MMscf	1.2E-04	5.2E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	28,588	125,216	3
N_2O (low NOx burner)	0.64	lb/MMscf	0.2	0.7	3
Methane	2.3	lb/MMscf	0.5	2.4	3
CO_2e			28,649	125,483	4

Notes:
(1) Design Data
(2) BACT
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT assumed to be equal to 0.01 lb/mmBtu for new boiler with SCR
(7) BACT assumed to be equal to 50 ppm @ 3% O2, or approximately 0.037 lb/mmBtu

Stack ID **49**
Tag Number **6B-708A**
Source Name **Package Boiler**

Operating Parameters			Note
Heat Input	243.0	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.24	MMscf/hr	
	2087	MMscf/yr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.01	lb/MMBtu	2.4	10.6	2,6
CO	0.037	lb/MMBtu	9.0	39.4	2,7
SO_2	0.600	lb/MMscf	1.4E-01	0.6	3
PM (Filterable)	1.9	lb/MMscf	0.5	2.0	3
PM_{10} (total)	7.6	lb/MMscf	1.8	7.9	3
$PM_{2.5}$ (total)	7.6	lb/MMscf	1.8	7.9	3
VOC	5.5	lb/MMscf	1.3	5.7	3
Lead	0.0005	lb/MMscf	1.2E-04	5.2E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	28,588	125,216	3
N_2O (low NOx burner)	0.64	lb/MMscf	0.15	0.67	3
Methane	2.3	lb/MMscf	0.55	2.40	3
CO_2e			28,649	125,483	4

Notes:
(1) Design Data
(2) BACT
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT assumed to be equal to 0.01 lb/mmBtu for new boiler with SCR
(7) BACT assumed to be equal to 50 ppm @ 3% O2, or approximately 0.037 lb/mmBtu

Stack ID **50**
Tag Number **B-705A**
Source Name **Waste Heat Boiler**

Operating Parameters			Note
Heat Input	46.7	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.05	MMscf/hr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate lb/hr	Emission Rate tpy	Note
NO_x	0.0185	lb/MMBtu	0.86	3.79	1,6
CO	0.109	lb/MMBtu	5.09	22.31	1,7
SO_2	0.6	lb/MMscf	2.7E-02	0.12	3
PM (Filterable)	1.9	lb/MMscf	0.09	0.38	1,3,8
PM_{10} (total)	7.6	lb/MMscf	0.35	1.53	1,3,8
$PM_{2.5}$ (total)	7.6	lb/MMscf	0.35	1.53	1,3,8
VOC	5.5	lb/MMscf	0.25	1.10	1,3,9
Lead	0.0005	lb/MMscf	2.3E-05	0.00	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	5,498	24,079	3
N_2O	2.2	lb/MMscf	0.10	0.44	3
Methane	2.3	lb/MMscf	0.11	0.46	3
CO_2e			5,531	24,224	1,4,10

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-1, July 1998
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion*, Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Waste Heat Boilers
(7) BACT proposed to be 50 ppm CO @ 15% O2, or approximately 0.109 lb/mmBtu
(8) BACT proposed to be 0.0074 lb/MMBtu
(9) BACT proposed to be 0.0054 lb/MMBtu (3-hr average)
(10) BACT proposed to be a combined CO2e emission limit of 121,112 tons per year from all turbines

Stack ID **51**
Tag Number **B-705B**
Source Name **Waste Heat Boiler**

Operating Parameters			Note
Heat Input	46.7	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.05	MMscf/hr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.0185	lb/MMBtu	0.86	3.79	1,6
CO	0.109	lb/MMBtu	5.09	22.31	1,7
SO_2	0.6	lb/MMscf	2.7E-02	0.12	3
PM (Filterable)	1.9	lb/MMscf	0.09	0.38	1,3,8
PM_{10} (total)	7.6	lb/MMscf	0.35	1.53	1,3,8
$PM_{2.5}$ (total)	7.6	lb/MMscf	0.35	1.53	1,3,8
VOC	5.5	lb/MMscf	0.25	1.10	1,3,9
Lead	0.0005	lb/MMscf	2.3E-05	1.00E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	5,497.53	24,079.18	3
N_2O	2.2	lb/MMscf	0.10	0.44	3
Methane	2.3	lb/MMscf	0.11	0.46	3
CO_2e			5,530.51	24,223.65	1,4,10

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-1, July 1998
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Waste Heat Boilers
(7) BACT proposed to be 50 ppm CO @ 15% O2, or approximately 0.109 lb/mmBtu
(8) BACT proposed to be 0.0074 lb/MMBtu
(9) BACT proposed to be 0.0054 lb/MMBtu (3-hr average)
(10) BACT proposed to be a combined CO2e emission limit of 121,112 tons per year from all turbines

Stack ID **52**
Tag Number **B-705C**
Source Name **Waste Heat Boiler**

Operating Parameters			Note
Heat Input	46.7	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.05	MMscf/hr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate lb/hr	Emission Rate tpy	Note
NO_x	0.0185	lb/MMBtu	0.86	3.8	1,6
CO	0.109	lb/MMBtu	5.09	22.3	1,7
SO_2	0.6	lb/MMscf	2.7E-02	0.1	3
PM (Filterable)	1.9	lb/MMscf	0.09	0.4	1,3,8
PM_{10} (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
$PM_{2.5}$ (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
VOC	5.5	lb/MMscf	0.25	1.1	1,3,9
Lead	0.0005	lb/MMscf	2.3E-05	1.00E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	5,497.53	24,079.18	3
N_2O	2.2	lb/MMscf	0.10	0.44	3
Methane	2.3	lb/MMscf	0.11	0.46	3
CO_2e			5,530.51	24,223.65	1,4,10

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-1, July 1998
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Waste Heat Boilers
(7) BACT proposed to be 50 ppm CO @ 15% O2, or approximately 0.109 lb/mmBtu
(8) BACT proposed to be 0.0074 lb/MMBtu
(9) BACT proposed to be 0.0054 lb/MMBtu (3-hr average)
(10) BACT proposed to be a combined CO2e emission limit of 121,112 tons per year from all turbines

Stack ID **53**
Tag Number **B-705D**
Source Name **Waste Heat Boiler**

Operating Parameters			Note
Heat Input	46.7	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.05	MMscf/hr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.0185	lb/MMBtu	0.86	3.8	1,6
CO	0.109	lb/MMBtu	5.09	22.3	1,7
SO_2	0.6	lb/MMscf	2.7E-02	0.1	3
PM (Filterable)	1.9	lb/MMscf	0.09	0.4	1,3,8
PM_{10} (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
$PM_{2.5}$ (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
VOC	5.5	lb/MMscf	0.25	1.1	1,3,9
Lead	0.0005	lb/MMscf	2.3E-05	1.00E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	5,497.53	24,079.18	3
N_2O	2.2	lb/MMscf	0.10	0.44	3
Methane	2.3	lb/MMscf	0.11	0.46	3
CO_2e			5,530.51	24,223.65	1,4,10

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-1, July 1998
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Waste Heat Boilers
(7) BACT proposed to be 50 ppm CO @ 15% O2, or approximately 0.109 lb/mmBtu
(8) BACT proposed to be 0.0074 lb/MMBtu
(9) BACT proposed to be 0.0054 lb/MMBtu (3-hr average)
(10) BACT proposed to be a combined CO2e emission limit of 121,112 tons per year from all turbines

Stack ID **54**
Tag Number **B-705E**
Source Name **Waste Heat Boiler**

Operating Parameters			Note
Heat Input	46.7	MMBtu/hr	1
Fuel Heating Value	1,020	Btu/scf	1
Maximum Fuel Usage	0.05	MMscf/hr	
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.0185	lb/MMBtu	0.86	3.8	1,6
CO	0.109	lb/MMBtu	5.09	22.3	1,7
SO_2	0.6	lb/MMscf	2.7E-02	0.1	3
PM (Filterable)	1.9	lb/MMscf	0.09	0.4	1,3,8
PM_{10} (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
$PM_{2.5}$ (total)	7.6	lb/MMscf	0.35	1.5	1,3,8
VOC	5.5	lb/MMscf	0.25	1.1	1,3,9
Lead	0.0005	lb/MMscf	2.3E-05	1.00E-04	3
NH3	10	ppmv			5
CO_2	120,000	lb/MMscf	5,497.53	24,079.18	3
N_2O	2.2	lb/MMscf	0.10	0.44	3
Methane	2.3	lb/MMscf	0.11	0.46	3
CO_2e			5,530.20	24,222.27	1,4,10

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-1, July 1998
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) Ammonia Slip
(6) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Waste Heat Boilers
(7) BACT proposed to be 50 ppm CO @ 15% O2, or approximately 0.109 lb/mmBtu
(8) BACT proposed to be 0.0074 lb/MMBtu
(9) BACT proposed to be 0.0054 lb/MMBtu (3-hr average)
(10) BACT proposed to be a combined CO2e emission limit of 121,112 tons per year from all turbines

Stack ID **55a**
Tag Number **GGT-744A**
Source Name **Solar Turbine/Generator Set**

Operating Parameters			Note
Heat Input	55.4	MMBtu/hr	1
Bypass Hours	204.0	hr/year	5
NOx Emissions during bypass hours	36.4	lb/hr	6
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	0.0185	lb/MMBtu	1.03	8.10	1,7
CO	0.109	lb/MMBtu	6.04	26.47	1,8
SO_2	3.4E-03	lb/MMBtu	0.19	0.83	2,3
PM (Filterable)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
PM_{10} (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
$PM_{2.5}$ (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
CO_2	110.00	lb/MMBtu	6.10E+03	2.67E+04	2
N_2O	3.0E-03	lb/MMBtu	0.17	0.73	2
Methane	8.6E-03	lb/MMBtu	0.48	2.09	2
CO_2e			6,161.65	26,988.01	4,10
VOC	2.1E-03	lb/MMBtu	0.12	0.51	1,11

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 3.1 *Stationary Gas Turbines* , Table 3.1-2a, April 2000
(3) Assumed factor for natural gas usage, see note h in Table 3.1-1a
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) hours per year Solar Turbine would operate without Waste Heat Boiler (bypassing the SCR control system
(6) highest hourly emission rate based on worst case Solar NOx generation rate (0.656 lbs/MMBtu) considering both HHV and LHV
(7) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Solar Turbine
(8) BACT proposed to be 50 ppm @ 15% O2, or approximately 0.109 lb/MMBtu
(9) BACT proposed to be 0.0074 lb/MMBtu
(10) BACT proposed to be a combined CO2e emission limit of 134,909 tons per year from all turbines
(11) BACT proposed to be 0.0021 lb/MMBtu (3-hr average)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum Hours per day = 24

	lb/hr	lb/day	t/yr	t/yr increase over baseline
NOx	36.4	874.08	159.5196	147.6
PM10	no change			
SO2	no change			

Stack ID **56a**
Tag Number **GGT-744B**
Source Name **Solar Turbine/Generator Set**

Operating Parameters			**Note**
Heat Input	55.4	MMBtu/hr	1
Bypass Hours	204.0	hr/year	5
NOx Emissions during bypass hours	36.4	lb/hr	6
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NO_x	0.0185	lb/MMBtu	1.03	8.10	1,7
CO	0.109	lb/MMBtu	6.04	26.47	1,8
SO_2	3.4E-03	lb/MMBtu	0.19	0.83	2,3
PM (Filterable)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
PM_{10} (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
$PM_{2.5}$ (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
CO_2	110	lb/MMBtu	6,098.73	26,712.44	2
N_2O	3.0E-03	lb/MMBtu	0.17	0.73	2
Methane	8.6E-03	lb/MMBtu	0.48	2.09	2
CO_2e			6,161.65	26,988.01	4,10
VOC	2.1E-03	lb/MMBtu	0.12	0.51	1,11

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 3.1 *Stationary Gas Turbines* , Table 3.1-2a, April 2000
(3) Assumed factor for natural gas usage, see note h in Table 3.1-1a
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) hours per year Solar Turbine would operate without Waste Heat Boiler (bypassing the SCR control system
(6) highest hourly emission rate based on worst case Solar NOx generation rate (0.656 lbs/MMBtu) considering both HHV and LHV
(7) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Solar Turbine
(8) BACT proposed to be 50 ppm @ 15% O2, or approximately 0.109 lb/MMBtu
(9) BACT proposed to be 0.0074 lb/MMBtu
(10) BACT proposed to be a combined CO2e emission limit of 134,909 tons per year from all turbines
(11) BACT proposed to be 0.0021 lb/MMBtu (3-hr average)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum Hours per day = 24

	lb/hr	lb/day	t/yr	t/yr increase over baseline
NOx	36.4	874.08	159.5196	147.6
PM10	no change			
SO2	no change			

Stack ID **57a**
Tag Number **GGT-744C**
Source Name **Solar Turbine/Generator Set**

Operating Parameters			**Note**
Heat Input	55.4	MMBtu/hr	1
Bypass Hours	204.0	hr/year	5
NOx Emissions during bypass hours	36.4	lb/hr	6
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NO_x	0.0185	lb/MMBtu	1.03	8.10	1,7
CO	0.109	lb/MMBtu	6.04	26.47	1,8
SO_2	3.4E-03	lb/MMBtu	0.19	0.83	2,3
PM (Filterable)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
PM_{10} (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
$PM_{2.5}$ (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,2,9
CO_2	110	lb/MMBtu	6,098.73	26,712.44	2
N_2O	3.0E-03	lb/MMBtu	0.17	0.73	2
Methane	8.6E-03	lb/MMBtu	0.48	2.09	2
CO_2e			6,161.65	26,988.01	1,4,10
VOC	2.1E-03	lb/MMBtu	0.12	0.51	1,11

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 3.1 *Stationary Gas Turbines* , Table 3.1-2a, April 2000
(3) Assumed factor for natural gas usage, see note h in Table 3.1-1a
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) hours per year Solar Turbine would operate without Waste Heat Boiler (bypassing the SCR control system
(6) highest hourly emission rate based on worst case Solar NOx generation rate (0.656 lbs/MMBtu) considering both HHV and LHV
(7) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Solar Turbine
(8) BACT proposed to be 50 ppm @ 15% O2, or approximately 0.109 lb/MMBtu
(9) BACT proposed to be 0.0074 lb/MMBtu
(10) BACT proposed to be a combined CO2e emission limit of 134,909 tons per year from all turbines
(11) BACT proposed to be 0.0021 lb/MMBtu (3-hr average)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

No change (maximum of two Solar Turbines at one time would be operated in bypass mode)

Stack ID **58a**
Tag Number **GGT-744D**
Source Name **Solar Turbine/Generator Set**

Operating Parameters			**Note**
Heat Input	55.4	MMBtu/hr	1
Bypass Hours	204.0	hr/year	5
NOx Emissions during bypass hours	36.4	lb/hr	6
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NO_x	0.0185	lb/MMBtu	1.03	8.10	1,7
CO	0.109	lb/MMBtu	6.04	26.47	1,8
SO_2	3.4E-03	lb/MMBtu	0.19	0.83	2,3
PM (Filterable)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
PM_{10} (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
$PM_{2.5}$ (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
CO_2	110	lb/MMBtu	6,098.73	26,712.44	2
N_2O	3.0E-03	lb/MMBtu	0.17	0.73	2
Methane	8.6E-03	lb/MMBtu	0.48	2.09	2
CO_2e			6,161.65	26,988.01	1,4,10
VOC	2.1E-03	lb/MMBtu	0.12	0.51	1,11

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 3.1 *Stationary Gas Turbines*, Table 3.1-2a, April 2000
(3) Assumed factor for natural gas usage, see note h in Table 3.1-1a
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) hours per year Solar Turbine would operate without Waste Heat Boiler (bypassing the SCR control system)
(6) highest hourly emission rate based on worst case Solar NOx generation rate (0.656 lbs/MMBtu) considering both HHV and LHV
(7) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Solar Turbine
(8) BACT proposed to be 50 ppm @ 15% O2, or approximately 0.109 lb/MMBtu
(9) BACT proposed to be 0.0074 lb/MMBtu
(10) BACT proposed to be a combined CO2e emission limit of 134,909 tons per year from all turbines
(11) BACT proposed to be 0.0021 lb/MMBtu (3-hr average)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

No change (maximum of two Solar Turbines at one time would be operated in bypass mode)

Stack ID **59a**
Tag Number **GGT-744E**
Source Name **Solar Turbine/Generator Set**

Operating Parameters			**Note**
Heat Input	55.4	MMBtu/hr	1
Bypass Hours	204.0	hr/year	5
NOx Emissions during bypass hours	36.4	lb/hr	6
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NO_x	0.019	lb/MMBtu	1.03	8.10	1,7
CO	0.109	lb/MMBtu	6.04	26.47	1,8
SO_2	3.4E-03	lb/MMBtu	0.19	0.83	2,3
PM (Filterable)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
PM_{10} (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
$PM_{2.5}$ (total)	7.4E-03	lb/MMBtu	0.41	1.80	1,9
CO_2	110	lb/MMBtu	6,098.73	26,712.44	2
N_2O	3.0E-03	lb/MMBtu	0.17	0.73	2
Methane	8.6E-03	lb/MMBtu	0.48	2.09	2
CO_2e			6,161.65	26,988.01	1,4,10
VOC	2.1E-03	lb/MMBtu	0.12	0.51	1,11

Notes:
(1) Proposed BACT
(2) USEPA AP-42 Chapter 3.1 *Stationary Gas Turbines* , Table 3.1-2a, April 2000
(3) Assumed factor for natural gas usage, see note h in Table 3.1-1a
(4) 40 CFR Part 98 Table A-1 Global Warming Potentials
(5) hours per year Solar Turbine would operate without Waste Heat Boiler (bypassing the SCR control system
(6) highest hourly emission rate based on worst case Solar NOx generation rate (0.656 lbs/MMBtu) considering both HHV and LHV
(7) BACT proposed to be SCR achieving 5 ppmv NOx @15% O2 for combined Solar Turbine/Waste Heat Boiler exhaust, or approximately 0.0185 lb/mmBtu NOx emission rate from Solar Turbine
(8) BACT proposed to be 50 ppm @ 15% O2, or approximately 0.109 lb/MMBtu
(9) BACT proposed to be 0.0074 lb/MMBtu
(10) BACT proposed to be a combined CO2e emission limit of 134,909 tons per year from all turbines
(11) BACT proposed to be 0.0021 lb/MMBtu (3-hr average)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

No change (maximum of two Solar Turbines at one time would be operated in bypass mode)

Stack ID **60**
Tag Number **F-791**
Source Name **Deaerator Vent**

Operating Parameters			Note
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NH_3	1.75	lb/hr	1.75	7.7	2

Notes:
(1) Design Data
(2) Engineering estimate based on laboratory analysis

Stack ID **61**
Tag Number **F-711**
Source Name **Degasifier Vent**

Operating Parameters			**Note**
Operating Time:	24	hr/day	1
	8,760	hr/year	1

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NH_3	0.65	lb/day	0.03	0.1	2

Notes:
(1) Design Data
(4) Engineering estimate based on free NH3 and laboratory analysis of pH

Stack ID 65
Tag Number GM-616D
Source Name Diesel Fired Well Pump (Well 14)

Operating Parameters			Note
Heat Input	2.7	MMBtu/hr	1
Operating Time:	1	hr/day	2
	168	hr/year	2

Pollutant	Emission Factor	Unit	Emission Rate lb/hr	Emission Rate tpy	Note
NO_x	4.41	lb/MMBtu	11.91	1.0E+00	3
CO	0.95	lb/MMBtu	2.57	2.2E-01	3
SO_2	0.29	lb/MMBtu	0.78	6.6E-02	3
PM (total)	0.31	lb/MMBtu	0.84	7.0E-02	3
PM_{10} (total)	0.31	lb/MMBtu	0.84	7.0E-02	3
$PM_{2.5}$ (total)	0.31	lb/MMBtu	0.84	7.0E-02	3
CO_2	164	lb/MMBtu	442.8	37.20	3
VOC	0.36	lb/MMBtu	1.0	8.2E-02	3

Notes:
(1) Design Data
(2) Anticipated maximum operation
(3) USEPA AP-42 Chapter 3.3 *Gasoline and Diesel Engines* , Table 3.3-1, April 2025
NOTE: Unit is located approximately 2.5 miles east of the plant, near Cabin Lake on Cabin Lake Road)

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day: 1

	lb/hr	lb/day	t/yr	T/yr increase over baseline
NOx	11.9	11.907	2.173028	1.2
PM10	0.8	0.837	0.152753	0.1
SO2	0.8	0.783	0.142898	0.1

Stack ID **66**
Tag Number **G-613B**
Source Name **Gasoline Fired Firewater Pump**

Operating Parameters			**Note**
Heat Input	2.1	MMBtu/hr	1
Operating Time:	4	hr/day	2
	168	hr/year	2

Pollutant	**Emission Factor**	**Unit**	**Emission Rate**		**Note**
			lb/hr	**tpy**	
NO_x	1.63	lb/MMBtu	3.42	0.29	3
CO	0.99	lb/MMBtu	2.08	0.17	3
SO_2	0.08	lb/MMBtu	0.18	1.5E-02	3
PM (total)	0.10	lb/MMBtu	0.21	1.8E-02	3
PM_{10} (total)	0.10	lb/MMBtu	0.21	1.8E-02	3
$PM_{2.5}$ (total)	0.10	lb/MMBtu	0.21	1.8E-02	3
CO_2	154	lb/MMBtu	323.4	27.17	3
VOC	3.03	lb/MMBtu	6.4	0.53	3

Notes:
(1) Design Data
(2) Anticipated worst-case annual operations
(3) USEPA AP-42 Chapter 3.3 *Gasoline and Diesel Engines* , Table 3.3-1, April 2025

Computation of Annual Emissions for Q/D (Incremental Increase Based on Max 24-hour Emissions Multiplied by 365)

Maximum hours per day:			4	T/yr increase over baseline
	lb/hr	lb/day	t/yr	
NOx	3.4	13.692	2.49879	2.2
PM10	0.2	0.84	0.1533	0.1
SO2	0.2	0.7056	0.128772	0.1

Agrium U.S. Inc., Kenai Nitrogen Operations

Projected Actual Fugitive Emissions from Urea Plant
Kenai, Alaska

Fugitive Emission Calculations (EU67)

Component Type	NH3 Service	Urea Plant Total Fugitive Count[1]	NH_3 Emission Factor [2] (lb/comp/hr)	Control Efficiency (%)[3]	Urea Plant NH_3 Emissions lb/hr	Urea Plant NH_3 Emissions tpy
Valves	Gas/Vapor	188	0.01316	97	0.074	0.33
	Light Liquid	424	0.00888	97	0.113	0.49
Flanges[5]	Gas/Vapor	136	0.01316	97	0.054	0.24
	Light Liquid	287	0.00888	97	0.076	0.34
Pumps	Light Liquid	18	0.04387	93	0.055	0.24
	Heavy Liquid	0	0.01900	93	0.000	0.00
Compressors	Gas/Vapor	5	0.50265	95	0.126	0.55
Relief Valves	Gas/Vapor	0	0.22928	97	0.000	0.00
Open-Ended Lines	All	0	0.00375	97	0.000	0.00
Sampling Connections	All	0	0.03307	97	0.000	0.00
				Total Fugitive Emissions	0.498	2.18

Calculations:
NH3 Emissionslb/hr = 188 (component count) x 0.013(lb/comp/hr) x [1-97 (%)] = 0.074 (lb/hr)
NH3 Emissions (tpy) = 0.074lb/hr x 8760 (hr/yr) / 2000 (lb/ton) = 0.325 (tpy)

NOTES:

1 Counts based on current configuration.
2 Table 8 of NPI Emission Estimation Technique manual for Synthetic Ammonia Manufacturing. Conservatively assumed 100% NH_3 in the gas/liquid stream.
3 Control efficiencies allowed for NH3 Process streams - Audio, Visual, Olfactory program.
4 Annual emissions based on 8,760 hours of operation.
5 Emission factor for flanges was conservatively assumed to be the same as valves.

Area	Valves		Flanges		Pumps	Compressors
	Liquid	Gas	Liquid	Gas	Liquid	Gas
R3I-3120 (Ammonia Storage)	73	13	31	19	4	
R4I-4070 (Ammonia Liquefaction)	45		48			
R4I-4080 (Refrigeration)	129	89	77	98	6	1
R4I-4085 (Ammonia Vent System)	17		7		2	
R4I4090 (Syngas Compression)	47	2	37	3	2	
R4I-4200 (Purge Recovery)	20	8	11	6	2	
R4I-4220 (Vilters)	36	76	36	10		4
R5I-5000 (Urea Reaction)	57		40		2	
TOTAL	424	188	287	136	18	5

Stack ID **IEU**
Tag Number **N/A**
Source Name **Building Heaters**

Operating Parameters			Note
Heat Input	7.3	(MMBtu/hr)	1
Maximum Fuel Usage	7.1E-03	(MMscf/hr)	6
Operating Time:	24	(hr/day)	1
	8,760	(hr/year)	1

Fuel Parameters			Note
Fuel Heating Value	1,020	(Btu/scf)	1

Pollutant	Emission Factor	Unit	Emission Rate		Note
			lb/hr	tpy	
NO_x	94	(lb/MMscf)	6.7E-01	2.9E+00	2,3
CO	40	(lb/MMscf)	2.9E-01	1.3E+00	2,3
SO_2	0.6	(lb/MMscf)	4.3E-03	1.9E-02	4
PM (filterable)	1.9	(lb/MMscf)	1.4E-02	5.9E-02	4
PM_{10} (total)	7.6	(lb/MMscf)	5.4E-02	2.4E-01	4
PM2.5 (total)	7.6	(lb/MMscf)	5.4E-02	2.4E-01	4
VOC	5.5	(lb/MMscf)	3.9E-02	1.7E-01	4
Lead	0.0005	(lb/MMscf)	3.6E-06	1.6E-05	4
CO_2	120,000	(lb/MMscf)	856.35	3,750.83	4
N_2O	2.2	(lb/MMscf)	0.02	0.07	4
Methane	2.3	(lb/MMscf)	0.02	0.07	4
CO_2e			861.44	3,773.12	5

Notes:
(1) Design Data
(2) Proposed BACT
(3) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-1, July 1998
(4) USEPA AP-42 Chapter 1.4 *Natural Gas Combustion* , Table 1.4-2, July 1998
(5) 40 CFR Part 98 Table A-1 Global Warming Potentials
(6) Total capacity does not include Winterization Heaters, which only operate in the winter during a plant shutdown

BUILDING	EQUIP # /LOCATION	BTU	TYPE
Maintenance/Warehouse			
1	Group 1	200,000	Modine
2	Group 1	200,000	Modine
3	Group 1	200,000	Modine
4	Group 1	1,100,000	Trane
1	Warehouse	200,000	Modine
2	Warehouse	200,000	Modine
3	Warehouse	200,000	Modine
4	Warehouse	200,000	Modine
5	Warehouse	200,000	Modine
6	Warehouse	200,000	Modine
1	Auto Shop	200,000	Modine
2	Auto Shop	200,000	Modine
1	Maintenance (Planner)	160,000	GFFA Mamoth
1	Maintenance HW	197,000	AO Smith
1	Group II Millwright	200,000	Modine
2	Group II Millwright	200,000	Modine
3	Group II Millwright	200,000	Modine
4	Group II Millwright	200,000	Modine
5	Group II Millwright	200,000	Modine
6	Group II Millwright	200,000	Modine
Group III			
1		60,000	Hastings
2		150,000	Weil McClain
3		36,000	AO Smith
4		150,000	Sterling
5		150,000	Sterling
6		60,000	Hastings
7		150,000	Modine
Group IV			
1		120,000	Sterling
2		120,000	Sterling
3			HVAC
4	Annex	40,000	Sterling
5	Annex	40,000	Sterling
Water Pump MCC			
1	3B671E	175,000	Modine
F/M Switchgear room			
1		60,000	Modine
2		60,000	Modine
3		40,000	Exello
Admin Building			
1	3B604A (Main Wing)	120,000	Boiler
2	(Main Wing)	224,000	GFFA
3	3B604B (West Wing)	120,000	Boiler
4	3B607C (West Wing)	65,000	HW
5	(West Wing)		GFFA Dunham Bush
6	3B604C (North Wing)	208,000	Boiler
7	3B607D (North Wing)	34,000	HW
8	3B671F (North Wing)	100,000	GFFA
ERB			
1		140,000	GFFA Rheem
		7,279,000	

GFFA Gas Fired Forced Air
HW Hot Water Heater

Natural Gas Fired Combustion

		Source ID	12	13	44	48	49	50	51	52	53	54	Insignificant Heaters
Annual Operating Time		(hr/yr)	8,760	200	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Firing Rate		(MMscf/hr)	1.32	0.10	0.24	0.24	0.24	0.046	0.046	0.046	0.046	0.046	7.14E-03
		(MMscf/yr)	11,594.1	19.8	2,086.9	2,086.9	2,086.9	401.3	401.3	401.3	401.3	401.3	62.5
Pollutant		Emission Factor (lb/MMscf)											
Benzene		2.10E-03	1.2E-02	2.1E-05	2.2E-03	2.2E-03	2.2E-03	4.2E-04	4.2E-04	4.2E-04	4.2E-04	4.2E-04	6.6E-05
Dichlorobenzene		1.20E-03	7.0E-03	1.2E-05	1.3E-03	1.3E-03	1.3E-03	2.4E-04	2.4E-04	2.4E-04	2.4E-04	2.4E-04	3.8E-05
Formaldehyde		7.50E-02	4.3E-01	7.4E-04	7.8E-02	7.8E-02	7.8E-02	1.5E-02	1.5E-02	1.5E-02	1.5E-02	1.5E-02	2.3E-03
n-Hexane		1.80E+00	1.0E+01	1.8E-02	1.9E+00	1.9E+00	1.9E+00	3.6E-01	3.6E-01	3.6E-01	3.6E-01	3.6E-01	5.6E-02
Naphthalene		6.10E-04	3.5E-03	6.0E-06	6.4E-04	6.4E-04	6.4E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.9E-05
Toluene		3.40E-03	2.0E-02	3.4E-05	3.5E-03	3.5E-03	3.5E-03	6.8E-04	6.8E-04	6.8E-04	6.8E-04	6.8E-04	1.1E-04
Polycyclic Aromatic Hydrocarbons	Acenaphthene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	Acenaphthylene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	Anthracene	2.40E-06	1.4E-05	2.4E-08	2.5E-06	2.5E-06	2.5E-06	4.8E-07	4.8E-07	4.8E-07	4.8E-07	4.8E-07	7.5E-08
	Benz(a)anthrancene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	Benzo(b,k)fluoranthene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	Benzo(g,h,i)perylene	1.20E-06	7.0E-06	1.2E-08	1.3E-06	1.3E-06	1.3E-06	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	3.8E-08
	Benzo(a)pyrene	1.20E-06	7.0E-06	1.2E-08	1.3E-06	1.3E-06	1.3E-06	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	3.8E-08
	Chrysene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	Dibenzo(a,h)anthracene	1.20E-06	7.0E-06	1.2E-08	1.3E-06	1.3E-06	1.3E-06	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	3.8E-08
	7,12-Dimethylbenz(a)anthracene	1.60E-05	9.3E-05	1.6E-07	1.7E-05	1.7E-05	1.7E-05	3.2E-06	3.2E-06	3.2E-06	3.2E-06	3.2E-06	5.0E-07
	Fluoranthene	3.00E-06	1.7E-05	3.0E-08	3.1E-06	3.1E-06	3.1E-06	6.0E-07	6.0E-07	6.0E-07	6.0E-07	6.0E-07	9.4E-08
	Fluorene	2.80E-06	1.6E-05	2.8E-08	2.9E-06	2.9E-06	2.9E-06	5.6E-07	5.6E-07	5.6E-07	5.6E-07	5.6E-07	8.8E-08
	Indeno(1,2,3-cd)pyrene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	3-Methylchloranthene	1.80E-06	1.0E-05	1.8E-08	1.9E-06	1.9E-06	1.9E-06	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	5.6E-08
	2-Methylnaphthalene	2.40E-05	1.4E-04	2.4E-07	2.5E-05	2.5E-05	2.5E-05	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06	7.5E-07
	Phenanthrene	1.70E-05	9.9E-05	1.7E-07	1.8E-05	1.8E-05	1.8E-05	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	5.3E-07
	Pyrene	5.00E-06	2.9E-05	5.0E-08	5.2E-06	5.2E-06	5.2E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.6E-07
	Total PAH	8.64E-05	5.0E-04	8.6E-07	9.0E-05	9.0E-05	9.0E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	2.7E-06

Waste Oil Combustion

		Source ID
Annual Operating Time		(hr/yr)
Firing Rate		(gal/hr)
		(10^3 gal/yr)
Pollutant		Emission Factor ($lb/10^3$ gal)
Arsenic		1.10E-01
Cadmium		9.30E-03
Chromium		2.00E-02
Cobalt		2.10E-04
Manganese		6.80E-02
Nickel		1.10E-02
Bis(2-ethylhexyl)phthalate		2.20E-03
Dicholorbenzene		8.00E-07
Naphthalene		1.30E-02
Phenol		2.40E-03
PAH	Benz(a)anthrancene	4.00E-03
	Chrysene	4.00E-03
	Pyrene	7.10E-03
	Total PAH	1.5E-02

Gas Fired Turbines

	Source ID	55	56	57	58	59
Annual Operating Time	(hr/yr)	8,760	8,760	8,760	8,760	8,760
Firing Rate	(MMBtu/hr)	55.4	55.4	55.4	55.4	55.4
	(MMBtu/yr)	485,681	485,681	485,681	485,681	485,681
Pollutant	Emission Factor (lb/MMBtu)	Emission Rate (tpy)				
Acetaldehyde	4.00E-05	9.7E-03	9.7E-03	9.7E-03	9.7E-03	9.7E-03
Acrolein	6.40E-06	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Benzene	1.20E-05	2.9E-03	2.9E-03	2.9E-03	2.9E-03	2.9E-03
1,3-Butadiene	4.30E-07	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Ethylbenzene	3.20E-05	7.8E-03	7.8E-03	7.8E-03	7.8E-03	7.8E-03
Formaldehyde	7.10E-04	1.7E-01	1.7E-01	1.7E-01	1.7E-01	1.7E-01
Naphthalene	1.30E-06	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04
Propylene Oxide	2.90E-05	7.0E-03	7.0E-03	7.0E-03	7.0E-03	7.0E-03
Toluene	1.30E-04	3.2E-02	3.2E-02	3.2E-02	3.2E-02	3.2E-02
Xylenes	6.40E-05	1.6E-02	1.6E-02	1.6E-02	1.6E-02	1.6E-02
PAH	2.20E-06	5.3E-04	5.3E-04	5.3E-04	5.3E-04	5.3E-04

Diesel Fired Engines

		Source ID	65		
Annual Operating Time		(hr/yr)	168		
Firing Rate		(MMBtu/hr)	2.70		
		(MMBtu/yr)	453.6		
Pollutant		Emission Factor (lb/MMBtu)	Emission Rate (tpy)		
Acetaldehyde		7.67E-04	1.7E-04		
Acrolein		9.25E-05	2.1E-05		
Benzene		9.33E-04	2.1E-04		
1,3-Butadiene		3.91E-05	8.9E-06		
Formaldehyde		1.18E-03	2.7E-04		
Napththalene		8.48E-05	1.9E-05		
Toluene		4.09E-04	9.3E-05		
Xylenes		2.85E-04	6.5E-05		
Polycyclic Aromatic Hydrocarbons	Acenaphthene	1.42E-06	3.2E-07		
	Acenaphthylene	5.06E-06	1.1E-06		
	Anthracene	1.87E-06	4.2E-07		
	Benzo(a)anthracene	1.68E-06	3.8E-07		
	Benzo(b,j,k) fluoranthene	2.54E-07	5.8E-08		
	Benzo(g,h,i)perylene	4.89E-07	1.1E-07		
	Benzo(a)pyrene	1.88E-07	4.3E-08		
	Chrysene	3.53E-07	8.0E-08		
	Dibenzo(a,h)anthracene	5.83E-07	1.3E-07		
	Fluoranthene	7.61E-06	1.7E-06		
	Fluorene	2.92E-05	6.6E-06		
	Indeno(1,2,3-cd)pyrene	3.75E-07	8.5E-08		
	Phenanthrene	2.94E-05	6.7E-06		
	Pyrene	4.78E-06	1.1E-06		
	Total PAH	8.33E-05	1.9E-05		

APPENDIX C BACT DETERMINATION

ERM

BACT Analysis

Kenai Nitrogen Operation

PREPARED FOR
Nutrien US LLC

DATE
23 July 2025

REFERENCE
0781074

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BACT Analysis

Kenai Nitrogen Operation

0781074

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CONTENTS

1. BEST AVAILABLE CONTROL TECHNOLOGY BACKGROUND

1.1 INTRODUCTION

This document is presented as Attachment C to Nutrien US LLC's (Nutrien) 2025 Prevention of Significant Deterioration (PSD) permit application (application) for the Kenai Nitrogen Operation (KNO, Facility) and presents the Best Available Control Technology (BACT) review for the affected emission units (EUs) at the Facility. In addition, this document includes information contained in appendices as follows:

- Attachment A RBLC Search Summary – This attachment includes the search results of the United States Environmental Protection Agency (USEPA) RACT/BACT/LAER Clearinghouse (RBLC) database to identify the permit limits on similar sources within the United States.
- Attachment B Cost Estimates – This attachment includes information on the cost estimates for various air pollution control equipment. These costs are unchanged from the air permit application submittal in 2019, since there are no new technologies identified and therefore no changes in BACT conclusions.

This document incorporates by reference additional information contained in the original PSD application from 18 October 2013, and the second PSD application from 21 May 2019.

1.2 REGULATORY BASIS FOR BACT ANALYSIS

Section 163(3) of the Clean Air Act (CAA) defines BACT as:

> *An emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under [the CAA] emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.*

Based on projected potential emission rates, BACT is required for the following criteria pollutants:

- Nitrogen oxides (NO_X)
- Carbon monoxide (CO)
- Volatile Organic Compounds (VOCs)
- Particulate Matter (PM)
- Particulate Matter less than 10 microns in diameter (PM10)
- Particulate Matter less than 2.5 microns in diameter (PM2.5)

In addition, the proposed project is subject to a BACT review for greenhouse gas (GHG) pollutants under USEPA's Tailoring Rule. The regulated GHGs include the following:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Carbon dioxide equivalent (CO_2e)

Where CO_2e represents the CO_2 equivalence of the GHG emissions. CO_2e emissions are calculated as the sum of the mass emissions of each individual GHG adjusted for its respective global warming potential (GWP). The GWP values are included in Table A-1 of the Greenhouse Gas Mandatory Reporting Rule found in 40 Code of Federal Regulation (CFR) 98, Subpart A.

1.3 FIVE-STEP TOP-DOWN BACT PROCESS

This BACT analysis is conducted following USEPA's "top-down" BACT approach, as described in EPA's *Draft New Source Review Workshop Manual* (EPA 1990). The five basic steps of a top-down BACT analysis are listed below:

Step 1: Identify potential control technologies

Step 2: Eliminate technically infeasible options

Step 3: Rank remaining control technologies by control effectiveness

Step 4: Evaluate the most effective controls and document results

Step 5: Select BACT

The first step is to identify potentially "available" control options for each emission unit triggering PSD, for each pollutant under review. Available options consist of a comprehensive list of those technologies with a potentially practical application to the emission unit in question. The list includes technologies used to satisfy BACT requirements, innovative technologies, and controls applied to similar source categories.

For this analysis, the USEPA's RBLC database was investigated to identify any new technologies required as BACT for each emission unit type at KNO.

After identifying potential technologies, the second step is to eliminate technically infeasible options from further consideration. To be considered feasible for BACT, a technology must be commercially available and applicable to a given emission unit.

The third step is to rank the technologies not eliminated in Step 2 in order of descending control effectiveness for each pollutant of concern. If the highest ranked technology is proposed as BACT, it is not necessary to perform technical or economic evaluation of the selected or less effective control technologies identified as outlined in Step 4. Potential adverse impacts, however, must still be identified and evaluated.

The fourth step entails an evaluation of energy, environmental, and economic impacts for determining a final level of control. The evaluation begins with the most stringent control option and continues until a technology under consideration cannot be eliminated based on adverse energy, environmental, or economic impacts. The economic or "cost-effectiveness" analysis is conducted in a manner consistent with USEPA's *OAQPS Control Cost Manuel, Sixth Edition* and subsequent revisions.

Cost effectiveness is expressed in terms of dollars per ton of pollutant removed ($/ton). The costs in the numerator of that expression are determined by adding the annualized capital cost and the annual operation and maintenance costs of a given control devices under evaluation. Annualized costs are determined by the following equation:

Annualized Equipment cost in $/year = PV(i/[1-(1+i)-n])

Where:

PV = Present value of the equipment;

i = Interest rate (cost of money), and

n = Number of years of the life of the equipment.

The annual mass (ton) of pollutant removed is determined by multiplying the annual uncontrolled emission rate by the expected control efficiency. The uncontrolled emission rate may, in some cases, be the rate after some level of control. In addition, the annual emission rate may be the potential to emit, or a level based on limited hours of operation.

The fifth, and final, step is to select as BACT the emission limit from application of the most effective of the remaining technologies under consideration for each pollutant of concern.

2. SUMMARY OF AFFECTED EMISSION UNITS AND POLLUTANTS

Air Quality Control Construction Permit AQ0083CPT07, Revision 1 permitted Nutrien to construct an agricultural fertilizer production facility. A more detailed description of the permitted facility and associated air emission units is provided in Appendix A of the original BACT analyses submitted with the first PSD Construction Permit application dated October 2013, and in Section 2 of the BACT analyses submitted with the second PSD Construction Permit application dated May 2019.

Due to there being no changes in the emission unit inventory for KNO since the second PSD application dated May 2019, this BACT analysis only contains updates by emission unit type. No additional top-down analyses are required as no new control technologies were identified.

3. BACT ANALYSIS UPDATES

This section is provided as a supplement to the BACT analyses performed for the PSD Construction Permit applications dated October 2013 and May 2019. This section provides an evaluation of the RBLC results associated with permits issued since Air Quality Control Construction Permit AQ0083CPT07 was issued in March 2021. Based on the information provided below, Nutrien concludes that no new permits have been issued since the issuance of AQ0083CPT07 that contain BACT limits that are inconsistent with the BACT determinations made for KNO as part of the PSD Construction Permit applications for AQ0083CPT06 and AQ0083CPT07.

Tables summarizing RBLC entries since the issuance of AQ0083CPT07 are provided in Attachment A to this BACT Analysis. The results of the BACT analyses contained in the KNO PSD permit are summarized below.

3.1 AMMONIA TANK FLARE (EU 11)

Three permits have been issued since the issuance of AQ0083CPT07 in March 2021. Control determinations for these flares were good combustion practices, natural gas to fuel pilots and limiting flare usage to periods of start-up, shutdown, and malfunction events. Additional requirements include a smokeless design to reduce visible emissions (VE).

The current BACT determination for EU 11 includes flare use minimization, a smokeless flare design, continuous pilot flame, and limited number of hours for NO_X, CO, VOC, PM, and GHG. These requirements are consistent with recently issued permits. Therefore, no updates to the BACT determination are currently required.

3.2 PRIMARY REFORMER (EU 12)

There have been three permits issued since March 2021 for reformers at two fertilizer plants and one chemical facility. An energy efficient design with good combustion practices and use of natural gas and/or process off gas were the general control technologies required. At the chemical plant and one of the fertilizer plants, low-NO_X burners and selective catalytic reduction (SCR) were required for NO_X emission controls. The remaining fertilizer plant required the use of SCR at all times of operation for the reformer.

Currently, AQ0083CPT07, Revision 1 lists BACT for NO_X as the operation of SCR which is in line with the recently issued permits for reformers at a fertilizer plant. Similarly, good combustion practices and use of natural gas and/or process gas as fuel continue to be BACT for CO, PM, VOC, and GHG. Therefore, no updates to the prior BACT determination for EU 12 are required.

3.3 STARTUP HEATER (EU 13)

Five permits have been issued since March 2021 for facilities with a startup heater. Typically, good combustion practices, use of gaseous fuel, and limited hours of operation were provided as BACT for all pollutants. For NO_X, use of low-NO_X burners was required at chemical facilities, but not at the permitted fertilizer plant. The fertilizer plant only required natural gas combustion, good combustion practices, and a limited number of hours.

For EU 13 AQ0083CPT07, Revision 1 includes a limit on hours of operation with good combustion practices as BACT for NO_X, CO, VOC, PM, and GHG. These determinations are consistent with the recently permitted fertilizer plant. Therefore, no updates to the prior BACT determination are necessary for EU 13.

3.4 CO_2 VENT (EU 14)

Since the issuance of AQ0083CPT07 in March 2021, two permits have been issued for facilities with a CO_2 Vent or CO_2 Stripper, and one of which was issued for a fertilizer plant. An energy efficient design and good combustion practices were required for GHG, CO, and VOC emissions.

One determination required the use of an oxygen trim system for the reformer furnace and boilers for GHG. However, this is not for the CO_2 Vent unit itself. For VOC control, one determination required the use of amine solution as a CO_2 liquid catalyst/activator.

Nutrien is currently required to operate a catalyst for control of CO and VOC, and maintaining good combustion practices as BACT for GHG from EU 14. Since no additional control technologies have been identified, the original BACT determinations for EU 14 are still valid.

3.5 SMALL FLARE AND EMERGENCY FLARE (EUS 22 AND 23)

Search of the RBLC showed that three permits have been issued for facilities with similar emissions units to the small flare and emergency flare. BACT determinations for these units include good combustion practices, flare design, natural gas to fuel pilot flames, venting limitations (i.e., only during startup, shutdown, malfunction or operating time limitations), or a minimization plan for CO, NO_X, PM10, PM2.5, VOC, and CO_2e.

AQ0083CPT07, Revision 1 includes a flare use minimization plan, continuous pilot flame, flare design, and limits on hours of operation for EUs 22 and 23 as BACT for CO, PM, VOC, and GHG. This is consistent with the latest RBLC entries for small flares. Therefore, a revision of the BACT determination is not necessary at this time.

3.6 UREA GRANULATION (EUS 35 AND 36)

One permit has been issued for a facility with urea granulators since the issuance of AQ0083CPT07 in March 2021. BACT was determined to be the use of a wet scrubber for PM10, PM2.5, VOC, and VE.

For EUs 35 & 36 AQ0083CPT07, Revision 1 requires the use of a wet scrubber as BACT for VOC, PM, PM2.5, and PM10. These determinations are consistent with the recently permitted fertilizer plant. Therefore, no updates to the prior BACT determination are necessary for EUs 35 & 36.

3.7 COOLING TOWER (EU 40)

Since the issuance of AQ0083CPT07 in March 2021, 57 permits have been issued for facilities with cooling towers, three of which have been for fertilizer facilities. BACT determination for these facilities include good design, routine maintenance, mist eliminators, and non-contact design for VOC, PM, PM10, PM2.5, and VE. A few facilities use the same BACT for additional releases of hydrogen sulfide, but these facilities are refineries and do not apply.

AQ0083CPT07, Revision 1 includes a drift limit with high efficiency drift eliminators for the control of PM, PM10, PM2.5 from EU 40. The original BACT determination for EU 40 remains valid as no additional control technologies have been identified in the RBLC review.

3.8 UF-85 STORAGE TANK (EU 41A)

No permits have been issued since March 2021 for facilities with a MDEA, methyl, or urea tank. A wet scrubber remains the BACT for this process, which is in line with the VOC control method listed for EU 41A in AQ0083CPT07, Revision 1. No updates to the prior BACT determination are necessary for EU 41A.

3.9 MDEA STORAGE TANKS (EUS 41B AND 41C)

No permits have been issued since March 2021 for facilities with a MDEA or methyl tank. Submerged fill design is the control method listed for VOCs for EUs 41B and 41C in AQ0083CPT07, Revision 1. The original BACT determinations are still valid for EUs 41B and 41C due to no additional control technologies being identified.

3.10 UREA SHIP LOADING (EU 47)

There has been one permit issued for a facility with urea loading equipment since the issuance of AQ0083CPT07 in March 2021. The permit is for a fertilizer facility. The BACT determination was for filterable particulate matter (FPM) to have bin vent filters as the method of control. No other pollutants were addressed for this technology.

For EU 47 AQ0083CPT07, Revision 1, the BACT sets a limit for PM, PM10, and PM2.5 with methods of control including use of UF-85 (hardening agent), product coolers on granulation urea process lines, and loading into a partial enclosure telescoping chute. There remains no practical means to fully capture emissions during the ship loading process to send them to a control device (e.g., bin filter), so the previous BACT determination remains valid for the urea ship loading process.

3.11 UREA MATERIAL HANDLING UNITS (EUS 47A THROUGH 47D)

Since the issuance of AQ0083CPT07 in March 2021, one permit has been issued for a facility with urea transfer equipment. The permit is for a fertilizer facility. The BACT determination was for filterable particulate matter (FPM) to have bin vent filters as the method of control. No other pollutants were addressed for this technology.

For EUs 47A through 47D AQ0083CPT07, Revision 1, fully enclosed conveyors and fabric filters were determined as BACT for PM, PM10, and PM2.5 emissions. The original BACT determination remains valid for EUs 47A through 47D as it is consistent with the latest RBLC entry for urea material handling.

3.12 PACKAGE BOILERS (EUS 44, 48 AND 49)

Since March 2021, 16 permits have been issued for facilities with boilers or heaters greater than 100 MMBtu/hr. BACT determination for these facilities include the control of CO2e, CO, NOx, PM, PM10, PM2.5, VOC, SO2, sulfuric acid, and VE using clean fuels, good combustion practices, low NOx burners, low sulfur fuel, good burner design, and SCR.

For EUs 44, 48, and 49, AQ0083CPT07, Revision 1 specifies the control method for NOx as selective catalytic reduction, while CO, VOC, PM, PM10, PM2.5, and CO2e use good combustion practices. These methods are consistent with the currently permitted facilities, so the original BACT determination for EUs 44, 48, and 49 are still valid.

3.13 WASTE HEAT BOILERS (EUS 50 THROUGH 54)

There have been 19 permits issues for facilities with boilers less than 100 million British thermal units per hour (MMBtu/hr), excluding start up heaters, since March 2021. BACT determinations for these facilities include good combustion practices and good quality fuels for all pollutants, and the use of low NO_X burners and SCRs for NO_X.

EUs 50 through 54 are required by AQ0083CPT07, Revision 1 to install, operate, and maintain SCR for NO_X emissions control. This determination is consistent with the recently issued permits. For control of CO, VOC, PM, PM10, PM2.5, and CO2e, good combustion practices and waste heat recovery for CO2e are currently required as BACT. These determinations are also consistent with the recently issued permits. Therefore, the previous BACT determinations for EUs 50 through 54 are still valid, and do not need to be updated at this time.

3.14 SOLAR TURBINES/GENERATOR SETS (EUS 55A THROUGH 59A)

Seven permits for facilities with a combined cycle and cogeneration turbines with a rating of less than 25 megawatts (MW) have been issued since March 2021. BACT determinations for these units include good combustion practices, low carbon fuel, natural gas as fuel, limited hours of operation for all pollutants, and use of dry low NO_X combustors and SCR for NO_X.

EUs 55a through 59a are required by AQ0083CPT07, Revision 1 to install, operate, and maintain SCR for NO_X emissions control and to install turbines equipped with SoLoNO_X, or equivalent, technology as BACT for NO_X. This determination is consistent with recently issued permits. BACT determinations performed in support of AQ0083CPT07 selected good combustion practice and burning clean fuel as BACT for CO, PM, VOC, and GHG. These selections are also consistent with more recently issued permits. Therefore, the previous BACT determinations are not required to be revised at this time.

3.15 DIESEL WELL PUMP (EU 65)

There have been 20 permits issued for fuel-oil fired small combustion engines since March 2021. Compliance with 40 Code of Federal Regulation (CFR) 60, Subpart IIII or Subpart JJJJ, good combustion practices, limited operation and use of ultra-low sulfur diesel (ULSD) were included as BACT for all pollutants.

EU 65 is limited to 168 hours of operation per 12 consecutive month period in AQ0083CPT07, Revision 1. Limited operation as BACT is consistent for small fuel oil-fired engines with recently issued permits with similar sources. Therefore, it is not necessary to perform a new BACT determination presently.

3.16 GASOLINE FIRE PUMP (EU 66)

There have been 20 permits issued for fuel-oil fired small combustion engines since March 2021. Compliance with 40 CFR 60, Subpart IIII or Subpart JJJJ, good combustion practices, limited operation and use of ULSD were included as BACT for all pollutants.

EU 66 is limited to 168 hours of operation per 12 consecutive month period in AQ0083CPT07, Revision 1. Limited operation as BACT is consistent for small fuel oil-fired engines with recently issued permits for similar sources. Therefore, a new BACT determination is not required at this time.

ATTACHMENT A RBLC SUMMARY

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 11 - Ammonia Tank Flare

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO	Back-End Process with flare (P003)	46.57	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO	Back-End Process with flare (P003)	22.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	NOx	Back-End Process with flare (P003)	5.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	NOx	Back-End Process with flare (P003)	10.37	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM10	Back-End Process with flare (P003)	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM10	Back-End Process with flare (P003)	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM2.5	Back-End Process with flare (P003)	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM2.5	Back-End Process with flare (P003)	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	VOC	Back-End Process with flare (P003)	85.5	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	VOC	Back-End Process with flare (P003)	41.1	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events. This emissions unit shall be equipped with a flare to control OC emissionss. The flare shall be fired with natural gas and shall be oeprated with at least 98% control efficiency
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO2e	Back-End Process with flare (P003)	714	tpy	good operational practices and energy efficient operation through a minimization plan and oepration and maintenance in accordance with manufacturer recommendations
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO	Ammonia Synthesis Process with flare (P	46.57	lb/hr	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO	Ammonia Synthesis Process with flare (P	22.6	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	NOx	Ammonia Synthesis Process with flare (P	6.6	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	NOx	Ammonia Synthesis Process with flare (P	12.44	lb/hr	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM10	Ammonia Synthesis Process with flare (P	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM10	Ammonia Synthesis Process with flare (P	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM2.5	Ammonia Synthesis Process with flare (P	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	PM2.5	Ammonia Synthesis Process with flare (P	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	VOC	Ammonia Synthesis Process with flare (P	85.5	lb/hr	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	VOC	Ammonia Synthesis Process with flare (P	41.1	tpy	utilizing a flare with good combustion practices, natural gas to fuell pilots, and venting flare during only-start-up, shutdown and malfunction events. This emissions unit shall be equipped with a flare to control OC emissionss. The flare shall be fired with natural gas and shall be oeprated with at least 98% control efficiency
Pallas Nitrogen LLC	OH-0368	04/19/2017, update	CO2e	Ammonia Synthesis Process with flare (P	714	tpy	good operational practices and energy efficient operation through a minimization plan and oepration and maintenance in accordance with manufacturer recommendations
Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Front End Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Front End Flare	0.068	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Front End Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Front End Flare	0.31	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Front End Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Front End Flare	0.01	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM10	Front End Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM2.5	Front End Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO2e	Front End Flare	18603	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 11 - Ammonia Tank Flare

Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Ammonia Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Ammonia Flare	0.068	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Ammonia Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Ammonia Flare	0.31	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Ammonia Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Ammonia Flare	0.01	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM10	Ammonia Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM2.5	Ammonia Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO2e	Ammonia Flare	16093	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Ammonia Storage Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	NOx	Ammonia Storage Flare	0.068	lb/MMBtu - during boil off eve	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Ammonia Storage Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO	Ammonia Storage Flare	0.31	lb/MMBtu - during boil off eve	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Ammonia Storage Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	VOC	Ammonia Storage Flare	0.15	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM10	Ammonia Storage Flare	0.01	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	PM2.5	Ammonia Storage Flare	0.01	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, update	CO2e	Ammonia Storage Flare	3305	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Front End Flare EU 017	0.0075	lb/MMBtu	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Front End Flare EU 017	336	hr/yr	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Front End Flare EU 017	0.0075	lb/MMBtu	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Front End Flare EU 017	336	hr/yr	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Back End Flare EU-018	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Back End Flare EU-018	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Back End Flare EU-018	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Back End Flare EU-018	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 11 - Ammonia Tank Flare

Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Back End Flare EU-018	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Back End Flare EU-018	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Discontinuous Urea Flare EU-DUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Discontinuous Urea Flare EU-DUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Discontinuous Urea Flare EU-DUF	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Discontinuous Urea Flare EU-DUF	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Discontinuous Urea Flare EU-DUF	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Discontinuous Urea Flare EU-DUF	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Emergency Urea Flare EU-EUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Emergency Urea Flare EU-EUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Emergency Urea Flare EU-EUF	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Emergency Urea Flare EU-EUF	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Emergency Urea Flare EU-EUF	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Emergency Urea Flare EU-EUF	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM10	Ammonia Storage Flare EU-016	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	PM2.5	Ammonia Storage Flare EU-016	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	NOx	Ammonia Storage Flare EU-016	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO	Ammonia Storage Flare EU-016	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	VOC	Ammonia Storage Flare EU-016	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, update	CO2e	Ammonia Storage Flare EU-016	563	lb/MMBtu	The pilot and purge gas fuels shall be natural gas

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 11 - Ammonia Tank Flare

RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Ammonia Storage Flare (EU-016)	0.0075	lb/MMBtu 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Ammonia Storage Flare (EU-016)	168	hours/12 consec month compliance determined end of month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Ammonia Storage Flare (EU-016)	0.0075	lb/MMBtu 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Ammonia Storage Flare (EU-016)	168	hours/12 consec month compliance determined end of month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Ammonia Storage Flare (EU-016)	125	lb/hr while venting 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Ammonia Storage Flare (EU-016)	0.068	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Ammonia Storage Flare (EU-016)	0.37	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Ammonia Storage Flare (EU-016)	168	hours/year compliance determined end of ea month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Ammonia Storage Flare (EU-016)	0.0054	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Ammonia Storage Flare (EU-016)	168	hours/12 consec month compliance determined end of month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Ammonia Storage Flare (EU-016)	563	tons/12 consec month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Ammonia Storage Flare (EU-016)	168	hours/12 consec month compliance determined end of month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Ammonia Storage Flare (EU-016)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Front End Process Flare	0.37	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Front End Process Flare	3240.16	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Back end ammonia process vent flare	0.37	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Back end ammonia process vent flare	804.76	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	Process Flare	No Numeric Limit	No Numeric Limit	Good combustion practices. Meet 40 CFR 60.18
United Wisconsin Grain Producers UWGP - Fuel Grade Ethanol Plant	WI-0204	8/14/2003	CO	Bypass Flare, Biomethanator	2.4	lbs/hr	Operation Limit: No more than 5040 hr/yr
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Ammonia Storage Flare	0.37	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	Ammonia Storage Flare	No Numeric Limit	No Numeric Limit	Good combustion practices. Meet 40 CFR 60.18
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Front End Process Flare	511.8	ton/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Front End Process Flare	116.89	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Back end ammonia process vent flare	116.89	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 11 - Ammonia Tank Flare

Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Ammonia Storage Flare	52.02	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	N2O	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	N2O	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
Degussa Engineered Carbons Inc. Borger Carbon Black Plant	TX-0436	10/3/2002	NOx	Dryers, Boilers, Flare	0.1	lb/MMBtu	Good combustion practices and design
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Front End Process Flare	0.068	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Front End Process Flare	595.47	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Back end ammonia process vent flare	0.068	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Back end ammonia process vent flare	624.94	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	Process Flare	No Numeric Limit	No Numeric Limit	Good combustion practices. Meet 40 CFR 60.19
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Ammonia Storage Flare	0.068	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Ammonia Storage Flare	125	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	Ammonia Storage Flare	No Numeric Limit	No Numeric Limit	Good combustion practices. Meet 40 CFR 60.19
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Ohio Valley Resources, LLC	TBD	9/25/2013	PM	Ammonia Storage Flare	0.0019	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Ammonia Storage Flare	No Numeric Limit	No Numeric Limit	Smokeless flare. Air or steam-assist only if unassisted flare produces smoke. Good combustion practices. Meet 40 CFR 60.21
Ohio Valley Resources, LLC	TBD	9/25/2013	PM10	Ammonia Storage Flare	0.0075	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	Ammonia Storage Flare	No Numeric Limit	No Numeric Limit	Smokeless flare. Air or steam-assist only if unassisted flare produces smoke. Good combustion practices. Meet 40 CFR 60.21
Ohio Valley Resources, LLC	TBD	9/25/2013	PM2.5	Ammonia Storage Flare	0.0075	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Ammonia Flare	0	%	Work Practice/Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Ammonia Storage Flare	0.0054	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.

KNO Restart
RBLC Search Summary
Search: "Reformer" - Fertilizer Plants only
Unit 12 - Primary Reformer

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO2e	Ammonia Plant - CO2 Vent, Reformer Furnace and Boilers	1.84	ton/ton of ammonia	Energy efficient plant design, good operating practices, good combustion practices for Reformer Furnance and Boilers, automated combustion management systems with oxygen trim systes for the Reformer Furnace and Boilers
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO2e	Ammonia Plant - CO2 Vent, Reformer Furnace and Boilers	6,143	tons per day	Energy efficient plant design, good operating practices, good combustion practices for Reformer Furnance and Boilers, automated combustion management systems with oxygen trim systes for the Reformer Furnace and Boilers
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	NOx	Reformer Furnace	0.0109	lb/MMBtu	Low-NOx Burners (LNB) and Selective Catalytic Reduction (SCR)
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO	Reformer Furnace	0.0194	lb/MMBtu	Good Combustion Practices
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	VOC	Reformer Furnace	0.0014	lb/MMBtu	Good Combustion Practices
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM10	Reformer Furnace	0.0024	lb/MMBtu	Good Combustion Practices
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM2.5	Reformer Furnace	0.0024	lb/MMBtu	Good Combustion Practices
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	PM10	Reformer Furnace EU-001	0.0024	lb/MMBtu	Good combustion practices and proper design
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	PM10	Reformer Furnace EU-001	1.8700	lb/hr	Good combustion practices and proper design
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	PM2.5	Reformer Furnace EU-001	0.0024	lb/MMBtu	Good combustion practices and proper design
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	PM2.5	Reformer Furnace EU-001	1.8700	lb/hr	Good combustion practices and proper design
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	NOx	Reformer Furnace EU-001	9.0000	ppmvd	Selective catalytic reduction at all times the reformer is in operation, except during startup and shtudown when the catalyst is below its normal operating temperature.
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	CO	Reformer Furnace EU-001	0.0194	lb/MMBtu	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	CO	Reformer Furnace EU-001	15.1300	lb/hr	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	VOC	Reformer Furnace EU-001	0.0014	lb/MMBtu	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	VOC	Reformer Furnace EU-001	1.0900	lb/hr	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	CO2e	Reformer Furnace EU-001	59.6100	lb/MMBtu	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams, shall be equipped with the following engergy efficiency features: air inlet controls and flue gas heat recovery to pre-heat inlet fuel, inlet air and inlet stream flows, shall be designed to achieve a thermal efficiency of 80% (HHV)
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 8/16/22	CO2e	Reformer Furnace EU-001	3,399,317	tpy	Good combustion practices and proper design, shall combust natural gas and/or process off gas streams, shall be equipped with the following engergy efficiency features: air inlet controls and flue gas heat recovery to pre-heat inlet fuel, inlet air and inlet stream flows, shall be designed to achieve a thermal efficiency of 80% (HHV)
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	NOx	Ammonia Plant Primary Reformer	0.0120	lb/MMBtu	Low NOx burners and Selective Catalytic Reduction
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	CO	Ammonia Plant Primary Reformer	0.0194	lb/MMBtu	Good Combustion Practices
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	PM, filterable	Ammonia Plant Primary Reformer	1.9000	lb/MMscf	Good Combustion Practices
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	PM10	Ammonia Plant Primary Reformer	5.3850	lb/MMscf	Good Combustion Practices
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	PM2.5	Ammonia Plant Primary Reformer	5.3850	lb/MMscf	Good Combustion Practices
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	VOC	Ammonia Plant Primary Reformer	1.0014	lb/MMBtu	Good Combustion Practices
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	CO2e	Ammonia Plant Primary Reformer	515,778.0000	tpy	Energy Efficiency Measures
Grand Forks Fertilizer Plant	ND-0033	8/10/2015, updated 4/5/21	VE	Ammonia Plant Primary Reformer	5.0000	percent	Good Combustion Practices

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO2e	Primary Reformer Stack RS-16-1 (EQT029)	363,287	tpy	Energy Efficiency Measure (note: 111.72 kg/MM BTU of CO2, 0.001 kg/MM BTU of CH4, and 0.0001 kg/MM BTU of N2O)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Primary Reformer Stack RS-16-1 (EQT029)	33.26	lb/hr	Good Combustion Practices (Note: 0.0824 lb/MMBtu of natural gas)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Primary Reformer Stack RS-16-1 (EQT029)	121.41	tpy	Good Combustion Practices (Note: 0.0824 lb/MMBtu of natural gas)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Primary Reformer Stack RS-16-1 (EQT029)	3.01	lb/hr	Good Combustion Practices (Note: 0.00745 lb/MMBtu of natural gas)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Primary Reformer Stack RS-16-1 (EQT029)	10.99	tpy	Good Combustion Practices (Note: 0.00745 lb/MMBtu of natural gas)
Agrium US, Inc	TX-0814	1/5/2017(draft)	CO2e	Reformer Furnace 101-B	564,019	tpy	Good engineering practices (1100 MMBtu/hr)

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Primary Reformer	0.0023	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CH4	Primary Reformer	0.0023	lb/MMBtu average of 3 stack tests	Good Combustion Practices
CF Industries Inc. Donaldsonville Nitrogen Co	LA-0236	3/3/2009	CO	NO. 1,2,3,&4 Ammonia Plant Reformers	301.29	tons/year	Optimum combustion control and the use of natural gas as fuel
CF Industries Inc. Donaldsonville Nitrogen Co	LA-0236	3/3/2009	CO	NO. 1,2,3,&4 Ammonia Plant Reformers	303.47	lb/hr	Optimum combustion control and the use of natural gas as fuel
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Primary Reformer	0.0194	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Primary Reformer	90.3	tpy Rolling 12 month total	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Primary Reformer	0.0194	lb/MMBtu average of 3 stack tests	Good Combustion Practices

Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Primary Reformer	96.3	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Primary Reformer	43.45	lb/MMcf 3 hour average	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2	Primary Reformer	117	lb/MMBtu 30 day rolling average	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2	Primary Reformer	117	lb/MMBtu 30 day rolling average	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Primary Reformer	59.61	tons/MMcf 3 hour average	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Primary Reformer	515246	tons per 12 consecutive month period	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Primary Reformer	545674	tpy Rolling 12 month total	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2e	Primary Reformer	596905	tpy Rolling 12 month total	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	N2O	Primary Reformer	0.0006	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	N2O	Primary Reformer	0.0006	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Altoona GTL LLC/Gilberton	PA-0285	1/16/2013	NH3	Convection Reformers	5	PPMVD @ 15%O2, 3 hr average, rolling by 1 hr	SCR
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	NOx	Reformers	48.74	lb/hr hourly maximum	ULNB and SCR
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	NOx	Reformers	0.015	lb/MMBtu annual average	ULNB and SCR
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Primary Reformer	9	ppmv 30 day rolling average	SCR
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Primary Reformer	56	tons/year rolling 12 month total	SCR
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Primary Reformer	9	ppmvd 30 day rolling average	SCR
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM	Reformers	11.24	lb/hr hourly average	Proper equipment designs, good combustion practices, and gaseous fuel
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM	Reformers	0.0075	lb/MMBtu	Proper equipment designs, good combustion practices, and gaseous fuel
Altoona GTL LLC/Gilberton	PA-0285	1/16/2013	PM	Convection Reformers	0.2	Grains/DSCF	Unknown
Altoona GTL LLC/Gilberton	PA-0285	1/16/2013	PM	Reformers	0.2	Grains/DSCF	Unknown
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Primary Reformer	0.0024	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Primary Reformer	11.2	tpy Rolling 12 month total	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Primary Reformer	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Primary Reformer	11.9	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM	Primary Reformer	1.9	lb/MMcf 3 hour average	Good Combustion Practices
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM10	Reformers	11.24	lb/hr hourly average	Proper equipment designs, good combustion practices, and gaseous fuel
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM10	Reformers	0.0075	lb/MMBtu	Proper equipment designs, good combustion practices, and gaseous fuel
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Primary Reformer	0.0024	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Primary Reformer	11.2	tpy Rolling 12 month total	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Primary Reformer	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Primary Reformer	11.9	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM10	Primary Reformer	7.6	lb/MMcf 3 hour average	Good Combustion Practices
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM2.5	Reformers	11.24	lb/hr hourly average	Proper equipment designs, good combustion practices, and gaseous fuel
Air Products and Chemicals, Inc.	LA-0264	9/4/2012	PM2.5	Reformers	0.0075	lb/MMBtu	Proper equipment designs, good combustion practices, and gaseous fuel
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Primary Reformer	0.0024	lb/MMBtu average of 3 stack tests	Good operating practices & use of natural gas
Navajo Refining Company LLC Navajo Refini	NM-0050	12/14/2007	PM10	Steam Methane Reformer Heater	2.52	lbs/hr hourly	Gaseous Fuel Combustion Only
Navajo Refining Company LLC Navajo Refini	NM-0050	12/14/2007	SO2	Steam Methane Reformer Heater	2.16	tpy	Selective Catalytic Reduction
Navajo Refining Company LLC Navajo Refini	NM-0050	12/14/2007	SO2	Steam Methane Reformer Heater	0.494	lbs/hr	Selective Catalytic Reduction
Navajo Refining Company LLC Navajo Refini	NM-0050	12/14/2007	VOC	Steam Methane Reformer Heater	0.005	lb/MMBtu hourly	Gaseous Fuel Combustion Only
Navajo Refining Company LLC Navajo Refini	NM-0050	12/14/2007	VOC	Steam Methane Reformer Heater	1.69	lbs/hr hourly	Gaseous Fuel Combustion Only
Altoona GTL LLC/Gilberton	PA-0285	1/16/2013	SOx	Reformers	500	PPMVD expressed as SO2	Unknown
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emissions	Primary Reformer	0	%	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Primary Reformer	0	%	Good Operation Practices
Pryor Plant Chemical Company	OK-0134 OK-0135	2/23/2009	PM	Primary Reformer	1.68	lbs/hr	Unknown
Pryor Plant Chemical Company	OK-0134 OK-0135	2/23/2009	PM10	Primary Reformer	1.26	lbs/hr 24-hr	Unknown
Pryor Plant Chemical Company	OK-0134 OK-0135	2/23/2009	SO2	Primary Reformer	1.35	lb/hr	Natural Gas
Pryor Plant Chemical Company	OK-0134 OK-0135	2/23/2009	SO2	Primary Reformer	0.2	lb/MMBtu	Natural Gas
Pryor Plant Chemical Company	OK-0134 OK-0135	2/23/2009	VOC	Primary Reformer	1.21	lbs/hr	Unknown

Notes:
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they are not natural gas fired.

