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(PW)

January 30, 2020

SRNS-J2200-2019-00240
RSM Track #: 10818

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JAN 29 2020

BUREAU OF AIR QUALITY

Air Permitting Division Director
Bureau of Air Quality
South Carolina Department of Health and
Environmental Control (SCDHEC)
2600 Bull Street
Columbia, SC 29201

Dear Director:

SAVANNAH RIVER SITE (SRS) PART 70 AIR QUALITY PERMIT TV-0080-0041: CLEAN RENEWAL APPLICATIONS

Per the February 14, 2019 phone discussion with the SCDHEC permit engineer, two hard copies of the TV-0080-0041 Title V renewal application are being transmitted. Please note the table of contents specifies the tabs and forms that had actual content impacted by this transmittal. Many of the tabs simply had the footer document number changed to SRNS-J2200-2019-00240. An electronic copy will be emailed to permit engineer Fatina Clark.

Modeling in support of the renewal application is being rerun and will be submitted once it is complete. Modelling will include PM2.5 (not required when the application was originally submitted). Form K was updated to reflect more recent regulations.

Please contact me at (803)952-6853 if you have any questions concerning the attached document.

Sincerely,

Kim A. Wolfe
Environmental Compliance

Enclosure

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BUREAU OF AIR QUALITY

May 27, 2020

SRNS-J2200-2020-00146
RSM Track #: 10808

Engineering Services Division Director
Bureau of Air Quality
South Carolina Department of Health and
Environmental Control (SCDHEC)
2600 Bull Street
Columbia, SC 29201

Dear Director:

SAVANNAH RIVER SITE (SRS) PART 70 AIR QUALITY PERMIT TV-0080-0041: REVISION TO RENEWAL APPLICATION UPDATED B003 AND B006 TABs

This revision captures the like-for-like replacement of B003 with B006. The B003 Tab has been replaced with the B006 tab and the process description and drawings associated with B004 and B005 have been revised. The notice of actual startup of B006 was transmitted May 11, 2020 (SRNS-J2200-2020-00092).

Please contact me at (803)952-6853 if you have any questions concerning the attached document.

Sincerely,

Amy Meyer for Kim Wolfe

Kim A. Wolfe
Environmental Compliance

Enclosure

C: R. K. Mahoney, SCDHEC – Columbia (electronic)
T. R. Fuss, SCDHEC - Aiken (electronic)
G. N. O'Quinn, SCDHEC – Aiken (electronic)
P. A. Risa, SCDHEC - Aiken (electronic)
J. G. DeMass, DOE-SR, 730-B
M. N. Ndingwan, 730-B
C. L. Bergren, SRNS, 730-4B
A. J. Meyer, 730-4B
C. J. Ward, 730-4B
A. R. Waller, 730-4B
K. A. Wolfe, 730-4B
J. R. Wicker, 730-4B
C. Rivera, 730-4B
C. B. Stevens, 707-F
M.C. Wright, 703-47A
Records Processing, 773-52A

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

GENERAL INFORMATION

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

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Bureau of Air Quality
Title V Operating Permit Application
Facility Information

FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) 0080 - 0041	Application Date 5/27/2020
Facility Name (This should be the name used to identify the facility at the physical address listed below) U.S. Department of Energy - Savannah River Site managed and operated by Savannah River Nuclear Solutions, LLC	Facility Federal Tax Identification Number (Established by the U.S. Internal Revenue Service to identify a business entity) 530197006 (US-DOE) 26-0240191 (SRNS, LLC)

FACILITY PHYSICAL ADDRESS		
Physical Address: SRS		County: Aiken (also Barnwell and Allendale)
City: Aiken	State: SC	Zip Code: 29808-0001
Facility Coordinates (Facility coordinates should be based at the front door or main entrance of the facility.)		
Latitude: 431031.9034	Longitude: 3689653.3696	☐ NAD27 (North American Datum of 1927) Or ☒ NAD83 (North American Datum of 1983)

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☐ No ☒ Yes*
List potential co-located facilities, including air permit numbers, if applicable: See Attached Table
If applicable, location in application for co-location determination: See Attached Table

(*If yes, please submit co-location applicability determination details in an attachment to this application.)

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

*If yes, include a sanitized version of the application for public review and **ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED**

AIR PERMIT FACILITY CONTACT (Person who can answer technical questions about the facility and permit application.)			
Title/Position: Air Program Lead, Environmental Compliance - SRNS, LLC	Salutation:	First Name: Kim	Last Name: Wolfe
Mailing Address: 730-4B, Savannah River Site			
City: Aiken		State: SC	Zip Code: 29808-0001
E-mail Address: kim.wolfe@srs.gov		Phone No.: 803-952-6853	Cell No.:

Bureau of Air Quality
Title V Operating Permit Application
Facility Information

RESPONSIBLE OFFICIAL			
Title/Position: Director - EC&ACP	Salutation:	First Name: Christopher	Last Name: Bergren
Mailing Address: 730-4B, Savannah River Site			
City: Aiken		State: SC	Zip Code: 29808-0001
E-mail Address: chris.bergren@srs.gov		Phone No.: 803-952-6530	Cell No.: 803-507-5278
RESPONSIBLE OFFICIAL SIGNATURE			
I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.			

5/27/20

Signature of Responsible Official — Date

H. AIR PERMIT CONSULTANT			
Consulting Firm Name:			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

Attachment A Form 2566 – Collocation Determination

Facility	Air Permit Numbers	Proximity	Ownership/Common Control	Additional Information
Ameresco Biomass Cogeneration Facility (including K-Area and L-Area biomass boilers)	0080-0144	Located within boundaries of SRS	Property is Owned by the Department of Energy (DOE)	Steam generated at Ameresco facilities support SRS facilities.
Salt Waste Processing Facility (SWPF)	NA-Exempted via condition 7.B.3 of SRS's original Title V Operating permit	Located within boundaries of SRS	Property is Owned by the Department of Energy (DOE)	The purpose of SWPF is to process streams from other SRS facilities, especially those facilities operated by SRR. This is a support facility
Research and Development (R&D) Activities performed at leased facilities within the Savannah River Research Campus maintained by Aiken County	NA-R&D activities are exempt from construction and operating permitting	In 2013 a determination was made that even though these facilities are not within the SRS boundary they were collocated (SRNS-J2000-2013-00248). The current guidance states, "[The collocation guidance] is intended to be a guide and not an exhaustive list of all possible scenarios. These determinations are made on a case-by-case basis regarding the existing situation at specific facilities."	Personnel performing R&D activities at the Aiken country facilities are SRS personnel that share common employee benefits, health plans, retirement funds and other administrative functions	Research performed at these laboratories support the work at SRS.
Three Rivers Solid Waste Authority Regional Landfill (Landfill)	0080-0112	The Landfill is within the SRS site boundary, but a fence separates the Landfill from the remainder of SRS. Public access to the Landfill is not allowed, but access is provided to member counties and approved commercial haulers. (http://www.trswa.org/landfill.shtml)	• Landfill does not share a common workforce with SRS. • Landfill is responsible for its own equipment, property, and pollution control devices. • Landfill personnel do not share common employee benefits, health plans, retirement funds and other administrative functions • The Landfill does accept waste from the SRS. However, SRS contributes only 1.3% of the total waste received (http://www.trswa.org/landfill.shtml) SRS could transport their waste to another permitted facility with little or no impacts to the Landfill or SRS. • Landfill personnel are responsible for compliance with air quality control requirements at the Landfill. The DOE is not listed on the air permit for the Landfill. • Easement has been provided to the Landfill for the use of the property. The Landfill does receive waste from the SRS. These are not agreements that impact control and operation of the Landfill.	The Landfill and SRS are not within the same industrial grouping. The Landfill is not a support facility for SRS since the SRS contributes far less than 50% of the waste being disposed at the Landfill and does not have operational control over the Landfill. **Conclude not co-located based on SIC/NAICS codes or support.**

* "Guidance for Collocation/Single Source Determinations," issued by Elizabeth Basil, dated 10/28/2016, was utilized in the generation of this table.

Conclusion: Ameresco Biomass Cogeneration Facility, Salt Waste Processing Facility, and the Research and Development (R&D) Activities performed at leased facilities within the Savannah River Research Campus maintained by Aiken County are co-located facilities/activities. The Three Rivers Solid Waste Authority Regional Landfill is not co-located facilities with SRS. Simplistically speaking the Landfill is not dependent on the presence of SRS to perform their services.

Title V Permit Application
Emission Unit B-006
Process Description

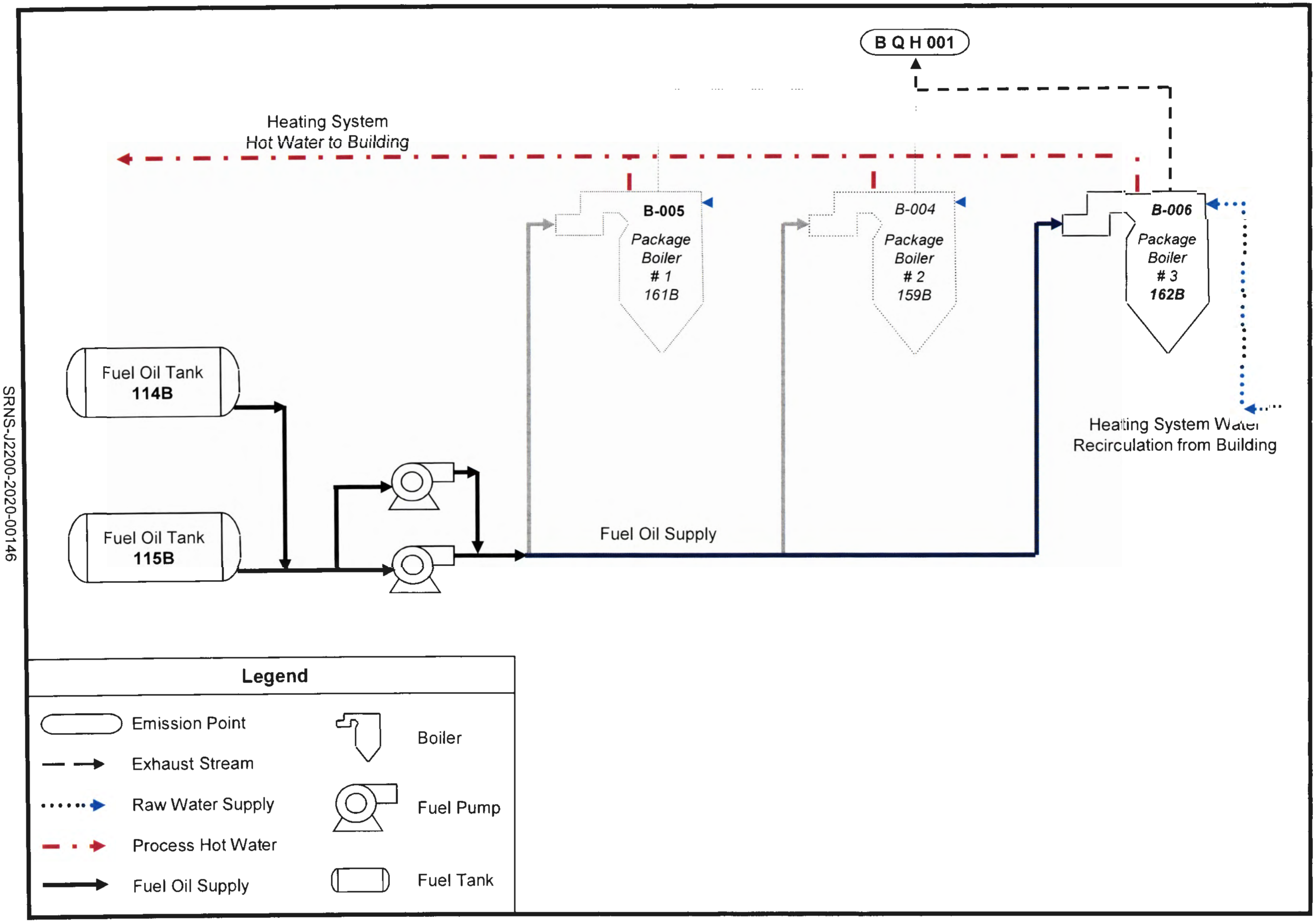
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. All of the boilers have a rated heat input of 3.129 MM/Btu/hr. The three boilers are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (BQH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.6 – Emission Unit B-006

Emission Unit B-006 SCDHEC ID 162B



SRNS-J2200-2020-00146

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION (Table is a description of emission units located at this facility)		
1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
B-006	735-1B LAB. HOTWATER HEATER/BOILER 6	NONE

EMISSION UNIT PROCESS DESCRIPTION (For each emission unit listed above, provide the following emission unit process description information)					
1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
B-006	N/A	3.129 MMBTU/HR	HOT WATER	4961 - 221330	NONE

CONTROL DEVICE INFORMATION (Table is a description of control devices located at this facility)			
3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

SRNS-J2200-2020-00146

CONTROL DEVICE INFORMATION (CONTINUED)							
3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION (For each emission unit please provide a description of the all equipment located at this facility)							
1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
B-006	162B	HOTWATER HEATER/BOILER NO. 6	Nov. 2019	NONE	N/A	B Q H 001	3.129 MMBTU/HR

South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

Equipment Description (Continued)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or [redacted]ble)	27. Comments (list special permit limitations, fuel info, etc.)
162B	NO. 2 HOME HEATING OIL-ULTRA LOW S	N/A	NA	Like-for-Like replacement of 112B with 162B

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
B-006	B Q H 001	CARBON MONOXIDE	630 08 0	CRITERIA	1.25E-01	5.48E-01	1.25E-01	5.48E-01
B-006	B Q H 001	NITROGEN DIOXIDE	10102 44 0	CRITERIA	5.51E-01	2.41E+00	5.51E-01	2.41E+00
B-006	B Q H 001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	7.20E-02	3.15E-01	7.20E-02	3.15E-01
B-006	B Q H 001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	5.32E-02	2.33E-01	5.32E-02	2.33E-01
B-006	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	4.76E-02	2.09E-01	4.76E-02	2.09E-01
B-006	B Q H 001	SULFUR DIOXIDE	7446 09 5	CRITERIA	4.76E-03	2.09E-02	4.76E-03	2.09E-02
B-006	B Q H 001	VOC (OZONE PRECURSORS)		CRITERIA	4.07E-02	1.78E-01	4.07E-02	1.78E-01
B-006	B Q H 001	LEAD	7439 92 1	CRITERIA HAP	2.82E-05	1.23E-04	2.82E-05	1.23E-04

SRNS-J2200-2020-00146

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
B-006	B Q H 001	CARBON MONOXIDE	EPA AP-42	N/A
B-006	B Q H 001	NITROGEN DIOXIDE	EPA AP-42	N/A
B-006	B Q H 001	TOTAL PARTICULATE MATTER (PM)	EPA AP-42	N/A
B-006	B Q H 001	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A
B-006	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A
B-006	B Q H 001	SULFUR DIOXIDE	EPA AP-42	N/A
B-006	B Q H 001	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
B-006	B Q H 001	LEAD	EPA AP-42	N/A

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2020-00146

EMISSION LIMITS AND STANDARDS (This section summarizes the emission unit emission limits and standards)					
1. Emission Unit	**2. Unit ID**	**3. Pollutant/Standard**	**4. Limit**	**5. Reference Method**	**6. Applicable Regulation (Regulation Citation/Condition)**
735-1B LAB. HOTWATER HEATER/BOILER 6	B-006	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.B
735-1B LAB. HOTWATER HEATER/BOILER 6	B-006	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 1, Sect. II
735-1B LAB. HOTWATER HEATER/BOILER 6	B-006	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	2.3 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006	SC 61-62.5, Std. 1, Sect. III

COMPLIANCE AND PERMIT REQUIREMENTS (This section summarizes the emission unit compliance requirements)					
2. Unit ID	**6. Applicable Regulation (Regulation Citation/Condition)**	**7. In Compliance (Y/N)**	**8. Compliance Statement**	**9. Compliance Date**	**10. First Submittal**
B-006	SC 61-62.5, Std. 1, Sect. I.B	Y	CLB	Apr-03	
B-006	SC 61-62.5, Std. 1, Sect. II	Y	CLB	Apr-03	
B-006	SC 61-62.5, Std. 1, Sect. III	Y	CLB	Apr-03	
B-006	40 CFR 63, Subpart DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I (This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).					
2. Unit ID	**11. Pollutant/Parameter**	**4. Limit**	**12. Required Monitoring**	**13. Monitoring Frequency**	**14. Reporting Frequency**
B-006	FUEL SPECIFICATIONS	< 0.0015% SULFUR	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	ANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II (This section summarizes the monitoring and reporting requirements)						
2. Unit ID	**3. or 11. Pollutant/Standard or Pollutant/Parameter**	**4. Limit**	**15. Recordkeeping Frequency**	**16. Averaging Time**	**17.Stack Test**	
					Y/N	**Frequency**
B-006	FUEL SPECIFICATIONS	< 0.0015% SULFUR	PER SHIPMENT	N/A	N	N/A

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NO. 2 HOME HEATING OIL-ULTRA LOW SULFUR	195,786 GALLONS	HEATED WATER	4961-221330	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III

(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
B-006	FUEL SPECIFICATIONS	< 0.0015% SULFUR	MONITORING REQUIRED SEE PART I AND II	NA- requesting to no longer maintain log of startups and shutdowns that is currently required by TV permit condition b5.E.2.

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	CARBON MONOXIDE	5.48E-01		5.48E-01		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	TOTAL PARTICULATE MATTER (PM)	3.15E-01		3.15E-01		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	PARTICULATE MATTER (10 MICRONS)	2.33E-01		2.33E-01		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	PARTICULATE MATTER (2.5 MICRONS)	2.09E-01		2.09E-01		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	NITROGEN DIOXIDE	2.41E+00		2.41E+00		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	VOC (OZONE PRECURSORS)	1.78E-01		1.78E-01		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	LEAD	1.23E-04		1.23E-04		X	N	
B-006	735-1B LAB. HOTWATER HEATER/BOILER 3	SULFUR DIOXIDE	2.09E-02		2.09E-02		X	N	

SRNS-J2200-2020-00146

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2020-00146

Sample Calculations, Emission Factors Used for New Boiler B-006 (162B)
Equipment ID 162B, Boiler B-006, Burnham V1116 Emissions Calculations
Assumptions

1. Boiler is rate 3,129,000 Btu/hr (Attachment B form 2569)
2. Boiler will utilize #2 home heating fuel,ultra low sulfur (0.0015 wt% S) (Refer to attached excerpt from October 28, 2016 Title V semiannual report)
3. The emission factors from the attached Webster combustion sheet for the Model JB burner were utilized for NOx, CO, VOC, and PM. Other emission factors were obtained from AP42, 5/10 version, section 1.3. SOx emission factor from Webster was not used since these units receive ULS fuel and not 0.5%sulfur fuel (Refer to attached excpert from 10/28/2016 semiannual report for permit 0080-0041.)
4. The BTU value for distillate oil is 140,000 Btu/gal [Appendix A of AP42, 9/85]
5. No control devices present.
6. Fuel is 0.0015 wt% sulfur
7. Assume JB burner VOC emission level includes methane.
8. Assume JB burner PM emission level does not include condensable PM (CPM). CPM value from AP42 was added to JB burner value to obtain emission factor for PM.

Standard No. 2 and
Greenhouse Gases

Pollutant	AP-42 Table	Emission Factor (lb/kgal)	Emission Factor (lb/MMBtu)	Emisison Factor (lb/10^12Btu)	GWP(g)	lb/hr	ton/yr
SO2	1.3-1	142*S				4.76E-03	2.09E-02
CO			0.04			1.25E-01	5.48E-01
PM10 (b)	1.3-7 &1.3-2	2.38				5.32E-02	2.33E-01
CPM	1.3-2	1.3				2.91E-02	1.27E-01
HC/VOC (e)			0.013			4.07E-02	1.78E-01
NOx (a)			0.176			5.51E-01	2.41E+00
PM (c)			0.023			7.20E-02	3.15E-01
PM2.5 (d)	1.3-7 & 1.3-2	2.13				4.76E-02	2.09E-01
Pb	1.3-10			9		2.82E-05	1.23E-04
nitrous oxide N2O(f)	1.3-8	2.60E-01			298	5.81E-03	2.55E-02
methane(f)	1.3-3	2.16E-01			25	4.83E-03	2.11E-02
CO2 (f)	1.3-12	2.23E+04			1	4.98E+02	2.18E+03
CO2e						4.98E+02	2.18E+03

(a) NOx=NO2
(b) PM10 = PM10 + CPM = 1.08 + 1.3 = 2.38
(c) PM = PM + CPM = 0.014 + (1.3/1000)(1/140,000)(1000000)= 0.023
(d) PM2.5 = PM2.5 + CPM = 0.83 + 1.3 = 2.13
(e) Assumes VOC includes methane since Webster reports it as HC/VOC.
(f) greenhouse gas
(g) Global Warming Potential (table A-1 to Subpart A of 40 CFR 98)
example calc:
SO2 = (142lb/1000gal)(0.0015)(3,129,000Btu/hr)(gal/140,000Btu) = 4.76E-03 lb/hr
(4.76E-03lb/hr)(8760hr/yr)(ton/2000lb) = 2.09E-02 TPY

Total emissions utilized to determine trace in TYP
PM+N2O+NOx+SO2+CO+VOC = 3.50E+00

Adam R Waller 10/8/19
Calculation Originator

Cary B. Stevens 10-9-19
Reviewer

Sample Calculations, Emission Factors Used for New Boiler B-006 (162B)

Basis/Assumptions

1. R61.62.5 Std. No. 8 does not apply to sources the burn only virgin fuel. 162B will only burn virgin fuel. However, non-trace toxic air pollutants must be included in facility wide emissions.
2. The BTU value for distillate oil is 140,000 btu/gal [Appendix A of AP42, 9/85]
3. The rating for each boiler is 3,129,000 btu/hr (Refer to attached excerpt from October 28, 2016
4. Fuel is 0.0015 wt% sulfur Title V semiannual report)

Pollutant	Emission Factor (lb/kgal) *	lb/hr	ton/yr	wt%	
Acenaphthene	2.11E-05	4.72E-07	2.07E-06	0.00	
Acenaphthylene	2.53E-07	5.65E-09	2.48E-08	0.00	
Anthracene	1.22E-06	2.73E-08	1.19E-07	0.00	
Benzene	2.14E-04	4.78E-06	2.09E-05	0.00	
Benzo(a)anthracene	4.01E-06	8.96E-08	3.93E-07	0.00	
Benzo(b,k)fluoranthene	1.48E-06	3.31E-08	1.45E-07	0.00	
Benzo(ghi)perylene	2.26E-06	5.05E-08	2.21E-07	0.00	
Chrysene	2.38E-06	5.32E-08	2.33E-07	0.00	
Dibenzo(a,h)anthracene	1.67E-06	3.73E-08	1.63E-07	0.00	
Ethylbenzene	6.36E-05	1.42E-06	6.23E-06	0.00	
Fluoranthene	4.84E-06	1.08E-07	4.74E-07	0.00	
Formaldehyde	3.30E-02	7.38E-04	3.23E-03	0.09	cas 50-00-0 - carcinogen
Indo(1,2,3-cd)pyrene	2.14E-06	4.78E-08	2.09E-07	0.00	
Naphthalene	1.13E-03	2.53E-05	1.11E-04	0.00	
OCDD (CAS 3268-87-9)	3.10E-09	6.93E-11	3.03E-10	0.00	
Phenanthrene	1.05E-05	2.35E-07	1.03E-06	0.00	
Pyrene	4.25E-06	9.50E-08	4.16E-07	0.00	
Toluene	6.20E-03	1.39E-04	6.07E-04	0.02	
1,1,1-Trichloroethane	2.36E-04	5.27E-06	2.31E-05	0.00	
o-Xylene	1.09E-04	2.44E-06	1.07E-05	0.00	
Fluorene	4.47E-06	9.99E-08	4.38E-07	0.00	

*Table 1.3-9 of AP-42

Pollutant	Emission Factor (lb/kgal) **	lb/hr	ton/yr	Emission Factor (lb/10^12 BTU)***	lb/hr	ton/yr	wt%
As				4	1.25E-05	5.48E-05	0.00
Be				3	9.39E-06	4.11E-05	0.00
Cd				3	9.39E-06	4.11E-05	0.00
Cr				3	9.39E-06	4.11E-05	0.00
Cu				6	1.88E-05	8.22E-05	0.00
Mn				6	1.88E-05	8.22E-05	0.00
Hg				3	9.39E-06	4.11E-05	0.00
Ni				3	9.39E-06	4.11E-05	0.00
Se				15	4.69E-05	2.06E-04	0.01
Zn				4	1.25E-05	5.48E-05	0.00

**Table 1.3-11 of AP-42

***Table 1.3-10 of AP-42

(a) assumed Chloride is all chlorine

example calc:

As: (4lb/10^12btu)(3,129,000btu/hr) = 1.25E-05 lb/hr

(1.25E-05lb/hr)(8760hr/yr)(ton/2000lb) = 5.48E-05 TPY

To determine trace emissions the total emissions of Total PM, N2O, NO2, SO2, CO, and VOCs was determined to be 3.50E+00 TPY

The above wt% column utilizes this total emissions value.

example calc:

Toluene: (6.07E-04 TPY toluene)/3.50Total tons *100 = 0.02%)

No HAP/TAP is 0.1% by weight or higher.

Trace determination follows the method outlined in the July 2001 SCDHEC Air Quality Modeling Guidelines.