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
WaBash Valley Resources, LLC	IN-0371	03/05/2024, updated 02/27/202	NOx	Ammonia Catalyst Startup Heater	50	lb/mmscf	Low NOx Burners
WaBash Valley Resources, LLC	IN-0371	03/05/2024, updated 02/27/202	NOx	Ammonia Catalyst Startup Heater	14.22	mmcf	Low NOx Burners
WaBash Valley Resources, LLC	IN-0371	03/05/2024, updated 02/27/202	CO2e	Ammonia Catalyst Startup Heater	117	lb/MMBtu	Good Combustion Practices
WaBash Valley Resources, LLC	IN-0371	03/05/2024, updated 02/27/202	CO2e	Ammonia Catalyst Startup Heater	14.22	mmcf	Good Combustion Practices
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	NOx	Startup Heater	0.07	lb/MMBtu - 3 hr average	LNB, good burner design, and GCP
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	CO	Startup Heater	0.0194	lb/MMBtu - 3 hr average	LNB, good burner design, and GCP
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	VOC	Startup Heater	0.0014	lb/MMBtu - 3 hr average	LNB, good burner design, and GCP
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	PM10	Startup Heater	0.0024	lb/MMBtu - 3 hr average	LNB, good burner design, and GCP
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	PM2.5	Startup Heater	0.0024	lb/MMBtu - 3 hr average	LNB, good burner design, and GCP
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	CO2e	Startup Heater	604	tpy	Energy efficient design, GCP, and use of automated combustion management system with inlet air controls
Cronous Chemicals	IL-0134	12/21/2023, updated 02/26/202	CO2e	Startup Heater	604	tons/bi-month period	Energy efficient design, GCP, and use of automated combustion management system with inlet air controls
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	PM10	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	PM10	startup heater EU-002	0.249	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	PM2.5	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	PM2.5	startup heater EU-002	0.249	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	NOx	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	NOx	startup heater EU-002	6.007	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	CO	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	CO	startup heater EU-002	1.217	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	VOC	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	VOC	startup heater EU-002	0.18	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	CO2e	startup heater EU-002	200	hr/yr	shall combust natural gas, shall be controlled by good combustion practices
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated 08/16/202	CO2e	startup heater EU-002	3898	lb/hr	shall combust natural gas, shall be controlled by good combustion practices
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	CO	Startup Heater (B001)	8.24	lb/hr	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	CO	Startup Heater (B001)	1.98	tpy	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	CO	Startup Heater (B001)	0.0824	lb/MMBtu	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	NOx	Startup Heater (B001)	10	lb/hr	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	NOx	Startup Heater (B001)	2.4	tpy	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	NOx	Startup Heater (B001)	0.1	lb/MMBtu	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM10	Startup Heater (B001)	0.75	lb/hr	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM10	Startup Heater (B001)	0.18	tpy	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM10	Startup Heater (B001)	0.0075	lb/MMBtu	good combustion control (i.e., high temperatures, sufficient excess a ir, sufficient residence times, and god air/fuel mixing)

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM2.5	Startup Heater (B001)	0.75	lb/hr	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM2.5	Startup Heater (B001)	0.18	tpy	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	PM2.5	Startup Heater (B001)	0.0075	lb/MMBtu	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	VOC	Startup Heater (B001)	0.54	lb/hr	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	VOC	Startup Heater (B001)	0.13	tpy	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	VOC	Startup Heater (B001)	0.0054	lb/MMBtu	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	CO2e	Startup Heater (B001)	2840	tpy	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/201	Visible Emissions (V	Startup Heater (B001)	10	% opacity as a 6 minute average	good combustion control (i.e., high temperatures, sufficient excess air, sufficient residence times, and god air/fuel mixing)
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	CO	Ammonia Start-up Heater	1.96	lb/hr	limited hours of operation
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	CO	Ammonia Start-up Heater	50	PPMVD @3% O2	limited hours of operation
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	NOx	Ammonia Start-up Heater	1.91	lb/hr	limited hours of operation and low NOx burners
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	NOx	Ammonia Start-up Heater	0.036	lb/MMBtu	limited hours of operation and low NOx burners
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	PM2.5	Ammonia Start-up Heater	0.4	lb/hr	use of gaseous fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	PM2.5	Ammonia Start-up Heater	0.03	tpy	use of gaseous fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	SO2	Ammonia Start-up Heater	0.03	lb/hr	limited hours of operation and low sulfur fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	SO2	Ammonia Start-up Heater	0.01	tpy	limited hours of operation and low sulfur fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	VOC	Ammonia Start-up Heater	0.27	lb/hr	use of gaseous fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	VOC	Ammonia Start-up Heater	0.02	tpy	use of gaseous fuel
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	Lead (Pb)/ Lead Co	Ammonia Start-up Heater	0.01	lb/hr	limited hours of operation
BASF Peony Chemical Manufacturing Facility	TX-0728	04/01/2015, updated 01/31/202	Lead (Pb)/ Lead Co	Ammonia Start-up Heater	0.01	tpy	limited hours of operation

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	FPM	Ladle Preheater (30 mmbtu/hr burner)	0.0076	lb/MMBtu Hourly	Use of NG fuel and good combustion practices
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	PM10	Ladle Preheater (30 mmbtu/hr burner)	0.0076	lb/MMBtu Hourly	Use of NG fuel and good combustion practices
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	PM2.5	Ladle Preheater (30 mmbtu/hr burner)	0.0076	lb/MMBtu Hourly	Use of NG fuel and good combustion practices
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	NOx	Ladle Preheater (30 mmbtu/hr burner)	0.08	lb/MMBtu Hourly	LAER - Low NOx burners, use of NG fuel, and good combustion practices. NOx subject to LAER due to non-attainment for ozone, also subject to NOx BACT in NOx attainment area.
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	CO	Ladle Preheater (30 mmbtu/hr burner)	0.084	lb/MMBtu Hourly	Use of NG fuel and good combustion practices
Gerdau Macsteel Inc. - Gerdau Macsteel Monroe	MI-0438	10/29/2018, updated 2/19/2019	SO2	Ladle Preheater (30 mmbtu/hr burner)	0.0006	lb/MMBtu Hourly	Use of NG fuel and good combustion practices
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Ammonia Converter Start-up Heater Stack SUH-16-1 (EQT030)	0.18	lb/hr hourly maximum	Use of pipeline quality natural gas and good combustion practices
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Ammonia Converter Start-up Heater Stack SUH-16-1 (EQT030)	0.01	tpy annual maximum	Use of pipeline quality natural gas and good combustion practices
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Ammonia Converter Start-up Heater Stack SUH-16-1 (EQT030)	1.96	lb/hr hourly maximum	Use of pipeline quality natural gas and good combustion practices
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Ammonia Converter Start-up Heater Stack SUH-16-1 (EQT030)	0.12	tpy annual maximum	Use of pipeline quality natural gas and good combustion practices
Topchem Pollock, LLC	IN-0263 (draft)	12/20/2016, updated 8/8/17	CO2e	Ammonia Converter Start-up Heater Stack SUH-16-1 (EQT030)	169	tpy annual maximum	Use of pipeline quality natural gas and good combustion practices
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	FPM	Startup Heater EU-002	0.13	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	FPM	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM10	Startup Heater EU-002	0.522	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM10	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM2.5	Startup Heater EU-002	0.522	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM2.5	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	NOx	Startup Heater EU-002	12.611	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	NOx	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO	Startup Heater EU-002	2.556	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	VOC	Startup Heater EU-002	0.378	lb/hr 3 hour average	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	VOC	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of natural gas (70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO2	Startup Heater EU-002	8184	lb/hr 3 hour average	Good Combustion Practices & use of inlet air control sensors that limit excess air(70 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO2	Startup Heater EU-002	200	hours/year	Good Combustion Practices & use of inlet air control sensors that limit excess air(70 MMBtu/hr)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM10	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering practices, good combustion technology, and use of clean fuels (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM2.5	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering practices, good combustion technology, and use of clean fuels (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	SO2	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering practices, good combustion technology, and use of clean fuels (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	NOx	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering practices, good combustion technology, and use of clean fuels (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering practices, good combustion technology, and use of clean fuels (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO2e	Gasifier Start-up Preheat Burners	No Numeric Limit	No Numeric Limit	Good equipment design and good combustion practices (23 MMBtu/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM10	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering design and practices and use of clean fuels (no size listed)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM2.5	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering design and practices and use of clean fuels(no size listed)

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	SO2	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering design and practices and use of clean fuels (no size listed)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	NOx	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering design and practices and use of clean fuels(no size listed)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good engineering design and practices and use of clean fuels (no size listed)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO2e	WSA Preheat Burners	No Numeric Limit	No Numeric Limit	Good equipment design and good combustion practices (no size listed)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	CO	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	2.22	lb/hr hourly; each unit	SIP - Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	NOx	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	2.65	lb/hr hourly; each unit	SIP - Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	FPM	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	0.002	lb/MMBtu Test Protocol will Specify Avg Time	Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	TPM10	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	0.2	lb/hr hourly; each fuel heater	SIP - Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	TPM2.5	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	0.2	lb/hr hourly; each fuel heater	SIP - Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	VOC	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	0.15	lb/hr hourly; each fuel heater	Good combustion practices (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	SO2	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	2000	gr/MMscf Based upon Fuel Receipt Records	SIP - Good combustion practices and the use of pipeline quality natural gas (The limit is 2,000 grains of sulfur per MMscf. The natural gas material limit of 2000 grains of sulfur per MMscf is what the emission factor is based upon.) (27 MMBtu/hr each)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	CO2e	FGFUELHTR (Two fuel pre-heaters identified as EUFUELHTR1 & EUFUELHTR2)	13848	tpy combined 12-month rolling time period	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas) (27 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft) (update of MI-0412)	12/5/2016, 7/31/17 update	CO	EUFUELHTR (Fuel pre-heater)	0.41	lb/hr Test Protocol will Specify Avg Time	SIP - Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	NOx	EUFUELHTR (Fuel pre-heater)	0.55	lb/hr Test Protocol will Specify Avg Time	SIP - Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	FPM	EUFUELHTR (Fuel pre-heater)	0.007	lb/MMBtu Test Protocol will Specify Avg Time	Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	TPM10	EUFUELHTR (Fuel pre-heater)	0.0075	lb/MMBtu Test Protocol will Specify Avg Time	SIP - Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	TPM2.5	EUFUELHTR (Fuel pre-heater)	0.0075	lb/MMBtu Test Protocol will Specify Avg Time	SIP - Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	VOC	EUFUELHTR (Fuel pre-heater)	0.03	lb/hr Test Protocol will Specify Avg Time	Good combustion practices (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	SO2	EUFUELHTR (Fuel pre-heater)	2000	gr/MMscf Based upon Fuel Receipt Records	SIP - Good combustion practices and the use of pipeline quality natural gas (The limit is 2,000 grains of sulfur per MMscf. The natural gas material limit of 2000 grains of sulfur per MMscf is what the emission factor is based upon.) (3.7 MMBtu/hr each)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	CO2e	EUFUELHTR (Fuel pre-heater)	1934	tpy combined 12-month rolling time period	Good combustion practices (3.7 MMBtu/hr each)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	NOx	Dew Point Heater 13.8	0.011	lb/MMBtu	NSPS (12.8 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	CO	Dew Point Heater 13.8	0.08	lb/MMBtu	NSPS (12.8 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	CO	Dew Point Heater 3.2	0.08	lb/MMBtu	NSPS (3.2 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	NOx	Dew Point Heater 3.2	0.035	lb/MMBtu	NSPS (3.2 MMBtu/hr)
Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	NOx	Indirect Fuel-Gas Heater	0.2	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)
Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	CO	Indirect Fuel-Gas Heater	0.16	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	VOC	Indirect Fuel-Gas Heater	0.011	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)
Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	TPM	Indirect Fuel-Gas Heater	0.015	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)
Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	TPM10	Indirect Fuel-Gas Heater	0.015	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Start up", "Start-up","Preheat" - All Results Included
Unit 13 - Startup Heater

Mid-Kansas Electric Company, LLC - Rubart Stati	KS-0030 (draft)	3/31/16, 7/19/17 update	TPM2.5	Indirect Fuel-Gas Heater	0.015	lb/hr excludes SSM	(One (1) indirect fuel-gas heater, rated at 2 mmBtu/hr heat input, which shall only burn natural gas, for the purpose of heating the natural gas fuel prior to combustion in the Caterpillar 4SLB RICE)

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Startup Heater	0.0023	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CH4	Startup Heater	0.0023	lb/MMBtu average of 3 stack tests	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Startup Heater	0.0194	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Startup Heater	0.057	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Startup Heater	0.0194	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Startup Heater	0.1	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Ammonia catalyst startup heater	37.23	lb/MMcf 3 hour average	good heater design and good combustion practices
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	CO	Heaters	0.01	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	CO	Heaters, Reboiler	0.01	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	CO	Heater, CCR Reactor	0.01	lb/MMBtu	Unknown
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2	Startup Heater	117	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2	Startup Heater	117	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Ammonia catalyst startup heater	59.61	ton/MMcf 3 hour average	good heater design and good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Startup Heater	345	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2e	Startup Heater	638	tons/year rolling 12 month total	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	N2O	Startup Heater	0.0006	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	N2O	Startup Heater	0.0006	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Startup Heater	0.119	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Startup Heater	0.63	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Ammonia catalyst startup heater	183.7	lb/MMcf 3 hour average	good heater design and good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Startup Heater	0.007	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Startup Heater	0.01	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM	Ammonia catalyst startup heater	1.9	lb/MMcf 3 hour average	good heater design and good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Startup Heater	0.007	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Startup Heater	0.01	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM10	Ammonia catalyst startup heater	7.6	lb/MMcf 3 hour average	good heater design and good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Startup Heater	0.007	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Startup Heater	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Startup Heater	0.01	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM2.5	Ammonia catalyst startup heater	7.6	lb/MMcf 3 hour average	good heater design and good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emissions	Startup Heater	0	%	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Startup Heater	0	% Opacity	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Startup Heater	0.0014	lb/MMBtu average of 3 stack tests	good operating practices & use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Startup Heater	0.004	tons/year rolling 12 month total	good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Startup Heater	0.0014	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Startup Heater	0.01	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Ammonia catalyst startup heater	5.5	lb/MMcf 3 hour average	good heater design and good combustion practices

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they are not used for startup.

KNO Restart
RBLC Search Summary
Search: "CO2 Vent", "CO2 Stripper" - All Results Included
Unit 14 - CO_2 Vent

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	CO2e	Ammonia Plant - CO2 Vent, Re	1.84	ton/ton of ammonia	Energy efficient plant design, good operating practices, good combustion practices for Reformer Furnance and Boilers, automated combustion management systems with oxygen trim systems for the Reformer Furnace and Boilers
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	CO2e	Ammonia Plant - CO2 Vent, Re	6,143	tons/day	Energy efficient plant design, good operating practices, good combustion practices for Reformer Furnance and Boilers, automated combustion management systems with oxygen trim systems for the Reformer Furnace and Boilers
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	VOC	CO2 Vent	0.052	lb/ton of ammonia	Use of amine solution as CO2 liquid catalyst/activator, good operating practices, process and equipment design
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	VOC	CO2 Vent	156	lb/day	Use of amine solution as CO2 liquid catalyst/activator, good operating practices, process and equipment design
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	CO	CO2 Vent	0.0089	ton/ton of ammonia	Process and equipment design, good operating practices
Cronus Chemical	IL-0134	12/21/2023, updated 2/26/25	CO	CO2 Vent	27	lb/day	Process and equipment design, good operating practices
Northern Plains Nitrogen Grand Forks Fertilizer Plant	ND-0033	8/10/2025, updated 4/5/2021	CO2e	Ammonia CO2 Vent	389809	tons/year CO2e	CO2 Recover and Reuse/ Good Operating Practices
Northern Plains Nitrogen Grand Forks Fertilizer Plant	ND-0033	8/10/2025, updated 4/5/2021	CO	Ammonia CO2 Vent	2.83	lb/hr	Good operating practices
Northern Plains Nitrogen Grand Forks Fertilizer Plant	ND-0033	8/10/2025, updated 4/5/2021	VOC	Ammonia CO2 Vent	14.57	lb/hr	Good design and operating practices

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Praxair Inc - Praxair Clear Lake Plant	TX-0830	10/19/2017	CO2e	HyCO CO2 Stripper MSS	0		No controls feasible.
Praxair Inc - Praxair Clear Lake Plant	TX-0830	10/19/2017	CO	HyCO CO2 Stripper MSS	3.3	tpy	No controls feasible.
Praxair Inc - Praxair Clear Lake Plant	TX-0827	10/19/2017	CO2e	HyCO CO2 Stripper MSS	0		No controls feasible. Emissions included in sitewide grouped limit
Praxair Inc - Praxair Clear Lake Plant	TX-0827	10/19/2017	CO	HyCO CO2 Stripper MSS	3.3	tpy	No controls feasible.
Agrium US, Inc. Ammonia and Urea Plant	TX-0814	1/5/2017, updated 11/16/2017	CO2e	CO2 Stripper Vent	843150	tpy	Good engineering practices to minimize CO2e emissions, with emissions limited to releasing to the atmoshpere the CO2 with cannot be sold. This is BACT for this source
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO	Acid Gas Removal Unit/CO2 Vent	No Numeric Limit	No Numeric Limit	Thermal Oxidizers
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO2e	Acid Gas Removal Unit/CO2 Vent	No Numeric Limit	No Numeric Limit	Thermal Oxidizers
Topchem Pollock, LLC	LA-0306	12/20/2016 (draft), 08/08/2017 update	CO2e	CO2 Stripper Column CO2SC-16-1 (EQT031)	162511	tpy	Use of pipeline quality natural gas and good combustion practices. 0.29 Ton CO2e/Metric Ton of NH3 produced.

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Acetaldehyde[1]	Carbon Dioxide Regenerator	1,226,814	tpy rolling 12 month total	Good operational practices
CF Industries Inc. Donaldsonville Nitrogen Complex - Ammonia Plant	LA-0236	3/3/2009	CO	CO2 Vents	5.59	lbs/hr	Optimum Catalytic Conversion of CO to CO2 in the high and low shift converters, and continued use of an optimum liquid alkanol amine solution, or other solution to maximize the absorbing of CO2
CF Industries Inc. Donaldsonville Nitrogen Complex - Ammonia Plant	LA-0236	3/3/2009	CO	CO2 Vents	6.55	tons/year	Optimum Catalytic Conversion of CO to CO2 in the high and low shift converters, and continued use of an optimum liquid alkanol amine solution, or other solution to maximize the absorbing of CO2
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Carbon Dioxide Regenerator	0.02	lb/ton of NH3 average of 3 stack tests	Good operational practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Carbon Dioxide Regenerator	9.74	tpy rolling 12 month total	Good operational practices
Iowa Fertilizer company	IA-0105	10/26/2012	CO	CO2 Regenerator	0.02	lb/ton of NH3 average of 3 stack tests	Good operational practices
Iowa Fertilizer company	IA-0105	10/26/2012	CO	CO2 Regenerator	9.65	tpy rolling 12 month total	Good operational practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	CO2 purification process	0.0117	lb/ton of NH3 3 hour average	good operational practices and the use of a process catalyst
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	Selexol AGR CO2 Vent	8.7	lbs/hr	Thermal Oxidizer (Cat-Ox)
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2	Carbon Dioxide Regenerator	1.26	lb/ton of NH3 30 day rollin g average[2]	Good operational practices
Iowa Fertilizer company	IA-0105	10/26/2012	CO2	CO2 Regenerator	1.26	Tons/ton of NH3 rolling 30 day average	Good operational practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	CO2 purification process	1.275	ton/ton of NH3 3 hour average	Good Operational Practices
Pryor Plant Chemical Company	OK-0135	2/23/2009	CO2	Carbon dioxide vent	3.65	lbs/hr 1 hour/8 hour	good operation practices
Iowa Fertilizer company	IA-0105	10/26/2012	CO2e	CO2 Regenerator	1,211,847	tpy rolling 12 month total	Good operational practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	Selexol AGR CO2 Vent	0.9	lbs/hr	Thermal Oxidizer (Cat-Ox)
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Carbon Dioxide Regenerator	0.106	lb/ton of NH3 average of 3 stack tests	Good operational practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Carbon Dioxide Regenerator	51.60	tpy rolling 12 month total	Good operational practices
Iowa Fertilizer company	IA-0105	10/26/2012	VOC	CO2 Regenerator	0.106	lb/ton of NH3 average of 3 stack tests	Good operational practices
Iowa Fertilizer company	IA-0105	10/26/2012	VOC	CO2 Regenerator	51.2	tpy rolling 12 month total	Good operational practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	CO2 purification process	0.0558	lb/ton of NH3 3 hour average	low VOC catalyst

[1] This is not correct according to Chris Roling for the Iowa DNR, most likely CO2e
[2] The units may be incorrect. It might be tons/ton of NH3

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 22 - Plants 4 and 5 Small Flare
Unit 23 - Plants 4 and 5 Emergency Flare

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO	Back-End Process with flare (P003)	46.57	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO	Back-End Process with flare (P003)	22.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	NOx	Back-End Process with flare (P003)	5.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	NOx	Back-End Process with flare (P003)	10.37	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM10	Back-End Process with flare (P003)	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM10	Back-End Process with flare (P003)	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM2.5	Back-End Process with flare (P003)	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM2.5	Back-End Process with flare (P003)	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	VOC	Back-End Process with flare (P003)	85.5	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	VOC	Back-End Process with flare (P003)	41.1	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events. This emissions unit shall be equipped with a flare to control OC emissions. The flare shall be fired with natural gas and shall be operated with at least 98% control efficiency
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO2e	Back-End Process with flare (P003)	714	tpy	good operational practices and energy efficient operation through a minimization plan and operation and maintenance in accordance with manufacturer recommendations
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO	Ammonia Synthesis Process with flare (P00	46.57	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO	Ammonia Synthesis Process with flare (P00	22.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	NOx	Ammonia Synthesis Process with flare (P00	6.6	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	NOx	Ammonia Synthesis Process with flare (P00	12.44	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM10	Ammonia Synthesis Process with flare (P00	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM10	Ammonia Synthesis Process with flare (P00	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM2.5	Ammonia Synthesis Process with flare (P00	4.06	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	PM2.5	Ammonia Synthesis Process with flare (P00	1.97	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	VOC	Ammonia Synthesis Process with flare (P00	85.5	lb/hr	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	VOC	Ammonia Synthesis Process with flare (P00	41.1	tpy	utilizing a flare with good combustion practices, natural gas to fuel pilots, and venting flare during only-start-up, shutdown and malfunction events. This emissions unit shall be equipped with a flare to control OC emissionss. The flare shall be fired with natural gas and shall be oeprated with at least 98% control efficiency
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated	CO2e	Ammonia Synthesis Process with flare (P00	714	tpy	good operational practices and energy efficient operation through a minimization plan and oepration and maintenance in accordance with manufacturer recommendations
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Front End Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Front End Flare	0.068	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Front End Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Front End Flare	0.31	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Front End Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Front End Flare	0.01	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM10	Front End Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM2.5	Front End Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO2e	Front End Flare	18603	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Ammonia Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Ammonia Flare	0.068	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Ammonia Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Ammonia Flare	0.31	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Ammonia Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Ammonia Flare	0.01	lb/MMBtu - SSM flaring	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM10	Ammonia Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM2.5	Ammonia Flare	0.0075	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO2e	Ammonia Flare	16093	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Ammonia Storage Flare	0.1	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	NOx	Ammonia Storage Flare	0.068	lb/MMBtu - during boil off event	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Ammonia Storage Flare	0.08	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO	Ammonia Storage Flare	0.31	lb/MMBtu - during boil off event	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Ammonia Storage Flare	0.0054	lb/MMBtu - pilot	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 22 - Plants 4 and 5 Small Flare
Unit 23 - Plants 4 and 5 Emergency Flare

Cronus Chemicals	IL-0134	12/21/2023, updated	VOC	Ammonia Storage Flare	0.15	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM10	Ammonia Storage Flare	0.01	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	PM2.5	Ammonia Storage Flare	0.01	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Cronus Chemicals	IL-0134	12/21/2023, updated	CO2e	Ammonia Storage Flare	3305	tpy	Flare minimization plan and root cause analysis, smokeless, steam-assist flare design, work practices in accorance with 40 CFR 63.11(b), GCP, nitrogen purge gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Front End Flare EU 017	0.0075	lb/MMBtu	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Front End Flare EU 017	336	hr/yr	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Front End Flare EU 017	0.0075	lb/MMBtu	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Front End Flare EU 017	336	hr/yr	The pilot and purge gas fuels used shall be natural gas, Flares shall be designed for and operated with no visible emissions, except for periods not to exceed 5 minutes during any two consecutive hours, Flares shall be operated with a flame present at all times, Flares shall be continuously monitored to assure the presence of a pilot flame with a thermocouple, infrared monitor, or other approved device
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Back End Flare EU-018	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Back End Flare EU-018	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Back End Flare EU-018	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Back End Flare EU-018	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Back End Flare EU-018	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Back End Flare EU-018	336	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Back End Flare EU-018	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Discontinuous Urea Flare EU-DUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Discontinuous Urea Flare EU-DUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Discontinuous Urea Flare EU-DUF	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Discontinuous Urea Flare EU-DUF	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Discontinuous Urea Flare EU-DUF	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Discontinuous Urea Flare EU-DUF	240	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Discontinuous Urea Flare EU-DUF	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Emergency Urea Flare EU-EUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Emergency Urea Flare EU-EUF	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Emergency Urea Flare EU-EUF	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Emergency Urea Flare EU-EUF	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Emergency Urea Flare EU-EUF	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Emergency Urea Flare EU-EUF	116.89	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM10	Ammonia Storage Flare EU-016	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	PM2.5	Ammonia Storage Flare EU-016	0.0075	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	NOx	Ammonia Storage Flare EU-016	0.068	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO	Ammonia Storage Flare EU-016	0.37	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	VOC	Ammonia Storage Flare EU-016	0.0054	lb/MMBtu	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Ammonia Storage Flare EU-016	168	hr/yr	The pilot and purge gas fuels shall be natural gas
Midwest Fertilizer Company LLC	IN-0324	05/06/2022, updated	CO2e	Ammonia Storage Flare EU-016	563	lb/MMBtu	The pilot and purge gas fuels shall be natural gas

RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Process Flare FL-16-1 (EQT034)	0.01	lb/hr hourly maximum	Correct flare design and good combustion practices; Compliance with the Louisiana Non-NSPS Flare Requirements (2.17 MMBtu/hr)(Flare shall not operate more than 4 hours above normal firing rate in any 24 consecutive hours and 148 hours per year)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Process Flare FL-16-1 (EQT034)	0.02	tpy annual maximum	Correct flare design and good combustion practices; Compliance with the Louisiana Non-NSPS Flare Requirements (2.17 MMBtu/hr)(Flare shall not operate more than 4 hours above normal firing rate in any 24 consecutive hours and 148 hours per year)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Process Flare FL-16-1 (EQT034)	0.87	lb/hr hourly maximum	Correct flare design and good combustion practices; Compliance with the Louisiana Non-NSPS Flare Requirements (2.17 MMBtu/hr)(Flare shall not operate more than 4 hours above normal firing rate in any 24 consecutive hours and 148 hours per year)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO	Process Flare FL-16-1 (EQT034)	3.76	tpy annual maximum	Correct flare design and good combustion practices; Compliance with the Louisiana Non-NSPS Flare Requirements (2.17 MMBtu/hr)(Flare shall not operate more than 4 hours above normal firing rate in any 24 consecutive hours and 148 hours per year)
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	CO2e	Process Flare FL-16-1 (EQT034)	370	tpy annual maximum	Correct flare design and good combustion practices; Compliance with the Louisiana Non-NSPS Flare Requirements (2.17 MMBtu/hr)(Flare shall not operate more than 4 hours above normal firing rate in any 24 consecutive hours and 148 hours per year)
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	TPM	Back End Flare (EU-018)	0.0019	lb/MMBtu 3 hour average	

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 22 - Plants 4 and 5 Small Flare
Unit 23 - Plants 4 and 5 Emergency Flare

Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	TPM	Back End Flare (EU-018)	336	hours/12 consec month	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	TPM	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Back End Flare (EU-018)	0.0075	lb/MMBtu 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Back End Flare (EU-018)	336	hours/12 consec month venting	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM10	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Back End Flare (EU-018)	0.0075	lb/MMBtu 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Back End Flare (EU-018)	336	hours/12 consec month venting	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	PM2.5	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Back End Flare (EU-018)	0.068	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Back End Flare (EU-018)	624.94	lb/hour venting operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	NOx	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Back End Flare (EU-018)	0.37	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Back End Flare (EU-018)	804.76	lb/hour venting operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Back End Flare (EU-018)	0.0054	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Back End Flare (EU-018)	11.73	lb/hour venting operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	VOC	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Back End Flare (EU-018)	116.89	lb/MMBtu during normal operations 3 hour average	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Back End Flare (EU-018)	573	tons/12 consecutive months	
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft), updated 7/10/17	CO2	Back End Flare (EU-018)	No Numeric Limit	No Numeric Limit	Pilot and purge gas shall be natural gas; and process flaring minimization practices; operated with a flame present at all times; continuously monitored
Agrium US, Inc	TX-0814	1/5/2017(draft)	CO2e	Ammonia Emergency Flare	157	tpy	Good Engineering Practices (0.31 MMBtu/hr and 2715 MMBtu/year)
Agrium US, Inc	TX-0814	1/5/2017(draft)	CO2e	Urea Emergency Flare	1418	tpy	Good Engineering Practices (2.76 MMBtu/hr)
Agrium US, Inc	TX-0814	1/5/2017(draft)	CO2e	Urea Emergency Flare (maintenance)	5.9	tpy	Good Engineering Practices (2000 kg/event, 36 hrs/event, 4 events/yr)

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Flare" - Fertilizer Plants only
Unit 22 - Plants 4 and 5 Small Flare
Unit 23 - Plants 4 and 5 Emergency Flare

CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CH4	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Front End Process Flare	0.37	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Front End Process Flare	3240.16	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Back end ammonia process vent flare	0.37	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Back end ammonia process vent flare	804.76	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	Process Flare	No Numeric Limit	No Numeric Limit	Good combustion practices. Meet 40 CFR 60.18
United Wisconsin Grain Producers UWGP - Fuel Grade Ethanol Plant	WI-0204	8/14/2003	CO	Bypass Flare, Biomethanator	2.4	lbs/hr	Operation Limit: No more than 5040 hr/yr
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Front End Process Flare	0.068	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Front End Process Flare	595.47	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emissions	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Flares	No Numeric Limit	No Numeric Limit	Good operating practices & use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Ammonia Flare	No Numeric Limit	No Numeric Limit	Work Practice/Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Front End Process Flare	0.0054	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Front End Process Flare	47.26	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	CO	Flare, Steam Assisted	12.8	lbs/hr	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	CO	Flare, Steam Assisted	56.07	tons/year 365-day sum of daily emissions	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	NOx	Flare, Steam Assisted	15.23	lbs/hr	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	NOx	Flare, Steam Assisted	66.71	tons/year 365-day sum of daily emissions	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	PM10	Flare, Steam Assisted	1.16	lbs/hr	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	PM10	Flare, Steam Assisted	5.08	tons/year 365-day sum of daily emissions	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	SOx	Flare, Steam Assisted	4.2	lbs/hr	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	SOx	Flare, Steam Assisted	18.4	tons/year 365-day sum of daily emissions	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	Visible Emissions	Flare, Steam Assisted	0	% opacity no NE except for 5 min during any 2 hrs	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	VOC	Flare, Steam Assisted	3.68	tons/year 365-day sum of daily emissions	Unknown
Sunoco, Inc. Sun Company, Inc., Toledo Refinery	OH-0308	2/23/2009	VOC	Flare, Steam Assisted	0.84	lbs/hr	Unknown
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Back end ammonia process vent flare	0.0054	lb/MMBtu 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Back end ammonia process vent flare	11.73	lb/hr 3 hour average	Proper flare design and good combustion practices; and process flaring minimization practices
United Wisconsin Grain Producers UWGP - Fuel Grade Ethanol Plant	WI-0204	8/14/2003	VOC	Bypass Flare, Biomethanator	0.3	lbs/hr	Operation Limit: No more than 5040 hr/yr
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	CO	Flares, 3500 SCFM LFG (3)	17.3	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	CO	Flares, 3500 SCFM LFG (3)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	CO	Flares, 2500 SCFM LFG (2)	12.3	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	CO	Flares, 2500 SCFM LFG (2)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	NOx	Flares, 2500 SCFM LFG (2)	3.6	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	NOx	Flares, 3500 SCFM LFG (3)	5.1	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	NOx	Flares, 3500 SCFM LFG (3)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	NOx	Flares, 2500 SCFM LFG (2)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	PM10	Flares, 2500 SCFM LFG (2)	1.6	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	PM10	Flares, 2500 SCFM LFG (2)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	PM10	Flares, 3500 SCFM LFG (3)	2.2	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	PM10	Flares, 3500 SCFM LFG (3)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	SO2	Flares, 2500 SCFM LFG (2)	1.4	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	SO2	Flares, 3500 SCFM LFG (3)	1.9	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	VOC	Flares, 2500 SCFM LFG (2)	1	lbs/hr nonmethane organic carbon	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	VOC	Flares, 2500 SCFM LFG (2)	98%	Reduction	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	VOC	Flares, 3500 SCFM LFG (3)	0.6	lbs/hr	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG
WM Atlantic Waste Disposal Inc. Atlantic Waste Disposal Landfill	VA-0294	2/5/2003	VOC	Flares, 3500 SCFM LFG (3)	1.4	lbs/hr nonmethane organic carbon	Proper maintenance of the flare, including monitoring for the presence of flame, LGF flow rate, 0% opacity, measuring % methane in LFG

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.

KNO Restart
RBLC Search Summary
Search: "Urea" - All Results Included
Unit 35 - Urea Granulators A/B
Unit 36 - Urea Granulators C/D

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	PM10	Urea Granulation Process (P006)	1.76	lb/hr	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	PM10	Urea Granulation Process (P006)	7.71	tpy	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	PM2.5	Urea Granulation Process (P006)	1.76	lb/hr	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	PM2.5	Urea Granulation Process (P006)	7.71	tpy	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	VOC	Urea Granulation Process (P006)	0.3	lb/hr	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	VOC	Urea Granulation Process (P006)	1.2	tpy	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	Visible Emissions (VE)	Urea Granulation Process (P006)	5%	%	wet scrubber
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 0	FPM	Granulated Urea Transfer Points with bin vents (P	0.005	gr/dscf	bin vent filters

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM	Urea Granulation Unit (EU-008)	0.163	lb/ton 3 hour average	Wet Scrubber
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM	Urea Granulation Unit (EU-008)	368040	tons/12 consecutive mos	Wet Scrubber
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM10	Urea Granulation Unit (EU-008)	0.163	lb/ton 3 hour average	Wet Scrubber
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM10	Urea Granulation Unit (EU-008)	368040	tons/12 consecutive mos	Wet Scrubber
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM2.5	Urea Granulation Unit (EU-008)	0.163	lb/ton 3 hour average	Wet Scrubber
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM2.5	Urea Granulation Unit (EU-008)	368040	tons/12 consecutive mos	Wet Scrubber

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Urea Granulator	0.0023	lb/MMBtu average of 3 stack tests	good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Urea Granulator	0.0194	lb/MMBtu average of 3 stack tests	good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Urea Granulator	5.5	tpy rolling 12 month total	good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2	Urea Granulator	117	lb/MMBtu average of 3 stack tests	good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Urea Granulator	33469	tpy rolling 12 month total	good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	N2O	Urea Granulator	0.0006	lb/MMBtu average of 3 stack tests	good combustion practices
Agrium U.S. Incorporated Kennewick Fertilizer Operations	WA-0318	7/11/2008	PM	Granular Urea Ammonium Nitrate Production	0.096	gr/dscf 24 hour average	Wet Scrubber, Mist Eliminator, and Product Hardener
Agrium U.S. Incorporated Kennewick Fertilizer Operations	WA-0318	7/11/2008	PM	Granular Urea Ammonium Nitrate Production	99.6	tons/year 12 month rolling average	Wet Scrubber, Mist Eliminator, and Product Hardener
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Urea Granulator	0.11	lb/ton of urea average of 3 stack tests	good combustion practices along with a wet scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Urea Granulator	85.7	tpy rolling 12 month total	good combustion practices along with a wet scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Urea Granulator	0.1	kg/metric ton average of 3 stack tests	Wet Scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Urea Granulator	60.4	tons/year rolling 12 month total	Wet Scrubber
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM	Granulator Scrubbers	0.7	lbs/hr 24-hour	Good operating practices
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM	Granulator Scrubbers	80%	Reduction	Good operating practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Urea Granulation Vent	0.011	lb/ton	Wet Scrubber
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Urea Granulation Vent	20.5	lbs/hr	Wet Scrubber
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Urea Granulation Vent	20%	Reduction	Wet Scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Urea Granulator	0.11	lb/ton of urea average of 3 stack tests	good combustion practices along with a wet scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Urea Granulator	85.7	tpy rolling 12 month total	good combustion practices along with a wet scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Urea Granulator	0.1	kg/metric ton average of 3 stack tests	Wet Scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Urea Granulator	60.4	tons/year rolling 12 month total	Wet Scrubber
Koch Nitrogen Company Enid Nitrogen Plant	OK-0124	5/1/2008	PM10	Urea Granulators	6.6	lbs/hr per granulator	Wet Scrubber
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM10	Granulator Scrubbers	0.7	lbs/hr 24-hour	Good operating practices
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM10	Granulator Scrubbers	80%	Reduction	Good operating practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	Urea Granulation Vent	0.005	lb/ton	Wet Scrubber
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	Urea Granulation Vent	9	lbs/hr	Wet Scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Urea Granulator	0.108	lb/ton of urea average of 3 stack tests	good combustion practices along with a wet scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Urea Granulator	85.7	tpy rolling 12 month total	good combustion practices along with a wet scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Urea Granulator	0.025	kg/metric ton average of 3 stack tests	Wet Scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Urea Granulator	15.1	tons/year rolling 12 month total	Wet Scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emission	Urea Granulator	0	%	good combustion practices and wet scrubber
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emission	Urea Granulator	0	% opacity	Wet Scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Urea Granulator	0.05	lb/ton of urea average of 3 stack tests	good combustion practices and wet scrubber
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Urea Granulator	38.9	tpy rolling 12 month total	good combustion practices and wet scrubber

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Cooling Tower" - All Results Included
Unit 40 - Cooling Tower

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Duke Energy Indiana, Inc. - Cayuga Generating Station	IN-0382	02/14/2025, updated 04/09/2025	TPM	Cooling Towers	No Numeric Limit	No Numeric Limit	Drift Eliminator System
Valero Refining Texas, LP - Valero Corpus Christi Refinery West Plant	TX-0938	05/03/24, updated 04/07/2025	VOC	Cooling Tower	0.08	ppmw	Non-contact design and sampling of strippable VOC
Valero Refining Texas, LP - Valero Corpus Christi Refinery West Plant	TX-0938	05/03/24, updated 04/07/2025	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001% drift
Valero Refining Texas, LP - Valero Corpus Christi Refinery West Plant	TX-0938	05/03/24, updated 04/07/2025	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001% drift
Valero Refining Texas, LP - Valero Corpus Christi Refinery West Plant	TX-0938	05/03/24, updated 04/07/2025	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001% drift
Exploratory Ventures LLC	AR-0184	03/05/2024, updated 02/26/2025	TPM	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Exploratory Ventures LLC	AR-0184	03/05/2024, updated 02/26/2025	PM10	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Exploratory Ventures LLC	AR-0184	03/05/2024, updated 02/26/2025	PM2.5	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Exploratory Ventures LLC	AR-0184	03/05/2024, updated 02/26/2025	Visible Emissions	Cooling Towers	5	%	Drift Eliminators Low TDS
Big River Steel LLC	AR-0183	02/08/2024, updated 02/26/2025	TPM	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Big River Steel LLC	AR-0183	02/08/2024, updated 02/26/2025	PM10	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Big River Steel LLC	AR-0183	02/08/2024, updated 02/26/2025	PM2.5	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Big River Steel LLC	AR-0183	02/08/2024, updated 02/26/2025	Visible Emissions	Cooling Towers	5	%	Drift Eliminators Low TDS
Quail Run Carbon, LLC - Carbon Capture Plant	TX-0967	02/05/2025, updated 04/08/2025	VOC	Cooling Towers	No Numeric Limit	No Numeric Limit	cooling water is maintained at a pressure of at least 5 psi greater than the process fluid pressure which prevents leakage of VOC into the cooling tower water (CAM: pressure).
Quail Run Carbon, LLC - Carbon Capture Plant	TX-0967	02/05/2025, updated 04/08/2025	TPM	Cooling Towers	No Numeric Limit	No Numeric Limit	drift eliminators 0.0005%
Quail Run Carbon, LLC - Carbon Capture Plant	TX-0967	02/05/2025, updated 04/08/2025	PM10	Cooling Towers	No Numeric Limit	No Numeric Limit	drift eliminators 0.0005%
Quail Run Carbon, LLC - Carbon Capture Plant	TX-0967	02/05/2025, updated 04/08/2025	PM2.5	Cooling Towers	No Numeric Limit	No Numeric Limit	drift eliminators 0.0005%
Scout Motors Inc A Delaware Corportation - Blythewood Plant	SC-0205	10/31/2023, updated 04/01/2025	TPM	Cooling Towers	0.001	% Drift Rate	Drift Eliminator
Scout Motors Inc A Delaware Corportation - Blythewood Plant	SC-0205	10/31/2023, updated 04/01/2025	PM10	Cooling Towers	0.001	% Drift Rate	Drift Eliminator
Scout Motors Inc A Delaware Corportation - Blythewood Plant	SC-0205	10/31/2023, updated 04/01/2025	PM2.5	Cooling Towers	0.001	% Drift Rate	Drift Eliminator
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	TPM	Cooling Towers (P023, P024, P025)	0.05	lb/hr	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	TPM	Cooling Towers (P023, P024, P025)	0.22	tpy; 12-month rolling	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	PM10	Cooling Towers (P023, P024, P025)	0.04	lb/hr	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	PM10	Cooling Towers (P023, P024, P025)	0.15	tpy; 12-month rolling	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	PM2.5	Cooling Towers (P023, P024, P025)	0.02	lb/hr	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	PM2.5	Cooling Towers (P023, P024, P025)	0.09	tpy; 12-month rolling	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Valencia Project LLC	OH-0391	10/27/2023, updated 03/05/2025	Visible Emissions	Cooling Towers (P023, P024, P025)	10	% opacity as 6 minute average	A drift eliminator achieving “drift loss” equal to or less than 0.0005 percent
Linde, Inc - Nederland Facility	TX-0964	10/05/2023, updated 04/08/2025	FPM	Cooling Towers	2000	ppmw	Drift eliminators with 0.001% drift
Linde, Inc - Nederland Facility	TX-0964	10/05/2023, updated 04/08/2025	PM10	Cooling Towers	2000	ppmw	Drift eliminators with 0.001% drift
Nucor Steel Louisiana LLC - Direct Reduced Iron Facility	LA-0400	09/20/2023, updated 02/27/2025	Hydrogen Sulfide	Cooling Tower CT-1 (EQT0074)	No Numeric Limit	No Numeric Limit	Limit cooling water circulating rate to no more than 51,888 gpm (annual average)
AG Processing Inc, A Cooperative - David City	NE-0068	06/27/2023, updated 03/05/2025	TPM	Cooling Tower 1	0.0005	%	There is a drift loss design specification with the mist eliminator (CE-8000) and a TDS concentration limit
AG Processing Inc, A Cooperative - David City	NE-0068	06/27/2023, updated 03/05/2025	TPM	Cooling Tower 1	3000	ppm	There is a drift loss design specification with the mist eliminator (CE-8000) and a TDS concentration limit
AG Processing Inc, A Cooperative - David City	NE-0068	06/27/2023, updated 03/05/2025	TPM	Cooling Tower 2	0.0005	%	There is a drift loss design specification with the mist eliminator (CE-8000) and a TDS concentration limit
AG Processing Inc, A Cooperative - David City	NE-0068	06/27/2023, updated 03/05/2025	TPM	Cooling Tower 2	3000	ppm	There is a drift loss design specification with the mist eliminator (CE-8000) and a TDS concentration limit
Enterprise Products Operating LLC - Enterprise Mont Belviue Complex	TX-0956	06/08/2023, updated 04/07/2025	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift less than or equal to 0.001%
Enterprise Products Operating LLC - Enterprise Mont Belviue Complex	TX-0956	06/08/2023, updated 04/07/2025	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift less than or equal to 0.001%
Enterprise Products Operating LLC - Enterprise Mont Belviue Complex	TX-0956	06/08/2023, updated 04/07/2025	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift less than or equal to 0.001%
Hybar LLC	AR-0180	04/28/2023, updated 02/26/2025	FPM	Cooling Towers	0.0005	%Drift Loss	Drift eliminators and low TDS
Hybar LLC	AR-0180	04/28/2023, updated 02/26/2025	PM10	Cooling Towers	0.0005	%Drift Loss	Drift eliminators and low TDS
Hybar LLC	AR-0180	04/28/2023, updated 02/26/2025	PM2.5	Cooling Towers	0.0005	%Drift Loss	Drift eliminators and low TDS
Energy Texas, Inc - Orange County Advanced Power Station	TX-0939	03/13/2023, updated 05/23/2023	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	0.001% Drift Eliminators
Energy Texas, Inc - Orange County Advanced Power Station	TX-0939	03/13/2023, updated 05/23/2023	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	0.001% Drift Eliminators
Energy Texas, Inc - Orange County Advanced Power Station	TX-0939	03/13/2023, updated 05/23/2023	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	0.001% Drift Eliminators
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	FPM	Cooling tower, SN-241	0.0005	%Drift Loss	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	FPM	Cooling tower, SN-241	0.1	lb/hr	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	FPM	Cooling tower, SN-241	0.3	tpy	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM10	Cooling tower, SN-241	0.0005	%Drift Loss	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM10	Cooling tower, SN-241	0.1	lb/hr	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM10	Cooling tower, SN-241	0.1	tpy	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM2.5	Cooling tower, SN-241	0.0005	%Drift Loss	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM2.5	Cooling tower, SN-241	0.1	lb/hr	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	PM2.5	Cooling tower, SN-241	0.1	tpy	Mist Eliminator
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	VOC	Cooling tower, SN-241	0.1	lb/hr	No BACT Specified
Nucor Corporation - Nucor Steel Arkansas	AR-0177	11/21/2022, updated 04/25/2023	VOC	Cooling tower, SN-241	0.1	tpy	No BACT Specified
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 03/02/2025	TPM	Cooling Tower	0.0005	% drift loss	There is a drift loss design specification and a TDS concentration limit
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 03/02/2025	TPM	Cooling Tower	3000	ppm	There is a drift loss design specification and a TDS concentration limit
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3C-4 - C/A Cooling Tower	0.14	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3C-4 - C/A Cooling Tower	0.51	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3C-4 - C/A Cooling Tower	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3C-4 - C/A Cooling Tower	0.14	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3C-4 - C/A Cooling Tower	0.51	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3C-4 - C/A Cooling Tower	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-7 - VCM Cooling Tower 1	0.21	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-7 - VCM Cooling Tower 1	0.78	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-7 - VCM Cooling Tower 1	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-7 - VCM Cooling Tower 1	0.36	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-7 - VCM Cooling Tower 1	1.31	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-7 - VCM Cooling Tower 1	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-18 - VCM Cooling Tower 2	0.05	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-18 - VCM Cooling Tower 2	0.18	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	3M-18 - VCM Cooling Tower 2	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-18 - VCM Cooling Tower 2	0.08	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-18 - VCM Cooling Tower 2	0.31	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	3M-18 - VCM Cooling Tower 2	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	2P-15 - Cooling Tower	0.11	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	2P-15 - Cooling Tower	0.42	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM2.5	2P-15 - Cooling Tower	0.0005	%drift	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	2P-15 - Cooling Tower	0.19	lb/hr	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	2P-15 - Cooling Tower	0.69	tpy	Drift eliminator
Shintech Louisiana LLC - Shintech Plaquemine Plant 3	LA-0389	10/20/2022, updated 04/25/2023	PM10	2P-15 - Cooling Tower	0.0005	%drift	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	TPM	Cooling Towers: P054 through P178	0.0005	% drift rate	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	TPM	Cooling Towers: P054 through P178	0.28	tpy; 12-month rolling	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	PM10	Cooling Towers: P054 through P178	0.0005	% drift rate	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	PM10	Cooling Towers: P054 through P178	0.059	tpy; 12-month rolling	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	PM2.5	Cooling Towers: P054 through P178	0.0005	% drift rate	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	PM2.5	Cooling Towers: P054 through P178	0.0004	tpy; 12-month rolling	Drift eliminator
Intel Ohio Site	OH-0387	09/20/2022, updated 04/25/2023	Visible Emissions	Cooling Towers: P054 through P178	10	% opacity as 6 minute average	Drift eliminator
Knauf Insulation Inc, Fiberglass Manufacturing Facility	TX-0940	09/06/2022, updated 05/23/2023	TPM	Cooling Tower	0.001	%	Drift eliminator
Knauf Insulation Inc, Fiberglass Manufacturing Facility	TX-0940	09/06/2022, updated 05/23/2023	PM10	Cooling Tower	0.001	%	Drift eliminator
Knauf Insulation Inc, Fiberglass Manufacturing Facility	TX-0940	09/06/2022, updated 05/23/2023	PM2.5	Cooling Tower	0.001	%	Drift eliminator

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Cooling Tower" - All Results Included
Unit 40 - Cooling Tower

Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	FPM	EU 043 - Cooling Tower #1	0.013	lb/hr; monthly average	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	FPM	EU 043 - Cooling Tower #1	0.06	tpy; 12-month rolling	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	PM10	EU 043 - Cooling Tower #1	0.006	lb/hr; monthly average	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	PM10	EU 043 - Cooling Tower #1	0.03	tpy; 12-month rolling	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	PM2.5	EU 043 - Cooling Tower #1	0	lb/hr; monthly average	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
Novelis Corporation - Guthrie	KY-0116	7/25/2022, updated 04/25/2023	PM2.5	EU 043 - Cooling Tower #1	0.0001	tpy; 12-month rolling	Mist Eliminator (0.001% drift loss), Total Dissolved Solids (TDS) concentration limit of 1000 ppm
TPC Group LLC - Houston Plant	TX-0922	06/13/2022, updated 08/16/2022	VOC	Cooling Tower	0.042	ppmw	Non-contact design and sampling of strippable VOC
TPC Group LLC - Houston Plant	TX-0922	06/13/2022, updated 08/16/2022	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.0005% drift
TPC Group LLC - Houston Plant	TX-0922	06/13/2022, updated 08/16/2022	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.0005% drift
TPC Group LLC - Houston Plant	TX-0922	06/13/2022, updated 08/16/2022	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.0005% drift
Magnolia Power LLC - Magnolia Power Generating Station Unit 1	LA-0391	06/03/2022, updated 05/23/2023	PM10	Cooling Tower	0.0005	%	High-efficiency drift eliminators
Magnolia Power LLC - Magnolia Power Generating Station Unit 1	LA-0391	06/03/2022, updated 05/23/2023	PM2.5	Cooling Tower	0.0005	%	High-efficiency drift eliminators
Big River Steel LLC	AR-0173	01/31/2022, updated 03/04/2022	FPM	Cooling Towers	0.0005	Drift Loss	Drift Eliminator Low TDS
Big River Steel LLC	AR-0173	01/31/2022, updated 03/04/2022	PM10	Cooling Towers	0.0005	Drift Loss	Drift Eliminator Low TDS
Big River Steel LLC	AR-0173	01/31/2022, updated 03/04/2022	PM2.5	Cooling Towers	0.0005	Drift Loss	Drift Eliminator Low TDS
Big River Steel LLC	AR-0173	01/31/2022, updated 03/04/2022	Visible Emissions (VE)	Cooling Towers	5	%	Drift Eliminators Low TDS
Roehm America LLC - Bay City Site	TX-0931	12/16/2021, updated 03/08/2022	VOC	Cooling Tower	No Numeric Limit	No Numeric Limit	Non-contact design and sampling of strippable VOC
Roehm America LLC - Bay City Site	TX-0931	12/16/2021, updated 03/08/2022	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.001% drift
Roehm America LLC - Bay City Site	TX-0931	12/16/2021, updated 03/08/2022	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.001% drift
Roehm America LLC - Bay City Site	TX-0931	12/16/2021, updated 03/08/2022	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.001% drift
Nacero TX 1 LLC - Penwell Facility	TX-0933	11/17/2021, updated 03/08/2022	VOC	Cooling Tower	0.08	ppmw	Non-contact design and sampling of strippable VOC
Nacero TX 1 LLC - Penwell Facility	TX-0933	11/17/2021, updated 03/08/2022	TPM	Cooling Tower	5000	ppm	Drift eliminators with 0.001% drift
Nacero TX 1 LLC - Penwell Facility	TX-0933	11/17/2021, updated 03/08/2022	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.001% drift
Nacero TX 1 LLC - Penwell Facility	TX-0933	11/17/2021, updated 03/08/2022	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators with 0.001% drift
Jupiter Brownsville, LLC - Centurion Brownsville	TX-0930	10/19/2021, updated 03/08/2022	VOC	Cooling Tower	3.1	ppmvd	Monthly VOC monitoring required. Leak action level (for new sources) defined as a total strippable hydrocarbon concentration (as methane) in the stripping gas of 3.1 ppmv. Non-contact design
Jupiter Brownsville, LLC - Centurion Brownsville	TX-0930	10/19/2021, updated 03/08/2022	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Monthly VOC monitoring required. Leak action level (for new sources) defined as a total strippable hydrocarbon concentration (as methane) in the stripping gas of 3.1 ppmv. Non-contact design
Jupiter Brownsville, LLC - Centurion Brownsville	TX-0930	10/19/2021, updated 03/08/2022	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Monthly VOC monitoring required. Leak action level (for new sources) defined as a total strippable hydrocarbon concentration (as methane) in the stripping gas of 3.1 ppmv. Non-contact design
Jupiter Brownsville, LLC - Centurion Brownsville	TX-0930	10/19/2021, updated 03/08/2022	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Monthly VOC monitoring required. Leak action level (for new sources) defined as a total strippable hydrocarbon concentration (as methane) in the stripping gas of 3.1 ppmv. Non-contact design
Formosa Plastic Corportation, Texas - Point Comfort Plant	TX-0929	10/51/2021, updated 03/08/2022	VOC	Cooling Tower	No Numeric Limit	No Numeric Limit	One cooling tower (EPN: PE3-12) provides process cooling for the new unit. This cooling tower is non-contact design. Monthly monitoring of VOC content of the cooling water in addition to a VOC leak detection system will be implemented.
Shintech Louisiana LLC - Shintech Plaquemine Plant 1	LA-0379	05/04/2021, updated 03/04/2022	TPM	C/A Cooling Tower	0.08	lb/mm gal	Good design, maintenance and mist eliminators
Shintech Louisiana LLC - Shintech Plaquemine Plant 1	LA-0379	05/04/2021, updated 03/04/2022	PM10	C/A Cooling Tower	0.08	lb/mm gal	Good design, maintenance and mist eliminators
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	0.27	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	1.18	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	0.19	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	0.87	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	0.0006	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Laminar Cooling Tower - Hot Mill Cells (EP 03-09)	0.0026	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.17	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.75	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.12	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.55	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.0004	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Direct Cooling Tower-Caster & Roughing Mill Cells (EP 03-10)	0.002	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	0.39	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	1.71	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	0.29	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	1.27	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	0.0008	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Melt Shop #2 Cooling Tower (indirect) (EP 03-11)	0.003	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Cold Mill Cooling Tower (EP 03-12)	0.14	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Cold Mill Cooling Tower (EP 03-12)	0.6	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Cold Mill Cooling Tower (EP 03-12)	0.094	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Cold Mill Cooling Tower (EP 03-12)	0.41	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Cold Mill Cooling Tower (EP 03-12)	0.0003	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Cold Mill Cooling Tower (EP 03-12)	0.0013	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Air Separation Plant Cooling Tower (EP 03-13)	0.08	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	Air Separation Plant Cooling Tower (EP 03-13)	0.37	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Air Separation Plant Cooling Tower (EP 03-13)	0.07	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	Air Separation Plant Cooling Tower (EP 03-13)	0.32	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Air Separation Plant Cooling Tower (EP 03-13)	0.0002	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	Air Separation Plant Cooling Tower (EP 03-13)	0.0008	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	DCW Auxiliary Cooling Tower (EP 03-14)	0.06	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	FPM	DCW Auxiliary Cooling Tower (EP 03-14)	0.27	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	DCW Auxiliary Cooling Tower (EP 03-14)	0.05	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM10	DCW Auxiliary Cooling Tower (EP 03-14)	0.21	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	DCW Auxiliary Cooling Tower (EP 03-14)	0.0001	lb/hr	Mist Eliminator, 0.001% drift loss
Nucor Steel Gallatin, LLC	KY-0115	04/19/2021, updated 05/26/2021	PM2.5	DCW Auxiliary Cooling Tower (EP 03-14)	0.0006	tpy; 12-month rolling	Mist Eliminator, 0.001% drift loss
NRG Cedar Bayou LLC - Unit 5	TX-0915	03/17/2021, updated 03/08/2022	TPM	Cooling Tower	60000	ppm	Drift eliminators – 0.0005%
NRG Cedar Bayou LLC - Unit 5	TX-0915	03/17/2021, updated 03/08/2022	PM10	Cooling Tower	60000	ppm	Drift eliminators – 0.0005%
NRG Cedar Bayou LLC - Unit 5	TX-0915	03/17/2021, updated 03/08/2022	PM2.5	Cooling Tower	60000	ppm	Drift eliminators – 0.0005%
Marathon Petroleum Company LP - Garyville Refinery	LA-0385	02/11/2021, updated 03/04/2022	PM10	Cooling Towers	No Numeric Limit	No Numeric Limit	High-efficiency drift eliminators
Marathon Petroleum Company LP - Garyville Refinery	LA-0385	02/11/2021, updated 03/04/2022	PM2.5	Cooling Towers	No Numeric Limit	No Numeric Limit	High-efficiency drift eliminators
Marathon Petroleum Company LP - Garyville Refinery	LA-0385	02/11/2021, updated 03/04/2022	VOC	Cooling Towers	No Numeric Limit	No Numeric Limit	Periodic monitoring cooling water as specified by 40 CFR 63 Subpart CC (for EQT0213 and EQT0397)
Marathon Petroleum Company LP - Garyville Refinery	LA-0385	02/11/2021, updated 03/04/2022	Hydrogen Sulfide	Cooling Towers	No Numeric Limit	No Numeric Limit	Periodic monitoring cooling water as specified by 40 CFR 63 Subpart CC (for EQT0213 and EQT0397)
Targa Midstream Services LLC - Mont Belvieu Fractionator	TX-0912	02/05/2021, updated 05/10/2021	VOC	Cooling Tower	No Numeric Limit	No Numeric Limit	drift eliminators with 0.0005% maximum drift
Louisiana Pigment Company - Titanium Dioxide Plant	LA-0367	11/17/2020, updated 04/01/2021	PM10	Cooling Tower	0.0005	%	High efficiency drift eliminators
Louisiana Pigment Company - Titanium Dioxide Plant	LA-0367	11/17/2020, updated 04/01/2021	PM2.5	Cooling Tower	0.0005	%	High efficiency drift eliminators
Westlake Vinyls, Inc - PVC Plant	KY-0112	11/13/2020, updated 04/06/2021	FPM	Cooling Tower [EU 31]	0.125	lbs/hr; monthly basis	1. State-of-the-art, high-efficiency drift eliminators with a drift rate specified at 0.0005% percent of the circulating water rate; 2. Monitoring and limiting total dissolved solids in the circulating water; and 3. Proper equipment operation, and maintenance
Westlake Vinyls, Inc - PVC Plant	KY-0112	11/13/2020, updated 04/06/2021	PM10	Cooling Tower [EU 31]	0.079	lbs/hr; monthly basis	1. State-of-the-art, high-efficiency drift eliminators with a drift rate specified at 0.0005% percent of the circulating water rate; 2. Monitoring and limiting total dissolved solids in the circulating water; and 3. Proper equipment operation, and maintenance