Adam R. Weller 10/8/19

Calculation Originator

CARY B. STEVENS 10-9-19

Reviewer

Title V Permit Application
Emission Unit B-004
Process Description

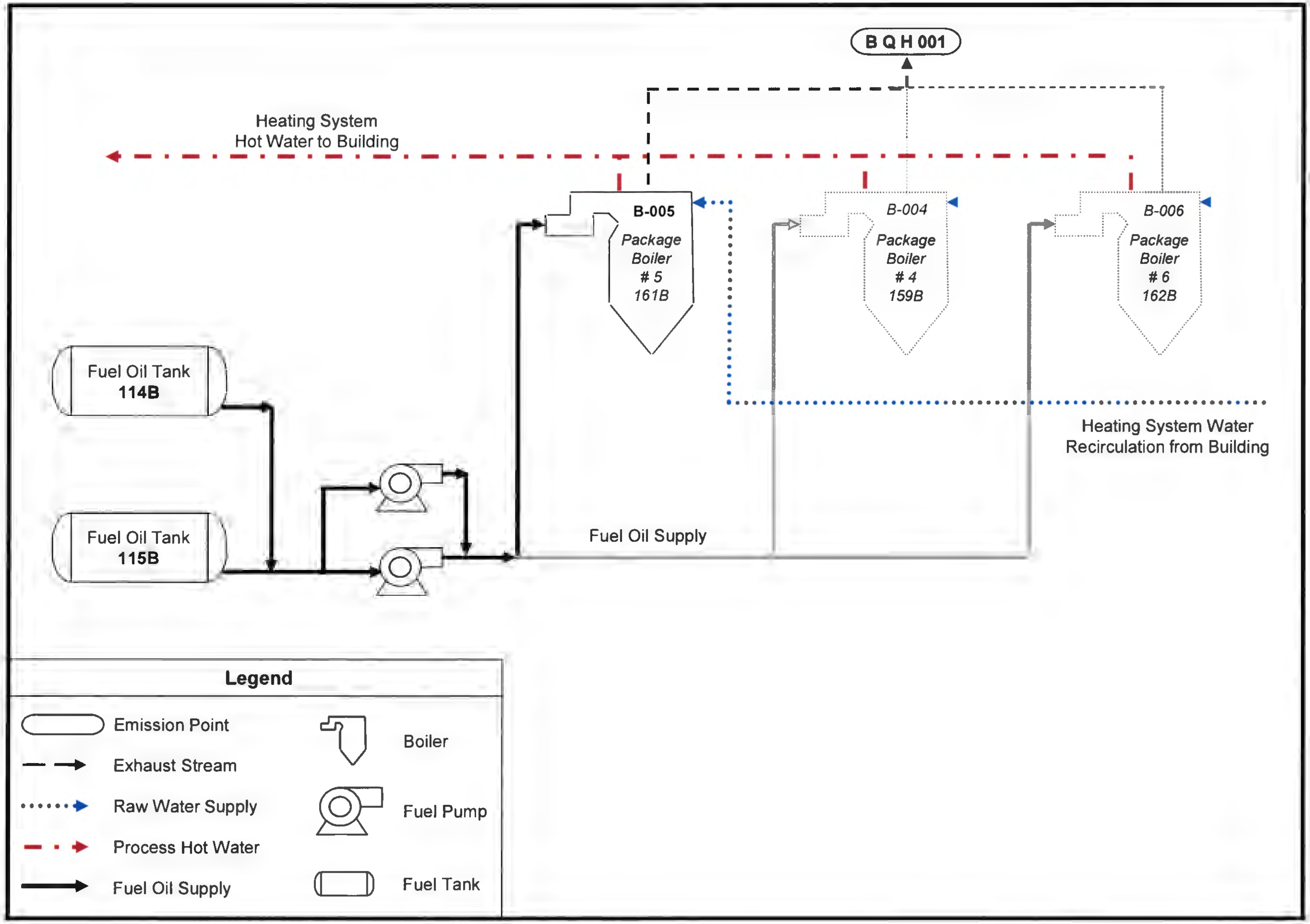
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. All of the boilers have a rated heat input of 3.129 MM/Btu/hr. The three boilers are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (BQH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.6 – Emission Unit B-006

Emission Unit B-004



SRNS-J2200-2020-00146

Title V Permit Application
Emission Unit B-005
Process Description

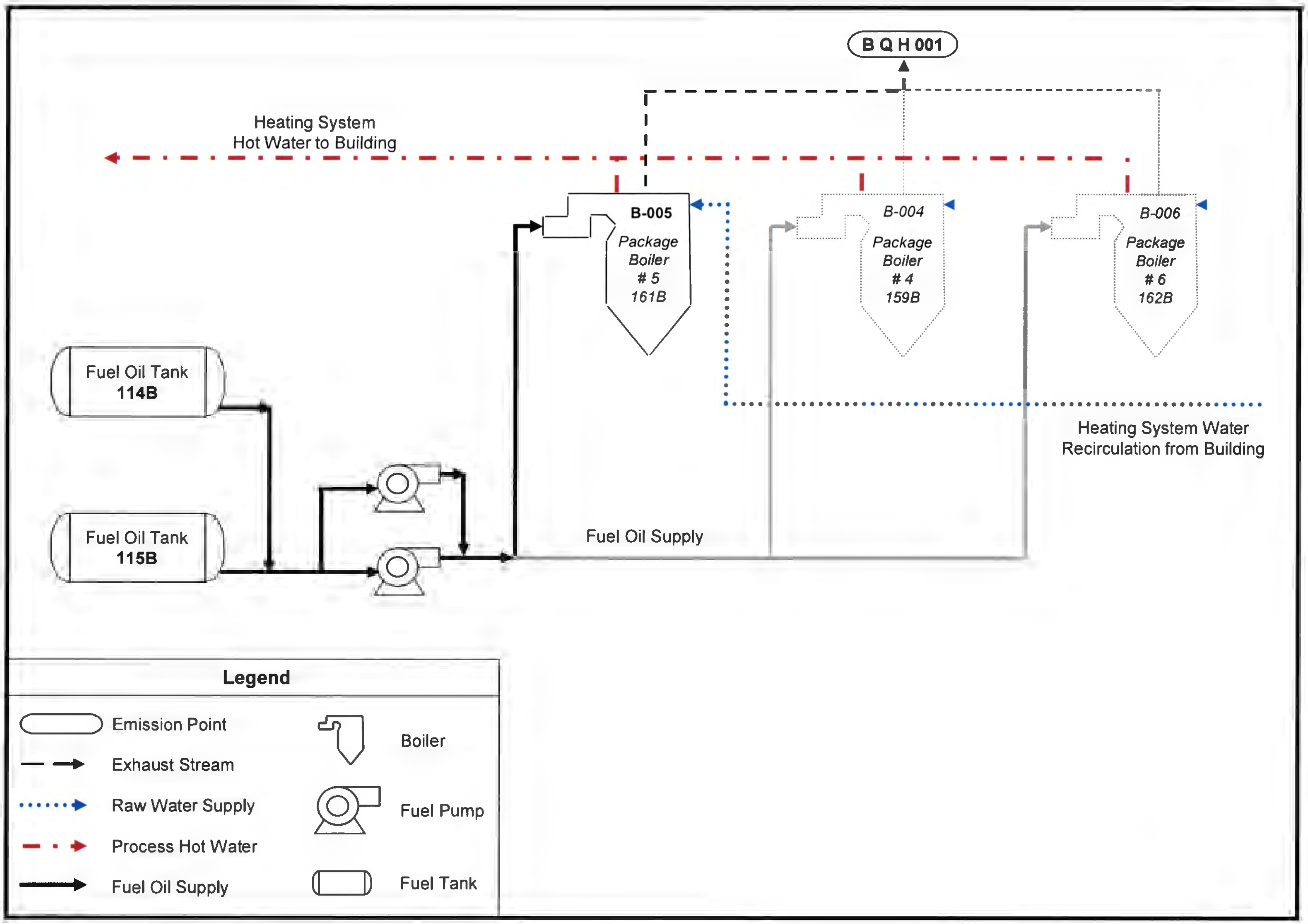
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. All of the boilers have a rated heat input of 3.129 MM/Btu/hr. The three boilers are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (BQH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.6 – Emission Unit B-006

Emission Unit B-005



SRNS-J2200-2020-00146

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FACILITY WIDE TOTAL EMISSIONS			
1. Pollutant	2. CAS No. (If Applicable)	3. Uncontrolled Emissions (TPY)	4. Controlled Emissions (TPY)
STANDARD 2 (CRITERIA) POLLUTANTS			
CO	630-08-0	6.59E+02	6.59E+02
Nitrogen Dioxide (NO2)	10102-44-0	8.50E+02	6.83E+02
NOx	NA	9.72E+02	8.05E+02
Pb	7439-92-1	3.57E-01	2.39E-01
PM	NA	2.73E+03	2.75E+02
PM10	NA	2.04E+03	2.68E+02
PM2.5	NA	2.01E+03	2.46E+02
SO2	7446-09-5	2.80E+03	5.61E+02
VOC	NA	1.99E+02	1.98E+02
STANDARD 8 (TOXIC AND HAZARDOUS) POLLUTANTS			
1,1,1-Trichloroethane (Methy	71-55-6	1.25E-01	1.25E-01
1,1-dichloroethylene (vinyli	75-35-4	1.33E-02	1.33E-02
1,4-Dioxane	123-91-1	4.51E-02	4.51E-02
Acetaldehyde	75-07-0	4.02E-01	4.02E-01
Acrylonitrile	107-13-1	2.60E-10	2.60E-10
Antimony Compounds	NA	1.82E-02	1.82E-02
Benzene	71-43-2	4.64E+00	4.64E+00
Carbon Disulfide	75-15-0	1.42E-05	1.42E-05
Carbon Tetrachloride	56-23-5	2.50E-01	2.50E-01
Chlorine	7782-50-5	2.25E+00	2.25E+00
Chloroform	67-66-3	6.91E-02	6.91E-02
Chromium Compounds	NA	3.31E-01	3.31E-01
Cumene	98-82-8	1.72E-02	1.72E-02
Ethylbenzene	100-41-4	3.87E-01	3.87E-01
Formaldehyde	75-12-7	3.64E+00	3.64E+00
Formic Acid	64-18-6	1.78E-01	1.40E-01
Hexane	110-54-3	2.08E-01	2.08E-01
Hydrochloric Acid	7647-01-0	2.85E+01	1.36E+01
Hydrogen Cyanide	74-90-8	1.07E-02	1.07E-02
Hydrogen Sulfide	7783-06-4	2.96E-04	2.96E-04
Lead Compounds	NA	6.71E-05	6.71E-05
Manganese Compounds	NA	1.79E+00	1.79E+00
Mercury	7439-97-6	1.79E-01	1.79E-01
Methanol	67-56-1	9.42E-01	9.42E-01

Methyl Ethyl Ketone	78-93-3	6.22E-03	6.22E-03
Methyl Isobutyl Ketone	108-10-1	1.58E-02	1.58E-02
Methylene Chloride (Dichloro	75-09-2	6.77E-01	6.77E-01
Nickel Compounds	NA	1.77E-01	1.77E-01
Nickel Oxide	1313-99-1	1.53E-04	1.53E-04
Nickel	7440-02-0	2.11E-01	2.11E-01
Nitric Acid	7697-37-2	1.67E+02	1.67E+02
Oxalic Acid	144-62-7	1.05E-01	1.05E-01
Sodium Hydroxide	1310-73-2	1.19E+00	1.19E+00
Styrene	100-42-5	1.41E+00	1.41E+00
Tetrachloroethylene (Perchl	127-18-4	4.96E+01	4.96E+01
Toluene	108-88-3	3.59E+00	3.59E+00
Trichloroethylene	79-01-6	1.85E+01	1.85E+01
Vinyl Chloride	75-01-4	4.65E-02	4.65E-02
Xylene (m-)	108-38-3	2.47E+00	2.47E+00
Xylene (o-)	95-47-6	6.57E-02	6.57E-02
Xylenes	1330-20-7	1.78E-02	1.78E-02
Acenaphthene (POM)	83-32-9	2.09E-03	2.09E-03
Acenaphthylene (POM)	208-96-8	1.15E-02	1.15E-02
Acetophenone	98-86-2	7.37E-06	7.37E-06
Acrolein	107-02-8	3.87E+00	3.87E+00
Anthracene (POM)	120-12-7	6.91E-03	6.91E-03
Benzo(a)anthracene (POM, PAH)	56-55-3	1.50E-04	1.50E-04
Benzo(a)pyrene (POM, PAH)	50-32-8	5.99E-03	5.99E-03
Benzo(b)fluoranthene (POM, PAH)	205-99-2	2.30E-04	2.30E-04
Benzo(b,k)fluoranthene (POM, PAH)	207-08-9	1.92E-05	1.92E-05
Benzo(e)pyrene	192-97-2	5.99E-06	5.99E-06
Benzo(g,h,i)perylene (POM)	191-24-2	2.14E-04	2.14E-04
Benzo(j,k)fluoranthene	205-82-3	3.68E-04	3.68E-04
Benzo(k)fluoranthene (POM)	207-08-9	8.29E-05	8.29E-05
Bis(2-Ethylhexyl)phthalate (DEHP)	117-91-7	1.08E-04	1.08E-04
Bromomethane (methyl bromide)	74-83-9	3.45E-02	3.45E-02
Chlorobenzene	108-90-7	7.60E-02	7.60E-02
Chloromethane (Methyl chloride)	74-87-3	5.30E-02	5.30E-02
Chrysene (POM)	218-01-9	8.75E-05	8.75E-05
Dibenzo(a,h)anthracene (POM)	53-70-3	2.74E-05	2.74E-05
1,2-Dichloroethane (Ethylene dichloride)	107-06-2	6.68E-02	6.68E-02
1,2-Dichloropropane (Propylene dichloride)	78-87-5	7.60E-02	7.60E-02

Title V Permit Application
Facility Wide Total Emissions – Form F
Bureau of Air Quality

2,4-Dinitrophenol	51-28-5	4.14E-04	4.14E-04
Fluoranthene (POM)	206-44-0	3.68E-03	3.68E-03
Fluorene (POM)	86-73-7	7.83E-03	7.83E-03
Heptachlorodibenzo-p-dioxins	37871-00-4	4.60E-06	4.60E-06
Heptachlorodibenzo-p-furans	38998-75-3	5.53E-07	5.53E-07
Hexachlorodibenzo-p-dioxins	34465-46-8	3.68E-03	3.68E-03
Hexachlorodibenzo-p-furans	55684-94-1	6.45E-07	6.45E-07
Octachlorodibenzo-p-dioxins	114423-97-1	1.52E-04	1.52E-04
Octachlorodibenzo-p-furans	39001-02-0	2.03E-07	2.03E-07
Pentachlorodibenzo-p-dioxins	36088-22-9	3.45E-06	3.45E-06
Pentachlorodibenzo-p-furans	30402-15-4	9.67E-07	9.67E-07
2,3,7,8-Tetrachlorodibenzo-p-furans	51207-31-9	2.07E-07	2.07E-07
Tetrachlorodibenzo-p-furans	30402-14-3	1.73E-06	1.73E-06
Indeno(1,2,3,c,d)pyrene (POM, PAH)	193-39-5	2.00E-04	2.00E-04
Naphthalene	81-20-3	2.23E-01	2.23E-01
4-Nitrophenol	100-02-7	2.53E-04	2.53E-04
Pentachlorophenol	87-86-5	1.17E-04	1.17E-04
Phenanthrene (POM)	85-01-8	1.61E-02	1.61E-02
Phenol	108-95-2	1.17E-01	1.17E-01
PCB (Polychlorinated Biphenyls)	NA	1.88E-05	1.88E-05
POM (Polycyclic Organic Matter)	NA	2.88E-01	2.88E-01
Propionaldehyde	123-38-6	1.40E-01	1.40E-01
Pyrene (POM)	129-00-0	8.52E-03	8.52E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxins	1746-01-6	3.98E-09	3.98E-09
Tetrachlorodibenzo-p-dioxins	41903-57-5	2.17E-07	2.17E-07
2,4,6-Trichlorophenol	88-06-2	5.06E-05	5.06E-05
Arsenic	7440-38-2	2.86E-02	2.86E-02
Beryllium	7440-41-7	6.64E-03	6.64E-03
Cadmium	7440-43-9	3.89E-02	3.89E-02
Chromium	7440-47-3	2.81E-02	2.81E-02
Chromium (Hex)	18540-29-9	8.06E-03	8.06E-03
Cobalt	7440-48-4	1.50E-02	1.50E-02
Manganese	7439-96-5	1.02E+00	1.02E+00
Phosphorus	7723-14-0	6.22E-02	6.22E-02
Selenium	7782-49-2	3.32E-02	3.32E-02
Total HAP/TAP		2.95E+02	2.80E+02
REGULATED POLLUTANTS			
CO2 EQUIVALENTS	NA	5.87E+05	5.87E+05

C: T. R. Fuss, SCDHEC - Aiken (electronic)
G. N. O'Quinn, SCDHEC – Aiken (electronic)
P. A. Risa, SCDHEC - Aiken (electronic)
J. G. DeMass, DOE-SR, 730-B
M. N. Ndingwan, 730-B
C. L. Bergren, SRNS, 730-4B
A. J. Meyer, 730-4B
T. O. Oliver, 730-4B
G. C. Fanning, 730-4B
A. R. Waller, 730-4B
K. A. Wolfe, 730-4B
M.C. Wright, 730-1B
J. S. Kirk, 766-H
D. P. Skiff, 766-H
K. R. Liner, 704-S
P. J. Rowan, 704-S
L. A. Wooten, 704-S
Records Processing, 773-52A

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

VOLUME I

GENERAL INFORMATION

SRS PART 70 AIR QUALITY PERMIT TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

VOLUME II

SRS PART 70 AIR QUALITY PERMIT TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

TABLE OF CONTENTS

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Bureau of Air Quality
Title V Operating Permit Application
Facility Information
Page 1 of 2

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FACILITY IDENTIFICATION	
SC Air Permit Number (8-digits only) 0080 - 0041	Application Date 1/30/2020
Facility Name (This should be the name used to identify the facility at the physical address listed below) U.S. Department of Energy - Savannah River Site managed and operated by Savannah River Nuclear Solutions, LLC	Facility Federal Tax Identification Number (Established by the U.S. Internal Revenue Service to identify a business entity) 530197006 (US-DOE) 26-0240191 (SRNS, LLC)

FACILITY PHYSICAL ADDRESS		
Physical Address: SRS		County: Aiken (also Barnwell and Allendale)
City: Aiken	State: SC	Zip Code: 29808-0001
Facility Coordinates (Facility coordinates should be based at the front door or main entrance of the facility.)		
Latitude: 33 20'37.79"	Longitude: -81 44'28.23"	☒ NAD27 (North American Datum of 1927) Or ☐ NAD83 (North American Datum of 1983)

CO-LOCATION DETERMINATION
Are there other facilities in close proximity that could be considered co-located? ☐ No ☒ Yes*
List potential co-located facilities, including air permit numbers, if applicable: See Attached Table
If applicable, location in application for co-location determination: See Attached Table

(*If yes, please submit co-location applicability determination details in an attachment to this application.)

CONFIDENTIAL INFORMATION / DATA
Does this application contain confidential information or data? ☒ No ☐ Yes*

*If yes, include a sanitized version of the application for public review and **ONLY ONE COPY OF CONFIDENTIAL INFORMATION SHOULD BE SUBMITTED**

AIR PERMIT FACILITY CONTACT (Person who can answer technical questions about the facility and permit application.)			
Title/Position: Air Program Lead, Environmental Compliance - SRNS, LLC	Salutation:	First Name: Kim	Last Name: Wolfe
Mailing Address: 730-4B, Savannah River Site			
City: Aiken		State: SC	Zip Code: 29808-0001
E-mail Address: kim.wolfe@srs.gov		Phone No.: 803-952-6853	Cell No.:

Bureau of Air Quality
Title V Operating Permit Application
Facility Information

RESPONSIBLE OFFICIAL			
Title/Position: Director - EC&ACP	Salutation:	First Name: Christopher	Last Name: Bergren
Mailing Address: 730-4B, Savannah River Site			
City: Aiken		State: SC	Zip Code: 29808-0001
E-mail Address: chris.bergren@srs.gov		Phone No.: 803-952-6530	Cell No.: 803-507-5278
RESPONSIBLE OFFICIAL SIGNATURE			
I certify, to the best of my knowledge and belief, that no applicable standards and/or regulations will be contravened or violated. I certify that any application form, report, or compliance certification submitted in this permit application is true, accurate, and complete based on information and belief formed after reasonable inquiry. I understand that any statements and/or descriptions, which are found to be incorrect, may result in the immediate revocation of any permit issued for this application.			

11/27/20

Signature of Responsible Official | Date

H. AIR PERMIT CONSULTANT			
Consulting Firm Name:			
Title/Position:	Salutation:	First Name:	Last Name:
Mailing Address:			
City:		State:	Zip Code:
E-mail Address:		Phone No.:	Cell No.:
SC Professional Engineer License/Registration No. (if applicable):			

Attachment A Form 2566 – Collocation Determination

Facility	Air Permit Numbers	Proximity	Ownership/Common Control	Additional Information
Ameresco Biomass Cogeneration Facility (including K-Area and L-Area biomass boilers)	0080-0144	Located within boundaries of SRS	Property is Owned by the Department of Energy (DOE)	Steam generated at Ameresco facilities support SRS facilities.
Salt Waste Processing Facility (SWPF)	NA-Exempted via condition 7.B.3 of SRS's original Title V Operating permit	Located within boundaries of SRS	Property is Owned by the Department of Energy (DOE)	The purpose of SWPF is to process streams from other SRS facilities. This is a support facility.
Research and Development (R&D) Activities performed at leased facilities within the Savannah River Research Campus maintained by Aiken County	NA-R&D activities are exempt from construction and operating permitting	In 2013 a determination was made that even though these facilities are not within the SRS boundary they were collocated (SRNS-J2000-2013-00248). The current guidance states, "[The collocation guidance] is intended to be a guide and not an exhaustive list of all possible scenarios. These determinations are made on a case-by-case basis regarding the existing situation at specific facilities."	Personnel performing R&D activities at the Aiken country facilities are SRS personnel that share common employee benefits, health plans, retirement funds and other administrative functions	Research performed at these laboratories support the work at SRS.
Three Rivers Solid Waste Authority Regional Landfill (Landfill)	0080-0112	The Landfill is within the SRS site boundary, but a fence separates the Landfill from the remainder of SRS. Public access to the Landfill is not allowed, but access is provided to member counties and approved commercial haulers. (http://www.trswa.org/landfill.shtml)	• Landfill does not share a common workforce with SRS. • Landfill is responsible for its own equipment, property, and pollution control devices. • Landfill personnel do not share common employee benefits, health plans, retirement funds and other administrative functions • The Landfill does accept waste from the SRS. However, SRS contributes only 1.3% of the total waste received (http://www.trswa.org/landfill.shtml) SRS could transport their waste to another permitted facility with little or no impacts to the Landfill or SRS. • Landfill personnel are responsible for compliance with air quality control requirements at the Landfill. The DOE is not listed on the air permit for the Landfill. • Easement has been provided to the Landfill for the use of the property. The Landfill does receive waste from the SRS. These are not agreements that impact control and operation of the Landfill.	The Landfill and SRS are not within the same industrial grouping. The Landfill is not a support facility for SRS since the SRS contributes far less than 50% of the waste being disposed at the Landfill and does not have operational control over the Landfill. **Conclude not co-located based on SIC/NAICS codes or support.**

* "Guidance for Collocation/Single Source Determinations," issued by Elizabeth Basil, dated 10/28/2016, was utilized in the generation of this table.

Conclusion: Ameresco Biomass Cogeneration Facility, Salt Waste Processing Facility, and the Research and Development (R&D) Activities performed at leased facilities within the Savannah River Research Campus maintained by Aiken County are co-located facilities/activities. The Three Rivers Solid Waste Authority Regional Landfill is not co-located facilities with SRS. Simplistically speaking the Landfill is not dependent on the presence of SRS to perform their services.

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Application Checklist - Form B
Bureau of Air Quality

SUMMARY OF APPLICATION CONTENTS	
GENERAL APPLICATION CONTENTS - DOES THE APPLICATION PACKAGE INCLUDE...	
1. A Table of Contents?	☒ Yes ☐ No ☐ N/A
2. A list of all items for which a permit is being sought (Form C Information)?	☒ Yes ☐ No ☐ N/A
3. A plot plan or map?	☒ Yes ☐ No ☐ N/A
4. A detailed drawing of the layout of the facility showing exhaust points and dimensions of each structure, including height, width, and length?	☒ Yes ☐ No ☐ N/A
5. A detailed facility-wide process description and flow diagram showing the relationship between each emission unit at the facility?	☒ Yes ☐ No ☐ N/A
6. A detailed process description and diagram for each emission unit at the facility?	☒ Yes ☐ No ☐ N/A
7. All reasonably anticipated operating scenarios?	☐ Yes ☐ No ☒ N/A
8. Are fugitive emissions included in Forms D, and F?	☒ Yes ☐ No ☐ N/A
9. Detailed calculations showing: (1) Uncontrolled emissions; (2) Control equipment efficiency; (3) Controlled emissions in pounds per hour and other applicable units, e. g. ppm or grains per cubic foot, if necessary, etc.; and (4) Allowable emissions, in the same terms as above?	☒ Yes ☐ No ☐ N/A
10. A request to utilize the operational flexibility provisions and include the information required for such use? (if applicable)	☒ Yes ☐ No ☐ N/A
11. A request for a permit shield? (Complete Form K)	☒ Yes ☐ No ☒ N/A
12. A completed listing of insignificant emission units, if applicable? (Complete Form G)	☒ Yes ☐ No ☐ N/A
13a. Modeling results for NAAQS, PSD Class II Increment and/or Air Toxics if this facility has not already demonstrated compliance with these Standards as applicable (S.C. Regulation 61-62.5, Standards 2, 7 and 8)?	☒ Yes ☐ No ☐ N/A
13b. If #13a is yes, does the plot plan required by item #3 show stack locations and dimensions (length, width, and height) of buildings/structure?	☐ Yes ☐ No ☒ N/A
14. A completed compliance plan/schedule of compliance as requested in Form I?	☐ Yes ☐ No ☒ N/A
15. A completed compliance plan/schedule of compliance addendum for each of the non-complying emission units for which issuance of a Part 70 permit is requested?	☐ Yes ☐ No ☒ N/A
16. A completed compliance certification form? Complete Forms A and I.	☒ Yes ☐ No ☐ N/A
17. Acid rain portions of permit application and compliance plans, as required by regulations promulgated under Title IV of the Act (if applicable). (See EPA forms on EPA's web site http://www.epa.gov/airmarkets/forms/index.html#permits).	☐ Yes ☐ No ☒ N/A
COPIES OF APPLICATION	
18a. Does the application contain confidential information? If yes, all confidential information should be submitted under separate cover.	☒ Yes ☐ No ☐ N/A
18b. Have **two copies** of the application suitable for public inspection and one copy with confidential information properly marked (if applicable) been submitted, in accordance with applicable regulations?	☒ Yes ☐ No ☐ N/A
19. Has the application been submitted to any other government agency (not required)? If so, who?	☐ Yes ☒ No ☐ N/A
20. Does the application include an electronic copy of the application? (Mandatory)	☒ Yes ☐ No ☐ N/A
21. Is the facility submitting a draft Title V permit with this application (optional)?	☐ Yes ☒ No ☐ N/A
22. For any non-permitted emission sources or activities a separate construction permit application should not be included in this application. Please submit construction permit applications under a separate cover.	
REGULATORY INFORMATION REQUESTED	
23. Does the application include a proposed determination of maximum achievable control technology (MACT) for hazardous air pollutants pursuant to sections 112(g) and 112(j) of the Clean Air Act Amendments of 1990? (if applicable)	☐ Yes ☐ No ☒ N/A
24. Does the application include sufficient information regarding accidental releases pursuant to section 112(r) of the Clean Air Act Amendments of 1990? (if applicable)	☐ Yes ☐ No ☒ N/A
25. Does the application identify all applicable requirements including section 111 (NSPS) and/or Section 112 (NESHAP) of the Clean Air Act? (Form K)	☒ Yes ☐ No ☐ N/A
26. If applicable, is a Compliance Assurance Monitoring (CAM) Plan submitted with this Title V permit application (Form I and/or CAM Plan Supplemental Form)?	☐ Yes ☐ No ☒ N/A
27. Does the application include an applicability determination for all sources subject to CAM (Form I)?	☒ Yes ☐ No ☐ N/A
28. Is a Lowest Achievable Emission Rate (LAER)/ Best Available Control Technology (BACT) baseline and analysis included?	☐ Yes ☐ No ☒ N/A
28a. Is the facility subject to the NOx SIP call?	☐ Yes ☒ No ☐ N/A
WHY APPLICANT IS APPLYING FOR A TITLE V PERMIT? (CHECK ALL THAT APPLY)	

Title V Permit Application
Application Checklist - Form B
Bureau of Air Quality

29a. The "potential to emit" of the facility is 100 tons/year or more for an individual regulated pollutant.	☒ Yes ☐ No ☐ N/A
29b. The facility is an affected facility for acid rain deposition.	☐ Yes ☒ No ☐ N/A
29c. The "potential to emit" for any one hazardous air pollutant is 10 tons/year or more, or the total of all hazardous air pollutants is 25 tons/year or more, or the facility meets an other applicable lower threshold required by a MACT Standard.	☒ Yes ☐ No ☐ N/A
29d. Other reason –(e.g. co-location) Please list:	☐ Yes ☐ No ☒ N/A
CONDITIONAL MAJOR REQUEST OR REGULATORY AVOIDANCE	
30. Are all controlled emissions of the facility below the applicability levels for Part 70 permit?	☐ Yes ☐ No ☒ N/A
31. Does the application propose limitations that will constrain the operation of the facility such that potential emissions of the facility will fall below applicability levels for Part 70 permits or MACT applicability?	☐ Yes ☐ No ☒ N/A
32. Is the facility requesting a MACT avoidance limit?	☐ Yes ☐ No ☒ N/A
33. Is the facility requesting a PSD/NSR avoidance (facility-wide)?	☐ Yes ☐ No ☒ N/A
34. Is the facility requesting a BACT/LAER, SC Regulation 61-62.5, Standard 5.1 avoidance?	☐ Yes ☐ No ☒ N/A

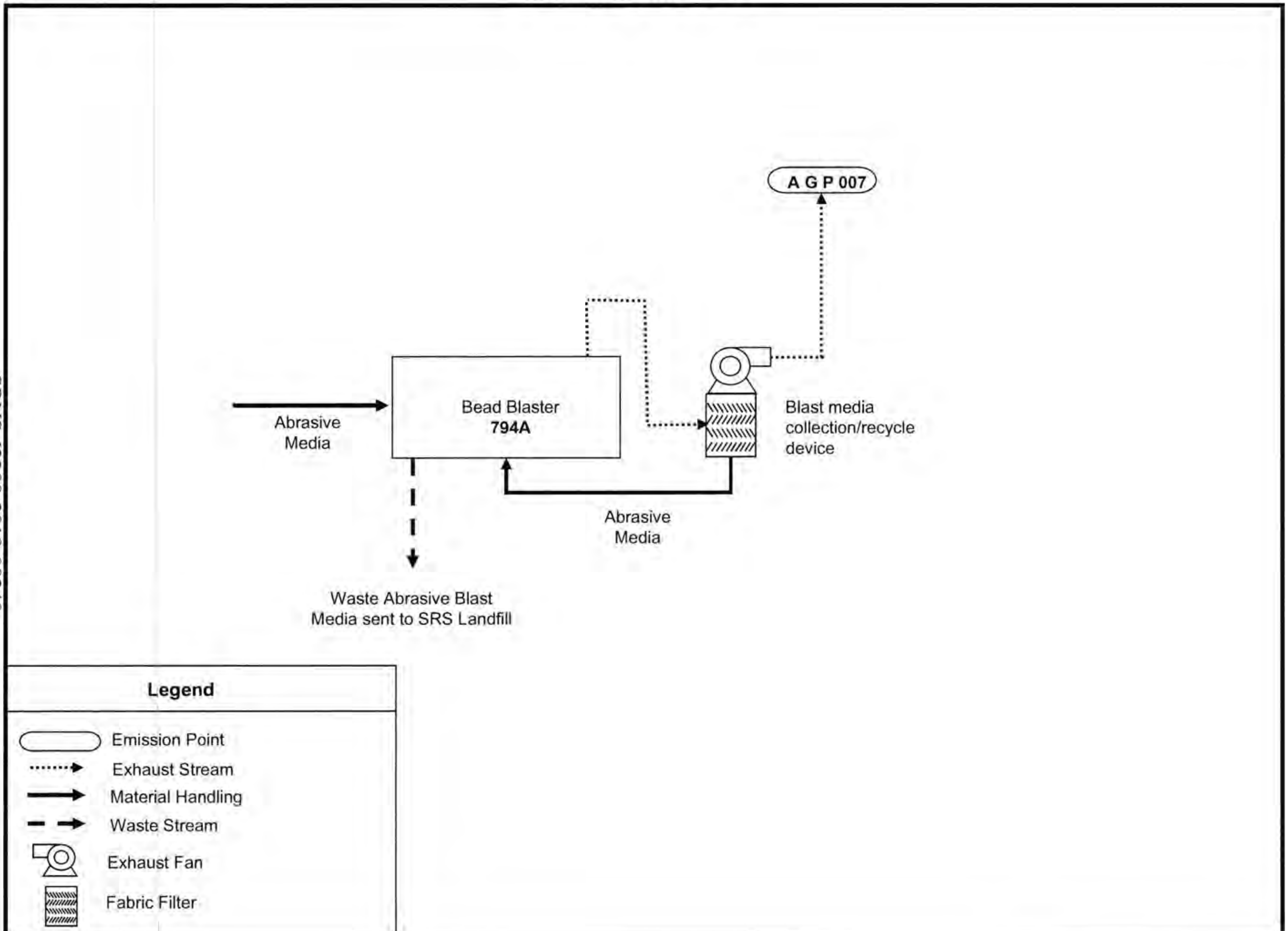
Title V Permit Application
Emission Unit A-005
Process Description

Emission Unit A-005 is an Empire Abrasive Equipment Co. bead blaster for use in the 722-4A electrical maintenance shop. The unit is used to blast paints, corrosion products and other miscellaneous foreign materials off of various pieces of equipment such as motors, breakers, switches, etc. The unit uses glass beads as the blasting material. The unit is located within a climate controlled building and is equipped with an abrasive media collection/recycle system with reclamation efficiency of 99.5%. The collection/recycle system is an integral part of the abrasive process since it collects blast media for immediate reuse in the process. The supporting calculation provides the emissions controlled (with the presence of the building) and uncontrolled (without the presence of the building). Since the building is actually inherent to the location of this process the calculated controlled emission rates are provided as both the controlled and uncontrolled rate in the Title V permit application forms.