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Westlake Vinyls, Inc - PVC Plant	KY-0112	11/13/2020, updated 04/06/2021	PM2.5	Cooling Tower [EU 31]	0.0003	lbs/hr; monthly basis	1. State-of-the-art, high-efficiency drift eliminators with a drift rate specified at 0.0005% percent of the circulating water rate; 2. Monitoring and limiting total dissolved solids in the circulating water; and 3. Proper equipment operation, and maintenance
Westlake Vinyls, Inc - PVC Plant	KY-0112	11/13/2020, updated 04/06/2021	VOC	Cooling Tower [EU 31]	3.9	ppmv; 12 month rolling	1. State-of-the-art, high-efficiency drift eliminators with a drift rate specified at 0.0005% percent of the circulating water rate; 2. Monitoring and limiting total dissolved solids in the circulating water; and 3. Proper equipment operation, and maintenance
Westlake Vinyls, Inc - PVC Plant	KY-0112	11/13/2020, updated 04/06/2021	VOC	Cooling Tower [EU 31]	50	ppbw of vcm; 12 month rolling	1. State-of-the-art, high-efficiency drift eliminators with a drift rate specified at 0.0005% percent of the circulating water rate; 2. Monitoring and limiting total dissolved solids in the circulating water; and 3. Proper equipment operation, and maintenance
Chevron Phillips Chemical Company LP - Sweeny Complex	TX-0894	10/30/2020, updated 11/12/2020	VOC	Cooling Tower (EPN 81-05-9202)	No Numeric Limit	No Numeric Limit	The cooling tower will have a non-contact design and will be monitored continuously for VOC equipment leaks in accordance with 30 TAC 115.764(a)(2) requirements. The leaks discovered from this monitoring shall be repaired as soon as possible, but no later than the next scheduled shutdown, or a shutdown triggered by a 0.08 ppmw cooling water VOC concentration.
Diamond Green Diesel - Port Arthur Facility	TX-0905	09/16/2020, updated 09/10/2021	VOC	Cooling Tower	No Numeric Limit	No Numeric Limit	Non-contact design and sampling of strippable VOC
Diamond Green Diesel - Port Arthur Facility	TX-0905	09/16/2020, updated 09/10/2021	TPM	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001%
Diamond Green Diesel - Port Arthur Facility	TX-0905	09/16/2020, updated 09/10/2021	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001%
Diamond Green Diesel - Port Arthur Facility	TX-0905	09/16/2020, updated 09/10/2021	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift eliminators 0.001%
Motiva Polyethylene Manufacturing Complex - TX	TX-0904	09/09/2020, updated 12/01/2021	VOC	Cooling Tower	0.08	ppmw	Non-contact design and sampling of strippable VOC
Motiva Polyethylene Manufacturing Complex - TX	TX-0904	09/09/2020, updated 12/01/2021	TPM	Cooling Tower	1200	ppmw	Non-contact design and drift eliminators
Motiva Polyethylene Manufacturing Complex - TX	TX-0904	09/09/2020, updated 12/01/2021	PM10	Cooling Tower	1200	ppmw	Non-contact design and drift eliminators
Motiva Polyethylene Manufacturing Complex - TX	TX-0904	09/09/2020, updated 12/01/2021	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Non-contact design and drift eliminators
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	- EP 09-01 - Melt Shop ICW Cooling Tower	0.36	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	- EP 09-01 - Melt Shop ICW Cooling Tower	1.56	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	- EP 09-01 - Melt Shop ICW Cooling Tower	0.27	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	- EP 09-01 - Melt Shop ICW Cooling Tower	1.16	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	- EP 09-01 - Melt Shop ICW Cooling Tower	0.0008	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	- EP 09-01 - Melt Shop ICW Cooling Tower	0.0035	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-02 - Melt Shop DCW Cooling Tower	0.04	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-02 - Melt Shop DCW Cooling Tower	0.19	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-02 - Melt Shop DCW Cooling Tower	0.03	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-02 - Melt Shop DCW Cooling Tower	0.14	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-02 - Melt Shop DCW Cooling Tower	0.0001	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-02 - Melt Shop DCW Cooling Tower	0.0004	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-03 - Rolling Mill ICW Cooling Tower	0.06	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-03 - Rolling Mill ICW Cooling Tower	0.25	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-03 - Rolling Mill ICW Cooling Tower	0.04	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-03 - Rolling Mill ICW Cooling Tower	0.19	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-03 - Rolling Mill ICW Cooling Tower	0.0001	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-03 - Rolling Mill ICW Cooling Tower	0.0006	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-04 - Rolling Mill DCW Cooling Tower	0.17	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-04 - Rolling Mill DCW Cooling Tower	0.75	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-04 - Rolling Mill DCW Cooling Tower	0.12	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-04 - Rolling Mill DCW Cooling Tower	0.51	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-04 - Rolling Mill DCW Cooling Tower	0.0004	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-04 - Rolling Mill DCW Cooling Tower	0.0016	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	0.78	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	3.41	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	0.54	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	2.35	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	0.0017	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-05 - Rolling Mill Quench/ACC Cooling Tower	0.0075	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.06	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.26	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.04	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.19	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.0001	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-06 - Light Plate Quench DCW Cooling Tower	0.0006	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.02	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.1	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.02	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.07	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.0001	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-07 - Heavy Plate Quench DCW Cooling Tower	0.0002	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-08 - Air Separation Plant Cooling Tower	0.1	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	FPM	EP 09-08 - Air Separation Plant Cooling Tower	0.46	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-08 - Air Separation Plant Cooling Tower	0.08	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM10	EP 09-08 - Air Separation Plant Cooling Tower	0.34	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-08 - Air Separation Plant Cooling Tower	0.0002	lb/hr	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Nucor Steel Brandenburg	KY-0110	07/23/2020, updated 1/25/2021	PM2.5	EP 09-08 - Air Separation Plant Cooling Tower	0.001	tpy; 12-month rolling	High Efficiency Mist Eliminator. The mist eliminator drift loss shall bemaintained at 0.001% or less to total gpm
Chevron Phillips Chemical Company LP - Orange Polyethylene Plant	TX-0888	04/23/2020, updated 11/12/2020	VOC	Cooling Towers	0.7	lb/mmgal	Use of a non-contact cooling tower design and monthly monitoring
Chevron Phillips Chemical Company LP - Orange Polyethylene Plant	TX-0888	04/23/2020, updated 11/12/2020	CO2e	Cooling Towers	No Numeric Limit	No Numeric Limit	Use of a non-contact cooling tower design and monthly monitoring
Chevron Phillips Chemical Company LP - Orange Polyethylene Plant	TX-0888	04/23/2020, updated 11/12/2020	TPM	Cooling Towers	No Numeric Limit	No Numeric Limit	Drift Eliminators
Chevron Phillips Chemical Company LP - Orange Polyethylene Plant	TX-0888	04/23/2020, updated 11/12/2020	PM10	Cooling Towers	No Numeric Limit	No Numeric Limit	Drift Eliminators
Chevron Phillips Chemical Company LP - Orange Polyethylene Plant	TX-0888	04/23/2020, updated 11/12/2020	PM2.5	Cooling Towers	No Numeric Limit	No Numeric Limit	Drift Eliminators
Oneok Hydrocarbons LP - Mont Belview NGL Fractionation Unit	TX-0886	03/31/3020, updated 11/12/2020	VOC	Cooling Tower	0.7	lb/mmgal; hourly	Monthly cooling water monitoring using air stripping
Oneok Hydrocarbons LP - Mont Belview NGL Fractionation Unit	TX-0886	03/31/3020, updated 11/12/2020	VOC	Cooling Tower	0.3	lb/mmgal; annual	Monthly cooling water monitoring using air stripping
Exxon Mobil Oil Company - Beaumont Refinery	TX-0881	01/10/2020, updated 11/12/2020	PM10	Cooling Towers	No Numeric Limit	No Numeric Limit	High efficiency drift eliminators to control drift to no more than 0.005%
Exxon Mobil Oil Company - Beaumont Refinery	TX-0881	01/10/2020, updated 11/12/2020	PM2.5	Cooling Towers	No Numeric Limit	No Numeric Limit	High efficiency drift eliminators to control drift to no more than 0.005%
Phillips 66 Company - Sweeny Refinery	TX-0877	01/08/2020, updated 11/12/2020	VOC	Cooling Tower	0.08	ppmw	non-contact design; the VOC in water will be monitored monthly per Appendix P; and identified leaks will be repaired as soon as possible, but before next scheduled shutdown, or shutdown triggered by 0.08 ppmw cooling water VOC concentration. Circulation rate 32000 gal/min
FG LA LLC - LA Complex	LA-0364	01/06/2020, updated 08/09/2021	PM10	Cooling Towers	0.001	%	High efficiency drift eliminators and low TDS cooling water
FG LA LLC - LA Complex	LA-0364	01/06/2020, updated 08/09/2021	PM2.5	Cooling Towers	0.001	%	High efficiency drift eliminators and low TDS cooling water
Johns Manville at McPherson	KS-0040	12/03/2019, updated 08/25/2020	TPM	Cooling Towers	0.001	% drift rate	Drift rate control

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Northstar Bluescope Steel, LLC	OH-0381	09/27/2019, updated 08/09/2021	FPM	Contact Cooling Towers (P014)	8.7	tpy; 12-month rolling	use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Northstar Bluescope Steel, LLC	OH-0381	09/27/2019, updated 08/09/2021	FPM10	Contact Cooling Towers (P014)	6.95	tpy; 12-month rolling	use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Northstar Bluescope Steel, LLC	OH-0381	09/27/2019, updated 08/09/2021	FPM2.5	Contact Cooling Towers (P014)	0.02	tpy; 12-month rolling	use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Northstar Bluescope Steel, LLC	OH-0381	09/27/2019, updated 08/09/2021	FPM	Contact Cooling Towers - Melt Shop 2 (P027)	1.17	tpy; 12-month rolling	use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Northstar Bluescope Steel, LLC	OH-0381	09/27/2019, updated 08/09/2021	FPM10	Contact Cooling Towers - Melt Shop 2 (P027)	0.93	tpy; 12-month rolling	use of drift eliminator(s) designed to achieve a 0.003% drift rate; ii. maintenance of a total dissolved solids (TDS) content (for the 5 individual cooling towers) not to exceed the ppm in the circulating cooling water based on a rolling 12-month average as indicated in the table below: Cooling Tower - TDS (ppm) Meltshop Cooling Tower (501) - 800 Caster Non-Contact Cooling Tower (6 Cell) - 800 Caster Contact Cooling Tower (503) - 1100 Mill Contact Cooling Tower (505) - 2000 Laminar Flow Cooling Tower (506) - 1400
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	TPM	Cooling Tower No.1 (P80)	0.0005	%circulation drift	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	TPM	Cooling Tower No.1 (P80)	10000	gpm; hourly average	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	PM10	Cooling Tower No.1 (P80)	0.0005	%circulation drift	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	PM10	Cooling Tower No.1 (P80)	10000	gpm; hourly average	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	PM2.5	Cooling Tower No.1 (P80)	0.0005	%circulation drift	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	PM2.5	Cooling Tower No.1 (P80)	10000	gpm; hourly average	Drift eliminator, cooling additive control system that results in a total dissolved solids (TDS) concentration of not more than 3,000 ppm.
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	VOC	Cooling Tower No.1 (P80)	0.0005	%circulation drift	Leak Detection and Repair (LDSR) and drift eliminator
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	VOC	Cooling Tower No.1 (P80)	10000	gpm; hourly average	Leak Detection and Repair (LDSR) and drift eliminator
Superior Refining Company LLC	WI-0311	09/27/2019, updated 09/16/2022	Visible Emissions	Cooling Tower No.1 (P80)	10	%OPAC	No BACT Specified
Sun Bio Material Company	AR-0161	09/23/2019, updated 05/05/2021	FPM	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Sun Bio Material Company	AR-0161	09/23/2019, updated 05/05/2021	PM10	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Sun Bio Material Company	AR-0161	09/23/2019, updated 05/05/2021	PM2.5	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Sun Bio Material Company	AR-0161	09/23/2019, updated 05/05/2021	Visible Emissions	Cooling Towers	0.0005	% Drift Loss	Drift Eliminators Low TDS
Equistar Chemicals Channelview Complex	TX-0864	09/09/2019, updated 11/12/2020	VOC	Cooling Tower	42	ppbw	indirect design
Equistar Chemicals Channelview Complex	TX-0864	09/09/2019, updated 11/12/2020	TPM	Cooling Tower	6000	ppmw	drift eliminators
Equistar Chemicals Channelview Complex	TX-0864	09/09/2019, updated 11/12/2020	PM10	Cooling Tower	6000	ppmw	drift eliminators
Equistar Chemicals Channelview Complex	TX-0864	09/09/2019, updated 11/12/2020	PM2.5	Cooling Tower	6000	ppmw	drift eliminators
The Dow Chemical Company - Polyethylene 7 Facility	TX-0863	09/03/2019, updated 11/12/2020	VOC	Cooling Tower	No Numeric Limit	No Numeric Limit	Monthly monitoring cooling water for VOC content
The Dow Chemical Company - Polyethylene 7 Facility	TX-0863	09/03/2019, updated 11/12/2020	PM10	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift Eliminator
The Dow Chemical Company - Polyethylene 7 Facility	TX-0863	09/03/2019, updated 11/12/2020	PM2.5	Cooling Tower	No Numeric Limit	No Numeric Limit	Drift Eliminator
Buckeye Texas Processing, LLC - Corpus Christi Facility	TX-0861	08/29/2019, updated 11/12/2020	VOC	Cooling Tower	0.08	ppmw	no contact design
CHS Oilseed Processing - Fairmont	MN-0094	08/22/2019, updated 03/24/2020	TPM	Cooling Towers	0.005	% drift loss	No BACT Specified
CHS Oilseed Processing - Fairmont	MN-0094	08/22/2019, updated 03/24/2020	TPM	Cooling Towers	1800	ppmw; monthly test	No BACT Specified
GCGV Assest Holding LLC - Gulf Coast Growth Ventures Project	TX-0858	06/12/2019, updated 11/12/2020	VOC	Cooling Tower	0.4	ppmw	weekly sampling of cooling water for strippable VOC. Corrective action must be taken if total strippable hydrocarbon content of the cooling water exceeds 0.08 ppmw equivalent, and delay of repair procedures cannot be used if the strippable hydrocarbon content exceeds 0.8 ppmw. Additionally, the permit specifies that a cooling water concentration qualifying as a leak under MACT XX is also a leak for purposes of permit compliance
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	TPM	Cooling tower EU-6001	2395	mg/L; tds in circulating water	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	TPM	Cooling tower EU-6001	0.0005	%drift	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	PM10	Cooling tower EU-6001	2395	mg/L; tds in circulating water	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	PM10	Cooling tower EU-6001	0.0005	%drift	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	PM2.5	Cooling tower EU-6001	2395	mg/L; tds in circulating water	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	PM2.5	Cooling tower EU-6001	0.0005	%drift	drift eliminator
Riverview Energy Corporation	IN-0317	06/11/2019, updated 05/26/2021	VOC	Cooling tower EU-6001	1.34	lb/hr	No BACT Specified
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	FPM	Cooling Tower (Reheat #1 Cooling Tower)	0.0025	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM10	Cooling Tower (Reheat #1 Cooling Tower)	0.0023	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM2.5	Cooling Tower (Reheat #1 Cooling Tower)	0.0001	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	FPM	Cooling Tower (Reheat #2 Cooling Tower)	0.0032	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM10	Cooling Tower (Reheat #2 Cooling Tower)	0.0028	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM2.5	Cooling Tower (Reheat #2 Cooling Tower)	0	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	FPM	Cooling Tower (Rod Line Cooling Tower)	0.0026	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM10	Cooling Tower (Rod Line Cooling Tower)	0.0025	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Nucor Corporation - Darlington Plant	SC-0196	04/29/2019, updated 05/13/2020	PM2.5	Cooling Tower (Rod Line Cooling Tower)	0.0001	lb/hr; 3 hour average	Proper equipment design, operation, and maintenance.
Big Lake Fuels LLC - Methanol Plant	LA-0382	04/25/2019, updated 03/04/2022	PM10	Cooling Towers (EQT0033, EQT0046, EQT0047)	0.0005	%	High efficiency mist eliminators
Cronus Chemicals, LLC	IL-0134	12/21/2023, updated 02.26.2025	PM10	Cooling Tower	0.0005	% - drift rate	High efficiency drift eliminators
Cronus Chemicals, LLC	IL-0134	12/21/2023, updated 02.26.2025	PM10	Cooling Tower	2000	PPM	High efficiency drift eliminators
Cronus Chemicals, LLC	IL-0134	12/21/2023, updated 02.26.2025	PM2.5	Cooling Tower	0.0005	% - drift rate	High efficiency drift eliminators
Cronus Chemicals, LLC	IL-0134	12/21/2023, updated 02.26.2025	PM2.5	Cooling Tower	2000	PPM	High efficiency drift eliminators
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 08/16/2022	PM10	ten cell evaporative cooling tower EU-010	2000	mg/L	Unspecified
Midwest Fertilizer Company LLC	IN-0324	5/6/2022, updated 08/16/2022	PM2.5	ten cell evaporative cooling tower EU-010	2000	mg/L	Unspecified
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM10	Cooling Towers #1 & #2 (P010 & P011)	0.3	lb/hr	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM10	Cooling Towers #1 & #2 (P010 & P011)	1.3	tpy	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Cooling Tower" - All Results Included
Unit 40 - Cooling Tower

Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM2.5	Cooling Towers #1 & #2 (P010 & P011)	0.0018	lb/hr	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM2.5	Cooling Towers #1 & #2 (P010 & P011)	0.01	tpy	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	Visible Emissions (VE)	Cooling Towers #1 & #2 (P010 & P011)	10	% - opacity as a 6 minute average	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM10	Wastewater Treatment Plant Cooling Water Tower (P012)	5	X10-4 LB/H	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	PM10	Wastewater Treatment Plant Cooling Water Tower (P012)	2.1	X10-3 T/YR	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)
Pallas Nitrogen LLC	OH-0368	04/19/2017, updated 06/19/2019	Visible Emissions (VE)	Wastewater Treatment Plant Cooling Water Tower (P012)	10	% - opacity as a 6 minute average	drift eliminators with a maximum drift rate specification of 0.0005 percent or less and total dissolved solids (TDS) concentration of the cooling water less than or equal to 5,000 milligrams per liter (mg/l)

Notes:
Highlighted entries are for fertilizer facilities.

RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018 updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Cooling Tower	0.0010	Weight %	Drift Eliminator (BACT-PSD) 4500.00 gallons/minute throughput
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018 updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Cooling Tower	4000	total dissolved solid	Drift Eliminator (BACT-PSD) 4500.00 gallons/minute throughput
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018 updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Cooling Tower	0.79	tpy 12-month rolling basis	Permit Limit
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	FPM	EU-COOLTOWER (Cooling Tower)	0.39	tpy 12-month rolling basis	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP) 1500.00 gallons/minute throughput
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM10	EU-COOLTOWER (Cooling Tower)	0.39	tpy 12-month rolling basis	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP)
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM2.5	EU-COOLTOWER (Cooling Tower)	0.39	tpy 12-month rolling basis	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP)
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	FPM	EU-COOLTOWER (Cooling Tower)	2200	PPM by weight monthly	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP)
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM10	EU-COOLTOWER (Cooling Tower)	2200	PPM by weight monthly	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP)
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM2.5	EU-COOLTOWER (Cooling Tower)	2200	PPM by weight monthly	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP)
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	FPM	EU-COOLTOWER (Cooling Tower)	0.005	% drift rate or less	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP) Vendor certification of drift rate required
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM10	EU-COOLTOWER (Cooling Tower)	0.005	% drift rate or less	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP) Vendor certification of drift rate required
Knauf Insulation, Inc. - Albion Facility	MI-0437	10/10/2018 updated 2/19/2019	TPM2.5	EU-COOLTOWER (Cooling Tower)	0.005	% drift rate or less	Drift Eliminator (99.0 % efficient) (BACT-PSD-SIP) Vendor certification of drift rate required
Premcor Refining Group - Valero Port Arthur Refinery	TX-0847 (draft)	9/16/2018 updated 2/14/2019	VOC	Cooling Tower/Heat Exchange System	0.08	PPMW	Noncontact (BACT-PSD)
Premcor Refining Group - Valero Port Arthur Refinery	TX-0847 (draft)	9/16/2018 updated 2/14/2019	TPM10	Cooling Tower/Heat Exchange System	0.001	% drift rate or less	Drift Eliminators (BACT-PSD)
Premcor Refining Group - Valero Port Arthur Refinery	TX-0847 (draft)	9/16/2018 updated 2/14/2019	TPM2.5	Cooling Tower/Heat Exchange System	0.001	% drift rate or less	Drift Eliminators (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	FPM	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	4.03	lb/hr hourly	High Efficiency Drift/Mist Eliminators (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	FPM	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	FPM	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM10	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	0.48	lb/hr	High Efficiency Drift/Mist Eliminators (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM10	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM10	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM2.5	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	0.48	lb/hr	High Efficiency Drift/Mist Eliminators (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM2.5	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018 updated 2/19/2019	TPM2.5	EUCOOLINGTWR: Cooling Tower (14 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Dow Chemical - LHC-9	TX-0841	7/1/2018 updated 2/19/2019	FPM	Cooling Tower/Heat Exchange System	0.005	% efficiency	Drift Eliminators (BACT-PSD)
Dow Chemical - LHC-9	TX-0841	7/1/2018 updated 2/19/2019	TPM10	Cooling Tower/Heat Exchange System	0.005	% efficiency	Drift Eliminators (BACT-PSD)
Dow Chemical - LHC-9	TX-0841	7/1/2018 updated 2/19/2019	TPM2.5	Cooling Tower/Heat Exchange System	0.005	% efficiency	Drift Eliminators (BACT-PSD)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	5.59	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	2.85	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	2.85	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (North Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	5.59	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	FPM	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	2.85	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM10	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TDS by weight monthly	Permit Limit
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	2.85	tpy 12-month rolling basis	High Efficiency Drift/Mist Eliminators (BACT-PSD) (170,000 gal/min)
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	0.0005	% drift rate or less	High Efficiency Drift/Mist Eliminators (BACT-PSD) Vendor certification of drift rate required
Marshall Energy Center LLC MEC North, LLC and MEC South LLC	MI-0433	6/29/2018 updated 2/19/2019	TPM2.5	EUCOOLTOWER (South Plant): Cooling Tower (8 cell wet mechanical draft cooling tower)	3000	PPM TSD by weight monthly	High Efficiency Drift/Mist Eliminators (Permit) (170,000 gal/min)
Shintech Louisiana, LLC - Plaquemines Plant 1	LA-0328	5/2/2018 updated 2/19/2019	TPM10	Cooling Tower 2 (P-35)	0.0005	% drift rate or less	Drift Eliminator (BACT-PSD, OPERATING PERMIT) (26,000 gal/min)
Shintech Louisiana, LLC - Plaquemines Plant 1	LA-0328	5/2/2018 updated 2/19/2019	TPM2.5	Cooling Tower 2 (P-35)	0.0005	% drift rate or less	Drift Eliminator (BACT-PSD, OPERATING PERMIT) (26,000 gal/min)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018 updated 11/16/2018(draft)		Cooling Tower	6250	mg/l TSD - monthly water quality testing	This is pollution prevention measure. No Controls Feasible (SIP)
Entergy Texas Inc - Montgomery County Power Station	TX-0834	3/30/2018 updated 2/19/2019	TPM	Cooling Tower	0.005	% efficiency	Drift Eliminators (BACT-PSD)(9,864,000 gal/hr)
Entergy Texas Inc - Montgomery County Power Station	TX-0834	3/30/2018 updated 2/19/2019	TPM10	Cooling Tower	0.005	% efficiency	Drift Eliminators (BACT-PSD)(9,864,000 gal/hr)
Entergy Texas Inc - Montgomery County Power Station	TX-0834	3/30/2018 updated 2/19/2019	TPM2.5	Cooling Tower	0.005	% efficiency	Drift Eliminators (BACT-PSD)(9,864,000 gal/hr)
Exxonmobil Oil Corporation - Exxonmobile Beaumont Refinery	TX-0832	1/9/2018 updated 2/19/2019	TPM	Cooling Towers	0.005	% efficiency	Drift Eliminator (BACT-PSD, NSPS Ja, MACT CC)
Exxonmobil Oil Corporation - Exxonmobile Beaumont Refinery	TX-0832	1/9/2018 updated 2/19/2019	TPM10	Cooling Towers	0.005	% efficiency	Drift Eliminator (BACT-PSD, NSPS Ja, MACT CC)
Exxonmobil Oil Corporation - Exxonmobile Beaumont Refinery	TX-0832	1/9/2018 updated 2/19/2019	TPM2.5	Cooling Towers	0.005	% efficiency	Drift Eliminator (BACT-PSD, NSPS Ja, MACT CC)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	FPM	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	0.0006	% max drift rate (vendor certified)	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	FPM	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	7700	PPM TDS by weight	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	TPM10	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	0.0006	% max drift rate (vendor certified)	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	TPM10	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	7700	PPM TDS by weight	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	TPM2.5	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	0.0006	% max drift rate (vendor certified)	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017 updated 3/8/2018	TPM2.5	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	7700	PPM TDS by weight	BACT is to equip and maintain four-cell evaporative cooling tower in series with mechanical chilling to cool turbine inlet air with high efficiency drift eliminators.
Kimberly-Clark Corporation - Mobile Operations - Kimberly-Clark Mobile	AL-0321	10/11/2017 updated 5/11/2018	FPM10	803 Cooling Tower	0.005	% drift elimination	No Controls Feasible
Kimberly-Clark Corporation - Mobile Operations - Kimberly-Clark Mobile	AL-0321	10/11/2017 updated 5/11/2018	FPM10	803 Cooling Tower	1000	mg/L TDS 12 month avg	No Controls Feasible
Kimberly-Clark Corporation - Mobile Operations - Kimberly-Clark Mobile	AL-0321	10/11/2017 updated 5/11/2018	FPM2.5	803 Cooling Tower	0.005	% drift elimination	No Controls Feasible

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Cooling Tower" - All Results Included
Unit 40 - Cooling Tower

Kimberly-Clark Corporation - Mobile Operations - Kimberly-Clark Mobile	AL-0321	10/11/2017 updated 5/11/2018	FPM2.5	803 Cooling Tower	1000	mg/L TDS 12 month avg	No Controls Feasible
Knauf Insulation, Inc. - Inwood	WV-0027	9/15/2017 updated 5/1/2018	TPM	Cooling Tower 3 Cells	0.04	lb/hr 3-hour avg	0.005% drift eliminator - Restrict the make-up water to be provided from the local water company or have a TDS of less than 750 ppm by weight. 3 mechanical draft cooling towers.
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM	Eighteen Cell Cooling Tower (EU-010)	2000	mg/l avg on a monthly basis	High Efficiency Drift Eliminator
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM	Eighteen Cell Cooling Tower (EU-010)	0.0005	% Drift	High Efficiency Drift Eliminator
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM10	Eighteen Cell Cooling Tower (EU-010)	2000	mg/l avg on a monthly basis	High Efficiency Drift Eliminator
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM10	Eighteen Cell Cooling Tower (EU-010)	0.0005	% Drift	High Efficiency Drift Eliminator
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM2.5	Eighteen Cell Cooling Tower (EU-010)	2000	mg/l avg on a monthly basis	High Efficiency Drift Eliminator
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft)	PM2.5	Eighteen Cell Cooling Tower (EU-010)	0.0005	% Drift	High Efficiency Drift Eliminator
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Cooling Tower CT-16-1 (EQT032)	0.001	lbs/hr	High Efficiency Drift Eliminator
Topchem Pollock, LLC	LA-0306	12/20/2016, updated 8/8/17	PM2.5	Cooling Tower CT-16-1 (EQT032)	0.01	tons/year	High Efficiency Drift Eliminator
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM10	Cooling Towers	0.0005	% three one-hour test average	Drift Eliminators (Unit A = 241,843 gpm Unit B = 201,196 gpm Unit C = 72,531 gpm)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM2.5	Cooling Towers		% three one-hour test average	Drift Eliminators (Unit A = 241,843 gpm Unit B = 201,196 gpm Unit C = 72,531 gpm)
Lyondell Chemical Bayport Choate Plant	TX-0823 (draft)	6/7/17 draft, 8/7/17 update	VOC	Cooling Towers	4.05	tpy	VOC leak detection system to identify leaks into the cooling water (LAER) (products and byproducts throughput)
Total Petrochemicals & Refining USA, Inc.	TX-0815 (draft)	1/17/17 draft, 1/26/17 update	VOC	Cooling Towers	27.95	tpy	coolint water VOC concentration (non-contact) (MACT XX) (no additional notes)
Total Petrochemicals & Refining USA, Inc.	TX-0815 (draft)	1/17/17 draft, 1/26/17 update	PM10	Cooling Towers	No numerical limit	No numerical limit	Drift Eliminators (99.999% efficiency)
Methanex - Geismar Methanol Plant	LA-0317	12/22/16, 4/28/17 update	PM10	Cooling Towers (I-CT-621, II-CT-621)	0.001	% Drift Rate	Drift Eliminators (66000 gpm throughput)
Methanex - Geismar Methanol Plant	LA-0317	12/22/16, 4/28/17 update	PM2.5	Cooling Towers (I-CT-621, II-CT-621)	0.001	% Drift Rate	Drift Eliminators (66000 gpm throughput)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/16 draft, 7/31/17 update	TPM10	EUCOOLTWR (Cooling Tower--Wet Mechanical Draft)	2.37	tpy 12-month rolling time period	Mist/Drift Eliminators (SIP) (A three-cell wet mechanical draft cooling tower with plume abatement by a dry heat exchanger.)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/16 draft, 7/31/17 update	TPM10	EUCOOLTWR (Cooling Tower--Wet Mechanical Draft)	0.005	% Drift Rate	Mist/Drift Eliminators (SIP) (A three-cell wet mechanical draft cooling tower with plume abatement by a dry heat exchanger.)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/16 draft, 7/31/17 update	TPM2.5	EUCOOLTWR (Cooling Tower--Wet Mechanical Draft)	2.37	tpy 12-month rolling time period	Mist/Drift Eliminators (SIP) (A three-cell wet mechanical draft cooling tower with plume abatement by a dry heat exchanger.)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/16 draft, 7/31/17 update	TPM2.5	EUCOOLTWR (Cooling Tower--Wet Mechanical Draft)	0.005	% Drift Rate	Mist/Drift Eliminators (SIP) (A three-cell wet mechanical draft cooling tower with plume abatement by a dry heat exchanger.)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	FPM	Hot Mill Contact Cooling Tower	0.001	% Drift Rate	Drift Eliminators (25000 gpm throughput)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	FPM	Hot Mill Contact Cooling Tower	0.38	lb/hr	Drift Eliminators (25000 gpm throughput)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	TPM10	Hot Mill Contact Cooling Tower	0.001	% Drift Rate	Drift Eliminators (25000 gpm throughput)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	TPM10	Hot Mill Contact Cooling Tower	0.19	lb/hr	Drift Eliminators (25000 gpm throughput)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	TPM2.5	Hot Mill Contact Cooling Tower	0.001	% Drift Rate	Drift Eliminators (25000 gpm throughput)
Nucor Steel	IN-0255	9/21/16, 10/11/16 update	TPM2.5	Hot Mill Contact Cooling Tower	0.001	lb/hr	Drift Eliminators (25000 gpm throughput)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM	Cooling Tower	0.8	lb/hr	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM	Cooling Tower	3.4	tpy 12-month rolling basis	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM10	Cooling Tower	0.8	lb/hr	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM10	Cooling Tower	3.4	tpy	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM2.5	Cooling Tower	0.4	lb/hr	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
CPV Fairview Energy Center	PA-0310 (draft)	9/2/16 draft, 7/31/17 update	TPM2.5	Cooling Tower	1.8	tpy	NSPS (12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. Permittee shall sample, analyze, and record the circulating water TDS on a monthly basis. TDS solids shall not exceed 1500 ppm.)
Sasol Chemicals - Comonimer-1 Unit	LA-0277	9/1/16, 4/28/17 update	VOC	Cooling Tower Y12-800			NESHAP - Comply with requirements of 40 CFR 63.104 (15200 gpm)
Sasol Chemicals -Lake Charles Chemical Complex - Comonimer-1 Unit	LA-0319	9/1/16, 4/28/17 update	VOC	cooling tower y12-800			NESHAP - Comply with requirements of 40 CFR 63.104
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM10	SCPS Cooling Tower 1	1.24	lb/hr hourly maximum	High Efficiency Drift Eliminators (164400 gpm)
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM10	SCPS Cooling Tower 1	3.61	tpy annual maximum	High Efficiency Drift Eliminators (164400 gpm)
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM10	SCPS Cooling Tower 1	0.005	% Drift Rate	BACT - High Efficiency Drift Eliminators (164400 gpm)
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM2.5	SCPS Cooling Tower 1	1.24	lb/hr hourly maximum	High Efficiency Drift Eliminators (164400 gpm)
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM2.5	SCPS Cooling Tower 1	3.61	tpy annual maximum	High Efficiency Drift Eliminators (164400 gpm)
Entergy Louisiana, LLC - St. Charles Power Station	LA-0313	8/31/16, 4/28/17 update	FPM2.5	SCPS Cooling Tower 1	0.005	% Drift Rate	BACT - High Efficiency Drift Eliminators (164400 gpm)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM10	cooling towers - 007	0.005	% Drift Rate	Drift Eliminators (86500 gpm)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM10	cooling towers - 007	1400	PPM TDS	Drift Eliminators (86500 gpm)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM2.5	cooling towers - 007	0.005	% Drift Rate	Drift Eliminators (86500 gpm)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM2.5	cooling towers - 007	1400	PPM TDS	Drift Eliminators (86500 gpm)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	VOC	cooling towers - 007	No numeric limit		NESHAP - monitored as required by 40 CFR 63 subpart XX (86500 gpm)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	FPM	Cooling Tower	0.685	lb/hr	BACT, NSPS - High Efficiency Drift Eliminators (One 8-cell, 124,800 gallon per minute (GPM) Mechanical Induced Draft Cooling Tower)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	FPM10	Cooling Tower	0.535	lb/hr	BACT - High Efficiency Drift Eliminators (One 8-cell, 124,800 gallon per minute (GPM) Mechanical Induced Draft Cooling Tower)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	FPM2.5	Cooling Tower	0.223	lb/hr	BACT - High Efficiency Drift Eliminators (One 8-cell, 124,800 gallon per minute (GPM) Mechanical Induced Draft Cooling Tower)
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/16, 9/19/16 update	VOC	CGP Unit Cooling Tower (3-03, EQT 15)	0.13	lb/hr hourly maximum	BACT - Monthly hydrocarbon monitoring; maintain equipment to minimize fugitive emissions; repair faulty equipment at the earliest opportunity, but no later than the next scheduled unit shutdown (Annual VOC emissions from the CGP Unit Cooling Tower, along with VOC emissions from a number of other cooling towers not addressed in the PSD permit, are capped at 12.29 TPY (GRP 13). (3000 GPM)
Flint Hills Resources Houston Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16 draft, 8/31/16 update	TPM10	Cooling Tower	0.001	% Drift Rate	BACT - Drift Eliminators
Flint Hills Resources Houston Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16 draft, 8/31/16 update	TPM2.5	Cooling Tower	0.001	% Drift Rate	BACT - Drift Eliminators
Flint Hills Resources Houston Chemical LLC - PL Propylene Houston Olefins Plant	TX-0801 (draft)	6/24/16 draft, 7/20/16 update	CO2e	Cooling Tower	0.005	Drift	BACT - % drift design
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	03/09/2016	TPM	Mechanical draft cooling tower	0.0005	% Drift Rate	BACT (Must have certified drift rate no more than 0.0005%)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/16, 7/7/16 update	TPM10	Cooling Towers	0.001	% Drift Rate	BACT - Drift Eliminators (For this analysis, as a simplifying conservative assumption, all of the particulate resulting from the drift is considered to be PM10.Throughput Capacity/Size deemed "Confidential" by applicant.) (The only feasible option at this location is a wet cooling tower with high efficiency drift eliminators (0.001%). The emission rate is somewhat higher than many cooling towers, but the sizes proposed are very much smaller than the cooling towers that are installed at power plants, refineries, etc.)
Flopam, Inc. - Flopam Facility	LA-0318	1/7/16, 4/28/17 update	TPM10	Cooling Towers	No numeric limit		Integrated Drift Eliminators (PSD-LA-747 entered as LA-0240 and PSD-LA-747(M1) entered as LA-0251. LA-0318 is for PSD-747(M2), dated 7/5/12 (add dust collectors, cooling tower, and diesel engines), PSD-747(M3), dated 5/13/13 (no BACT changes), PSD-747(M4), dated 2/10/15 (add a cooling tower and diesel engines), and PSD-747(M5), dated 1/7/16 (add dust collectors))

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Cooling Tower" - All Results Included
Unit 40 - Cooling Tower

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Cooling Towers	0.0005	% Drift	Drift Eliminator
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Cooling Tower	0.0005	% Drift	Drift Eliminator
Ohio Valley Resources, LLC	TBD	9/26/2013	PM	Cooling Towers	0.0005	% Drift	High Efficiency Drift Eliminator
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Cooling Tower	0.0005	% of total circ flow	Drift/Mist Eliminators
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Cooling Tower	1.5	lbs/hr	Drift/Mist Eliminators
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	Cooling Tower	20%	Reduction	Drift/Mist Eliminators
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Cooling Towers	0.0005	% Drift	Drift Eliminator
Consolidated Environmental Management Inc. - Nucor Direct Reduction Iron Plant	LA-0248	1/27/2011	PM10	Process Water Cooling Tower	0.11	lbs/hr	BACT is a combination of less than or equal to 1000 milligrams per liter TDS concentration in the culling water and drift eliminators employing a drift maximum of 0.0005%
Consolidated Environmental Management Inc. - Nucor Direct Reduction Iron Plant	LA-0248	1/27/2011	PM10	Process Water Cooling Tower	0.4	tons/year	BACT is a combination of less than or equal to 1000 milligrams per liter TDS concentration in the culling water and drift eliminators employing a drift maximum of 0.0005%
Consolidated Environmental Management Inc. - Nucor Direct Reduction Iron Plant	LA-0248	1/27/2011	PM10	Clean Water Cooling Tower	0.07	lbs/hr	BACT is a combination of less than or equal to 1000 milligrams per liter TDS concentration in the culling water and drift eliminators employing a drift maximum of 0.0005%
Consolidated Environmental Management Inc. - Nucor Direct Reduction Iron Plant	LA-0248	1/27/2011	PM10	Clean Water Cooling Tower	0.29	tons/year	BACT is a combination of less than or equal to 1000 milligrams per liter TDS concentration in the culling water and drift eliminators employing a drift maximum of 0.0005%
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM10	Cooling Tower	0.0005	% Drift annual average	High Efficiency Mist Eliminator
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM10	Chiller Cooling Tower	0.001	% Drift annual average	High Efficiency Mist Eliminator
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Cooling Tower	0.0005	% Drift	Drift Eliminator
Koch Nitrogen Company Enid Nitrogen Plant	OK-0124	5/1/2008	PM10	Cooling Tower	No numeric limit		High Efficiency Drift Eliminator
Ohio Valley Resources, LLC	TBD	9/26/2013	PM10	Cooling Towers	0.0005	% Drift	High Efficiency Drift Eliminator
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	Cooling Tower	0.0005	% of total circ flow	Drift/Mist Eliminators
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	Cooling Tower	1.5	lbs/hr	Drift/Mist Eliminators
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Cooling Towers	0.0005	% Drift	Drift Eliminator
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM2.5	Cooling Tower	0.0005	% Drift annual average	High Efficiency Mist Eliminator
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM2.5	Chiller Cooling Tower	0.001	% Drift annual average	High Efficiency Mist Eliminator
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Cooling Tower	0.0005	% Drift	Drift Eliminator
Ohio Valley Resources, LLC	TBD	9/26/2013	PM2.5	Cooling Towers	0.0005	% Drift	High Efficiency Drift Eliminator
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emission	Cooling Towers	0	%	Drift Eliminator
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emission	Cooling Tower	0	% Opacity	Drift Eliminator
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Cooling Towers	No numeric limit		limit the amount of VOC in treatment chemicals and a drift eliminator

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "MDEA", "methyl","urea","42.009","61.999" - All Results
UF-85 Tanks

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
No New Results							

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
No New Results							

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Toyota Motors - Motor Vehicle Assembly Plant	TX-0846	9/23/2018(draft)	VOC	Storage Tanks – Very Low Vapor Pressure Non Gasoline Automotive Fluids – Gear Lube, Engine Oil, Diesel fuel, Urea, ATF Etc. <20,000 gal each	0		P2: White fixed roof storage tanks equipped with a submerged fill pipe. use of drain dry construction is required to minimize the emissions from tank entry and inspection.
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	MDEA Storage Tank	0.1	tons/year rolling 12 month total	Nitrogen Gas Blanket
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Urea uf-85 Storage Tank	0.046	lb/hr average of 3 stack tests	packed bed scrubber

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "MDEA", "methyl","42.009","61.999" - All Results
MDEA Storage Tank

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
No New Results							

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
No New Results							

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Methyl-diethanol Amine (MDEA) Storage Tank	0.1	tons/year rolling 12 month total	Nitrogen Gas Blanket
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	MDEA Storage Tank	0.1	tons/year rolling 12 month total	Nitrogen Gas Blanket

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu).

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "Urea" - All Results Included
Unit 47 - Urea Loading
Unit 47a - Urea Transfer
Unit 47b - Urea Transfer

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Pallas Nitrogen LLC	OH-0368	3/1/2019, updated 06/19/2	FPM	Granulated Urea Transfer P	0.005	gr/dscf	bin vent filters

RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM	Truck and Rail Loading Operation (EU-021A)	0.15	lb/hr 3 hour average	Baghouse (4800 metric ton/day)
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM10	Truck and Rail Loading Operation (EU-021A)	0.15	lb/hr 3 hour average	Baghouse (4800 metric ton/day)
Midwest Fertilizer Company LLC	IN-0263	3/23/17 (draft)	PM2.5	Truck and Rail Loading Operation (EU-021A)	0.15	lb/hr 3 hour average	Baghouse (4800 metric ton/day)

RBLC Entries for October 2013 Application

CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Urea Loading	0.003	lb/ton average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Urea Loading	5.48	tpy rolling 12 month total	Bin Vent Filter
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Granulated Urea Transfer	0.005	gr/dscf average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Urea Loading	0.0011	lb/ton average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Urea Loading	2.01	tpy rolling 12 month total	Bin Vent Filter
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Granulated Urea Transfer	0.005	gr/dscf average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Urea Loading	0.0011	lb/ton average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Urea Loading	1.97	tpy rolling 12 month total	Bin Vent Filter
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Granulated Urea Transfer	0.0013	gr/dscf average of 3 stack tests	Bin Vent Filter
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emissions	Urea Loading	0	%	Bin Vent Filter
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Granulated Urea Transfer	0	% opacity	Bin Vent Filter

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers and heaters >100 MMBtu/hr Included
Unit 44 - Package Boiler
Unit 48 - Package Boiler
Unit 49 - Package Boiler

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Duke Energy Indiana, Inc. - Cayuga Generating Station	IN-0382	01/17/2024, updated 04/09/2025	CO	Auxiliary Boiler	0.037	lb/mmbtu; 3-hour average	good combustion practices
Duke Energy Indiana, Inc. - Cayuga Generating Station	IN-0382	01/17/2024, updated 04/09/2025	VOC	Auxiliary Boiler	0.005	lb/MMBtu	good combustion practices
Duke Energy Indiana, Inc. - Cayuga Generating Station	IN-0382	01/17/2024, updated 04/09/2025	TPM	Auxiliary Boiler	0.0019	lb/MMBtu; 3-hour average	good combustion practices and combusting pipeline-quality natural gas
Duke Energy Indiana, Inc. - Cayuga Generating Station	IN-0382	01/17/2024, updated 04/09/2025	CO2e	Auxiliary Boiler	115400	tons; per 12 month consecutive month p	good combustion practices
Wabash Valley Resouces, LLC	IN-0371	03/10/2022, updated 02/27/2025	NOx	Auxiliary Boiler (Unit 1C)	0.01	lb/MMBtu	Low NOx burner and SCR with good combustion practices
Wabash Valley Resouces, LLC	IN-0371	03/10/2022, updated 02/27/2025	NOx	Auxiliary Boiler (Unit 1C)	1183.5	MMcf; per 12 consecutive month period	Low NOx burner and SCR with good combustion practices
Wabash Valley Resouces, LLC	IN-0371	03/10/2022, updated 02/27/2025	CO2e	Auxiliary Boiler (Unit 1C)	117	lb/MMBtu	good combustion practices
Wabash Valley Resouces, LLC	IN-0371	03/10/2022, updated 02/27/2025	CO2e	Auxiliary Boiler (Unit 1C)	1183.5	MMcf; per 12 consecutive month period	good combustion practices
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	NOx	Boilers	0.01	lb/mmbtu; 3-hour average	LNB and SCR
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	NOx	Boilers	1.79	lb/hour, each; during startup or shutdowr	LNB and SCR
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	CO	Boilers	0.0013	lb/mmbtu; 3-hour average	oxidation catalysts, GCP and good burner design
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	CO	Boilers	0.23	lb/hour, each; during startup or shutdowr	oxidation catalysts, GCP and good burner design
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	VOC	Boilers	0.0014	lb/mmbtu; 3-hour average	oxidation catalysts, GCP and good burner design
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	PM10	Boilers	0.0019	lb/mmbtu; 3-hour average	GCP and good burner design
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	PM2.5	Boilers	0.001	lb/mmbtu; 3-hour average	GCP and good burner design
Cronous Chemicals, LLC	IL-0134	03/06/2020, updated 02/26/2025	CO2e	Boilers	No Numeric Limit	No Numeric Limit	No BACT specified
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	VOC	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	2.89	tpy; 12 month rolling	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	VOC	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.0054	lb/MMBtu	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	TPM	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.27	tpy; 12 month rolling	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	TPM	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.0005	lb/MMBtu	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	PM10	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.27	tpy; 12 month rolling	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	PM10	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.0005	lb/MMBtu	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	PM2.5	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.23	tpy; 12 month rolling	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	PM2.5	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	0.0004	lb/MMBtu	use of low-carbon natural gas fuel, good combustion practice
Valencia, LLC	OH-0391	02/06/2023, updated 03/05/2025	CO2e	Boilers #1 and #2 - 122 MMBtu/hr (B001 and B002)	62441	tpy; 12 month rolling	use of low-carbon natural gas fuel, good combustion practice
Oklaunion Industrial Park LLC	TX-0941	08/15/2022, updated 04/25/2023	VOC	Boiler	0.004	lb/MMBtu	good combustion practices, clean fuel
Oklaunion Industrial Park LLC	TX-0941	08/15/2022, updated 04/25/2023	CO	Boiler	50	ppmvd; 3% O2	Good combustion practices. CEMS installed to monitor emissions and ensure good combustion.
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	PM10	natural gas-fired auxiliary boilers EU 012A and EU 012B	7.6	lb/MMcf	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	PM10	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	PM2.5	natural gas-fired auxiliary boilers EU 012A and EU 012B	7.6	lb/MMcf	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	PM2.5	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	NOx	natural gas-fired auxiliary boilers EU 012A and EU 012B	20.4	lb/MMcf	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	NOx	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	CO	natural gas-fired auxiliary boilers EU 012A and EU 012B	37.22	lb/MMcf; 3-hour average	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	CO	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	VOC	natural gas-fired auxiliary boilers EU 012A and EU 012B	5.5	lb/MMcf	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	VOC	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	CO2e	natural gas-fired auxiliary boilers EU 012A and EU 012B	59.61	ton/MMcf	The natural gas-fired auxiliary boilers shall combust natural gas; shall be designed to achieve a minimum 80% thermal efficiency (HHV); shall be equipped with the following energy efficient design features: air inlet controls, heat recovery, condensate recovery, and blow down heat recovery
Midwest Fertilizer Company LLC	IN-0324	09/10/2021, updated 08/16/2022	CO2e	natural gas-fired auxiliary boilers EU 012A and EU 012B	1877.39	MMcf; per 12 consecutive month period	The natural gas-fired auxiliary boilers shall combust natural gas; shall be designed to achieve a minimum 80% thermal efficiency (HHV); shall be equipped with the following energy efficient design features: air inlet controls, heat recovery, condensate recovery, and blow down heat recovery
Indorama Ventures Olefins, LLC - Westlake Ethylene Plant	LA-0397	08/30/2021, updated 02/27/2025	NOx	Boilers (EQT0011, EQT0012, EQT0016)	0.01	lb/MMBtu	SCR + LNB + FGR
Ineos Styrolution America LLC - Texas City Chemical Plant	TX-0913	07/13/2021, updated 12/06/2022	PM2.5	Boilers	1.38	lb/hr/boiler	good combustion practices, natural gas
Ineos Styrolution America LLC - Texas City Chemical Plant	TX-0913	07/13/2021, updated 12/06/2022	CO	Boilers	50	ppmv, 3% O2	good combustion practices, natural gas
Ineos Styrolution America LLC - Texas City Chemical Plant	TX-0913	07/13/2021, updated 12/06/2022	CO2e	Boilers	No Numeric Limit	No Numeric Limit	good combustion practices, natural gas
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	PM10	Boiler D (EQT0482)	0.005	lb/MMBtu	Good combustion practices and use of natural gas during startup
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	PM2.5	Boiler D (EQT0482)	0.005	lb/MMBtu	Good combustion practices and use of natural gas during startup
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	VOC	Boiler D (EQT0482)	0.0026	lb/MMBtu	Good combustion practices
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	CO	Boiler D (EQT0482)	0.0362	lb/MMBtu	Good combustion practices
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	NOx	Boiler D (EQT0482)	0.01	lb/MMBtu	LNB + SCR Good combustion practices
Shintech Louisiana LLC - Plaquemine Plant 3	LA-0339	09/30/2020, updated 02/27/2025	CO2e	Boiler D (EQT0482)	No Numeric Limit	No Numeric Limit	Improved combustion measures; Insulation; Minimization of air infiltration; Reduced carbon feedstock and fuel
Shintech Louisiana LLC - Plaquemine Plant 1	LA-0352	08/30/2019, updated 08/06/2021	NOx	BP Steam Boiler Packages (EU-2/EU-2, EQT0266/EQT0267)	0.021	lb/MMBtu; 30 day rolling average	LNB + SCR and good combustion practices
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	CO	New Boiler	0.035	lb/MMBtu; 3-hour average	Ultra Low NOx Burners
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	NOx	New Boiler	0.04	lb/MMBtu; 30 day rolling average	Ultra Low NOx Burners
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	PM	New Boiler	0.0075	lb/MMBtu; 3-hour average	Ultra Low NOx Burners
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	PM10	New Boiler	0.0075	lb/MMBtu; 3-hour average	Ultra Low NOx Burners
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	PM2.5	New Boiler	0.0075	lb/MMBtu; 3-hour average	Ultra Low NOx Burners
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	SO2	New Boiler	162	ppmv; 3-hour average	low sulfur fuel gas
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	SO2	New Boiler	60	ppmv; 365-day rolling average	low sulfur fuel gas
Hollyfrontier El Dorado Refining LLC	KS-0041	04/29/2019, updated 03/27/2023	VOC	New Boiler	0.0015	lb/MMBtu; 3-hour rolling average	Ultra Low NOx Burners
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	NOx	Two (2) Auxiliary Boilers	0.011	lb/MMBtu; 3% O2	Low NOx burners
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	NOx	Two (2) Auxiliary Boilers	1	lb/hr	Low NOx burners
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	CO	Two (2) Auxiliary Boilers	0.037	lb/MMBtu	Pollution Prevention/Add-on Control Equipment Description: good combustion practices, operator training, and proper emissions unit design, construction and maintenance
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	CO	Two (2) Auxiliary Boilers	3.2	lb/hr	Pollution Prevention/Add-on Control Equipment Description: good combustion practices, operator training, and proper emissions unit design, construction and maintenance
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	PM10	Two (2) Auxiliary Boilers	0.6	lb/hr	Good combustion practices and the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	PM10	Two (2) Auxiliary Boilers	2.6	tpy; 12 month rolling	Good combustion practices and the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	PM2.5	Two (2) Auxiliary Boilers	0.6	lb/hr	Good combustion practices and the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	PM2.5	Two (2) Auxiliary Boilers	2.6	tpy; 12 month rolling	Good combustion practices and the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	SO2	Two (2) Auxiliary Boilers	0.0011	lb/MMBtu	the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	SO2	Two (2) Auxiliary Boilers	0.5	tpy; 12 month rolling	the use of pipeline quality natural gas with a maximum sulfur content of 0.4 gr/100 scf on a 12-month rolling average
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	VOC	Two (2) Auxiliary Boilers	0.5	lb/MMBtu	Pollution Prevention/Add-on Control Equipment Description: good combustion practices, operator training, and proper emissions unit design, construction and maintenance.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	VOC	Two (2) Auxiliary Boilers	1.9	tpy; 12 month rolling	Pollution Prevention/Add-on Control Equipment Description: good combustion practices, operator training, and proper emissions unit design, construction and maintenance.
Chicahominy Power LLC	VA-0332	11/05/2018, updated 05/19/2021	CO2e	Two (2) Auxiliary Boilers	43827	tpy; 12 month rolling	use of natural gas and high efficiency design and operation
ND Paper, INC. - Biron Division	WI-0268	01/09/2019, updated 06/19/2019	CO	Boiler B26 - Natural gas/biogas-fired boiler	0.044	lb/MMBtu	good combustion practices, use of natural gas and/or biogas
ND Paper, INC. - Biron Division	WI-0268	01/09/2019, updated 06/19/2019	VOC	Boiler B26 - Natural gas/biogas-fired boiler	0.0054	lb/MMBtu	Good combustion practices, Use only natural gas and/or biogas, low-Nox burners with flue gas recirculation
ND Paper, INC. - Biron Division	WI-0268	01/09/2019, updated 06/19/2019	CO2e	Boiler B26 - Natural gas/biogas-fired boiler	160	lb CO2e/1000 lb steam; 12-month avg	Good combustion practices, Use only natural gas and/or biogas, low-Nox burners with flue gas recirculation
Duke Energy Indiana, Inc. - Edwardsport Generating Station	IN-0287	12/22/2016, updated 03/07/2019	CO	Auxiliary Boiler	0.036	lb/MMBtu	good combustion practices
Duke Energy Indiana, Inc. - Edwardsport Generating Station	IN-0287	12/22/2016, updated 03/07/2019	VOC	Auxiliary Boiler	0.005	lb/MMBtu	good combustion practices
Duke Energy Indiana, Inc. - Edwardsport Generating Station	IN-0287	12/22/2016, updated 03/07/2019	TPM	Auxiliary Boiler	0.0075	lb/MMBtu	good combustion practices
Duke Energy Indiana, Inc. - Edwardsport Generating Station	IN-0287	12/22/2016, updated 03/07/2019	PM2.5	Auxiliary Boiler	0.0075	lb/MMBtu	good combustion practices
Duke Energy Indiana, Inc. - Edwardsport Generating Station	IN-0287	12/22/2016, updated 03/07/2019	PM10	Auxiliary Boiler	0.0075	lb/MMBtu	good combustion practices
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	3.7	lb/hr	low-NOx burners and flue gas recirculation
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	9.25	tpy; 12 month rolling	low-NOx burners and flue gas recirculation
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	0.02	lb/MMBtu	low-NOx burners and flue gas recirculation
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	CO	Auxiliary Boiler (B001)	10.18	lb/hr	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	CO	Auxiliary Boiler (B001)	25.45	tpy; 12 month rolling	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	CO	Auxiliary Boiler (B001)	0.055	lb/MMBtu	Gas combustion control

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers and heaters >100 MMBtu/hr Included
Unit 44 - Package Boiler
Unit 48 - Package Boiler
Unit 49 - Package Boiler

Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	0.93	lb/hr	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	2.33	tpy; 12 month rolling	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	0.005	lb/MMBtu	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	TPM	Auxiliary Boiler (B001)	1.3	lb/hr	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	TPM	Auxiliary Boiler (B001)	3.25	tpy; 12 month rolling	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	TPM	Auxiliary Boiler (B001)	0.007	lb/MMBtu	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	1.3	lb/hr	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	3.25	tpy; 12 month rolling	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	0.007	lb/MMBtu	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	1.3	lb/hr	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	3.25	tpy; 12 month rolling	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	0.007	lb/MMBtu	Gas combustion control
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	0.28	lb/hr	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	0.7	tpy; 12 month rolling	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	0.0015	lb/MMBtu	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	0.043	lb/hr	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	0.11	tpy; 12 month rolling	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	2.3	x 10-4 lb/MMBtu	Pipeline natural gas fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	CO2e	Auxiliary Boiler (B001)	54167	tpy; 12 month rolling	Natural gas, low-emitting fuel
Guernsey Power Station LLC	OH-0374	04/14/2017, updated 06/19/2019	Visible Emissions	Auxiliary Boiler (B001)	10	% opacity as a 6 minute average	Gas combustion control
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	VOC	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.5	tpy; 12 month rolling	Good combustion practices
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	NOx	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.011	lb/MMBtu	Ultra Low NOx Burners
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	SO2	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.011	lb/MMBtu	Low sulfur fuel
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	Sulfuric Acid	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.0001	lb/MMBtu	Pipeline quality natural gas
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	CO	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.035	lb/MMBtu	Clean fuel and good combustion practices
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	CO	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	6.6	lb/hr	Clean fuel and good combustion practices
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	PM10	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.007	lb/MMBtu	low sulfur/carbon fuel and good combustion practices
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	PM2.5	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	0.007	lb/MMBtu	low sulfur/carbon fuel and good combustion practices
Virginia Electric and Power Company - Greensville Power Station	VA-0325	02/10/2016, updated 06/19/2019	CO2e	AUXILIARY BOILER (1) AND FUEL GAS HEATERS (6)	117.1	lb/MMBtu	Natural gas and fuel and high efficiency design and operation

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	NOx	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.038	lb/MMBtu 3-hr average	Ultra Low NOx Burners and Good Combustion Practices (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	CO	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.082	lb/MMBtu 3-hr average	Exclusive Combustion of Fuel Gas and Good Combustion Practices (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	TPM10	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.0075	lb/MMBtu 3-hr average	Exclusive Combustion of Fuel Gas and Good Combustion Practices (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	TPM2.5	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.0075	lb/MMBtu 3-hr average	Exclusive Combustion of Fuel Gas and Good Combustion Practices (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	SO2	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.0006	lb/MMBtu 3-hr average	Exclusive Use of Low Sulfur Fuel Gas and Proper Engineering Practices (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	VOC	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	0.0054	lb/MMBtu 3-hr average	Proper Equipment Design and Operation, Good Combustion Practices, and Exclusive Combustion of Fuel Gas (BACT-PSD NSPS)
Venture Global Calcasieu Pass, LLC - Calcasieu Pass LNG Project	LA-0331 (draft)	9/21/2018, updated 2/19/2019	CO2e	Hot Oil Heaters (HOH1 to HOH6) (115 MMBtu/hr)	354456	tons/year	Exclusive Use of Low Carbon Fuel Gas, Good Combustion Practices, Good Operation and Mantenance Practices and Insulation (BACT Limit based on Annual Total for 6 Heaters. 40 CFR Subpart Dc) (BACT-PSD NSPS)
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	TPM (all PM is assumed to be PM2.5 or less)	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.008	lbs/MMBtu	Good combustion practices, use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	TPM (all PM is assumed to be PM2.5 or less)	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.87	lb/hr	Good combustion practices, use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	TPM (all PM is assumed to be PM2.5 or less)	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	1.99	tons/year	Good combustion practices at all times boilers are in operation, use of natural gas. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	Sulfuric Acid	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.0001	lbs/MMBtu	Use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	Sulfuric Acid	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.02	lb/hr	Use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	Sulfuric Acid	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.03	tons/year	Use of natural gas. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	NOx	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.011	lb/MMBtu	Low NOx burners and good combustion practices. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	NOx	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	1.23	lb/hour	Low NOx burners and good combustion practices.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	NOx	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	2.82	tons/year	Low NOx burners and good combustion practices.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	CO	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.037	lb/MMBtu	Good combustion practices at all times boilers are in operation, must only combust natural gas. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	CO	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	4.14	lb/hour	Good combustion practices.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	CO	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	9.47	tons/year	Good combustion practices, use of natural gas. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	VOC	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.008	lb/MMBtu	Good combustion practices, use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	VOC	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	0.9	lb/hour	Good combustion practices, use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	VOC	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	2.05	tons/year	Good combustion practices, use of natural gas. Annual emissions are based on 512,140 mmBtu/yr.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	CO2e	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	14768	lb/hour	Use of natural gas.
ESC Brooke County Power I, LLC	WV-0032 (draft)	9/18/2018 (draft) updated 1/2/2019	CO2e	Auxiliary Boiler (111.90 MMBtu/hr - Natural Gas/Ethane)	33790	tons/year	Use of natural gas. Annual emissions are based on 512,140 mmBtu/yr.
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	NOx	Auxiliary Boiler (902 mmcf/year)	0.011	lb/MMBtu corrected to 3% O2	Low NOx Burners (Annual limit of 5.1 tons/yr on a 12-month rolling total. Compliance based on stack test and annual fuel throughput) (BACT-PSD NSPS SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	NOx	Auxiliary Boiler (902 mmcf/year)	1.2	lb/hr	Low NOx Burners (Annual limit of 5.1 tons/yr on a 12-month rolling total. Compliance based on stack test and annual fuel throughput) (BACT-PSD NSPS SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	CO	Auxiliary Boiler (902 mmcf/year)	0.037	lb/MMBtu	Good Combustion Practices and Clean Fuel (Compliance based on stack test. Annual limit 17.1 tons/year base on fuel throughput.)(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	CO	Auxiliary Boiler (902 mmcf/year)	3.9	lb/hr	Good Combustion Practices and Clean Fuel (Compliance based on stack test. Annual limit 17.1 tons/year base on fuel throughput.)(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	TPM10	Auxiliary Boiler (902 mmcf/year)	0.8	lb/hr	Good Combustion Practices and the Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg.(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	TPM10	Auxiliary Boiler (902 mmcf/year)	3.3	tons/year 12-month rolling total	Good Combustion Practices and the Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg.(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	TPM2.5	Auxiliary Boiler (902 mmcf/year)	0.8	lb/hr	Good Combustion Practices and the Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg.(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	TPM2.5	Auxiliary Boiler (902 mmcf/year)	3.3	tons/year 12-month rolling total	Good Combustion Practices and the Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg.(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	SO2	Auxiliary Boiler (902 mmcf/year)	0.0012	lb/MMBtu	The Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg. (Compliance based on compliance with the fuel sulfur limit)(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	SO2	Auxiliary Boiler (902 mmcf/year)	0.6	tons/year 12-month rolling avg	The Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg. (Compliance based on compliance with the fuel sulfur limit)(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (902 mmcf/year)			The Use of Pipeline Quality Natural Gas with a Maximum Sulfur Content of 0.4 gr/100 scf on a 12-month rolling avg. (Compliance based on compliance with the fuel sulfur content)(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	VOC	Auxiliary Boiler (902 mmcf/year)	0.005	lb/MMBtu	Good Combustion Practices(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	VOC	Auxiliary Boiler (902 mmcf/year)	2.3	tons/year 12-month rolling avg	Good Combustion Practices(BACT-PSD SIP)
Novi Energy - C4GT, LLC	VA-0328 (draft)	4/26/2018, updated 11/16/2018	CO2e	Auxiliary Boiler (902 mmcf/year)	53863	tons/year 12-month rolling total	Use of Natural Gas and High Efficiency Design and Operation(BACT-PSD SIP)
Targa - Channel View Terminal	TX-0835	4/13/2018, updated 2/19/2019	VOC	Crude Process Heaters (100 MMBtu/hr)	0.0013	lb/MMBtu	Good Combustion (Note: Process Type says Refinery Flares) (LAER NSPS)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	CO	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	0.04	lb/MMBtu	Good Combustion Practices (Catalytic Reduction not economically feasible)(BACT-PSD SIP)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	NOx	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	0.04	lb/MMBtu 30 day rolling avg	LNB that incorporate intern (within the burner) FGR and Good Combustion Practices (70% control efficiency) (SCR not economically feasible)(BACT-PSD SIP)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	FPM	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	0.005	lb/MMBtu	Good Combustion Practices (Add-on controls not economically feasible)(BACT-PSD)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	TPM10	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	0.0075	lb/MMBtu	Good Combustion Practices (Add-on controls not economically feasible)(BACT-PSD)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	TPM2.5	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	0.0075	lb/MMBtu	Good Combustion Practices (Add-on controls not economically feasible)(BACT-PSD)
Filer City Station Limited Partnership - Filer City Station	MI-0427	11/17/2017, updated 3/8/2018	CO2e	EUAUXBOILER (Auxiliary Boiler) (182 MMBtu/hr)	93346	tons/year 12-month roll time period	Good Combustion Practices (Add-on controls not economically feasible)(BACT-PSD)
Praxiar Inc. - Praxiar Clear Lake	TX-0830	10/20/2017, updated 2/19/2019	CO	HyCO Heater (180 MMBtu/hr)	50	PPMVD@3% O2	The Use of gaseous fuel and good combustion practices (BACT-PSD NSPS)
Praxiar Inc. - Praxiar Clear Lake	TX-0830	10/20/2017, updated 2/19/2019	CO2e	HyCO Heater (180 MMBtu/hr)	1148305	tons/year	Annual tune ups. Emissions are based on a plantwide grouped limit(BACT-PSD NSPS)
Praxair Inc. - Praxair Clear Lake Plant	TX-0827	10/19/2017, updated 11/2/2017	CO	HyCO Heater (180 MMBtu/hr)	50	PPMVD@3% O2	The Use of gaseous fuel and good combustion practices(BACT-PSD NSPS)
Praxair Inc. - Praxair Clear Lake Plant	TX-0827	10/19/2017, updated 11/2/2017	CO2e	HyCO Heater (180 MMBtu/hr)	1148305	tons/year	Annual tune ups. Emissions are based on a plantwide grouped limit(BACT-PSD NSPS)
Agrium US, Inc	TX-0814	1/5/2017 (draft)	CO2e	Package Boiler 1 (240 MMBtu/hr)	123059	tpy	Good Engineering Practices
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	TPM	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1.9	lb/MMcf 3 hour average	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers and heaters >100 MMBtu/hr Included
Unit 44 - Package Boiler
Unit 48 - Package Boiler
Unit 49 - Package Boiler

Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	TPM	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM10	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	7.6	lb/MMcf 3 hour average	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM10	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM2.5	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	7.6	lb/MMcf 3 hour average	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	PM2.5	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Proper design and good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	NOx	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	20.4	lb/MMcf 3 hour average	Low NOx burners with flue gas recirculation and good combustion practices, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	NOx	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Low NOx burners with flue gas recirculation and good combustion practices, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	37.22	lb/MMcf 3 hour average	Good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	VOC	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	5.5	lb/MMcf 3 hour average	Good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	VOC	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO2	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	59.61	ton/MMcf 3 hour average	Good combustion practices at all times boilers are in operation, must only combust natural gas (218.6 MMBtu/hr)
Midwest Fertilizer Company LLC	IN-0263 (draft)	3/23/17 (draft), updated 7/10/17	CO2	Natural Gas Auxiliary Boilers (EU-012A, EU-012B, EU-012C)	1877.39	MMcf per 12 consecutive months	Good combustion practices at all times boilers are in operation, must only combust natural gas, shall be designed to achieve a minimum 80% thermal efficiency limit, each shall be equipped with the energy efficiency design features (1) air inlet controls, (2) heat recovery, (3) condensate recovery, (4) blow down heat recovery (218.6 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	CO	EUAUXBOILER (Auxiliary Boiler)	0.04	lb/MMBtu Test protocol will specify avg time	SIP - Good combustion practices (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	NOx	EUAUXBOILER (Auxiliary Boiler)	0.04	lb/MMBtu 30-day rolling avg time period	NSPS, SIP - Low NOx burners/Flue gas recirculation and good combustion practices. (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	FPM	EUAUXBOILER (Auxiliary Boiler)	0.005	lb/MMBtu Test protocol will specify avg time	Good combustion practices (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	TPM10	EUAUXBOILER (Auxiliary Boiler)	1.36	lb/hr hourly, test protocol	SIP - Good combustion practices (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	TPM2.5	EUAUXBOILER (Auxiliary Boiler)	1.36	lb/hr hourly, test protocol	Good combustion practices (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	VOC	EUAUXBOILER (Auxiliary Boiler)	0.004	lb/MMBtu Test protocol will specify avg time	Good combustion practices (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	SO2	EUAUXBOILER (Auxiliary Boiler)	0.6	lb/MMscf Based on Fuel Receipt Records	Good combustion practices and the use of pipeline quality natural gas (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	SO2	EUAUXBOILER (Auxiliary Boiler)	2000	gr/MMscf Based upon Fuel Receipts	NSPS, SIP - Good combustion practices and the use of pipeline quality natural gas.(2,000 grains of sulfur per MMscf. The natural gas material limit of 2,000 grains of sulfur per MMscf is what the emission factor is based upon) (182 MMBtu/hr)
Indeck Niles, LLC	MI-0423 (draft)	1/4/2017, 7/25/17 update	CO2e	EUAUXBOILER (Auxiliary Boiler)	93346	tpy 12-month rolling time period	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas). (182 MMBtu/hr)
Rextac, LLC - Odessa Petrochemical Plant	TX-0813 (draft)	11/22/2016, 12/1/16 update	VOC	Boilers	0.0005	lb/MMBtu	NSPS Db - Best combustion practices (2 boilers - 223 Mmbtu/hr)
Rextac, LLC - Odessa Petrochemical Plant	TX-0813 (draft)	11/22/2016, 12/1/16 update	CO2e	Boilers	63796	tpy	MACT DDDDD - Minimul thermal design efficiency of 75%
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM10	Auxiliary Boilers and Superheaters	No Numeric Limit	No Numeric Limit	Good engineering design and proper operation (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	PM2.5	Auxiliary Boilers and Superheaters	No Numeric Limit	No Numeric Limit	Good engineering design and proper operation (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	SO2	Auxiliary Boilers and Superheaters	No Numeric Limit	No Numeric Limit	Fuel gases and/or pipeline quality natural gas (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	NOx	Auxiliary Boilers and Superheaters	0.015	lbs/MMBtu 30 rolling avg, except SCR, SU or Maint	SCR (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO	Auxiliary Boilers and Superheaters	No Numeric Limit	No Numeric Limit	Good engineering design and good combustion practices (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Lake Charles Methanol, LLC	LA-0305	6/30/16, 4/26/17 update	CO2e	Auxiliary Boilers and Superheaters	No Numeric Limit	No Numeric Limit	Good equipment design and good combustion practices (Supplement fuel: fuel gas Boilers: 225 MM BTU/hr each)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	CO2e	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Good combustion/operating/maintenance practices and fueled by natural gas (171 MMBtu/hr)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	TPM10	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Good combustion practices (171 MMBtu/hr)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	TPM2.5	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Good combustion practices (171 MMBtu/hr)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	NOx	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Low NOx Burners (171 MMBtu/hr)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	CO	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Good combustion practices (171 MMBtu/hr)
Magnolia LNG Facility	LA-0307	3/21/16, 4/28/17 update	VOC	Auxiliary Boilers	No Numeric Limit	No Numeric Limit	Good combustion practices (171 MMBtu/hr)
Tennessee Valley Authority	TN-0162 (draft)	4/19/16, 5/19/16 update	TPM	Two Natural Gas-Fired Auxiliary Boilers	0.008	lb/MMBtu	Good combustion design and practices (450 MMBtu/hr each)
Tennessee Valley Authority	TN-0162 (draft)	4/19/16, 5/19/16 update	CO	Two Natural Gas-Fired Auxiliary Boilers	0.084	lb/MMBtu	Good combustion design and practices (450 MMBtu/hr each)
Tennessee Valley Authority	TN-0162 (draft)	4/19/16, 5/19/16 update	NOx	Two Natural Gas-Fired Auxiliary Boilers	0.013	lb/MMBtu	NSPS - Good combustion design and practices, SCR, low NOx burners with FGR (90% efficiency) (450 MMBtu/hr each)
Tennessee Valley Authority	TN-0162 (draft)	4/19/16, 5/19/16 update	CO2e	Two Natural Gas-Fired Auxiliary Boilers	117	lb/MMBtu	Efficient design (including insulation to reduce ambient heat loss), good combustion practices, good operating and maintenance practices (450 MMBtu/hr each)
Gravity Midstream Corpus Christi LLC - Crude Oil Processing Facility	TX-0182 (draft)	10/31/16,12/1/16 update	CO2e	Industrial Boilers and Furnaces (Natural Gas Fired)	54800	tpy	An automated air-fuel controller shall be used to ensure a minimum net thermal efficiency of 80% (Direct Process Heater - 104 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM10	boiler A and B (010 and 011)	0.007	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process gas (248 MMBtu/hr each)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM2.5	boiler A and B (010 and 011)	0.007	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process gas (248 MMBtu/hr each)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	NOx	boiler A and B (010 and 011)	0.06	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process gas; ULNB (FGR and economizer) (248 MMBtu/hr each)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	CO	boiler A and B (010 and 011)	0.082	lbMMBtu three 1-hour test avg	Good combustion practices and proper operation and maintenance (248 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	VOC	boiler A and B (010 and 011)	0.0054	lbMMBtu three 1-hour test avg	Good combustion practices and proper operation and maintenance (248 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	CO2e	boiler A and B (010 and 011)	No Numeric Limit	No Numeric Limit	Good combustion practices and proper operation and maintenance; gaseous fuels; economizers & Insulation; combustion air preheating; condensate return system (248 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM10	boiler B-201	0.007	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process fuel gas (229 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	TPM2.5	boiler B-201	0.007	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process fuel gas (229 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	NOx	boiler B-201	0.06	lbMMBtu three 1-hour test avg	Good combustion practices; fueled by natural gas or process fuel gas; ULNB (FGR and Economizer) (229 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	CO	boiler B-201	0.037	lbMMBtu three 1-hour test avg	Good combustion practices and proper operation and maintenance (229 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	VOC	boiler B-201	0.0054	lbMMBtu three 1-hour test avg	Good combustion practices and proper operation and maintenance (229 MMBtu/hr)
Indorama Ventures Olefins, LLC - Indorama Lake Charles Facility	LA-0314	8/3/16, 4/28/17 update	CO2e	boiler B-201	No Numeric Limit	No Numeric Limit	Good combustion practices and proper operation and maintenance; gaseous fuels; economizers & Insulation; combustion air preheating; condensate return system (229 MMBtu/hr)
Flint Hills Resources Houson Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16. 8/31/16 update	NOx	Charge Gas Heater	0.007	lb/MMBtu	SIP - SCR (463 MMBtu/hr) (30 TAC Chapter 117 Subchapter B)
Flint Hills Resources Houson Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16. 8/31/16 update	VOC	Charge Gas Heater	0.69	lb/hr	Good combustion practices (463 MMBtu/hr)
Flint Hills Resources Houson Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16. 8/31/16 update	TPM10	Charge Gas Heater	1.19	lb/hr	Good combustion practices (463 MMBtu/hr)
Flint Hills Resources Houson Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16. 8/31/16 update	TPM2.5	Charge Gas Heater	1.19	lb/hr	Good combustion practices (463 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	VOC	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.5	tons per 12 mos rolling avg, 12 mos rolling total	Good combustion practices. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	NOx	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.011	lb/MMBtu	Ultra Low NOx burners. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	SO2	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.0011	lb/MMBtu	Low sulfur fuel. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.0001	lb/MMBtu	Pipeline quality natural gas. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	CO	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.035	lb/MMBtu	Clean fuel and good combustion practices. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	CO	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	6.6	lb/hr	Clean fuel and good combustion practices. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	TPM10	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.007	lb/MMBtu	Low sulfur/carbon fuel and good combustion practices. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	TPM2.5	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	0.007	lb/MMBtu	Low sulfur/carbon fuel and good combustion practices. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers and heaters >100 MMBtu/hr Included
Unit 44 - Package Boiler
Unit 48 - Package Boiler
Unit 49 - Package Boiler

Virginia Electric and Power Company - Greensville Power Station	VA-0325 (draft)	6/17/16, 2/24/17 update	CO2e	Auxiliary Boiler (1) and Fuel Gas Heaters (6)	117.1	lb/MMBtu	Natural gas and fuel and high efficiency design and operation. The auxiliary boiler will provide steam to the steam turbine at startup and at cold starts to warm up the ST rotor. The steam from the auxiliary boiler will not be used to augment the power generation of the combustion turbines or steam turbine. The boiler is proposed to operate 8760 hrs/yr but will be limited by an annual fuel throughput based on a capacity factor of 10%. (185 MMBtu/hr)
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	NOx	245 MMBtu natural gas fired Auxiliary boiler	0.011	lb/MMBtu	NSPS - Good combustion practices and ULNOx burners. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	NOx	245 MMBtu natural gas fired Auxiliary boiler	9	ppmdv @ 15% O2	NSPS - Good combustion practices and ULNOx burners. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	CO	245 MMBtu natural gas fired Auxiliary boiler	0.037	lb/MMBtu	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	CO	245 MMBtu natural gas fired Auxiliary boiler	19.85	lb/hr	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	TPM	245 MMBtu natural gas fired Auxiliary boiler	0.0075	lb/MMBtu 3 hr avg	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	TPM10	245 MMBtu natural gas fired Auxiliary boiler	0.0075	lb/MMBtu 3 hr avg	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	TPM10	245 MMBtu natural gas fired Auxiliary boiler	4	t;py	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	TPM2.5	245 MMBtu natural gas fired Auxiliary boiler	0.0075	lb/MMBtu 3 hr avg	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	TPM2.5	245 MMBtu natural gas fired Auxiliary boiler	4	t;py	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	Sulfuric Acid (mist, vapors, etc)	245 MMBtu natural gas fired Auxiliary boiler	0.0049	t;py	NSPS - Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	VOC	245 MMBtu natural gas fired Auxiliary boiler	0.0054	lb/MMBtu	Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.
Tenaska PA Partners LLC - Tenaska PA Partners/Westmoreland Gen Fac	PA-0306 (draft)	2/12/16, 7/12/17 update	VOC	245 MMBtu natural gas fired Auxiliary boiler	2.89	t;py	Good combustion practices. Total fuel usage of the auxiliary boiler shall not exceed 1052 MMsch/yr on a 12-month rolling basis.

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
American Municipal Power Generating Station	OH-0310	10/8/2009	CO	Auxiliary Boiler	12.6	lbs/hr	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	CO	Auxiliary Boiler	5.52	tons/year per rolling 12 months	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	NOx	Auxiliary Boiler	21	lbs/hr	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	NOx	Auxiliary Boiler	9.2	tons/year per rolling 12 months	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	PM10	Auxiliary Boiler	1.14	lbs/hr	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	PM10	Auxiliary Boiler	0.5	tons/year per rolling 12 months	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	SO2	Auxiliary Boiler	0.09	lbs/hr	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	SO2	Auxiliary Boiler	0.04	tons/year per rolling 12 months	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	Visible Emission	Auxiliary Boiler	10	% opacity as a 6 minute average	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	VOC	Auxiliary Boiler	0.83	lbs/hr	Unknown
American Municipal Power Generating Station	OH-0310	10/8/2009	VOC	Auxiliary Boiler	0.36	tons/year per rolling 12 months	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	CO	Auxiliary Boiler	13.9	lbs/hr	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	CO	Auxiliary Boiler	0.08	lb/MMBtu	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	H2SO4	Auxiliary Boiler	0.129	lbs/hr	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	NOx	Auxiliary Boiler	6.2	lbs/hr	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	NOx	Auxiliary Boiler	0.04	lb/MMBtu	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	PM10	Auxiliary Boiler	3.23	lbs/hr	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	PM10	Auxiliary Boiler	0.02	lb/MMBtu	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	SO2	Auxiliary Boiler	0.843	lbs/hr	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	SO2	Auxiliary Boiler	0.005	lb/MMBtu	Unknown
Calpine Construction Finance Co. LP Amella Energy Center	TX-0386	3/26/2002	VOC	Auxiliary Boiler	3.1	lb/hr	Unknown
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	CO	Auxiliary Boiler	0.038	lb/MMBtu 3-h block	Oxidation Catalyst
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	CO	Auxiliary Boiler	92%	Reduction	Oxidation Catalyst
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	H2SO4 mist	Auxiliary Boiler	No numeric limit	No numeric limit	use of natural gas
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	NOx	Auxiliary Boiler	0.011	lb/MMBtu	SCR
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	NOx	Auxiliary Boiler	92%	Reduction	SCR
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	PM10	Auxiliary Boiler	No numeric limit	No numeric limit	use of natural gas
Calpine Turner Energy Center, LLC	OR-0046	1/6/2005	VOC	Auxiliary Boiler	0.0044	lb/MMBtu 3-hr block	Oxidation Catalyst
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CH4	Boilers	0.0023	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CH4	Auxiliary Boiler	0.0023	lb/MMBtu average of 3 stack tests	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Boilers	0.0013	lb/MMBtu average of 3 stack tests	oxidation catalyst
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO	Boilers	2.6	tpy rolling 12 month total	oxidation catalyst
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Auxiliary Boiler	0.0013	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Auxiliary Boiler	0.57	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	CO	Natural gas fired boilers	37.22	lb/MMcf 3 hour average	proper burning design, good combustion practices
Rocky Mountain Energy Center, LLC	CO-0052	8/11/2002	CO	Auxiliary Boiler	0.039	lb/MMBtu	Good combustion control practices
Rocky Mountain Energy Center, LLC	CO-0052	8/11/2002	CO	Auxiliary Boiler	70%	Reduction	Good combustion control practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	250 MMBTU/H package boiler	0.074	lb/MMBtu	Good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	250 MMBTU/H package boiler	18.5	lb/hr	Good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2	Boilers	117	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2	Auxiliary Boiler	117	lb/MMBtu rolling 30 day average	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	CO2	Natural gas fired boilers	59.61	ton/MMcf 3 hour average	proper burning design, good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	CO2e	Boilers	234168	tpy rolling 12 month total	proper operation and use of natural gas
Forsyth Energy Projects, LLC Forsyth Energy Plant	NC-0101	9/29/2005	CO	Auxiliary Boiler	9.08	lbs/hr based on 3-hr average	Low-NOx Burners, good combustion control and clean burning, low sulfur fuel (natural gas)
Forsyth Energy Projects, LLC Forsyth Energy Plant	NC-0101	9/29/2005	NOx	Auxiliary Boiler	15.13	lbs/hr based on 3-hr average	Low-NOx Burners, good combustion control and clean burning, low sulfur fuel (natural gas)
Forsyth Energy Projects, LLC Forsyth Energy Plant	NC-0101	9/29/2005	PM10	Auxiliary Boiler	0.82	lbs/hr based on 3-hr average	Low-NOx Burners, good combustion control and clean burning, low sulfur fuel (natural gas)
Forsyth Energy Projects, LLC Forsyth Energy Plant	NC-0101	9/29/2005	SOx	Auxiliary Boiler	0.61	lbs/hr based on 3-hr average	Low-NOx Burners, good combustion control and clean burning, low sulfur fuel (natural gas)
Forsyth Energy Projects, LLC Forsyth Energy Plant	NC-0101	9/29/2005	VOC	Auxiliary Boiler	0.59	lbs/hr based on 3-hr average	Low-NOx Burners, good combustion control and clean burning, low sulfur fuel (natural gas)
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2e	Auxiliary Boiler	51748	tpy rolling 12 month total	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	N2O	Boilers	0.0006	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	N2O	Auxiliary Boiler	0.0006	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Auxiliary Boiler	0.0125	lb/MMBtu rolling 30 day average	LNB and FGR
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Auxiliary Boiler	5.52	tons/year rolling 12 month total	LNB and FGR
Ohio Valley Resources, LLC	TBD	9/26/2013	NOx	Natural gas fired boilers	20.4	lb/MMcf 24 hour average	Ultra Low NOx Burners and Flue Gas Recirculation
Rocky Mountain Energy Center, LLC.	CO-0052	8/11/2002	NOx	Auxiliary Boiler	0.038	lb/MMBtu	Operation is limited to 1900 hr/yr. Low NOx combustion system.
Rocky Mountain Energy Center, LLC.	CO-0052	8/11/2002	NOx	Auxiliary Boiler	80%	Reduction	Operation is limited to 1900 hr/yr. Low NOx combustion system.
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	250 MMBTU/H package boiler	0.02	lb/MMBtu	Low-NOx Burners and FGR
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	250 MMBTU/H package boiler	5	lb/hr	Low-NOx Burners and FGR
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Boilers	0.0024	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM	Boilers	4.79	tpy rolling 12 month total	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Auxiliary Boiler	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Auxiliary Boiler	1.06	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	PM	Natural gas fired boilers	1.9	lb/MMcf 3 hour average	proper burning design, good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	250 MMBTU/H package boiler	0.0052	lb/MMBtu	Good Combustion Practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	250 MMBTU/H package boiler	1.3	lbs/hr	Good Combustion Practices
Liberty Generating Station	NJ-0043	3/28/2002	CO	Auxiliary Boiler	100	ppmvd @ 7% O2	CO catalyst
Liberty Generating Station	NJ-0043	3/28/2002	CO	Auxiliary Boiler	17.4	lb/hr	CO catalyst
Liberty Generating Station	NJ-0043	3/28/2002	NOx	Auxiliary Boiler	0.2	lb/MMBtu	SCR
Liberty Generating Station	NJ-0043	3/28/2002	NOx	Auxiliary Boiler	7.2	lbs/hr	SCR
Liberty Generating Station	NJ-0043	3/28/2002	PM	Auxiliary Boiler	1.6	lb/hr	unknown
Liberty Generating Station	NJ-0043	3/28/2002	PM	Auxiliary Boiler	0.008	lb/MMBtu	Unknown
Liberty Generating Station	NJ-0043	3/28/2002	PM10	Auxiliary Boiler	1.6	lb/hr	unknown
Liberty Generating Station	NJ-0043	3/28/2002	PM10	Auxiliary Boiler	0.008	lb/MMBtu	Unknown
Liberty Generating Station	NJ-0043	3/28/2002	SO2	Auxiliary Boiler	0.004	lb/MMBtu	None
Liberty Generating Station	NJ-0043	3/28/2002	SO2	Auxiliary Boiler	0.8	lbs/hr	None

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers and heaters >100 MMBtu/hr Included
Unit 44 - Package Boiler
Unit 48 - Package Boiler
Unit 49 - Package Boiler

Liberty Generating Station	NJ-0043	3/28/2002	VOC	Auxiliary Boiler	50	ppmvd @7% O2	CO catalyst
Liberty Generating Station	NJ-0043	3/28/2002	VOC	Auxiliary Boiler	1.6	lbs/hr	CO catalyst
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	250 MMBTU/H package boiler	20%	Reduction	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Boilers	0.0024	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM10	Boilers	4.79	tpy rolling 12 month total	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Auxiliary Boiler	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Some facilities are not shown because they are not fertilizer production facilities. These	IA-0105	10/26/2012	PM10	Auxiliary Boiler	1.06	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	PM10	Natural gas fired boilers	7.6	lb/MMcf 3 hour average	proper burning design, good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	250 MMBTU/H package boiler	0.0052	lb/MMBtu	Good Combustion Practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	250 MMBTU/H package boiler	1.3	lbs/hr	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Boilers	0.0024	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	PM2.5	Boilers	4.79	tpy rolling 12 month total	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Auxiliary Boiler	0.0024	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Auxiliary Boiler	1.06	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	PM2.5	Natural gas fired boilers	7.6	lb/MMcf 3 hour average	proper burning design, good combustion practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	Visible Emission	Boilers	0	%	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emission	Auxiliary Boiler	0	% opacity	Good Combustion Practices
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Boilers	0.0014	lb/MMBtu average of 3 stack tests	proper operation and use of natural gas
CF Industries Nitrogen, LLC	IA-0106	7/12/2013	VOC	Boilers	2.8	tpy rolling 12 month total	proper operation and use of natural gas
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Auxiliary Boiler	0.0014	lb/MMBtu average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Auxiliary Boiler	0.62	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/26/2013	VOC	Natural gas fired boilers	5.5	lb/MMcf 3 hour average	proper burning design, good combustion practices
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	NOx	WCR Heater	0.03	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	PM	Heaters	0.005	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	PM	Heater, Reboiler	0.005	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	PM	WCR Heater	0.005	lb/MMBtu	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	PM	CCR Reactor	0.005	lb/MMBtu	Unknown

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they are not natural gas fired.

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers <100 MMBtu/hr, not included in startup
Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Wabash Valley Resources, LLC	IN-0371	03/10/2022, updated 02/27/2025	NOx	Auxiliary Boiler (AB-3)	35	LB/MMSCF	Low NOx burners and Good Combustion Practices
Wabash Valley Resources, LLC	IN-0371	03/10/2022, updated 02/27/2025	CO2e	Auxiliary Boiler (AB-3)	117	LB/MMBTU	Good Combustion Practices
AG PROCESSING INC - DAVID CITY	NE-0068	12/21/2022, updated 03/05/2025	PM10	Boiler 1	1.43	LB/HR, THREE 1-HOUR TESTS / TEST METHOD AVERAGE	No BACT Specified
AG PROCESSING INC - DAVID CITY	NE-0068	12/21/2022, updated 03/05/2025	PM10	Boiler 2	1.43	LB/HR, THREE 1-HOUR TESTS / TEST METHOD AVERAGE	No BACT Specified
AG PROCESSING INC - DAVID CITY	NE-0068	12/21/2022, updated 03/05/2025	PM10	Boiler 3	1.43	LB/HR, THREE 1-HOUR TESTS / TEST METHOD AVERAGE	No BACT Specified
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	TPM	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	1.9	LB/MMCF (EACH)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	TPM	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	1240	MMCF/YR (COMBINED)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	PM10	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	7.6	LB/MMCF (EACH)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	PM10	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	1240	MMCF/YR (COMBINED)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	PM2.5	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	7.6	LB/MMCF (EACH)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	PM2.5	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	1240	MMCF/YR (COMBINED)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	VOC	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	5.5	LB/MMCF (EACH)	Good Combustion Practices
Bunge North America (East), LLC - C-Plant (Speciality Soy Bean Extraction)	IN-0361	09/19/2022, updated 02/27/2025	VOC	SPC Boiler #1 PS37 & SPC Boiler #2 PS38	1240	MMCF/YR (COMBINED)	Good Combustion Practices
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	FPM	Boiler (CC-Boil)	0.0007	lb/MMBtu	good combustion practices and only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	PM10	Boiler (CC-Boil)	0.0007	lb/MMBtu	good combustion practices and only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	PM2.5	Boiler (CC-Boil)	0.0007	lb/MMBtu	good combustion practices and only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	NOx	Boiler (CC-Boil)	0.035	lb/MMBtu	low Nox burners
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	CO	Boiler (CC-Boil)	61	lb/MMscf	good combustion practices
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	SO2	Boiler (CC-Boil)	0.0006	lb/MMBtu	good combustion practices and only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	VOC	Boiler (CC-Boil)	0.0054	lb/MMBtu	good combustion practices and natural gas fuel (clean fuel)
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	Lead (Pb)/ Lead Cor	Boiler (CC-Boil)	0.0005	lb/mmscf	only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	CO2e	Boiler (CC-Boil)	117.1	lb/MMBtu	energy efficiency measures and only pipeline quality natural gas fuel shall be combusted
Nucor Steel	IN-0359	06/02/2022, updated 05/23/2023	CO2e	Boiler (CC-Boil)	25645	tpy	energy efficiency measures and only pipeline quality natural gas fuel shall be combusted
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	NOx	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	30	PPM; HOURLY	Low NOx Burners (LNB) or Flue Gas Recirculation (FGR) along with good combustion practices.
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	CO	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	50	PPMVD AT 3%O2; HOURLY	Good combustion practices.
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	PM10	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	0.4	LB/H; HOURLY	Good combustion practices.
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	PM2.5	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	0.4	LB/H; HOURLY	Good combustion practices.
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	VOC	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	0.3	LB/H; HOURLY	Good combustion practices.
Lansing Board of Water and Light, LBWL-Erickson Station	MI-0454	10/25/2022, updated 05/23/2023	CO2e	EUAUXBOILER--natural-gas fired auxiliary boiler, rated at less than or equal to 99 MMBTU/H	25644	T/YR; 12-MO ROLLING TIME PERIOD	Low carbon fuel (pipeline quality natural gas), good combustion practices, and energy efficiency measures
Norfolk Crush, LLC	NE-0064	08/11/2022, updated 03/05/2025	PM10	Boiler A & Boiler B	0.26	LB/HR, THREE 1-HOUR TESTS / TEST METHOD AVERAGE	No BACT Specified
Norfolk Crush, LLC	NE-0064	08/11/2022, updated 03/05/2025	VOC	Boiler A & Boiler B	0.52	LB/HR, THREE 1-HOUR TESTS / TEST METHOD AVERAGE	No BACT Specified
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	NOx	Auxiliary Boiler	0.01	POUNDS/MMBTU; rolling 3-operating hour	Ultra low-NOx burners and flue gas recirculation, air preheater, automated combustion management system, with an oxygen trim system and an automated water blowdown system.
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	CO	Auxiliary Boiler	0.037	POUNDS/MMBTU; rolling 3-operating hour	Good burner design and good combustion practices

KNO Restart
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Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	VOC	Auxiliary Boiler	0.0015	POUNDS/MMBTU; rolling 3-operating hour	Good burner design and good combustion practices
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	TPM	Auxiliary Boiler	0.0019	POUNDS/MMBTU; rolling 3-operating hour	Good burner design and good combustion practices
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	PM10	Auxiliary Boiler	0.0075	POUNDS/MMBTU; rolling 3-operating hour	Good burner design and good combustion practices
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	SO2	Auxiliary Boiler	0.0014	POUNDS/MMBTU; rolling 3-operating hour	Use of only natural gas with a sulfur content of no greater than 0.5 grains (gr)/100 standard cubic feet (scf)
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	Sulfuric Acid	Auxiliary Boiler	0.02	POUNDS/MMBTU; rolling 3-operating hour	Use of only natural gas with a sulfur content of no greater than 0.5 grains (gr)/100 standard cubic feet (scf)
LINCOLN LAND ENERGY CENTER	IL-0133	09/30/2021, updated 12/06/2022	CO2e	Auxiliary Boiler	5059	tpy; 12 month rolling	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	CO	EUAUXBOILER (North Plant): Auxiliary Boiler	0.08	lb/mmbtu; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	NOx	EUAUXBOILER (North Plant): Auxiliary Boiler	0.04	lb/mmbtu; 30-day rolling average	Low NOx burners/Flue gas recirculation and good combustion practices.
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	FPM	EUAUXBOILER (North Plant): Auxiliary Boiler	0.005	lb/mmbtu; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	PM10	EUAUXBOILER (North Plant): Auxiliary Boiler	0.46	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	PM2.5	EUAUXBOILER (North Plant): Auxiliary Boiler	0.46	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	VOC	EUAUXBOILER (North Plant): Auxiliary Boiler	0.004	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	SO2	EUAUXBOILER (North Plant): Auxiliary Boiler	1.8	lb/mmscf; monthly	Good combustion practices and the use of pipeline quality natural gas
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	SO2	EUAUXBOILER (North Plant): Auxiliary Boiler	0.6	gr/scf; fuel supplier records	Good combustion practices and the use of pipeline quality natural gas
Marshall Energy Center, LLC - MEC North, LLC	MI-0451	12/08/21, updated 04/25/2023	CO2e	EUAUXBOILER (North Plant): Auxiliary Boiler	31540	tpy; 12 month rolling	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas)
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	CO	EUAUXBOILER (South Plant): Auxiliary Boiler	0.08	lb/mmbtu; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	NOx	EUAUXBOILER (South Plant): Auxiliary Boiler	0.04	lb/mmbtu; 30-day rolling average	Low NOx burners/Flue gas recirculation and good combustion practices.
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	FPM	EUAUXBOILER (South Plant): Auxiliary Boiler	0.005	lb/mmbtu; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	PM10	EUAUXBOILER (South Plant): Auxiliary Boiler	0.46	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	PM2.5	EUAUXBOILER (South Plant): Auxiliary Boiler	0.46	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	VOC	EUAUXBOILER (South Plant): Auxiliary Boiler	0.004	lb/hr; hourly	Good combustion practices
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	SO2	EUAUXBOILER (South Plant): Auxiliary Boiler	1.8	lb/mmscf; monthly	Good combustion practices and the use of pipeline quality natural gas
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	SO2	EUAUXBOILER (South Plant): Auxiliary Boiler	0.6	gr/scf; fuel supplier records	Good combustion practices and the use of pipeline quality natural gas
Marshall Energy Center, LLC - MEC South, LLC	MI-0452	12/08/21, updated 04/25/2023	CO2e	EUAUXBOILER (South Plant): Auxiliary Boiler	31540	tpy; 12 month rolling	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas)
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	NOx	PR Waste Heat Boiler	14.41	lb/hr; 12 month rolling	SCR and LNB
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	CO	PR Waste Heat Boiler	26.21	lb/hr	Good combustion practices and oxidation catalyst
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	VOC	PR Waste Heat Boiler	13.37	lb/hr	Good combustion practices and oxidation catalyst
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	SO2	PR Waste Heat Boiler	8.03	lb/hr	Use of pipeline quality natural gas or fuel gas
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	PM10	PR Waste Heat Boiler	0.61	lb/hr	Use of pipeline quality natural gas or fuel gas and good combustion practices
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	PM2.5	PR Waste Heat Boiler	0.61	lb/hr	Use of pipeline quality natural gas or fuel gas and good combustion practices
FG LA COMPLEX	LA-0364	01/14/2019, updated 08/09/2021	CO2e	PR Waste Heat Boiler	455475	tpy	Use of natural gas or fuel gas as fuel, energy-efficient design options, and operational/maintenance practices.
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	NOx	Auxiliary Boiler	0.01	LB/MM BTU	Ultra-low NOx burners and good combustion practices
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	PM10	Auxiliary Boiler	0.0074	LB/MM BTU	Exclusive combustion of natural gas and good combustion practices.
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	PM2.5	Auxiliary Boiler	0.0074	LB/MM BTU	Exclusive combustion of natural gas and good combustion practices.
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	CO2e	Auxiliary Boiler	117	LB/MM BTU	Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	CO	Auxiliary Boiler	0.05	LB/MM BTU	Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD
MAGNOLIA POWER GENERATING STATION UNIT 1	LA-0391	09/08/2020, updated 05/23/2023	VOC	Auxiliary Boiler	0.0054	LB/MM BTU	Good combustion practices; compliance with 40 CFR 63 Subpart DDDDD
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	CO	60 MMBtu/hour Auxiliary Boiler	0.08	LB/MMBTU	Good combustion practices and low-NOx burners
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	NOx	60 MMBtu/hour Auxiliary Boiler	0.05	LB/MMBTU	Low-NOx burners
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	SO2	60 MMBtu/hour Auxiliary Boiler	1.4	GR. S/100 SCF NG	Limited sulfur content in fuel
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	SO2	60 MMBtu/hour Auxiliary Boiler	20	% OPACITY	Limited sulfur content in fuel
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	Sulfuric Acid	60 MMBtu/hour Auxiliary Boiler	1.4	GR. S/100 SCF NG	Limited sulfur content in fuel
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	Sulfuric Acid	60 MMBtu/hour Auxiliary Boiler	20	% OPACITY	Limited sulfur content in fuel
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	FPM	60 MMBtu/hour Auxiliary Boiler	1.4	GR. S/100 SCF NG	No BACT Specified
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	FPM	60 MMBtu/hour Auxiliary Boiler	20	% OPACITY	No BACT Specified
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	PM2.5	60 MMBtu/hour Auxiliary Boiler	1.4	GR. S/100 SCF NG	No BACT Specified
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	PM2.5	60 MMBtu/hour Auxiliary Boiler	20	% OPACITY	No BACT Specified
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	PM10	60 MMBtu/hour Auxiliary Boiler	1.4	GR. S/100 SCF NG	Clean fuels
SHADY HILLS ENERGY CENTER, LLC	FL-0371	04/02/2021, updated 03/04/2022	PM10	60 MMBtu/hour Auxiliary Boiler	20	% OPACITY	Clean fuels
WPL- RIVERSIDE ENERGY CENTER	WI-0305	12/16/2020, updated 09/16/2022	CO2e	Natural Gas Auxiliary Boiler (B22)	157	LB CO2/MMBTU; ANY MONTH, AVG ANY CONSECUTIVE 12-MONTHS	Combust only pipeline quality natural gas.
Green Bay Packaging Inc. - GB Mill Div.	WI-0303	06/03/2020, updated 09/16/2022	CO2e	Natural Gas-Fired Boiler (B01)	16771	tpy; any consecutive 12-month period	Only burn natural gas, good combustion practices, low NOx burner, and flue gas recirculation
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	NOx	FGAUXBOILER	0.036	LB/MMBTU; hourly each boiler	Good combustion practices and low NOx burners.

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers <100 MMBtu/hr, not included in startup
Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	CO	FGAUXBOILER	0.037	LB/MMBTU; hourly each boiler	Good combustion practices
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	TPM	FGAUXBOILER	1.9	LB/MMSCF; hourly each boiler	Low sulfur fuel and good combustion practices
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	PM10	FGAUXBOILER	7.6	LB/MMSCF; hourly each boiler	Low sulfur fuel and good combustion practices
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	PM2.5	FGAUXBOILER	7.6	LB/MMSCF; hourly each boiler	Low sulfur fuel and good combustion practices
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	VOC	FGAUXBOILER	0.0054	LB/MMBTU; hourly each boiler	Good combustion practices
Thomas Township Energy, LLC	MI-0442	06/10/2019, updated 08/09/21	CO2e	FGAUXBOILER	41031	tpy; 12-mo rolling time period; each boiler	Energy efficiency
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	NOx	Auxiliary Boiler	0.01	lb/MMBtu; 3-hour average	Ultra low-NOx burners and flue gas recirculation air preheater, automated combustion management systems, automated water blowdown, good combustion practices
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	CO	Auxiliary Boiler	0.037	lb/MMBtu; 3-hour average	Good combustion practice
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	PM	Auxiliary Boiler	0.0075	lb/MMBtu; 3-hour average	Good combustion practice
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	PM	Auxiliary Boiler	0.0019	lb/MMBtud; 3-hour average	Good combustion practice
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	Sulfuric Acid	Auxiliary Boiler	0.1	lb/hr	Good combustion practice
Jackson Generation, LLC - Jackson Energy Center	IL-0130	04/04/2017, updated 04/16/2020	CO2e	Auxiliary Boiler	11250	tpy; 12-month rolling average	Good combustion practice
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	TPM	B01-B12, Boilers	0.0075	LB/MMBTU	Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	PM10	B01-B12, Boilers	0.0075	LB/MMBTU	Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	PM2.5	B01-B12, Boilers	0.0075	LB/MMBTU	Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	Visible Emissions	B01-B12, Boilers	7.5	% opacity	The available options described for controlling visible emissions are generally the controls for controlling particulate matter, sulfur dioxide, and nitrogen oxides emissions.
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	SO2	B01-B12, Boilers	0.0006	LB/MMBTU	Good Combustion Practices and the Use of Pipeline Quality Natural Gas
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	NOx	B01-B12, Boilers	0.0105	LB/MMBTU	Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	CO2e	B01-B12, Boilers	160	lb/1000 lb CO2e, 12-month average	Ultra-low NOx Burners, Flue Gas Recirculation, Good Combustion Practices and the Use of Pipeline Quality Natural Gas
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	CO	B01-B12, Boilers	25	ppmvd	Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	CO	B01-B12, Boilers	0.52	lb/hr	Ultra-low NOx Burners, Flue Gas Recirculation and Good Combustion Practices
AFE, INC. –LCM PLANT	WI-0283	03/01/2018, updated 03/08/2022	VOC	B01-B12, Boilers	0.0036	LB/MMBTU	good combustion controls
CPV Three Rivers, LLC -Three Rivers Energy Center	IL-0129	06/10/2018, updated 02/19/2019	NOx	Auxiliary Boiler	0.011	lb/MMBtu; 3-hour average	Ultra-low NOx burners and flue gas recirculation, air preheater, automated combustion management system with O2 trim system and automated water blowdown, and good combustion practices
CPV Three Rivers, LLC -Three Rivers Energy Center	IL-0129	06/10/2018, updated 02/19/2019	CO	Auxiliary Boiler	0.037	lb/MMBtu; 3-hour average	good combustion practices
CPV Three Rivers, LLC -Three Rivers Energy Center	IL-0129	06/10/2018, updated 02/19/2019	PM	Auxiliary Boiler	0.0075	no unit specified	good combustion practices
CPV Three Rivers, LLC -Three Rivers Energy Center	IL-0129	06/10/2018, updated 02/19/2019	Sulfuric Acid	Auxiliary Boiler	0.1	lb/hr	good combustion practices
CPV Three Rivers, LLC -Three Rivers Energy Center	IL-0129	06/10/2018, updated 02/19/2019	CO2e	Auxiliary Boiler	22500	tpy; 12-month rolling average	good combustion practices
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	CO	Auxiliary Boiler (B001)	2.08	LB/H	good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	CO	Auxiliary Boiler (B001)	2.08	tpy; 12 month rolling	good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	CO	Auxiliary Boiler (B001)	0.055	LB/MMBTU	good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	0.76	LB/H	low NOX burners and flue gas recirculation
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	0.76	tpy; 12 month rolling	low NOX burners and flue gas recirculation
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	NOx	Auxiliary Boiler (B001)	0.02	LB/MMBTU	low NOX burners and flue gas recirculation
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	0.3	LB/H	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	0.3	tpy; 12 month rolling	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM10	Auxiliary Boiler (B001)	0.008	LB/MMBTU	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	0.3	LB/H	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	0.3	tpy; 12 month rolling	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	PM2.5	Auxiliary Boiler (B001)	0.008	LB/MMBTU	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	0.06	LB/H	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	0.06	tpy; 12 month rolling	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	SO2	Auxiliary Boiler (B001)	1.5	X10-3 LB/MMBTU	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	Visible Emissions	Auxiliary Boiler (B001)	10	% opacity as a 6 minute average	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	0.004	LB/H	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	0.004	tpy; 12 month rolling	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	Sulfuric Acid	Auxiliary Boiler (B001)	1.5	X10-4 LB/MMBTU	low sulfur fuel
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	CO2e	Auxiliary Boiler (B001)	4502	tpy; 12 month rolling	use of natural gas, good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	0.23	LB/H	good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	0.23	tpy; 12 month rolling	good combustion controls
OREGON ENERGY CENTER	OH-0372	06/27/2016, updated 06/19/2019	VOC	Auxiliary Boiler (B001)	0.006	LB/MMBTU	good combustion controls

New RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	FPM	Gas-Fired Space Heaters (25 MMBtu/hr)	0.0019	lb/MMBtu Individual Units	Operate and maintain in accordance with manufacturer's design
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	FPM	Gas-Fired Space Heaters (25 MMBtu/hr)	0.15	lb/hr (total from all units)	Permit Limit

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers <100 MMBtu/hr, not included in startup
Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	NOx	Gas-Fired Space Heaters (25 MMBtu/hr)	0.1	lb/MMBtu Individual Units	Good combustion practices
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	NOx	Gas-Fired Space Heaters (25 MMBtu/hr)	1.93	lb/hr (total from all units)	Good combustion practices
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	CO2e	Gas-Fired Space Heaters (25 MMBtu/hr)	10197	ton/year	Good combustion practices (Compliance with limit in accordance with provisions of 40 CFR Part 98)
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	TPM10	Gas-Fired Space Heaters (25 MMBtu/hr)	0.0075	lb/MMBtu Individual Units	(Test methods EPA/OAR Mthd 201 and OTM 28) (BACT-PSD)
Nucor Steel Kankakee, Inc.	IL-0126	11/1/2018, updated 2/19/2019	TPM2.5	Gas-Fired Space Heaters (25 MMBtu/hr)	0.0075	lb/MMBtu Individual Units	(BACT-PSD)
Green Bay Packaging, Inc. - Shipping Container Division	WI-0266	9/6/2018, updated 2/19/2019	VOC	Natural gas-fired boiler (Boiler B01) (35 MMBtu/hr)	0.0055	lb/MMBtu	Good combustion practices, use only natural gas, equip boiler with Low NOx burners and flue gas recirculation
Green Bay Packaging, Inc. - Shipping Container Division	WI-0266	9/6/2018, updated 2/19/2019	CO2e	Natural gas-fired boiler (Boiler B01) (35 MMBtu/hr)	160	lb CO2e/1000 lb steam	Good combustion practices, use only natural gas, equip boiler with Low NOx burners and flue gas recirculation
Green Bay Packaging, Inc. - Shipping Container Division	WI-0266	9/6/2018, updated 2/19/2019	VOC	Space heaters (process P53) (40 MMBtu/hr)	0.0055	lb/MMBtu	Good combustion practices, use only natural gas, equip with Low NOx burners
Green Bay Packaging, Inc. - Shipping Container Division	WI-0266	9/6/2018, updated 2/19/2019	CO2e	Space heaters (process P53) (40 MMBtu/hr)	no numerical limit		Good combustion practices, use only natural gas, equip with Low NOx burners minimum design annual fuel utilization efficiency of 90%
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.011	lb/MMBtu 3-hr avg	Ultra-low NOx burners and flue gas recirculation, air preheater, automated combusion managment system with O2 trim system and automated water blowdown, and good combustion practices (LAER)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	1.1	lb/hr	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	2.2	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.037	lb/MMBtu 3-hr avg	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	3.6	lb/hr	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	7.2	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.0075	no units listed	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.72	lb/hr	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	1.44	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.1	lb/hr	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	0.2	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO2e	Auxiliary Boiler (96 MMBtu/hr) (used on an intermittent basis (up to 4000 hrs/yr)	22500	ton/year 12-month rolling avg	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Fuel Heater (12.80 MMBtu/hr)	0.011	lb/MMBtu	LAER NSPS - Low NOx burners
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Fuel Heater (12.80 MMBtu/hr)	0.45	lb/hr	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	NOx	Fuel Heater (12.80 MMBtu/hr)	2.0	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Fuel Heater (12.80 MMBtu/hr)	0.08	lb/hr	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Fuel Heater (12.80 MMBtu/hr)	1.02	lb/hr	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO	Fuel Heater (12.80 MMBtu/hr)	4.5	ton/year	Permit Limit
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	TPM (PM, PM10 and PM2.5)	Fuel Heater (12.80 MMBtu/hr)	0.0075	lb/MMBtu	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	Fuel Heater (12.80 MMBtu/hr)	0.014	lb/hr	Good Combustion Practices(BACT-PSD)
CPV Three Rivers, LLC - Energy Center	IL-0129	7/30/2018, updated 2/19/2019	CO2e	Fuel Heater (12.80 MMBtu/hr)	6600	ton/year 12-month rolling avg	Good Combustion Practices(BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.007	lb/mmbtu hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.7	lb/hr hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	NOx	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.036	lb/mmbtu hourly	Low NOx Burners/Flue Gas Recirculation (SCR not cost effective) (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	NOx	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	3.6	lb/hr hourly	Low NOx Burners/Flue Gas Recirculation (SCR not cost effective) (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	FPM	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.007	lb/mmbtu hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	FPM	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.7	lb/hr hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM10	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.007	lb/mmbtu hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM10	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.7	lb/hr hourly	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM2.5	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.075	lb/mmbtu hourly	Good Combustion Practices (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM2.5	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	7.49	lb/hr hourly	Good Combustion Practices (BACT-PSD SIP)

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers <100 MMBtu/hr, not included in startup
Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	VOC	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.008	lb/mmbtu hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	VOC	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.8	lb/hr hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	0.34	gr s/100 scf Fuel supplier records	Good Combustion Practices, Low Sulfur Fuel (BACT-PSD NSPS SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO2e	EUAUXBOILER: Auxiliary Boiler (99.9 MMBtu/hr)	25623	ton/year 12-month rolling time period	Energy Efficiency Measures, Use of Natural Gas (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.77	lb/hr hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	NOx	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.75	lb/hr hourly	Low NOx Burners (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	FPM	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.15	lb/hr hourly	Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM10	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.15	lb/hr hourly	Low Sulfur Fuel (Oxidation catalyst is not economically feasible) (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM2.5	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.15	lb/hr hourly	Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	VOC	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.17	lb/hr hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	0.34	gr s/100 scf Fuel supplier records	Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO2e	EUFUELHTR1: Natural gas fired fuel heater (20.80 MMBtu/hr)	6310	ton/year 12-month rolling time period (combined EUFUELHTR1 and EUFUELHTR2)	Natural Gas Fuel (BACT-PSD)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.14	lb/hr hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	NOx	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.14	lb/hr hourly	Low NOx Burners (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	FPM	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.03	lb/hr hourly	Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM10	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.03	lb/hr hourly	Low Sulfur Fuel (oxidation catalyst not economically feasible) (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	TPM2.5	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.03	lb/hr hourly	BACT PSD SIP Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	VOC	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.03	lb/hr hourly	Good Combustion Controls (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	Sulfuric Acid (mist, vapors, etc)	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	0.34	gr s/100 scf Fuel supplier records	Low Sulfur Fuel (BACT-PSD SIP)
DTE Electric Company - Belle River Combined Cycle Power Plant	MI-0435	7/16/2018, updated 2/19/2019	CO2e	EUFUELHTR2: Natural gas fired fuel heater (3.80 MMBtu/hr)	6310	ton/year 12-month rolling time period (combined EUFUELHTR1 and EUFUELHTR2)	Natural Gas Fuel (BACT-PSD)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	CO	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.08	lb/MMBtu hourly	Good Combustion Practices (oxidation catalyst not economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	NOx	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.04	lb/MMBtu 30-day rolling avg time period	Low NOx Burners/flue gas recirculation and good combustion practices (SCR not economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	FPM	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.005	lb/MMBtu hourly	Good Combustion Practices (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	TPM10	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.46	lb/hr hourly	Good Combustion Practices (no control equipment economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	TPM2.5	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.46	lb/hr hourly	Good Combustion Practices (no control equipment economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	VOC	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.004	lb/MMBtu hourly	Good Combustion Practices (oxidation catalysts not economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	SO2	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	1.8	lb/MMscf monthly	Good Combustion Practices and use of pipeline quality natural gas (BACT-PSD NSPS SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	SO2	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.6	gr s/100 scf Fuel supplier records	Good Combustion Practices and use of pipeline quality natural gas (emission factor based on natural gas material limit of 2,000 grains of sulfur per MMSCF) (BACT-PSD NSPS SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	CO2e	EUAUXBOILER (North Plant): Auxiliary Boiler (61.5 MMBtu/hr)	31540	ton/year 12-month rolling time period	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas) (BACT-PSD)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	CO	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.08	lb/MMBtu hourly	Good Combustion Practices (oxidation catalyst not economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	NOx	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.04	lb/MMBtu 30-day rolling avg time period	Low NOx Burners/flue gas recirculation and good combustion practices (SCR not economically feasible) (BACT-PSD SIP)

KNO Restart
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Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	FPM	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.005	lb/MMBtu hourly	Good Combustion Practices (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	TPM10	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.46	lb/hr hourly	Good Combustion Practices (no control equipment economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	TPM2.5	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.46	lb/hr hourly	Good Combustion Practices (no control equipment economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	VOC	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.004	lb/MMBtu hourly	Good Combustion Practices (oxidation catalysts not economically feasible) (BACT-PSD SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	SO2	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	1.8	lb/MMscf monthly	Good Combustion Practices and use of pipeline quality natural gas (BACT-PSD NSPS SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	SO2	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	0.6	gr s/100 scf Fuel supplier records	Good Combustion Practices and use of pipeline quality natural gas (emission factor based on natural gas material limit of 2,000 grains of sulfur per MMSCF) (BACT-PSD NSPS SIP)
Marshall Energy Center LLC - MEC North, LLC and MEC South, LLC	MI-0433	6/29/2018, updated 2/19/2019	CO2e	EUAUXBOILER (South Plant): Auxiliary Boiler (61.5 MMBtu/hr)	31540	ton/year 12-month rolling time period	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas) (BACT-PSD)
Dominion Energy Transmission, Inc. - Mockingbird Hill Compressor Station	WV-0031	6/14/2018, updated 9/24/2018	TPM2.5	WH-1 - Boiler (8.72 MMBtu/hr)	0.28	ton/year 12-month rolling	Limited to Natural Gas (Monitoring is limit to either fuel usage or tracking hours of operation) (BACT-PSD SIP)
Dominion Energy Transmission, Inc. - Mockingbird Hill Compressor Station	WV-0031	6/14/2018, updated 9/24/2018	TPM10	WH-1 - Boiler (8.72 MMBtu/hr)	0.28	ton/year 12-month rolling	Limited to Natural Gas (Monitoring is limit to either fuel usage or tracking hours of operation) (BACT-PSD SIP)
Dominion Energy Transmission, Inc. - Mockingbird Hill Compressor Station	WV-0031	6/14/2018, updated 9/24/2018	TPM	WH-1 - Boiler (8.72 MMBtu/hr)	0.28	ton/year 12-month rolling	Limited to Natural Gas (Monitoring is limit to either fuel usage or tracking hours of operation) (BACT-PSD SIP)
Dominion Energy Transmission, Inc. - Mockingbird Hill Compressor Station	WV-0031	6/14/2018, updated 9/24/2018	CO2e	WH-1 - Boiler (8.72 MMBtu/hr)	4468	ton/year 12-month rolling	Restricted to pipeline quality natural gas and tune-up the boiler once every five years (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO	Auxiliary Boiler (77.8 MMBtu/hr)	2.88	lb/hr	Good Combustion Practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO	Auxiliary Boiler (77.8 MMBtu/hr)	6.58	tons/year	Good Combustion Practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO	Auxiliary Boiler (77.8 MMBtu/hr)	0.037	lb/MMBtu	Good Combustion Practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	NOx	Auxiliary Boiler (77.8 MMBtu/hr)	0.86	lb/hr	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	NOx	Auxiliary Boiler (77.8 MMBtu/hr)	1.96	tons/year	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	NOx	Auxiliary Boiler (77.8 MMBtu/hr)	0.0011	lb/MMBtu	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	TPM	Auxiliary Boiler (77.8 MMBtu/hr)	0.6	lb/hr	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	TPM	Auxiliary Boiler (77.8 MMBtu/hr)	1.38	tons/year	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	TPM	Auxiliary Boiler (77.8 MMBtu/hr)	0.008	lb/MMBtu	Low NOx Burners/flue gas recirculation and good combustion practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	VOC	Auxiliary Boiler (77.8 MMBtu/hr)	0.62	lb/hr	Use of Natural Gas, Good Combustion Practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	VOC	Auxiliary Boiler (77.8 MMBtu/hr)	1.42	tons/year	Use of Natural Gas, Good Combustion Practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	VOC	Auxiliary Boiler (77.8 MMBtu/hr)	0.008	lb/MMBtu	Use of Natural Gas, Good Combustion Practices (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (77.8 MMBtu/hr)	0.0132	lb/hr	Use of Natural Gas (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (77.8 MMBtu/hr)	0.03	tons/year	Use of Natural Gas (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	Sulfuric Acid (mist, vapors, etc)	Auxiliary Boiler (77.8 MMBtu/hr)	0.0002	lb/MMBtu	Use of Natural Gas (BACT-PSD SIP)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO2e	Auxiliary Boiler (77.8 MMBtu/hr)	9107	lb/hr emission limit	Use of Natural Gas (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO2e	Auxiliary Boiler (77.8 MMBtu/hr)	20837	tons/year emission limit	Use of Natural Gas (BACT-PSD)
ESC Harrison County Power, LLC - Harrison County Power Plant	WV-0029	3/27/2018, updated 6/25/2018	CO2e	Auxiliary Boiler (77.8 MMBtu/hr)	9107	lb/hr standard emission	Use of Natural Gas (BACT-PSD)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	CO	99.8 MMBtu/hr Auxiliary Boiler	0.08	lb/MMBtu	Clean Fuel (Compliance by initial and annual stack test (EPA/OER mthd 10), or manufacturer guarantee. CO also serves as proxy for VOC.) (BACT-PSD)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	SO2	99.8 MMBtu/hr Auxiliary Boiler	no numeric limit		Clean Fuel (May only fire natural gas with sulfur content less than 2 grains per 100 scf. This limits SO2, SAM, PM, PM10, and PM2.5) (BACT-PSD NSPS)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	Sulfuric Acid (mist, vapors, etc)	99.8 MMBtu/hr Auxiliary Boiler	no numeric limit		Clean Fuel (May only fire natural gas with sulfur content less than 2 grains per 100 scf. This limits SO2, SAM, PM, PM10, and PM2.5) (BACT-PSD NSPS)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	FPM	99.8 MMBtu/hr Auxiliary Boiler	no numeric limit		Clean Fuel (May only fire natural gas with sulfur content less than 2 grains per 100 scf. This limits SO2, SAM, PM, PM10, and PM2.5) (BACT-PSD NSPS)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	TPM10	99.8 MMBtu/hr Auxiliary Boiler	no numeric limit		Clean Fuel (May only fire natural gas with sulfur content less than 2 grains per 100 scf. This limits SO2, SAM, PM, PM10, and PM2.5) (BACT-PSD)
Florida Power and Light Company - Dania Beach Energy Center	FL-0363 (draft)	12/4/2017, updated 4/11/2018	TPM2.5	99.8 MMBtu/hr Auxiliary Boiler	no numeric limit		Clean Fuel (May only fire natural gas with sulfur content less than 2 grains per 100 scf. This limits SO2, SAM, PM, PM10, and PM2.5) (BACT-PSD)

KNO Restart
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Unit 53- Waste Heat Boiler
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Holland Board of Public Works - East 5th Street	MI-0424 (draft) (update of MI-0412)	12/5/2016, 7/31/17 update	CO	EUAUXBOILER (Auxiliary Boiler)	0.077	lb/MMBtu Test protocol will specify avg time	SIP - Good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	NOx	EUAUXBOILER (Auxiliary Boiler)	0.05	lb/MMBtu Test protocol will specify avg time	SIP - Low NOx burners/Internal flue gas recirculation and good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	FPM	EUAUXBOILER (Auxiliary Boiler)	0.0018	lb/MMBtu Test protocol will specify avg time	Good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	TPM10	EUAUXBOILER (Auxiliary Boiler)	0.007	lb/MMBtu Test protocol will specify avg time	SIP - Good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	TPM2.5	EUAUXBOILER (Auxiliary Boiler)	0.007	lb/MMBtu Test protocol will specify avg time	SIP - Good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	VOC	EUAUXBOILER (Auxiliary Boiler)	0.008	lb/MMBtu Test protocol will specify avg time	Good combustion practices (83.5 MMBtu/hr)
Holland Board of Public Works - East 5th Street	MI-0424 (draft)	12/5/2016, 7/31/17 update	CO2e	EUAUXBOILER (Auxiliary Boiler)	43283	tpy 12-month rolling time period	Good combustion practices (83.5 MMBtu/hr)
Rextac, LLC - Odessa Petrochemical Plant	TX-0813 (draft)	11/22/2016, 12/1/16 update	VOC	Small Boiler	0.0005	MMBtu/hr	NSPS Dc - Best combustion practices (39.9 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	NOx	Auxilary boiler	0.11	Llb/MMBtu Avg of 3 1-hr test runs	NSPS - Ultra low NOx burners, FGR, good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	NOx	Auxilary boiler	2.03	tpy 12-month rolling basis	NSPS - Ultra low NOx burners, FGR, good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	CO	Auxilary boiler	0.037	lb/MMBtu Avg of 3 1-hr test runs	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	CO	Auxilary boiler	6.84	tpy 12-month rolling basis	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM	Auxilary boiler	0.007	lb/MMBtu	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM	Auxilary boiler	1.29	tpy 12-month rolling basis	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM10	Auxilary boiler	0.007	lb/MMBtu	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM10	Auxilary boiler	1.29	tpy 12-month rolling basis	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM2.5	Auxilary boiler	0.007	lb/MMBtu	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	TPM2.5	Auxilary boiler	1.29	tpy 12-month rolling basis	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	VOC	Auxilary boiler	0.004	lb/MMBtu Avg of 3 1-hr test runs	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
CPV Fairview, LLC - CPV Fairview Energy Center	PA-0310	9/2/16, 7/31/17 update	VOC	Auxilary boiler	0.74	tpy 12-month rolling basis	NSPS - ULSD and good combustion practices (Operation of the auxiliary boiler shall not exceed 4000 hrs in any continuous 12-month period) (92.4 MMBtu/hr)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	NOx	Auxilary boiler	0.975	lb/hr avg of three 1-hour initial stack test	NSPS - Low Nox burners and FGR and use of natural gas as a clean burning fuel (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	NOx	Auxilary boiler	0.01	lb/MMBtu avg of three 1-hour initial stack test	NSPS - Low Nox burners and FGR and use of natural gas as a clean burning fuel (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	CO	Auxilary boiler	3.6	lb/hr avg of three 1-hour initial stack test	Use of natural gas as a clean burning fuel and good combustion practices (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	VOC	Auxilary boiler	0.488	lb/hr avg of three 1-hour initial stack tests initially	Use of natural gas as a clean burning fuel and good combustion practices (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	FPM	Auxilary boiler	0.181	lb/hr avg of three 1-hour initial stack tests initially	Use of natural gas as a clean burning fuel and good combustion practices (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	TPM10	Auxilary boiler	0.488	lb/hr avg of three 1-hour initial stack tests initially	Use of natural gas as a clean burning fuel and good combustion practices (97.5 MMBtu/hr)(4000.00 H/YR)

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Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	TPM2.5	Auxilary boiler	0.488	lb/hr avg of three 1-hour initial stack tests initially	Use of natural gas as a clean burning fuel and good combustion practices (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	SO2	Auxilary boiler	0.128	lb/hr	Use of natural gas as a clean burning fuel low sulfur fuel (SUBJECT TO NJDEP STATE-OF-THE-ART REQUIREMENTS) (97.5 MMBtu/hr)(4000.00 H/YR)
Stonegate Power, LLC - Middlesex Energy Center, LLC	NJ-0085	7/19/16, 11/3/16 update	Sulfuric Acid (Mist, Vapors, etc)	Auxilary boiler	0.01	lb/hr	Use of natural gas as a clean burning fuel low sulfur fuel (97.5 MMBtu/hr)(4000.00 H/YR)
DTE Gas Company - Milford Compressor Station	MI-0420	6/3/16, 4/27/17 update	NOx	FGAUXBOILERS	14	ppmv at 15% O2; Test Protocol (each boiler)	SIP - Ultra Low NOx Burners and good combustion practices (2 boilers at 6 MMBtu/hr each)
DTE Gas Company - Milford Compressor Station	MI-0420	6/3/16, 4/27/17 update	CO	FGAUXBOILERS	0.08	lb/MMBtu each; Test Protocol	SIP - Good combustion practices and clean burn fuel (pipeline quality natural gas) (2 boilers at 6 MMBtu/hr each)
DTE Gas Company - Milford Compressor Station	MI-0420	6/3/16, 4/27/17 update	TPM10	FGAUXBOILERS	0.0075	lb/MMBtu each; Test Protocol	SIP - Good combustion practices and low sulfur fuel (pipeline quality natural gas) (2 boilers at 6 MMBtu/hr each)
DTE Gas Company - Milford Compressor Station	MI-0420	6/3/16, 4/27/17 update	TPM2.5	FGAUXBOILERS	0.0075	lb/MMBtu each; Test Protocol	SIP - Good combustion practices and low sulfur fuel (pipeline quality natural gas) (2 boilers at 6 MMBtu/hr each)
DTE Gas Company - Milford Compressor Station	MI-0420	6/3/16, 4/27/17 update	CO2e	FGAUXBOILERS	6155	tpy 12-month rolling time period	Use of pipeline quality natural gas and energy efficiency measures (2 boilers at 6 MMBtu/hr each)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	NOx	Auxiliary Boiler firing natural gas	0.8	lb/hr avg of three 1-hour stack tests	NSPS - Low NOx burners and FGR (80 MMBtu/hr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	NOx	Auxiliary Boiler firing natural gas	0.01	lb/MMBtu avg of three 1-hour stack tests	NSPS - Low NOx burners and FGR (80 MMBtu/hr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	CO	Auxiliary Boiler firing natural gas	2.88	lb/hr avg of three 1-hour stack tests	Use of good combustion practices and use of natural gas a clean burning fuel (80 MMBtuhr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	VOC	Auxiliary Boiler firing natural gas	0.32	lb/hr avg of three 1-hour stack tests	Use of good combustion practices and use of natural gas a clean burning fuel (80 MMBtuhr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	FPM	Auxiliary Boiler firing natural gas	0.26	lb/hr avg of three 1-hour stack tests	Use of natural gas a clean burning fuel (80 MMBtuhr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	TPM10	Auxiliary Boiler firing natural gas	0.4	lb/hr avg of three 1-hour stack tests	Use of natural gas a clean burning fuel (80 MMBtuhr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	TPM2.5	Auxiliary Boiler firing natural gas	0.4	lb/hr avg of three 1-hour stack tests	Use of natural gas a clean burning fuel (80 MMBtuhr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	SO2	Auxiliary Boiler firing natural gas	0.12	lb/hr	Use of natural gas a low sulfur fuel (80 MMBtu/hr)
PSEG Fossil LLC Sewaren Generating Station	NJ-0084	3/10/16, 7/25/16 update	Sulfuric Acid (Mist, Vapors, etc)	Auxiliary Boiler firing natural gas	0.02	lb/hr	Use of natural gas a low sulfur fuel (80 MMBtu/hr)
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	CO	Auxiliary Boiler, 99.8 MMBtu/hr	0.08	lb/MMBtu	Proper combustion prevents CO - only ng, limited to 2000 hours per year
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	NOx	Auxiliary Boiler, 99.8 MMBtu/hr	0.05	lb/MMBtu	Low NOx burners - only ng, limited to 2000 hours per year
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	TPM	Auxiliary Boiler, 99.8 MMBtu/hr	10	% Opacity	Use of natural gas with sulfur content less than 2 grains / 100 scf - only ng, limited to 2000 hours per year
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	SO2	Auxiliary Boiler, 99.8 MMBtu/hr	2	gr s/100 scf gas	Use of low-sulfur gas - only ng, limited to 2000 hours per year
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	CO2e	Auxiliary Boiler, 99.8 MMBtu/hr	No numeric limit	No numeric limit	Use of natural gas only - only ng, limited to 2000 hours per year
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	NOx	Two Natural Gas Heaters	0.1	lb/MMBtu	Must have NOx emission design value less than 0.1 lb/MMBtu (fueled only with ng, may operate one at a time, 10 MMBtu/hr)
Florida Power & Light - Okeechobee Clean Energy Center	FL-0356	3/9/16, 7/6/16 update	SO2	Two Natural Gas Heaters	2	gr s/100 scf gas	Use of low-sulfur fuel (fueled only with ng, may operate one at a time, 10 MMBtu/hr)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	CO2e	Heaters (Gas-Fired)	120	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	CO	Heaters (Gas-Fired)	0.084	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	NOx	Heaters (Gas-Fired)	0.1	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	TPM10	Heaters (Gas-Fired)	0.0076	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	TPM2.5	Heaters (Gas-Fired)	0.0076	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)
Commercial Metals Company - CMC Steel Oklahoma	OK-0173	1/19/2016, 7/7/16 update	VOC	Heaters (Gas-Fired)	0.0055	lb/MMBtu	Natural Gas Fuel (Numerous gas-fired heaters will be installed. The application requested that the sizes all be kept confidential.)

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "boiler","heater" - All Results for boilers <100 MMBtu/hr, not included in startup
Unit 50- Waste Heat Boiler
Unit 51- Waste Heat Boiler
Unit 52- Waste Heat Boiler
Unit 53- Waste Heat Boiler
Unit 54- Waste Heat Boiler

Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/16, 9/19/16 update	NOx	Firetube Boiler Nos. 1 and 2 (4-08, EQT 324 & 5-08, EQT 325)	2.75	lb/hr maximum	Flue gas recirculation and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques (63 MMBtu/hr - Natural Gas and Vent Gas). Aggregate NOx emissions from the boilers are capped at 10.05 TPY (GRP 11). Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. The PSD permit also references the 30 ppmvd @ 3% O2 limit as a "three 1-hour testing average."
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/16, 9/19/16 update	NOx	Firetube Boiler Nos. 1 and 2 (4-08, EQT 324 & 5-08, EQT 325)	30	ppmvd @ 3% O2 annual average	Flue gas recirculation and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques (63 MMBtu/hr - Natural Gas and Vent Gas). Aggregate NOx emissions from the boilers are capped at 10.05 TPY (GRP 11). Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. The PSD permit also references the 30 ppmvd @ 3% O2 limit as a "three 1-hour testing average."
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/16, 9/19/16 update	VOC	Firetube Boiler Nos. 1 and 2 (4-08, EQT 324 & 5-08, EQT 325)	0.21	lb/hr maximum	Oxidation catalyst and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques. (63 MMBtu/hr - Natural Gas and Vent Gas). Aggregate VOC emissions from the boilers are capped at 0.90 TPY (GRP 11). Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. The PSD permit also references the 2.8 ppmvd @ 3% O2 limit as a "three 1-hour testing average."
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/16, 9/19/16 update	VOC	Firetube Boiler Nos. 1 and 2 (4-08, EQT 324 & 5-08, EQT 325)	2.8	ppmvd @ 3% O2 annual average	Oxidation catalyst and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques. (63 MMBtu/hr - Natural Gas and Vent Gas). Aggregate VOC emissions from the boilers are capped at 0.90 TPY (GRP 11). Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. The PSD permit also references the 2.8 ppmvd @ 3% O2 limit as a "three 1-hour testing average."
Flint Hills Resources Houson Chemical LLC - PL Propylene Houston Olefins Plant	TX-0803 (draft)	7/12/16. 8/31/16 update					Includes 5 turbines, 1 regen air heater, and one duct burner exhausting through one stack to provide regenerative hot air to catalyst beds
Subaru of Indiana Automotive, Inc.	IN-0239	2/18/16, 9/14/16 update	VOC	Boiler	0.005	lb/MMBtu	38 MMBtu/hr - Miscellaneous process heaters and boilers from (this is where the description ends…)

RBLC Entries for October 2013 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Pryor Plant Chemical Company	OK-0135	2/23/2009	CO	Boilers #1 and #2	6.6	lbs/hr 1 hour/8 hour	Good operating practices
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	CO	Boiler, NO. 9	0.09	lb/MMBtu	Unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	Formaldehyde	Boilers #1 and #2	0.1	lb/hr	unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	NOx	Boilers #1 and #2	4	lb/hr 3-H/168-H rolling cumulative	Low NOx burners and good combustion practices
Pryor Plant Chemical Company	OK-0135	2/23/2009	NOx	Boilers #1 and #2	0.2	lb/MMBtu state limit	Low NOx burners and good combustion practices
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	NOx	Boiler, NO. 9	0.084	lb/MMBtu	Unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM	Boilers #1 and #2	0.6	lb/hr	Unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	PM10	Boilers #1 and #2	0.5	lb/hr 24-hour	Unknown
Williams Refining & Marketing, L.L.C.	TN-0153	4/3/2002	PM10	Boiler, NO. 9	0.0075	lb/MMBtu	Unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	SO2	Boilers #1 and #2	0.2	lb/hr	Unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	SO2	Boilers #1 and #2	0.2	lb/MMBtu state limit	unknown
Pryor Plant Chemical Company	OK-0135	2/23/2009	VOC	Boilers #1 and #2	0.5	lb/hr	unknown

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Nortern Indiana Public Services Company LLC - NIPSCO R.M Schahfer Generator Station	IN-0385	01/17/2025, updated 03/11/2025	VOC	frame-type natural gas-fired combustion turbine (Unit 20)	6.5	lb/hr	good combustion practices
Formosa Plastics Corportation - Point Comfort Plant	TX-0962	09/22/2023, updated 04/08/2025	VOC	Emergency Engines	No limit listed	No limit listed	601 hp and 100 hours of non-emergency operation per year. Good combustion practices
US Navy Norfolk Naval Shipyard	VA-0333	12/09/2020, updated 03/08/2022	CO2e	Two (2) turbines - HRSG	117.1	lb	use of low carbon fuel and efficient power generation
US Navy Norfolk Naval Shipyard	VA-0333	12/09/2020, updated 03/08/2022	PM10	Two (2) turbines - HRSG	0.011	lb	No BACT specified
US Navy Norfolk Naval Shipyard	VA-0333	12/09/2020, updated 03/08/2022	PM10	Two (2) turbines - HRSG	0.011	lb	No BACT specified
Sabine Pass LNG, LP and Sabine Pass Liquefaction	LA-0375	09/17/2020, updated 08/09/2021	NOx	Generator Turbines	150	ppm - @ 15% O2 and < 75% load	Dry Low NOx and good combustion practices
Sabine Pass LNG, LP and Sabine Pass Liquefaction	LA-0375	09/17/2020, updated 08/09/2021	CO	Generator Turbines	25	ppm - @ 15% O2 at all loads	Good combustion practices and use od clean natural gas
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	PM10	EU-CPP-CHPHRSG (combined heat and po	3.6	lb/hr when firing natural gas at full load	Use of natural gas as the primary fuel and good combustion practices.
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	PM10	EU-CPP-CHPHRSG (combined heat and po	3.5	lb/hr when firing ULSD at full load	Use of natural gas as the primary fuel and good combustion practices.
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	PM2.5	EU-CPP-CHPHRSG (combined heat and po	3.6	lb/hr when firing natural gas at full load	Use of natural gas as the primary fuel and good combustion practices.
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	PM2.5	EU-CPP-CHPHRSG (combined heat and po	3.5	lb/hr when firing ULSD at full load	Use of natural gas as the primary fuel and good combustion practices.
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	CO2e	EU-CPP-CHPHRSG (combined heat and po	155597	tpy	Follow manufacturer inspection and maintenance recommendations, install insulation where appropriate to minimize heat loss, use of computer-based control system that enables monitoring and optimal fuel and air flows, select system design to maximum efficiency, an audible, visible, and olfactory inspection and maintenance routine to minimize leaks in gas piping components.
The regents of the University of Michigan Central Power Plant	MI-0436	08/23/2018, updated 02/20/2019	PM2.5	EU-CPP-CHPHRSG (combined heat and po	1000	lb/mwh - of CO2e based on gross energy output	Follow manufacturer inspection and maintenance recommendations, install insulation where appropriate to minimize heat loss, use of computer-based control system that enables monitoring and optimal fuel and air flows, select system design to maximum efficiency, an audible, visible, and olfactory inspection and maintenance routine to minimize leaks in gas piping components.
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM10	801 Combustion Turbine	0.0089	lb/mmbtu - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM10	801 Combustion Turbine	1.94	lb/hr - 3 hr	No BACT specified

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM2.5	801 Combustion Turbine	0.0089	lb/mmbtu - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM2.5	801 Combustion Turbine	1.94	lb/hr - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	CO2e	801 Combustion Turbine	40921	lb/hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	CO2e	801 Combustion Turbine	179235	tpy	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM10	802 Combustion Turbine	0.0089	lb/mmbtu - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM10	802 Combustion Turbine	1.94	lb/hr - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM2.5	802 Combustion Turbine	0.0089	lb/mmbtu - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	PM2.5	802 Combustion Turbine	1.94	lb/hr - 3 hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	CO2e	802 Combustion Turbine	40921	lb/hr	No BACT specified
Kimberlly-Clark Corportation - Mobile Operations	AL-0321	10/11/2017, updated 05/11/2018	CO2e	802 Combustion Turbine	179235	tpy	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	NOx	Combustion Turbine with Duct Burner	2	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	Dry Low NOx combustor for CTG & Selective Catalytic Reduction
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	NOx	Combustion Turbine with Duct Burner	6.8	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	Dry Low NOx combustor for CTG & Selective Catalytic Reduction
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	CO	Combustion Turbine with Duct Burner	2	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	CO	Combustion Turbine with Duct Burner	6.3	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	SO2	Combustion Turbine with Duct Burner	0.0029	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	clean fuels - using natural gas as primary fuel and ultra low sulfur diesel as backup fuel
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	SO2	Combustion Turbine with Duct Burner	0.0021	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	clean fuels - using natural gas as primary fuel and ultra low sulfur diesel as backup fuel
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	Sulfuric Acid	Combustion Turbine with Duct Burner	0.0022	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	clean fuels - using natural gas as primary fuel and ultra low sulfur diesel as backup fuel
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	Sulfuric Acid	Combustion Turbine with Duct Burner	0.0016	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	clean fuels - using natural gas as primary fuel and ultra low sulfur diesel as backup fuel

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	NH3	Combustion Turbine with Duct Burner	2	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, NG/ULSD	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	NH3	Combustion Turbine with Duct Burner	0.0027	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	PM10	Combustion Turbine with Duct Burner	0.02	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	PM10	Combustion Turbine with Duct Burner	0.029	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	PM2.5	Combustion Turbine with Duct Burner	0.02	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	PM2.5	Combustion Turbine with Duct Burner	0.029	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	CO2e	Combustion Turbine with Duct Burner	117.098	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	CO2e	Combustion Turbine with Duct Burner	163.61	LB/MMBTU, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	VOC	Combustion Turbine with Duct Burner	1.7	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, NG FIRING	No BACT specified
Massachusetts Institute of Technology MIT Central Utility Plant	MA-0043	06/21/2017, updated 08/09/2021	VOC	Combustion Turbine with Duct Burner	6.5	PPMVD@15% O2, 1 HR BLOCK AVG/EXCLUDING SS, ULSD FIRING	No BACT specified

RBLC Entries for May 2019 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/2016	NOx	Solar Titan 130 Gas Turbine with Unfired HRSG (3-08, EQT 323)	14.25	lb/hr hourly maximum	Dry low NOx combustor (SoLoNOx) and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques (159.46 MM BTU/HR) (Output power at generator: 14.117 MW) Turbine is subject to 40 CFR 60 Subpart KKKK. Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit.
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/2016	NOx	Solar Titan 130 Gas Turbine with Unfired HRSG (3-08, EQT 323)	15	ppmv @ 15% O2 Annual Average	Dry low NOx combustor (SoLoNOx) and good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques (159.46 MM BTU/HR) (Output power at generator: 14.117 MW) Turbine is subject to 40 CFR 60 Subpart KKKK. Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit.

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/2016	VOC	Solar Titan 130 Gas Turbine with Unfired HRSG (3-08, EQT 323)	1.64	lb/hr hourly maximum	Good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques consistent with the manufacturer's recommendations to maximize fuel efficiency and minize emissions. (159.46 MM BTU/HR) (Output power at generator: 14.117 MW) Turbine is subject to 40 CFR 60 Subpart KKKK. Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. PSD permit requires an annual stack test for VOC. If VOC < 75% of the permit limit, the frequency of the testing may be reduced to once every 2 years. If result of any subsequent test exceeds 75% of the permit limit, resume annual testing.
Equistar Chemicals, LP - Westlake Facility	LA-0295	7/12/2016	VOC	Solar Titan 130 Gas Turbine with Unfired HRSG (3-08, EQT 323)	2.5	ppmv @ 15% O2 Annual Average	Good combustion practices, including good equipment design, use of gaseous fuels for good mixing, and proper combustion techniques consistent with the manufacturer's recommendations to maximize fuel efficiency and minize emissions. (159.46 MM BTU/HR) (Output power at generator: 14.117 MW) Turbine is subject to 40 CFR 60 Subpart KKKK. Good combustion practices shall include monitoring of the flue gas oxygen content, combustion air flow, fuel consumption, and flue gas temperature. These parameters shall be maintained within the manufacturer's recommended operating guidelines or within a range that is otherwise indicative of proper operation of the emissions unit. PSD permit requires an annual stack test for VOC. If VOC < 75% of the permit limit, the frequency of the testing may be reduced to once every 2 years. If result of any subsequent test exceeds 75% of the permit limit, resume annual testing.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	NOx	Combustion Turbine with Duct Burner	2	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	NSPS and SIP - Dry Low NOx Combustor & Selective Catalytic Reduction (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). NOx limits are determined as BACT under 310 CMR 7.02(8). NOx(firing NG): ≤0.0074 lb/MMBtu, ≤1.21 lb/hr(no duct firing), ≤1.51 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤36.2 lb per event, during shutdowns (≤1 hr): ≤11.2 lb per event.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	CO	Combustion Turbine with Duct Burner	2	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	SIP - Oxidation Catalyst (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). CO limits are determined as BACT under 310 CMR 7.02(8). CO(firing NG): ≤0.0045 lb/MMBtu, ≤0.74 lb/hr(no duct firing), ≤0.92 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤153.7 lb per event, during shutdowns (≤1 hr): ≤41.6 lb per event.

Attachment A
KNO Restart - RBLC Summary

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	VOC	Combustion Turbine with Duct Burner	1.7	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	SIP - Oxidation Catalyst (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). VOC limits are determined as BACT under 310 CMR 7.02(8). VOC as CH4(firing NG): ≤0.0022 lb/MMBtu, ≤0.36 lb/hr(no duct firing), ≤0.45 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤11.4 lb per event, during shutdowns (≤1 hr): ≤3.3 lb per event VOC as CH4.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	SO2	Combustion Turbine with Duct Burner	0.6	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	NSPS and SIP - clean fuels - using natural gas as primary fuel (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). SO2 limits are determined as BACT under 310 CMR 7.02(8). SO2(firing NG): ≤0.0029 lb/MMBtu, ≤0.48 lb/hr(no duct firing), ≤0.58 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤1.8 lb per event, during shutdowns (≤1 hr): ≤0.6 lb per event.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	Sulfuric Acid (mist, vapors, etc)	Combustion Turbine with Duct Burner	0.4	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	SIP - clean fuels - using natural gas as primary fuel (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). H2SO4 limits are determined as BACT under 310 CMR 7.02(8). H2SO4(firing NG): ≤0.0029lb/MMBtu, ≤0.47 lb/hr(no duct firing), ≤0.58 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤1.8 lb per event, during shutdowns (≤1 hr): ≤0.6 lb per event.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	Ammonia (NH3)	Combustion Turbine with Duct Burner	2	ppmv @ 15% O2 1-hour block avg/excluding SS - ng firing	SIP - no controls listed (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). NH3 limits are determined as BACT under 310 CMR 7.02(8). NH3(firing NG): ≤0.44 lb/hr(no duct firing), ≤0.55 lb/hr(with duct firing); NH3(turbine firing ULSD): ≤0.0029 lb/MMBtu, ≤0.46 lb/hr(no duct firing), ≤0.57 lb/hr(with duct firing).
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	Ammonia (NH3)	Combustion Turbine with Duct Burner	0.0027	lb/MMBtu 1-hour block avg/excluding SS - ng firing	SIP - no controls listed (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). NH3 limits are determined as BACT under 310 CMR 7.02(8). NH3(firing NG): ≤0.44 lb/hr(no duct firing), ≤0.55 lb/hr(with duct firing); NH3(turbine firing ULSD): ≤0.0029 lb/MMBtu, ≤0.46 lb/hr(no duct firing), ≤0.57 lb/hr(with duct firing).
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	TPM10	Combustion Turbine with Duct Burner	0.02	lb/MMBtu 1-hour block avg/excluding SS - ng firing	SIP - no controls listed (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). PM10(firing NG): ≤3.29 lb/hr(no duct firing), ≤4.07 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤12.2 lb per event, during shutdowns (≤1 hr): ≤4.1 lb per event.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	TPM2.5	Combustion Turbine with Duct Burner	0.02	lb/MMBtu 1-hour block avg/excluding SS - ng firing	SIP - no controls listed (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). PM2.5(firing NG): ≤3.29 lb/hr(no duct firing), ≤4.07 lb/hr(with duct firing); during start-ups (≤3 hrs): ≤12.2 lb per event, during shutdowns (≤1 hr): ≤4.1 lb per event.
Matem Limited Partnership - Medical Area Total Energy Plant	MA-0041	7/1/16, 4/28/17 update	CO2e	Combustion Turbine with Duct Burner	119	lb/MMBtu 1-hour block avg/excluding SS - ng firing	SIP - no controls listed (a nominal 14.4 Megawatt (MW) Solar Titan 130 Combustion Turbine Generator (164.6MMBtu/hr for NG firing(also permitted to burn fuel oil as backup)) with Heat Recovery Steam Generator including a Duct Burner) (38.8MMBtu/hr NG firing only). CO2e(firing NG): ≤19,584 lb/hr(no duct firing), ≤24,200 lb/hr(with duct firing).
RBLC Entries for October 2013 Application							
Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination

KNO Restart
RBLC Search Summary
Search: "16.210 - combined cycle & cogen <25 MW" - All Results
Unit 55-Solar Turbines
Unit 56-Solar Turbines
Unit 57-Solar Turbines
Unit 58-Solar Turbines
Unit 59-Solar Turbines

Wesleyan University	CT-0155	8/27/2008	CO	2.4 MW natural gas fired cogeneration facility	0.48	G/B-HP-H short term emission limit	oxidation catalyst
Wesleyan University	CT-0155	8/27/2008	CO	2.4 MW natural gas fired cogeneration facility	15.51	tpy annual emission limit	oxidation catalyst
Geisinger Medical Center	PA-0289	6/18/2010	CO	Combined heat and power combustion turbine	25	ppm @ 15% O2 in solonox mode	Unknown
Geisinger Medical Center	PA-0289	6/18/2010	CO	Combined heat and power combustion turbine	100	ppm @ 15% O2 in non solonox mode	Unknown
Geisinger Medical Center	PA-0289	6/18/2010	Formaldehyde	Combined heat and power combustion turbine	0.0029	lb/MMBtu	Unknown
Wesleyan University	CT-0155	8/27/2008	NOx	2.4 MW natural gas fired cogeneration facility	0.18	G/B-HP-H short term emission limit	Steuler Eco2pro SCR
Wesleyan University	CT-0155	8/27/2008	NOx	2.4 MW natural gas fired cogeneration facility	5.82	tpy annual emission limit	Steuler Eco2pro SCR
Cutrale Citrus Juices USA Auburndale citrus facility	FL-0313	6/12/2008	NOx	Cogen System Turbine NO.1 W/existing duct Burner #1	25	PPMVD hr average/corrected to 25%O2	dry low NOx burners
Cutrale Citrus Juices USA Leesburg citrus facility	FL-0314	6/2/2008	NOx	Cogen System Turbine & existing steam generator	25	PPMVD hr average/corrected to 25%O2	dry low NOx burners
Geisinger Medical Center	PA-0289	6/18/2010	NOx	Combined heat and power combustion turbine	15	ppm @ 15% O2 in solonox mode	SoLoNOx combustor
Geisinger Medical Center	PA-0289	6/18/2010	NOx	Combined heat and power combustion turbine	42	ppm @ 15% O2 in non solonox mode	SoLoNOx combustor
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM	Combustion Turbines 1, 2, 3	6.5	lb/hr above 1 hour average	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM	Combustion Turbines 1, 2, 3	0.022	lb/MMBtu above 1 hour average w/duct firing	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM10	Combustion Turbines 1, 2, 3	6.7	lb/hr above/below 1 hour average	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM10	Combustion Turbines 1, 2, 3	0.023	lb/MMBtu above/below 1 hour average w/duct firing	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM2.5	Combustion Turbines 1, 2, 3	6.7	lb/hr above/below 1 hour average	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Cornell university Cornell combined heat & power project	NY-0101	3/12/2008	PM2.5	Combustion Turbines 1, 2, 3	0.023	lb/MMBtu above/below 1 hour average w/duct firing	sulfur in gas assigned max 1.2 gr/100scf; work practices to minimize NHZ slip
Geisinger Medical Center	PA-0289	6/18/2010	VOC	Combined heat and power combustion turbine	0.6	lb/hr in solonox mode	unknown
Geisinger Medical Center	PA-0289	6/18/2010	VOC	Combined heat and power combustion turbine	11.9	lb/hr sub-zero in non-solonox mode	unknown

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.
Some facilities are not shown because they are not fertilizer production facilities. These units are not directly comparable because they do not flare common process gas.

KNO Restart
RBLC Search Summary
Search "17.210"
Unit 65 - Diesel Well Pump
Unit 66 - Gasoline Fire Pump

New RBLC Entries for 2025 Application

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM, total	Emergency Fire Water Pump	0.15	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM, total	Emergency Fire Water Pump	0.09	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM10, total	Emergency Fire Water Pump	0.17	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM10, total	Emergency Fire Water Pump	0.11	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM2.5, total	Emergency Fire Water Pump	0.17	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	PM2.5, total	Emergency Fire Water Pump	0.11	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	NOx	Emergency Fire Water Pump	2.85	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	NOx	Emergency Fire Water Pump	1.77	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	CO	Emergency Fire Water Pump	2.6	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	CO	Emergency Fire Water Pump	1.62	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	VOC	Emergency Fire Water Pump	0.15	g/hp-hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	VOC	Emergency Fire Water Pump	0.09	lb/hr	Good combustion practices, low sulfur fuel
Sycamore Riverside Energy LLC	IN-0374	3/31/2025, updated 4/9/25	CO2e	Emergency Fire Water Pump			
Duke Energy Indiana, Inc. - Cayuga Generating	IN-0382	02/14/2025, updated 4/9/25	CO	Emergency Fire Pump			Good combustion practices
Duke Energy Indiana, Inc. - Cayuga Generating	IN-0382	02/14/2025, updated 4/9/25	VOC	Emergency Fire Pump	4.00	g/kW-hr	Good combustion practices
Duke Energy Indiana, Inc. - Cayuga Generating	IN-0382	02/14/2025, updated 4/9/25	PM, total	Emergency Fire Pump	0.15	g/hp-hr	Good combustion practices
Duke Energy Indiana, Inc. - Cayuga Generating	IN-0382	02/14/2025, updated 4/9/25	CO2e	Emergency Fire Pump			Good combustion practices
Shinteck Plaquemine Plant 4	LA-0403	12/15/2024, updated 4/9/25	PM2.5, total	VCM Emergency Pump A/B/C	0.07	lb/hr	Compliance with 4 CFR 60 Subpart IIII
Shinteck Plaquemine Plant 4	LA-0403	12/15/2024, updated 4/9/25	PM10, total	VCM Emergency Pump A/B/C	0.07	lb/hr	Compliance with 4 CFR 60 Subpart IIII
Shinteck Plaquemine Plant 4	LA-0403	12/15/2024, updated 4/9/25	NOx	VCM Emergency Pump A/B/C	0.98	lb/hr	Compliance with 4 CFR 60 Subpart IIII
Shinteck Plaquemine Plant 4	LA-0403	12/15/2024, updated 4/9/25	CO	VCM Emergency Pump A/B/C	1.15	lb/hr	Compliance with 4 CFR 60 Subpart IIII
Shinteck Plaquemine Plant 4	LA-0403	12/15/2024, updated 4/9/25	VOC	VCM Emergency Pump A/B/C	0.33	lb/hr	Compliance with 4 CFR 60 Subpart IIII
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	NOx	EUFIREPUMP	4.00	g/kW-hr	
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	CO	EUFIREPUMP	3.50	g/kW-hr	Good combustion practices
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	VOC	EUFIREPUMP	4.00	g/kW-hr	Good combustion practices
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	PM, filterable	EUFIREPUMP	0.20	g/kW-hr	Good combustion practices, use of ULSD
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	PM10, total	EUFIREPUMP	1.10	lb/hr	Good combustion practices, use of ULSD
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	PM2.5, total	EUFIREPUMP	1.10	lb/hr	Good combustion practices, use of ULSD
Landsing Board of Water and Light-Delta Energy Park	MI-0459	6/27/2024, updated 3/5/25	CO2e	EUFIREPUMP	27.00	tpy	Good combustion practices, use of current energy efficient measures
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	NOx	Firewater Pump Engine	4.00	g/kW-hr	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	NOx	Firewater Pump Engine	100	hr/yr	Operational limit
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	VOC	Firewater Pump Engine	4.00	g/kW-hr	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	VOC	Firewater Pump Engine	100	hr/yr	Operational limit
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO	Firewater Pump Engine	3.50	g/kW-hr	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO	Firewater Pump Engine	100	hr/yr	Operational limit
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM10, total	Firewater Pump Engine	0.20	g/kW-hr	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM10, total	Firewater Pump Engine	100	hr/yr	Operational limit
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM2.5, total	Firewater Pump Engine	0.20	g/kW-hr	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	PM2.5, total	Firewater Pump Engine	100	hr/yr	Operational limit
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO2e	Firewater Pump Engine	25.00	tpy	
Cronus Chemicals	IL-0134	12/21/2023, updated 2/26/25	CO2e	Firewater Pump Engine	100	hr/yr	Operational limit
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	PM, total	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	PM10, total	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	PM2.5, total	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	SO2	Emergency Water Pumps	15.00	ppm max fuel content	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	CO	Emergency Water Pumps	3.03	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	NOx	Emergency Water Pumps	14.06	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Hybar LLC	AR-0180	4/28/2023, updated 2/26/25	CO2e	Emergency Water Pumps	164.00	lb/MMBtu	Good Combustion Practices
Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	PM, total	Emergency Generator (CC-GEN2)	0.15	g/hp-hr	certified engine
Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	PM10, total	Emergency Generator (CC-GEN2)	0.15	g/hp-hr	certified engine
Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	PM2.5, total	Emergency Generator (CC-GEN2)	0.15	g/hp-hr	certified engine

Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	NOx	Emergency Generator (CC-GEN2)	3.00	g/hp-hr	certified engine
Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	SO2	Emergency Water Pumps	0.0015	%S	ULSD
Nucor Steel	IN-0359	3/30/2023, updated 5/23/23	CO	Emergency Generator (CC-GEN2)	2.61	g/hp-hr	oxidation catalyst and certified engine
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	PM, total	Emergency Water Pump Engine 1	0.15	g/hp-hr	
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	NOx	Emergency Water Pump Engine 1	2.38	g/hp-hr	
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	VOC	Emergency Water Pump Engine 1	0.62	g/hp-hr	
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	PM, total	Emergency Water Pump Engine 2	0.15	g/hp-hr	
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	NOx	Emergency Water Pump Engine 2	2.38	g/hp-hr	
Norfolk Crush, LLC	NE-0064	11/21/2022, updated 3/5/25	VOC	Emergency Water Pump Engine 2	0.62	g/hp-hr	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	NOx	275 hp Diesel-Fired Emergency Fire Pump Engine	4.00	g/kW-hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	NOx	275 hp Diesel-Fired Emergency Fire Pump Engine	8.50	lb/hr	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	CO	275 hp Diesel-Fired Emergency Fire Pump Engine	3.50	g/kW-hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	CO	275 hp Diesel-Fired Emergency Fire Pump Engine	1.80	lb/hr	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	VOC	275 hp Diesel-Fired Emergency Fire Pump Engine	0.70	lb/hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	VOC	275 hp Diesel-Fired Emergency Fire Pump Engine	0.20	tpy	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.20	g/kW-hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.60	lb/hr	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM10, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.60	lb/hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM10, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.20	tpy	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM2.5, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.60	lb/hr	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	PM2.5, total	275 hp Diesel-Fired Emergency Fire Pump Engine	0.20	tpy	
Intel Ohio State	OH-0387	9/20/2022, updated 4/25/23	CO2	275 hp Diesel-Fired Emergency Fire Pump Engine	162.70	lb/MMBtu	Good combustion practices and proper maintenance
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	NOx	Fire Water Pump Engine	4.00	g/kW-hr	
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	CO	Fire Water Pump Engine	3.50	g/kW-hr	
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	PM, total	Fire Water Pump Engine	0.20	g/kW-hr	
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	SO2	Fire Water Pump Engine			Use of ultra-low sulfur diesel with a sulfur content <15 ppm sulfur
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	Sulfuric Acid (mist, vapors, etc.)	Fire Water Pump Engine			Use of ultra-low sulfur diesel with a sulfur content <15 ppm sulfur
Lincoln Land Energy Center	IL-0133	7/29/2022, updated 12/6/22	CO2e	Fire Water Pump Engine	92.00	tpy	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	NOx	Diesel Fire Pump Engine	3.60	g/hp-hr	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	NOx	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	CO	Diesel Fire Pump Engine	3.30	g/hp-hr	Oxidation Catalyst; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	CO	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM, total	Diesel Fire Pump Engine	0.19	g/hp-hr	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM, total	Diesel Fire Pump Engine	10	% Opacity	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM, total	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM10, total	Diesel Fire Pump Engine	0.19	g/hp-hr	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM10, total	Diesel Fire Pump Engine	10	% Opacity	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM10, total	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM2.5, total	Diesel Fire Pump Engine	0.19	g/hp-hr	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM2.5, total	Diesel Fire Pump Engine	10	% Opacity	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	PM2.5, total	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	SO2	Diesel Fire Pump Engine	15.00	ppmw sulfur in fuel	Good Combustion Practices; ULSD; Limited Operation
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	SO2	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	VOC	Diesel Fire Pump Engine	0.19	g/hp-hr	Oxidation Catalyst; Limited Operation; 40 CFR 60 Subpart IIII
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	VOC	Diesel Fire Pump Engine	500	hr/yr	
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	CO2e	Diesel Fire Pump Engine	163.60	lb/MMBtu	Good Combustion Practices; Limited Operation
Liquefaction Plant	AK-0088	7/7/2022, updated 8/16/22	CO2e	Diesel Fire Pump Engine	500	hr/yr	
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	CO	EUPENGINE (North Plant): Fire Pump Engine	2.60	g/bhp-hr	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	NOx	EUPENGINE (North Plant): Fire Pump Engine	3.00	g/bhp-hr	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	PM, filterable	EUPENGINE (North Plant): Fire Pump Engine	0.15	g/bhp-hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements

MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	PM10, total	EUPENGINE (North Plant): Fire Pump Engine	0.66	lb/hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	PM2.5, total	EUPENGINE (North Plant): Fire Pump Engine	0.66	lb/hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	VOC	EUPENGINE (North Plant): Fire Pump Engine	0.75	lb/hr	Good combustion practices
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	SO2	EUPENGINE (North Plant): Fire Pump Engine	15.00	ppm	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC North, LLC	MI-0451	6/23/2022, updated 4/25/23	CO2e	EUPENGINE (North Plant): Fire Pump Engine	85.60	tpy	Good combustion practices
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	CO	EUPENGINE (South Plant): Fire Pump Engine	2.60	g/bhp-hr	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	NOx	EUPENGINE (South Plant): Fire Pump Engine	3.00	g/bhp-hr	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	PM, filterable	EUPENGINE (South Plant): Fire Pump Engine	0.15	g/bhp-hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	PM10, total	EUPENGINE (South Plant): Fire Pump Engine	0.66	lb/hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	PM2.5, total	EUPENGINE (South Plant): Fire Pump Engine	0.66	lb/hr	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	VOC	EUPENGINE (South Plant): Fire Pump Engine	0.75	lb/hr	Good combustion practices
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	SO2	EUPENGINE (South Plant): Fire Pump Engine	15.00	ppm	Good combustion practices and meeting NSPS Subpart IIII requirements
MEC South, LLC	MI-0452	6/23/2022, updated 4/25/23	CO2e	EUPENGINE (South Plant): Fire Pump Engine	85.60	tpy	Good combustion practices
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	NOx	Emergency Diesel Fired Water Pump Engine	3.00	g/hp-hr	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	PM10, total	Emergency Diesel Fired Water Pump Engine	0.15	g/hp-hr	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	PM2.5, total	Emergency Diesel Fired Water Pump Engine	0.15	g/hp-hr	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	CO	Emergency Diesel Fired Water Pump Engine	2.60	g/hp-hr	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	VOC	Emergency Diesel Fired Water Pump Engine	3.00	g/hp-hr	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Magnolia Power Generating Station Unit 1	LA-0391	6/3/2022, updated 5/23/23	CO2e	Emergency Diesel Fired Water Pump Engine	74.21	kg/MMBtu	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, use of ultra-low sulfur diesel
Deridder Sawmill	LA-0390	5/10/2022, updated 4/25/23	VOC	ENG1 - Emergency Fire Water Pump	1.85	lb/hr	Good combustion pratices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitation for VOC
Deridder Sawmill	LA-0390	5/10/2022, updated 4/25/23	VOC	ENG1 - Emergency Fire Water Pump	0.08	tpy	
Westlake Ethylene Plant	LA-0397	4/29/2022, updated 2/27/25	PM10, total	Emergency Generators and Fire Water Pumps			Compliance with applicable requirements of 40 CFR 60 Subpart IIII
Westlake Ethylene Plant	LA-0397	4/29/2022, updated 2/27/25	PM2.5, total	Emergency Generators and Fire Water Pumps			Compliance with applicable requirements of 40 CFR 60 Subpart IIII
Westlake Ethylene Plant	LA-0397	4/29/2022, updated 2/27/25	NOx	Emergency Generators and Fire Water Pumps			Compliance with applicable requirements of 40 CFR 60 Subpart IIII
Westlake Ethylene Plant	LA-0397	4/29/2022, updated 2/27/25	CO	Emergency Generators and Fire Water Pumps			Compliance with applicable requirements of 40 CFR 60 Subpart IIII
Westlake Ethylene Plant	LA-0397	4/29/2022, updated 2/27/25	VOC	Emergency Generators and Fire Water Pumps			Compliance with applicable requirements of 40 CFR 60 Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	PM, filterable	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	PM10, total	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	PM2.5, total	Emergency Water Pumps	1.00	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	VE	Emergency Water Pumps	20.00	%	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	SO2	Emergency Water Pumps	15.00	ppm sulfur in fuel	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	VOC	Emergency Water Pumps	1.12	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	CO	Emergency Water Pumps	3.03	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	NOx	Emergency Water Pumps	14.06	g/bhp-hr	Good Operating Practices, limited hours of operation, compliance with NSPS Subpart IIII
Big River Steel LLC	AR-0173	1/31/2022, updated 3/4/22	CO2e	Emergency Water Pumps	164.00	lb/MMBTu	Good Operating Practices
Shady Hills Combined Cycle Facility	FL-0371	6/7/2021, updated 3/4/22	CO	Emergency Fire Pump Engine	3.50	g/kW-hr	
Shady Hills Combined Cycle Facility	FL-0371	6/7/2021, updated 3/4/22	PM, total	Emergency Fire Pump Engine	0.20	g/kW-hr	

Shady Hills Combined Cycle Facility	FL-0371	6/7/2021, updated 3/4/22	NOx	Emergency Fire Pump Engine	4.00	g/kW-hr	
Shady Hills Combined Cycle Facility	FL-0371	6/7/2021, updated 3/4/22	SO2	Emergency Fire Pump Engine	15.00	ppm sulfur in fuel	
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	PM10, total	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	PM2.5, total	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	VOC	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	CO	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	CO2e	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Lasalle Bioenergy LLC	LA-0386	5/5/2021, updated 3/4/22	NOx	Generators and Firewater Pump Engines			Comply with 40 CFR 60 Subpart IIII
Shintech Plaquemines Plant 1	LA-0379	5/4/2021, updated 3/4/22	PM, total	VCM Unit Emergency Cooling Water Pumps	0.20	g/kW-hr	Good combustion pratices/gaseous fuel burning
Shintech Plaquemines Plant 1	LA-0379	5/4/2021, updated 3/4/22	PM10, total	VCM Unit Emergency Cooling Water Pumps	0.20	g/kW-hr	Good combustion pratices/gaseous fuel burning
Shintech Plaquemines Plant 1	LA-0379	5/4/2021, updated 3/4/22	NOx	VCM Unit Emergency Cooling Water Pumps	2.98	g/kW-hr	Good combustion pratices/gaseous fuel burning
Shintech Plaquemines Plant 1	LA-0379	5/4/2021, updated 3/4/22	CO	VCM Unit Emergency Cooling Water Pumps	3.50	g/kW-hr	Good combustion pratices/gaseous fuel burning

**Does not include entries prior to KNO entry into RBLC on 3/26/2021

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Did not update in 2017							

Facility Name	RBLC ID	Permit Issue Date	Pollutant	Process Name	Emission Limit	Emission Limit Units	BACT Determination
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	CH4	Emergency Fire Pump	0.0061	lb/MMBtu	Ultra low sulfur diesel and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CH4	Fire Pump	0.0001	g/kw-hr average of 3 stack tests	Good Combustion Practices
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	CO	Emergency Diesel Fire Pump	2.76	lbs/hr	Low sulfur fuel, combustion control
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	CO	Emergency Diesel Fire Pump	0.69	tons/year	Low sulfur fuel, combustion control
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	CO	Emergency Fire Pump	2.6	g/hp-hr	Utra low sulfur diesel and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Fire Pump	3.5	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO	Fire Pump	0.45	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO	Diesel-Fired Emergency Firewater Pump	2.6	g/hp-hr 3 hour average	good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	CO	500 KW emergency generator, fire pump	No Numeric Limit	No Numeric Limit	Good combustion practices. EPA certified per NSPS IIII
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	CO2	Emergency Fire Pump	163	lb/MMBtu	proper operation and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2	Fire Pump	1.55	g/kw-hr average of 3 stack tests	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	CO2	Diesel-Fired Emergency Firewater Pump	527.4	g/hp-hr 3 hour average	good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	CO2e	Fire Pump	91	tpy rolling 12 month total	Good Combustion Practices
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	N2O	Emergency Fire Pump	0.0014	lb/MMbtu	Ultra low sulfur diesel and good combustion practices
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	NOx	Emergency Diesel Fire Pump	12.8	lbs/hr	Low sulfur fuel, combustion control
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	NOx	Emergency Diesel Fire Pump	3.2	tons/year	Low sulfur fuel, combustion control
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Fire Pump	3.75	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	NOx	Fire Pump	0.49	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	NOx	Diesel-Fired Emergency Firewater Pump	2.86	g/hp-hr 3 hour average	good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	NOx	501 KW emergency generator, fire pump	No Numeric Limit	No Numeric Limit	Good combustion practices. EPA certified per NSPS IIII
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	PM	Emergency Diesel Fire Pump	0.88	lbs/hr	Low sulfur fuel, combustion control
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	PM	Emergency Diesel Fire Pump	0.22	tons/year	Low sulfur fuel, combustion control
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Fire Pump	0.2	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM	Fire Pump	0.03	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM	Diesel-Fired Emergency Firewater Pump	0.15	g/hp-hr 3 hour average	good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM	503 KW emergency generator, fire pump	No Numeric Limit	No Numeric Limit	ULSD fuel, EPA certified per NSPS IIII
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM10	Emergency Fire Pump	0.15	g/hp-hr annual average	Ultra low sulfur diesel and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Fire Pump	0.2	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM10	Fire Pump	0.03	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM10	Diesel-Fired Emergency Firewater Pump	0.15	g/hp-hr 3 hour average	good combustion practices
Southeast Idaho Energy, LLC Power County Advanced Energy Center	ID-0017	2/10/2009	PM10	502 KW emergency generator, fire pump	No Numeric Limit	No Numeric Limit	ULSD fuel, EPA certified per NSPS IIII
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	PM2.5	Emergency Fire Pump	0.15	g/hp-hr annual average	Ultra low sulfur diesel and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Fire Pump	0.2	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	PM2.5	Fire Pump	0.03	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	PM2.5	Diesel-Fired Emergency Firewater Pump	0.15	g/hp-hr 3 hour average	good combustion practices
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	SO2	Emergency Diesel Fire Pump	0.84	lbs/hr	Low sulfur fuel, combustion control
Duke Energy North America Duke Energy Washington County LLC	OH-0254	8/14/2003	SO2	Emergency Diesel Fire Pump	0.21	tons/year	Low sulfur fuel, combustion control
Iowa Fertilizer Company	IA-0105	10/26/2012	Visible Emissions	Fire Pump	5	% 6 minute average	Good Combustion Practices
Entergy Louisiana LLC Ninemile Point Electric Generating Plant	LA-0254	8/16/2011	VOC	Emergency Fire Pump	1	g/hp-hr annual average	Ultra low sulfur diesel and good combustion practices
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Fire Pump	0.25	g/kw-hr average of 3 stack tests	Good Combustion Practices
Iowa Fertilizer Company	IA-0105	10/26/2012	VOC	Fire Pump	0.03	tons/year rolling 12 month total	Good Combustion Practices
Ohio Valley Resources, LLC	TBD	9/25/2013	VOC	Diesel-Fired Emergency Firewater Pump	0.141	g/hp-hr 3 hour average	good combustion practices

Notes:
Highlighted fields represent the lowest limit in common units (e.g., lb/MMBtu). Other units may be shown; however, there is not enough information to convert to common units or averaging times.

ATTACHMENT B BACT COST SUMMARY

Att B KNO
Restart
Oxidation Catalyst for CO&VOC Control
Package Boilers

VOC Control Efficiency (%)	80
CO Control Efficiency (%)	99

Facility Input Data

Item	Value	
Total Hours per year	8760	
Economic Life, years	10	
Interest Rate (%)	7	
CFR	0.1424	
SFF		
Source(s) Controlled	Package Boilers	
Rated Heat Input (MMBtu/hr)	243	
Total Flowrate (acfm)	161,157	
VOC Emission Rate (lb/hr)	1.30	
VOC Emissions (tpy)	5.69	
CO Emission Rate (lb/hr)	8.99	
CO Emissions (tpy)	39.38	
Site Specific Electricity Cost ($/kWh)	0.101	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
Site Specific Operating Labor Cost ($/hr)	$48.83	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
Site Specific Maint. Labor Cost ($/hr)	$48.83	(Vendor provided in 2013 - Adjusted for 8.51% inflation)

Capital Costs

	Value	Basis	
Direct Costs			
1.) Purchased Equipment Cost			
a.) Equipment cost + auxiliaries	$169,172	WE ENERGIES reference	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
b.) Instrumentation	$16,900	0.10 x A	
c.) Sales taxes	$11,800	0.07 x A	
d.) Freight	$8,500	0.05 x A	
Total Purchased equipment cost, (PEC)	$206,372	B = 1.22 x A	
2.) Direct installation costs			
a.) Foundations and supports	$16,500	0.08 x B	
b.) Handling and erection	$28,900	0.14 x B	
c.) Electrical	$8,300	0.04 x B	
d.) Piping	$4,100	0.02 x B	
e.) Insulation for ductwork	$2,100	0.01 x B	
f.) Painting	$2,100	0.01 x B	
Total direct installation cost	$62,000	0.30 x B	
3.) Site preparation	NA	As Required, SP	
4.) Buildings	NA	As Required, Bldg.	
Total Direct Cost, DC	$268,400	1.30B + SP + Bldg.	
Indirect Costs (installation)			
5.) Engineering	$20,600	0.10 x B	
6.) Construction and field expenses	$10,300	0.05 x B	
7.) Contractor fees	$20,600	0.10 x B	
8.) Start-up	$4,100	0.02 x B	
9.) Performance test	$2,100	0.01 x B	
10.) Contingencies	$6,200	0.03 x B	
11.) Maintenance Cost			
Total Indirect Cost, IC	$63,900	0.31B + Other	
Total Capital Investment (TCI) = DC + IC	**$332,300**	**1.61B + SP + Bldg. + Other**	

CO Control Efficiency (%)	99

Annual Costs

Item	Value	Basis	Source	
1) Electricity				
Reagent Pump Requirement (kW)	1,000		Estimate	
Electric Power Cost ($/kWh)	0.10			
Cost ($/yr)	$884,009			
2) Operating Costs				
Operating Labor Requirement (hr/hours of op	0.5	Estimate - 1/2 hr/shift	N/A	
Unit Cost ($/hr)	$48.83	Estimate	N/A	
Labor Cost ($/yr)	$26,730	Calculation	N/A	
Total Operating Costs	**$910,739**		Estimate	
3) Supervisory Labor				
Cost ($/yr)	$4,010	15% Operating Labor	OAQPS	
4) Maintenance				
Maintenance Labor Req. (hr/year)	300.0		Estimate	
Catalyst Replacement Labor Req. (hr/yr)	560.0		Estimate	
Unit Cost ($/hr)	$48.83	Facility Data	Estimate	
Labor Cost ($/yr)	$41,990	Calculation	N/A	
Material Cost ($/yr)	$41,990	100% of Maintenance Labor	OAQPS	
Total Cost ($/yr)	$83,980	Calculation	N/A	
5) Catalyst Replacement				
Catalyst Cost ($)	$112,781		WE ENERGIES	(Vendor provided in 2013 - Adjusted for 8.51%
Sales Tax ($)	$0	0% Sales Tax	Estimate	
Catalyst Life (yrs)	5	n	Estimate	
Interest Rate (%)	7	i	Estimate	
Factor	0.174			
Annual Cost ($/yr)	$19,610	(Volume)(Unit Cost)(CRF)	N/A	
6) Indirect Annual Costs				
Overhead	$68,830	60% of O&M Costs	OAQPS	
Administration	$6,650	2% of Total Capital Investment	OAQPS	
Property Tax	$3,320	1% of Total Capital Investment	OAQPS	
Insurance	$3,320	1% of Total Capital Investment	OAQPS	
Capital Recovery	$31,250	20 yr life; 7% interest (-cat. cost)	OAQPS	
Total Indirect ($/yr)	$113,370			

Total Annualized Cost ($/yr)	**$1,131,700**
Total VOC Controlled (tpy)	**4.555**
Total CO Controlled (tpy)	**38.982**
VOC Cost Effectiveness ($/ton)	**$248,400**
CO Cost Effectiveness ($/ton)	**$29,000**

Att B KNO
Restart
Oxidation Catalyst for CO&VOC Control
Waste Heat Boiler/Solar Turbine

VOC Control Efficiency (%)	80
CO Control Efficiency (%)	99

Facility Input Data

Item	Value	
Total Hours per year	8760	
Economic Life, years	10	
Interest Rate (%)	7	
CFR	0.1424	
SFF		
Source(s) Controlled	Waste Heat Boilers/Solar Turbines	
Rated Heat Input (MMBtu/hr)	102.172	
Total Flowrate (acfm)	46,750	Original flowrate from 2013 cost estimate
VOC Emission Rate (lb/hr)	0.37	
VOC Emissions (tpy)	1.61	
CO Emission Rate (lb/hr)	11.14	
CO Emissions (tpy)	48.78	
Site Specific Electricity Cost ($/kWh)	0.101	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
Site Specific Operating Labor Cost ($/hr)	$48.83	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
Site Specific Maint. Labor Cost ($/hr)	$48.83	(Vendor provided in 2013 - Adjusted for 8.51% inflation)

Capital Costs

	Value	Basis	
Direct Costs			
1.) Purchased Equipment Cost			
a.) Equipment cost + auxiliaries	$71,130	WE ENERGIES reference	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
b.) Instrumentation	$7,100	0.10 x A	
c.) Sales taxes	$5,000	0.07 x A	
d.) Freight	$3,600	0.05 x A	
Total Purchased equipment cost, (PEC)	$86,830	B = 1.22 x A	
2.) Direct installation costs			
a.) Foundations and supports	$6,900	0.08 x B	
b.) Handling and erection	$12,200	0.14 x B	
c.) Electrical	$3,500	0.04 x B	
d.) Piping	$1,700	0.02 x B	
e.) Insulation for ductwork	$900	0.01 x B	
f.) Painting	$900	0.01 x B	
Total direct installation cost	$26,100	0.30 x B	
3.) Site preparation	NA	As Required, SP	
4.) Buildings	NA	As Required, Bldg.	
Total Direct Cost, DC	$112,900	1.30B + SP + Bldg.	
Indirect Costs (installation)			
5.) Engineering	$8,700	0.10 x B	
6.) Construction and field expenses	$4,300	0.05 x B	
7.) Contractor fees	$8,700	0.10 x B	
8.) Start-up	$1,700	0.02 x B	
9.) Performance test	$900	0.01 x B	
10.) Contingencies	$2,600	0.03 x B	
11.) Maintenance Cost			
Total Indirect Cost, IC	$26,900	0.31B + Other	
Total Capital Investment (TCI) = DC + IC	**$139,800**	**1.61B + SP + Bldg. + Other**	

Annual Costs

Item	Value	Basis	Source	
1) Electricity				
Reagent Pump Requirement (kW)	1,000		Estimate	
Electric Power Cost ($/kWh)	0.10			
Cost ($/yr)	$884,009			
2) Operating Costs				
Operating Labor Requirement (hr/hours of operation)	0.5	Estimate - 1/2 hr/shift	N/A	
Unit Cost ($/hr)	$48.83	Estimate	N/A	
Labor Cost ($/yr)	$26,730	Calculation	N/A	
Total Operating Costs	**$910,739**		Estimate	
3) Supervisory Labor				
Cost ($/yr)	$4,010	15% Operating Labor	OAQPS	
4) Maintenance				
Maintenance Labor Req. (hr/year)	300.0		Estimate	
Catalyst Replacement Labor Req. (hr/yr)	230.0		Estimate	
Unit Cost ($/hr)	$48.83	Facility Data	Estimate	
Labor Cost ($/yr)	$25,880	Calculation	N/A	
Material Cost ($/yr)	$25,880	100% of Maintenance Labor	OAQPS	
Total Cost ($/yr)	$51,760	Calculation	N/A	
5) Catalyst Replacement				
Catalyst Cost ($)	$47,420		WE ENERGIES	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
Sales Tax ($)	$0	0% Sales Tax	Estimate	
Catalyst Life (yrs)	5	n	Estimate	
Interest Rate (%)	7	i	Estimate	
Factor	0.174			
Annual Cost ($/yr)	$8,250	(Volume)(Unit Cost)(CRF)	N/A	
6) Indirect Annual Costs				
Overhead	$49,500	60% of O&M Costs	OAQPS	
Administration	$2,800	2% of Total Capital Investment	OAQPS	
Property Tax	$1,400	1% of Total Capital Investment	OAQPS	
Insurance	$1,400	1% of Total Capital Investment	OAQPS	
Capital Recovery	$13,150	20 yr life; 7% interest (-cat. cost)	OAQPS	
Total Indirect ($/yr)	$68,250			
Total Annualized Cost ($/yr)	**$1,043,000**			
Total VOC Controlled (tpy)	**1.288**			
Total CO Controlled (tpy)	**48.292**			
VOC Cost Effectiveness ($/ton)	**$809,800**			
CO Cost Effectiveness ($/ton)	**$21,600**			

Att B
KNO Restart
Low NOx Burners for Waste Heat Boilers

Source	**Waste Heat Boiler**
Rated Heat Input (MMBtu/hr)	46.729
Baseline Emissions	20.1
Control Efficiency	7.20%

	COST COMPONENT:	**COST (x $1000)**	
DIRECT COSTS			
	Purchased Equipment Costs (Included in TCI)		
	Initial Equipment Costs		
	Instrumentation		
	Freight		
	Taxes		
	Subtotal - Purchased Equipment Costs	**912.57**	(Vendor provided in 2013 - Adjusted for 8.51% infl
	Direct Installation Costs(Included in TCI)		
	Foundations & supports; handling & erection; electrical; piping; etc. (25% of PEC)		
	Site Preparation / Buildings (25% of PEC)		
	Subtotal - Direct Installation Costs	**214.85**	(Vendor provided in 2013 - Adjusted for 8.51% infl
TOTAL DIRECT COSTS (TDC)			
INDIRECT INSTALLATION COSTS			
	Engineering Costs (10% of Purchased Equip Costs)		
	Construct. & Field Expenses (5% of Purchased Equip Costs)		
	Contractor Fees (10% Purchased Equip Costs)		
	Start-up and Performance Test (2% of Purchased Equip Costs)		
	Contingency (3% of Purchased Equip Costs)		
TOTAL INDIRECT COSTS		**0.00**	
TOTAL CAPITAL INVESTMENT (TCI)		**1127.42**	

	COST COMPONENT:	**COST (x $1000)**
ANNUAL DIRECT COSTS		
	Operation and Maintenance Labor	
	Operating Labor	0.00
	O&M Supervision	0.00
	Maintenance Labor and Material (2.75% of PEC)	
	Subtotal - Operation and Maintenance Labor	**0.00**
	Utilities	
	Subtotal - Utilities	**0.00**
TOTAL ANNUAL DIRECT COSTS		**0.00**

	COST COMPONENT:		**COST (x $1000)**
INDIRECT COSTS			
	Overhead (not applicable)		0.00
	Property Tax (not applicable)		0.00
	Insurance (negligible)		0.00
	Administration (not applicable)		0.00
TOTAL INDIRECT COSTS			0.00
TOTAL ANNUAL O&M COSTS			**0.00**
CAPITAL RECOVERY FACTOR			
	Equipment Life (years) =	10	
	Interest Rate (%) =	7	
	Capital Recovery Factor		0.1424
CAPITAL RECOVERY COSTS			
	TOTAL CAPITAL REQUIREMENT		1127.42
	TOTAL ANNUAL CAPITAL REQUIREMENT		**160.52**
TOTAL ANNUALIZED COST (Total annual O&M cost and annualized capital cost)			**160.52**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)			**1.44**
COST-EFFECTIVENESS			
	ENVIRONMENTAL BASIS ($ per ton pollutant removed)		**$111,105**

Baseline Emissions =
Heat Input Capacity (46.729 MMBtu/hr) * AP-42 CO Ef. Sm. Boiler (100 lb/10^6 scf) * (1 MMBtu/ 1,020 scf) * (8760 hrs/1 yr) * (1 ton/2000 lbs)

Att B
KNO Restart
Water injection for NOx control on Solar Turbines

Source	**Solar Turbine**
Rated Heat Input (MMBtu/hr)	55.443
Baseline Emissions	9.96
Control Efficiency	76.00%

	COST COMPONENT:	COST (x $1000)	
DIRECT COSTS			
	Purchased Equipment Costs (Included in TCI)		
	Initial Equipment Costs		
	Instrumentation		
	Freight		
	Taxes		
	Subtotal - Purchased Equipment Costs	**490.47**	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
	Direct Installation Costs(Included in TCI)		
	Foundations & supports; handling & erection; electrical; piping; etc. (25% of PEC)		
	Site Preparation / Buildings (25% of PEC)		
	Subtotal - Direct Installation Costs	**0.00**	
TOTAL DIRECT COSTS (TDC)			
INDIRECT INSTALLATION COSTS			
	Engineering Costs (10% of Purchased Equip Costs)		
	Construct. & Field Expenses (5% of Purchased Equip Costs)		
	Contractor Fees (10% Purchased Equip Costs)		
	Start-up and Performance Test (2% of Purchased Equip Costs)		
	Contingency (3% of Purchased Equip Costs)		
TOTAL INDIRECT COSTS		**0.00**	
TOTAL CAPITAL INVESTMENT (TCI)		**490.47**	

	COST COMPONENT:	COST (x $1000)	
ANNUAL DIRECT COSTS			
	Operation and Maintenance Labor		
	Operating Labor	0.00	
	O&M Supervision	0.00	
	Maintenance Labor and Material	18.21	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
	Subtotal - Operation and Maintenance Labor	**18.21**	
	Utilities		
	Power	4.96	(Vendor provided in 2013 - Adjusted for 8.51% inflation)
	Subtotal - Utilities	**4.96**	
TOTAL ANNUAL DIRECT COSTS		**23.17**	

	COST COMPONENT:		COST (x $1000)
INDIRECT COSTS			
	Overhead (not applicable)		0.00
	Property Tax (not applicable)		0.00
	Insurance (negligible)		0.00
	Administration (not applicable)		0.00
TOTAL INDIRECT COSTS			0.00
TOTAL ANNUAL O&M COSTS			**23.17**
CAPITAL RECOVERY FACTOR			
	Equipment Life (years) =	10	
	Interest Rate (%) =	7	
	Capital Recovery Factor		0.1424
CAPITAL RECOVERY COSTS			
	TOTAL CAPITAL REQUIREMENT		490.47
	TOTAL ANNUAL CAPITAL REQUIREMENT		**69.83**
TOTAL ANNUALIZED COST (Total annual O&M cost and annualized capital cost)			**93.00**
TONS OF POLLUTANT REMOVED PER YEAR (baseline * control efficiency)			**7.57**
COST-EFFECTIVENESS	**ENVIRONMENTAL BASIS ($ per ton pollutant removed)**		**$12,291**

Baseline Emissions =
Heat Input Capacity (55.443 MMBtu/hr) * SCR Controlled Emission Rate (0.041 lb/MMBtu) * (8760 hrs/1 yr) * (1 ton/2000 lbs)

ERM

APPENDIX D AMBIENT AIR MODELING DEMONSTRATION REPORT

Report for Dispersion Modeling Analysis

Agrium KNO Facility

PREPARED FOR
Nutrien

DATE
23 July 2025

REFERENCE
0781074

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Report for Dispersion Modeling Analysis

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EXECUTIVE SUMMARY

As part of a new construction permit application, Nutrien prepared dispersion modeling summarizing the results of the Prevention of Significant Deterioration (PSD) air quality impact analysis for emissions of NO_X, CO, PM_{10} and $PM_{2.5}$ resulting from the Kenai Nitrogen Operations (KNO). The modeling results are prepared in a format consistent with the modeling protocol for this project and consistent with the ADEC document "Air Quality Modeling Protocol Outline, PSD Permit Applications", Version 1.6, dated April 18, 2018 (ADEC 2018).

This report demonstrates that all applicable increments and standards are protected, as shown in Table ES-1.

TABLE ES-1 – SUMMARY OF MODELING RESULTS

MODELING SUMMARY		Class II SIL		Class II Increment		NAAQS/AAAQS		Class I SIL	
Pollutant	Averaging Period	Threshold	Max Result	Threshold	Max Result	Threshold	Max Result	Threshold	Max Result
NO_2	Annual	1	5.99	25	6.67	100	14.67	0.1	0.006
NO_2	1-hour	7.5	157.87	-	-	188	169.50	-	-
PM_{10}	Annual	1	1.29	17	1.40	-	-	0.2	0.01
PM_{10}	24- hour	5	16.95	30	21.25	150	44.84	0.3	0.172
$PM_{2.5}$	Annual	0.13	0.82	4	0.93	9	4.85	0.03	0.009
$PM_{2.5}$	24- hour	1.2	6.67	9	6.83	35	18.16	0.27	0.16
CO	1- hour	2,000	7033.88	-	-	40,000	6426	-	-
CO	8- hour	500	2761.93	-	-	10,000	2804	-	-
Ammonia	8- hour	-	-	-	-	2,100	223.4	-	-

1. INTRODUCTION

This document presents a dispersion modeling report to the Alaska Department of Environmental Conservation (ADEC) summarizing the results of the Prevention of Significant Deterioration (PSD) air quality impact analysis for emissions of NO_X, CO, PM_{10} and $PM_{2.5}$ resulting from the Kenai Nitrogen Operations (KNO). The modeling results are prepared in a format consistent with the modeling protocol for this project and consistent with the ADEC document "Air Quality Modeling Protocol Outline, PSD Permit Applications", Version 1.6, dated April 18, 2018 (ADEC 2018).

2. PROJECT DESCRIPTION

KNO is proposing to restart sources associated with Plants 4, 5, and 6 at its Kenai, Alaska site. A summary of potential annual emissions from significant sources is provided in Attachment A with anticipated maximum hourly emissions shown in Attachment B. These emission rates reflect the application of Best Available Control Technology (BACT) to emission units that have potential emissions of PSD-regulated air pollutants.

The restarted KNO facility will include liquid ammonia production equipment and granulated urea production equipment. The plant will also include support equipment necessary for these operations, including energy production. Major operations at the site will include the following:

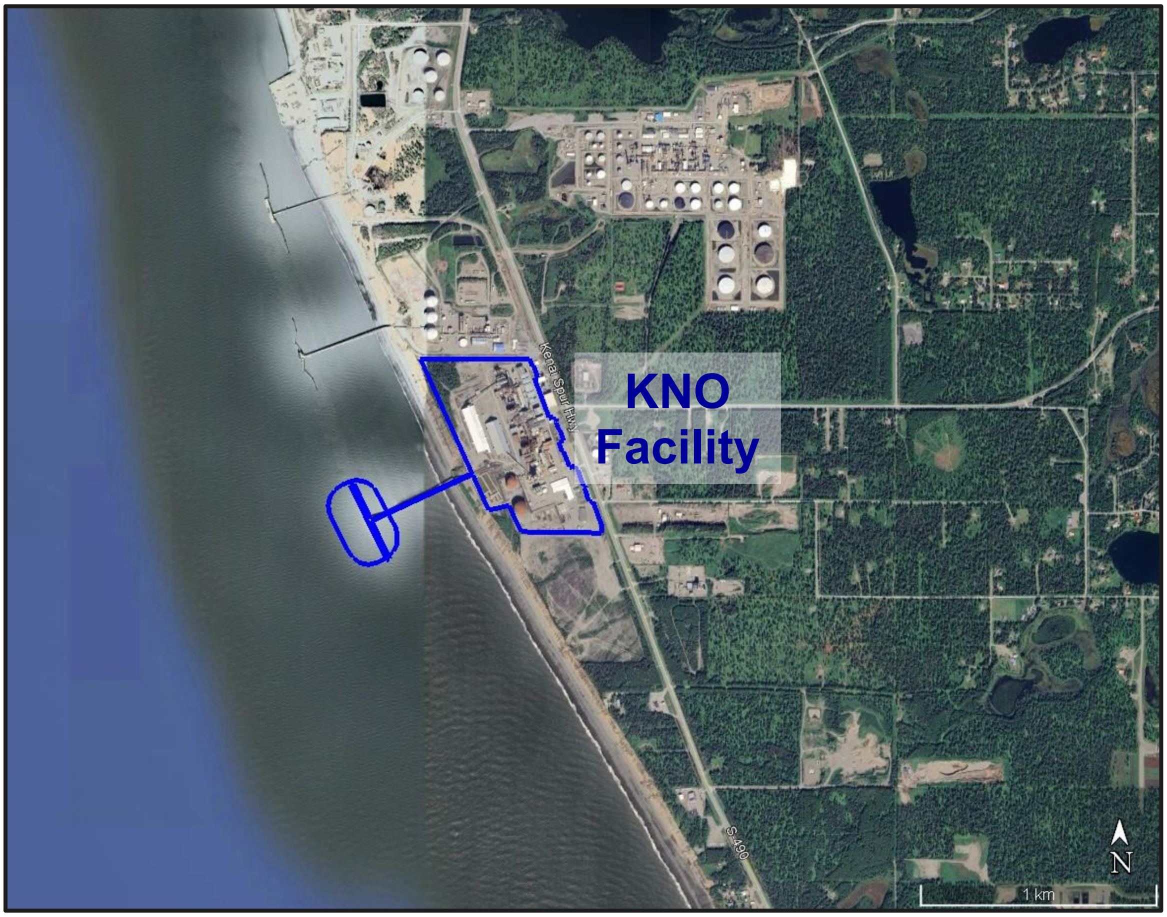
- Ammonia plant with a design capacity of 2160 tons per day of liquid ammonia from natural gas via steam reforming and synthesis gas generation by CO conversion, CO_2 removal, and methanation. Liquid ammonia may be shipped by ocean vessel as a product from the facility or used in the production of urea.
- Urea plant with a design capacity of 2400 tons per day of granulated urea produced by reacting liquid ammonia and gaseous carbon dioxide. Granulated urea is shipped by ocean vessel as a product from the facility.
- Three natural gas-fired package boilers to produce steam necessary for production operations at the site.
- Five Solar turbines to produce electricity that are each equipped with a waste heat boiler.
- Additional auxiliary and support equipment, including a fuel-fired back-up water supply pump, a fuel-fired fire pump, three flares, and a startup heater.

2.1 PROJECT LOCATION

The KNO facility, shown in Figure 1 and Figure 2, is located at Mile 21 Kenai Spur Hwy, Kenai, Alaska on the eastern shore of the Cook Inlet. The facility is located within the Cook Inlet Intrastate Air Quality Control Region in Kenai Peninsula Borough, which is in attainment for all criteria pollutants. There are two Class I areas located within the vicinity of the project site, the nearest being Tuxedni National Wildlife Refuge which is 86.8 kilometers to the southwest. Also, Denali National Park is located 199.3 km to the north of the project site.

FIGURE 1 - LOCATION OF KNO FACILITY

FIGURE 2 - SATELLITE VIEW OF KNO FACILITY



2.2 PROJECT CLASSIFICATION

KNO has determined that the restart of its facility will be regulated as a major source under PSD rules for NO_X, PM_{10}, $PM_{2.5}$, CO, and ozone. The site will also have ammonia (NH_3) emissions which are not identified as a regulated air pollutant under Prevention of Significant Deterioration (PSD) rules but are regulated under State of Alaska rules.

2.3 POLLUTANTS AND AVERAGING TIMES

The dispersion modeling analysis includes atmospheric dispersion modeling using a U.S. EPA-approved model to simulate the downwind transport and predicted off-site concentrations of NO_2, CO, PM_{10} and $PM_{2.5}$. The analysis was performed using EPA-approved dispersion models to provide a quantitative analysis of off-site impacts from the project. The analysis also considers secondary particulate matter formation using qualitative analyses (see Section 10).

Although the site will have VOC emissions above major source thresholds, modeling is not required for VOC emissions or for the impact that VOC emissions will have on ozone ambient air concentrations. KNO has also performed a dispersion modeling analysis for NH_3 emissions to demonstrate that the site will comply with ambient standards established by the State of Alaska. Table 2 provides a simple listing of the pollutants and averaging times that were assessed with air quality modeling. Maximum hourly and annual emissions are provided for all sources associated with the restart in Attachment A and Attachment B.

TABLE 2 - PROJECT CLASSIFICATIONS, POLLUTANTS, AND AVERAGING TIMES

Project Classification	Pollutants to be Assessed Due to Project Classification							Comments
	NO_2	SO_2	PM_{10}	$PM_{2.5}$	CO	O_3	Pb	
PSD (18 AAC 50.306)	☒	☐	☒	☒	☒	☒	☐	
18 AAC 50.502(c)(2)(A)	☐	☐	☐	☐	--	--	--	
18 AAC 50.502(c)(2)(B)	--	☐	--	--	--	--	--	
18 AAC 50.502(c)(3)	☐	☐	☐	☐	☐	--	--	
18 AAC 50.502(c)(4)	☐	☐	☐	☐	☐	--	--	
18 AAC 50.508(3)	☐	☐	☐	☐	☐	☐	☐	
18 AAC 50.508(6)	☐	☐	☐	☐	☐	☐	☐	
Regulatory Provision	**Pollutants to be Assessed Due to Department Request**							**Comments**
	NO_2	SO_2	PM_{10}	$PM_{2.5}$	CO	O_3	Pb	
18 AAC 50.540(c)(2)(D)	☐	☐	☐	☐	☐	☐	☐	
18 AAC 50.201(a)	☐	☐	☐	☐	☐	☐	☐	
18 AAC 50.540(l)	☐ (1-hour NO_2)							
Other:	☐	☐	☐	☐	☐	☐	☐	

Averaging Period	**Averaging Periods to be Modeled**								**Comments**
	NO_2	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**O_3**	**Pb**	**Other***	
1-hour	☒	☐	--	--	☒	--	--	☐	1-hr NO2 for NAAQS only
3-hour	--	☐	--	--	--	--	--	☐	
8-hour	--	--	--	--	☒	☐	--	☒	*Ammonia (8-hr)
24-hour	--	☐	☒	☒	--	--	--	☐	
3-month	--	--	--	--	--	--	☐	☐	
Annual	☒	☐	☒	☒	--	--	--	☐	Annual PM10 for PSD Increment only

2.4 STATIONARY SOURCE DESCRIPTION

A description of processes affected by the restart of sources at the KNO facility is provided in Section 1. The restart of the KNO facility will not alter the locations of the present structures or EUs. A Facility Layout Drawing and 3D building depiction of existing structures, EUs, fence lines, and the ambient air boundary are provided in Figure 3 and Figure 4 located in Section 11.0 of this document.

This updated assessment of air quality impacts does include a small stack height increase for the granulator stacks (15 ft increase from 140 feet to 155 feet) in order to demonstrate compliance with applicable increments and standards.

3. PRE-CONSTRUCTION MONITORING

KNO has determined that the restart of its facility will be regulated as a major source under PSD rules for NO_X, CO, PM_{10}, and $PM_{2.5}$. To the extent that ambient monitoring requirements under §52.21(m) would otherwise apply to pollutants emitted by the new facility in major amounts, predicted ground-level concentrations for most pollutants will be evaluated to determine if the significant monitoring concentrations provided in §52.21(i)(5)(i) are exceeded.