The maximum annual quantity of raw material consumed for Form E is based on a maximum quantity of abrasive material entering the building at 1.71 lb/hr and the process conservatively running 8760 hours/year.

SRNS-J2200-2019-00240

Emission Unit A-005



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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
A-005	722-4A BEADBLASTER	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
A-005	N/A	171 LB/HR	SURFACE PREPARATION	8111 / 811310	NONE

SRNS-J2200-2019-00240

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
NA			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
NA							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
A-005	794A	BEAD BLASTING	02/1992	None	NA	A G P 007	171 LBS/HR

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

Equipment Description (Continued)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
794A	N/A	N/A	GRANDFATHERED	NONE

SRNS-J2200-2019-0240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
A-005	A G P 007	TOTAL PARTICULATE MATTER	N/A	CRITERIA	1.73E+00	7.58E+00	4.51E-01	1.98E+00
A-005	A G P 007	PARTICULATE MATTER (10 MICRONS)	N/A	CRITERIA	8.34E-01	3.65E+00	2.17E-01	9.49E-01
A-005	A G P 007	PARTICULATE MATTER (2.5 MICRONS)	N/A	CRITERIA	8.34E-02	3.65E-01	2.17E-02	9.50E-02

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
A-005	A G P 007	TOTAL PARTICULATE MATTER	EPA's AP-42	N/A
A-005	A G P 007	PARTICULATE MATTER (10 MICRONS)	EPA's AP-42	N/A
A-005	A G P 007	PARTICULATE MATTER (2.5 MICRONS)	EPA's AP-42	N/A

SRNS-J2200-2019-00240

South Carolina Department of Health and Environmental Control

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
GLASS BEADS-SILCONE BLASTER BEADS	1.50E+04 LB/YR	METAL CLEANING	8111-811310	VARIES

SRNS-J2200-2019-00240

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
722-4A BEADBLASTER	A-005	EMISSIONS FROM PROCESS INDUSTRIES - OTHER MANUFACTURING	0.789 LB / HR PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 4, Sect. VIII
722-4A BEADBLASTER	A-005	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.B

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
A-005	SC 61-62.5, Std. 4, Sect. VIII	Y	CLB	Apr-03	
A-005	SC 61-62.5, Std. 4, Sect. IX.B	Y	CLB	Apr-03	

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
A-005	VISIBLE INSPECTIONS (VI)	N/A	RECORDKEEPING	PER OCCURANCE	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
A-005	VISIBLE INSPECTIONS (VI)	N/A	PER OCCURANCE	N/A	N	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
A-005	VISIBLE INSPECTIONS (VI)	N/A	N/A	At the beginning of each blasting operation, perform Visual Inspection (VI) of the emissions from the baghouse exhaust and document VI in a logbook.

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
A-005	722-4A BEADBLASTER	TOTAL PARTICULATE MATTER	7.58E+00	NA	1.98E+00		X	N	
A-005	722-4A BEADBLASTER	PARTICULATE MATTER (10 MICRONS)	3.65E+00	NA	9.49E-01		X	N	
A-005	722-4A BEADBLASTER	PARTICULATE MATTER (2.5 MICRONS)	3.65E-01	NA	9.50E-02		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

SRNS-J2200-2019-00240

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FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2019-00240

A AREA
BEAD BLASTER 722-4A

AGP0007, Emission Unit A-005
DHEC ID 794A

Assumptions/Basis:

1. Maximum hourly rate of abrasive material utilized is 171 lb/hr. This is extremely conservative, based on the actuals reported over the past several years. The actuals have been 0.1 lb/hr.
2. The equipment is 99% efficient at keeping PM contained within the equipment.
3. The booth is located within a climate controlled building and the building will be considered a control device. Therefore the calculation conservatively assumes that 25% of the PM that escapes the equipment will also escape the building and enter the atmosphere. The bead blaster exhaust is directed out of the building.
4. The induced fan equipment generates an equivalent wind speed of 5mph within the equipment. Utilized Emission Factor for Total PM 27*lb*/1000*lb*, PM_{10} 13*lb*/1000*lb*, $PM_{2.5}$ 1.3*lb*/1000*lb* abrasive from EPA's AP-42, 5th Edition, Chapter 13.2.6: Abrasive Blasting, Sept 1997, Table 13.2.6-1 Particulate Emission Factors for Abrasive Blasting.
5. These factors are used to determine the amount of PM, PM_{10}, $PM_{2.5}$ entering the recycling system.
6. Recycling equipment is 99.5% efficient at containing and recycling abrasive material.
7. Ratios for PM_{10} and $PM_{2.5}$ using the Emission Factors are 48.1% and 4.81% respectively.

TOTAL PM

Equation 1: Uncontrolled PM leaving equipment and entering building

$$171\frac{lb}{hr}(1.00-0.99)=1.71\frac{lb}{hr}$$

Equation 2: Controlled PM fugitive emission rate from equipment into atmosphere

$$171\frac{lb}{hr}(1.00-0.99)(0.25)=0.428\frac{lb}{hr}$$

Equation 3: PM entering recycling equipment

$$\frac{27\,lb\,PM}{1000lb\ abrasive}\left(171\frac{lb}{hr}\right)=4.62\frac{lb}{hr}$$ $\Rightarrow$ See assumption 4 for EF

Equation 4: PM lost from recycling equipment and entering atmosphere

$$4.62\frac{lb}{hr}(1.00-0.995)=0.0231\frac{lb}{hr}$$

Equation 5: Uncontrolled PM entering atmosphere

$$1.71\frac{lb}{hr}+0.0231\frac{lb}{hr}=1.73\frac{lb}{hr}$$

Equation 6: Controlled PM entering atmosphere

$$0.428\frac{lb}{hr}+0.0231\frac{lb}{hr}=0.451\frac{lb}{hr}$$

Equation 7: Standard 4 calculation $E=4.10\bullet P^{0.67}$ $\Rightarrow$ where P = process weight rate

$$E = 4.10\left(171\frac{lb}{hr}\bullet\frac{1\,ton}{2000\,lb}\right)^{0.67}=0.789\frac{lb}{hr}$$

PM-10

Equation 1: Uncontrolled PM_{10} leaving equipment and entering building

$$(0.481)\cdot 171\frac{lb}{hr}(1.00-0.99)=0.8233\frac{lb}{hr}$$

Equation 2: Controlled PM_{10} fugitive emission rate from equipment into atmosphere

$$(0.481)\cdot 171\frac{lb}{hr}(1.00-0.99)(0.25)=0.206\frac{lb}{hr}$$

Equation 3: PM_{10} entering recycling equipment

$$\frac{13lb\,PM}{1000lb\;abrasive}\left(171\frac{lb}{hr}\right)=2.223\frac{lb}{hr}$$ $\Rightarrow$ See assumption 4 for EF

Equation 4: PM_{10} lost from recycling equipment and entering atmosphere

$$2.223\frac{lb}{hr}(1.00-0.995)=0.0111\frac{lb}{hr}$$

Equation 5: Uncontrolled PM_{10} entering atmosphere

$$0.8233\frac{lb}{hr}+0.0111\frac{lb}{hr}=0.834\frac{lb}{hr}$$

Equation 6: Controlled PM_{10} entering atmosphere

$$0.2056\frac{lb}{hr}+0.0111\frac{lb}{hr}=0.2167\frac{lb}{hr}$$

PM-2.5

Equation 1: Uncontrolled $PM_{2.5}$ leaving equipment and entering building

$$(0.0481)\cdot 171\frac{lb}{hr}(1.00-0.99)=0.0823\frac{lb}{hr}$$

Equation 2: Controlled $PM_{2.5}$ fugitive emission rate from equipment into atmosphere

$$(0.0481)\cdot 171\frac{lb}{hr}(1.00-0.99)(0.25)=0.0206\frac{lb}{hr}$$

Equation 3: $PM_{2.5}$ entering recycling equipment

$$\frac{1.3\,lb\,PM}{1000\,lb\ abrasive}\left(171\frac{lb}{hr}\right)=0.2223\frac{lb}{hr}\quad\Rightarrow\ \text{See assumption 4 for EF}$$

Equation 4: $PM_{2.5}$ lost from recycling equipment and entering atmosphere

$$0.2223\frac{lb}{hr}(1.00-0.995)=0.0011\frac{lb}{hr}$$

Equation 5: Uncontrolled $PM_{2.5}$ entering atmosphere

$$0.0823\frac{lb}{hr}+0.0011\frac{lb}{hr}=0.0834\frac{lb}{hr}$$

Equation 6: Controlled $PM_{2.5}$ entering atmosphere

$$0.0206\frac{lb}{hr}+0.0011\frac{lb}{hr}=0.0217\frac{lb}{hr}$$

Pollutant	Uncontrolled lb/hr	Uncontrolled TPY	Controlled lb/hr	Controlled TPY
PM	1.73	7.577	0.451	1.975
PM_{10}	0.834	3.653	0.2167	0.9491
$PM_{2.5}$	0.0834	0.3653	0.0217	0.0950

Reginald E. Robinson REB 8/27/09

Calculation Originator Signature

J.H. Riggsbee J. H. Riggsbee 8/27/09

Reviewer Signature

Title V Permit Application
Emission Unit A-013
Process Description

Emission Unit A-013 is a Hurst reciprocating grate solid fuel hybrid 40 MMBTU/hr boiler (Biomass) rated for 30,000 pph steam. This boiler generates steam by the direct combustion of wood and supplies steam to the A-Area and SRNL, where steam is used primarily for heating, air conditioning and turbine drives for steam driven equipment. However, steam is also used to transfer radiological materials.

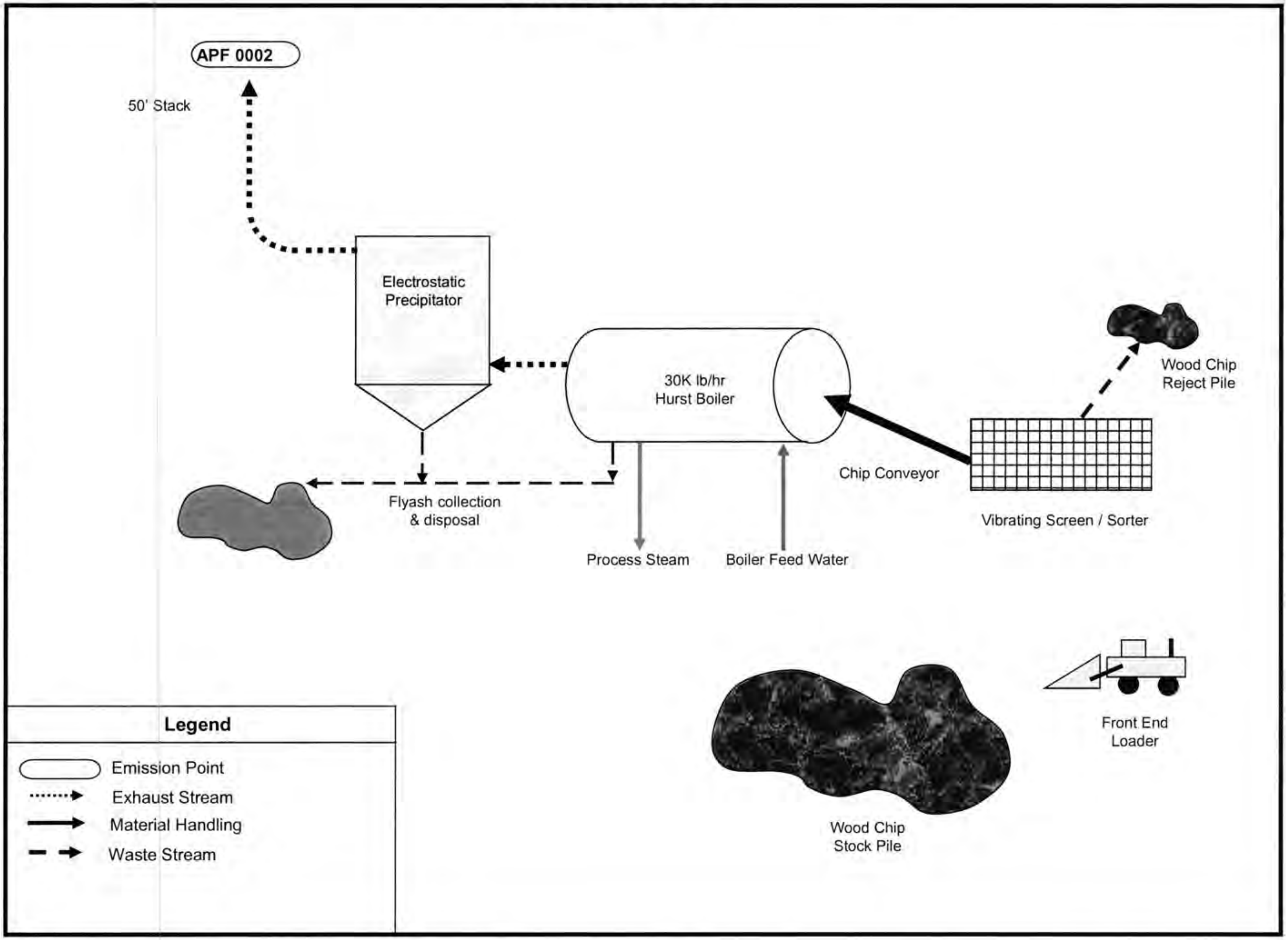
The Biomass boiler has one process stack. The process stack is 50 feet high, three (3) foot diameter with an exit velocity of 44 feet per second. EPA AP42 and EPA Emission Inventory Improvement Program (EIIP) provided emission factors of "n/a" for wood chip handling with a moisture content greater than five percent. Bulk wood chips will be delivered by truck, loaded onto the vibratory screener/sorter by front end loader, and conveyed to the boiler by a belt conveyor. Fly ash from the boiler and the electrostatic precipitator is collected into associated hoppers and manually emptied as required. The fly ash is trucked to an approved landfill for disposal.

The biomass boiler is equipped with all the controls necessary to be compliant with all applicable requirements. They are:

- Electrostatic Precipitator: The biomass boiler is equipped with an electrostatic precipitator (ESP). The ESP is a PPC Industries Model H1212-2S designed to reduce particulate emissions from an estimated 0.5 lbs/MMBTU to 0.025 lbs/MMBTU. This unit includes two cells, longitudinal trough hopper, 50-foot discharge elevation stub stack, and 180 degree stack test platform. The current applied across the ESP during start-up and testing will be correlated with the opacity to determine optimum removal efficiency.

- Opacity Monitors: The biomass boiler is equipped with a continuous opacity monitoring system.

Emission Unit A-013



SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
A-013	784-7A STEAM FACILITY BIOMASS BOILER	ELECTROSTATIC PRECIPITATOR (ESP)

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
A-013	4.27	30000 LB/HR	STEAM	4961-221330	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
E 0009	ELECTROSTATIC PRECIPITATOR (ESP)---PPC INDUSTRIES, H1212-2S,	~ 9/2008	TOTAL PARTICULATE MATTER (PM)
E 0009	ELECTROSTATIC PRECIPITATOR (ESP)---PPC INDUSTRIES, H1212-2S,	~ 9/2008	PARTICULATE MATTER (10 MICRONS)
E 0009	ELECTROSTATIC PRECIPITATOR (ESP)---PPC INDUSTRIES, H1212-2S,	~ 9/2008	PARTICULATE MATTER (2.5 MICRONS)

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
E 0009	FORCED DRAFT	99.9	90	VENDOR DATA	AMP METER	A PF 0002	PARTICULATE MATTER (2.5 MICRONS)
E 0009	FORCED DRAFT	99.9	90	VENDOR DATA	TEMPERATURE GAUGE	A PF 0002	PARTICULATE MATTER (2.5 MICRONS)
E 0009	FORCED DRAFT	99.9	90	VENDOR DATA	VOLT METER	A PF 0002	PARTICULATE MATTER (2.5 MICRONS)
E 0009	FORCED DRAFT	99.9	95	VENDOR DATA	AMP METER	A PF 0002	PARTICULATE MATTER (10 MICRONS)

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
E 0009	FORCED DRAFT	99.9	95	VENDOR DATA	TEMPERATURE GAUGE	A PF 0002	PARTICULATE MATTER (10 MICRONS)
E 0009	FORCED DRAFT	99.9	95	VENDOR DATA	VOLT METER	A PF 0002	PARTICULATE MATTER (10 MICRONS)
E 0009	FORCED DRAFT	99.9	96	VENDOR DATA	AMP METER	A PF 0002	TOTAL PARTICULATE MATTER (PM)
E 0009	FORCED DRAFT	99.9	96	VENDOR DATA	TEMPERATURE GAUGE	A PF 0002	TOTAL PARTICULATE MATTER (PM)
E 0009	FORCED DRAFT	99.9	96	VENDOR DATA	VOLT METER	A PF 0002	TOTAL PARTICULATE MATTER (PM)

SRNS-J2200-2019-00240

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
A-013	66GA	BIOMASS BOILER 30K LB/HR	1/10/08 – manufactured date	NONE	E 0009	A PF 0002	40 MMBTU/HR

EQUIPMENT DESCRIPTION (CONTINUED)

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
66GA	CLEAN WOOD	N/A	0080-0041a-CG	NONE

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
A-013	A P F 0002	SULFUR DIOXIDE	7446 09 5	CRITERIA	1.00E+00	4.38E+00	1.00E+00	4.38E+00
A-013	A P F 0002	VOC (OZONE PRECURSORS)		CRITERIA	6.80E-01	2.98E+00	6.80E-01	2.98E+00
A-013	A P F 0002	NITROGEN DIOXIDE	10102 44 0	CRITERIA	1.32E+01	5.78E+01	1.32E+01	5.78E+01
A-013	A P F 0002	TOTAL PARTICULATE MATTER (PM)		CRITERIA	1.39E+01	6.08E+01	1.48E+00	6.48E+00
A-013	A P F 0002	PARTICULATE MATTER (10 MICRONS)		CRITERIA	1.23E+01	5.38E+01	2.28E+00	9.99E+00
A-013	A P F 0002	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	1.07E+01	4.68E+01	2.08E+00	9.11E+00
A-013	A P F 0002	CARBON MONOXIDE	630 08 0	CRITERIA	2.40E+01	1.05E+02	2.40E+01	1.05E+02
A-013	A P F 0002	LEAD	7439 92 1	CRITERIA HAP	1.92E-03	8.41E-03	1.92E-03	8.41E-03
A-013	A P F 0002	FORMALDEHYDE	50 00 0	HAP TAP	1.76E-01	7.71E-01	1.76E-01	7.71E-01
A-013	A P F 0002	BENZENE	71 43 2	HAP TAP	1.68E-01	7.36E-01	1.68E-01	7.36E-01
A-013	A P F 0002	STYRENE	100 42 5	HAP TAP	7.60E-02	3.33E-01	7.60E-02	3.33E-01
A-013	A P F 0002	HYDROCHLORIC ACID (HYDROGEN CHLORIDE)	7647 01 0	HAP TAP	7.60E-01	3.33E+00	8.80E-01	3.85E+00
A-013	A P F 0002	Mercury (Hg)	7439 97 6	N/A	1.40E-04	6.13E-04	2.28E-04	9.99E-04

SRNS-J2200-2019-00240

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
A-013	A P F 0002	NITROGEN DIOXIDE	CONSTRUCTION PERMIT	N/A
A-013	A P F 0002	SULFUR DIOXIDE	EPA AP-42	N/A
A-013	A P F 0002	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
A-013	A P F 0002	TOTAL PARTICULATE MATTER (PM)	40 CFR 63 Subpart DDDDD	Table 2
A-013	A P F 0002	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A
A-013	A P F 0002	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
A-013	A P F 0002	CARBON MONOXIDE	EPA AP-42	N/A
A-013	A P F 0002	FORMALDEHYDE	EPA AP-42	N/A
A-013	A P F 0002	BENZENE	EPA AP-42	N/A
A-013	A P F 0002	STYRENE	EPA AP-42	N/A
A-013	A P F 0002	LEAD	EPA AP-42	N/A
A-013	A P F 0002	HYDROCHLORIC ACID (HYDROGEN CHLORIDE)	40 CFR 63 Subpart DDDDD	Table 2
A-013	A P F 0002	Mercury (Hg)	40 CFR 63 Subpart DDDDD	Table 2

SRNS-J2200-2019-00240

South Carolina Department of Health and Environmental Control

Facility Wide Raw Materials and Products				
1. Raw Materials	**2. Quantity**	**3. Products (List Products in order of major to minor)**	**4. SIC/NAICS Code**	**5. Production Rate**
CLEAN WOOD	4.27 TONS/HR	STEAM	4961-221330	30,000 LB/HR

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SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS

(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
784-7A STEAM FACILITY BIOMASS BOILER	A-013	STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	40 CFR 60, SUBPART D (c)
784-7A STEAM FACILITY BIOMASS BOILER	A-013	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.B
784-7A STEAM FACILITY BIOMASS BOILER	A-013	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 100 TON / YR CO	40 CFR 60, APPENDIX A, METHOD 010	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY BIOMASS BOILER	A-013	STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	0.030 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005, 005B, OR 017	40 CFR 60, SUBPART D (c)
784-7A STEAM FACILITY BIOMASS BOILER	A-013	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 25 TON / YR PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY BIOMASS BOILER	A-013	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005, 005B, OR 017	SC 61-62.5, Std. 1, Sect. II.A
784-7A STEAM FACILITY BIOMASS BOILER	A-013	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 15 TON / YR PM10	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY BIOMASS BOILER	A-013	CONTROL OF OXIDES OF NITROGEN - STANDARD REQUIREMENTS FOR NEW SOURCES	0.33 LB / MMBTU NOX	40 CFR 60, APPENDIX A, METHOD 007 OR 007E	SC 61-62.5, Std. 5.2, Sect. III
784-7A STEAM FACILITY BIOMASS BOILER	A-013	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 40 TON / YR NOX	40 CFR 60, APPENDIX A, METHOD 007 OR 007E	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY BIOMASS BOILER	A-013	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	3.5 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006 OR 06C	SC 61-62.5, Std. 1, Sect. III.C.2

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SRNS-J2200-2019-00240

Emission Limits and Standards

(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
784-7A STEAM FACILITY BIOMASS BOILER	A-013	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 40 TON / YR SO2	40 CFR 60, APPENDIX A, METHOD 006 OR 06C	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY BIOMASS BOILER	A-013	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	2.20E-02 lb/mmBTU HCl	40 CFR 60, Appendix A-8, Method 26 or 26A	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY BIOMASS BOILER	A-013	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	3.70E-02 lb/mmBTU PM (or 2.40E-04 lb/mmBTU TSM)	40 CFR 60, Appendix A-3 or A-6, Method 5 or 17 (or Appendix A-8, Method 29)	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY BIOMASS BOILER	A-013	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	2.00E-06 lb/mmBTU Hg	40 CFR 60, Appendix A-8, Method 29, 30A or 30B	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY BIOMASS BOILER	A-013	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	130 ppmvd@3%O2 CO	40 CFR 60, Appendix A-4, Method 10	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY BIOMASS BOILER	A-013	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	10% OPACITY	Continuous Opacity Monitoring System (40 CFR 60, Appendix B, Performance Specification 1)	40 CFR 63, Subpart DDDDD

Compliance and Permit Requirements

(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
A-013	40 CFR 60, SUBPART D (c)	Y	CLB	8/6/08	
A-013	SC 61-62.5, Std. 1, Sect. I.B	Y	CLB	8/6/08	

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South Carolina Department of Health and Environmental Control

SRNS-J2200-2019-00240

COMPLIANCE AND PERMIT REQUIREMENTS

(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
A-013	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-013	40 CFR 60, SUBPART D (c)	Y	CLB	3/26/09	
A-013	SC 61-62.1, Sect. II.E	Y	CLB	3/26/09	
A-013	SC 61-62.5, Std. 1, Sect. II.A	Y	CLB	3/26/09	
A-013	SC 61-62.1, Sect. II.E	Y	CLB	3/26/09	
A-013	SC 61-62.5, Std. 5.2, Sect. III	Y	CLB	3/26/09	
A-013	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-013	SC 61-62.5, Std. 1, Sect. III.C.2	Y	CLB	3/26/09	
A-013	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-013	40 CFR 63, SUBPART DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I

(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
A-013	OPACITY	20% OPACITY	Continuous Monitoring System	6 MINUTE	Semiannual
A-013	OPACITY	20% OPACITY	Continuous Monitoring System	6 MINUTE	Semiannual
A-013	CARBON MONOXIDE (CO)	< 100 TON / YR CO	FUEL USAGE	WEEKLY	QUARTERLY
A-013	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	SOURCE TEST	INITIAL	30 DAYS AFTER TEST
A-013	PARTICULATE MATTER (PM)	< 25 TON / YR PM	FUEL USAGE	WEEKLY	QUARTERLY
A-013	PARTICULATE MATTER (PM)	0.6 LB / MMBTU PM	SOURCE TEST	BIENNIAL	30 DAYS AFTER TEST
A-013	PARTICULATE MATTER < 10 MICRON (PM10)	< 15 TON / YR PM10	FUEL USAGE	WEEKLY	QUARTERLY
A-013	OXIDES OF NITROGEN (NOX)	0.33 LB / MMBTU NOX	BOILER TUNE UP	BIENNIAL	N/A
A-013	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	FUEL USAGE	WEEKLY	QUARTERLY

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SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I

(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
A-013	SULFUR DIOXIDE (SO2)	3.5 LB / MMBTU SO2	SOURCE TEST	BIENNIAL	30 DAYS AFTER TEST
A-013	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	FUEL USAGE	WEEKLY	QUARTERLY
A-013	Hydrogen Chloride (HCl)	2.20E-02 lb/mmBTU HCl	Source Test	3 years	60 Days after Test
A-013	Mercury (Hg)	2.00E-06 lb/mmBTU Hg	Source Test	3 years	60 Days after Test
A-013	Carbon Monoxide (CO)	130 ppmvd@3%O2 CO	Source Test	3 years	60 Days after Test
A-013	Particulate Matter (PM) or Total Selected Metals (TSM)	3.70E-02 lb/mmBTU PM (or 2.40E-04 lb/mmBTU TSM)	Source Test	3 years	60 Days after Test
A-013	Opacity	10%	Continuous Monitoring System	6 minute	Semiannual
A-013	Hydrogen Chloride (HCl)	2.20E-02 lb/mmBTU HCl	Fuel Usage	Monthly	N/A
A-013	Mercury (Hg)	2.00E-06 lb/mmBTU Hg	Fuel Usage	Monthly	N/A
A-013	Carbon Monoxide (CO)	130 ppmvd@3%O2 CO	Fuel Usage	Monthly	N/A
A-013	Particulate Matter (PM) or Total Selected Metals (TSM)	3.70E-02 lb/mmBTU PM (or 2.40E-04 lb/mmBTU TSM)	Fuel Usage	Monthly	N/A
A-013	Carbon Monoxide (CO)	130 ppmvd@3%O2 CO	Oxygen Analyzer System	Continuous	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
A-013	OPACITY	20% OPACITY	BIENNIAL	6 MINUTE	Y	BIENNIAL
A-013	OPACITY	20% OPACITY	BIENNIAL	6 MINUTE	Y	BIENNIAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
A-013	CARBON MONOXIDE (CO)	< 100 TON / YR CO	WEEKLY	12 MONTH	N	N/A
A-013	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	BIENNIAL	N/A	Y	BIENNIAL
A-013	PARTICULATE MATTER (PM)	< 25 TON / YR PM	WEEKLY	12 MONTH	N	N/A
A-013	PARTICULATE MATTER (PM)	0.6 LB / MMBTU PM	BIENNIAL	N/A	Y	BIENNIAL
A-013	PARTICULATE MATTER < 10 (PM10)	< 15 TON / YR PM10	WEEKLY	12 MONTH	N	N/A
A-013	OXIDES OF NITROGEN (NOX)	0.33 LB / MMBTU NOX	BIENNIAL	N/A	Y	BIENNIAL
A-013	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	WEEKLY	12 MONTH	N	N/A
A-013	SULFUR DIOXIDE (SO2)	3.5 LB / MMBTU SO2	BIENNIAL	N/A	Y	BIENNIAL
A-013	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	WEEKLY	12 MONTH	N	N/A
A-013	Hydrogen Chloride (HCl)	<1.10E-03 lb/mmBTU HCl	Fuel Usage	N/A	Y	3 year
A-013	Mercury (Hg)	<2.00E-06 lb/mmBTU Hg	Fuel Usage	N/A	Y	3 year
A-013	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Fuel Usage	N/A	Y	3 year
A-013	Particulate Matter (PM) or Total Selected Metals (TSM)	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	Fuel Usage	N/A	Y	3 year
A-013	Opacity	10%	Daily	6 minute	Y	3 year
A-013	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Hourly	Rolling 30 day	Y	3 year