For $PM_{2.5}$, however, EPA has been precluded from using the significant monitoring concentration as an exemption for $PM_{2.5}$ preconstruction monitoring. Consequently, KNO previously completed $PM_{2.5}$ preconstruction monitoring with ADEC approval. KNO also completed preconstruction monitoring for PM_{10} so that data are available in the event modeled PM_{10} concentrations exceed significant monitoring concentrations. A summary of PM_{10} and $PM_{2.5}$ monitoring data fo the twelve month period beginning October 1, 2013 and ending September 30, 2014 is provided below:

- $PM_{2.5}$ annual average = 3.6 µg/m^3
- $PM_{2.5}$ seventh high 24-hour average = 8.0 µg/m^3
- PM_{10} annual average = 10.0 µg/m^3
- PM_{10} 2nd high 24-hour average = 58.5 µg/m^3

As specified in §52.21(i)(5)(i)(f), no significant monitoring concentration (SMC) exists for ozone. Because uncontrolled VOC emissions and NO_X emissions will exceed 100 tons per year, preconstruction monitoring is also required for ozone air quality. KNO performed this monitoring during the calendar year 2014 ozone season, as approved by ADEC. It is believed that this monitored data is still representative of background ambient ozone concentrations for the project site today. KNO has also completed a secondary ozone impacts analysis, discussed in Section 19. A summary of ozone monitoring results from April 1, 2014 through August 31, 2014 is provided below:

TABLE 3 - OZONE CONCENTRATIONS MEASURED AT KNO AMBIENT AIR QUALITY MONITORING SITE

KNO Ambient Air Quality Monitoring Site				
Parameter	NAAQS 8-hour Average (ppb)	Period Average (ppb)	8-hour 1st high value (ppb)	NAAQS exceedances
Ozone	70	29.4	60.9	None

The table below summarizes the maximum modeled impacts for CO, NO_2 and PM_{10} compared to the SMCs:

TABLE 4 - COMPARISON OF MAXIMUM MODELED CONCENTRATIONS TO SIGNIFICANT MONITORING CONCENTRATION THRESHOLDS

Pollutant	Averaging Period	Modeled Maximum Impact (µg/m³)	SMC (µg/m³)
CO (Startup Scenario)	8-hr	2,762	575
CO (All Other Operating Scenarios)	8-hr	230	575
NO_2	Annual	6.0	14
PM_{10}	24-hr	17.0	10

The maximum predicted impacts for NO2 is below the SMC. Therefore, ambient air monitoring is not required for NO2. The maximum predicted impact for PM10 is above the SMC, indicating that preconstruction monitoring for PM10 (which was completed as described above) is necessary.

For CO, although the Startup operating scenario results in a predicted maximum air quality impact above the SMC, KNO anticipates that it will be operating under this scenario for no more than 200 hours per year (2.3% of the operating hours). The remainder of time, KNO will be operating under one of the other operating scenarios, all of which are well below the SMC for CO.

Although ambient monitoring for CO should not be necessary given the infrequent operation of the plant under the Startup operating scenario, KNO believes that there is sufficient ambient CO data to characterize existing CO air quality in the vicinity of the plant. Union Oil Company of California operated a CO ambient air quality monitor from May 1, 2008 through April 30, 2009 at its Swanson River Station. This site is located approximately 25 km east northeast of KNO's site. KNO believes that CO air quality data collected at this site is representative of CO air quality in the vicinity of its site for the following reasons:

- To the extent that there are combustion CO sources in the vicinity of the KNO site, there are similar combustion CO sources in the vicinity of the Swanson River Station. None of the sources located in the vicinity of KNO or in the vicinity of the Swanson River monitoring station are considered to be particularly large CO sources.
- High ambient CO concentrations in the US are typically attributable to motor vehicle emissions, particularly from motor vehicles operating at idle or low speeds. Although a highway is located adjacent to the KNO site, vehicle volumes on this roadway are relatively low and vehicle speeds are high. As a result, KNO expects that motor vehicles would have little impact on ambient CO concentrations in the vicinity of its plant.

KNO will utilize CO air quality data collected at the Swanson River Station to characterize existing CO air quality in the vicinity of its plant and to establish background CO concentrations. A summary of these data in comparison to the Alaska Ambient Air Quality Standards (AAAQS) is provided below.

- Maximum 1-hour concentration = 2.5 mg/m^3 (AAAQS = 40.0 mg/m^3)
- Maximum 8-hour concentration = 1.1 mg/m^3 (AAAQS = 10.0 mg/m^3)

4. SOURCE IMPACT ANALYSIS

4.1 MODEL SELECTION

The air quality modeling analysis employed the AMS/EPA Regulatory Model (AERMOD) version 24142. AERMOD allows for simulation of multiple sources (and source types) simultaneously, while making the correct accounting for building downwash and building cavity effects.

Pollutants modeled included NO_X, CO, and particulate matter (PM_{10} and $PM_{2.5}$). Although the site will have VOC emissions above major source thresholds, modeling is not required for VOC emissions or for the impact that VOC emissions will have on ozone ambient air concentrations. An assessment was performed for secondary ozone impacts as discussed in Section 19. An analysis for ammonia was also performed to demonstrate that ammonia emissions do not result in an exceedance of ambient standards established under Alaska rules.

4.2 MODEL OPTIONS

The AERMOD modeling used regulatory default options, including:

- Complex terrain – receptor elevations and hill scales
- Rural dispersion coefficients
- Regulatory default model parameters, including:
  - Calm correction
  - Buoyancy induced dispersion
  - Final plume rise
  - Default wind profile coefficients
  - Default vertical potential temperature gradients
  - Stack-tip downwash
  - Direction specific building downwash

4.3 OPERATING SCENARIOS

The operating scenarios that were assessed in the modeling are discussed in Section 8.2.

5. METEOROLOGY

5.1 REFINED METEOROLOGY

The modeling analysis used the most recent five years (2020-2024) of meteorological data from the surface station at Kenai Municipal Airport (station ID 26523) and the upper air station in Anchorage, AK (station ID 26409). ADEC reviewed and approved the use of this data for the modeling analysis.

5.1.1 REPRESENTATIVENESS

Surface data from Kenai Municipal Airport are representative of the project site because it is close by (approximately 10 miles to the south), and there is very little terrain/topographic differences between the project site and the airport site.

5.1.2 DATA PROCESSING

The data were processed with AERMET version 24142, supplemented with 1-min and 5-min wind speed and direction observations using AERMINUTE version 15272. AERSURFACE version 24142 was used to calculate surface characteristics from 2016 National Land Cover Dataset (NLCD) land use files.

Wind rose data compiled from hourly surface observations over calendar years 2020 through 2024 from the Kenai Municipal Airport are provided in Attachment C. The wind rose shows that surface winds in this area are from the northeast quadrant more often than other directions. The next most common wind direction is from the southwest.

6. COORDINATE SYSTEM

The location coordinates of all EUs, receptors, and buildings are defined using the Universal Transverse Mercator (UTM) coordinates, Zone 5.

7. TERRAIN AND LAND USE ANALYSIS

The terrain in the immediate vicinity of the project site is relatively flat, raised up from sea level to elevations at or around 130 feet ASL. Terrain elevations along the shoreline with the Cook Inlet rise quickly (within approximately 250 feet from shoreline) from sea level to elevations of approximately 130 feet. AERSURFACE version 24142 was used to analyze land use in a 3-km radius around the project site using the Auer method which confirms the area is rural (Attachment D).

AERMAP version 24142 was used to process 1/3 arc-second resolution National Elevation Data (NED) to determine source and receptor elevations.

8. EU INVENTORY

8.1 STATIONARY SOURCE EMISSIONS

The KNO emission units have not changed since the previous modeling was performed. The only changes to emission rates are due to using more recent AP-42 emission factors for certain sources that U.S. EPA updated after the previous modeling was performed. Therefore, all project sources, including volume sources, will be modeled using the same assumptions that were made in the 2019 Modeling Analysis. This includes assumptions on emission rates (except as updated with more recent emission factors), stack parameters, building parameters, operating hours, and hoteling emissions from urea and ammonia ship loading activities.

Annual emission rates used in the long-term modeling analyses are provided in Attachment A while maximum hourly emission rates used in the short-term modeling analyses are provided in Attachment B. For most sources, annual emission rates are computed based on maximum hourly emissions multiplied by 8,760 hours per year. Generally, these sources have estimated emission rates that are based on full potential to emit, without schedule or throughput restrictions. Other sources are intermittent sources where annual emission rates have been computed based on anticipated operational schedule expectations, which impose operational hour limitations. Stack parameters utilized in the modeling for KNO sources are provided in Attachment E. For annual NO_2, PM_{10}, and $PM_{2.5}$ modeling, all sources with potential NO_2, PM_{10}, or $PM_{2.5}$ emissions were modeled using ton per year emission rates provided in Attachment A. Annual emission rates for each pollutant were divided by 8,760 hours per year to compute emission rates to use as model input for each source. For short-term modeling of sources that will be permitted to operate continuously, KNO modeled these sources using the same pound per hour emission rates as described for annual modeling above.

For intermittently operated sources, KNO has evaluated operations at the facility to identify the circumstances under which intermittent sources are operated. KNO has evaluated EPA modeling guidance to determine how these sources should be characterized in short term modeling analyses. KNO's understanding of modeling guidance for intermittent sources is briefly discussed below.

EPA modeling guidance draws a distinction between those air quality standards that are deterministic (1-hour CO, 8-hour CO, and 24-hour PM_{10}, and 24-hour $PM_{2.5}$) and those standards that are probabilistic (1-hour NO_2, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$). For standards that are deterministic, KNO believes that short term modeling for intermittent sources should be performed using maximum hourly emission rates as permitted in various operating scenarios. For the 1-hour NO_2 standard, KNO reviewed modeling guidance provided in a March 1, 2011, memorandum titled "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard" (Fox 2011). This document provides the following in regard to the treatment of intermittent sources in 1-hour NO_2 modeling assessments:

> "Recommends that compliance demonstrations for the 1-hour NO_2 NAAQS address emission scenarios that can logically be assumed to be relatively continuous or which occur

> frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations based on existing modeling guidelines, which provide sufficient discretion for reviewing authorities to not include intermittent emissions from emergency generators or startup/shutdown operations from compliance demonstrations for the 1-hour NO_2 standard under appropriate circumstances."

As this guidance has not changed since KNO's previous review of intermittent sources, KNO uses the same modeling approaches for each intermittent source as used in the 2019 modeling analysis. The intermittent sources and the approaches used in short-term modeling are summarized below.

Source 11 – Ammonia Tank Flare

This flare is in place to combust ammonia emissions that would occur from the over-pressurization of an ammonia storage tank. This unit is used strictly as an emergency precaution to limit emissions of ammonia to the atmosphere. There are no planned circumstances under which this flare would be used to combust ammonia emissions. Under normal operation, emissions occur from pilot combustion only. KNO modeled pilot emissions only from this unit for all short-term modeling.

Source 13 – Startup Heater

This unit is a 101 MMBtu/hr natural gas-fired heater that operates only during startup and shutdown of the Reformer, and to reduce catalyst following catalyst change out. KNO is proposing to limit the operation of this unit to a maximum of 200 hours per year, based on four startup/shutdown events per year and one catalyst change out per year. Based on EPA NO_2 modeling guidance, KNO excluded this unit from consideration in the 1-hour NO_2 modeling analysis for the site given the fact that this operation would be on a limited basis. For short-term modeling of other pollutants, KNO did not include emissions from the Startup Heater during normal operation but performed a separate modeling analysis for a "startup" operating scenario using maximum permitted hourly emissions for these assessments (i.e., 1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$).

Source 19 – Hydrogen Vent Stack

Emissions occur from this vent only during startup. KNO is proposing to limit operation of this vent to 48 hours per year based on four startups per year. This source has CO emissions only and thus was only addressed in short-term modeling related to CO air quality standards. As with the Startup Heater above, KNO did not include emissions from this unit in the normal operating scenario for the plant but performed a separate modeling analysis for a "startup" operating scenario using maximum permitted hourly CO emission rates.

Source ID 22 and Source ID 23 – Plant 4 and 5 Small Flare and Emergency Flare

As with the Ammonia Tank Flare, the Plant 4 and 5 Small Flare and Emergency Flare are primarily in place for combusting ammonia during malfunction conditions to limit ammonia emissions to the atmosphere. The only planned activities that result in the venting of ammonia to the small flare are activities associated with turnaround, which will occur once every four years. During all other operating periods, emissions from the Small Flare and Emergency Flare are assumed to be those associated with pilot operations only.

Table 5 below summarizes ammonia venting activities to the Small Flare and Emergency Flare during turnaround. This table identifies each activity that results in planned venting of ammonia to the Small Flare or the Emergency Flare, the quantity of ammonia that would be vented during each event, the sequence of this event during the turnaround period, and the total duration of each event. The sequencing of these events is such that none of the events occur at the same time. Since the Small Flare and Emergency Flare are the same height above ground level, the worst-case scenario for modeling purposes will be the scenario for either flare that results in the greatest emissions. Therefore, the greatest emissions occur from the Emergency Flare on Day 1 of the turnaround. This scenario represented the worst-case hourly emission rate for short term modeling during turnaround for the Small Flare and Emergency Flare.

TABLE 5 - SUMMARY OF PLANNED FLARING EVENTS FOR SMALL AND EMERGENCY FLARES

Description of Activity	Flare	Sequence	Ammonia Vented (lb/hr)	Duration (hr)
Reactor Draining	Emergency	Day 1	30,000	3
Synthesis Loop Depressurization	Small	Day 2	690	4
Refrigeration System Shutdown	Small	Day 3-4	60	4
Drain Underground Ammonia Tank	Small	Day 7	7.5	4
Refrigeration System Startup	Small	Day 20	30	4
PRU Cool Down	Small	Day 21	620	6

Given the fact that all flaring events described in Table 5 will occur for a short duration (a few hours once every four years), KNO excluded these emissions from the 1-hour NO_2 modeling analysis. Because there is no CO or PM emission factor associated with ammonia flaring events, there is no projected change in CO or PM emissions as a result of these events. As a result, KNO included pilot emissions only for all short-term modeling (1-hour NO_2, 1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$) for the Small Flare and the Emergency Flare.

Source IDs 47, 47B, 47C, and 47D – Urea Handling and Bulk Loading

Although urea transfer operations will be permitted to operate at a rate of up to 1000 tons per hour, annual average emissions are limited to the capacity of Plant 5, which is 100 tons per hour. For annual PM_{10} and $PM_{2.5}$ modeling, a maximum throughput of 876,000 tons per year of urea was used to compute potential annual PM_{10} and $PM_{2.5}$ emission rates from all urea handling operations. Maximum hourly PM_{10} and $PM_{2.5}$ emissions for use in 24-hour PM_{10} and 24-hour $PM_{2.5}$ modeling analyses were based on a maximum hourly handling rate of 1,000 tons per hour.

Source IDs 55 through 59 – Solar Combustion Turbines

During normal operations, the exhaust from each of the Solar Combustion Turbine, equipped with low-NOx combustor technology (e.g. SoLoNOx), is directed to a Waste Heat boiler for energy recovery. The exhaust from each Waste Heat boiler is then directed to a SCR control system to limit NOx emissions. KNO has requested that it be permitted to operate one Solar Turbine with the SoLoNOx combustor technology during normal operations in a configuration where the corresponding Waste Heat Boiler and associated SCR control system is being bypassed. This situation is expected to occur in rare instances where a Waste Heat Boiler must be taken out of service for maintenance, but continued operation of the Solar Turbine is necessary for power generation for the plant. This maintenance period is expected to last no more than one week per boiler each year. Given the rare instance where a Waste Heat Boiler would need to be taken out of service for maintenance, KNO proposes to address this operating scenario by modeling average annual emissions from a single unit to address the 1-hour NO_2 modeling analysis.

KNO has also requested that it be permitted to operate one Solar Turbine during plant turnaround without the corresponding Waste Heat Boiler and associated SCR control systems. During turnaround, one Solar Turbine is desired to provide necessary power to plant operations, however there is no steam demand at the plant since all operations that utilize steam are off-line. Although this scenario will only occur once every four years, the operation of Solar Turbines while operating with SoLoNOx combustors in a bypass mode (bypassing SCR controls) will occur for an extended period of time during turnaround. As a consequence, KNO proposes to model maximum hourly emissions of NOx, CO, PM_{10}, and $PM_{2.5}$ from one Solar Turbine while in bypass mode in order to determine compliance with the 1-hour NO_2, 1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$ standards. Because this scenario represents operations during turnaround only, equipment that would not be expected to operate during turnaround (such as Reformer, all Waste Heat Boilers, and all remaining Solar Turbines) were excluded from this operating scenario.

Source ID 65 – Diesel-Fired Well Pump

This unit provides power to the well pump in the event of a power interruption. Scheduled operations of this unit are solely for periodic checks to ensure that the unit is operational in the event of a power interruption. KNO is proposing to limit this unit to a maximum of one hour per day and 168 hours per year. KNO included annual emissions from this unit in long term modeling analyses and used the same average annual emission rate in 1-hour NO_2 modeling given the nature of its operation. Short term modeling for other pollutants (1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$) was performed using maximum hourly emission rates.

Source ID 66 – Gasoline-Fired Firewater Pump

Source ID 66, Gasoline Fired Firewater Pump – This unit provides power to a firewater pump in the event of a fire. Scheduled operations of this unit are solely for periodic checks to ensure that the unit is operational in the event of a power interruption and for training purposes. KNO is proposing to limit this unit to a maximum of four (4) hours per day and 168 hours per year. KNO included annual emissions from this unit in long term modeling analyses and used the same average annual emission rate in 1-hour NO_2 modeling given the nature of its operation. Short term modeling for other pollutants (1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$) was performed using maximum hourly emission rates.

8.2 OPERATING SCENARIOS

As noted above, KNO performed short term modeling considering four separate operating scenarios. These scenarios have not changed from the previous 2019 modeling analysis and are summarized below:

Normal Operations

For normal operations, all units other than the intermittent sources identified above were modeled using the maximum hourly emission rates summarized in Attachment B. All three flares (Ammonia Tank Flare, Plants 4 and 5 Small Flare, and Plants 4 and 5 Emergency Flare) were modeled with emissions from pilot combustion only. All Solar Combustion Turbines were modeled with exhaust from each directed to the corresponding Waste Heat Boiler and associated SCR control system. The Startup Heater and Hydrogen Vent Stack were not included in this operating scenario. The well pump engine and fire pump engine were modeled using an emission rate corresponding to 168 hours per year of operation.

Normal Operations with One Waste Heat Boiler Down

This scenario is identical with the Normal Operations scenario described above with the exception that one Solar Turbine operating with SoLoNOx combustor technology is modeled venting through a bypass stack with no SCR control system.The Waste Heat Boiler corresponding with this unit is not modeled. For the 2019 modeling analysis, a sensitivity analysis was performed to identify which Solar Turbine would result in the worst-case offsite impact when modeled in bypass mode and this worst-case unit was used in the modeling of this operating scenario.

Reformer Startup

Emissions from the Startup Heater and Hydrogen Vent Stack were modeled for the short-term modeling scenario simulating Reformer startup. The Reformer was modeled with an emission rate equal to 50% of its maximum emission rate, as the Reformer will be at approximately 50% of its maximum capacity at the time the Startup Heater goes offline. All flares were modeled with emissions from pilot combustion only. All Solar Combustion Turbines were modeled assuming corresponding Waste Heat Boilers and associated SCR control systems are in operation.

Turnaround

The turnaround operating scenario was modeled assuming one Solar Turbine operates with emissions vented through the bypass stack with no SCR control system in place, yet while still operating with low-NOx combustor technology (SoLoNOx) to help reduce NOx emissions. As discussed above, the worst-case flare operating scenario will be the Emergency Flare during Reactor Draining. Emissions associated with this activity were modeled for the Emergency Flare and emissions from pilot combustion only were modeled for other flares. All Waste Heat Boilers and all remaining Solar Turbines will not operate during turnaround and were not included in the turnaround operating scenario. The Reformer, Startup Heater, and Hydrogen Vent Stack will also not operate during this scenario and were excluded from the turnaround modeling scenario. For the 2019 modeling analysis, a sensitivity analysis was performed to identify the combination of Solar Turbines that would result in the worst-case offsite impact. This combination was used in the modeling of this operating scenario.

8.3 HOTELING EMISSIONS FROM MARINE VESSELS

In addition to direct emission sources identified and discussed in Section 8.1 above, emissions will occur from marine vessels while positioned at the KNO wharf. These emissions occur from on-board equipment necessary to maintain ship operations while marine vessels are being loaded with products from the site. KNO will generate two products that will be shipped by marine vessels, which are ammonia and granulated urea. KNO contacted ammonia and bulk urea shipping companies to obtain information on the typical operating load of such vessels and the physical characteristics of these vessels, including dimensions necessary to evaluate downwash. The information provided below and used in the air quality impact analysis is considered to be typical of such vessels, however it must be stressed that it is impossible to evaluate each marine vessel that could conceivably be used to transport ammonia or urea, as each vessel would have its own characteristics in regards to dimensions, operations, and stack characteristics.

8.3.1 AMMONIA VESSELS

Ammonia produced at the plant may be sold directly or utilized as a raw material for urea production. At maximum capacity, the urea plant will consume approximately 58% of the ammonia that is produced by Plant 4. Normal operations at the plant involve maximization of urea production so that maximum ammonia shipments would be 42% of the capacity of the ammonia plant. The Plant 4 maximum ammonia capacity is 90 tons per hour, which means that the maximum amount of ammonia that would be shipped from the plant site is approximately 331,000 tons per year (300,900 metric tons per year).

KNO obtained information on the typical configuration of marine vessels that carry ammonia from GasChem Services (GasChem) and from Clarksons Shipping (Clarksons). GasChem is a shipping company based in Hamburg, Germany that operates refrigerated ships of the type that can transport ammonia. Clarksons is a shipping broker located in London, England. A schematic for a typical ammonia ship is provided in Attachment F to this protocol. This vessel has the following dimensions:

- Ammonia Capacity = 23,000 Mt
- Length = 174 m
- Breadth = 28 m

Ammonia vessels will be loaded at a rate of 500 metric tons of ammonia per hour. It is anticipated that a vessel of the size of this vessel would be positioned at the wharf for approximately 48 hours to completely load an empty ship. Larger ships would be positioned at the wharf for a proportionally longer period of time while smaller ships (or vessels receiving a load that was less than the ship's capacity) would be positioned at the wharf for a proportionally shorter period of time.

GasChem indicates that refrigeration ships of the type that would transport ammonia from KNO will be equipped with two to three auxiliary generators that will be used to generate necessary power for onboard activities. The bulk of this energy is to maintain onboard refrigeration systems while the ship is being loaded. GasChem indicates that these generators have a typical generation capacity of 960 kW per unit, and that the expected operating level while being loaded with ammonia would be a load of 900 kW from each of the two onboard generators. GasChem indicates that this operating load would not be expected to vary much from summer to winter. These generators would be fueled with Low Sulfur Marine Gas Oil, equivalent to low sulfur #2 distillate oil. Exhaust from onboard generators exits the ship through exhaust stacks positioned in the ship's "funnel", located approximately 15 meters from the aft of the ship. GasChem provided the following typical stack parameters for exhaust from a generator operating at a load of 900 kW:

- Stack Height = 39 m
- Stack Diameter = 10 inch
- Stack Air Flow Rate = 12,698 m^3 per hour
- Stack Temperature = 340 °C

Emissions from onboard generators have been estimated using emission factors from AP-42 Compilation of Air Pollutant Emission Factors, Chapter 3.4, "Large Stationary Diesel and All Stationary Dual-fuel Engines". Specific factors used to quantify emissions for this modeling analysis are:

- Nitrogen oxides = 0.024 lb/hp-hr
- Carbon monoxide = 0.0055 lb/hp-hr
- PM_{10} = 4.3×10^{-4} lb/hp-hr
- $PM_{2.5}$ = 4.17×10^{-4} lb/hp-hr

As discussed above, GasChem provided information on a refrigerated vessel that would hold 23,000 Mt of ammonia. Based on the maximum expected ammonia throughput from the plant (300,900 Mt per year), thirteen ships of the size of the Bosun Store would be needed over the course of a year, assuming ships were completely empty and loaded completely full. Although the number of ships loaded over the course of a year may vary from this figure depending on the size and extent to which the ship carries a full load, the total hours that ships are positioned at the dock should be relatively constant, as this will be a function of the ammonia loading rate only, which will be constant at 500 Mt per hour for all ships.

Using the AP-42 emission factors identified above, an operating load of 900 kW, and annual operating hours of 624 hours (13 vessels times 48 hours per vessel), hourly and emissions have been computed and summarized in Table 6 below:

TABLE 6 - AMMONIA VESSEL HOTELING EMISSIONS (PER GENERATOR)

Pollutant	EF (lb/hp-hr)	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (TPY)	Average Annual Emissions (g/s)
NO_x	0.024	29.0	9.04	0.26
CO	0.0055	6.64	2.07	0.060
PM_{10}	0.00043	0.52	0.16	0.0046
$PM_{2.5}$	0.000417	0.50	0.16	0.0046

Modeling for the annual NO_2, PM_{10}, and $PM_{2.5}$ air quality standards was performed using the average annual emission rate provided in Table 6. Modeling for the 1-hour NO_2 standard was also performed using average annual average emissions given the intermittent nature of this source and the nature of the NO_2 standard. Modeling for the 1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$ air quality standards was performed using the maximum hourly emission rate provided in Table 6. The physical dimensions of the vessel, including the elevated structure containing crew quarters and the ship's bridge, were input into the model and treated as a building for downwash purposes.

8.3.2 UREA VESSELS

As noted previously, the maximum rated capacity of Plant 5 is 100 tons of granulated urea per hour. At this capacity, maximum theoretical urea production is 876,000 tons per year, or 796,000 Mt per year of granulated urea. Although the maximum historical granulated urea production rate at the KNO facility is 647,080 Mt per year, KNO evaluated urea vessel hoteling emissions using the conservative 796,000 Mt per year figure.

KNO obtained information on the configuration of vessels that might carry granulated urea from Pacific Northwest Ship & Cargo Services (Pacific Northwest). A schematic for a typical vessel that would transport granulated urea is provided in Attachment G. This vessel has the following dimensions:

- Urea Capacity = 27,500 Mt
- Length = 170 m
- Breadth = 27 m

Urea vessels can be loaded at a maximum rate of 1,000 metric tons of ammonia per hour; however, such vessels must be repositioned as each hold is filled, which lengthens the time for loading. It is anticipated that a vessel of the size of this vessel would be positioned at the wharf for four to five days to completely load an empty ship. Larger ships would be positioned at the wharf for a proportionally longer period of time while smaller ships (or vessels receiving a load that was less than the ship's capacity) would be positioned at the wharf for a proportionally shorter period of time.

Pacific Northwest ships of the type that would transport urea from KNO will be equipped with two to three auxiliary generators that will be used to generate necessary power for onboard activities. These generators would be used to power on-board cranes when unloading cargo, however such cranes are not required when ships are loaded with urea. Pacific Northwest indicates that these generators have a typical generation capacity of 400 kW per unit, and that the expected operating level while being loaded with urea would be a load of 240 kW from a single onboard generator. These generators would be fueled with Low Sulfur Marine Gas Oil, equivalent to low sulfur #2 distillate oil. Exhaust from onboard generators exits the ship through exhaust stacks positioned in the ship's "funnel", located approximately 15 meters from the aft of the ship. Pacific Northwest indicated that the air flow rate for a generator operating at a load of 240 kW would be approximately 8.25 kg of air per kW-hr. Based on this value, physical dimensions contained in the diagram in Attachment G, and stack temperature data from the ammonia generator exhaust, typical stack parameters for exhaust from a generator operating at a load of 240 kW would be:

- Stack Height = 29 m
- Stack Diameter = 12 inch
- Stack Air Flow Rate = 3,360 m^3 per hour
- Stack Temperature = 340° C

Emissions from onboard generators have been estimated using emission factors from AP-42 Compilation of Air Pollutant Emission Factors, Chapter 3.4, "Large Stationary Diesel and All Stationary Dual-fuel Engines". Specific factors used to quantify emissions for this modeling analysis are:

- Nitrogen oxides = 0.024 lb/hp-hr
- Carbon monoxide = 0.0055 lb/hp-hr
- PM_{10} = 4.3x10-4 lb/hp-hr
- $PM_{2.5}$ = 4.17x10-4 lb/hp-hr

As discussed above, Pacific Northwest provided information on a cargo vessel that would hold 27,500 Mt of urea. Based on the maximum expected urea throughput from the plant (796,000 Mt per year), 29 ships of this size would be needed over the course of a year, assuming ships were completely empty and loaded completely full. Although the number of ships loaded over the course of a year may vary from this figure depending on the size and extent to which the ship carries a full load, the total hours that ships are positioned at the dock should be relatively constant, as this will be a function of the urea loading rate and the time to reposition ships, which will be fairly constant from ship to ship.

Using the AP-42 emission factors identified above, an operating load of 240 kW, and annual operating hours of 3,132 hours (29 vessels times 108 hours [4.5 days] per vessel), hourly and annual emissions have been computed and summarized in Table 7 below:

TABLE 7 - UREA VESSEL HOTELING EMISSIONS

Pollutant	EF (lb/hp-hr)	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (TPY)	Average Annual Emissions (g/s)
NO_x	0.024	7.72	12.10	0.35
CO	0.0055	1.77	2.77	0.080
PM_{10}	0.00043	0.14	0.22	0.0062
$PM_{2.5}$	0.000417	0.13	0.21	0.0060

Modeling for the annual NO_2, PM_{10}, and $PM_{2.5}$ air quality standards was performed using the average annual emission rate provided in Table 7. Modeling for the 1-hour NO_2, 1-hour CO, 8-hour CO, 24-hour PM_{10}, and 24-hour $PM_{2.5}$ air quality standards was performed using the maximum hourly emission rate provided in Table 7. The physical dimensions of the vessel, including the elevated structure containing crew quarters and the ship's bridge, were input into the model and treated as a building for downwash purposes.

8.4 OTHER SECONDARY EMISSIONS

Because most of the equipment and buildings associated with the project already exist and are at the KNO site, there is little construction activity that will result in secondary emissions at the site. Construction activities will include construction of three new package boilers, construction of Selective Catalytic Reduction control systems for the Reformer and Solar Turbines/Waste Heat Boilers, and construction of certain support operations (such as wastewater treatment equipment). There will also be maintenance activities performed on existing equipment at the plant that will involve mobile equipment such as cranes and forklifts. Little or no land clearing will be necessary as a part of these activities. The only secondary emissions of consequence are those from ship "hoteling", which are addressed in Section 8.2 above. An analysis of secondary $PM_{2.5}$ and secondary ozone impacts was also completed as described in Section 10 and Section 19, respectively.

9. EU RELEASE PARAMETERS

9.1 LOAD ANALYSIS

For any unit which has the potential to operate at reduced operating loads, KNO previously performed sensitivity runs at partial load (100%, 75%, and 50% load) to identify the operating load scenario that is expected to result in the maximum ground level impact. These worst-case operating scenarios are used in the current modeling analyses.

9.2 OPERATING LIMITS

Proposed operating limits are discussed in Section 8.0.

9.3 HORIZONTAL OR CAPPED STACKS

AERMOD provides keywords that can be used for any stack with a horizontal orientation (POINTHOR) or any stack that is capped (POINTCAP). These keywords will be used as applicable with actual air flow rates to represent sources with horizontal or capped stacks.

Specifically, the scrubber (EU41), Deaerator Vent (EU60), well pump engine (EU65), fire pump engine (EU66), and urea storage warehouse baghouse (EU47C) all have horizontal exhausts and were modeled with the POINTHOR keyword. The Startup Heater (EU13) has a rain cap and was modeled with the POINTCAP keyword. The cooling tower at the facility was modeled as a point source using fan air flow rate information and cell tower configuration (height and length/width).

9.4 HAUL ROADS, STOCKPILES, AND OTHER FUGITIVE EMISSIONS

The only volume sources expected at the site will be the urea storage building, component leaks, and loading of urea into marine vessels. These sources were modeled in the following manner:

- Urea Storage Warehouse – The Urea Storage Warehouse has physical dimensions of 200 meters long and 50 meters wide. The roof of the building has a height that varies from a low of 24 feet along the side to a height of 70 feet at the peak. Although enclosed, the building is not considered to be completely sealed, and emissions can occur from various points in the building structure as well as from a door opening on the south side of the building. These emissions result from urea transfer from Conveyor 701 to the floor of the warehouse and movement of urea within the warehouse. KNO modeled fugitive particulate matter emissions from the warehouse as a volume source with an initial horizontal dimension of 11.63 meters (50 meters divided by 4.3), initial vertical dimension of 9.91 meters (70 feet divided by 2.15), and release height of 46 feet (average between peak and eve).
- Component Leaks – Ammonia emissions from component leaks occur from various points throughout the plant. Components include flanges, valves, pumps, and compressors. Emissions occur primarily in the pipe gallery east of Plants 4 and 5 at the KNO site.
- Marine Vessels – Fugitive particulate matter emissions occur from marine vessels as urea is loaded into vessels. Urea loading chutes extend into the hold of the vessels; however, emissions will occur from the hold openings, which are not sealed. As a result of the fact

that ship loading emissions are generated in the hold of a ship which is reasonably enclosed, KNO assumed that uncontrolled particulate matter emissions from ship loading are reduced by approximately 50%. This capture efficiency is used in emission estimates for this activity. Urea is expected to be loaded into marine vessels where the deck of the ship is well above the surface of the water. KNO is capable of loading only one vessel hold at a time.

All urea transfer points will be enclosed and vented to baghouse dust collectors. Since these activities will be enclosed, no fugitive emissions will be modeled from urea transfer points. A more detailed description of the urea handling system is provided below.

Once granulated urea is produced in the Granulation Building, it is transferred from the building by way of Conveyor 701. Particulate matter generated during the transfer of material onto this conveyor is controlled within the Granulation Building and routed to the granulation wet scrubbers. Conveyor 701 transfers granulated urea to Conveyor 702 prior to the urea storage warehouse. The transfer point for Conveyor 701 to Conveyor 702 will be enclosed and vented to the urea warehouse dust collector.

Conveyor 702 will transfer granulated urea to the floor of the Urea Storage Warehouse. Although there are no mechanisms to directly capture particulate matter emissions generated during this transfer, the building is enclosed with no local building exhaust, other than pickups elsewhere in the building to the Urea Warehouse Dust collector. No particulate matter emissions will be generated during granulated urea storage since the building is completely enclosed. From storage on the Urea Storage Warehouse floor, granulated urea is picked up by front-end loader and dumped into grizzlys, which then place granulated urea on Conveyor 705 from the Urea Storage Warehouse. Air pick-up points are located at the transfer from the grizzlys to Conveyor 705 to control particulate matter emissions generated during this transfer. These pickups are directed to the Urea Storage Warehouse Baghouse.

Conveyor 705 then transfers granulated urea to Conveyor 800, which transfers granulated urea to the end of the wharf. This transfer point is enclosed and vented to the Urea Storage Warehouse Baghouse. Conveyor 800 then transfers granulated urea to Conveyor 810, a short conveyor used to feed marine loading equipment. This transfer point will be enclosed and vented to a local dust collection system (Emission Unit 47D). A diagram of the location of granulated urea conveyors is provided in Attachment H.

No outdoor storage piles are expected at the site, nor does the site receive any raw materials by truck. The site has limited capabilities for shipping of urea by truck, with an average of one truck per day anticipated at full production. Based on the limited volume of truck shipping from the site, KNO does not propose to include any modeling of truck traffic at the site. As a result, no area sources are included for particulate matter emissions in the modeling analysis.

9.5 INCREMENT MODELING CONSIDERATIONS

As the facility will be restarting from a closed status, all KNO sources are considered increment consuming.

9.6 OFFSITE EUS

Off-site sources included in the analysis are discussed in Section 13.0.

9.7 INTERMITTENT EMISSIONS

Intermittently operated EUs are discussed in Section 8.0.

9.8 SOURCE GROUPS

There are two types of marine vessels that may dock at the KNO wharf (Ammonia vessel or Urea vessel, discussed in Section 8.3). Only one vessel type would be docked for unloading at any given time. Therefore, for each modeled scenario, there are two source groups used: one that includes all Ammonia vessel associated sources (and excludes all Urea vessel associated sources), and one that includes all Urea vessel associated sources (and excludes all Ammonia vessel associated sources).

Specific source groupings are also used to represent the three modes of operation for two offsite Tesoro Refinery sources (EU ID 132 and 133) in cumulative modeling. These modes of operation are: Startup Mode, Fresh Air Firing (FAF) Mode, and Cogeneration Operation. The hours of operation for the Cogeneration mode is 8,760 less FAF hours. The FAF mode is assumed to be 35 days of FAF operation each year. These three unique operational modes are applicable to all pollutants; however, the startup mode only affects NO_2 and CO emissions.

10. POLLUTANT SPECIFIC MODELING CONSIDERATIONS

10.1 NO_2

Initial NO_2 modeling will be performed using default Tier 2 analysis settings (ARM2). In the event this analysis results in unacceptable NO_2 concentrations, KNO will seek approval from ADEC to perform Tier 3 NO_2 modeling to account for NO_2 formation from NO_X emitting sources.

10.2 PM2.5

Regarding project impacts on secondary $PM_{2.5}$ formation, recent EPA guidance recommends the use of a two-tiered approach to assess secondary $PM_{2.5}$ impacts (Fox 2024). This approach includes the use of photochemical modeling to assess source-specific impacts, or relying on existing photochemical modeling and supporting datasets to assess a source-specific impact, such as EPA's photochemical modeling of "hypothetical sources" that can be used for Tier 1 demonstrations. However, EPA's hypothetical source modeling did not include any sources in Alaska, and KNO is not aware of any other existing photochemical modeling that could be relied on to complete such an assessment. Therefore, due to the lack of existing technical information and photochemical modeling analyses in the area, and given that a photochemical modeling analysis is recommended but not required for the assessment, KNO proposes to continue to rely on a qualitative analysis of secondary $PM_{2.5}$ formation.

Criteria pollutants that contribute to secondary formation of $PM_{2.5}$ are NO_X and SO_2. The project will result in a major increase in NO_X emissions and a minor increase in SO_2 emissions. The site will also result in a significant emissions increase in ammonia emissions, which have also been linked to secondary $PM_{2.5}$ formation, but are assumed not to be a precursor to secondary $PM_{2.5}$ formation unless a demonstration is made showing the link between ammonia emissions and $PM_{2.5}$ concentrations in the area.

In order to adequately assess the impact of the project on $PM_{2.5}$ air quality levels in the vicinity of the plant, KNO commenced an ambient air quality monitoring program for $PM_{2.5}$ on October 1, 2013. Ambient $PM_{2.5}$ concentrations measured at the monitoring station through the first nine months of the program (through June 30, 2014) are:

- Annual Average = 4.0 μg/m^3 (44% of the NAAQS of 9.0 μg/m^3); and
- Eighth-high 24-hour concentration of 7.9 μg/m^3 (23% of the NAAQS of 35.0 μg/m^3)

Potential emissions of known $PM_{2.5}$ precursors from the Agrium KNO Facility are shown below, along with currently permitted potential emissions from other nearby major stationary sources. The $PM_{2.5}$ precursor emissions from Agrium KNO are also compared relative to the sum of the current permitted emissions from the nearby facilities.

TABLE 8 – PM2.5 PRECURSOR EMISSIONS FROM AGRIUM KNO AND NEARBY SOURCES

Stationary Source	**Potential Emissions (tpy)**	
	NO_X	**SO_2**
Agrium KNO	216	10.2
Tesoro Kenai Refinery	706	104
Bernice Lake Power Plant	748	4.4
AE&EC Nikisi Generation Plant	695	26
Kenai LNG Plant	1,513	4.9
Total All Sources:	3,662	139
KNO Emissions as Percent of All Sources:	5.8%	7.3%

Potential emissions of known $PM_{2.5}$ precursors from Agrium KNO are significantly less than the total of existing potential emissions from nearby stationary sources. Since the region is currently well in attainment of the 24-hr $PM_{2.5}$ NAAQS (below 50% of both the annual and 24-hour NAAQS), the minor increase in $PM_{2.5}$ precursors from Agrium KNO (in comparison to nearby emissions of $PM_{2.5}$ precursors) could not realistically pose a threat to the ongoing attainment of the $PM_{2.5}$ NAAQS in the region.

As noted earlier, ammonia emissions are assumed by EPA not to lead to secondary $PM_{2.5}$ formation unless a study has been performed showing that ammonia emissions in the area contribute to $PM_{2.5}$ concentrations in that area. Because ammonia is not a regulated air pollutant, there are no data available on potential ammonia emissions from other sources in the vicinity of the plant. Potential ammonia emissions from the project are 699 tons per year. Although no ammonia emissions information is available for other existing sources, the mass emissions of ammonia are relatively small in comparison to area-wide emissions of NO_X. Due to the relatively low ammonia emissions in the area in comparison to NO_X emissions and the low existing ambient $PM_{2.5}$ air quality levels in the area, KNO does not believe that ammonia emissions pose a threat to attainment of the $PM_{2.5}$ NAAQS in the region.

10.3 PM DEPOSITION

PM_{10} deposition was not evaluated.

11. BUILDING DOWNWASH

The BPIPPRM program (04274) was used to assess the influence of building wake effects. Each source location and height above ground was input into the BPIPPRM program along with locations and heights of nearby structures. The actual dimensions of buildings and structures on the KNO site were obtained from a 3D CAD model of the KNO facility. The BPIPPRM program determines the wind direction specific building parameters used by the AERMOD model to account for downwash effects of nearby buildings, including cavity effects.

Building dimensions were also incorporated into the model for the Tesoro facility located north of KNO and for the AE&EC facility located on the east property line. Although the Tesoro structures are not expected to cause downwash from stacks located at the KNO site, they are likely to have an impact upon sources located at the Tesoro facility. Due to the proximity of the AE&EC structures to KNO stacks, these structures have the potential to cause downwash from both KNO and AE&EC sources.

Figure 3 shows a plan view of the sources and buildings proposed in the model. Figure 4 shows a 3D view of the facility structures.

Attachment I provides a listing of the KNO structures, including elevations, number of tiers and tier heights. Table 9 provides a listing of KNO tanks and tank dimensions. Table 10 and Table 11 provide a summary of AE&EC and Tesoro structures included in the modeling analysis. Figure 5 and Figure 6 provide layout diagrams of the AE&EC and Tesoro structures included in the modeling analysis.

FIGURE 3 - PLAN VIEW OF KNO FACILITY STRUCTURES

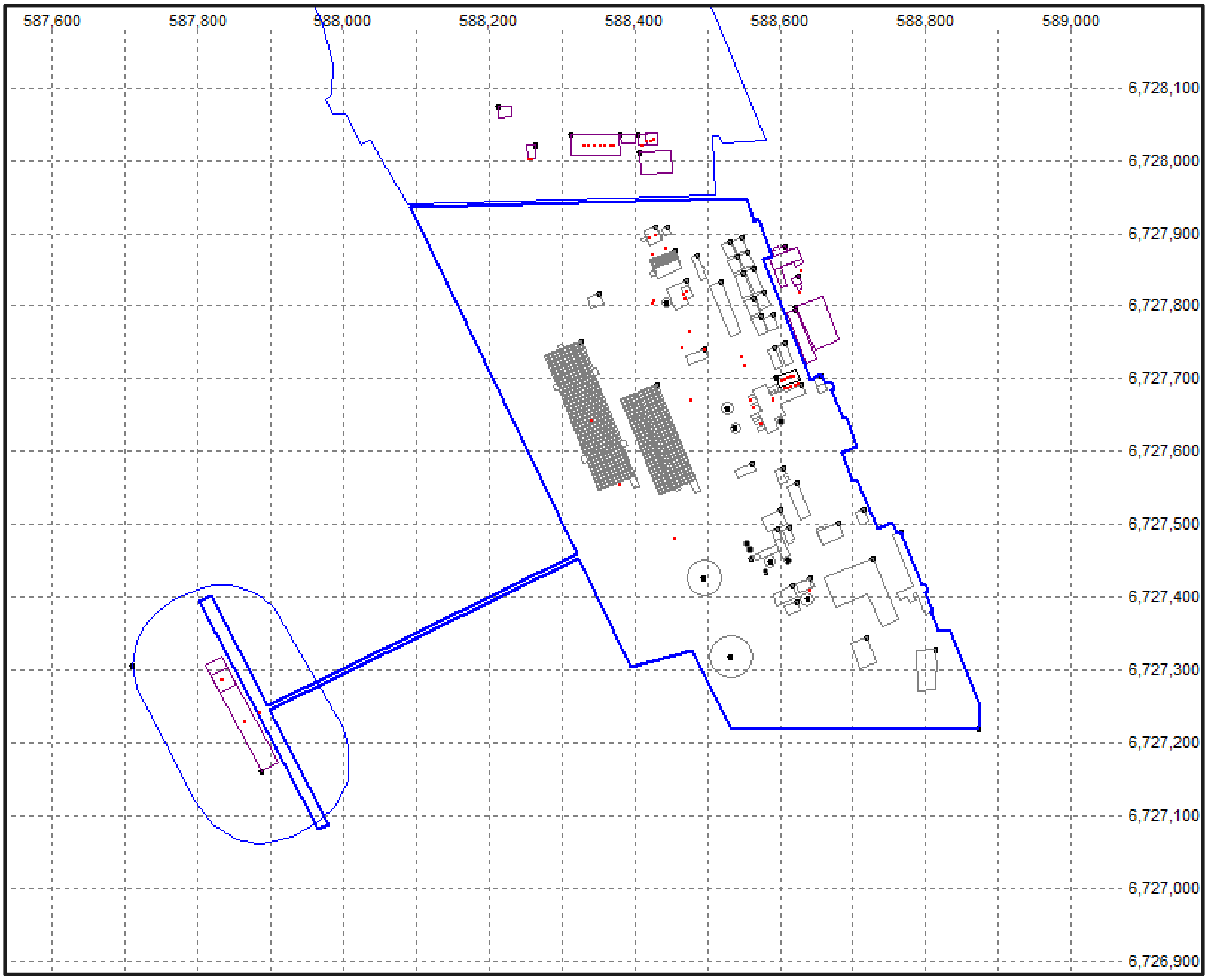


FIGURE 4 - 3D VIEW OF KNO FACILITY STRUCTURES

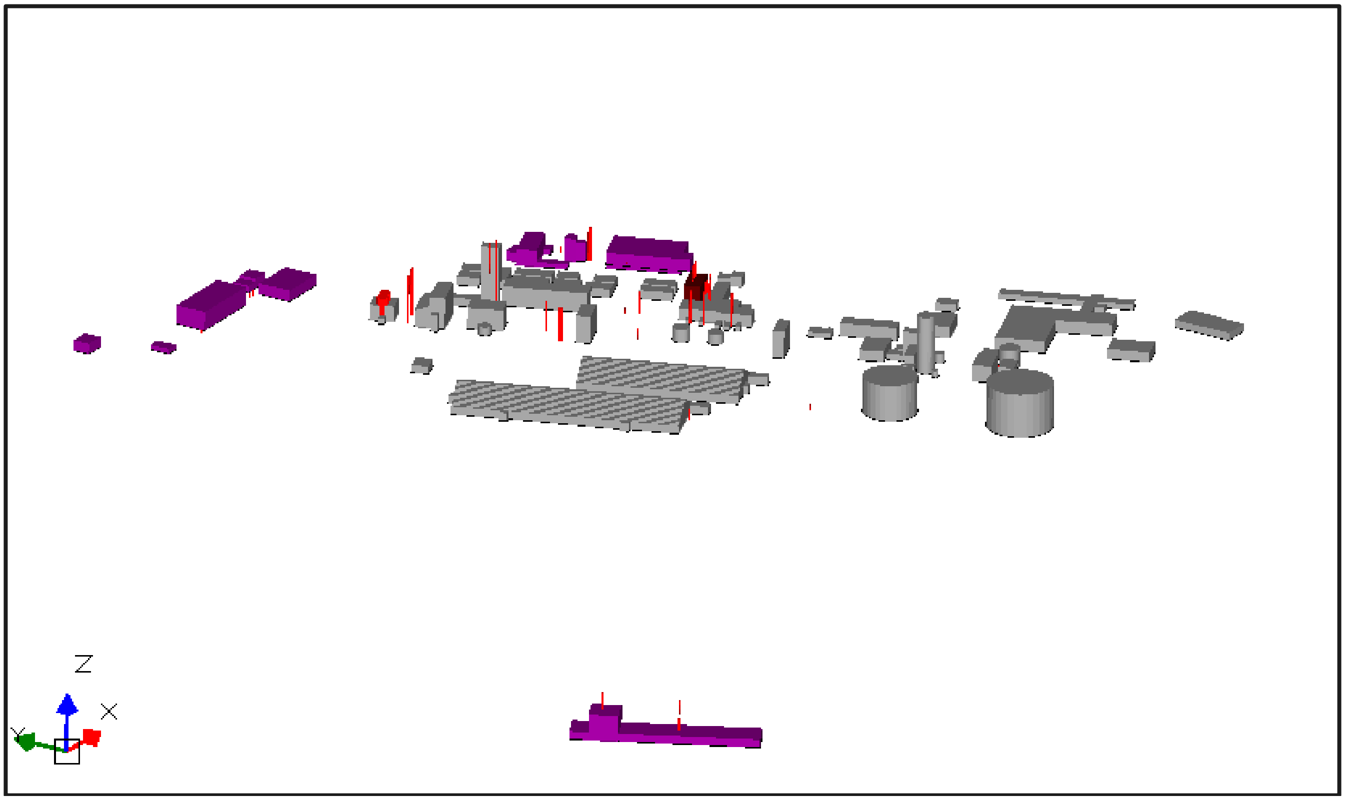


TABLE 9 - LIST OF TANKS

KNO Facility Tanks						
Tank Name	Comment	Base Elevation	Center East (X)	Center North (Y)	Tank Height	Tank Diameter
		(ft)	(m)	(m)	(ft)	(ft)
T1	Plant #1 Ammonia Storage Tank	130	588495.24	6727426.61	106	156
T2	Plant #4 Ammonia Tank	130	588532.42	6727318.36	128	191
T3	Prill Tower	130	588586	6727449.44	170	51
T4	Structure 21	130	588600.69	6727641.4	32	30
T5	Structure 22	130	588527.01	6727660.03	38	50
T6	Structure 23	130	588538.56	6727632.57	30	45
T7	Structure 28	130	588443.24	6727805.66	24.25	38
T8	Structure 10	130	588637.42	6727397.58	53	60
T9	Structure 35	130	588610.24	6727450.93	27.5	30
T10	Structure 36	130	588580.39	6727435.95	20	20
T11	Structure 37	130	588560.41	6727454.22	44	16
T12	Structure 38	130	588558.4	6727466.65	27	26
T13	Structure 39	130	588553.87	6727473.71	20	26

TABLE 10 - AE&EC STRUCTURES

	Building Name	Number of Tiers	Tier Number	Comment	Base Elevation	Tier Height	Number of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)
					(ft)	(ft)		(m)	(m)	(m)	(m)
HE1-1	HE1	3	1	Hommer Electric Building	130	13	16	588607.18	6727882.84	588609.86	6727876.23
HE1-2	HE1	*	2	*	*	26	12	588607.18	6727882.84	588609.86	6727876.23
HE1-3	HE1	*	3	*	*	47.5	4	588623.24	6727881.55	588629.88	6727865.25
HE2-1	HE2	2	1	Penthouse Building	130	56	10	588626.13	6727840.89	588629.49	6727832.25
HE2-2	HE2	*	2	*	*	68	4	588626.13	6727840.89	588629.49	6727832.25
HE3-1	HE3	1	1	Combined Cycle Plant	130	48.5	4	588622.4	6727799.12	588657.17	6727813.26
HE4-1	HE4	1	1	Elevated Building Structure	165	35	4	588622	6727795.32	588608.14	6727789.89

Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
588623.24	6727881.55	588632.31	6727859.15	588620.96	6727854.26	588618.27	6727860.63	588600.25	6727853.34	588609.98	6727828.49
588623.24	6727881.55	588629.88	6727865.25	588591.63	6727849.73	588584.99	6727866.15	588592.36	6727869.15	588589.68	6727875.9
588591.63	6727849.73	588584.99	6727866.15								
588628.1	6727831.47	588630.16	6727826.44	588628.66	6727825.75	588629.59	6727823.48	588624.79	6727821.37	588621.46	6727828.93
588619.25	6727828.14	588615.85	6727836.85								
588680.55	6727753.36	588647.91	6727739								
588635.34	6727721.14	588650.12	6727727.78								

Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)	Corner 11 East (X)	Corner 11 North (Y)	Corner 12 East (X)	Corner 12 North (Y)	Corner 13 East (X)	Corner 13 North (Y)	Corner 14 East (X)	Corner 14 North (Y)	Corner 15 East (X)	Corner 15 North (Y)	Corner 16 East (X)	Corner 16 North (Y)
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
588601.79	6727825.23	588584.99	6727866.15	588592.36	6727869.15	588589.68	6727875.9	588592.21	6727876.98	588591.17	6727879.31	588597.78	6727881.9	588598.69	6727879.54
588592.21	6727876.98	588591.17	6727879.31	588597.78	6727881.9	588598.69	6727879.54								
588619.25	6727828.14	588615.85	6727836.85												

FIGURE 5 - LAYOUT OF AE&EC STRUCTURES

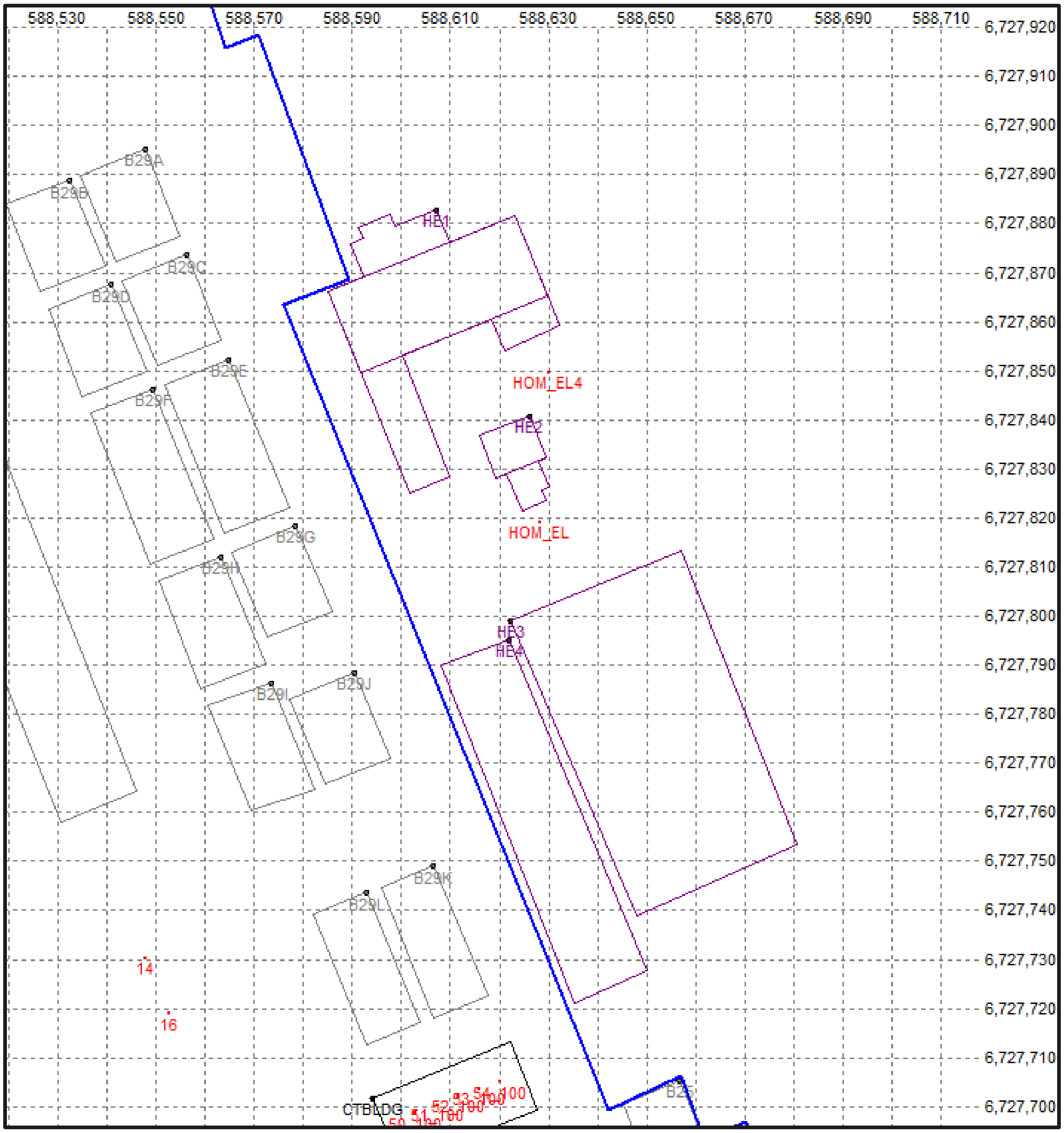
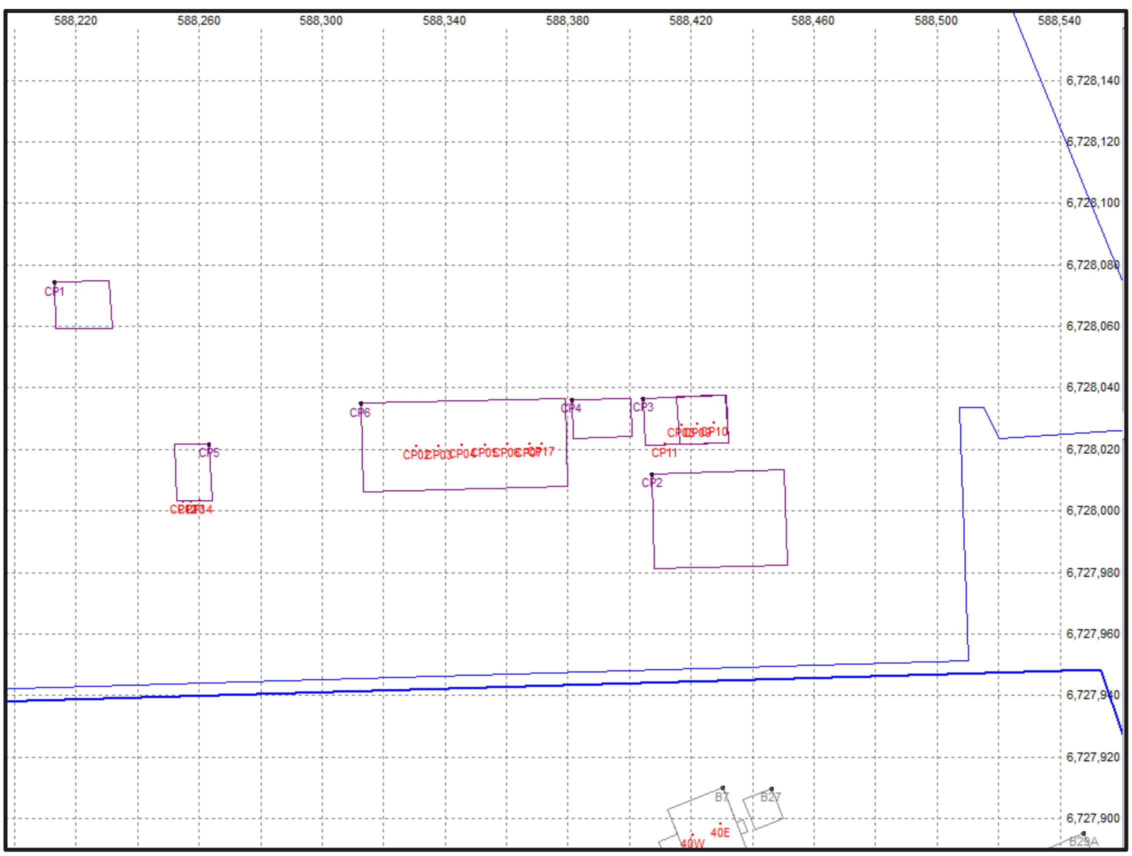


TABLE 11 - TESORO STRUCTURES

	Building Name	Number of Tiers	Tier Number	Comment	Base Elevation (ft)	Tier Height (ft)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)
CP1-1	CP1	1	1	Compressor Building	130	31	4	588213.2	6728074.35	588230.8	6728075	588231.7	6728059.41	588213.5	6728059.3
CP2-1	CP2	1	1	Warehouse	130	32	4	588407.3	6728012.1	588450.1	6728013.42	588451.3	6727982.53	588408.2	6727981.5
CP3-1	CP3	2	1	Boiler House	130	19	4	588404.6	6728036.61	588431.4	6728037.73	588432	6728021.95	588404.9	6728021.3
CP3-2	CP3	*	2	*	*	28	4	588431.1	6728037.57	588432	6728021.95	588416.4	6728021.77	588415.3	6728037.2
CP4-1	CP4	1	1	Control Building	130	21	4	588381.2	6728036.26	588400.3	6728036.72	588400.6	6728024.19	588381.6	6728023.5
CP5-1	CP5	1	1	Firewater Pumphouse	130	14	4	588263.2	6728021.92	588252.1	6728021.67	588252.6	6728003.16	588264.3	6728003.5
CP6-1	CP6	1	1	Compressor Bldg 1	130	55	4	588312.6	6728034.95	588379.2	6728036.53	588379.9	6728007.99	588313.3	6728006.3

FIGURE 6 - LAYOUT OF TESORO STRUCTURES

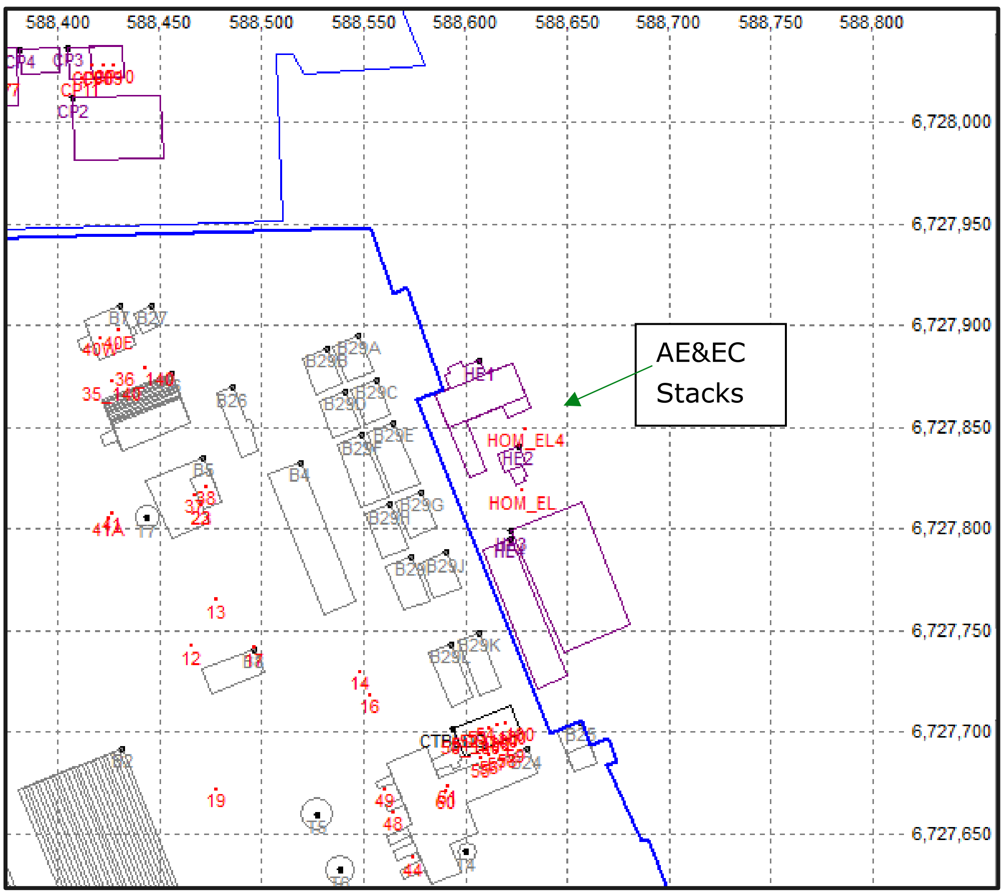


12. AMBIENT AIR BOUNDARY

Ambient air is defined under EPA regulation as areas where public access is precluded. The facility will preclude access to all areas in the model that are not modeled as ambient. It is understood that this will be included as a permit special condition. When there is a lessor and lessee involved, ambient air is determined by who controls access to the property. If another company controls access to a portion of the land surrounding the facility, that area of land will be considered ambient to the KNO facility.

For the KNO facility, the ambient boundary is considered to be any area beyond the fenced portion of the site. This includes the AE&EC facility located along the fence line on the east side of the property. Figure 7 below shows the location of the fence line relative to the AE&EC stack. For the wharf and ship loading, KNO has established a receptor network that begins at a distance of 100 meters in all directions from marine vessels that would be loading at the plant. This distance is consistent with ADEC policy in regard to defining ambient boundary surrounding ships.

FIGURE 7 - LOCATION OF FENCE LINE BETWEEN KNO AND AE&EC



13. WORKER HOUSING AREAS

No onsite housing is provided for plant workers. This section is not applicable to the KNO modeling analysis.

14. RECEPTORS

14.1 RECEPTOR PLACEMENT

Receptors will be placed along the fenced property boundary with 25-meter grid spacing, and at 25-meter spacing immediately out from the fence to a distance of 100 meters. Beyond the fenced property boundary, nested Cartesian Grids will be placed with decreasing density, as follows:

- Property Fenced Boundary to 100 meters: 25-meter spacing
- 100 meters to 500 meters: 50-meter spacing
- 500 meters to 3,000 meters: 100-meter spacing

A depiction of these receptor grids are provided in Attachment J.

The latest version of the AERMAP program (version 24142), with NED terrain files was used to develop hill scale and terrain elevation inputs for each receptor. All coordinates are based on the NAD83 datum. Rural dispersion coefficients were used based on the land use analysis discussed in Section 7.0. KNO located receptors over water in Cook Inlet consistent with EPA guidance. In the area of urea ship loading, KNO located receptors at a distance of 100 meters in all directions from ships loading at the wharf.

For initial screening analysis of potential Class I impacts, the AERMOD model was used to predict concentrations along a ring of receptors placed at 50 km distance from the KNO facility, along radials that would encompass each Class I area (Denali and Tuxedni). In addition to the receptors placed at the 50 km distance, polar grid receptors were placed at 5 km intervals from 10 km to 50 km, within the radial segments encompassing the directions toward the Class I area, in order to assess the gradient of impacts across that distance.