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III

(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
A-013	OPACITY	20% OPACITY	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	OPACITY	20% OPACITY	MONITORING REQUIRED, SEE PARTS I AND II	NONE

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A-013	CARBON MONOXIDE (CO)	< 100 TON / YR CO	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	PARTICULATE MATTER (PM)	< 25 TON / YR PM	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	PARTICULATE MATTER (PM)	0.6 LB / MMBTU PM	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	PARTICULATE MATTER < 10 (PM10)	< 15 TON / YR PM10	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	OXIDES OF NITROGEN (NOX)	0.33 LB / MMBTU NOX	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	SULFUR DIOXIDE (SO2)	3.5 LB / MMBTU SO2	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	Hydrogen Chloride (HCl)	<1.10E-03 lb/mmBTU HCl	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	Mercury (Hg)	<2.00E-06 lb/mmBTU Hg	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	Particulate Matter (PM) or Total Selected Metals (TSM)	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	MONITORING REQUIRED, SEE PARTS I AND II	NONE
A-013	Opacity	10%	MONITORING REQUIRED, SEE PARTS I AND II	NONE

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			25. Reason Exempt?
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
A-013	784-7A STEAM FACILITY BIOMASS BOILER	CARBON MONOXIDE	1.05E+02		1.05E+02		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	TOTAL PARTICULATE MATTER (PM)	6.08E+01	E009	6.48E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	PARTICULATE MATTER (10 MICRONS)	5.38E+01	E0009	9.99E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	PARTICULATE MATTER (2.5 MICRONS)	4.68E+01	E0009	9.11E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	NITROGEN DIOXIDE	5.78E+01		5.78E+01		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	SULFUR DIOXIDE	4.38E+00		4.38E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	VOC (OZONE PRECURSORS)	2.98E+00		2.98E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	BENZENE	7.36E-01		7.36E-01		X	N	

SRNS-J2200-2019-00240

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
A-013	784-7A STEAM FACILITY BIOMASS BOILER	FORMALDEHYDE	7.71E-01		7.71E-01		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	LEAD	8.41E-03		8.41E-03		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	STYRENE	3.33E-01		3.33E-01		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	Hydrogen Chloride	3.33E+00		3.85E+00		X	N	
A-013	784-7A STEAM FACILITY BIOMASS BOILER	Mercury	6.13E-04		9.99E-04		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI
(This section allows for additional information or requirements for sources subject to a MACT Standard)

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2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2019-00240

A-013 Biomass Boiler

Basis/Assumptions:

1. The 784-7A Biomass Boiler (Unit A-013) is 40 mmBTU/hr (Title V renewal application and green sheet).
2. Unit A-013 combusts only "clean wood" as fuel (Form C of TV renewal application).
3. South Carolina Dept of Health and Environmental Control "Modeling Guidelines for Air Quality Permits," October 2018, Section 2.3.1 provides there are several bases on which sources may be exempt from the requirements to demonstrate compliance with Standard No.8 modelling. "Fuel-burning sources that burn only virgin fuel or specification used oil as defined in SC Regulation 61-62.1" are exempt.
4. Regulation 61-62.1 Section I (Definitions) defines virgin fuel as "unused solid, liquid, or gaseous commercial fuel. Also, clean wood or bark that has not been processed other than for size reduction excluding clean wood or bark burned in an air curtain incinerator."
5. Based on the language contained in the modeling guidelines (Basis 3) and the regulatory definition of virgin fuel (Basis 4), Toxic Air Pollutants will not be modelled for Unit A-013.
6. Based on Section 2.2.3 and Table 2.1 of the modeling guidelines referenced above, the potential controlled emissions of PM10, PM2.5, CO, NOx will be modelled. VOCs will be modelled as ozone precursors.
7. Emission limits for PM, HCl and Hg are contained in Table 2 of Subpart DDDDD of 40 CFR 63. Controlled emissions for these pollutants are based on Table 2 of Subpart DDDDD.
8. AP-42 Emissions Factors from Chapter 1.6, Wood Residue Combustion in Boilers.
9. The construction green sheet for Unit A-013 did not include condensable PM (PMC) for PM10. Based on January 5, 2009 telephone conversation with F. Clark, it is appropriate to include the PMC in the PM10 calculation.

A-013 Biomass Boiler

Pollutant	Reference	Emission Factor (lb/mmBTU)	lb/hr uncontrolled	ton/yr uncontrolled	Emission Factor (lb/mmBTU)	lb/hr controlled	ton/yr controlled
PM (a)	AP-42 Table 1.6-1 (uncontrolled) and Table 2 Subpart DDDDD (controlled)	3.47E-01	1.39E+01	6.08E+01	3.70E-02	1.48E+00	6.48E+00
PM10 (b)	AP-42 Table 1.6-1	3.07E-01	1.23E+01	5.38E+01	5.70E-02	2.28E+00	9.99E+00
PM2.5 (c)	AP-42 Table 1.6-1	2.67E-01	1.07E+01	4.68E+01	5.20E-02	2.08E+00	9.11E+00
PMC (condensible PM)	AP-42 Table 1.6-1	1.70E-02	6.80E-01	2.98E+00	1.70E-02	6.80E-01	2.98E+00
SO2 (d)	AP-42 Table 1.6-2	2.50E-02	1.00E+00	4.38E+00		1.00E+00	4.38E+00
CO	AP-42 Table 1.6-2	6.00E-01	2.40E+01	1.05E+02		2.40E+01	1.05E+02
VOC (ozone precursor)	AP-42 Table 1.6-3	1.70E-02	6.80E-01	2.98E+00		6.80E-01	2.98E+00
NOx (e)	Construction Permit	3.30E-01	1.32E+01	5.78E+01		1.32E+01	5.78E+01
HCl	AP-42 Table 1.6-3 (uncontrolled) and Table 2 Subpart DDDDD (controlled)	1.90E-02	7.60E-01	3.33E+00	2.20E-02	8.80E-01	3.85E+00
Pb	AP-42 Table 1.6-4	4.80E-05	1.92E-03	8.41E-03	4.80E-05	1.92E-03	8.41E-03
Hg	AP-42 Table 1.6-4 (uncontrolled) and Table 2 Subpart DDDDD (controlled)	3.50E-06	1.40E-04	6.13E-04	5.70E-06	2.28E-04	9.99E-04

a. EF (PM) = EF (TSP) = PM + PMC = 0.33 lb/mmBTU + 0.017 lb/mmBTU = 0.347 uncontrolled EF
b. EF (PM10) = PM10 + PMC = 0.29 lb/mmBTU + 0.017 lb/mmBTU = 0.307 lb/mmBTU uncontrolled EF, Controlled EF (PM10) = 0.04 lb/mmBTU + 0.017 lb/mmBTU = 0.057 controlled EF
c. EF (PM2.5) = PM2.5 + PMC = 0.25 lb/mmBTU + 0.017 lb/mmBTU = 0.267 lb/mmBTU uncontrolled EF, Controlled EF (PM2.5) = 0.035 lb/mmBTU + 0.017 lb/mmBTU = 0.052 controlled EF
d. Assume SO2 = SOx
e. Assume NOx = NO2

Example calculation:

PM (lb/hr) = EF * Heat Input = (0.347 lb/mmBTU)*(40 mmBTU/hr) = 13.9 lb/hr

PM (ton/yr) = 13.9 lb/hr * (8760 hr/yr)*(ton/2000 lb) = 60.8 ton/yr

A-013 Biomass Boiler

Prepared and Reviewed

Greta C. Fanning 1/22/2020

Preparer: Greta C. Fanning Date

1/22/20

Reviewer: Adam Waller Date

Title V Permit Application
Emission Unit A-014
Process Description

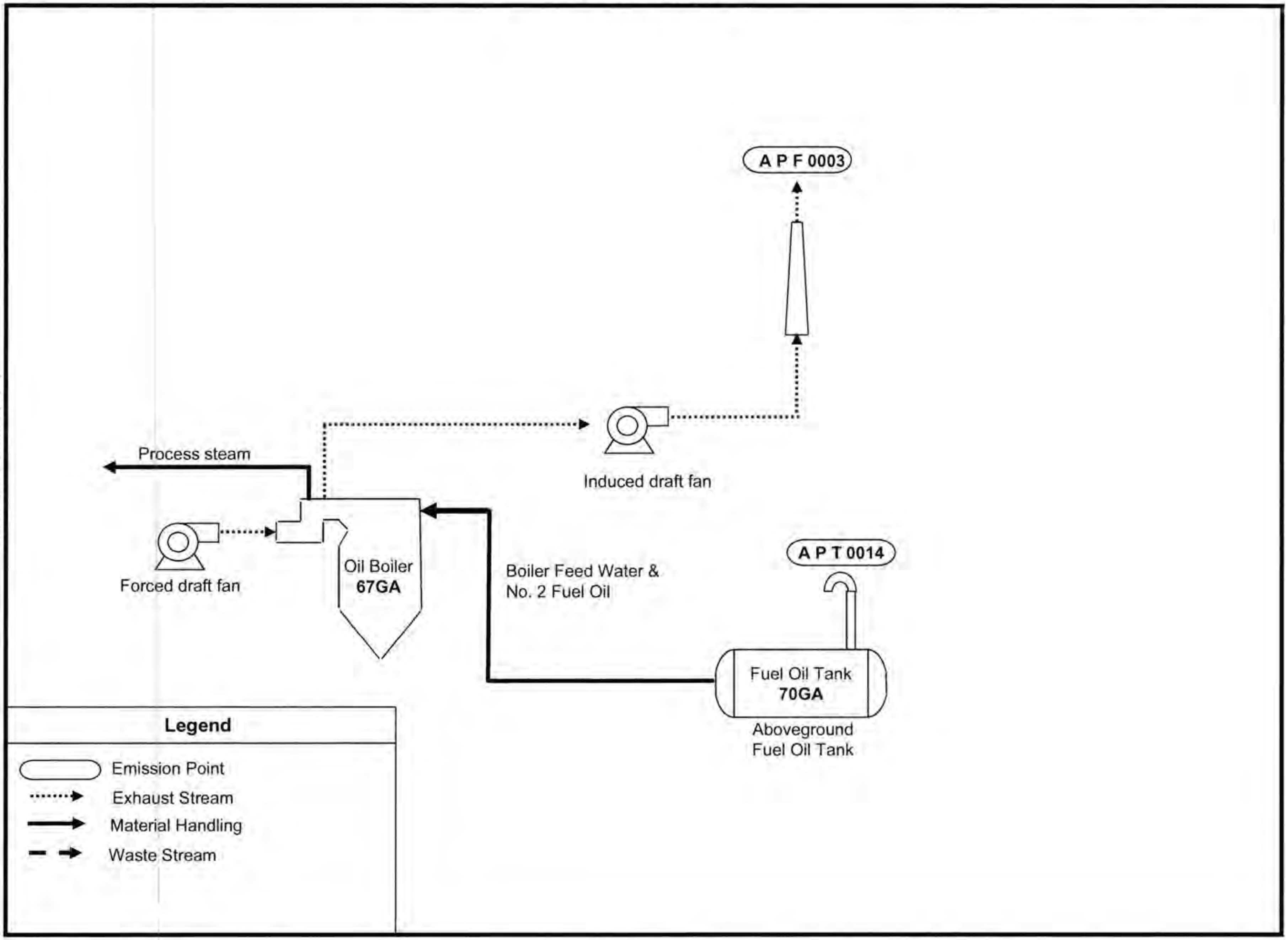
Emission Unit A-014 is a Scotch Marine 40 MMBTU/HR fuel oil fired boiler rated for 30,000 pph. This boiler generates steam by the direct combustion of #2 fuel oil and, supply steam to the A-Area and SRNL, where steam is used primarily for heating, air conditioning and turbine drives for steam driven equipment. However, steam is also used to transfer radiological materials.

It is anticipated that the oil fired boiler will be in operation for a maximum of 3,500 hours per year. The oil fired boiler will be the backup source for steam when the biomass boiler (Emission Unit A-0013) is shutdown for maintenance and can be used to supplement the steam load during high demand situations.

There are no control devices associated with this unit.

SRNS-J2200-2019-00240

Emission Unit A-014



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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
A-014	1	30000 LB/HR	STEAM	4961-221330	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
A-014	67GA	OIL FIRED BOILER 30K LB/HR	12/17/07 – Manufactured Date	NONE	NONE	A PF 0003	40 MMBTU/HR

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

Equipment Description (Continued)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
67GA	#2 FUEL OIL	NONE	0080-0041A-CF	#2 FUEL OIL WITH LESS THAN 0.05% SULFUR

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
A-014	A P F 003	CARBON MONOXIDE	630 08 0	CRITERIA	1.43E+00	6.26E+00	1.43E+00	6.26E+00
A-014	A P F 003	LEAD	7439 92 1	CRITERIA HAP	4.31E-04	1.89E-03	4.31E-04	1.89E-03
A-014	A P F 003	NITROGEN DIOXIDE		CRITERIA	5.71E+00	2.50E+01	2.86E+00	1.25E+01
A-014	A P F 003	PARTICULATE MATTER (10 MICRONS)		CRITERIA	6.57E-01	2.88E+00	6.57E-01	2.88E+00
A-014	A P F 003	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	4.43E-01	1.94E+00	4.43E-01	1.94E+00
A-014	A P F 003	SULFUR DIOXIDE	7446 09 5	CRITERIA	6.09E-02	2.67E-01	6.09E-02	2.67E-01
A-014	A P F 003	TOTAL PARTICULATE MATTER (PM)		CRITERIA	3.16E-01	1.38E+00	3.16E-01	1.38E+00
A-014	A P F 003	VOC (OZONE PRECURSORS)		CRITERIA	5.71E-02	2.50E-01	5.71E-02	2.50E-01
A-014	A P F 003	CHLORINE	7782 50 5	HAP TAP	9.91E-02	4.34E-01	9.91E-02	4.34E-01
A-014	A P F 003	FORMALDEHYDE	50 00 0	HAP TAP	9.43E-03	4.13E-02	9.43E-03	4.13E-02
A-014	A P F 003	Mercury (Hg)	7439 97 6	N/A	8.00E-05	3.50E-04	8.00E-05	3.50E-04
A-014	A P F 003	Hydrogen Chloride (HCl)	7647 01 0	HAP TAP	4.40E-02	1.93E-01	4.40E-02	1.93E-01

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
A-014	A P F 003	CARBON MONOXIDE	EPA AP-42	N/A
A-014	A P F 003	LEAD	EPA AP-42	N/A
A-014	A P F 003	NITROGEN DIOXIDE	EPA AP-42	N/A
A-014	A P F 003	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
A-014	A P F 003	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A
A-014	A P F 003	SULFUR DIOXIDE	EPA AP-42	N/A
A-014	A P F 003	TOTAL PARTICULATE MATTER (PM)	40 CFR 63 Subpart DDDDD	Table 2
A-014	A P F 003	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
A-014	A P F 003	CHLORINE	EPA AP-42	N/A
A-014	A P F 003	FORMALDEHYDE	EPA AP-42	N/A
A-014	A P F 003	Hydrogen Chloride (HCl)	40 CFR 63 Subpart DDDDD	Table 2
A-014	A P F 003	Mercury (Hg)	40 CFR 63 Subpart DDDDD	Table 2

SRNS-J2200-2019-00240

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Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
#2 FUEL OIL	286 GAL/HR	STEAM	4961-221330	30000 LB/HR

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	40 CFR 60, SUBPART D (c)
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.B
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 100 TON / YR CO	40 CFR 60, APPENDIX A, METHOD 010	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	0.030 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005, 005B or 017	40 CFR 60, SUBPART D (c)
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 25 TON / YR PM	40 CFR 60, APPENDIX A, METHOD 005, 005B, OR 017	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005, 005B or 017	SC 61-62.5, Std. 1, Sect. II
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 15 TON / YR PM10	40 CFR 60, APPENDIX A, METHOD 005, 005B or 017	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	CONTROL OF OXIDES OF NITROGEN-STANDARD REQUIREMENTS FOR NEW SOURCES	0.15 LB/MMBTU NOX	40 CFR 60, APPENDIX A, METHOD 007 OR 007E	SC 61-62.5, Std. 5.2, Sect. III
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 40 TON / YR NOX	40 CFR 60, APPENDIX A, METHOD 007 or 7E	SC 61-62.1, Sect. II.E

SRNS-J2200-2019-00240

Emission Limits and Standards (This section summarizes the emission unit emission limits and standards)					
1. Emission Unit	**2. Unit ID**	**3. Pollutant/Standard**	**4. Limit**	**5. Reference Method**	**6. Applicable Regulation (Regulation Citation/Condition)**
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	0.5 LB / MMBTU OR 0.5 % S	40 CFR 60, APPENDIX A, METHOD 006 OR 06C	40 CFR 60, SUBPART D (c)
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	PERMIT REQUIREMENTS - SYNTHETIC MINOR PLANT PERMITS	< 40 TON / YR SO2	40 CFR 60, APPENDIX A, METHOD 006 OR 06C	SC 61-62.1, Sect. II.E
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	3.5 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006 OR 06C	SC 61-62.5, Std. 1, Sect. III.C.2
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	<1.10E-03 lb/mmBTU HCl	40 CFR 60, Appendix A-8, Method 26 or 26A	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	40 CFR 60, Appendix A-3 or A-6, Method 5 or 17 (or Appendix A-8, Method 29)	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	<2.00E-06 lb/mmBTU Hg	40 CFR 60, Appendix A-8, Method 29, 30A or 30B	40 CFR 63, Subpart DDDDD
784-7A STEAM FACILITY OIL FIRED BOILER	A-014	NESHAP for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters	<130 ppmvd@3%O2 CO	40 CFR 60, Appendix A-4, Method 10	40 CFR 63, Subpart DDDDD

Compliance and Permit Requirements (This section summarizes the emission unit compliance requirements)					
2. Unit ID	**6. Applicable Regulation (Regulation Citation/Condition)**	**7. In Compliance (Y/N)**	**8. Compliance Statement**	**9. Compliance Date**	**10. First Submittal**
A-014	40 CFR 60, SUBPART D (c)	Y	CLB	8/5/08	
A-014	SC 61-62.5, Std. 1, Sect. I.B	Y	CLB	8/5/08	

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
A-014	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-014	40 CFR 60, SUBPART D (c)	Y	CLB	8/5/08	
A-014	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-014	SC 61-62.5, Std. 1, Sect. II	Y	CLB	8/5/08	
A-014	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-014	SC 61-62.5, Std. 5.2, Sect. III	Y	CLB	8/5/08	
A-014	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-014	40 CFR 60, SUBPART D (c)	Y	CLB	8/5/08	
A-014	SC 61-62.1, Sect. II.E	Y	CLB	8/9/08	
A-014	SC 61-62.5, Std. 1, Sect. III.C.2	Y	CLB	8/5/08	
A-014	40 CFR 63, SUBPART DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
A-014	OPACITY	20%	VISUAL INSPECTIONS	WEEKLY	SEMIANNUAL
A-014	CARBON MONOXIDE (CO)	< 100 TON / YR CO	FUEL USAGE	WEEKLY	QUARTERLY
A-014	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	FUEL USAGE	DAILY	QUARTERLY
A-014	PARTICULATE MATTER (PM)	< 25 TON / YR PM	FUEL USAGE	WEEKLY	QUARTERLY
A-014	PARTICULATE MATTER (PM)	0.6 LB /MMBTU PM	FUEL USAGE	DAILY	QUARTERLY
A-014	PARTICULATE MATTER (PM10)	< 15 TON / YR PM10	FUEL USAGE	WEEKLY	QUARTERLY
A-014	OXIDES OF NITROGEN (NOX)	0.15 LB / MMBTU NOX	BOILER TUNE-UPS	BIENNIAL	N/A
A-014	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	FUEL USAGE	WEEKLY	QUARTERLY
A-014	SULFUR CONTENT	< 0.0015% SULFUR	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	SEMIANNUAL

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South Carolina Department of Health and Environmental Control

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I

(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
A-014	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	FUEL USAGE	WEEKLY	QUARTERLY
A-014	SULFUR DIOXIDE (SO2)	< 3.5 LB / MMBTU SO2	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	SEMIANNUAL
A-014	Hydrogen Chloride (HCl)	<1.10E-03 lb/mmBTU HCl	Fuel Usage	Monthly	N/A
A-014	Mercury (Hg)	<2.00E-06 lb/mmBTU Hg	Fuel Usage	Monthly	N/A
A-014	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Fuel Usage	Monthly	N/A
A-014	Particulate Matter (PM) or Total Selected Metals (TSM)	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	Fuel Usage	Monthly	N/A
A-014	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Oxygen Analyzer System	Continuous	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
A-014	OPACITY	20%	WEEKLY	N/A	N	N/A
A-014	CARBON MONOXIDE (CO)	< 100 TON / YR CO	WEEKLY	12 MONTH	N	N/A
A-014	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	DAILY	N/A	N	N/A
A-014	PARTICULATE MATTER (PM)	< 25 TON / YR PM	WEEKLY	12 MONTH	N	N/A
A-014	PARTICULATE MATTER (PM)	0.6 LB / MMBTU PM	DAILY	N/A	N	N/A
A-014	PARTICULATE MATTER < 10 (PM10)	< 15 TON / YR PM10	WEEKLY	12 MONTH	N	N/A
A-014	OXIDES OF NITROGEN (NOX)	< 0.15 LB / MMBTU NOX	BIENNIAL	N/A	N	N/A
A-014	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	WEEKLY	12 MONTH	N	N/A
A-014	SULFUR CONTENT	0.5 LB / MMBTU OR 0.5 % S	PER SHIPMENT	N/A	N	N/A

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
A-014	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	WEEKLY	12 MONTH	N	N/A
A-014	SULFUR DIOXIDE (SO2)	3.5 LB / MMBTU SO2	PER SHIPMENT	N/A	N	N/A
A-014	Hydrogen Chloride (HCl)	<1.10E-03 lb/mmBTU HCl	Monthly	N/A	Y	Initial
A-014	Mercury (Hg)	<2.00E-06 lb/mmBTU Hg	Monthly	N/A	Y	Initial
A-014	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Monthly	N/A	Y	Initial
A-014	Particulate Matter (PM) or Total Selected Metals (TSM)	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	Monthly	N/A	Y	Initial
A-014	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	Hourly	Rolling 30 day	Y	Initial

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III
(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
A-014	OPACITY	20%	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	CARBON MONOXIDE (CO)	< 100 TON / YR CO	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	PARTICULATE MATTER (PM)	0.030 LB / MMBTU PM	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	PARTICULATE MATTER (PM)	< 25 TON / YR PM	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	PARTICULATE MATTER (PM)	0.6 LB / MMBTU PM	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	PARTICULATE MATTER < 10 (PM10)	< 15 TON / YR PM10	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	OXIDES OF NITROGEN (NOX)	0.15 LB / MMBTU NOX	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	OXIDES OF NITROGEN (NOX)	< 40 TON / YR NOX	MONITORING REQUIRED SEE PARTS I AND II	NONE

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MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III

(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
A-014	SULFUR CONTENT	< 0.0015% SULFUR	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	SULFUR DIOXIDE (SO2)	< 40 TON / YR SO2	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	SULFUR DIOXIDE (SO2)	3.5 LB / MMBTU SO2	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	Hydrogen Chloride (HCl)	<1.10E-03 lb/mmBTU HCl	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	Mercury (Hg)	<2.00E-06 lb/mmBTU Hg	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	Carbon Monoxide (CO)	<130 ppmvd@3%O2 CO	MONITORING REQUIRED SEE PARTS I AND II	NONE
A-014	Particulate Matter (PM) or Total Selected Metals (TSM)	<7.90E-03 lb/mmBTU PM (or 6.20E-05 lb/mmBTU TSM)	MONITORING REQUIRED SEE PARTS I AND II	NONE

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			25. Reason Exempt?
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	CARBON MONOXIDE	6.26E+00		6.26E+00		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	TOTAL PARTICULATE MATTER (PM)	1.38E+00		1.38E+00		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	PARTICULATE MATTER (10 MICRONS)	2.88E+00		2.88E+00		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	PARTICULATE MATTER (2.5 MICRONS)	1.94E+00		1.94E+00		X	N	

SRNS-J2200-2019-00240

South Carolina Department of Health and Environmental Control

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	NITROGEN DIOXIDE	2.50E+01	G0001	1.25E+01		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	VOC (OZONE PRECURSORS)	2.50E-01		2.50E-01		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	CHLORINE	4.34E-01		4.34E-01		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	FORMALDEHYDE	4.13E-02		4.13E-02		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	LEAD	1.89E-03		1.89E-03		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	Hydrogen Chloride	1.93E-01		1.93E-01		X	N	
A-014	784-7A STEAM FACILITY OIL FIRED BOILER	Mercury	3.50E-04		3.50E-04		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

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Additional Information for MACT Sources-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

Additional Information for MACT Sources-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2019-00240

A-014 Fuel Oil Fired Boiler

Basis/Assumptions:

1. The 784-7A Fuel Oil Fired Boiler (Unit A-014) is 40 mmBTU/hr (Title V renewal application and green sheet).
2. Unit A-014 combusts only ultra-low sulfur diesel fuel oil (Form C of TV renewal application).
3. South Carolina Dept of Health and Environmental Control "Modeling Guidelines for Air Quality Permits," October 2018, Section 2.3.1 provides several bases on which sources may be exempt from the requirements to demonstrate compliance with Standard No.8 modelling. "Fuel-burning sources that burn only virgin fuel or specification used oil as defined in SC Regulation 61-62.1" are exempt.
4. Regulation 61-62.1 Section I (Definitions) defines virgin fuel as unused solid, liquid, or gaseous commercial fuel.
5. Based on the language contained in the modeling guidelines (Basis 3) and the regulatory definition of virgin fuel (Basis 4), Toxic Air Pollutants will not be modelled for Unit A-014.
6. Based on Section 2.2.3 and Table 2.1 of the modeling guidelines referenced above, the potential emissions of PM, CO, and NOx will be modelled.
7. Emission limits for PM, HCl and Hg are contained in Table 2 of Subpart DDDDD of 40 CFR 63. Controlled emissions for these pollutants are based on Table 2 of Subpart DDDDD.
8. Emission limits from 40 CFR 63 Subpart DDDDD, Table 2 were used for PM, HCl and Hg to generate the revised SCDHEC forms.
9. AP-42 Emission Factors for distillate oil fired combustion from Chapter 1.3, Fuel Oil Combustion are used.
10. This unit uses 0.0015 wt% ultra-low sulfur fuel.
11. The BTU value for distillate oil is 140,000 BTU/gal (AP-42, Appendix A: Liquid Fuels)
12. The construction green sheet for Unit A-014 did not include condensable PM (PMC) for PM10. Based on January 5, 2009 telephone conversation with F. Clark, it is appropriate to include the PMC in the PM10 calculation.