14.2 FLAGPOLE RECEPTORS

Flagpole receptors were not used.

15. OFFSITE EUS AND BACKGROUND AIR QUALITY DATA

KNO performed cumulative modeling analyses for pollutants with predicted ambient impacts that exceed the significant impact levels. These analyses included consideration of nearby sources and background concentrations.

15.1 NEARBY SOURCES

For cumulative modeling, KNO included the same nearby sources that were included in the previous modeling analysis. ADEC has reviewed and approved the inclusion of these nearby sources, with updated emissions and stack parameters. These nearby sources are:

- AQ0090, Tesoro Kenai LNG Plant
- AQ0035, Tesoro Refinery
- AQ0086, AE&EC Bernice Lake
- AQ1190, AE&EC Nikiski Combined Cycle Plant

Stack parameters and emission rates for use in modeling were provided by ADEC. A table that summarizes the nearby sources included in the modeling is provided in Attachment K. A map of the nearby sources is included in Attachment L.

For short term modeling, maximum hourly emission rates were generally used while for annual modeling assessments, annual emission rates were used. For 1-hour NO_2 modeling, KNO also considered the extent to which specific emission units may qualify as intermittent sources (as discussed in Section 8.1). For intermittent sources that are infrequently operated (such as emergency generators), KNO modeled such sources using actual annual average emission rates consistent with EPA guidance on the treatment of intermittent sources in modeling assessments. In cases where units are operated infrequently (such as peaking units), KNO performed 1-hour NO_2 modeling analyses using average annual emission rates rather than maximum 1-hour emission rates.

15.2 BACKGROUND AIR QUALITY DATA

Background air quality levels are based on the AK LNG data collected in Nikiski in 2015, including CO, NO_2, PM_{10}, and $PM_{2.5}$. Background values used for these pollutants using the AK LNG data are summarized in Table 12 below.

TABLE 12 - BACKGROUND AIR QUALITY VALUES

Pollutant	Averaging Period	Background Value (μg/m^3)
$PM_{2.5}$	Annual Average	3.6
	98th Percentile 24-hour Average	12.0
PM_{10}	2nd High 24-hour Average	30.0
NO_2	Annual Average	2.6
	98th Percentile 1-hour Average	30.6
CO	1-hour Average	1.4
	8-hour Average	1.0

KNO used the same ammonia background concentration of 0.5 ppb that was used in the 2019 Modeling Analysis.

15.3 INCREMENT CONSUMING SOURCES

KNO confirmed with ADEC that the nearby source inventories used in the 2019 modeling analysis are still valid, except that emission rates were updated, recently permitted sources were added, and decommissioned sources were removed, based on information provided to KNO by ADEC.

16. DESIGN CONCENTRATIONS

KNO will evaluate model output values in the following manner:

- Significant Impact Levels: For SILs, KNO will compare the highest modeled concentrations to the applicable SIL, as summarized in Table 13.

TABLE 13 - SIGNIFICANT IMPACT LEVELS APPLICABLE TO THE PROJECT

Pollutant	Averaging Time	Rank	SIL (µg/m^3)
CO	8-hour	H1H	500
	1-hour	H1H	2,000
NO_2	Annual	Max Annual Average	1
	1-hour	5-year Avg H1H	7.5
PM_{10}	Annual	Max Annual Avg	1
	24-hour	H1H	5
$PM_{2.5}$	Annual	Max 5-year Avg	0.13
	24-hour	5-year Avg H1H	1.2

- Significant Monitoring Concentrations: For SMCs, KNO will evaluate model results in the same manner as for SILs, comparing highest values for appropriate averaging periods to SMCs.
- Increments: For evaluation of increment consumption, KNO will model increment-consuming sources (defined elsewhere in this document) and compare the second-highest value from model results for short-term standards and the highest annual average for annual standards to applicable increment thresholds.
- National Ambient Air Quality Standards: In demonstrating that National Ambient Air Quality Standards will not be exceeded, KNO will evaluate model results in a manner consistent with the applicable air quality standard, as summarized in Table 14:

TABLE 14 - NAAQS THRESHOLDS APPLICABLE TO THE PROJECT

Pollutant	Averaging Time	Rank	NAAQS (µg/m^3)
CO	8-hour	H2H	10,000
	1-hour	H2H	40,000
NO_2	Annual	Max Annual Average	100
	1-hour	5-year Avg H8H	188
PM_{10}	24-hour	H6H	150
$PM_{2.5}$	Annual	Max 5-year Avg	9
	24-hour	5-year Avg H8H	35

17. POST-PROCESSING

The additional post-processing analysis proposed for analysis conducted with CALPUFF is discussed in Section 22.3.3. No additional post-processing is required for the analyses conducted with AERMOD.

18. MODELING RESULTS

18.1 SIGNIFICANT IMPACT LEVEL (SIL)

In general, the Class II area modeling analysis is required to demonstrate that the emissions from the proposed project will not cause or contribute to any violations of the National Ambient Air Quality Standards (NAAQS). A significant impact is defined as a modeled concentration in excess of the SILs summarized in Table 15 for PM_{10}, $PM_{2.5}$, NO_2, and CO.

TABLE 15 - SIGNIFICANT IMPACT LEVELS APPLICABLE TO THE PROJECT

Pollutant	Averaging Time	Rank	SIL (µg/m³)
CO	8-hour	H1H	500
	1-hour	H1H	2,000
NO_2	Annual	Max Annual Average	1
	1-hour	5-year Avg H1H	7.5
PM_{10}	Annual	Max Annual Avg	1
	24-hour	H1H	5
$PM_{2.5}$	Annual	Max 5-year Avg	0.13
	24-hour	5-year Avg H1H	1.2

The results of the SIL modeling analysis are shown in Table 16. These results show that the predicted impacts from the project exceed the SIL for each pollutant of concern. As a result, a cumulative modeling analysis was necessary to show that emissions from the project will not exceed the applicable Class II increments and that the project will not result in an exceedance of the NAAQS.

18.2 INCREMENT CONSUMPTION

Modeling was performed to determine the extent to which emissions from the project, in combination with other increment-consuming sources, will consume air quality increment permitted for Class II areas. The results of this analysis are provided in Table 17. These results show that emissions from increment consuming sources in the vicinity of the plant will not exceed allowable Class II increments.

18.3 NAAQS ASSESSMENT

KNO performed detailed modeling analyses for pollutants with predicted ambient impacts that exceed the SILs. These analyses included consideration of interactive sources and background concentrations.

Results of the NAAQS modeling analysis are summarized in Table 18, Table 19, and Table 20. These results show that the impact from KNO sources, in combination with other sources located in the area and background concentrations, will not result in an exceedance of the NAAQS.

Electronic copies of all input and output files for the modeling analyses performed will be provided to ADEC under separate cover.

TABLE 16 – SIL SUMMARY

Pollutant	Annual		Ammonia Ship at Dock Short-term					Urea Ship at Dock Short-term				
	Annual SIL	Annual Modeling Result	Class II SIL	S1 normal	S2 CT in bypass	S3 startup	S4 turnaround	Class II SIL	S1 normal	S2 CT in bypass	S3 startup	S4 turnaround
NO2	1	5.99	7.5	157.87	148.93	157.87	157.87	7.5	142.09	149.02	148.99	148.99
PM10	1	1.29	5	15.71	15.71	15.71	15.71	5	16.95	16.95	16.96	16.95
PM2.5	0.13	0.82	1.2	6.67	6.63	6.66	5.79	1.2	6.67	6.63	6.66	5.80
CO 1-hr	-	-	2,000	1005.86	1001.05	7033.88	1001.05	2,000				
CO 8-hr	-	-	500	229.70	228.64	2761.93	228.59	500				

*All concentrations are in μg/m^3.

TABLE 17 – INCREMENT SUMMARY

Pollutant	Annual		Ammonia Ship at Dock Short-term					Urea Ship at Dock Short-term				
	Annual Increment	Annual Modeling Result	Class II Increment	S1 normal	S2 CT in bypass	S3 startup	S4 turnaround	Class II Increment	S1 normal	S2 CT in bypass	S3 startup	S4 turnaround
NO2	25	6.67	-	-	-	-	-	-	-	-	-	-
PM10	17	1.40	30	15.39	14.67	14.67	21.25	30	14.67	15.38	15.39	21.25
PM2.5	4	0.93	9	6.83	6.60	6.83	6.02	9	6.83	6.60	6.83	6.02

TABLE 18 – NAAQS SUMMARY – ANNUAL

Pollutant	Annual				
	Annual NAAQS	Annual Modeling Result	Background	Total	% of NAAQS
NO2	100	12.07	2.60	14.67	15%
PM2.5	9	1.25	3.60	4.85	54%

TABLE 19 – NAAQS SUMMARY – SHORT-TERM – AMMONIA SHIP AT DOCK

		Ammonia Ship at Dock															
		Short-term															
		S1 - Normal				**S2 – CT in bypass**				**S3 – Startup**				**S4 – Turnaround**			
Pollutant	**NAAQS/ AAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modele d Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**
NO2 1-hr	188	169.40	incl.	169.40	90%	169.40	incl.	169.40	90%	169.40	incl.	169.40	90%	169.40	incl.	169.40	90%
PM10 24-hr	150	13.20	30	43.20	29%	13.67	30	43.67	29%	13.68	30	43.68	29%	13.80	30	43.80	29%
PM2.5 24-hr	35	5.73	12	17.73	51%	6.03	12	18.03	52%	6.16	12	18.16	52%	4.92	12	16.92	48%
CO 1-hr	40,000	-	-	-	-	-	-	-	-	6412	1.4	6414	16%	-	-	-	-
CO 8-hr	10,000	-	-	-	-	-	-	-	-	2804	1	2805	28%	-	-	-	-
Ammonia 8-hr	2,100	220	0.35	220.4	10%	219	0.35	219.4	10%	223	0.35	223.4	11%	219	0.35	219.4	10%

TABLE 20 – NAAQS SUMMARY – SHORT-TERM – UREA SHIP AT DOCK

		Urea Ship at Dock															
		Short-term															
		S1 - Normal				**S2 – CT in bypass**				**S3 – Startup**				**S4 – Turnaround**			
Pollutant	**NAAQS/ AAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modele d Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**	**Modeled Conc.**	**Bkgrnd**	**Total**	**% of NAAQS**
NO2 1-hr	188	169.50	incl.	169.50	90%	169.46	incl.	169.46	90%	169.47	incl.	169.47	90%	169.45	incl.	169.45	90%
PM10 24-hr	150	14.39	30	44.39	30%	14.32	30	44.32	30%	14.33	30	44.33	30%	14.84	30	44.84	30%
PM2.5 24-hr	35	5.73	12	17.73	51%	6.03	12	18.03	52%	6.16	12	18.16	52%	4.92	12	16.92	48%
CO 1-hr	40,000	-	-	-	-	-	-	-	-	6426	1.4	6428	16%	-	-	-	-
CO 8-hr	10,000	-	-	-	-	-	-	-	-	2804	1	2805	28%	-	-	-	-
Ammonia 8-hr	2,100	220	0.35	220.4	10%	219	0.35	219.4	10%	223	0.35	223.4	11%	219	0.35	219.4	10%

19. OZONE IMPACTS

An analysis of secondary ozone impacts is required because emissions of both NO_X and VOC (ozone precursors) from KNO are above 100 TPY. EPA guidance currently recommends the use of a two-tiered approach to assess secondary ozone impacts, similar to secondary $PM_{2.5}$ impacts as discussed in Section 10.2 (Fox 2024). This approach includes the use of photochemical modeling to assess source-specific impacts or relying on existing photochemical modeling and supporting datasets to assess a source-specific impact, such as EPA's photochemical modeling of "hypothetical sources" that can be used for Tier 1 demonstrations. However, EPA's hypothetical source modeling did not include any sources in Alaska, and KNO is not aware of any other existing photochemical modeling that could be relied on to complete such an assessment. Therefore, due to the lack of existing technical information and photochemical modeling analyses in the area, and given that a photochemical modeling analysis is recommended but not required for the assessment, KNO is continuing to rely on a qualitative analysis of secondary ozone formation.

The KNO facility PTE for NOX will be 205 tpy, and the PTE for VOC will be 121.3 tpy. In order to assess potential impacts on ambient ozone, the current ozone levels in the region must be assessed. The current 8-hr ozone NAAQS is 70 ppb, based on the three year average of the 4th highest 8-hr ozone concentration annually. The current 2022-2024 USEPA ozone design value for the Denali CASTNET monitor (Monitor ID# 2-068-0003) is 52 ppb.

Potential emissions of ozone precursors from the Agrium KNO Facility are shown in Table 16, along with currently permitted potential emissions from other nearby major stationary sources. The ozone precursor emissions from Agrium KNO are also compared relative to the sum of the current permitted emissions from the nearby facilities.

TABLE 21 – OZONE PRECURSOR EMISSIONS FROM AGRIUM KNO AND NEARBY SOURCES

Stationary Source	**Potential Emissions (tpy)**	
	NOX	**VOC**
Agrium KNO	216	121.3
Tesoro Kenai Refinery	774	1132
Bernice Lake Power Plant	748	9.2
AE&EC Nikisi Generation Plant	695	79
Kenai LNG Plant	1513	312
Total All Sources:	3730	1532
KNO Emissions as Percent of All Sources:	5.8%	7.9%

Potential emissions of ozone precursors from Agrium KNO are significantly less than the total of existing potential emissions from nearby stationary sources. Since the region is currently well in attainment of the 8-hr ozone, the minor increase in ozone precursors from Agrium KNO (in comparison to nearby emissions of ozone precursors) could not realistically pose a threat to the ongoing attainment of the ozone NAAQS in the region.

20. ADDITIONAL IMPACT ANALYSES

20.1 VISIBILITY, SOIL AND VEGETATION ANALYSIS

As part of the modeling analysis, PSD applicants must assess whether the emissions from their stationary source, including associated growth, will impair visibility. Visibility impairment means any humanly perceptible change in visibility (visual range, contrast, or coloration) from that which would have existed under natural conditions (40 CFR 51.301 Visibility impairment). Visibility impacts can be in the form of visible plumes ("plume blight") or in a general, area-wide reduction in visibility ("regional haze").

KNO used VISCREEN to complete the analysis. The project emissions of 174.3 tons per year of particulates and 215.8 tons per year of NO_X were used in the Level 1 VISCREEN analysis, also using the default values of zero emissions for primary NO_2, soot and SO_4.

Default particle characteristics were assumed, as default to the model, as well as the following parameters (using default ozone background level of 0.04 ppm (40 ppb):

Transport Scenario Specifications:

Background Ozone:	0.04 ppm
Background Visual Range:	250.00 km
Source-Observer Distance:	50.00 km
Min. Source-Class I Distance:	50.00 km
Max. Source-Class I Distance:	53.25 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	6
Wind Speed:	1.00 m/s

Results were compared to default Class I impact thresholds (Plume Perceptibility [Delta E] of 2.0, and Plume Contrast of 0.05). Results are provided for impacts "inside" and "outside" the Class I area. According to ADEC guidance, the impacts provided for "inside" the Class I area are indicative of whether the project plume may be perceptible; the impacts provided for "outside" the Class I area are to be ignored for the Class II analysis.

The results indicate that for low viewing angles (10 degrees), the VISCREEN-predicted plume parameters are above the Class I thresholds for plume perceptibility (2.0), and plume contrast (0.05). For high viewing angles (140 degrees), the predicted plume parameters were below the Class I thresholds.

These results indicate that the plume from the proposed KNO project may be visible in the Class I areas, and the integral vistas associated with these areas. Attachment N provides the results file as produced by the VISCREEN model.

As a part of a PSD analysis, the applicant must also demonstrate that the project will not result in an adverse impact upon soils and vegetation in the area. KNO satisfied this requirement by demonstrating compliance with the secondary ambient air quality standards.

20.2 ASSOCIATED GROWTH ANALYSIS

The applicant is required to evaluate the impact that the project will have upon associated growth in the area of the project. When fully operational, the KNO facility will employ 140 people, raising the potential for some population growth in the area of the plant. The population of Kenai in 2023 was 7,746 while the population of neighboring Soldotna was 4,577. Thus, the number of employees for the plant in comparison to the overall population is relatively small (approximately one percent of the population of Kenai and Soldotna combined). Any impacts of growth on air quality in the area are expected to be correspondingly low. Thus, the project is not expected to result in an adverse impact on air quality in the area as a consequence of associated growth.

21. CLASS I ANALYSES

Air quality impacts on federally protected Class I areas must be assessed for projects meeting the criteria discussed in the 2010 Federal Land Managers' (FLM) Air Quality Related Values Work Group (FLAG) Phase I report (Department of the Interior 2010). The 2010 FLAG Phase I report states:

> "Generally, the permitting authority should notify the FLM of all new or modified major facilities proposing to locate within 100 km (62 miles) of a Class I area. In addition, the permitting authority should notify the FLM of 'very large sources' with the potential to affect Class I areas proposing to locate at distances greater than 100 km. Given the multitude of possible size/distance combinations, the FLMs cannot precisely define in advance what constitutes a 'very large source' located more than 100 km away that may impact a particular Class I area. However, as discussed elsewhere in this report, the Agencies have adopted a size (Q)/distance (D) criteria to screen out from AQRV review those sources with relatively small amounts of emissions located a large distance from a Class I area. Consequently, as a minimum, the permitting authority should notify the FLM of all sources that exceed these Q/D criteria."

As required by the FLM, the Q/D analysis compares the ratio of the sum of proposed annualized maximum daily emission rates of all visibility impairing pollutants (in tons per year) and the distance to the nearest Class I area (in km) to a threshold value of 10.

The nearest Class I area to the proposed project site is Tuxedni National Wildlife Refuge. This area is 86.8 kilometers southwest of the project site. Also, Denali National Park is located 199.3 km to the north of the project site.

21.1 AQRV Q/D ANALYSIS

Per the 2010 FLAG Phase I report, the Q/D analysis must compare the ratio of the annualized 24-hour maximum allowable emissions of all visibility impairing pollutants (in tons per year, based on 24-hour maximum allowable emissions) and the distance to the nearest Class I area (in km) to a threshold value of 10. The emissions data provided in Attachment A represent the maximum potential annual emission rate for each emission unit based on proposed operational limits for the plant. For emission units that will be permitted to operate at maximum capacity each hour of the year, the values provided in Attachment A correspond to the values necessary to compute Q consistent with Federal guidance. For emission units that operate intermittently, however, the annual emission rates provided in Attachment A must be adjusted to account for maximum 24-hour emission rates projected to annual values. In order to compute Q for the Class I impact analysis, the following adjustments were made to intermittently operated emission units:

- EU11 - Tank Flare: Because there are no planned ammonia venting events associated with the Tank Flare, emissions are associated with pilot emissions only. Thus, no adjustments were made to annual emission rates for this unit.
- EU13 – Startup Heater: It is assumed that it is possible that the startup heater would need to operate up to 24 consecutive hours. This would occur only during startup events and not during any other operating scenarios.

- EU22 - Small Flare: The only planned ammonia venting events associated with the Small Flare will occur during turnaround. As discussed in greater detail in Section 8.0, there will be several ammonia flaring events during turnaround, however each will occur on separate days, and none would be larger than the scheduled flaring event for the Emergency Flare. Thus, for the purpose of computing Q for the Q/D analysis, no additional emissions will be included beyond those that would occur from pilot operations.
- EU23 - Emergency Flare: The only planned ammonia venting events associated with the Emergency Flare will also occur during turnaround. It is assumed that a maximum of 30,000 pounds of ammonia per hour would be vented to the emergency flare and that this would need to continue for up to three hours (90,000 pounds total). Emissions associated with this flaring event will be added to emissions that would occur from pilot operations to determine Q during turnaround events.
- EU55-59 – Solar Turbines: During normal operations, it is assumed that one Solar Turbine may be operated for as long as 24 consecutive hours in a bypass mode from the waste heat boilers (thus bypassing the SCR NO_X control system). During turnaround, it is assumed that up to two Solar Turbines could be operated in this fashion in any one 24-hour period.
- EU65 – Diesel Well Pump: It is assumed that the diesel well pump would never be operated in a “planned” mode for more than one hour in a 24-hour period.
- EU66 – Gasoline Fire Pump: It is assumed that the gasoline fire pump would operate for up to four hours in a 24 consecutive hour period for fire water system testing and training.

As noted above, plant operations will occur under several different operating scenarios. The computations of Q based on anticipated operating scenarios for KNO are:

- Normal Operations: During normal operations, the flares, startup heater, and bypass Solar Turbine emissions will not occur. Q for this scenario is 437.4 tons/year. Using this value, the Q/D for Tuxedni is computed to be 5.0 and the Q/D value for Denali is 2.2.
- Normal Operations with One Solar Turbine on Bypass: This scenario is identical with Scenario #1 except that the excess emissions from one Solar Turbine are added to the total emissions, making Q for this scenario 589.1 tons/year. Using this value, the Q/D for Tuxedni is computed to be 6.8 and the Q/D value for Denali is 3.0.
- Startup: During the Startup operating scenario, the Startup Heater will be added to the total plant emissions, however no flares will be operated, and no Solar Turbines will be operated in a bypass mode, making the total Q value 484.3 tons/year. Using this value, the Q/D for Tuxedni is computed to be 5.6 and the Q/D value for Denali is 2.4.
- Turnaround: During the Turnaround operating scenario, two Solar Turbines operating in bypass mode would be in operation, and the small flare or emergency flare could be in operation (both would not operate at the same time). The highest Q value would occur with operation of the emergency flare. The Startup Heater would not operate during Turnaround, nor would the Reformer, nor any of the Waste Heat Boilers or any of the remaining Solar Turbines. Total Q for this scenario would therefore be 411.2 tons per year.

Using this value, the Q/D for Tuxedni is computed to be 4.7 and the Q/D value for Denali is 2.1.

Based on the fact that the Q/D value for all operating scenarios is below a value of 10, Class I impacts analysis will be provided for Class I increment consumption; however, additional AQRV analyses are not required. KNO understands that the Federal Land Managers (FLMs) for both sites have been contacted by ADEC regarding the proposed KNO restart application and that neither has requested a more detailed Class I impact assessment.

21.2 MODELING ANALYSIS AND PROCEDURES

21.2.1 CLASS I AREA SIL ANALYSIS

In general, the Class I area modeling analysis is required to demonstrate that the emissions from the proposed project will not cause or contribute to any violations of the National Ambient Air Quality Standards (NAAQS). A significant impact is defined as a modeled concentration in excess of the SILs summarized in Table 22 for PM_{10}, $PM_{2.5}$, NO_2, and CO.

As an initial screening assessment of Class I Increment consumption, the AERMOD model will be used to predict concentrations along a ring of receptors placed at 50 km distance from the KNO facility, along radials that would encompass each Class I area (Denali and Tuxedni). If the predicted impacts at those receptors are less than the SIL thresholds, a qualitative conclusion will be made that actual impacts within the Class I areas will also be less than the SIL levels. As such, no additional air quality modeling would be required to predict Class I increment consumption for the Class Areas (using AERMOD or CALPUFF).

Should the initial modeling indicate that predicted impacts at the 50km ring receptors are above the SIL thresholds, then a more refined analysis of Class I increment consumption would be required.

CALPUFF (Version 5.8.4) was previously used to assess the impacts of KNO emissions on Class I SIL and increments in the 2014 modeling analysis. KNO is proposing to rely on this previously completed CALPUFF modeling analysis, because unlike AERMOD, the CALPUFF version used and the inputs to the model would not be any different from that used for the original CALPUFF modeling analysis. Therefore, the CALPUFF modeling results would not be expected to be different from the original analysis, which demonstrated compliance with the Class I increments. However, a summary of the approach that was followed is provided in Section 21.3 below.

TABLE 22 - CLASS I AREA SILS

Pollutant / Averaging Time	Class I SIL Threshold ($\mu g/m^3$)
NO_2 / Annual	0.1
PM_{10} / Annual	0.2
PM_{10} / 24-hour	0.3
$PM_{2.5}$ / Annual	0.03
$PM_{2.5}$ / 24-hour	0.27

21.3 MODEL SELECTION AND INPUTS

21.3.1 MODEL SELECTION

The preferred model for analyzing long-range pollutant transport (i.e., distances greater than 50 km) is the CALPUFF dispersion model. CALPUFF is a multi-layer, multi-species, non-steady-state Lagrangian puff model, which can simulate the effects of time- and space-varying meteorological conditions on pollutant transport, transformation, and removal.

In addition to meteorological data, the CALPUFF model uses several other input files to specify source and receptor parameters. The selection and control of CALPUFF options are determined by user-specific inputs contained in the control file. This file contains all of the necessary information to define a model run (e.g., starting date, run length, grid specifications, technical options, output options). The air quality modeling was performed using CALPUFF default options unless otherwise noted, as specified in the federal Guideline, 2010 FLAG report, and Interagency Workgroup on Air Quality Modeling (IWAQM) documents. The following sections describe the modeling domain, meteorological data, background concentrations, and model implementation that were used for the analysis of the proposed Project operations.

21.3.2 CALMET METHODOLOGY

The Class I modeling analysis used meteorological data originally developed by the Alaska BART Coalition (ABC), a group of industrial Best Available Retrofit Technology (BART) stakeholders in Alaska. The BART rule required sources to conduct modeling analyses to assess visibility impacts in Class I areas. ABC submitted a CALMET modeling protocol[1] and protocol addendum[2] to ADEC in

[1] "Alaska CALMET Modeling Protocol – Alaska CALMET Modeling for BART – Southern Alaska", Submitted to ADEC from the Alaska BART Coalition and Geomatrix Consultants, Inc., September 2007

[2] "CALMET Modeling Protocol – Addendum – Alaska CALMET Modeling for BART", Letter from KenRichmond, Geomatrix Consultants, Inc. to Alan Schuler, ADEC, December 17, 2007

September 2007 and December 2007, respectively. ADEC subsequently approved the CALMET modeling protocol on December 19, 2007. ABC performed a three year, MM5-based CALMET analysis for use by the BART stakeholders in their own individual visibility analyses in support of requirements of the BART rule.

KNO used the inputs from the ABC CALMET analysis (MM5 data, precipitation data, surface data, and buoy data) in an updated run of CALMET using CALMET version 5.8.4. A summary of major assumptions in the CALMET analysis, as described in the ABC CALMET protocol, is summarized below:

- The NOOBS=1 option was used. The NOOBS=1 option uses MM5 data as the sole source of upper air data, rather than upper air observations.
- 45 surface stations were used.
- Precipitation observations were derived from 6 precipitation stations within the modeling domain, along with 3,575 pseudo precipitation observation stations derived from MM5 data.
- The regulatory options check within CALMET (MREG=1) was used.
- The modeled years were 2002, 2003, and 2004.

21.3.3 CALPUFF METHODOLOGY

The most recent EPA-approved version of the CALPUFF model (Version 5.8.4) was used in the analysis. Similarly, the most recent EPA-approved version of CALPOST (Version 6.221) was used to post-process the output from CALPUFF. The following is a summary of the major CALPUFF options that were used in the analysis:

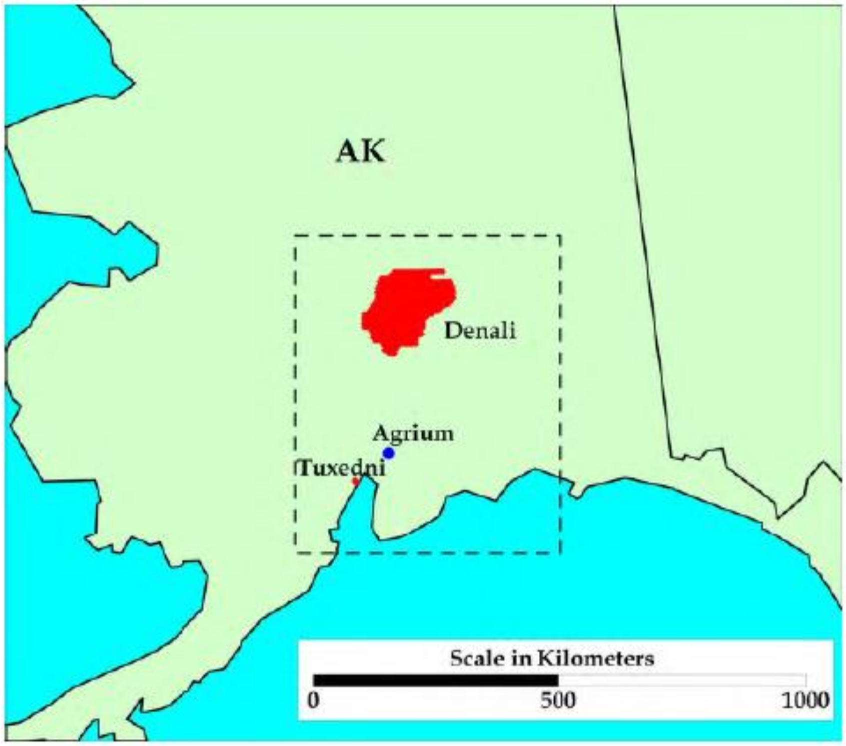
- Pasquill-Gifford stability class-based dispersion was used.
- The Mesopuff II Chemical Transformation Mechanism (MCHEM=1) was used.
- Hourly ozone concentrations measured in Denali National Park were used for the chemistry mechanism. A value of 40 ppb as used to fill any missing hourly ozone data.
- A background ammonia concentration of 0.5 ppb was used.
- Wet removal and dry deposition were included.
- The regulatory options check within CALPUFF (MREG=1) was used.
- NO_X to NO_2 annual equilibrium ratio of 75% was used in CALPOST (NO2CALC=1, RNO2NOX = 0.75)

Attachment L of this protocol contains a complete list of CALPUFF options that were used.

21.3.4 MODELING DOMAINS

The CALPUFF modeling domain was set equal to the CALMET meteorological domain used by the Alaska BART Coalition. The extent of the domain is shown in Figure 8, along with the locations of both Class I areas and the Agrium facility.

FIGURE 8 - PROPOSED MODELING DOMAIN



21.3.5 CLASS I AREA RECEPTORS

For each Class I area, receptor locations and elevations will be developed based on the standard National Park Service (NPS) receptor files[3]. Denali National Park is represented by 996 receptors, while Tuxedni National Wildlife Refuge is represented by 40 receptors. Figure 9 shows the locations of all receptors in relation to the Agrium Kenai facility.

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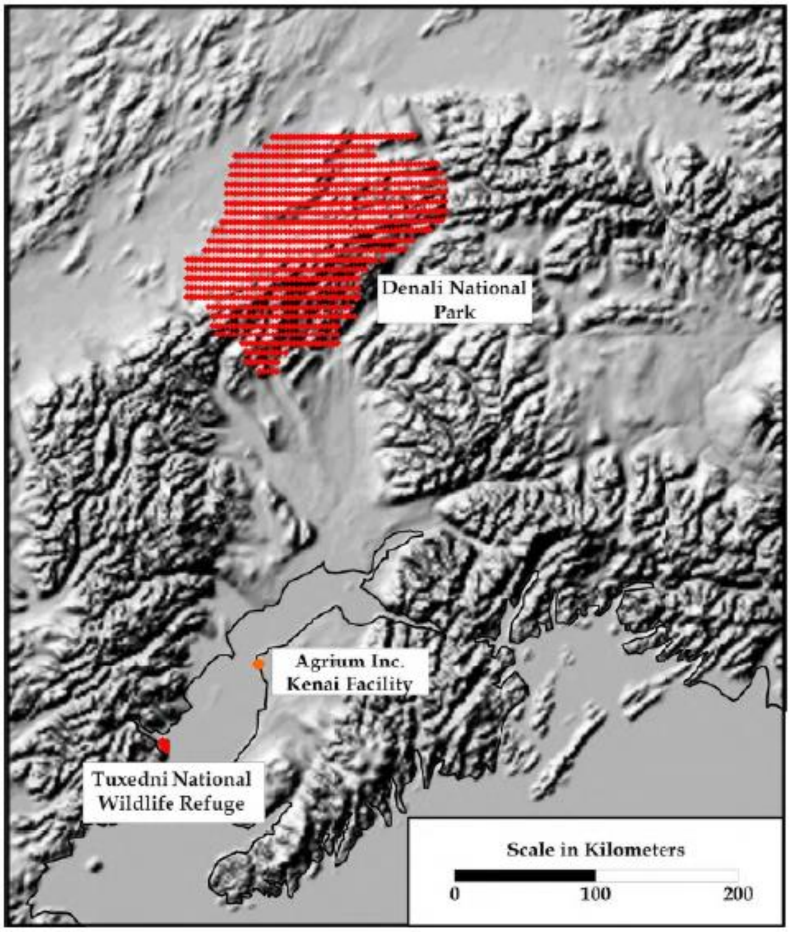
[3] Class I Area Receptors: https://irma.nps.gov/DataStore/Reference/Profile/2249830

FIGURE 9 - CLASS I AREA RECEPTORS



21.3.6 RESULTS OF THE CLASS I MODELING ANALYSIS

Table 23 and Table 24 present the maximum modeled concentrations by year due to the emissions of NO_X, PM_{10}, and $PM_{2.5}$ from Agrium KNO at Denali NP and Tuxedni NWR, respectively. The maximum modeled concentrations of these pollutants are all less than their respective SILs, as indicated in the tables. Therefore, a cumulative analysis is not necessary for either Class I area.

TABLE 23 – MAXIMUM MODELED CONCENTRATIONS WITHIN DENALI NATIONAL PARK

Denali Results	KNO Scenario	2002	2003	2004	Class I SIL
PM10 24-hr	Scenario 1	0.039	0.039	0.036	0.3
PM10 24-hr	Scenario 2	0.039	0.038	0.036	0.3
PM10 24-hr	Scenario 3	0.034	0.036	0.034	0.3
PM10 24-hr	Scenario 4	0.028	0.030	0.027	0.3
PM10 Annual	Scenario 1	0.002	0.002	0.002	0.2
PM2.5 24-hr	Scenario 1	0.037	0.037	0.034	0.27
PM2.5 24-hr	Scenario 2	0.036	0.037	0.033	0.27
PM2.5 24-hr	Scenario 3	0.032	0.033	0.032	0.27
PM2.5 24-hr	Scenario 4	0.025	0.027	0.025	0.27
PM2.5 Annual	Scenario 1	0.002	0.002	0.002	0.03
NO2 Annual	Scenario 1	0.001	0.001	0.001	0.1

TABLE 24 – MAXIMUM MODELED CONCENTRATIONS WITHIN TUXEDNI NATIONAL WILDLIFE REFUGE

Tuxedni Results	KNO Scenario	2002	2003	2004	Class I SIL
PM10 24-hr	Scenario 1	0.128	0.172	0.124	0.3
PM10 24-hr	Scenario 2	0.127	0.17	0.123	0.3
PM10 24-hr	Scenario 3	0.116	0.159	0.116	0.3
PM10 24-hr	Scenario 4	0.091	0.128	0.095	0.3
PM10 Annual	Scenario 1	0.008	0.009	0.01	0.2
PM2.5 24-hr	Scenario 1	0.118	0.16	0.115	0.27
PM2.5 24-hr	Scenario 2	0.117	0.158	0.114	0.27
PM2.5 24-hr	Scenario 3	0.106	0.146	0.107	0.27
PM2.5 24-hr	Scenario 4	0.082	0.115	0.086	0.27
PM2.5 Annual	Scenario 1	0.008	0.009	0.009	0.03
NO2 Annual	Scenario 1	0.005	0.005	0.006	0.1

21.4 AMMONIA MODELING

Alaska Rule 18 AAC 50.010(8) contains an ambient air quality standard for ammonia of 2.1 mg/m^3 for an 8-hour average, not to be exceeded more than once per year. KNO performed an air quality modeling analysis for sources involved in the restart to demonstrate that this standard will be met. The procedure followed was consistent with the procedures outlined above for other pollutants. Maximum hourly ammonia emissions were modeled for all sources included in the restart. Maximum hourly emissions are provided in Attachment B. Results are summarized in the table below and show that the AAAQS for ammonia is protected:

TABLE 25 – AMMONIA MODELING RESULTS

Year	**KNO Sources (mg/m3)**	**Background (mg/m3)**	**Total Ammonia Conc. (mg/m3)**
2020	0.157	0.00035	0.1574
2021	0.223	0.00035	0.2234
2022	0.184	0.00035	0.1844
2023	0.174	0.00035	0.1744
2024	0.140	0.00035	0.1404

22. REFERENCES

- Alaska Department of Environmental Conservation (ADEC). NO_2 - *NOx Instack Ratios Per Source Tests Approved by the Alaska Department of Environmental Conservation.* Online Posting. https://dec.alaska.gov/media/10228/no2-nox-instack-ratios-from-source-tests-082313.xlsx
- Alaska Department of Environmental Conservation (ADEC). April 19, 2018. *Air Quality Modeling Protocol Outline, PSD Permit Applications*. Version 1.6. The Alaska Department of Environmental Conservation (ADEC).
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- Fox, Tyler, Group Leader, Air Quality Modeling Group. April 30, 2024. *Updates to the Guidance for Ozone and Fine Particulate Matter Permit Modeling*. Memorandum from United States EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711.
- National Park Service (NPS) Air Resources Division (ARD). *Class I Area Modeling Receptors Database.* Online Posting. US Department of the Interior. https://irma.nps.gov/DataStore/Reference/Profile/2249830

ERM

ATTACHMENT A MAXIMUM ANNUAL PTE FOR KNO SOURCES

Stationary Sources															
Source ID	Tag Number	Source Description	Potential to Emit (tpy)												
			NO_x	CO	SO_2	PM (filterable)	PM_{10}	$PM_{2.5}$	VOC	NH_3	Pb	CO_2	CH_4	N_2O	CO_2e
22	B-502	Plants 4 and 5 Small Flare	0.38	1.70	3.22E-03	0.01	0.04	0.04	3.61	0.03	-	644.99	0.01	1.22E-03	645.69
23	B-501	Plants 4 and 5 Emergency Flare	0.20	0.54	1.03E-03	0.00	0.01	0.01	1.16	0.23	-	206.40	3.89E-03	3.89E-04	206.62
11	B-609	Ammonia Tank Storage System Flare	0.37	1.70	3.22E-03	0.01	0.04	0.04	3.61	0.00		644.99	0.01	1.22E-03	12.00
12	B-201	Primary Reformer	118.26	251.88	3.48	11.01	44.06	44.06	31.88	0.00	2.9E-03	695,647	13.33	12.75	699,821
13	B-200	Startup Heater	0.99	0.83	0.01	0.02	0.08	0.08	0.05	0.00	5.0E-06	1,188	0.02	0.02	1,195
14	D-207	CO_2 Vent	-	12.7	-	-	-	-	49.93	25.55	-	845,486	-	-	845,486
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	-	-	1.0E-02	0.00	-	0.00	-	-	0.00
16	H-269	Amine Fat Flasher Vent	-	4.6	-	-	-	-	0.96	2.10	-	13,739	-		13,739
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	-	-	0.24	0.06	-	0.00	-	-	0.00
19	C-200	H2 Vent Stack (dry gas vent)	-	126.9	-	-	-	-	-	50.04	-			-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stack	-	-	-	43.80	43.80	43.80	1.75	200.75	-	-	-	-	-
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stack	-	-	-	43.80	43.80	43.80	1.75	200.75	-	-	-	-	-
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	-	-	0.10	91.10	-	73.00	-	-	73.00
38	D-511	Inerts Vent Scrubber				-	-	-	0.12	49.28		547.50	-	-	547.50
39	E-535	After Condenser Exchanger	-	-	-	-	-	-	-	0.00	-	0.00	-	-	0.00
40	E-711	Cooling tower	-	-	-	3.29	0.99	5.8E-03	-	2.92	-		-	-	0.00
41	D-514	Tank Scrubber	-	-	-	-	-	-	-	0.44	-	0.00	-	-	0.00
41A	D-513	Tank Scrubber							1.7E-04	0.88					
41B	F-209	MDEA Storage Tank							3.0E-05						
41C	F-615	MDEA Storage Tank							5.0E-06						
44a	6B-708C	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
48a	6B-708B	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
49a	6B-708A	Package Boiler	10.64	39.38	0.63	1.98	7.93	7.93	5.74	9.40	5.2E-04	125,216	2.40	0.67	125,483
47	N/A	Urea Loading Wharf	-	-	-	0.55	0.47	0.16	-	0.00	-	0.00	-	-	0.00
47A		Urea Transfer				*	*	*							
47C		Urea Warehouse/Transfer (stack)				0.04	0.04	0.01							
47B		Urea Warehouse/Transfer (fugitive)				0.22	0.19	0.07							
47D		Urea Transfer				0.04	0.04	0.01							
50	B-705A	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
51	B-705B	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
52	B-705C	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
53	B-705D	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,224
54	B-705E	Waste Heat Boiler	3.79	22.31	0.12	0.38	1.53	1.53	1.10	7.34	1.0E-04	24,079	0.46	0.44	24,222
55a	GGT-744A	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
56a	GGT-744B	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
57a	GGT-744C	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
58a	GGT-744D	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
59a	GGT-744E	Solar Turbine/Generator Set	8.10	26.47	0.83	1.80	1.80	1.80	0.51	-	-	26,712	2.09	0.73	26,988
60	F-791	Deaerator Vent	-	-	-	-	-	-	-	7.67	-	0.00	-	-	0.00
61	F-711	Degasifier Vent	-	-	-	-	-	-	-	0.12	-	0.00	-	-	0.00
65	GM-616D	Diesel Fired Well Pump	1.00	0.22	0.07	0.07	0.07	0.07	0.08	-	-	37.20	-	-	37.20
66	G-613B	Gasoline Fired Firewater Pump	0.29	0.17	1.5E-02	1.8E-02	1.8E-02	1.8E-02	0.53	-	-	27.17	-	-	27.17
Comp	N/A	Fugitive Ammonia from Components								2.18					
IEU	N/A	Building Heaters/Water Heaters	2.94	1.25	0.02	0.06	0.24	0.24	0.17	-	1.6E-05	3,751	0.07	0.07	3,773
		Facility Total Potential to Emit	**215.81**	**764.48**	**10.20**	**119.78**	**174.26**	**172.82**	**121.26**	**699.01**	**5.0E-03**	**2,191,600**	**33.41**	**20.70**	**2,198,069**

ATTACHMENT B MAXIMUM HOURLY PTE FOR KNO SOURCES

Stationary Sources

Source ID	Tag Number	Source Description	Potential to Emit (lb/hr)												
			NO_x	CO	SO_2	PM (filterable)	PM_{10}	$PM_{2.5}$	VOC	NH_3	Pb	CO_2	CH_4	N_2O	CO_2e
22	B-502	Plants 4 and 5 Small Flare	2.2	0.4	0.0	0.0	0.0	0.0	0.8	6.0	-	147.26	2.78E-03	2.78E-04	147.42
23	B-501	Plants 4 and 5 Emergency Flare	54.0	0.1	0.0	0.0	0.0	0.0	0.3	150.0	-	47.12	8.89E-04	8.89E-05	47.17
11	B-609	Ammonia Tank Storage System Flare	0.1	0.4	0.0	0.0	0.0	0.0	0.8	-		147.42	0.00	2.78E-04	147.42
12	B-201	Primary Reformer	27.0	57.5	0.8	2.5	10.1	10.1	7.3	-	6.6E-04	1.59E+05	3.04E+00	2.91E+00	1.60E+05
13	B-200	Startup Heater	9.9	8.3	0.1	0.2	0.8	0.8	0.5	-	5.0E-05	11,882.35	0.23	0.22	11,953.65
14	D-207	CO_2 Vent	-	2.9	-	-	-	-	11.4	5.8	-	193,033.36	-	-	193,033.36
15	H-205	Organic Sulfur Removal Unit Vent	-	-	-	-	-	-	-	-	-	-	-	-	-
16	H-269	Amine Fat Flasher Vent	-	1.1	-	-	-	-	0.22	0.48	-	-	-		-
17	F-263	PC Stripper Surge Tank Vent	-	-	-	-	-	-	0.05	0.01	-	-	-	-	-
19	C-200	H2 Vent Stack (dry gas vent)	-	1,268.5	-	-	-	-	0.00	41.70	-			-	
35	C-560A	Granulator A/B Scrubber Exhaust Vent Stack	-	-	-	10.0	10.0	10.0	0.40	45.83	-	-	-	-	-
36	C-560B	Granulator C/D Scrubber Exhaust Vent Stack	-	-	-	10.0	10.0	10.0	0.40	45.83	-	-	-	-	-
37	D- 515	Atmospheric Absorber Final Scrubber	-	-	-	-	-	-	0.02	20.80	-	16.67	-	-	16.67
38	D-511	Inerts Vent Scrubber				-	-	-	0.03	11.25		125.00	-	-	125.00
39	E-535	After Condenser Exchanger	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-
40	E-711	Cooling tower	-	-	-	0.75	0.23	1.3E-03	0.00	0.67	-	-	-	-	-
41	D-514	Tank Scrubber	-	-	-	-	-	-	0.00	0.10	-	-	-	-	-
41A	D-513	Tank Scrubber								0.20					
41B	F-209	MDEA Storage Tank													
41C	F-615	MDEA Storage Tank													
44	6B-708A	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
48	6B-708B	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
49	6B-708C	Package Boiler	2.4	9.0	0.1	0.5	1.8	1.8	1.31	2.15	1.2E-04	28,588.24	0.55	0.15	28,649.01
47	N/A	Urea Loading Wharf	-	-	-	1.3	1.1	0.4	0.00	0.00	-	-	-	-	-
47A		Urea Transfer				*	*	*							
47C		Urea Warehouse/Transfer (stack)				0.10	0.08	0.03							
47B		Urea Warehouse/Transfer (fugitive)				0.50	0.43	0.15							
47D		Urea Transfer				0.10	0.09	0.03							
50	B-705A	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
51	B-705B	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
52	B-705C	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
53	B-705D	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.51
54	B-705E	Waste Heat Boiler	0.9	5.1	0.03	0.09	0.35	0.35	0.25	1.68	2.3E-05	5,497.53	0.11	0.10	5,530.20
55	GGT-744A	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
56	GGT-744B	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
57	GGT-744C	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
58	GGT-744D	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
59	GGT-744E	Solar Turbine/Generator Set	1.0	6.0	0.19	0.41	0.41	0.41	0.12	0.00	-	6.10E+03	0.48	0.17	6.16E+03
60	F-791	Deaerator Vent	-	-	-	-	-	-	0.00	1.75	-	-	-	-	-
61	F-711	Degasifier Vent	-	-	-	-	-	-	0.00	0.03	-	-	-	-	-
65	GM-616D	Diesel Fired Well Pump	11.9	2.6	0.8	0.8	0.8	0.8	0.97	0.00	-	442.80	-	-	442.80
66	G-613B	Gasoline Fired Firewater Pump	3.4	2.1	1.8E-01	2.1E-01	2.1E-01	2.1E-01	0.21	0.00	-	323.40	-	-	323.40
Comp	N/A	Fugitive Ammonia from Components								0.50					
IEU	N/A	Building Heaters/Water Heaters	0.7	2.9E-01	4.3E-03	1.4E-02	5.4E-02	5.4E-02	3.9E-02	-	3.6E-06	856.35	0.02	0.02	861.44
		Facility Total Potential to Emit (lb/hr)	**126.0**	**1,426.8**	**3.3**	**30.3**	**43.0**	**41.7**	**29.3**	**345.8**	**0.0012**	**509,591**	**7.85**	**4.94**	**511,282**

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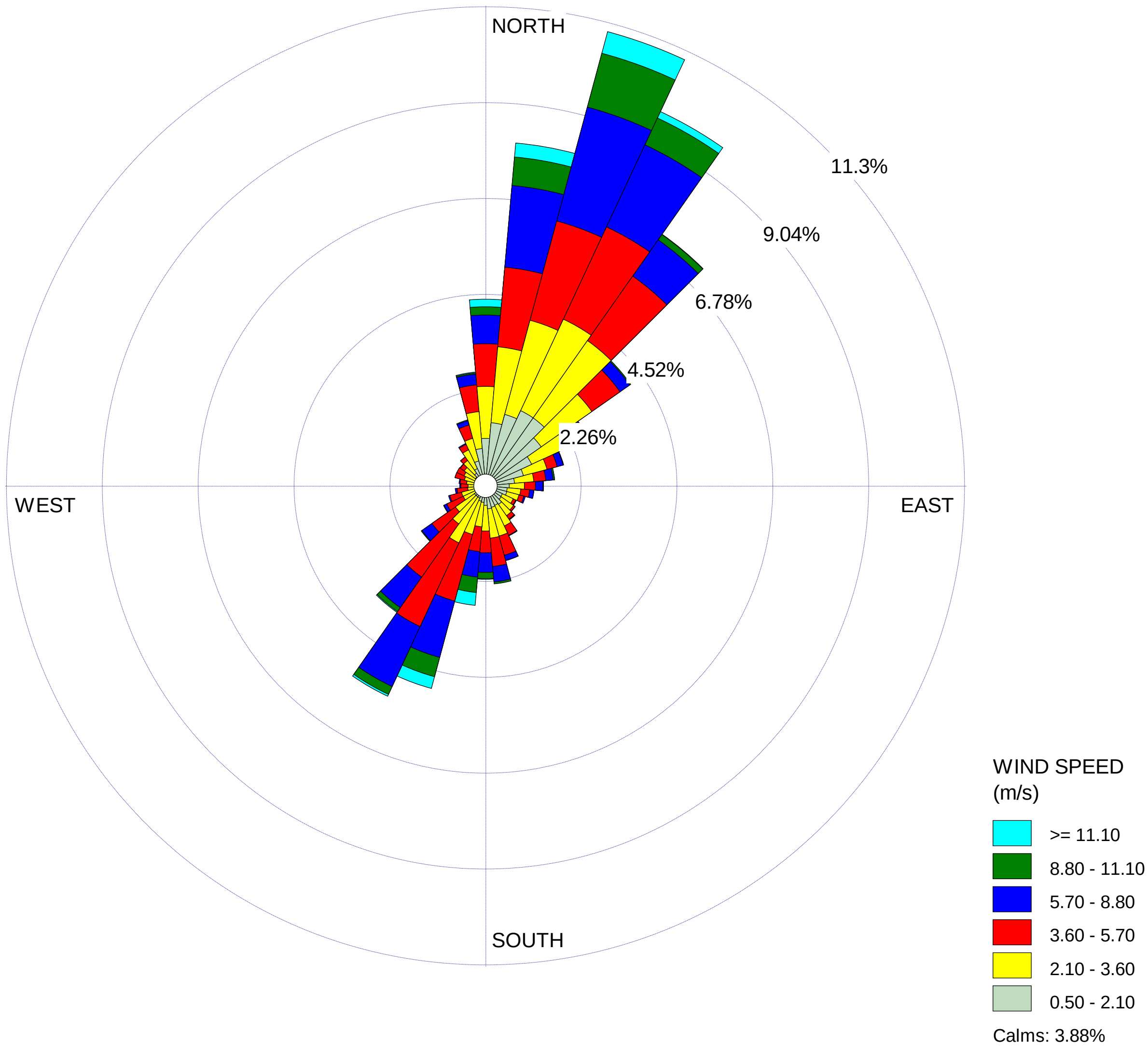
ATTACHMENT C WIND ROSE PLOT

WIND ROSE PLOT:

Station #26523

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	TITLE:	
	Start Date: 1/1/2020 - 00:00 **End Date: 12/31/2024 - 23:59**	**Kenai Meteorological Tower, 5-Year Annual Average Wind Rose, 2020-2024**	
		PROJECT: **Kenai Nitrogen Operations**	ERM
	CALM WINDS: **3.88%**	TOTAL COUNT: **43754 hrs.**	
	AVG. WIND SPEED: **3.97 m/s**	DATE: **6/10/2025**	DATA COMPLETENESS: **99.79%**

WRPLOT View - Lakes Environmental Software

ERM

ATTACHMENT D LAND USE ANALYSIS

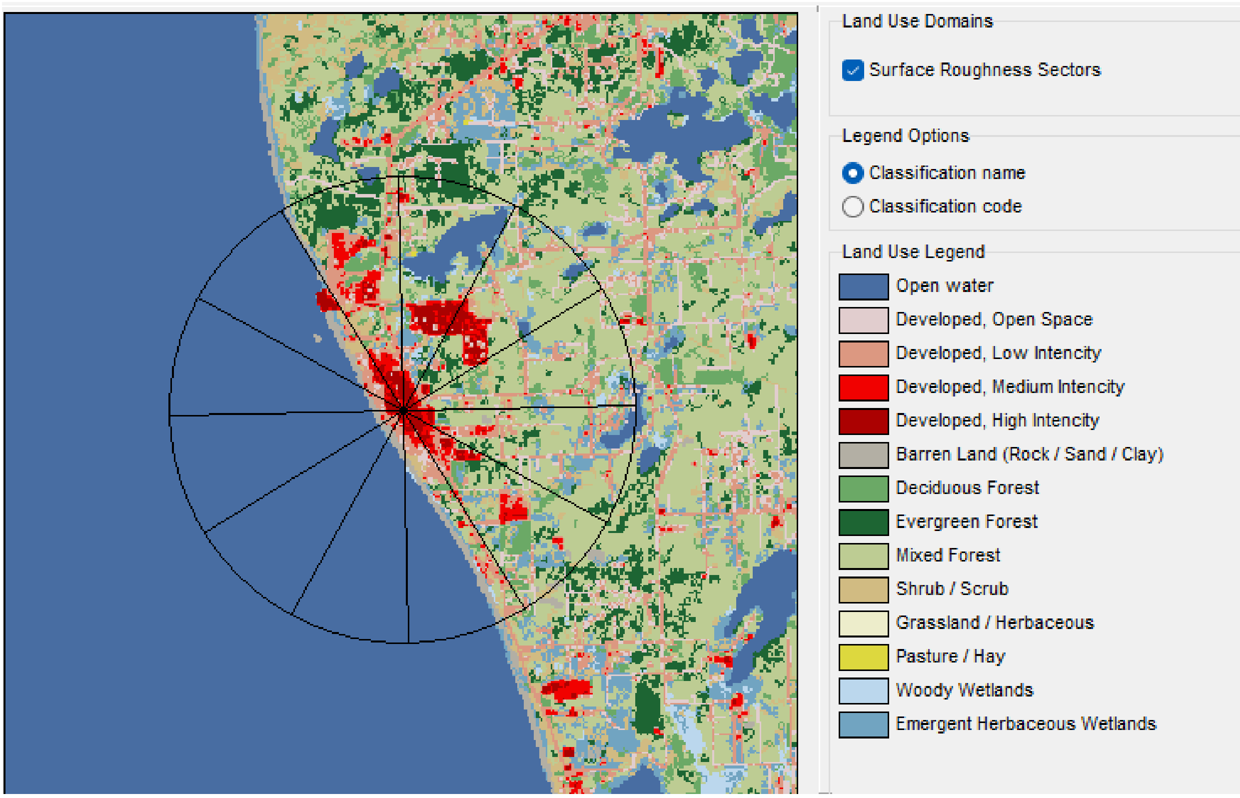


Figure 1: Land use analysis of KNO site and nearby surroundings within 3000 m radius

Table 1: Land use analysis summary for KNO site and surroundings. "Total cells" represents number of 900 m^2 cells (of 31,408) which fall into that land use category. Categories with no cells are excluded from the table.

Category	Total Cells	Fraction	Rank
Open Water:	14949	48%	1
Mixed Forest:	6161	20%	2
Developed, Low Intensity:	2260	7%	3
Evergreen Forest:	1428	5%	4
Emergent Herbaceous Wetland:	1215	4%	5
Deciduous Forest:	1082	3%	6
Shrub/Scrub:	984	3%	7
Developed, Medium Intensity:	955	3%	8
Developed, Open Space:	875	3%	9
Developed, High Intensity:	782	2%	10
Barren Land (Rock/Sand/Clay):	525	2%	11
Woody Wetlands:	187	1%	12
Pasture/Hay:	5	0%	13

ATTACHMENT E STACK PARAMETERS FOR KNO SOURCES

Point Sources

Source ID	Stack Release Type	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temperature (°F)	Exit Velocity (fps)	Stack Diameter (ft)
40W	DEFAULT	Cooling Tower west	588420.53	6727894.82	130	67.5	60.0	9.18	34.00
40E	DEFAULT	Cooling Tower east	588429.50	6727898.43	130	67.5	60.0	9.18	34.00
35_155	DEFAULT	granulator @ 155 ft	588426.06	6727873.05	130	155.0	350.0	37.73	7.50
36_155	DEFAULT	granulator @ 155 ft	588442.62	6727879.79	130	155.0	350.0	37.73	7.50
12	DEFAULT	Primary Reformer	588465.77	6727743.24	130	100.0	488.0	80.04	12.00
44	DEFAULT	package boiler	588574.01	6727639.19	130	100.0	300.0	50.42	5.50
48	DEFAULT	package boiler	588564.42	6727661.33	130	100.0	300.0	50.42	5.50
49	DEFAULT	package boiler	588560.36	6727672.71	130	100.0	300.0	50.42	5.50
55	DEFAULT	Solar CT- Bypass	588607.93	6727687.90	130	60.0	635.0	193.93	3.31
56	DEFAULT	Solar CT- Bypass	588612.05	6727689.31	130	60.0	635.0	193.93	3.31
57	DEFAULT	Solar CT- Bypass	588616.18	6727691.18	130	60.0	635.0	193.93	3.31
58	DEFAULT	Solar CT- Bypass	588620.57	6727692.17	130	60.0	635.0	193.93	3.31
59	DEFAULT	Solar CT- Bypass	588624.67	6727694.66	130	60.0	635.0	193.93	3.31
22	DEFAULT	Plant 4 and 5 Small Flare	588470.05	6727812.01	130	246.0	1200.0	3.58	2.00
11	DEFAULT	Ammonia Tank Storage System Flare (pilot only)	588456.44	6727482.07	130	30.0	250.0	150.00	1.30
13	POINTCAP	Startup Heater	588477.28	6727765.84	130	90.0	1400.0	44.38	6.00
14	DEFAULT	CO2 Vent	588547.96	6727730.48	130	154.0	167.0	88.28	1.75
16	DEFAULT	Amine Fat Flasher Vent	588552.85	6727719.15	130	70.0	200.0	12.28	1.88
17	DEFAULT	PC Stripper Surge Tank Vent	588496.43	6727742.17	130	46.0	212.0	20.00	0.67
19	DEFAULT	H2 Vent Stack (dry gas vent)	588477.70	6727672.80	130	80.0	400.0	97.95	3.00
50_100	DEFAULT	Waste Heat Boiler	588603.04	6727698.97	130	100.0	290.0	65.70	4.00
51_100	DEFAULT	Waste Heat Boiler	588607.41	6727700.52	130	100.0	290.0	65.70	4.00
52_100	DEFAULT	Waste Heat Boiler	588611.72	6727702.43	130	100.0	290.0	65.70	4.00
53_100	DEFAULT	Waste Heat Boiler	588615.96	6727703.92	130	100.0	290.0	65.70	4.00
54_100	DEFAULT	Waste Heat Boiler	588620.02	6727705.31	130	100.0	290.0	65.70	4.00
23	DEFAULT	Plants 4 and 5 Emergency Flare	588470.05	6727812.01	130	246.0	1200.0	400.00	5.50
47C	POINTHOR	Urea Transfer from Storage	588381.09	6727556.70	130	32.5	-459.7	37.67	2.00
47D	POINTHOR	Urea Transfer at Wharf	587885.53	6727243.39	0	80.0	-459.7	15.92	2.00
ASHIPSTK	DEFAULT	Ammonia Cargo Ship Stack	587833.57	6727288.28	0	128.0	644.0	228.74	0.83
USHIPSTK	DEFAULT	Urea Cargo Ship Stack	587835.14	6727288.85	0	95.1	185.0	20.16	1.00
65	POINTHOR	Diesel Fired Well Pump	590889.30	6727758.00	130	30.0	500.0	53.05	1.00
S66A	POINTHOR	fire water pump	588641.27	6727410.80	112	6.8	800.0	95.51	0.33
S66B	POINTHOR	fire water pump	588641.27	6727410.80	112	6.8	800.0	95.51	0.33
37	DEFAULT	Atmospheric Absorber Final Scrubber	588467.48	6727817.46	130	234.0	80.0	30.56	0.50
38	DEFAULT	Inerts Vent Scrubber	588472.58	6727821.45	130	234.0	190.0	2.00	2.83
41	POINTHOR	Tank Scrubber	588426.42	6727808.48	130	47.0	200.0	16.00	1.33
41A	POINTHOR	Tank Scrubber	588425.00	6727806.00	130	62.0	-459.7	8.49	0.50
60	POINTHOR	Deaerator Vent	588591.00	6727672.00	130	63.0	212.0	14.77	0.50
61	DEFAULT	Degasifier Vent	588591.66	6727674.42	130	84.0	212.0	60.44	0.83

Volume Sources

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Release Height (ft)	Init. Horizontal Dimension (ft)	Initial Vert. Dimension (ft)
47B	Fugitive Urea Transfer & Storage	588341.74	6727642.86	130	46	38.16	32.51
47	Fugitive Urea Transfer to Ship	587865.86	6727230.55	0	60	11.61	9.28
NH3FUG1	Ammonia Piping Fugitives	588486.70	6727821.60	130	20	7.64	0.76
NH3FUG2	Ammonia Piping Fugitives	588482.66	6727831.92	130	20	7.64	0.76
NH3FUG3	Ammonia Piping Fugitives	588475.46	6727850.39	130	20	7.64	0.76
NH3FUG4	Ammonia Piping Fugitives	588479.00	6727841.02	130	20	7.64	0.76
NH3FUG5	Ammonia Piping Fugitives	588471.49	6727860.01	130	20	7.64	0.76
NH3FUG6	Ammonia Piping Fugitives	588467.69	6727869.72	130	20	7.64	0.76
NH3FUG7	Ammonia Piping Fugitives	588463.90	6727880.41	130	20	7.64	0.76

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ATTACHMENT F AMMONIA VESSEL CONFIGURATION

GENERAL ARRANGEMENT

PLAN HISTORY

DATE	REV.	MARK	DESCRIPTION	DRAWN	CHECKED	APPROVED
Feb.19 2009	ORI		ORIGINALLY PREPARED FOR HULL NO.8065/066/067.			
July.13 2009	1		UPDATED UPPER DECK ARRANGEMENT. UPDATED ARRG'T OF S/G ROOM AND BOSUN STORE. UPDATED FORE & RADAR MAST. REFLECTED SPEED LOG & ECHO SOUNDER.			
Aug.12 2010			FINALLY PREPARED FOR FINISHED DRAWING OF HULL NO.8065.			

PRINCIPAL PARTICULARS

LENGTH	O.	A.	173.70 M
LENGTH	B.	P.	165.00 M
BREADTH	MLD.		28.00 M
DEPTH	MLD.		17.80 M
DRAFT	DESIGN	MLD.	9.50 M
	SCANT.	MLD.	10.40 M
	SCANT.	EXT.	10.419 M

MAIN ENGINE
TYPE : HYUNDAI B&W 6S50MC-C7
MCR : 9,480 KW x 127.0 RPM
NCR : 8,530 KW x 122.6 RPM

SERVICE SPEED AT THE DESIGN DRAFT
(NCR WITH 15% S.M) Abt.16.70 KNOTS

CLASSIFICATION: LR
+100A1, Liquefied gas carrier, Ship Type 2G, Propane, Butane, Butane-propane mixtures, Butylene, Propylene, Anhydrous Ammonia and Butadiene in Independent Tanks Type A, Max. specific gravity 0.70, Partial loading Vinyl Chloride Monomer with maximum specific gravity 0.97, Max. vapour pressure 0.25 bar g, Min. cargo temperature -50℃, ShipRight(SDA, FDA, CM), +LMC, UMS, +Lloyd's RMC(LG), LI, *IWS, EP, Green Passport with Descriptive notation ShipRight[ACS(B), SERS, SCM, BWMP(S)], ETA

FREEBOARD TYPE	B TYPE
FLAG	LIBERIA
COMPLEMENT	30 + 6P
IMO NO.	9471018

CLASSIFICATION A

DEP'T NO. 5610	DEP'T NAME BASIC DESIGN DEP'T	SHIP TYPE 35,000 M3 CLASS LPG/NH3 CARRIER
TEL.NO. 3757	SHIP NO. 8065	SHIP NAME GASCHEM HAMBURG
DATE 2010.08.12	APPROVED T. W. PARK CHECKED S. H. OH DRAWN H. D. KANG	NAME OF DRAWING GENERAL ARRANGEMENT
HMD	HYUNDAI MIPO DOCKYARD CO., LTD. ULSAN KOREA	SCALE 1/200 · DRAWING NO. 1A000B001 · REV. NO FIN.
		CONSOLIDATED B - 2

A0-G09(1890x840)

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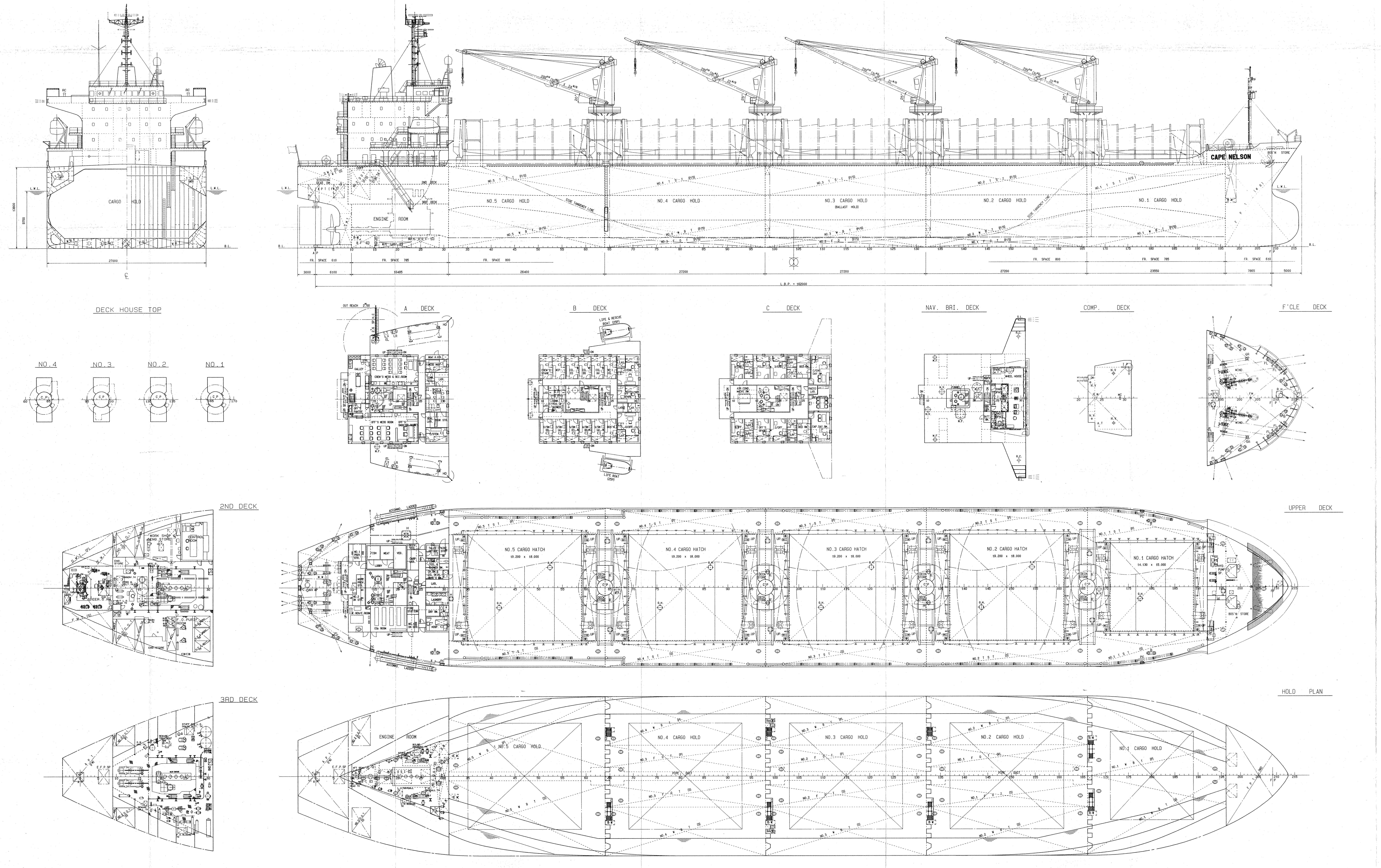
ATTACHMENT G UREA VESSEL CONFIGURATION

BIBLIOGRAPHY



PRINCIPAL PARTICULARS		
LENGTH	(O.A.)	170 M.00
LENGTH	(B.P.)	162 M.00
BREADTH	(MLD)	27 M.00
DEPTH	(MLD)	13 M.80
DESIGNED DRAFT	(MLD)	9 M.70
SUMMER DRAFT	(EXTREME)	9 M.767
GROSS TONNAGE		17,433 T
DEADWEIGHT	(DESIGNED DRAFT 9M70)	28,240.48 MT
	(SUMMER DRAFT 9M75)	28,437.62 MT
MAIN ENGINE	5UEC52LA	
	M.C.O. 5,884 kW (8,000 PS) x 133 min^{-1} (RPM)	
	C.S.O. 5,038 kW (6,850 PS) x 126 min^{-1} (RPM)	
SERVICE SPEED		
AT DESIGNED DRAFT = 9M70 C.S.O. 15% SM		ABOUT 14.0 KT
COMPLEMENT		25 P
CLASSIFICATION		NK
HOLD CAPACITY :	GRAIN	37,732 M^3
	BALE	36,683 M^3

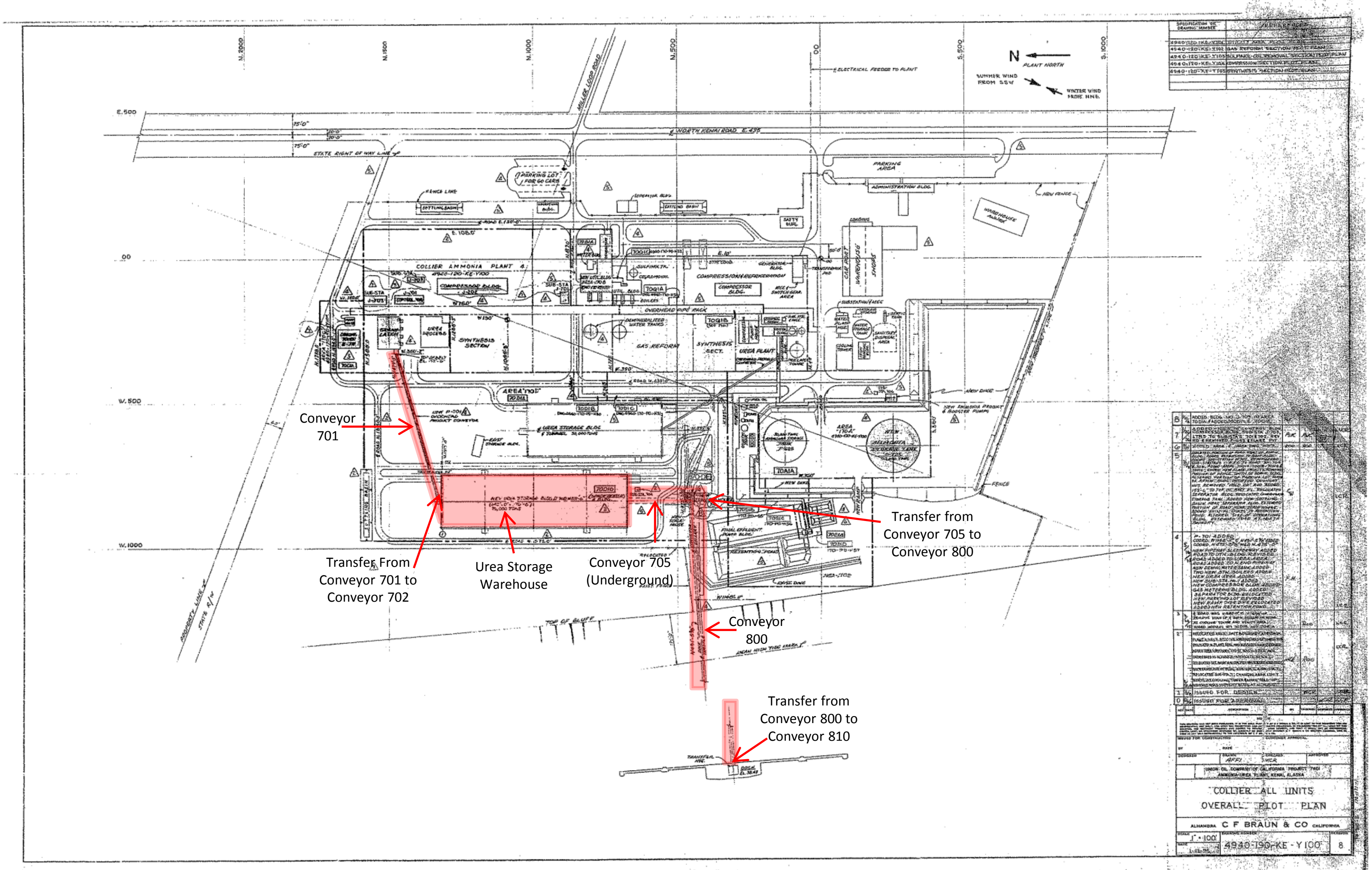
FINISHED PLAN

OWNER	**CATERINA (BVI) LIMITED**		
SHIP NAME	**CAPE NELSON**		
SHIP NO.	407	CLASSIFICATION NK	
D.W. 28,300 MT LOG & BULK CARRIER			
GENERAL ARRANGEMENT			
KANDA SHIPBUILDING CO., LTD. DESIGNING DIVISION KURE JAPAN	DIRECTOR: K. Matsuo	SCALE	1/200
	MANAGER	CODE NO.	
	ASS MANAGER	DATE DRAWN	16th Mar., 2001
	SECT CHIEF	DATE ISSUED	
	CHECKED BY	DATE APPROVED	
	DRAWN BY: Y.M	DRAWING NO.	K-1

配布先 船主 公団 本船 JG NK AB 基設 船設 艤設 機設 電設 工場長 営業 資材 外註 検査 船殻 艤装 機装 電装 修繕 メーカー 控 計

ERM

ATTACHMENT H SCHEMATIC AND LOCATION OF GRANULATED UREA CONVEYORS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PLANT NORTH
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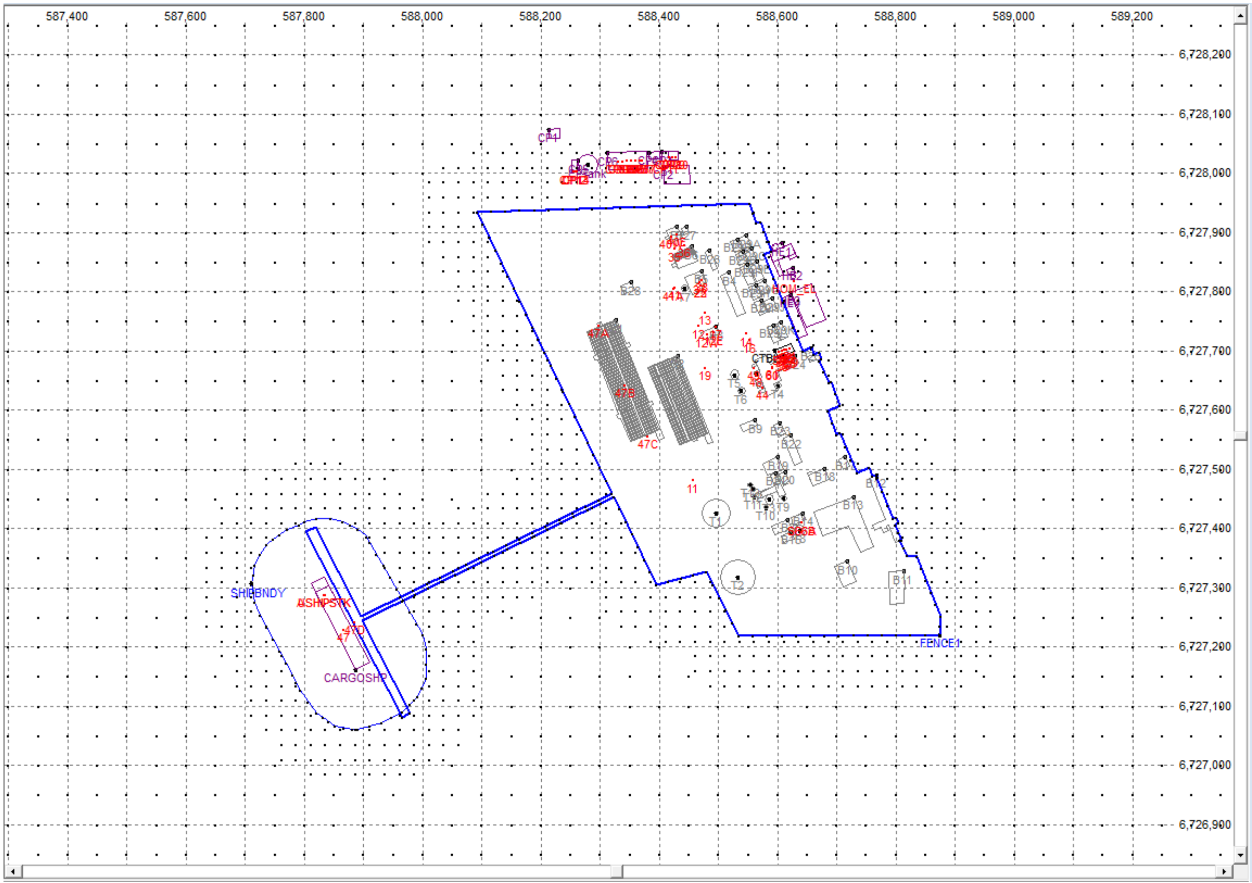
S.500
S.1000
E.500
W.500
W.1000
MILLER LOOP ROAD
NORTH KENAI ROAD
STATE RIGHT OF WAY LINE
PARKING LOT FOR 60 CARS
PARKING AREA
ADMINISTRATION BLDG.
COLLIER AMMONIA PLANT 4
COMPRESSOR BLDG.
UREA PROCESS
SYNTHESIS SECTION
GAS REFORM
SYNTHESIS SECT.
UREA PLANT
COMPRESSION/REFRIGERATION
OVERHEAD PIPE RACK
AREA "100"
UREA STORAGE BLDG.
FENCE
NEW FENCE
TOP OF BLUFF
PROPERTY LINE
Conveyor 701
Transfer From Conveyor 701 to Conveyor 702
Urea Storage Warehouse
Conveyor 705 (Underground)
Transfer from Conveyor 705 to Conveyor 800
Conveyor 800
Transfer from Conveyor 800 to Conveyor 810
ISSUED FOR DESIGN
COLLIER ALL UNITS
OVERALL PLOT PLAN
C F BRAUN & CO
4940-190-KE-Y100
8

ERM

ATTACHMENT I KNO STRUCTURES

KNO Facility Buildings							
	Building Name	**Number of Tiers**	**Tier Number**	**Comment**	**Base Elevation**	**Tier Height**	**Number of Corners**
					(ft)	**(ft)**	
B1-1	B1	14	1	Granules Storage Warehous	130	23.75	26
B1-2	B1	*	2	*	*	27.3064	4
B1-3	B1	*	3	*	*	30.8661	4
B1-4	B1	*	4	*	*	34.4226	4
B1-5	B1	*	5	*	*	37.9823	4
B1-6	B1	*	6	*	*	41.5387	4
B1-7	B1	*	7	*	*	45.0951	4
B1-8	B1	*	8	*	*	48.6549	4
B1-9	B1	*	9	*	*	52.2113	4
B1-10	B1	*	10	*	*	55.7677	4
B1-11	B1	*	11	*	*	59.3274	4
B1-12	B1	*	12	*	*	62.8839	4
B1-13	B1	*	13	*	*	66.4436	4
B1-14	B1	*	14	*	*	70	4
B2-1	B2	14	1	Prills Storage Warehouse	130	25	10
B2-2	B2	*	2	*	*	28.4613	4
B2-3	B2	*	3	*	*	31.9226	4
B2-4	B2	*	4	*	*	35.3839	4
B2-5	B2	*	5	*	*	38.8451	4
B2-6	B2	*	6	*	*	42.3064	4
B2-7	B2	*	7	*	*	45.7677	4
B2-8	B2	*	8	*	*	49.2323	4
B2-9	B2	*	9	*	*	52.6936	4
B2-10	B2	*	10	*	*	56.1549	4
B2-11	B2	*	11	*	*	59.6161	4
B2-12	B2	*	12	*	*	63.0774	4
B2-13	B2	*	13	*	*	66.5387	4
B2-14	B2	*	14	*	*	70	4
B3-1	B3	1	1	No. 2 Cooling Tower	130	48	4
B4-1	B4	1	1	N0. 4 Compressor Building	130	58	4
B5-1	B5	2	1	No. 5 Urea Process Building	130	63	6
B5-2	B5	*	2	*	*	223.5	4
B6-1	B6	14	1	Granulation #5 Building	130	49	8
B6-2	B6	*	2	*	*	50.3346	4
B6-3	B6	*	3	*	*	51.6667	4
B6-4	B6	*	4	*	*	52.9987	4
B6-5	B6	*	5	*	*	54.334	4
B6-6	B6	*	6	*	*	55.666	4
B6-7	B6	*	7	*	*	57.0013	4
B6-8	B6	*	8	*	*	58.3333	4
B6-9	B6	*	9	*	*	59.6654	4
B6-10	B6	*	10	*	*	61.0007	4
B6-11	B6	*	11	*	*	62.3327	4
B6-12	B6	*	12	*	*	63.668	4
B6-13	B6	*	13	*	*	65	4
B6-14	B6	*	14	*	*	92.9987	4
B7-1	B7	2	1	#5 Cooling Tower	130	15	12
B7-2	B7	*	2	*	*	46	4
B8-1	B8	1	1	#4 Primary Reformer	130	80	4
B9-1	B9	1	1	#1 Primary Reformer	130	80	4
B10-1	B10	1	1	Structure 4	130	29	4
B11-1	B11	1	1	Structure 5	130	21.75	6
B12-1	B12	1	1	Structure 6	130	15.75	18
B13-1	B13	1	1	Structure 7	130	35.5	6
B14-1	B14	2	1	Structure 8	130	15.9	4
B14-2	B14	*	2	*	*	28	4
B15-1	B15	1	1	Structure 9	130	36.88	4
B17-1	B17	1	1	Structure 11	130	21.64	8
B18-1	B18	2	1	Structure 12	130	15.9	6
B18-2	B18	*	2	*	*	33.75	4
B19-1	B19	1	1	Structure 13	130	31	4
B20-1	B20	1	1	Structure 14	130	15	6
B21-1	B21	4	1	Structure 15	130	17.37	12
B21-2	B21	*	2	*	*	30	12
B21-3	B21	*	3	*	*	54	8
B21-4	B21	*	4	*	*	88	4
B22-1	B22	1	1	Structure 17	130	38	4
B23-1	B23	1	1	Structure 18	130	14	10
B24-1	B24	2	1	Structure 19	130	12	42
B24-2	B24	*	2	*	*	35	14
B25-1	B25	2	1	Structure 24	130	20	4
B25-2	B25	*	2	*	*	28	4
B26-1	B26	1	1	Structure 26	130	24	8
B27-1	B27	1	1	Structure 31	130	15	4
B28-1	B28	1	1	Structure 32	130	21.25	4
B29A-1	B29A	1	1	Structure 40	130	25	4
B29B-1	B29B	1	1	Structure 40 B	130	25	4
B29C-1	B29C	1	1	Structure 40 C	130	25	4
B29D-1	B29D	1	1	Structure 40 D	130	25	4
B29E-1	B29E	1	1	Structure 40 E	130	25	4
B29F-1	B29F	1	1	Structure 2F	130	25	4
B29G-1	B29G	1	1	Structure 40 G	130	25	4
B29H-1	B29H	1	1	Structure 40 H	130	25	4
B29I-1	B29I	1	1	Structure 40 I	130	25	4
B29J-1	B29J	1	1	Structure 40 J	130	25	4
B29K-1	B29K	1	1	Structure 40 K	130	25	4
B29L-1	B29L	1	1	Structure 40 L	130	25	4
CTBLDG-1	CTBLDG	1	1		130	54	4
CARGOSHP-1	CARGOSHP	2	1	Cargo Ship	0	22.96588	4
CARGOSHP-2	CARGOSHP	*	2	*	*	75.45932	4

ATTACHMENT J RECEPTOR GRIDS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SHIPBNDY
CARGOSHP
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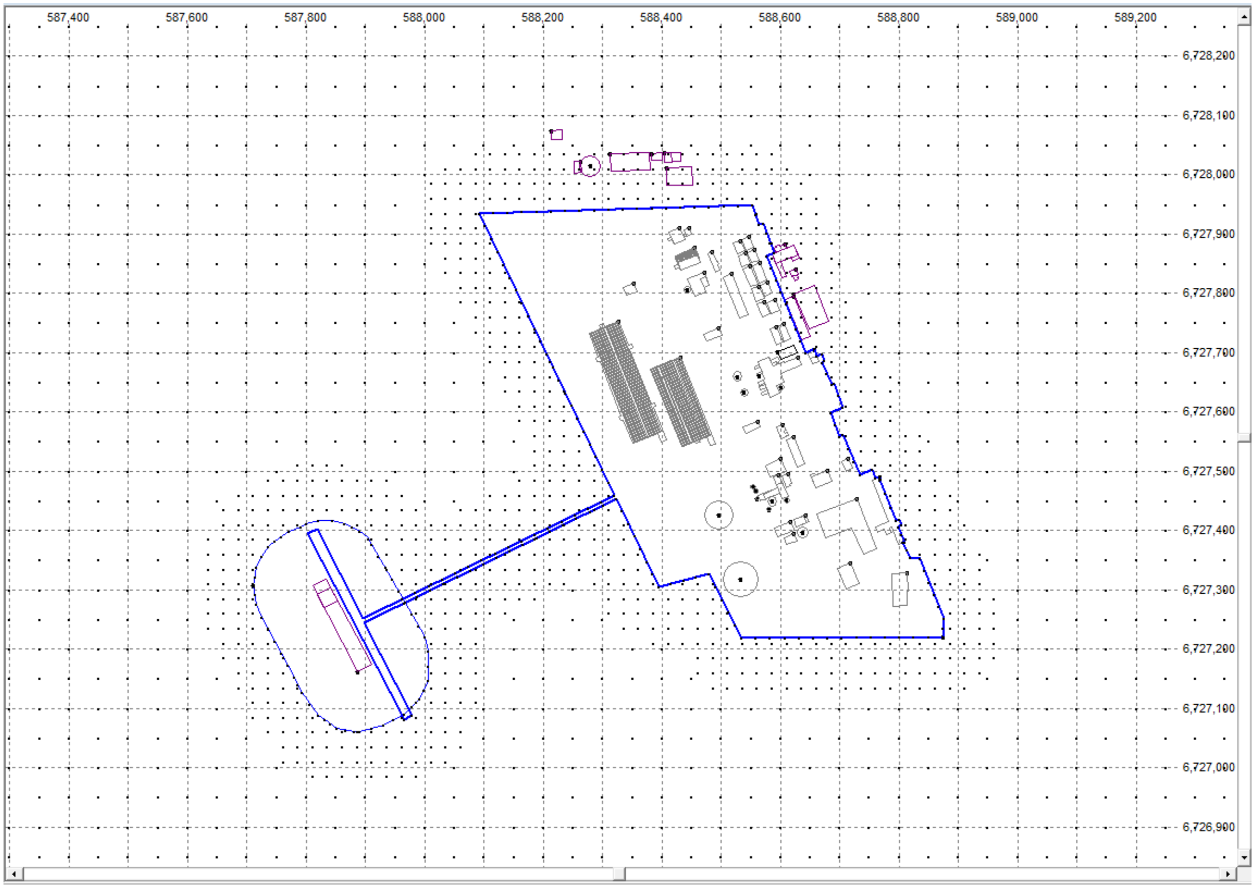
T1
T2
B10
B11
B13
11
19
13



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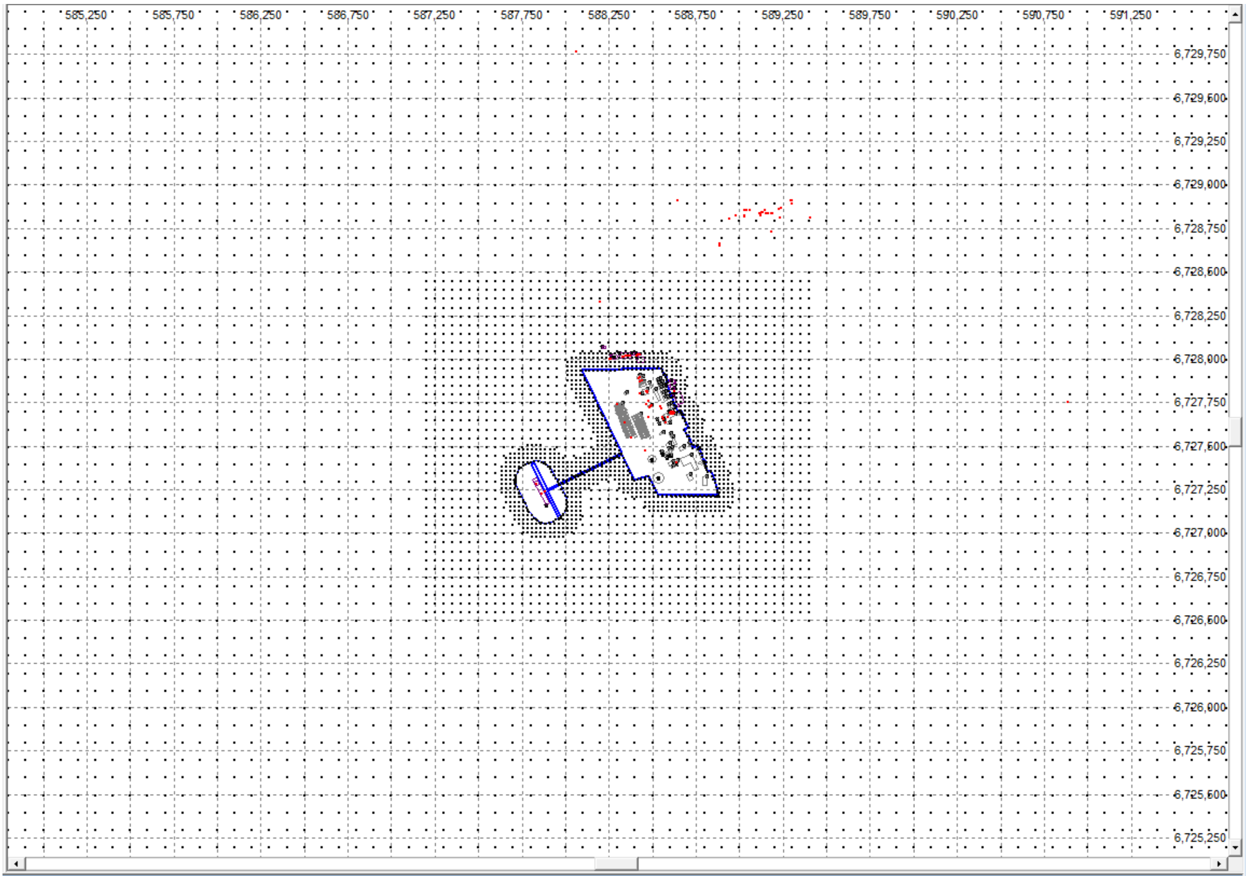
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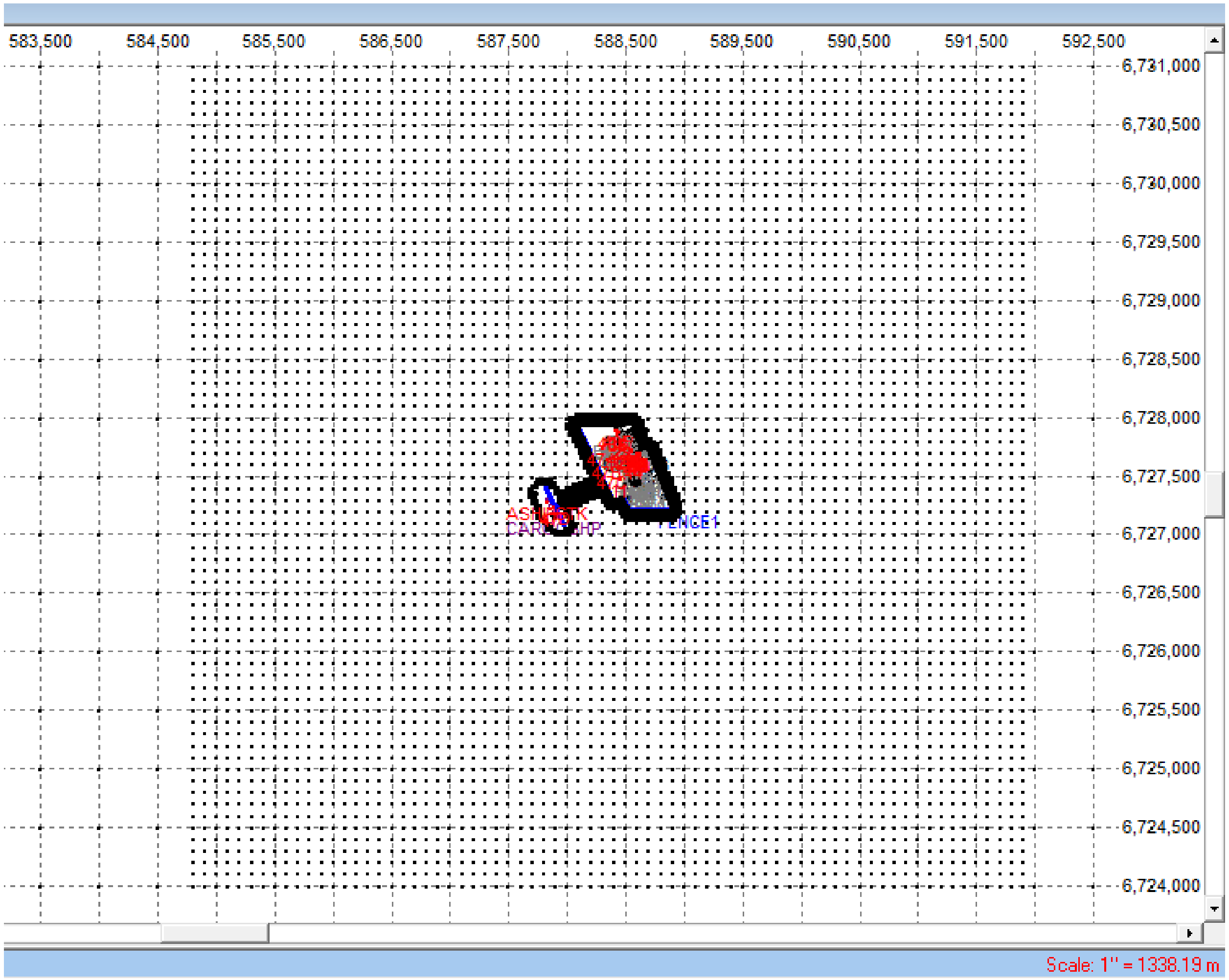
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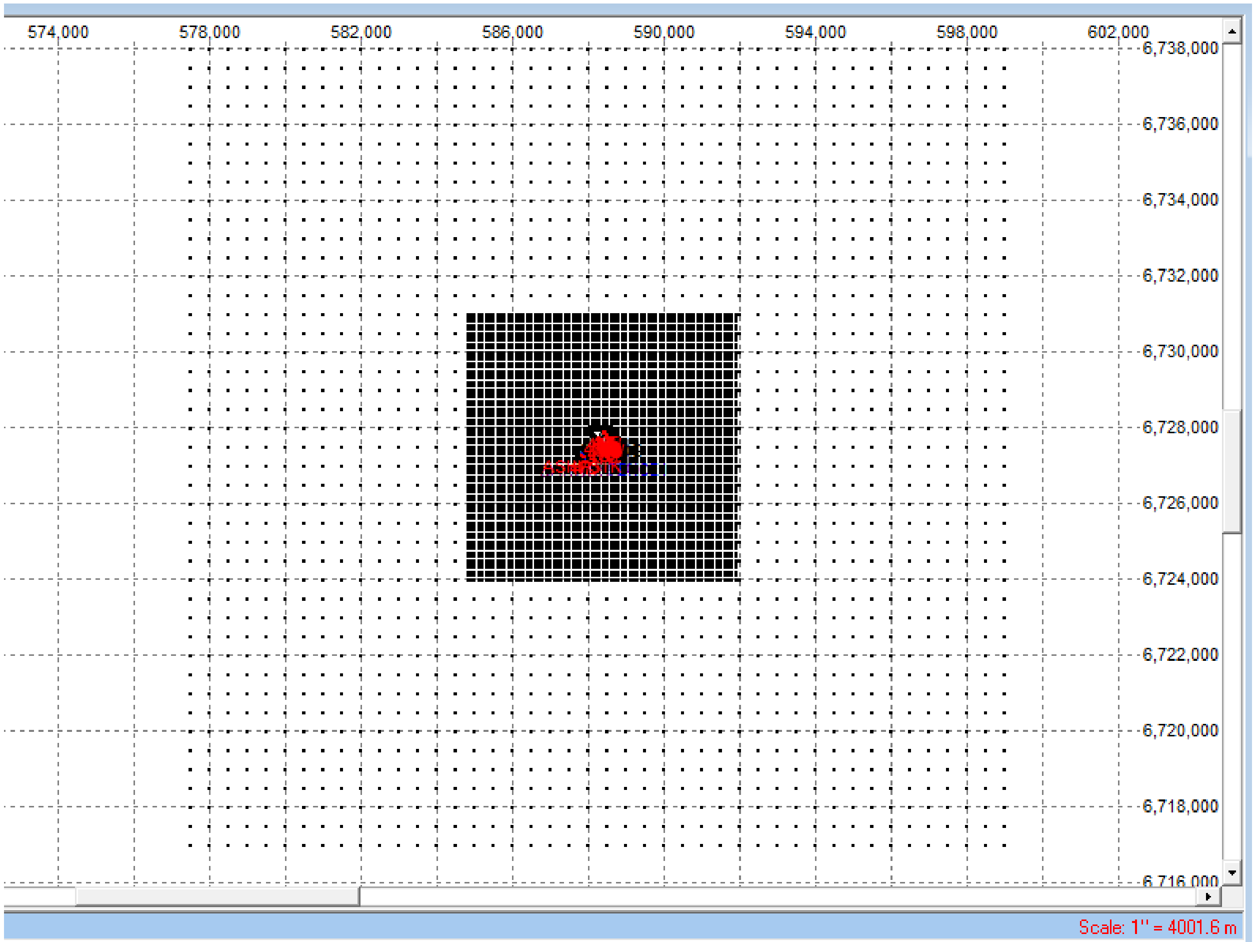
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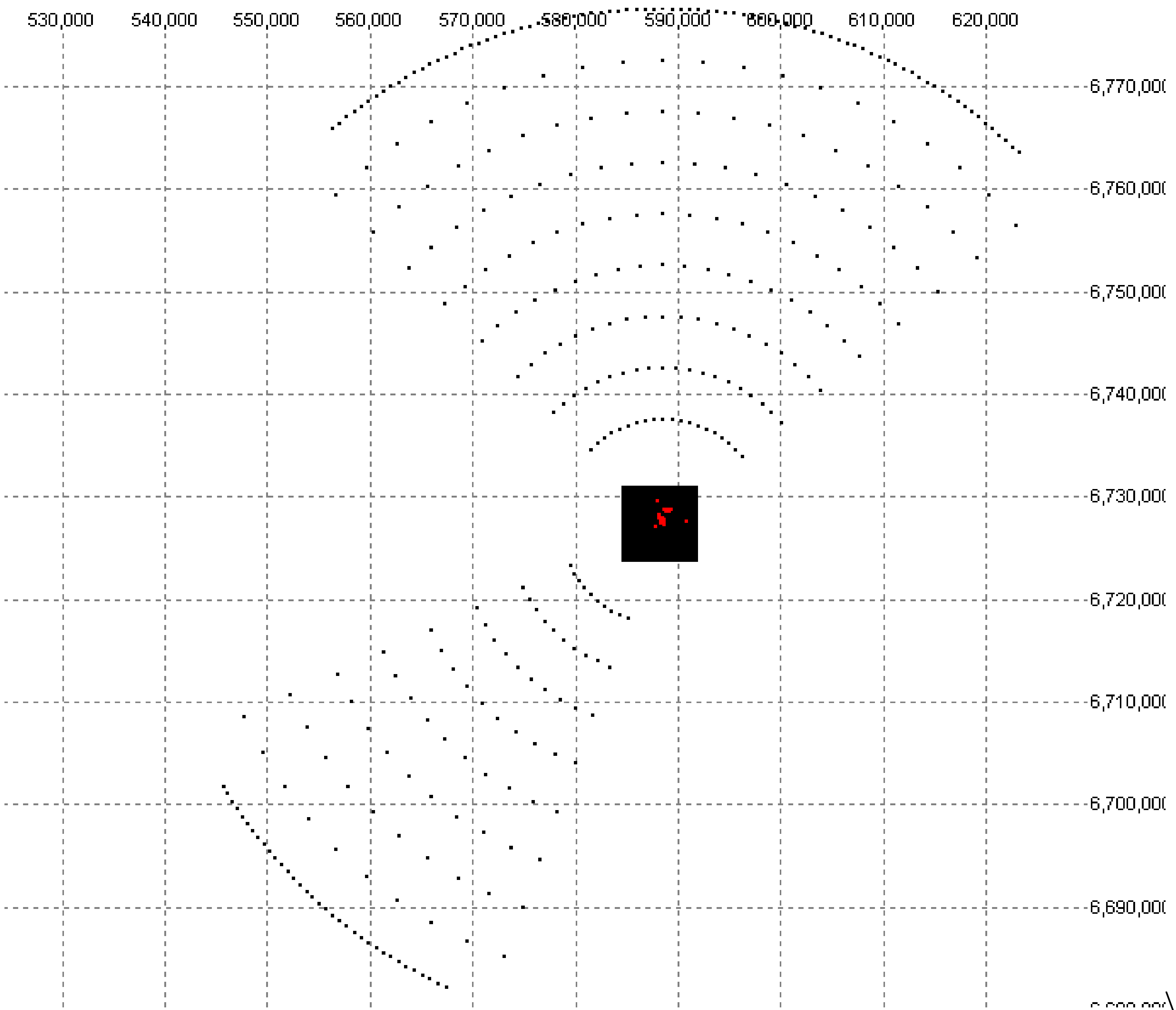
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ERM

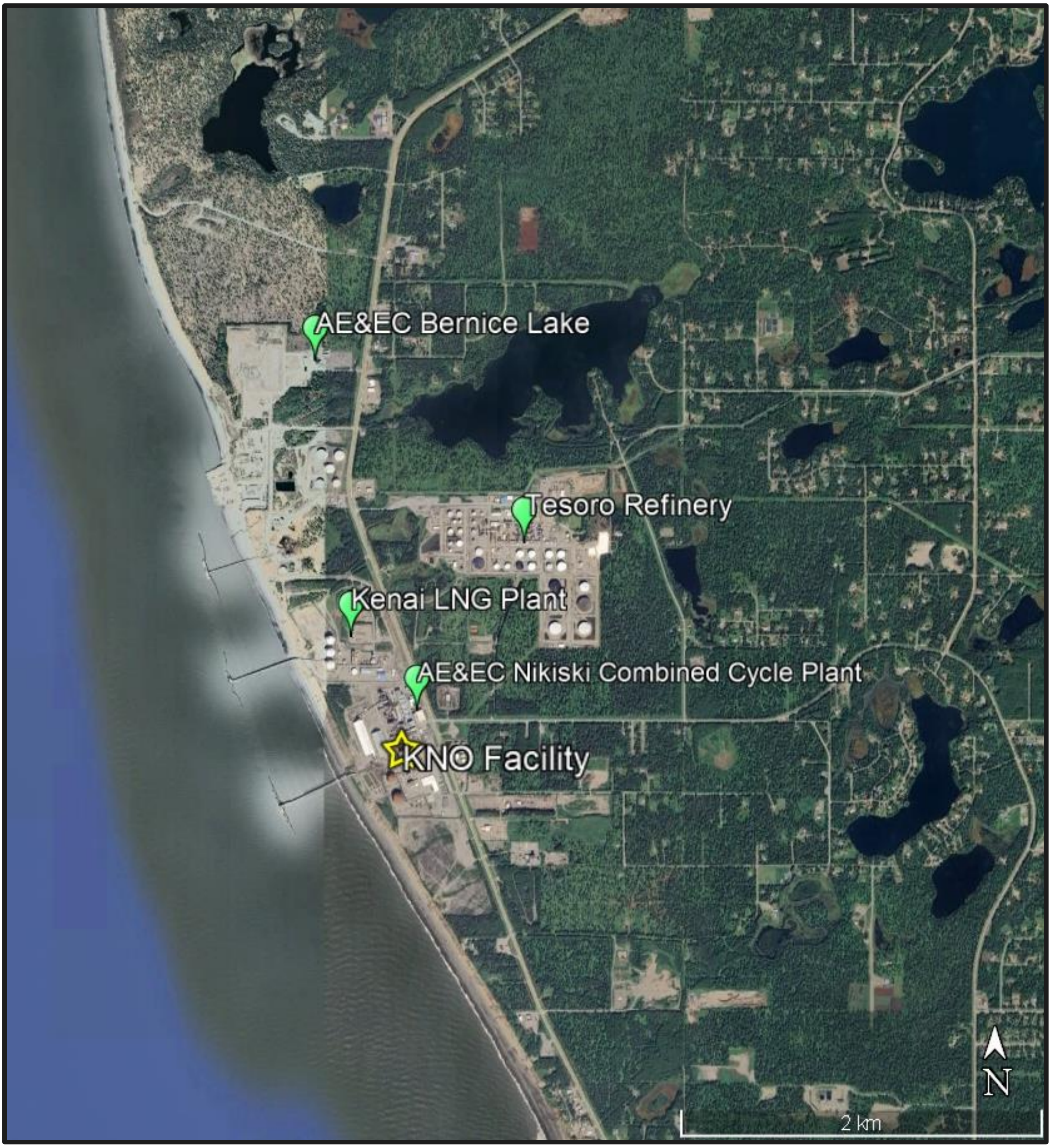
ATTACHMENT K NEARBY SOURCE DETAILS

Nutrien KNO Modeling - Nearby Sources

									PSD INCREMENT EMISSION RATES					NAAQS EMISSION RATES						
		x (m)	y (m)	base elevation (m)	stack height (m)	temp (K)	exit velocity (m/s)	stack diamater (m)	Annual NO2 tpy	24-hr PM2.5 lb/hr	Annual PM2.5 tpy	24-hr PM10 lb/hr	Annual PM10 tpy	1-hr NO2 lb/hr	Annual NO2 tpy	24-hr PM2.5 lb/hr	Annual PM2.5 tpy	24-hr PM10 lb/hr	1-hr CO lb/hr	8-hr CO lb/hr
AE&EC Nikiski Combined Cycle Plant																				
HOM_EL	GE Frame6 MS6001B CT	588628.27	6727819.46	39.624	30.78	403.15	19.81	3.35	739.9	0	0	6.39	27.988	169.92	739.9	6.39	27.99	6.39	38.18	38.18
HOM_EL4	Tier-2 Compliant Engine	588630.00	6727850.00	39.62	5.49	673.15	43.96	0.46	0	0	0	0	0	0	0	0	0	1.075	0	0
Tesoro Kenai LNG Plant																				
CP02	Compressor Drive - Propane Cycle #152	588330.83	6728021.22	28.34	21.34	755.37	32.61	2.13	0	0	0	0	0	27.4	120	0.7169	3.14	0.7169	8.9041	8.9041
CP03	Compressor Drive - Ethylene Cycle #251	588338.01	6728021.30	28.34	21.34	777.04	80.47	2.13	0	0	0	0	0	16.3	71.4	0.3562	1.56	0.3562	4.429	4.429
CP04	Compressor Drive - Ethylene Cycle #252	588345.60	6728021.64	28.34	21.34	777.04	49.07	2.13	0	0	0	0	0	13.86	60.7	0.3037	1.33	0.3037	3.77	3.77
CP05	Compressor Drive - Methane Cycle #351	588353.04	6728021.90	28.34	21.34	755.37	32.61	2.13	0	0	0	0	0	1.057	4.63	0.0274	0.12	0.0274	0.3356	0.3356
CP06	Compressor Drive - Methane Cycle #352	588360.25	6728022.05	28.34	21.34	755.37	32.61	2.13	0	0	0	0	0	20.274	88.8	0.516	2.26	0.516	6.4155	6.4155
CP07	Compressor Drive - Fuel System #701	588367.53	6728022.02	28.34	21.34	755.37	34.44	1.52	1.2	0	0	0.128	0.56	0.274	1.2	0.1279	0.56	0.1279	0.0708	0.0708
CP08	Boiler #501	588416.93	6728028.31	28.34	18.90	460.93	9.75	0.91	0	0	0	0	0	0.815	3.57	0.0616	0.27	0.0616	0.6849	0.6849
CP09	Boiler #502	588422.20	6728028.44	28.34	18.90	460.93	9.75	0.91	0	0	0	0	0	1.084	4.75	0.0822	0.36	0.0822	0.911	0.911
CP10	Boiler #511	588427.53	6728028.89	28.34	18.90	460.93	9.75	0.91	0	0	0	0	0	0.783	3.43	0.0594	0.26	0.0594	0.6575	0.6575
CP11	Emergency Generator	588411.68	6728021.98	28.34	4.27	749.82	32.92	0.30	0	0	0	0	0	0.037	0.16	0.0023	0.01	0.0023	0.0068	0.0068
CP12	Firewater Pump #2	588254.94	6728003.46	28.34	3.66	749.82	46.63	0.30	0.13	0	0	0.002	0.01	0.03	0.13	0.0023	0.01	0.0023	0.0068	0.0068
CP13	Firewater Pump #3	588257.48	6728003.48	28.34	3.66	749.82	46.63	0.30	0.13	0	0	0.002	0.01	0.03	0.13	0.0023	0.01	0.0023	0.0068	0.0068
CP14	Firewater Pump #4	588260.16	6728003.51	28.34	3.66	749.82	28.96	0.30	0.08	0	0	0.002	0.01	0.018	0.08	0.0023	0.01	0.0023	0.0046	0.0046
CP15	Safety Flare	588196.47	6728336.31	28.34	61.87	1273.15	19.99	13.72	0	0	0	0	0	0.452	1.98	0.1758	0.77	0.1758	2.4543	2.4543
CP17	Sullair Compressor #5	588371.36	6728022.16	28.34	0.30	272.04	0.03	0.03	0	0	0	0	0	0.009	0.04	0	0	0	0.0023	0.0023
Tesoro Refinery																				
TR01	H-101A Crude Heater	589028.30	6728821.33	39.93	15.85	602.04	6.71	1.52	0	0	0	0	0	38.43	168.30	1.04	4.60	1.04	11.53	11.53
TR02	H-101B Crude Heater	589027.93	6728829.53	39.93	26.52	530.93	6.10	1.22	23.05	0	0	0.653	2.86	9.90	43.40	1.23	5.40	1.23	13.59	13.59
TR03	H-201 Powerformer Preheater	589119.45	6728827.54	39.93	32.31	729.82	4.27	2.13	0	0	0	0.128	0.56	3.12	13.70	0.24	1.00	0.24	2.62	2.62
TR04	H-202 Powerformer Preheater	589119.45	6728827.54	39.93	32.31	729.82	4.27	2.13	0	0	0	0.24	1.05	5.00	21.90	0.38	1.70	0.38	4.20	4.20
TR05	H-203 Powerformer Preheater	589119.45	6728827.54	39.93	32.31	729.82	4.27	2.13	0	0	0	0.112	0.49	2.74	12.00	0.21	0.90	0.21	2.30	2.30
TR06	H-204 Powerformer Reheater	589120.00	6728838.64	39.93	46.33	533.15	6.10	1.52	0	0	0	0.174	0.76	4.30	18.90	0.40	1.80	0.40	4.43	4.43
TR07	H-205 Powerformer Reheater	589117.15	6728844.60	39.32	46.33	533.15	6.10	1.52	0	0	0	0.103	0.45	3.90	17.10	0.36	1.60	0.36	4.02	4.02
TR08	H-401 Hydrocracker Recycle Gas Heater	589189.56	6728841.64	39.32	25.91	532.04	5.18	1.22	4.86	0	0	0.103	0.45	3.11	13.60	0.29	1.30	0.29	3.20	3.20
TR09	H-402 Hydrocracker Recycle Gas Heater	589182.77	6728841.44	39.32	23.47	508.71	3.05	1.22	3.87	0	0	0.082	0.36	3.04	13.30	0.28	1.20	0.28	3.13	3.13
TR10	H-403N Hydrocracker Fractionator Reboiler	589162.08	6728841.03	39.32	22.86	564.26	7.62	1.22	8.39	0	0	0.237	1.04	3.00	13.10	0.37	1.60	0.37	4.12	4.12
TR11	H-404 Hydrocracker Stabilizer Reboiler	589153.93	6728841.14	39.32	23.47	561.48	5.49	1.52	12.4	0	0	0.263	1.15	3.86	16.90	0.48	2.10	0.48	5.30	5.30
TR12	H-609 Hot Oil Heater	588939.73	6728811.59	40.84	16.76	553.15	10.67	0.91	0	0	0	0	0	5.49	24.00	0.42	1.80	0.42	4.61	4.61
TR15	H-701 Fired Steam Generator	589042.09	6728857.86	39.93	12.19	555.93	9.14	0.61	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TR16	H-702 Fired Steam Generator	589035.90	6728857.96	39.93	12.19	555.93	9.14	0.61	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TR17	H-704 Natural Gas Supply Heater	589117.64	6728609.17	39.93	4.90	599.8	65.84	0.03	0	0	0	0.009	0.04	0.20	0.86	0.01	0.06	0.01	0.16	0.16
TR18	H-801 Fired Steam Generator	589029.85	6728857.60	39.93	12.19	450.37	8.53	0.61	0	0	0	0.119	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TR19	H-802 Hot Glycol Heater	589147.27	6728859.49	39.93	4.57	449.82	2.44	0.91	0	0	0	0	0	1.06	4.64	0.08	0.35	0.08	0.89	0.89
TR20	H-1001 Hydrogen Reformer Furnace	589235.01	6728818.33	39.62	21.34	446.48	21.03	1.22	0	0	0	0.281	1.23	12.18	53.37	1.13	4.97	1.13	12.54	12.54
TR21	Heaters, H-1101-1106, Units 0021-0026	589226.02	6728865.91	39.62	30.48	449.82	0.91	0.91	0	0	0	0.002	0.01	0.76	3.35	0.06	0.25	0.06	1.89	1.89
TR27	H-1201/1203 PRIP Adsorber Feed Furnace	589129.88	6728846.19	39.93	14.02	589.26	0.61	0.91	0	0	0	0.039	0.17	1.04	4.55	0.08	0.34	0.08	0.86	0.86
TR28	H-1202 PRIP Recycle H2 Furnace	589133.97	6728846.38	39.93	15.85	490.37	2.74	0.91	0	0	0	0.071	0.31	1.12	4.91	0.08	0.37	0.08	0.92	0.92
TR29	H-1701 Vacuum Tower Heater	588977.05	6728831.73	39.93	23.16	477.04	10.67	1.22	12.5	0	0	0.354	1.55	5.46	23.91	0.68	2.97	0.68	7.49	7.49
TR30	E-1400 Duct Burner For Steam Generation	589302.84	6728917.98	39.93	8.53	436.48	23.16	1.22	3.57	0	0	0.048	0.21	3.58	15.67	0.27	1.19	0.27	3.01	3.01
TR31	E-1410 Duct Burner For Steam Generation	589298.54	6728900.63	39.93	8.53	436.48	23.16	1.22	5.49	0	0	0.073	0.32	3.58	15.67	0.27	1.19	0.27	3.01	3.01
TR32	GT-1400 Cogen Turbine	589297.71	6728917.87	39.93	8.53	433.15	22.56	1.22	25.32	0.295	1.29	0.295	1.29	8.81	38.59	0.37	1.60	0.37	1.72	1.72
TR33	GT-1410 Cogen Turbine	589303.66	6728900.74	39.93	8.53	433.15	22.56	1.22	13.84	0.16	0.7	0.16	0.7	8.81	38.59	0.37	1.60	0.37	1.72	1.72
TR34	EG-704 Emergency Electric Generator - Utility	589060.39	6728857.96	39.93	3.05	599.82	48.77	0.30	0.96	0	0	0.016	0.07	0.35	1.54	0.01	0.05	0.01	0.09	0.09
TR35	EG-801 Emergency Electric Generator - Cracker	589181.55	6728736.95	39.93	3.05	599.82	10.67	0.30	0	0	0	0	0	0.45	1.95	0.01	0.06	0.01	0.12	0.12
TR36	P-605A VTB Recip. Pump Engine - North	588888.37	6728655.38	40.84	4.57	599.82	32.00	0.30	0	0	0	0	0	1.77	7.73	0.02	0.07	0.02	2.97	2.97
TR37	P-605B VTB Recip. Pump Engine - South	588888.13	6728668.01	40.84	6.10	599.82	32.00	0.30	0	0	0	0	0	1.77	7.73	0.02	0.07	0.02	2.97	2.97
TR42	J-801 Refinery Flare	589403.73	6728817.50	39.93	30.48	449.82	0.91	0.30	0	0	0	0	0	0.79	3.45	0.31	1.37	0.31	3.60	3.60
TR43	SRU Flare	589238.60	6728872.13	39.62	31.39	602.04	6.71	1.52	0	0	0	0	0	0.01	0.05	0.00	0.02	0.00	0.05	0.05
TR115	H1601-004 Heater	589297.71	6728917.87	39.93	26.21	579.8	4.57	1.22	0.57	0	0	0.002	0.01	1.99	8.70	0.15	0.66	0.15	1.67	1.67
TR116	H1602 DDU Fractionator Reboiler	589303.66	6728900.74	39.93	26.82	579.8	5.30	1.22	1.75	0	0	0.009	0.04	2.32	10.18	0.18	0.77	0.18	1.95	1.95
TR119	H1801 Naptha Splitter Reboiler Heater	589019.03	6728839.60	39.93	12.19	452	4.37	1.61	16.45	0	0	0.285	1.25	3.64	15.94	0.68	2.97	0.68	7.49	7.49
TR132_C	Tesoro Gas Turbine Generator - Cogen	589354.00	6728938.00	39.93	15.20	392	24.30	1.37	54	0.751	3.29	0.751	3.29	6.40	25.17	0.75	3.29	0.75	5.05	5.05
TR132_F	Tesoro Gas Turbine Generator - FAF	589338.00	6728938.00	39.93	12.10	366	40.40	0.60	54	0.080	0.35	0.080	0.35	6.40	2.67	0.08	0.35	0.08	5.05	5.05
TR132_S	Tesoro Gas Turbine Generator - Startup	589354.00	6728938.00	39.93	15.20	392	24.30	1.37	54	0	0	0	0	0.00	0.01	0.00	0.00	0.00	775.00	775.00
TR133_C	Tesoro Heat Recovery Steam Generator - Cogen	589354.00	6728938.00	39.93	15.20	392	24.30	1.37	54	0.406	1.78	0.406	1.78	4.30	17.10	0.41	1.78	0.41	2.70	2.70
TR133_F	Tesoro Heat Recovery Steam Generator - FAF	589354.00	6728938.00	39.93	15.20	392	24.30	1.37	54	0.098	0.43	0.098	0.43	20.80	8.72	0.10	0.43	0.10	6.15	6.15
AE&EC Bernice Lake																				
AEEC2	Generating Unit No. 2	588065.67	6729768.74	47	76.2	463.15	17.07	3.66	0	0	0	0	0	84.16	368.62	0.03	0.13	1.74	21.57	21.57
AEEC3	Generating Unit No. 3	588065.67	6729768.74	47	76.2	463.15	17.07	3.66	0	0	0	12	52.56	79.18	346.80	0.05	0.21	2.14	9.74	9.74
AEEC4	Generating Unit No. 4	588065.67	6729768.74	47	76.2	463.15	17.07	3.66	0	0	0	12	52.56	72.04	315.53	0.07	0.31	2.14	9.74	9.74

ATTACHMENT L MAP OF NEARBY SOURCES

ATTACHMENT L – MAP OF OFF-SITE SOURCES



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ATTACHMENT M CALPUFF OPTIONS

Attachment M – CALPUFF Options

Input Group	Variable	Description	Default	Used in Analysis
0	NMETDAT	Number of CALMET Data files	User Defined	12 per year
	NPTDAT	Number of PTEMARB.dat files	User Defined	0
	NARDAT	Number of BAEMARB.dat files	User Defined	0
	NVOLDAT	Number of VOLEMARB.dat files	User Defined	0
1	METRUN	Run all met data periods or subset?	0	0
	IBYR	Beginning year	User Defined	2002, 2003, 2004
	IBMO	Beginning month	User Defined	1
	IBDAY	Beginning day	User Defined	1
	INHR	Beginning hour	User Defined	1
	XBTZ	Base time zone	User Defined	9
	IRLG	Length of run in hours	User Defined	8760 (2002, 2003) 8784 (2004)
	NSPEC	Number of species modeled	5	7
	NSE	Number of species emitted	3	4
	ITEST	Flag to stop run after setup	2	2
	MRESTART	Restart configuration	0	0
	NRESPD	number of periods in restart	0	0
	METFM	Meteorological data format	1	1
	MPRFFM	Meteorological profile data format	1	1
	AVET	Averaging time	60	60
	PGTIME	PG Averaging Time	60	60
2	MGAUSS	Near field vertical distribution	1	1
	MCTADJ	Terrain adjustment method	3	3
	MCTSG	Subgrid scale complex terrain flag	0	0
	MSLUG	Slug model flag	0	0
	MTRANS	Transitional plume rise	1	1
	MTIP	Stack tip downwash	1	1
	MBDW	Downwash method	1	1
	MSHEAR	Vertical wind shear above stack top	0	0
	MSPLIT	Allow puff splitting	0	0
	MCHEM	Chemical mechanism flag	1	1
	MAQCHEM	Aqueous phase transformation flag	0	0
	MWET	Wet removal flag	1	1
	MDRY	Dry deposition flag	1	1
	MTILT	Plume tilt	0	0
	MDISP	Dispersion method	3	3
	MTURBVW	Turbulence measurements	3	3
	MDISP2	Back-up dispersion method	3	3

Input Group	Variable	Description	Default	Used in Analysis
	MTAULY	Sigma Y Lagrangian time scale	0	0
	MTAUADV	Turbulence advective decay time scale	0	0
	MCTURB	Turbulence sigma V and sigma W calculation method	1	1
	MROUGH	Adjust sigmas for roughness	0	0
	MPARTL	Partial plume penetration	1	1
	MTINV	Strength of temperature inversion	0	0
	MPDF	PDF for convective conditions	0	0
	MSGTIBL	Shore line TIBL	0	0
	MBCON	Boundary conditions	0	0
	MSOURCE	Source contributions	0	0
	MFOG	Fog model option	0	0
	MREG	Regulatory options check	1	1
3	CSPEC	Modeled Species	User Defined	SO2, SO4, NOX, HNO3, NO3, PM10, PM25
	PMAP	Map projection	User Defined	LCC
	FEAST	False Easting	User Defined	0
	FNORTH	False Northing	User Defined	0
	IUTMZN	UTM Zone	User Defined	N/A
	UTMHEM	Hemisphere for UTM	User Defined	N/A
	RLAT0	Latitude of projection origin	User Defined	59N
	RLON0	Longitude of projection origin	User Defined	151W
	XLAT1	Matching parallel	User Defined	30N
	XLAT2	Matching parallel	User Defined	60N
	DATUM	Datum for map projection	User Defined	NWS-84
	NX	Number of met grid cells in X direction	User Defined	270
	NY	Number of met grid cells in Y direction	User Defined	325
	NZ	Number of vertical layers	User Defined	10
	DGRIDKM	Horizontal cell spacing	User Defined	2
	ZFACE	Vertical cell face heights	User Defined	0, 20, 40, 65, 120, 200, 400, 700, 1200, 2200, 4000
	XORIGKM	Southwest coordinate of met grid	User Defined	-210
	YORIGKM	Southwest coordinate of met grid	User Defined	-20
	IBCOMP	LL corner of computational grid	User Defined	1
	JBCOMP	LL corner of computational grid	User Defined	1
	IECOMP	UR corner of computational grid	User Defined	270
	JECOMP	UR corner of computational grid	User Defined	325
	LSAMP	Flag for gridded receptors	F	F
	IBSAMP	LL corner of sampling grid	User Defined	N/A – Gridded Receptors
	JBSAMP	LL corner of sampling grid	User Defined	
	IESAMP	UR corner of sampling grid	User Defined	

Input Group	Variable	Description	Default	Used in Analysis
	JESAMP	UR corner of sampling grid	User Defined	are not used, only discrete receptors for each Class I area
	MESHDN	Nesting factor	1	1
5	ICON	Flag to output concentrations	1	1
	IDRY	Flag to output dry fluxes	1	1
	IWET	Flag to output wet fluxes	1	1
	IT2D	Flag to output 2D temperature	0	0
	IRHO	Flag to output 2D density	0	0
	IVIS	Flag to output relative humidity	1	1
	LCOMPRS	Data compression flag	T	T
	IQAPLOT	Plot file flag	1	1
	IMFLX	Mass flux flag	0	0
	IMBAL	Hourly mass balance	0	0
	ICPRT	Print concentrations	0	0
	IDPRT	Print dry fluxes	0	0
	IWPRT	Print wet fluxes	0	0
	ICFRQ	Concentration print interval	1	1
	IDFRQ	Dry flux print interval	1	1
	IWFRQ	Wet flux print interval	1	1
	IPRTU	Line printer output units	1	1
	IMESG	Screen message option	2	2
	LDEBUG	Debug output	F	F
	IPFDEB	First puff to track	1	1
	NPFDEB	Number of puffs to track	1	1
	NN1	Met period to start output	1	1
	NN2	Period to end output	10	10
6	NHILL	Number of terrain features	0	0
	NCTREC	Number of complex terrain receptors	0	0
	MHILL	CTDM format flag	2	1
	XHILL2M	Horizontal dimension factor	1	1
	ZHILL2M	Vertical dimension factor	1	1
	XCTDMKM	CTDM coordinate conversion factor	User Defined	1
	YCTDMKM	CTDM coordinate conversion factor	User Defined	1
9	RCUTR	Reference cuticle resistance	30	30
	RGR	Reference ground resistance	10	10
	REACTR	Reference pollutant activity	8	8
	NINT	Number of particle size intervals	9	9
	IVEG	Vegetation state in unirrigated areas	1	1
11	MOZ	Ozone data flag	1	1
	BCKO3	Background ozone data	12*80	12*40

Input Group	Variable	Description	Default	Used in Analysis
	BCKNH3	Background ammonia data	12*10	12*0.5
	RNITE1	Nighttime SO2 loss rate	0.2	0.2
	RNITE2	Nighttime NOX loss rate	2	2
	RNITE3	Nighttime HNO3 loss rate	2	2
	MH2O2	Nighttime HNO3 formation rate	1	1
	BCKH2O2	Monthly H2O2 concentrations	12*1	12*1
	BCKPMF	Background fine particulate for SOA module	12*1	12*1
	OFRAC	Organic fraction of fine particulate	12*0.15	12*0.15
	VCNX	VOC/NOX ratio	12*50	12*50
12	SYTDEP	Horizontal size of puff	550	550
	MHFTSZ	Heffter equation flag	0	1
	JSUP	Stability class flag	5	5
	CONK1	Vertical dispersion constant (stable)	0.01	0.01
	CONK2	Vertical dispersion constant (neutral/unstable)	0.1	0.1
	TBD	Building downwash factor	0.5	0.5
	IURB1	Urban dispersion LU cat range	10	10
	IURB2	Urban dispersion LU cat range	19	19
	XMXLEN	Maximum slug length	1	1
	XSAMLEN	Max travel distance of puff/slug during one sampling step	1	1
	MXNEW	Max number of puffs/slugs released for one time step	99	99
	MXSAM	Maximum number of sampling steps for puff/slug for one time step	99	99
	NCOUNT	Number of iterations to compute transport wind for gradual rise	2	2
	SYMIN	Minimum sigma Y for a new puff/slug	1	1
	SZMIN	Minimum sigma Z for a new puff/slug	1	1
	SVMIN	Minimum sigma V	0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.370, 0.370, 0.370, 0.370, 0.370, 0.370	0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500
	SWMIN	Minimum sigma W	0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120, 0.080, 0.060, 0.030, 0.016	0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120, 0.080, 0.060, 0.030, 0.016
	CDIV	Divergence criterion	0.0, 0.0	0.01, 0.01
	WSCALM	Minimum wind speed for non-calm	0.5	0.5
	XMAXZI	Maximum mixing height	3000	3000
	XMINZI	Minimum mixing height	50	50
	WSCAT	Default wind speed classes	1.54, 3.09, 5.14, 8.23,	1.54, 3.09, 5.14, 8.23,

Input Group	Variable	Description	Default	Used in Analysis
			10.8	10.8
	PLX0	Default power law exponents	0.07, 0.07, 0.1, 0.15, 0.35, 0.55	0.07, 0.07, 0.1, 0.15, 0.35, 0.55
	PTG0	Default potential temp gradient	0.020, 0.035	0.020, 0.035
	PPC	Default plume path coefficients	0.5, 0.5, 0.5, 0.5, 0.35, 0.35	0.5, 0.5, 0.5, 0.5, 0.35, 0.35
	SL2PF	Slug to puff transition factor	10	10
	NSPLIT	Number of split puffs from single puff	3	3
	ZISPLIT	Minimum mixing height for split	100	100
	ROLDMAX	Mixing height ratio for split	0.25	0.25
	NSPITH	Number of horizontal split puffs	5	5
	SYSSPLITH	Minimum sigma y before split	1	1
	SHSPLITH	Minimum puff elongation before split	2	2
	CNSPLITH	Minimum concentration in puff before split	1.00E-07	1.00E-07
	EPSSLUG	Slug fractional divergence criterion	1.00E-04	1.00E-04
	EPSAREA	Area fractional divergence criterion	1.00E-06	1.00E-06
	DRISE	Trajectory step length	1	1
	HTMINBC	Minimum mixing height for boundary condition puffs	500	500
	RSAMPBC	Search radius for nearest boundary condition puff	10	10
	MDEPBC	Near surface depletion adjustment	1	1
13	NPT1	Number of point sources	User Defined	10
	IPTU	Emission units flag	User Defined	1
	NSPT1	Source-species combinations with variable emissions	0	0
	NPT2	Number of point sources with variable emissions	0	0
	SRCNAME	Point source name	User Defined	See Report, note that all point sources (except source ID #65) are subject to downwash
	X	Source data array	User Defined	
	SIGYZI	Initial sigmas	0	N/A
	ZPLATFM	Platform height	0	0
	FMFAC	Vertical momentum flux factor	1	1
17	NREC	Number of discrete receptors	User Defined	1036

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ATTACHMENT N VISCREEN RESULTS

Visual Effects Screening Analysis for
Source: KNO
Class I Area: ClassII

*** Level-1 Screening ***

Input Emissions for

Particulates	174.30	TON/YR
NOx (as NO2)	205.10	TON/YR
Primary NO2	0.00	TON/YR
Soot	0.00	TON/YR
Primary SO4	0.00	TON/YR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04 ppm
Background Visual Range:	250.00 km
Source-Observer Distance:	50.00 km
Min. Source-Class I Distance:	50.00 km
Max. Source-Class I Distance:	53.25 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	6
Wind Speed:	1.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E Crit	Delta E Plume	Contrast Crit	Contrast Plume
SKY	10.	84.	50.0	84.	2.00	2.991*	.05	0.066*
SKY	140.	84.	50.0	84.	2.00	0.721	.05	-0.019
TERRAIN	10.	84.	50.0	84.	2.00	7.882*	.05	0.063*
TERRAIN	140.	84.	50.0	84.	2.00	0.372	.05	0.005

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

Backgrnd	Theta	Azi	Distance	Alpha	Delta E Crit	Delta E Plume	Contrast Crit	Contrast Plume
SKY	10.	0.	1.0	169.	2.00	38.303*	.05	0.867*
SKY	140.	0.	1.0	169.	2.00	8.320*	.05	-0.213*
TERRAIN	10.	0.	1.0	169.	2.00	29.963*	.05	.349*
TERRAIN	140.	0.	1.0	169.	2.00	9.682*	.05	.196*

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