A-014 Fuel Oil Fired Boiler

Pollutant	Reference	Emission Factor (lb/mmBTU)	Emission Factor (lb/kgal)	lb/hr	ton/yr
PM	Table 2 Subpart DDDDD	7.90E-03		3.16E-01	1.38E+00
PM10 (a)	AP-42 Table 1.3-6		2.30E+00	6.57E-01	2.88E+00
PM2.5 (b)	AP-42 Table 1.3-6		1.55E+00	4.43E-01	1.94E+00
PMC (condensible PM)	AP-42 Table 1.3-2		1.30E+00	3.71E-01	1.63E+00
SO2 (c)	AP-42 Table 1.3-1		142*S	6.09E-02	2.67E-01
CO	AP-42 Table 1.3-1		5.00E+00	1.43E+00	6.26E+00
NMTOC	AP-42 Table 1.3-3		2.00E-01	5.71E-02	2.50E-01
NOx (d)	AP-42 Table 1.3-1 Distillate oil (low NOx burner)		2.00E+01 (1.00E+01)	5.71E-00 (2.86E-00)	2.50E+01 (1.25E+01)
HCl	Table 2 Subpart DDDDD	1.10E-03		4.40E-02	1.93E-01
Pb	AP-42 Table 1.3-11		1.51E-03	4.31E-04	1.89E-03
Hg	Table 2 Subpart DDDDD	2.00E-06		8.00E-05	3.50E-04

a. EF (PM10) = PM10 + PMC = 1.00 lb/kgal + 1.30 lb/kgal = 2.30 lb/kgal
b. EF (PM2.5) = PM2.5 + PMC = 0.25 lb/kgal + 1.30 lb/gal = 1.55 lb/kgal EF
c. Assume NMTOC = VOC as Ozone precursor
d. Assume NOx = NO2

Example calculation:

SO2 (lb/hr) = EF * Heat Input = (142 lb/1000 gal)*(0.0015 % sulfur) *(40 mmBTU/hr)*(gal/140,000 BTU)

= 6.09E-02 lb/hr

SO2 (ton/yr) = 6.09E-02 lb/hr * (8760 hr/yr)*(ton/2000 lb) = 2.67E-01 ton/yr

A-014 Fuel Oil Fired Boiler

Prepared and Reviewed

Greta C. Fanning 1/22/2020

Preparer: Greta C. Fanning Date

1/22/20

Reviewer: Adam Waller Date

Title V Permit Application
Emission Unit B-003
Process Description

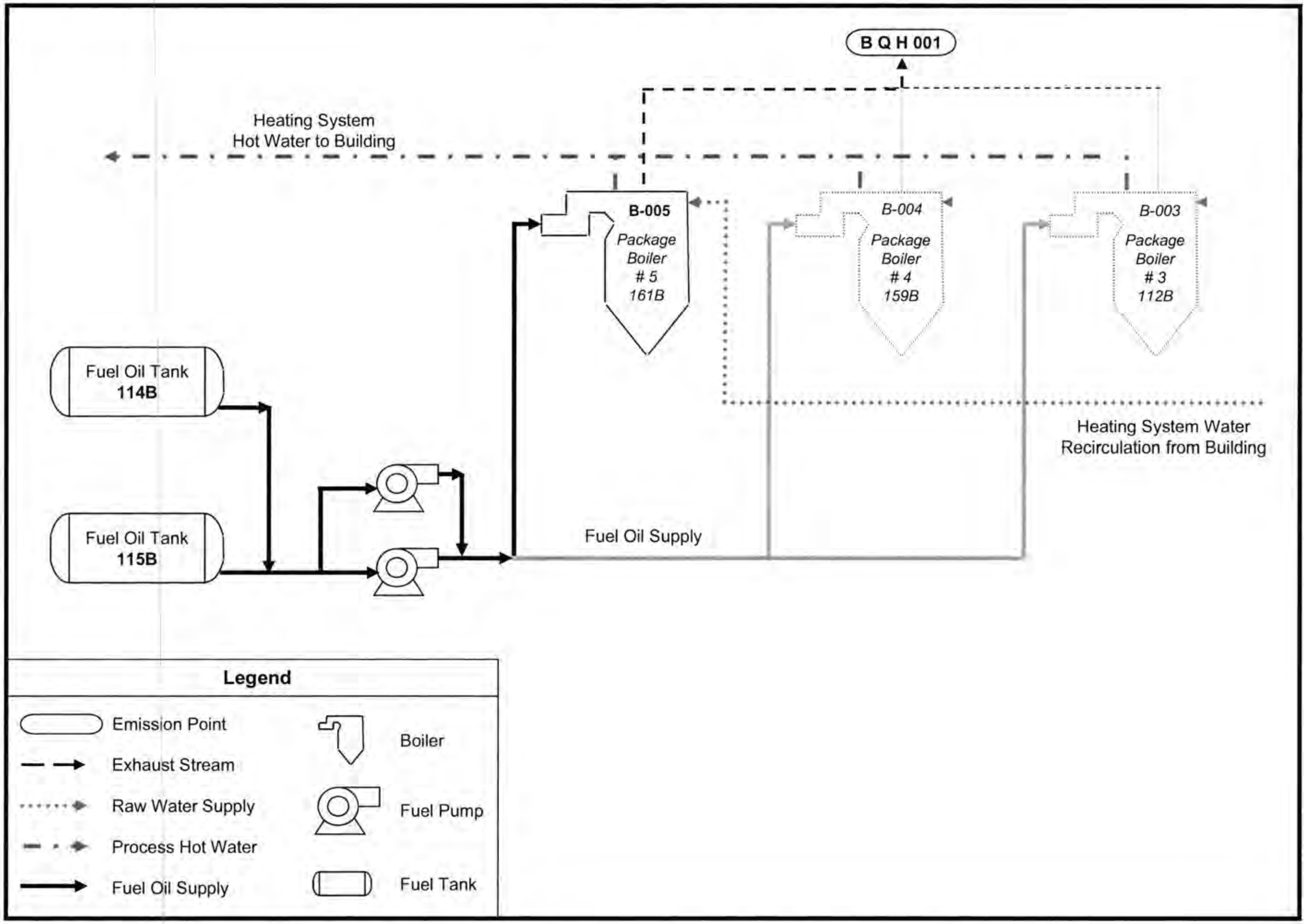
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. One of these boilers (B003) has a rated heat input of 3.897 MMBTU/hr and two of the boilers each have a rated heat input of 3.129MMBtu/hr. All three boilers they are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (QH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.3 – Emission Unit B-003

Emission Unit B-003



SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
B-003	N/A	4 MMBTU/HR	HOT WATER	4961 - 221330	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
B-003	112B	HOTWATER HEATER/BOILER NO. 3	Oct. 1998	NONE	N/A	B Q H 001	4 MMBTU/HR

SRNS-J2200-2019-00240

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EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
112B	NO. 2 HOME HEATING OIL-ULTRA LOW S	N/A	0080-0041-B-CA	NONE

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
B-003	B Q H 001	CARBON MONOXIDE	630 08 0	CRITERIA	1.39E-01	6.10E-01	1.39E-01	6.10E-01
B-003	B Q H 001	NITROGEN DIOXIDE	10102 44 0	CRITERIA	5.57E-01	2.44E+00	5.57E-01	2.44E+00
B-003	B Q H 001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	9.19E-02	4.02E-01	9.19E-02	4.02E-01
B-003	B Q H 001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	6.62E-02	2.90E-01	6.62E-02	2.90E-01
B-003	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	5.93E-02	2.60E-01	5.93E-02	2.60E-01
B-003	B Q H 001	SULFUR DIOXIDE	7446 09 5	CRITERIA	5.93E-03	2.60E-02	5.93E-03	2.60E-02
B-003	B Q H 001	VOC (OZONE PRECURSORS)		CRITERIA	9.46E-03	4.15E-02	9.46E-03	4.15E-02
B-003	B Q H 001	LEAD	7439 92 1	CRITERIA HAP	3.51E-05	1.54E-04	3.51E-05	1.54E-04

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
B-003	B Q H 001	CARBON MONOXIDE	EPA AP-42	N/A
B-003	B Q H 001	NITROGEN DIOXIDE	EPA AP-42	N/A
B-003	B Q H 001	TOTAL PARTICULATE MATTER (PM)	EPA AP-42	N/A
B-003	B Q H 001	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A
B-003	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A
B-003	B Q H 001	SULFUR DIOXIDE	EPA AP-42	N/A
B-003	B Q H 001	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
B-003	B Q H 001	LEAD	EPA AP-42	N/A

SRNS-J2200-2019-00240

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Facility Wide Raw Materials and Products				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NO. 2 HOME HEATING OIL-ULTRA LOW SULFUR	236,520 GALLONS	HEATED WATER	4961-221330	N/A

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
735-1B LAB. HOTWATER HEATER/BOILER 3	B-003	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.A
735-1B LAB. HOTWATER HEATER/BOILER 3	B-003	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 1, Sect. II
735-1B LAB. HOTWATER HEATER/BOILER 3	B-003	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	2.3 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006	SC 61-62.5, Std. 1, Sect. III

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
B-003	SC 61-62.5, Std. 1, Sect. I.A	Y	CLB	Apr-03	
B-003	SC 61-62.5, Std. 1, Sect. II	Y	CLB	Apr-03	
B-003	SC 61-62.5, Std. 1, Sect. III	Y	CLB	Apr-03	
B-003	40 CFR 63, Subpart DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
B-003	FUEL SPECIFICATIONS	< 0.0015% SULFUR	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	ANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
B-003	FUEL SPECIFICATIONS	< 0.0015% SULFUR	PER SHIPMENT	N/A	N	N/A

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
B-003	FUEL SPECIFICATIONS	< 0.0015% SULFUR	MONITORING REQUIRED SEE PART I AND II	NA- requesting to no longer maintain log of startups and shutdowns that is currently required by TV permit condition b5E.2.

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	CARBON MONOXIDE	6.10E-01		6.10E-01		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	TOTAL PARTICULATE MATTER (PM)	4.02E-01		4.02E-01		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	PARTICULATE MATTER (10 MICRONS)	2.90E-01		2.90E-01		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	PARTICULATE MATTER (2.5 MICRONS)	2.60E-01		2.60E-01		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	NITROGEN DIOXIDE	2.44E+00		2.44E+00		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	VOC (OZONE PRECURSORS)	4.15E-02		4.15E-02		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	LEAD	1.54E-04		1.54E-04		X	N	
B-003	735-1B LAB. HOTWATER HEATER/BOILER 3	SULFUR DIOXIDE	2.60E-02		2.60E-02		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2019-00240

Sample Calculations, Emission Factors Used for Boiler B-003 (112B)

Equipment ID 112B, Boiler B-003

Assumptions

1. Boiler is rate 3,897,000 Btu/hr (Original construction permit 10/27/1998 No. 0080-0041-B-CA)
2. Boiler will utilize #2 home heating fuel,ultra low sulfur (0.0015 wt% S)
3. Emission factors were obtained from AP42, 5/10 version, section 1.3.
4. The BTU value for distillate oil is 140,000 Btu/gal [Appendix A of AP42, 9/85]
5. No control devices present.
6. Fuel is 0.0015 wt% sulfur

Standard No. 2 and
Greenhouse Gases

Pollutant	AP-42 Table	Emission Factor (lb/kgal)	Emisison Factor (lb/10^12Btu)	GWP(g)	lb/hr	ton/yr
SO2	1.3-1	142*S			5.93E-03	2.60E-02
CO	1.3-1	5			1.39E-01	6.10E-01
PM10 (b)	1.3-7 &1.3-2	2.38			6.62E-02	2.90E-01
CPM	1.3-2	1.3			3.62E-02	1.58E-01
VOC (e)	1.3-3	0.34			9.46E-03	4.15E-02
NOx (a)	1.3-1	20			5.57E-01	2.44E+00
PM (c)	1.3-7 & 1.3-2	3.3			9.19E-02	4.02E-01
PM2.5 (d)	1.3-7 & 1.3-2	2.13			5.93E-02	2.60E-01
Pb	1.3-10		9		3.51E-05	1.54E-04
nitrous oxide N2O(f)	1.3-8	2.60E-01		298	7.24E-03	3.17E-02
methane(f)	1.3-3	2.16E-01		25	6.01E-03	2.63E-02
CO2 (f)	1.3-12	2.23E+04		1	6.21E+02	2.72E+03
CO2e					6.21E+02	2.72E+03

(a) NOx=NO2

(b) PM10 = PM10 + CPM = 1.08 + 1.3 = 2.38

(c) PM = PM + CPM = 2.00 + 1.3 = 3.3, TSP = PM

(d) PM2.5 = PM2.5 + CPM = 0.83 + 1.3 = 2.13

(e) Assumes NMTOC = VOC as Ozone precursors

(f) greenhouse gas

(g) Global Warming Potential (table A-1 to Subpart A of 40 CFR 98)

example calc:

SO2 = (142lb/1000gal)(0.0015)(3,897,000Btu/hr)(gal/140,000Btu) = 5.93E-03 lb/hr

(5.93E-03lb/hr)(8760hr/yr)(ton/2000lb) = 2.60E-02 TPY

Total emissions utilized to determine trace in TYP

PM+N2O+NOx+SO2+methane+CO+VOC = 3.58E+00

Kim A. Wolle 4/9/2018

Calculation Originator

Adam R. Waller 4/10/18

Reviewer

Sample Calculations, Emission Factors Used for Boiler B-003 (112B)

Basis/Assumptions

1. R61.62.5 Std. No. 8 does not apply to sources the burn only virgin fuel. 112B will only burn virgin fuel. However, non-trace toxic air pollutants must be included in facility wide emissions.
2. The BTU value for distillate oil is 140,000 btu/gal [Appendix A of AP42, 9/85]
3. The rating for each boiler is 3,897,000 btu/hr
4. Fuel is 0.0015 wt% sulfur

Pollutant	Emission Factor (lb/kgal) *	lb/hr	ton/yr	wt%	
Acenaphthene	2.11E-05	5.87E-07	2.57E-06	0.00	
Acenaphthylene	2.53E-07	7.04E-09	3.08E-08	0.00	
Anthracene	1.22E-06	3.40E-08	1.49E-07	0.00	
Benzene	2.14E-04	5.96E-06	2.61E-05	0.00	
Benzo(a)anthracene	4.01E-06	1.12E-07	4.89E-07	0.00	
Benzo(b,k)fluoranthene	1.48E-06	4.12E-08	1.80E-07	0.00	
Benzo(ghi)perylene	2.26E-06	6.29E-08	2.76E-07	0.00	
Chrysene	2.38E-06	6.62E-08	2.90E-07	0.00	
Dibenzo(a,h)anthracene	1.67E-06	4.65E-08	2.04E-07	0.00	
Ethylbenzene	6.36E-05	1.77E-06	7.75E-06	0.00	
Fluoranthene	4.84E-06	1.35E-07	5.90E-07	0.00	
Formaldehyde	3.30E-02	9.19E-04	4.02E-03	0.11	cas 50-00-0 - carcinogen
Indo(1,2,3-cd)pyrene	2.14E-06	5.96E-08	2.61E-07	0.00	
Naphthalene	1.13E-03	3.15E-05	1.38E-04	0.00	
OCDD (CAS 3268-87-9)	3.10E-09	8.63E-11	3.78E-10	0.00	
Phenanthrene	1.05E-05	2.92E-07	1.28E-06	0.00	
Pyrene	4.25E-06	1.18E-07	5.18E-07	0.00	
Toluene	6.20E-03	1.73E-04	7.56E-04	0.02	
1,1,1-Trichloroethane	2.36E-04	6.57E-06	2.88E-05	0.00	
o-Xylene	1.09E-04	3.03E-06	1.33E-05	0.00	
Fluorene	4.47E-06	1.24E-07	5.45E-07	0.00	

*Table 1.3-9 of AP-42

Pollutant	Emission Factor (lb/kgal) **	lb/hr	ton/yr	Emission Factor (lb/10^12 BTU)***	lb/hr	ton/yr	wt%
As				4	1.56E-05	6.83E-05	0.00
Be				3	1.17E-05	5.12E-05	0.00
Cd				3	1.17E-05	5.12E-05	0.00
Cr				3	1.17E-05	5.12E-05	0.00
Cu				6	2.34E-05	1.02E-04	0.00
Mn				6	2.34E-05	1.02E-04	0.00
Hg				3	1.17E-05	5.12E-05	0.00
Ni				3	1.17E-05	5.12E-05	0.00
Se				15	5.85E-05	2.56E-04	0.01
Zn				4	1.56E-05	6.83E-05	0.00

***Table 1.3-10 of AP-42

example calc:
As: (4lb/10^12btu)(3,897,000btu/hr) = 1.56E-05 lb/hr
(1.56E-05lb/hr)(8760hr/yr)(ton/2000lb) = 6.83E-05 TPY

To determine trace emissions the total emissions of Total PM, N2O, NO2, SO2, Methane, CO, and VOCs was determined to be 3.58E+00 TPY
The above wt% column utilizes this total emissions value.
example calc:
Toluene: (7.56E-04 TPY toluene)/3.58 Total tons *100 = 0.02%)
Only HAP/TAP not less than 0.1% by weight is formaldehyde (a carcinogen).
Trace determination follows the method outlined in the July 2001 SCDHEC Air Quality Modeling Guidelines.

Kim A. Wolf 4/10/2018
Calculation Originator

Adam R. Weller 4/10/18
Reviewer

Title V Permit Application
Emission Unit B-004
Process Description

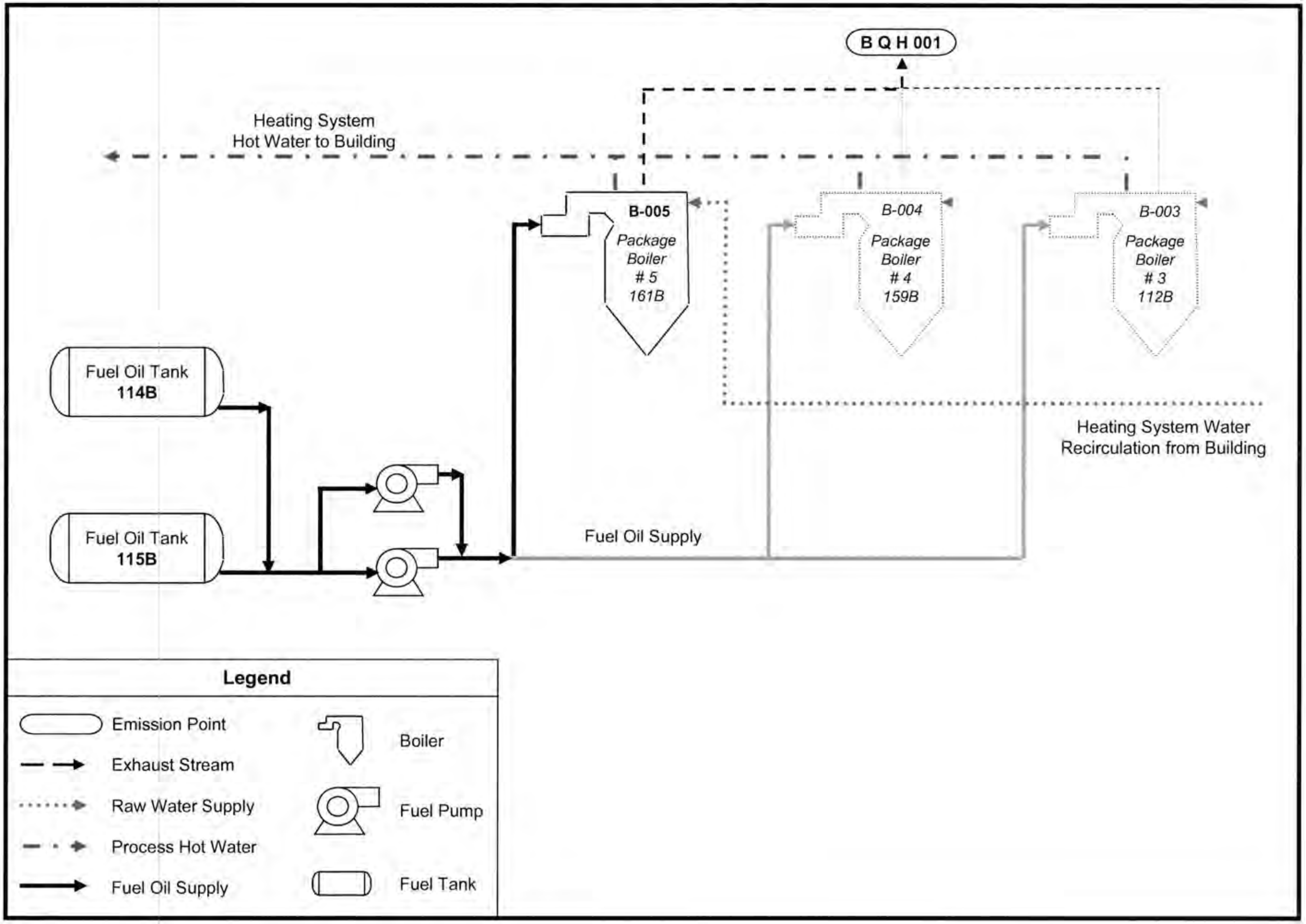
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. One of these boilers (B003) has a rated heat input of 3.897 MMBTU/hr and two of the boilers each have a rated heat input of 3.129MMBtu/hr. All three boilers they are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (QH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.3 – Emission Unit B-003

Emission Unit B-004



SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
B-004	N/A	3.129 MMBTU/HR	HOT WATER	4961 - 221330	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
B-004	159B	HOTWATER HEATER/BOILER NO. 5	May 2017	NONE	N/A	B Q H 001	3.129 MMBTU/HR

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	**24. Primary Fuel Combusted (If Applicable)**	**25. Secondary Fuel Combusted (If Applicable)**	**26. Construction Permit ID or Exemption Date (if applicable)**	**27. Comments (list special permit limitations, fuel info, etc.)**
159B	NO. 2 HOME HEATING OIL-ULTRA LOW S	N/A	NA	Like-for-Like replacement of B002 (111B)

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
B-004	B Q H 001	CARBON MONOXIDE	630 08 0	CRITERIA	1.25E-01	5.48E-01	1.25E-01	5.48E-01
B-004	B Q H 001	NITROGEN DIOXIDE	10102 44 0	CRITERIA	5.51E-01	2.41E+00	5.51E-01	2.41E+00
B-004	B Q H 001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	7.20E-02	3.15E-01	7.20E-02	3.15E-01
B-004	B Q H 001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	5.32E-02	2.33E-01	5.32E-02	2.33E-01
B-004	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	4.76E-02	2.09E-01	4.76E-02	2.09E-01
B-004	B Q H 001	SULFUR DIOXIDE	7446 09 5	CRITERIA	4.76E-03	2.09E-02	4.76E-03	2.09E-02
B-004	B Q H 001	VOC (OZONE PRECURSORS)		CRITERIA	4.07E-02	1.78E-01	4.07E-02	1.78E-01
B-004	B Q H 001	LEAD	7439 92 1	CRITERIA HAP	2.82E-05	1.23E-04	2.82E-05	1.23E-04

SRNS-J2200-2019-00240

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
B-004	B Q H 001	CARBON MONOXIDE	EPA AP-42	N/A
B-004	B Q H 001	NITROGEN DIOXIDE	EPA AP-42	N/A
B-004	B Q H 001	TOTAL PARTICULATE MATTER (PM)	EPA AP-42	N/A
B-004	B Q H 001	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A
B-004	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A
B-004	B Q H 001	SULFUR DIOXIDE	EPA AP-42	N/A
B-004	B Q H 001	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
B-004	B Q H 001	LEAD	EPA AP-42	N/A

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Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NO. 2 HOME HEATING OIL-ULTRA LOW SULFUR	195,786 GALLONS	HEATED WATER	4961-221330	N/A

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
735-1B LAB. HOTWATER HEATER/BOILER 4	B-004	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.A
735-1B LAB. HOTWATER HEATER/BOILER 4	B-004	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 1, Sect. II
735-1B LAB. HOTWATER HEATER/BOILER 4	B-004	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	2.3 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006	SC 61-62.5, Std. 1, Sect. III

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
B-004	SC 61-62.5, Std. 1, Sect. I.A	Y	CLB	Apr-03	
B-004	SC 61-62.5, Std. 1, Sect. II	Y	CLB	Apr-03	
B-004	SC 61-62.5, Std. 1, Sect. III	Y	CLB	Apr-03	
B-004	40 CFR 63, Subpart DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
B-004	FUEL SPECIFICATIONS	< 0.0015% SULFUR	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	ANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
B-004	FUEL SPECIFICATIONS	< 0.0015% SULFUR	PER SHIPMENT	N/A	N	N/A

South Carolina Department of Health and Environmental Control

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
B-004	FUEL SPECIFICATIONS	< 0.0015% SULFUR	MONITORING REQUIRED SEE PART I AND II	NA- requesting to no longer maintain log of startups and shutdowns that is currently required by TV permit condition b5E.2.

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	CARBON MONOXIDE	5.48E-01		5.48E-01		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	TOTAL PARTICULATE MATTER (PM)	3.15E-01		3.15E-01		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	PARTICULATE MATTER (10 MICRONS)	2.33E-01		2.33E-01		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	PARTICULATE MATTER (2.5 MICRONS)	2.09E-01		2.09E-01		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	NITROGEN DIOXIDE	2.41E+00		2.41E+00		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	VOC (OZONE PRECURSORS)	1.78E-01		1.78E-01		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	LEAD	1.23E-04		1.23E-04		X	N	
B-004	735-1B LAB. HOTWATER HEATER/BOILER 4	SULFUR DIOXIDE	2.09E-02		209E-02		X	N	

SRNS-J2200-2019-00240

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	**11. Pollutant/Parameter**	**4. Limit (Facility-Wide)**	**26. Parameter to Monitor**	**27. Applicable Regulation Avoidance**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	**28. New or Existing Equipment**	**29. Control Equip ID**	**30. List any unit/equipment which is specifically exempt from MACT standards and state why.**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	**31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.**

SRNS-J2200-2019-00240

Emission Calculations B-004 (159B)

Equipment ID 159B, Boiler B-004, Burnham V1116 Emissions Calculations
Assumptions
1. Boiler is rate 3,129,000 Btu/hr (Attachment B form 2569)
2. Boiler will utilize #2 home heating fuel,ultra low sulfur (0.0015 wt% S)

3. The emission factors from the attached Webster combustion sheet for the Model JB burner were utilized for NOx, CO, VOC, and PM. Other emission factors were obtained from AP42, 5/10 version, section 1.3. SOx emission factor from Webster was not used since these units receive ULS fuel and not 0.5%sulfur fuel (Refer to attached excpert from 10/28/2016 semiannual report for permit 0080-0041.)
4. The BTU value for distillate oil is 140,000 Btu/gal [Appendix A of AP42, 9/85]
5. No control devices present.
6. Fuel is 0.0015 wt% sulfur
7. Assume JB burner VOC emission level includes methane
8. Assume JB burner PM emission level does not include condensable PM (CPM). CPM value from AP42 was added to JB burner value to obtain emission factor for PM.

Standard No. 2 and
Greenhouse Gases

Pollutant	AP-42 Table	Emission Factor (lb/kgal)	Emission Factor (lb/MMBtu)	Emisison Factor (lb/10^12Btu)	GWP(g)	lb/hr	ton/yr
SO2	1.3-1	142*S				4.76E-03	2.09E-02
CO			0.04			1.25E-01	5.48E-01
PM10 (b)	1.3-7 &1.3-2	2.38				5.32E-02	2.33E-01
CPM	1.3-2	1.3				2.91E-02	1.27E-01
HC/VOC (e)			0.013			4.07E-02	1.78E-01
NOx (a)			0.176			5.51E-01	2.41E+00
PM (c)			0.023			7.20E-02	3.15E-01
PM2.5 (d)	1.3-7 & 1.3-2	2.13				4.76E-02	2.09E-01
Pb	1.3-10			9		2.82E-05	1.23E-04
nitrous oxide N2O(f)	1.3-8	2.60E-01			298	5.81E-03	2.55E-02
methane(f)	1.3-3	2.16E-01			25	4.83E-03	2.11E-02
CO2 (f)	1.3-12	2.23E+04			1	4.98E+02	2.18E+03
CO2e						4.98E+02	2.18E+03

(a) NOx=NO2
(b) PM10 = PM10 + CPM = 1.08 + 1.3 = 2.38
(c) PM = PM + CPM = 0.014 + (1.3/1000)(1/140,000)(1000000)= 0.023
(d) PM2.5 = PM2.5 + CPM = 0.83 + 1.3 = 2.13
(e) Assumes VOC includes methane since Webster reports it as HC/VOC
(f) greenhouse gas
(g) Global Warming Potential (table A-1 to Subpart A of 40 CFR 98)
example calc:
SO2 = (142lb/1000gal)(0.0015)(3,129,000Btu/hr)(gal/140,000Btu) = 4.76E-03 lb/hr
(4.76E-03lb/hr)(8760hr/yr)(ton/2000lb) = 2.09E-02 TPY

Total emissions utilized to determine trace in TYP
PM+N2O+NOx+SO2+CO+VOC = 3.50E+00

Kim A. Wolfe 12/30/2014
Calculation Originator Kim A. Wolfe

Adam R. Walker 1/4/17
Reviewer

Emission Calculations B-004 (159B)

Basis/Assumptions

1. R61.62.5 Std. No. 8 does not apply to sources the burn only virgin fuel. 159B will only burn virgin fuel. However, non-trace toxic air pollutants must be included in facility wide emissions.
2. The BTU value for distillate oil is 140,000 btu/gal [Appendix A of AP42, 9.85]
3. The rating for each boiler is 3,129,000 btu/hr (Refer to attached excerpt from October 28, 2016 Title V semiannual report)
4. Fuel is 0.0015 wt% sulfur

Pollutant	Emission Factor (lb/kgal) *	lb/hr	ton/yr	wt%	
Acenaphthene	2.11E-05	4.72E-07	2.07E-06	0.00	
Acenaphthylene	2.53E-07	5.66E-09	2.48E-08	0.00	
Anthracene	1.22E-06	2.73E-08	1.19E-07	0.00	
Benzene	2.14E-04	4.78E-06	2.09E-05	0.00	
Benzo(a)anthracene	4.01E-06	8.96E-08	3.93E-07	0.00	
Benzo(b,k)fluoranthene	1.48E-06	3.31E-08	1.45E-07	0.00	
Benzo(ghi)perylene	2.26E-06	5.05E-08	2.21E-07	0.00	
Chrysene	2.38E-06	5.32E-08	2.33E-07	0.00	
Dibenzo(a,h)anthracene	1.67E-06	3.73E-08	1.63E-07	0.00	
Ethylbenzene	6.36E-05	1.42E-06	6.23E-06	0.00	
Fluoranthene	4.84E-06	1.08E-07	4.74E-07	0.00	
Formaldehyde	3.30E-02	7.38E-04	3.23E-03	0.09	cas 50-00-0 - carcinogen
Indo(1,2,3-cd)pyrene	2.14E-06	4.78E-08	2.09E-07	0.00	
Naphthalene	1.13E-03	2.53E-05	1.11E-04	0.00	
OCDD (CAS 3268-87-9)	3.10E-09	6.93E-11	3.03E-10	0.00	
Phenanthrene	1.05E-05	2.35E-07	1.03E-06	0.00	
Pyrene	4.25E-06	9.50E-08	4.16E-07	0.00	
Toluene	6.20E-03	1.39E-04	6.07E-04	0.02	
1,1,1-Trichloroethane	2.36E-04	5.27E-06	2.31E-05	0.00	
o-Xylene	1.09E-04	2.44E-06	1.07E-05	0.00	
Fluorene	4.47E-06	9.99E-08	4.38E-07	0.00	

*Table 1.3-9 of AP-42

Pollutant	Emission Factor (lb/kgal) **	lb/hr	ton/yr	Emission Factor (lb/10^12 BTU)***	lb/hr	ton/yr	wt%
As				4	1.25E-05	5.48E-05	0.00
Be				3	9.39E-06	4.11E-05	0.00
Cd				3	9.39E-06	4.11E-05	0.00
Cr				3	9.39E-06	4.11E-05	0.00
Cu				6	1.88E-05	8.22E-05	0.00
Mn				6	1.88E-05	8.22E-05	0.00
Hg				3	9.39E-06	4.11E-05	0.00
Ni				3	9.39E-06	4.11E-05	0.00
Se				15	4.69E-05	2.06E-04	0.01
Zn				4	1.25E-05	5.48E-05	0.00

**Table 1.3-11 of AP-42
***Table 1.3-10 of AP-42
(a) assumed Chloride is all chlorine

example calc:
As: (4lb/10^12btu)(3,129,000btu/hr) = 1.25E-05 lb/hr
(1.25E-05lb/hr)(8760hr/yr)(ton/2000lb) = 5.48E-05 TPY

To determine trace emissions the total emissions of Total PM, N2O, NO2, SO2, CO, and VOCs was determined to be 3.50E+00 TPY
The above wt% column utilizes this total emissions value
example calc:
Toluene: (6.07E-04 TPY toluene)/3.50Total tons *100 = 0.02%)
No HAP/TAP is 0.1% by weight or higher.
Trace determination follows the method outlined in the July 2001 SCDHEC Air Quality Modeling Guidelines.

Kim L. Wolfe 12/30/2016
Calculation Originator
Kim R. Wolfe

S. Culler Alan R Waller 1/4/17
Reviewer

Title V Permit Application
Emission Unit B-005
Process Description

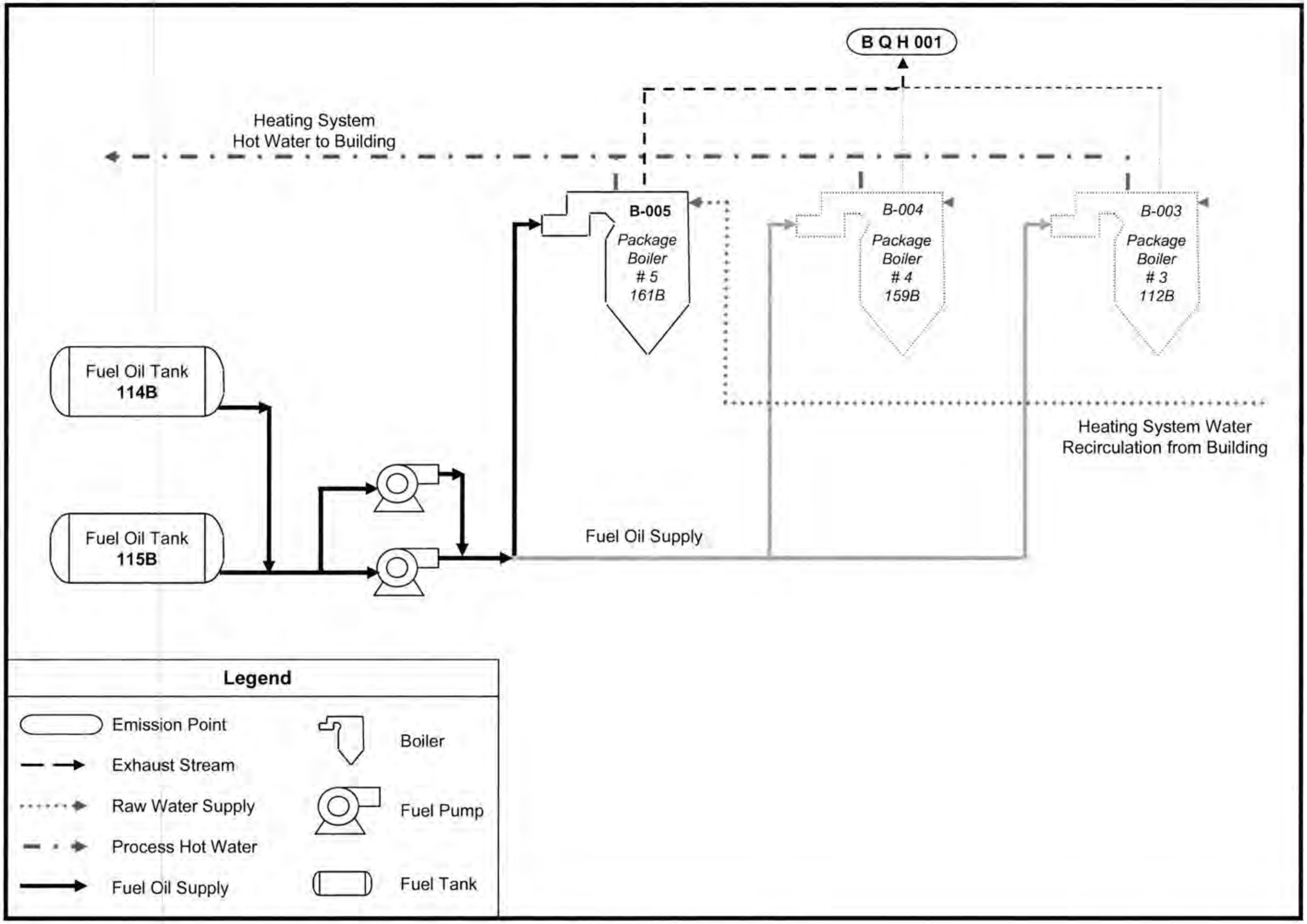
The Savannah River Site (SRS) operates laboratory facilities in the B-Area for the purpose of analyzing required regulatory environmental samples, in-house monitoring and site bioassay samples. The facility is called the 735-B, B-Area Laboratory (BAL).

The BAL facility operates three (3) oil fire boilers located in 735-1B, for building hot water and for building heating. One of these boilers (B003) has a rated heat input of 3.897 MMBTU/hr and two of the boilers each have a rated heat input of 3.129MMBtu/hr. All three boilers they are fueled with distillate oil No. 2.

The three boilers exhaust thru one stack (QH0001). The three boilers are:

- 735-1B Lab. Hotwater/Boiler No.5 – Emission Unit B-005
- 735-1B Lab. Hotwater/Boiler No.4 – Emission Unit B-004
- 735-1B Lab. Hotwater/Boiler No.3 – Emission Unit B-003

Emission Unit B-005



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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
B-005	N/A	3.129 MMBTU/HR	HOT WATER	4961 - 221330	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
B-005	161B	HOTWATER HEATER/BOILER NO. 5	Feb. 2018	NONE	N/A	B Q H 001	3.129 MMBTU/HR

SRNS-J2200-2019-00240

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EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	**24. Primary Fuel Combusted (If Applicable)**	**25. Secondary Fuel Combusted (If Applicable)**	**26. Construction Permit ID or Exemption Date (if applicable)**	**27. Comments (list special permit limitations, fuel info, etc.)**
161B	NO. 2 HOME HEATING OIL-ULTRA LOW S	N/A	NA	Like-for-Like replacement of B001 (110B)

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled (lb/hr)	6. Maximum Uncontrolled (TPY)	7. Maximum Controlled (lb/hr)	7. Maximum Controlled (TPY)
B-005	B Q H 001	CARBON MONOXIDE	630 08 0	CRITERIA	1.25E-01	5.48E-01	1.25E-01	5.48E-01
B-005	B Q H 001	NITROGEN DIOXIDE	10102 44 0	CRITERIA	5.51E-01	2.41E+00	5.51E-01	2.41E+00
B-005	B Q H 001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	7.20E-02	3.15E-01	7.20E-02	3.15E-01
B-005	B Q H 001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	5.32E-02	2.33E-01	5.32E-02	2.33E-01
B-005	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	4.76E-02	2.09E-01	4.76E-02	2.09E-01
B-005	B Q H 001	SULFUR DIOXIDE	7446 09 5	CRITERIA	4.76E-03	2.09E-02	4.76E-03	2.09E-02
B-005	B Q H 001	VOC (OZONE PRECURSORS)		CRITERIA	4.07E-02	1.78E-01	4.07E-02	1.78E-01
B-005	B Q H 001	LEAD	7439 92 1	CRITERIA HAP	2.82E-05	1.23E-04	2.82E-05	1.23E-04

SRNS-J2200-2019-00240

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
B-005	B Q H 001	CARBON MONOXIDE	EPA AP-42	N/A
B-005	B Q H 001	NITROGEN DIOXIDE	EPA AP-42	N/A
B-005	B Q H 001	TOTAL PARTICULATE MATTER (PM)	EPA AP-42	N/A
B-005	B Q H 001	PARTICULATE MATTER (10 MICRONS)	EPA AP-42	N/A
B-005	B Q H 001	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42	N/A
B-005	B Q H 001	SULFUR DIOXIDE	EPA AP-42	N/A
B-005	B Q H 001	VOC (OZONE PRECURSORS)	EPA AP-42	N/A
B-005	B Q H 001	LEAD	EPA AP-42	N/A

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NO. 2 HOME HEATING OIL-ULTRA LOW SULFUR	195,786 GALLONS	HEATED WATER	4961-221330	N/A

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
735-1B LAB. HOTWATER HEATER/BOILER 5	B-005	EMISSIONS FROM FUEL BURNING OPERATIONS - VISIBLE EMISSIONS	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 1, Sect. I.A
735-1B LAB. HOTWATER HEATER/BOILER 5	B-005	EMISSIONS FROM FUEL BURNING OPERATIONS - PARTICULATE MATTER EMISSIONS	0.6 LB / MMBTU PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 1, Sect. II
735-1B LAB. HOTWATER HEATER/BOILER 5	B-005	EMISSIONS FROM FUEL BURNING OPERATIONS - SULFUR DIOXIDE EMISSIONS	2.3 LB / MMBTU SO2	40 CFR 60, APPENDIX A, METHOD 006	SC 61-62.5, Std. 1, Sect. III

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
B-005	SC 61-62.5, Std. 1, Sect. I.A	Y	CLB	Apr-03	
B-005	SC 61-62.5, Std. 1, Sect. II	Y	CLB	Apr-03	
B-005	SC 61-62.5, Std. 1, Sect. III	Y	CLB	Apr-03	
B-005	40 CFR 63, Subpart DDDDD	Y	CLB	1/31/16	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
B-005	FUEL SPECIFICATIONS	< 0.0015% SULFUR	FUEL SUPPLIER CERTIFICATION	PER SHIPMENT	ANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
B-005	FUEL SPECIFICATIONS	< 0.0015% SULFUR	PER SHIPMENT	N/A	N	N/A

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MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	**11. Pollutant/Parameter**	**4. Limit**	**18. If no monitoring required, why?**	**19. List any monitoring requirements not listed above**
B-005	FUEL SPECIFICATIONS	< 0.0015% SULFUR	MONITORING REQUIRED SEE PART I AND II	NA- requesting to no longer maintain log of startups and shutdowns that is currently required by TV permit condition b5E.2.

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	**20. Description** (include equip/process ID)	**21. Potential Uncontrolled Emissions**		**22. Control Equip ID**	**23. Potential Controlled Emissions**	**24. Subject to CAM Rule (40 CFR 64)?**			
		Pollutant	**Tons/Year**		**Tons/Year**	**Yes***	**No**	**Exempt**	**25. Reason Exempt?**
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	CARBON MONOXIDE	5.48E-01		5.48E-01		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	TOTAL PARTICULATE MATTER (PM)	3.15E-01		3.15E-01		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	PARTICULATE MATTER (10 MICRONS)	2.33E-01		2.33E-01		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	PARTICULATE MATTER (2.5 MICRONS)	2.09E-01		2.09E-01		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	NITROGEN DIOXIDE	2.41E+00		2.41E+00		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	VOC (OZONE PRECURSORS)	1.78E-01		1.78E-01		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	LEAD	1.23E-04		1.23E-04		X	N	
B-005	735-1B LAB. HOTWATER HEATER/BOILER 5	SULFUR DIOXIDE	2.09E-02		2.09E-02				

SRNS-J2200-2019-00240

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NOTE* If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

SRNS-J2200-2019-00240

Emission Calculations B-005 (161B)

Sample Calculations, Emission Factors Used for New Boiler B-005 (161B)
Equipment ID 161B, Boiler B-005, Burnham V1116 Emissions Calculations
Assumptions

1. Boiler is rate 3,129,000 Btu/hr (Attachment B form 2569)
2. Boiler will utilize #2 home heating fuel,ultra low sulfur (0.0015 wt% S)

3. The emission factors from the attached Webster combustion sheet for the Model JB burner were utilized for NOx, CO, VOC, and PM. Other emission factors were obtained from AP42, 5/10 version, section 1.3. SOx emission factor from Webster was not used since these units receive ULS fuel and not 0.5%sulfur fuel (Refer to attached excpert from 10/28/2016 semiannual report for permit 0080-0041.)
4. The BTU value for distillate oil is 140,000 Btu/gal [Appendix A of AP42, 9/85]
5. No control devices present.
6. Fuel is 0.0015 wt% sulfur
7. Assume JB burner VOC emission level includes methane.
8. Assume JB burner PM emission level does not include condensable PM (CPM) CPM value from AP42 was added to JB burner value to obtain emission factor for PM.

Standard No. 2 and
Greenhouse Gases

Pollutant	AP-42 Table	Emission Factor (lb/kgal)	Emission Factor (lb/MMBtu)	Emisison Factor (lb/10^12Btu)	GWP(g)	lb/hr	ton/yr
SO2	1.3-1	142*S				4.76E-03	2.09E-02
CO			0.04			1.25E-01	5.48E-01
PM10 (b)	1.3-7 &1.3-2	2.38				5.32E-02	2.33E-01
CPM	1.3-2	1.3				2.91E-02	1.27E-01
HC/VOC (e)			0.013			4.07E-02	1.78E-01
NOx (a)			0.176			5.51E-01	2.41E+00
PM (c)			0.023			7.20E-02	3.15E-01
PM2.5 (d)	1.3-7 & 1.3-2	2.13				4.76E-02	2.09E-01
Pb	1.3-10			9		2.82E-05	1.23E-04
nitrous oxide N2O(f)	1.3-8	2.60E-01			298	5.81E-03	2.55E-02
methane(f)	1.3-3	2.16E-01			25	4.83E-03	2.11E-02
CO2 (f)	1.3-12	2.23E+04			1	4.98E+02	2.18E+03
CO2e						4.98E+02	2.18E+03

(a) NOx=NO2
(b) PM10 = PM10 + CPM = 1.08 + 1.3 = 2.38
(c) PM = PM + CPM = 0.014 + (1.3/1000)(1/140,000)(1000000)= 0.023
(d) PM2.5 = PM2.5 + CPM = 0.83 + 1.3 = 2.13
(e) Assumes VOC includes methane since Webster reports it as HC/VOC.
(f) greenhouse gas
(g) Global Warming Potential (table A-1 to Subpart A of 40 CFR 98)
example calc:
SO2 = (142lb/1000gal)(0.0015)(3,129,000Btu/hr)(gal/140,000Btu) = 4.76E-03 lb/hr
(4.76E-03lb/hr)(8760hr/yr)(ton/2000lb) = 2.09E-02 TPY

Total emissions utilized to determine trace in TPY
PM+N2O+NOx+SO2+CO+VOC = 3.50E+00

C. S. B. Stone 12-4-17
Calculation Originator

Tony A. Waffle Kim Lwolle 12/04/2017
Reviewer

Emission Calculations B-005 (161B)

Sample Calculations, Emission Factors Used for New Boiler B-005 (161B)
Basis/Assumptions
1. R61.62.5 Std. No. 8 does not apply to sources that burn only virgin fuel. 161B will only burn virgin fuel. However, non-trace toxic air pollutants must be included in facility wide emissions.
2. The BTU value for distillate oil is 140,000 btu/gal [Appendix A of AP42, 9/85]
3. The rating for each boiler is 3,129,000 btu/hr
4. Fuel is 0.0015 wt% sulfur (Refer to attached excerpt from October 28, 2016 Title V semiannual report)

Pollutant	Emission Factor (lb/kgal) *	lb/hr	ton/yr	wt%	
Acenaphthene	2.11E-05	4.72E-07	2.07E-06	0.00	
Acenaphthylene	2.53E-07	5.65E-09	2.48E-08	0.00	
Anthracene	1.22E-06	2.73E-08	1.19E-07	0.00	
Benzene	2.14E-04	4.78E-06	2.09E-05	0.00	
Benzo(a)anthracene	4.01E-06	8.96E-08	3.93E-07	0.00	
Benzo(b,k)fluoranthene	1.48E-06	3.31E-08	1.45E-07	0.00	
Benzo(ghi)perylene	2.26E-06	5.05E-08	2.21E-07	0.00	
Chrysene	2.38E-06	5.32E-08	2.33E-07	0.00	
Dibenzo(a,h)anthracene	1.67E-06	3.73E-08	1.63E-07	0.00	
Ethylbenzene	6.36E-05	1.42E-06	6.23E-06	0.00	
Fluoranthene	4.84E-06	1.08E-07	4.74E-07	0.00	
Formaldehyde	3.30E-02	7.38E-04	3.23E-03	0.09	cas 50-00-0 - carcinogen
Indo(1,2,3-cd)pyrene	2.14E-06	4.78E-08	2.09E-07	0.00	
Naphthalene	1.13E-03	2.53E-05	1.11E-04	0.00	
OCDD (CAS 3268-87-9)	3.10E-09	6.93E-11	3.03E-10	0.00	
Phenanthrene	1.05E-05	2.35E-07	1.03E-06	0.00	
Pyrene	4.25E-06	9.50E-08	4.16E-07	0.00	
Toluene	6.20E-03	1.39E-04	6.07E-04	0.02	
1,1,1-Trichloroethane	2.36E-04	5.27E-06	2.31E-05	0.00	
o-Xylene	1.09E-04	2.44E-06	1.07E-05	0.00	
Fluorene	4.47E-06	9.99E-08	4.38E-07	0.00	

*Table 1.3-9 of AP-42

Pollutant	Emission Factor (lb/kgal) **	lb/hr	ton/yr	Emission Factor (lb/10^12 BTU)***	lb/hr	ton/yr	wt%
As				4	1.25E-05	5.48E-05	0.00
Be				3	9.39E-06	4.11E-05	0.00
Cd				3	9.39E-06	4.11E-05	0.00
Cr				3	9.39E-06	4.11E-05	0.00
Cu				6	1.88E-05	8.22E-05	0.00
Mn				6	1.88E-05	8.22E-05	0.00
Hg				3	9.39E-06	4.11E-05	0.00
Ni				3	9.39E-06	4.11E-05	0.00
Se				15	4.69E-05	2.06E-04	0.01
Zn				4	1.25E-05	5.48E-05	0.00

**Table 1.3-11 of AP-42
***Table 1.3-10 of AP-42
(a) assumed Chloride is all chlorine

example calc:
As: (4lb/10^12btu)(3,129,000btu/hr) = 1.25E-05 lb/hr
(1.25E-05lb/hr)(8760hr/yr)(ton/2000lb) = 5.48E-05 TPY

To determine trace emissions the total emissions of Total PM, N2O, NO2, SO2, CO, and VOCs was determined to be 3.50E+00 TPY
The above wt% column utilizes this total emissions value.
example calc:
Toluene: (6.07E-04 TPY toluene)/3.50Total tons *100 = 0.02%)
No HAP/TAP is 0.1% by weight or higher.
Trace determination follows the method outlined in the July 2001 SCDHEC Air Quality Modeling Guidelines.

12-4-17
Calculation Originator

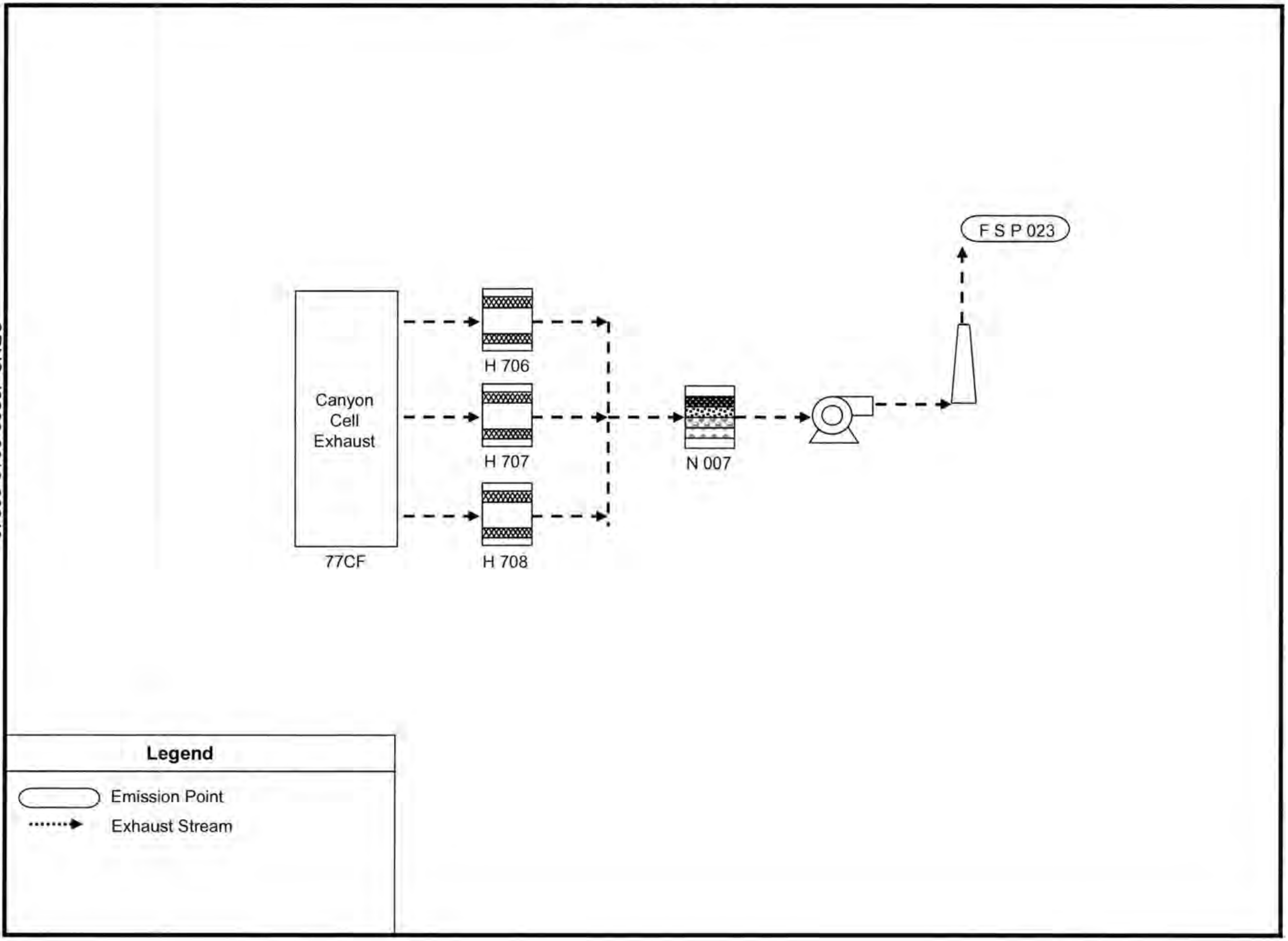
Kim A. Wolle 12/04/2017
Reviewer

Title V Permit Application
Emission Unit F-002
Process Description

The F Canyon (Emission Unit F-002) process recovered plutonium and uranium from irradiated fuel and other sources starting in 1955 until processing ended in 2004. The facility was then deactivated by removing all product, cleaning all tanks and equipment, removing or plugging pipes, and disconnecting support systems such as fire suppression and process water. The building contains residual radiation from small amounts of material retained in tanks and pipelines and legacy contamination on the facility walls and floor.

Two exhaust fans are in operation to take the building air through one sand filter and then discharge through the stack in order to control contamination inside the building.

Emission Unit F-002



SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
F-002	F CANYON	HEPA FILTER
F-002	F CANYON	SAND FILTER

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
F-002	*	*	NONE	2819 - 325188	* CLASSIFIED

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
H 0706	HEPA FILTER---FLANDERS OR EQUAL, GG-F OR EQUAL, NOT SPECIFIED	Jan-55	RADIONUCLIDES
H 0707	HEPA FILTER---FLANDERS OR EQUAL, GG-F OR EQUAL, UNKNOWN	Jan-55	RADIONUCLIDES
H 0708	HEPA FILTER---FLANDERS OR EQUAL, GG-F OR EQUAL, UNKNOWN	Jan-55	RADIONUCLIDES
N 0007	SAND FILTER---DUPONT, SANDFILTER, N/A	Jan-76	RADIONUCLIDES

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
H 0706	NEGATIVE PRESSURE	100	99	AEROSOL TEST	PRESSURE DROP GAUGE	F S P 023	RADIONUCLIDES ARE EMITTED AS ONLY FORM OF PARTICULATE MATTER
H 0707	NEGATIVE PRESSURE	100	99	AEROSOL TEST	PRESSURE DROP GAUGE	F S P 023	RADIONUCLIDES ARE EMITTED AS ONLY FORM OF PARTICULATE MATTER
H 0708	NEGATIVE PRESSURE	100	99	AEROSOL TEST	PRESSURE DROP GAUGE	F S P 023	RADIONUCLIDES ARE EMITTED AS ONLY FORM OF PARTICULATE MATTER

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N 0007	NEGATIVE PRESSURE	100	90	AEROSOL TEST	PRESSURE DROP GAUGE	F S P 023	RADIONUCLIDES ARE EMITTED AS ONLY FORM OF PARTICULATE MATTER

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
F-002	77CF	CANYONS CELL EXHAUST	01/1955	NONE	H 0706	F S P 023	N/A
F-002	77CF	CANYONS CELL EXHAUST	01/1955	NONE	H 0707	F S P 023	N/A
F-002	77CF	CANYONS CELL EXHAUST	01/1955	NONE	H 0708	F S P 023	N/A
F-002	77CF	CANYONS CELL EXHAUST	01/1955	NONE	N 0007	F S P 023	N/A

EQUIPMENT DESCRIPTION (CONTINUED)

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
77CF	N/A	N/A	GRANDFATHERED	NONE

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled (lb/hr)	6. Maximum Uncontrolled (TPY)	7. Maximum Controlled (lb/hr)	7. Maximum Controlled (TPY)
F-002	F S P 023	RADIONUCLIDES	N/A	HAP	0	0	0	0

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
F-002	F S P 023	RADIONUCLIDES	CONTINUOUS SAMPLING	N/A

SRNS-J2200-2019-00240

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Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NONE	N/A	NONE	2819-325188	NONE

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
F CANYON	F-002	EMISSIONS FROM PROCESS INDUSTRIES	N/A	N/A	SC 61-62.5, Std. 4
F CANYON	F-002	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	40% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.A
F CANYON	F-002	RADIONUCLIDES	10 MREM/YR	METHOD 114	40 CFR 61, APPENDIX B

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
F-002	SC 61-62.5, Std. 4	Y	CLB	Apr-03	
F-002	SC 61-62.5, Std. 4, Sect. IX.A	Y	CLB	Apr-03	
F-002	40 CFR 61, SUBPART H	Y	CLB	Apr-03	

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
F-002	EFFLUENT FLOW RATES	N/A	FLOW MEASUREMENT SYSTEM	CONTINUOUS	INITIAL
F-002	RADIONUCLIDES	10 MREM / YR	COMPUTER MODEL	N/A	ANNUAL
F-002	RADIONUCLIDES	N/A	SAMPLING	CONTINUOUS	SEMIANNUAL
F-002	RADIONUCLIDES	N/A	QUALITY ASSURANCE PROTECTION PLAN	N/A	N/A
F-002	RELATIVE ACCURACY (RA)	N/A	PERFORMANCE TEST	SEMIANNUAL	SEMIANNUAL
F-002	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	N/A	N/A	N/A

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MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
F-002	EFFLUENT FLOW RATES	N/A	INITIAL	N/A	N	N/A
F-002	RADIONUCLIDES	10 MREM / YR	ANNUAL	N/A	N	N/A
F-002	RADIONUCLIDES	N/A	CONTINUOUS	N/A	N	N/A
F-002	RADIONUCLIDES	N/A	AS REQUIRED	N/A	N	N/A
F-002	RELATIVE ACCURACY (RA)	N/A	SEMIANNUAL	N/A	N	N/A
F-002	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	ANNUAL	N/A	N	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III

(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
F-002	EFFLUENT FLOW RATES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
F-002	RADIONUCLIDES	10 MREM / YR	MONITORING REQUIRED SEE PARTS I AND II	NONE
F-002	RADIONUCLIDES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
F-002	RADIONUCLIDES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
F-002	RELATIVE ACCURACY (RA)	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
F-002	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	MONITORING REQUIRED SEE PARTS I AND II	INSPECTIONS OF STACK SAMPLING EQUIPMENT

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/proc	21. Potential Uncontrolled Emissions	22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
					Yes*	No	Exempt	25. Reason

SRNS-J2200-2019-00240

	ess ID)	Pollutant	Tons/Year		Tons/Year				Exempt?
F-002	F CANYON	RADIONUC LIDES	0	H0706, H0707, H0708, N0007	0		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	**11. Pollutant/Parameter**	**4. Limit (Facility-Wide)**	**26. Parameter to Monitor**	**27. Applicable Regulation Avoidance**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	**28. New or Existing Equipment**	**29. Control Equip ID**	**30. List any unit/equipment which is specifically exempt from MACT standards and state why.**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	**31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.**

SRNS-J2200-2019-00240

Title V Permit Application
Emission Unit H-001
Process Description

The H-Canyon and Outside facilities have recovered uranium, plutonium, neptunium, thorium and americium at various times since startup in 1953. The emission rates in this tab are based on processing un-irradiated uranium fuels and Highly Enriched Uranium (HEU) legacy materials containing U-235 with a maximum enrichment of 95%. The HEU legacy materials include miscellaneous uranium metals, oxides and powders. Laboratory Sample Returns from F/H Area Laboratory and the Savannah River National Laboratory (SRNL) are blended with H Canyon material for processing before being sent through H-Canyon to the H-Tank Farm. The H Canyon process consists of multiple primary unit operations with a number of support operations.

In the Dissolving process (99CH), fuel elements and fuel targets are placed in nitric acid that contains a potassium fluoride or mercuric nitrate catalyst. Materials may be blended with plant fuel solutions and processed through the Head End, First Cycle, and Second Uranium Cycles as described below.

In the Head End process (01DH), uranium solutions from the dissolver are concentrated, decontaminated, and clarified for subsequent solvent extraction processing. A gelatin strike gelatin is added to coagulate silica thus preventing formation of emulsions during the solvent extraction process. The resulting slurry is then centrifuged to remove the precipitate. The clarified solution is sent to First Cycle while the precipitated cake is rinsed to recover uranium prior to transfer to the High Activity Waste (HAW) neutralization tank and eventually to the H Area Tank Farm Facility. Plutonium and/or neptunium may be recovered from the solutions received into Head End.

In the First Cycle process (02DH) (solvent extraction), uranium and neptunium are separated from the aluminum, molybdenum, plutonium, and fission products in the feed through a series of three mixer-settler banks with various stages. A mixture of tri-butyl phosphate in n-paraffin is utilized to remove radioactive decay products and other chemical impurities and separate the solution into two product streams (uranium and neptunium/plutonium). Nitric acid and ferrous sulfamate are also utilized to effect separation. Ferrous sulfamate is not added during the current campaign because of the processing of un-irradiated fuel. The stream from First Cycle consists nominally of aluminum nitrate, nitric acid, ferrous sulfamate, fission products, and trace quantities of plutonium. The stream is processed through a decanter to remove entrained solvent and then fed to the HAW system. The product stream from First Cycle is fed to the Second Uranium Cycle while product stream is routed to the Second Product Cycle (if originally derived from irradiated materials) or processed directly as Low Activity Waste (LAW) (if coming from un-irradiated material).

In the Acid Recovery process (09DH), dilute nitric acid solutions are received from various processes in the Canyon. A distillation column is used to concentrate the nitric acid for reuse in the Canyon process. Aqueous overheads are sent to the Effluent Treatment Facility (ETF) for processing.

In the Second Uranium Cycle (03DH), the uranium product stream is passed through a decanter to remove entrained solvent, concentrated in an evaporator, and adjusted with acid to enhance extraction of the uranium. The stream is then fed to a series of two mixer-settler banks to further separate out neptunium and plutonium, and fission product impurities. Inlet streams to these mixer-settler banks include various concentrations of dilute nitric acid, a mixture of 8.5 % tri-butyl phosphate in n-paraffin, and ferrous sulfamate. The stream from Second Uranium consists nominally of nitric acid, ferrous sulfamate, fission products, and trace quantities of plutonium and neptunium. This stream is decanted and processed through the LAW system.

In the Second Neptunium/Plutonium process (04DH), multistage mixer/settlers banks capable of extracting transuranics from the product feed stream (containing fission products and chemical impurities) into a solvent stream, and then stripping the transuranics into a slightly acidic aqueous stream.

In the Solvent Recovery process (05DH), chemical degradation and radioactive contamination are removed from the solvent used in the extraction process. The solvent must also be processed to remove phosphates before it is recycled back to the mixer-settler banks because the quality of the solvent degrades upon exposure to radiation and nitric acid. Solvent recovery utilizes a sodium carbonate wash to remove uranium, neptunium, fission product contaminants, and byproducts of TBP. The solvent is then washed with low molar nitric acid. Each of the two sets of mixer-settler banks has a separate wash cycle. The material generated through the sodium carbonate wash is processed through the LAW system whereas the material generated in the acid wash phase is processed through the General Purpose evaporator.

In the High Activity Waste (HAW) process (08DH), material is received from 1st Cycle, Head End, and canyon sumps. Evaporators are used to concentrate the aqueous streams. The resulting concentrate, which contains radioactive decay streams and chemicals used in solvent extraction, is neutralized and transferred to the H Area High Level Waste Tanks. The overheads, which contain nitric acid and water, are transferred to the Acid Recovery system for recycling.

In the Rerun process (10DH), any material collected in the canyon sumps and material from other canyon processes that may require sampling and analysis are received and sampled in the rerun process. Depending on the analytical results, the material is transferred to the appropriate canyon processing unit.

In the Low Activity Waste (LAW) process (07DH), aqueous solutions are received from Second Uranium Cycle, Solvent Recovery, Second Neptunium/Plutonium Cycle, HB Line, Tank 805 and sumps. Laboratory Sample Returns from F/H Area Laboratory and the Savannah River National Laboratory (SRNL) are sent through H-Canyon to the H-Tank Farm. The aqueous streams are collected in a hold tank, the specific gravity is reduced to roughly 1.035 and sodium nitrite (nitrites only used in ferrous sulfamate bearing materials) is added to the material to destroy any residual sulfamate. The material is then fed to a low heat batch evaporator where the volume is reduced and a large fraction of the acid is recovered and recycled through the acid recovery unit in Outside Facilities. Nitrite may also be introduced in the evaporators to destroy ammonium that is present in the stream. The evaporator pot bottoms are concentrated until the acid and salt content reach a specific gravity of roughly 1.32. These bottoms containing salts and concentrated radionuclides are then stripped of recoverable nitric acid. The material has a neutron poison (manganous nitrate) added, and is then neutralized with excess sodium hydroxide and sent to H Area Tank Farm Facility.

In the General Purpose (GP) Evaporator process (12DH), aqueous streams with low contamination levels are received from various canyon sumps, chemical storage areas, and wastewater in outside sumps and pits. The GP evaporator concentrates aqueous solutions, primarily from the GP tanks, with radioactivity levels higher than acceptance limits, but low enough to be evaporated in unshielded equipment. The overheads are sent to the ETF, and the bottoms (concentrate) are sent to the H Area Tank Facility. Sodium hydroxide is used to neutralize the GP Evaporator feed streams and bottoms as necessary.

In the Cold Feed 3rd Level process (20DH), several vessels are utilized to store chemicals that will be utilized in other canyon processes. Emissions from the cold feed processs consist of working losses from these vessels.

In the Segregated Solvent process (13DH), degradation products from used solvent are removed and the solvent is then returned to other canyon processes. This process includes solvent decontamination and storage vessels.

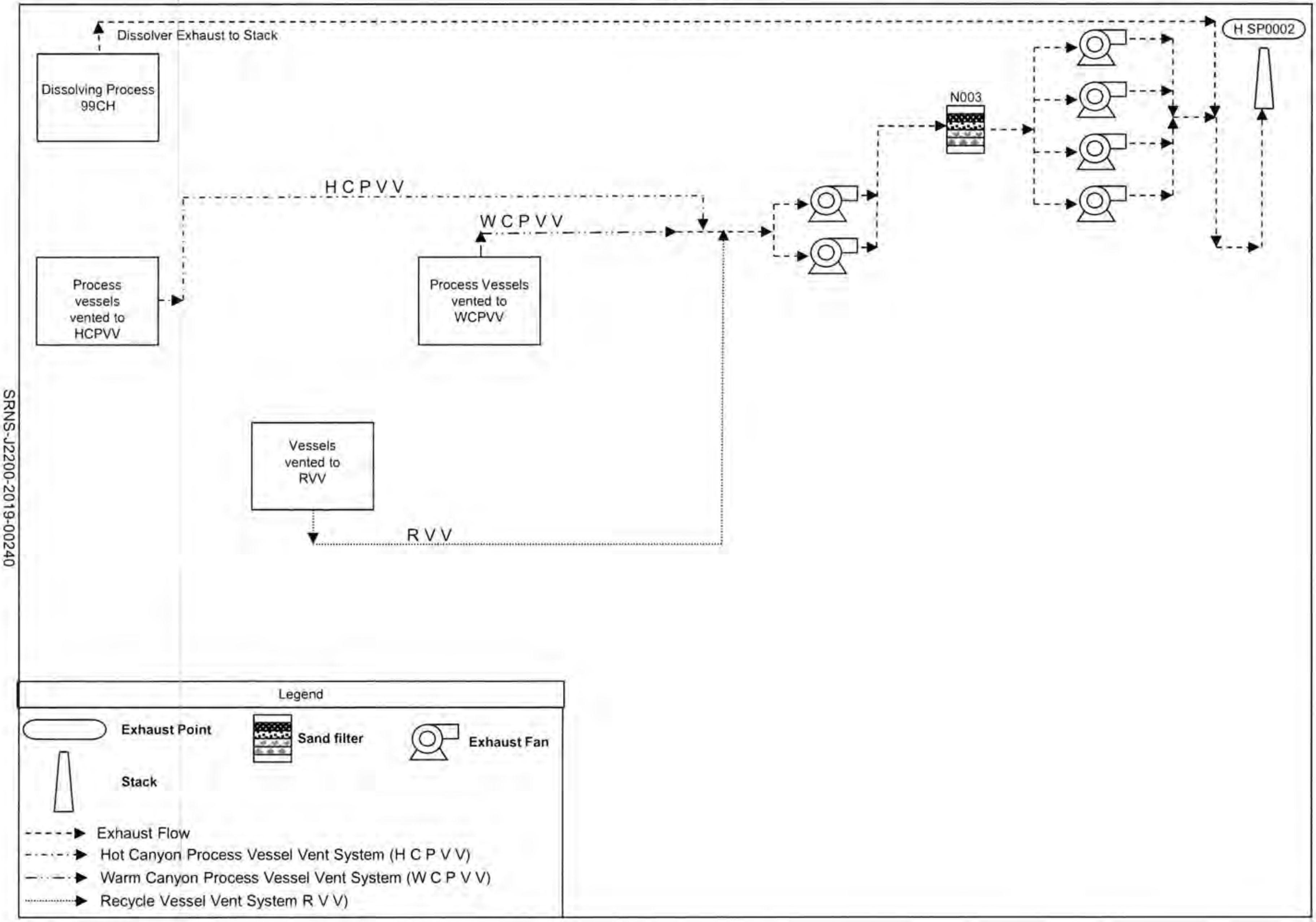
In the Enriched Uranium (EU) process (24DH), dilute aqueous solutions of uranyl nitrate enriched in Uranium 235 are received from the Second Uranium Cycle process. This material is stored in vessels within the EU process.

As part of the Title V renewal application process the emission calculations from the processes associated with the Canyon were re-evaluated. During this process it was determined that Equipment 21DH (Cell Exhaust, vented to Process Vessel Vent system), 22DH, (Sumps, vented to Process Vessel Vent system) and 23DH (water handling, vented to Recycle Vessel Vent System) did not emit any regulated pollutants. Therefore, these equipment IDs are not listed in the H001 Title V renewal application forms.

There are several raw material storage areas associated with the H001 emission unit. The SCDHEC IDs associated with these storage areas are 536H, 538H, 547H, 21BH, 541H, 542H, 544H, and 545H (all are vented to Recycle Vessel Vent system). Each of these are listed on Form G. Based on the June 15, 1999 SCDHEC Guidance document for Standard 4, Section VIII-PM Emission Limitations it is appropriate to not include the emissions from raw material storage areas in the emission calculations for the H001 process.

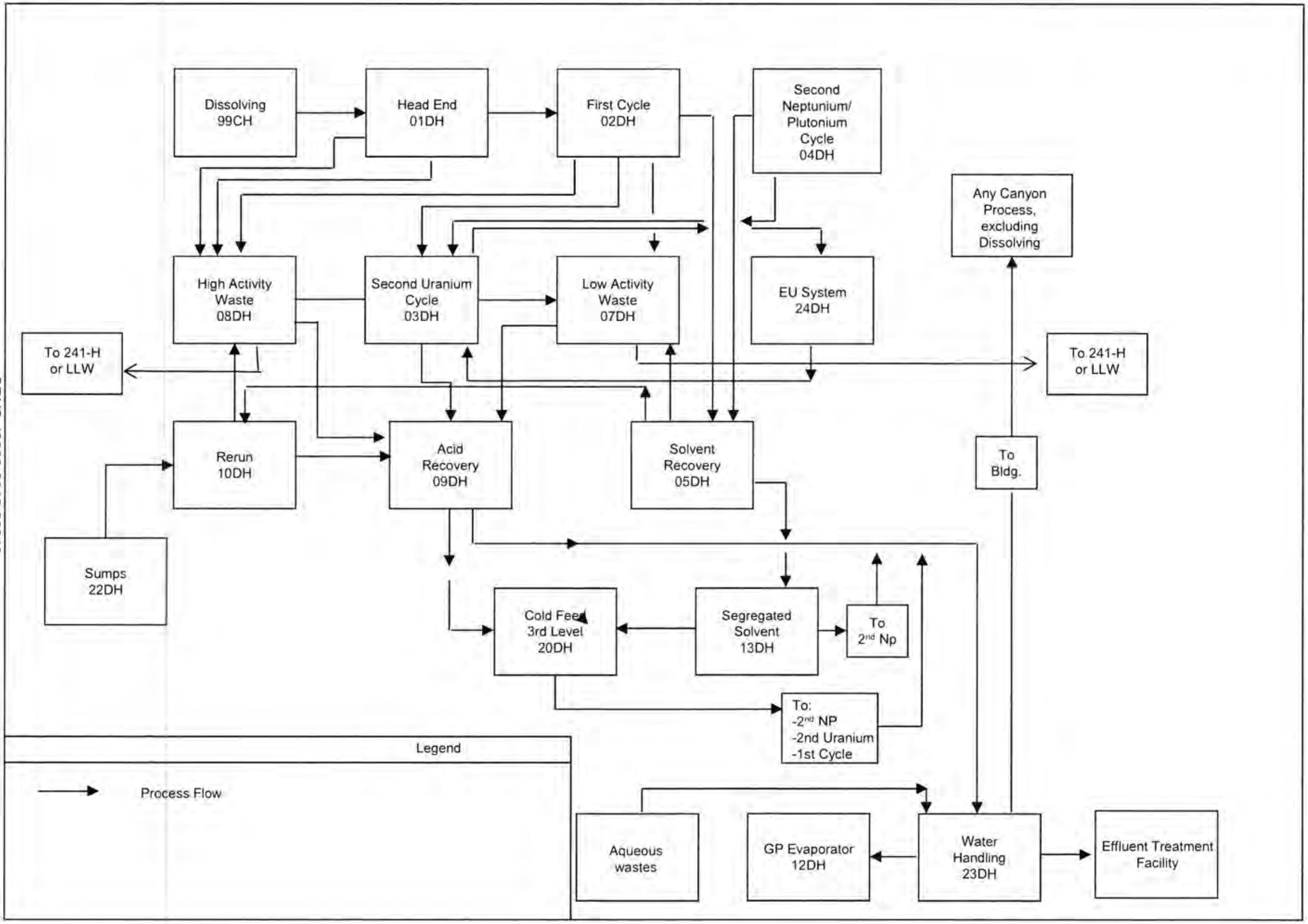
99CH, Dissolving, emits directly to the H-Canyon stack. The other processes described above either ventilate to the Hot Canyon, Warm Canyon, or Recycle Vessel Vent Systems. Each of these three Vessel Vent Systems is emitted to the two sandfilters and then out the H-Canyon stack. None of the equipment associated with H-001 emit to HEPA filters prior to exiting the H Canyon stack. The sandfilter (N0003) associated with the H-001 is present to control radionuclides and are not credited for the reduction of non-radioactive pollutants.

EMISSION UNIT H-001
EXHAUST FLOWS



SRNS-J2200-2019-00240

EMISSION UNIT H-001
PROCESS FLOWS



SRNS-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION (Table is a description of emission units located at this facility)		
1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	**2. Emission Unit Description/Purpose**	**3. Control Device**
H-001	H CANYON	SANDFILTER

EMISSION UNIT PROCESS DESCRIPTION (For each emission unit listed above, provide the following emission unit process description information)					
1. Emission Unit ID	**4. Process Weight Rate (tons/hr)**	**5. Production Rate (units per time period)**	**6. Major Product**	**7. SIC/NAICS Code**	**8. Comments (Special permit limits, etc.)**
H-001	**	**	Purified Radioactive Materials	2819 / 325188	** PROCESS RATE CLASSIFIED

CONTROL DEVICE INFORMATION (Table is a description of control devices located at this facility)			
3. Control Device ID	**9. Control Device Description (Manufacturer, Name, Model #, etc.)**	**10. Installation Date**	**11. Pollutant(s) Controlled**
N-003	SAND FILTER -- DUPONT, SANDFILTER, N/A	12/1976	RADIONUCLIDES

CONTROL DEVICE INFORMATION (CONTINUED)							
3. Control Device ID	**12. Capture System**	**13. Capture (%)**	**14. Removal/ Destruction (%)**	**15. Removal/ Destruction (Method Used to Determine)**	**16. Parameter Monitored**	**17. Exhaust ID**	**18. Comments (special permit limitations, Fuel info., different capture systems, etc.)**
N 0003	NEGATIVE PRESSURE	100	90	PRESSURE DROP GAUGE	Pressure Drop	H SP 0002	RADIONUCLIDES ARE EMITTED AS ONLY FORM OF PARTICULATE MATTER CONTROLLED BY SANDFILTER

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
H-001	01DH	HEAD END	1/1955	NONE	N 0003	H S P 002	14800 KGRAM
H-001	02DH	FIRST CYCLE	1/1955	NONE	N 0003	H S P 002	1840000 GALLONS
H-001	03DH	SECOND URANIUM CYCLE	1/1955	NONE	N 0003	H S P 002	2280000 GALLONS
H-001	04DH	SECOND PLUTONIUM / NEPTUNIUM CYCLE	1/1955	NONE	N 0003	H S P 002	3370000 GALLONS
H-001	05DH	SOLVENT RECOVERY	1/1955	NONE	N 0003	H S P 002	8200000 GALLONS
H-001	07DH	LOW ACTIVITY WASTE	1/1955	NONE	N 0003	H S P 002	4500000 GALLONS
H-001	08DH	HIGH ACTIVITY WASTE	1/1955	NONE	N 0003	H S P 002	2100000 GALLONS
H-001	09DH	ACID RECOVERY	1/1955	NONE	N 0003	H S P 002	26000000 GALLONS
H-001	10DH	RERUN	1/1955	NONE	N 0003	H S P 002	13000000 GALLONS
H-001	12DH	GP EVAPORATOR	1/1955	NONE	N 0003	H S P 002	4030000 GALLONS
H-001	13DH	SEGREGATED SOLVENT	1/1955	NONE	N 0003	H S P 002	21550000 GALLONS
H-001	20DH	COLD FEED, 3RD LEVEL	1/1955	NONE	N 0003	H S P 002	18400000 GALLONS
H-001	24DH	EU SYSTEM	1/1955	NONE	N 0003	H S P 002	150000 GALLONS
H-001	99CH	DISSOLVING	1/1955	NONE	N/A	H S P 002	14800 KGRAM

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
01DH	N/A	N/A	N/A	NONE
02DH	N/A	N/A	N/A	NONE
03DH	N/A	N/A	N/A	NONE
04DH	N/A	N/A	N/A	NONE
05DH	N/A	N/A	N/A	NONE
07DH	N/A	N/A	N/A	NONE
08DH	N/A	N/A	N/A	NONE
09DH	N/A	N/A	N/A	NONE
10DH	N/A	N/A	N/A	NONE
12DH	N/A	N/A	N/A	NONE
13DH	N/A	N/A	N/A	NONE
20DH	N/A	N/A	N/A	NONE
24DH	N/A	N/A	N/A	NONE
99CH	N/A	N/A	N/A	NONE

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
H-001	H S P 0002	NITROGEN DIOXIDE (NO2)	10102 44 0	CRITERIA	1.18E+02	1.59E+02	1.18E+02	1.59E+02
H-001	H S P 0002	NITRIC ACID	7697 37 2	HAP TAP	3.72E+01	1.63E+02	3.72E+01	1.63E+02
H-001	H S P 0002	VOC (OZONE PRECURSORS)		CRITERIA	1.25E+00	5.49E+00	1.25E+00	5.49E+00

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
H-001	H S P 0002	NITROGEN DIOXIDE (NO2)	ENGINEERING CALCULATIONS	
H-001	H S P 0002	NITRIC ACID	ENGINEERING CALCULATIONS	
H-001	H S P 0002	VOC (OZONE PRECURSORS)	ENGINEERING CALCULATIONS	

SRNS-J2200-2019-00240

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Major Raw Materials	**2. Quantity**	**3. Major Products (List Major Products in order of major to minor)**	**4. SIC/NAICS Code**	**5. Production Rate**
Fissile Material	2220kg	Processed Fissile Material	2819 - 325180	2220kg
50% NITRIC ACID (HNO_3)	818,284L			
64% NITRIC ACID (HNO_3)	133,000L			
SODIUM NITRITE ($NaNO_2$)	26,480L			
N-PARAFFIN/TBP	116,423L			
Mercuric Nitrate	38,400L			

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
H CANYON	H-001	EMISSIONS FROM PROCESS	N/A	N/A	SC 61-62.5, Std. 4
H CANYON	H-001	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	40% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX
H-CANYON	H-001	RADIONUCLIDES	10 MREM/YR	METHOD 114	40 CFR 61, APPENDIX B

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
H-001	SC 61-62.05, Std. 4	Y	CLB	Apr-03	
H-001	SC 61-62.05, Std. 4, Sect. IX	Y	CLB	Apr-03	
H-001	40 CFR 61, SUBPART H	Y	CLB	Apr-03	

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
H-001	EFFLUENT FLOW RATES	N/A	FLOW MEASUREMENT SYSTEM	CONTINUOUS	INITIAL
H-001	RADIONUCLIDES	10 MREM / YR	COMPUTER MODEL	N/A	ANNUAL
H-001	RADIONUCLIDES	N/A	SAMPLING	CONTINUOUS	SEMIANNUAL
H-001	RADIONUCLIDES	N/A	QUALITY ASSURANCE PROTECTION PLAN	N/A	N/A
H-001	RELATIVE ACCURACY (RA)	10%	PERFORMANCE TEST	SEMIANNUAL	SEMIANNUAL
H-001	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	N/A	N/A	N/A

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II (This section summarizes the monitoring and reporting requirements)						
2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
H-001	EFFLUENT FLOW RATES	N/A	INITIAL	N/A	N	N/A
H-001	RADIONUCLIDES	10 MREM / YR	ANNUAL	N/A	N	N/A
H-001	RADIONUCLIDES	N/A	CONTINUOUS	N/A	N	N/A
H-001	RADIONUCLIDES	N/A	AS REQUIRED	N/A	N	N/A
H-001	RELATIVE ACCURACY (RA)	10%	SEMIANNUAL	N/A	N	N/A
H-001	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	ANNUAL	N/A	N	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
H-001	EFFLUENT FLOW RATES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
H-001	RADIONUCLIDES	10 MREM / YR	MONITORING REQUIRED SEE PARTS I AND II	NONE
H-001	RADIONUCLIDES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
H-001	RADIONUCLIDES	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
H-001	RELATIVE ACCURACY (RA)	10%	MONITORING REQUIRED SEE PARTS I AND II	NONE
H-001	OPERATION & MAINTENANCE PROGRAM (O&M)	N/A	MONITORING REQUIRED SEE PARTS I AND II	INSPECTIONS OF STACK SAMPLING EQUIPMENT

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South Carolina Department of Health and Environmental Control

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
H-001	H CANYON	NITROGEN DIOXIDE (NO2)	1.59E+02		1.59E+02		X	N	
H-001	H CANYON	NITRIC ACID	1.63E+02		1.63E+02		X	N	
H-001	H CANYON	VOC (OZONE PRECURSORS)	5.49E+00		5.49E+00		X	N	

SRNS-J2200-2019-00240

NOTE* If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V
(This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)

2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI
(This section allows for additional information or requirements for sources subject to a MACT Standard)

2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII
(This section allows for additional requirements for sources subject to a MACT Standard)

2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Mercury Maximum Potential Air Emissions Calculations (U) **SHEET 1 OF 2 SHEETS**
Generated: Kim A. Wolfe Kim A Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum mercury (Hg) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The first step of the H-Canyon Process is dissolving material in nitric acid. It may be necessary to utilize mercuric nitrate ($Hg(NO_3)_2$) to catalyze dissolving of some materials that enter the process. Some mercury, as mercuric nitrate, dissociates and is reduced onto the surface of the material thus forming an amalgam that enables rapid dissolution of the material being dissolved by the nitric acid. However, it is conservatively assumed that all of the Hg will remain elemental and will not compound with other materials in solution.
2. If $Hg(NO_3)_2$ is utilized it will be at a concentration of 0.02M $Hg(NO_3)_2$ in the dissolver. (SRNS-8100-2013-00102)
3. The other material in the dissolver is assumed to be 50% by weight HNO_3. This simplification is conservative since it results in a higher mole fraction for Hg.
4. Molecular weight of HNO_3 is 63 g/mole.
5. Molecular weight of $Hg(NO_3)_2$ is 324.6g/mol.
6. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 78 cubic feet per minute (cfm). This value is based on documents X-CLC-H-00026 and S-TSR-H-00006.
7. The density of 50 wt. % nitric acid at 100 °C is 1.26kg/L.
8. The vapor pressure of pure Hg at 100 °C is 0. 0.2729 mm Hg obtained from *Handbook of Chemistry and Physics* (56th ed.) and Lange's *Handbook of Chemistry* (10th ed.).
9. The Hg will be released uniformly over 8760 hours/year.

III. CALCULATIONS

$$\frac{(1.26kg 50\% HNO_3)}{(L)}(0.5)\frac{(1000g)}{(kg)}\frac{(mole HNO_3)}{(63g)} = 1.00E+01 mole HNO_3 / L$$

$$\frac{(1.26kg 50\% HNO_3)}{(L)}(0.5)\frac{(1000g)}{(kg)}\frac{(mole H_2O)}{(18g)} = 3.50E+01 mole H_2O / L$$

Total Moles/L

$$(2.0E-02 M Hg) + (3.50E+01 M H_2O) + (1.00E+01 M HNO_3) = 45.02M$$

Constituent	Mole fraction
Hg	4.44E-04
HNO_3	2.22E-01
H_2O	7.77E-01

Raoult's Law:

$$p_i = (x_i)(p_i^{\bullet})$$

where: p_i = pressure of component *i*

x_i = mole fraction of component *i* in solution

$p_i^{\bullet}$ = vapor pressure of the pure substance *i*

$$p_i = (4.44E-04)(0.2729 mmHg) = 1.21E-04 mmHg$$

The number of moles of Hg in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where: n = Number moles of Hg in vapor
V = Volume
R = Universal Gas Constant, 62.36L mmHg/mole °K
T = Temperature, 100C = 373.15K
P = Partial Pressure of Hg

$$V = (78cfm)(60\,\text{min}/hr)(8760hour/year)(1000L/35.3145ft^3) = 1.16E+09L/yr$$

$$\frac{(1.21E-04mmHg)(1.16E+09L/yr)}{(62.36LmmHg/molK)(373.15K)} = 6.03E+00moleHg/yr$$

$$(6.03E+00moleHg/yr)(200.59g/moleHg)(1lb/453.593g)(1ton/2000lb) = 1.33E-03tonsHg/yr$$

$$(1.33E-03tonsHg/yr)(2000lb/ton)(year/8760hours) = 3.04E-04lbHg/hr$$

$$(3.04E-04lb/hr)(453.593g/lb)(hr/60\,\text{min})(\text{min}/60\,\text{sec}) = 3.83E-05gHg/\text{sec}$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
Hg	3.04E-04	1.33E-03	3.83E-05

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Nitric Acid Maximum Potential Air Emissions Calculations (U) **SHEET 1 OF 1 SHEETS**
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum nitric acid potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The first step of the H-Canyon Process is dissolving material in nitric acid.
2. There are points within the H-Canyon Process that concentrates nitric acid. The maximum nitric acid concentration throughout the H-Canyon Process is 52%. This percent is reached at the Acid Recovery portion of the process, but is conservatively applied throughout the Canyon Process.
3. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 78 cubic feet per minute (cfm). This value is based on documents X-CLC-H-00026 and S-TSR-H-00006.
4. The highest temperature utilized in the H-Canyon Process is 100C.
5. Molecular weight of HNO_3 is 63g/mole.
6. The partial pressures of a 52% nitric acid solution at 100C is conservatively represented in Perry's Chemical Engineers' Handbook for the partial pressures listed at 55% at 100C (47mmHg for HNO_3 and 331mmHg for H_2O).
7. There are no control devices for HNO3 so controlled and uncontrolled emissions are the same.

III. CALCULATIONS

The number of moles of nitric acid in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where: n = Number moles of nitric acid or water in vapor
V = Volume
R = Universal Gas Constant, 62.36L mmHg/molK
T = Temperature, 100C = 373.15K
P = Partial Pressure of nitric acid or water

$$V = (78cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 1.16E+09L/yr$$

$$n_{HNO_3} = \frac{(47mmHg)(1.16E+09L/yr)}{(62.36LmmHg/molK)(373.15K)}$$

$$n_{HNO_3} = 2.34E+06molesHNO_3$$

$$mass_{HNO_3} = (2.34E+06molesHNO_3)(63g/mole)(1lb/453.593g)(1ton/2000lb) = 1.63E+02tons/yr$$

$$mass_{HNO_3} = (1.63E+02tons/yr)(2000lb/1tons)(1year/8760hours) = 3.72E+01lb/hr$$

$$mass_{HNO_3} = (3.72E+01lb/hr)(1hr/60\min)(1\min/60\sec)(453.593g/lb) = 4.69E+00g/\sec$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
HNO_3	3.72E+01	1.63E+02	4.69E+00

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Nitric Oxides (NO_x) Maximum Potential Air Emissions Calculations (U)
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum Nitric Oxides (NOx) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The NO_x emitted from H-Canyon Process Operations originates from the nitric acid (HNO_3) used during the dissolving of metal materials and neutralizations in the High and Low Level Waste systems. Other sources of NO_x emissions in the H-Canyon Processes are negligible in comparison to dissolving (dissolution) and neutralizations operations.
2. The maximum annual emissions of NO_x from the dissolving process can be based on the maximum quantity of 50% by weight nitric acid received into the process. This value is 818,284 L/year. (SRNS-8100-2013-00102)
3. There will be a maximum of 180 dissolutions/yr. (SRNS-8100-203-00102)
4. During each dissolution process the NO_x emissions occurs within the first 20 hours.
5. NO_x includes emissions of NO_2 and NO.
6. Density of 50%wt HNO_3 is 1.3kg/L.
7. Molecular weight of HNO_3 is 63g/mole.
8. The maximum amount of $NaNO_2$ used in the Low Level Waste portion and High Level Waste portions of the process is a combined value of 32.4 tons/yr. (SRNS-8100-2013-00102)
9. A maximum of 516 neutralization processes per year will be completed in the combined High Level and Low Level Waste processes. (SRNS-8100-2013-00102) Assume NO_x is released during the first 2 hours of each neutralization process.
10. Molecular weight of $NaNO_2$ is 69g/mole.
11. Molecular weight of NO_x is 46g/mole.
12. Reactions are not temperature dependent.
13. There are no control devices for NO_x so controlled and uncontrolled emissions are the same.

III. CALCULATIONS

<u>Dissolving-NO_x from HNO_3</u>

The quantity of nitric acid required to dissolve a material is dependent on the material to be dissolved. The dissolving chemical equations that result in the highest generation of NO_x is the dissolution of aluminum clad Uranium:

$$U + 4.5HNO_3 \Rightarrow UO_2(NO_3)_2 + 1.55NO + 0.87NO_2 + 0.05N_2 + 2.25H_2O$$

$$Al + 3.75HNO_3 \Rightarrow Al(NO_3)_3 + 0.23NO + 0.15N_2O + 0.11N_2 + 1.9H_2O$$

$$8.25molesHNO_3result \sin 2.65molesNO_x$$

$$(818{,}284L50\%wtHNO_3)(1.3kg/L)(0.5) = 5.32E+05kgHNO_3$$

$$(5.32E+05kgHNO_3)(1000g/kg)(mole/63g) = 8.44E+06molesHNO_3$$

$$(8.44E+06molesHNO_3)(2.65molesNO_x/8.25molesHNO_3) = 2.71E+06molesNO_x$$

$$(2.71E+06molesNO_x)(46g/mol)(1lb/453.593g)(ton/2000lb) = 1.37E+02tonsNO_x/yr$$

$$(1.37E+02tonsNO_x/yr)(yr/180dissolutions)(dissolution/20hrs)(2000lb/ton) = 76.3lbsNO_x/hr$$

<u>Low and High Level Waste- NO_x from $NaNO_2$</u>
Sodium nitrite ($NaN0_2$) is added to the Low and High Level Waste Portions of the H-Canyon Process. This addition is another source of NO_x based on the following equation:

$$NaNO_2 \Rightarrow Na + NO_2$$

1 mole $NaNO_2$ results in 1 mole NO_x.

$$(32.4 tons NaNO_2)(2000 lb/ton)(453.593 g/lb)(mole/69g) \Rightarrow 4.26E+05 moles NaNO_2$$

$$(4.26E+05 moles NaNO_2)(1 mole NO_x / 1 mole NaNO_2 = 4.26E+05 moles NO_x$$

$$(4.26E+05 moles NO_x)(46 g/mol)(1 lb/453.593 g)(ton/2000 lb) = 2.16E+01 tons NO_x / yr$$

$$(2.16E+01 tons NO_x / yr)(2000 lb/ton)(yr/516 neutralizations)(neutralization/2hr) = 4.19E+01 lb NO_x / hr$$

<u>Total NOx from H-Canyon Process</u>

$$(1.37E+02 tons NO_x / yr) + (2.16E+01 tons NO_x / yr) = 1.59E+02 tons NO_x / yr$$

$$(76.3 lbs NO_x / hr) + (4.19E+01 lb NO_x / hr) = 1.18E+02 lb NO_x / hr$$

$$(1.18E+02 lb NO_x / hr)(hr/3600 \sec)(453.593 g/lb) = 1.49E+01 g NO_x / \sec$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
NO_x	1.18E+02	1.59E+02	1.49+01

SUBJECT: Volatile Organic Compounds (VOC) Maximum Potential Air Emissions Calculations (U)
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum Volatile Organic Compounds (VOC) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The only contributors to VOC emissions from the Canyon process are Tributyl Phoshpate (TBP) and N-Paraffin (assumed to be dodecane).
2. All of the TBP and N-Paraffin that enters the H-Canyon process originates from cold chemicals. The maximum concentration of each VOC is assumed to be 100% at cold chemicals prior to mixing that occurs in the H-Canyon process. Cold chemicals is at an ambient temperature (assumed to be 25C on annual average). The maximum concentration of N-Paraffin is 91.5 wt% within the active process and the maximum concentration of TBP is 35.35 wt% within the active process. The maximum temperature the VOCs are utilized at is 45C within the process.
3. This calculation compares the maximum emissions from cold chemicals and the maximum emissions from the interior canyon process where TBP and N-Paraffin are lower in concentration, but at higher temperatures. The highest emission rate of these two situations will be utilized as the bounding emission rate from the H-Canyon process.
4. Molecular weight of TBP is 266g/mole.
5. Molecular weight of N-Paraffin is assumed to be 170g/mol ($C_{12}H_{16}$).
6. The vessels containing raw materials are at ambient temperature and this is assumed to be approximately 25C on average throughout the year.
7. Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition does not provide vapor pressure for TBP at 25C. The vapor pressure of TBP is 1.13E-03mmHg at 25C (Skene WG, Krzmien ME; J Chem Eng Data 40: 394-7(1995)]
8. The vapor pressure of pure N-Paraffin (dodecane) at 25C is 0.1491mmHg obtained from Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition.
9. TBP has a density of 0.97g/cm^3 and N-Paraffin has a density of 0.75g/cm^3.
10. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 57 cubic feet per minute (cfm). This is the highest ventilation rate for the areas where TBP and N-Paraffin are located.
11. The emissions will be released uniformly over 8760hours/year.
12. Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition does not provide vapor pressure for TBP at 45C. The vapor pressure is estimated to be 0.4893mmHg based on data from the CRC Handbook of Lubrication & Tribology (1994) and a Fisher Scientific MSDS.
13. The vapor pressure of pure N-Paraffin (dodecane) at 45C is 0.6803 mmHg obtained from Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition.
14. Since the vapor pressure of N-Paraffin is higher than TBP the maximum emissions will be conservatively based on a 91.5wt% N-Paraffin and 8.5wt%TBP solution.
15. The maximum quantity of TBP and N-Paraffin utilized in the canyon process is 116,423 L/year. (SRNS-8100-2013-00102)

III. CALCULATIONS

Emission Calculations based on cold chemicals (maximum concentration at ambient temperature)

The number of moles of TBP and dodecane in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where: n = Number moles of TBP/dodecane in vapor
V = Volume
R = Universal Gas Constant, 62.36L mmHg/molK
T = Temperature, 25C = 298.15K
P – Pressure of TBP or N-Paraffin

$$V = (57cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 8.48E+08L/yr$$

$$\frac{(1.13E-03mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(298.15K)} = 5.15E+01moleTBP/yr$$

$$(\frac{5.15E+01moleTBP}{yr})(\frac{266g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 1.51E-02tonsTBP/yr$$

$$(\frac{1.51E-02tonsTBP}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 3.45E-03lbTBP/hr$$

$$(\frac{3.45E-03lbTBP}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 4.35E-04gTBP/\sec$$

$$\frac{(0.1491mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(298.15K)} = 6.80E+03moledodecane/yr$$

$$(\frac{6.80E+03moledodecane}{yr})(\frac{170g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 1.27E+00tonsdodecane/yr$$

$$(\frac{1.27E+00tonsdodecane}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 2.90E-01lbdodecane/hr$$

$$(\frac{2.90E-01lbdodecane}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 3.65E-02gdodecane/\sec$$

Constituent	Lb/hr	TPY	g/sec
TBP	3.45E-03	1.51E-02	4.35E-04
N-Paraffin (dodecane)	2.90E-01	1.27E+00	3.65E-02

Emission Calculations based on maximum temperature within canyon process

$$(0.97g/cm^3)(0.085) + (0.75g/cm^3)(0.915) = 0.77g/cm^3$$

$$(\frac{0.77g}{cm^3})(\frac{116{,}423LOrganics}{yr})(\frac{10^6 cm^3}{1000L}) = 8.96E+07gOrganics/yr$$

$$(8.96E+07gOrganics/yr)(0.915) = 8.20E+07gdodecane/yr$$

$$(\frac{8.20E+07gdodecane}{yr})(\frac{mole}{170g}) = 4.82E+05molesdodecane/yr$$

$$(8.96E+07gOrganics/yr)(0.085) = 7.62E+06gTBP/yr$$

$$(\frac{7.621E+06gTBP}{yr})(\frac{mole}{266g}) = 2.86E+04molesTBP/yr$$

Total Moles

$$(4.82E+05molesdodecane/yr) + (2.86E+04molesTBP/yr) = 5.11E+05moles$$

Constituent	Mole fraction
TBP	0.06
Dodecane (N-Paraffin)	0.94

Raoult's Law:

$$p_i = (x_i)(p_i^*)$$

where: p_i = pressure of component *i*

x_i = mole fraction of component *i* in solution

p_i^* = vapor pressure of the pure substance *I* (TBP or N-Paraffin)

$$p_{TBP} = (0.06)(0.4893\text{mm Hg}) = 0.029mmHg$$

$$p_{dodecane} = (0.94)(0.6803\text{mm Hg}) = 0.64mmHg$$

The number of moles of TBP and dodecane in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where:
- n = Number moles of TBP/dodecane in vapor
- V = Volume
- R = Universal Gas Constant, 62.36L mmHg/molK
- T = Temperature, 45C = 318.15K
- P = Partial Pressure of TBP or N-Paraffin

$$V = (57cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 8.48E+08L/yr$$

$$\frac{(0.029mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(318.15K)} = 1.24E+03moleTBP/yr$$

$$(\frac{1.24E+03moleTBP}{yr})(\frac{266g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 3.64E-01tonsTBP/yr$$

$$(\frac{3.64E-01tonsTBP}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 8.31E-02lbTBP/hr$$

$$(\frac{8.31E-02lbTBP}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 1.05E-02gTBP/\sec$$

$$\frac{(0.64mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(318.15K)} = 2.74E+04moledodecane/yr$$

$$(\frac{2.74E+04moledodecane}{yr})(\frac{170g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 5.13E+00tonsdodecane/yr$$

$$(\frac{5.13E+00tonsdodecane}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 1.17E+00lbdodecane/hr$$

$$(\frac{1.17E+00lbdodecane}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 1.47E-01gdodecane/\sec$$

Constituent	Lb/hr	TPY	g/sec
TBP	8.31E-02	3.64E-01	1.05E-02
N-Paraffin (dodecane)	1.17E+00	5.13E+00	1.47E-01

IV. RESULTS

The emission calculations based on heated temperatures within the canyon process at less than 100% TBP and N-Paraffin resulted in the highest emission rates. They will be used as the bounding emission rate for VOC from the canyon process.

Constituent	Lb/hr	TPY	g/sec
TBP	8.31E-02	3.64E-01	1.05E-02
N-Paraffin (dodecane)	1.17E+00	5.13E+00	1.47E-01
VOC	1.25E+00	5.49E+00	1.58E-01

December 19, 2013

SRNS-J2210-2013-00056
RSM Track #10808

TO: G. C. FANNING, 730-4B

FROM: K. A. WOLFE, 730-4B

SUPPORTING DOCUMENTATION FOR TRACE DETERMINATION FOR H-CANYON H001

In support of the effort to generate an accurate Form F for the site's Title V permit renewal application a trace determination was completed for the H-Canyon was reviewed. Attached are the calculations that will be transmitted with the Title V renewal application revision for the H001 tab. The following table summarizes the lb/hr emission rates from the attached calculations.

Pollutant	Emission rate (1 b/hr)	Wt%	Trace (y/n)
Mercury (Hg)	3.04E-04	1.95E-04	y
Nitric Acid (HNO3)	3.72E+01	23.8	n
Nitric Oxides (NOx)	1.18E+02	75.4	n
VOC	1.25E+00	0.8	NA

Trace determinations were based on the language contained in SCDHEC's Air Quality Modeling Guidelines dated July 2001 (http://www.scdhec.gov/environment/baq/docs/modeling/modguide.pdf). VOCs and trace constituents are not modeled. The SCDHEC permit engineer has also determined it is not necessary for the site to include trace constituents in the facility wide emissions (SRNS-OS-2012-00088).

Based on the above table and SCDHEC guidance, the trace mercury emissions from H001 will not be included in the site's modeling package or in the site's facility wide emissions.

Please contact me if you have any questions.

Att.

C: S. C. Powell, 705-H
Records Administration, 773-52A

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Mercury Maximum Potential Air Emissions Calculations (U)
Generated: Kim A. Wolfe Kim Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum mercury (Hg) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The first step of the H-Canyon Process is dissolving material in nitric acid. It may be necessary to utilize mercuric nitrate ($Hg(NO_3)_2$) to catalyze dissolving of some materials that enter the process. Some mercury, as mercuric nitrate, dissociates and is reduced onto the surface of the material thus forming an amalgam that enables rapid dissolution of the material being dissolved by the nitric acid. However, it is conservatively assumed that all of the Hg will remain elemental and will not compound with other materials in solution.
2. If $Hg(NO_3)_2$ is utilized it will be at a concentration of 0.02M $Hg(NO_3)_2$ in the dissolver. (SRNS-8100-2013-00102)
3. The other material in the dissolver is assumed to be 50% by weight HNO_3. This simplification is conservative since it results in a higher mole fraction for Hg.
4. Molecular weight of HNO_3 is 63 g/mole.
5. Molecular weight of $Hg(NO_3)_2$ is 324.6g/mol.
6. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 78 cubic feet per minute (cfm). This value is based on documents X-CLC-H-00026 and S-TSR-H-00006.
7. The density of 50 wt. % nitric acid at 100 °C is 1.26kg/L.
8. The vapor pressure of pure Hg at 100 °C is 0. 0.2729 mm Hg obtained from *Handbook of Chemistry and Physics* (56th ed.) and Lange's *Handbook of Chemistry* (10th ed.).
9. The Hg will be released uniformly over 8760 hours/year.

III. CALCULATIONS

$$\frac{(1.26kg50\%HNO_3)}{(L)}(0.5)\frac{(1000g)}{(kg)}\frac{(moleHNO_3)}{(63g)} = 1.00E+01moleHNO_3/L$$

$$\frac{(1.26kg50\%HNO_3)}{(L)}(0.5)\frac{(1000g)}{(kg)}\frac{(moleH_2O)}{(18g)} = 3.50E+01moleH_2O/L$$

Total Moles/L

$$(2.0E-02MHg)+(3.50E+01MH_2O)+(1.00E+01MHNO_3) = 45.02M$$

Constituent	Mole fraction
Hg	4.44E-04
HNO_3	2.22E-01
H_2O	7.77E-01

Raoult's Law:

$$p_i = (x_i)(p_i^*)$$

where: p_i = pressure of component *I*

x_i = mole fraction of component *i* in solution

p_i^* = vapor pressure of the pure substance *i*

$$p_i = (4.44E-04)(0.2729mmHg) = 1.21E-04mmHg$$

The number of moles of Hg in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where:
- n = Number moles of Hg in vapor
- V = Volume
- R = Universal Gas Constant, 62.36L mmHg/mole °K
- T = Temperature, 100C = 373.15K
- P = Partial Pressure of Hg

$$V = (78cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 1.16E+09L/yr$$

$$\frac{(1.21E-04mmHg)(1.16E+09L/yr)}{(62.36LmmHg/molK)(373.15K)} = 6.03E+00moleHg/yr$$

$$(6.03E+00moleHg/yr)(200.59g/moleHg)(1lb/453.593g)(1ton/2000lb) = 1.33E-03tonsHg/yr$$

$$(1.33E-03tonsHg/yr)(2000lb/ton)(year/8760hours) = 3.04E-04lbHg/hr$$

$$(3.04E-04lb/hr)(453.593g/lb)(hr/60\min)(\min/60\sec) = 3.83E-05gHg/\sec$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
Hg	3.04E-04	1.33E-03	3.83E-05

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Nitric Acid Maximum Potential Air Emissions Calculations (U) **SHEET 1 OF 1 SHEETS**
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum nitric acid potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The first step of the H-Canyon Process is dissolving material in nitric acid.
2. There are points within the H-Canyon Process that concentrates nitric acid. The maximum nitric acid concentration throughout the H-Canyon Process is 52%. This percent is reached at the Acid Recovery portion of the process, but is conservatively applied throughout the Canyon Process.
3. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 78 cubic feet per minute (cfm). This value is based on documents X-CLC-H-00026 and S-TSR-H-00006.
4. The highest temperature utilized in the H-Canyon Process is 100C.
5. Molecular weight of HNO_3 is 63g/mole.
6. The partial pressures of a 52% nitric acid solution at 100C is conservatively represented in Perry's Chemical Engineers' Handbook for the partial pressures listed at 55% at 100C (47mmHg for HNO_3 and 331mmHg for H_2O).
7. There are no control devices for HNO3 so controlled and uncontrolled emissions are the same.

III. CALCULATIONS

The number of moles of nitric acid in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where:
- n = Number moles of nitric acid or water in vapor
- V = Volume
- R = Universal Gas Constant, 62.36L mmHg/molK
- T = Temperature, 100C = 373.15K
- P Partial Pressure of nitric acid or water

$$V = (78cfm)(60\,\text{min}/hr)(8760hour/year)(1000L/35.3145ft^3) = 1.16E+09L/yr$$

$$n_{HNO_3} = \frac{(47mmHg)(1.16E+09L/yr)}{(62.36LmmHg/molK)(373.15K)}$$

$$n_{HNO_3} = 2.34E+06molesHNO_3$$

$$mass_{HNO_3} = (2.34E+06molesHNO_3)(63g/mole)(1lb/453.593g)(1ton/2000lb) = 1.63E+02tons/yr$$

$$mass_{HNO_3} = (1.63E+02tons/yr)(2000lb/1tons)(1year/8760hours) = 3.72E+01lb/hr$$

$$mass_{HNO_3} = (3.72E+01lb/hr)(1hr/60\,\text{min})(1\,\text{min}/60\,\text{sec})(453.593g/lb) = 4.69E+00g/\text{sec}$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
HNO_3	3.72E+01	1.63E+02	4.69E+00

EMISSION UNIT NAME: H-Canyon (HSP2) Emission Unit H001
SUBJECT: Nitric Oxides (NO_x) Maximum Potential Air Emissions Calculations (U)
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum Nitric Oxides (NOx) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The NO_x emitted from H-Canyon Process Operations originates from the nitric acid (HNO_3) used during the dissolving of metal materials and neutralizations in the High and Low Level Waste systems. Other sources of NO_x emissions in the H-Canyon Processes are negligible in comparison to dissolving (dissolution) and neutralizations operations.
2. The maximum annual emissions of NO_x from the dissolving process can be based on the maximum quantity of 50% by weight nitric acid received into the process. This value is 818,284 L/year. (SRNS-8100-2013-00102)
3. There will be a maximum of 180 dissolutions/yr. (SRNS-8100-203-00102)
4. During each dissolution process the NO_x emissions occurs within the first 20 hours.
5. NO_x includes emissions of NO_2 and NO.
6. Density of 50%wt HNO_3 is 1.3kg/L.
7. Molecular weight of HNO_3 is 63g/mole.
8. The maximum amount of $NaNO_2$ used in the Low Level Waste portion and High Level Waste portions of the process is a combined value of 32.4 tons/yr. (SRNS-8100-2013-00102)
9. A maximum of 516 neutralization processes per year will be completed in the combined High Level and Low Level Waste processes. (SRNS-8100-2013-00102) Assume NO_x is released during the first 2 hours of each neutralization process.
10. Molecular weight of $NaNO_2$ is 69g/mole.
11. Molecular weight of NO_x is 46g/mole.
12. Reactions are not temperature dependent.
13. There are no control devices for NO_x so controlled and uncontrolled emissions are the same.

III. CALCULATIONS

<u>Dissolving-NO_x from HNO_3</u>

The quantity of nitric acid required to dissolve a material is dependent on the material to be dissolved. The dissolving chemical equations that result in the highest generation of NO_x is the dissolution of aluminum clad Uranium:

$$U + 4.5HNO_3 \Rightarrow UO_2(NO_3)_2 + 1.55NO + 0.87NO_2 + 0.05N_2 + 2.25H_2O$$

$$Al + 3.75HNO_3 \Rightarrow Al(NO_3)_3 + 0.23NO + 0.15N_2O + 0.11N_2 + 1.9H_2O$$

$$8.25molesHNO_3result\sin 2.65molesNO_x$$

$$(818{,}284L50\%wtHNO_3)(1.3kg/L)(0.5) = 5.32E + 05kgHNO_3$$

$$(5.32E + 05kgHNO_3)(1000g/kg)(mole/63g) = 8.44E + 06molesHNO_3$$

$$(8.44E + 06molesHNO_3)(2.65molesNO_x/8.25molesHNO_3) = 2.71E + 06molesNO_x$$

$$(2.71E + 06molesNO_x)(46g/mol)(1lb/453.593g)(ton/2000lb) = 1.37E + 02tonsNO_x/yr$$

$$(1.37E + 02tonsNO_x/yr)(yr/180dissolutions)(dissolution/20hrs)(2000lb/ton) = 76.3lbsNO_x/hr$$

Low and High Level Waste- NO_x from $NaNO_2$

Sodium nitrite ($NaN0_2$) is added to the Low and High Level Waste Portions of the H-Canyon Process. This addition is another source of NO_x based on the following equation:

$$NaNO_2 \Rightarrow Na + NO_2$$

1 mole $NaNO_2$ results in 1 mole NO_x.

$$(32.4 tonsNaNO_2)(2000lb/ton)(453.593g/lb)(mole/69g) \Rightarrow 4.26E+05molesNaNO_2$$

$$(4.26E+05molesNaNO_2)(1moleNO_x/1moleNaNO_2 = 4.26E+05molesNO_x$$

$$(4.26E+05molesNO_x)(46g/mol)(1lb/453.593g)(ton/2000lb) = 2.16E+01tonsNO_x/yr$$

$$(2.16E+01tonsNO_x/yr)(2000lb/ton)(yr/516neutralizations)(neutralization/2hr) = 4.19E+01lbNO_x/hr$$

Total NOx from H-Canyon Process

$$(1.37E+02tonsNO_x/yr) + (2.16E+01tonsNO_x/yr) = 1.59E+02tonsNO_x/yr$$

$$(76.3lbsNO_x/hr) + (4.19E+01lbNO_x/hr) = 1.18E+02lbNO_x/hr$$

$$(1.18E+02lbNO_x/hr)(hr/3600\sec)(453.593g/lb) = 1.49E+01gNO_x/\sec$$

IV. RESULTS

Constituent	Lb/hr	TPY	g/sec
NO_x	1.18E+02	1.59E+02	1.49+01

SUBJECT: Volatile Organic Compounds (VOC) Maximum Potential Air Emissions Calculations (U)
Generated: Kim A. Wolfe Kim A. Wolfe 12/16/2013
Reviewed: Sherman C. Powell Sherman C. Powell 12/16/2013

I. OBJECTIVE

This calculation determines maximum Volatile Organic Compounds (VOC) potential air emissions from the H-Canyon Process.

II. ASSUMPTIONS

1. The only contributors to VOC emissions from the Canyon process are Tributyl Phoshpate (TBP) and N-Paraffin (assumed to be dodecane).
2. All of the TBP and N-Paraffin that enters the H-Canyon process originates from cold chemicals. The maximum concentration of each VOC is assumed to be 100% at cold chemicals prior to mixing that occurs in the H-Canyon process. Cold chemicals is at an ambient temperature (assumed to be 25C on annual average). The maximum concentration of N-Paraffin is 91.5 wt% within the active process and the maximum concentration of TBP is 35.35 wt% within the active process. The maximum temperature the VOCs are utilized at is 45C within the process.
3. This calculation compares the maximum emissions from cold chemicals and the maximum emissions from the interior canyon process where TBP and N-Paraffin are lower in concentration, but at higher temperatures. The highest emission rate of these two situations will be utilized as the bounding emission rate from the H-Canyon process.
4. Molecular weight of TBP is 266g/mole.
5. Molecular weight of N-Paraffin is assumed to be 170g/mol ($C_{12}H_{16}$).
6. The vessels containing raw materials are at ambient temperature and this is assumed to be approximately 25C on average throughout the year.
7. Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition does not provide vapor pressure for TBP at 25C. The vapor pressure of TBP is 1.13E-03mmHg at 25C (Skene WG, Krzmien ME; J Chem Eng Data 40: 394-7(1995)]
8. The vapor pressure of pure N-Paraffin (dodecane) at 25C is 0.1491mmHg obtained from Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition.
9. TBP has a density of 0.97g/cm^3 and N-Paraffin has a density of 0.75g/cm^3.
10. The H-Canyon Process vessels are all actively and continuously ventilated to the H-Canyon stack. The ventilation rate used for emission calculations is 57 cubic feet per minute (cfm). This is the highest ventilation rate for the areas where TBP and N-Paraffin are located.
11. The emissions will be released uniformly over 8760hours/year.
12. Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition does not provide vapor pressure for TBP at 45C. The vapor pressure is estimated to be 0.4893mmHg based on data from the CRC Handbook of Lubrication & Tribology (1994) and a Fisher Scientific MSDS.
13. The vapor pressure of pure N-Paraffin (dodecane) at 45C is 0.6803 mmHg obtained from Yaws' Handbook of Antoine Coefficient for Vapor Pressure, 2nd Electronic Edition.
14. Since the vapor pressure of N-Paraffin is higher than TBP the maximum emissions will be conservatively based on a 91.5wt% N-Paraffin and 8.5wt%TBP solution.
15. The maximum quantity of TBP and N-Paraffin utilized in the canyon process is 116,423 L/year. (SRNS-8100-2013-00102)

III. CALCULATIONS

Emission Calculations based on cold chemicals (maximum concentration at ambient temperature)

The number of moles of TBP and dodecane in the vapor can be calculated from the ideal gas law.

$$n = \frac{PV}{RT}$$

where:
- n = Number moles of TBP/dodecane in vapor
- V = Volume
- R = Universal Gas Constant, 62.36L mmHg/molK
- T = Temperature, 25C = 298.15K
- P = Pressure of TBP or N-Paraffin

$$V = (57cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 8.48E+08L/yr$$

$$\frac{(1.13E-03mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(298.15K)} = 5.15E+01moleTBP/yr$$

$$(\frac{5.15E+01moleTBP}{yr})(\frac{266g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 1.51E-02tonsTBP/yr$$

$$(\frac{1.51E-02tonsTBP}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 3.45E-03lbTBP/hr$$

$$(\frac{3.45E-03lbTBP}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 4.35E-04gTBP/\sec$$

$$\frac{(0.1491mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(298.15K)} = 6.80E+03moledodecane/yr$$

$$(\frac{6.80E+03moledodecane}{yr})(\frac{170g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 1.27E+00tonsdodecane/yr$$

$$(\frac{1.27E+00tonsdodecane}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 2.90E-01lbdodecane/hr$$

$$(\frac{2.90E-01lbdodecane}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 3.65E-02gdodecane/\sec$$

Constituent	Lb/hr	TPY	g/sec
TBP	3.45E-03	1.51E-02	4.35E-04
N-Paraffin (dodecane)	2.90E-01	1.27E+00	3.65E-02

Emission Calculations based on maximum temperature within canyon process

$$(0.97g/cm^3)(0.085)+(0.75g/cm^3)(0.915)=0.77g/cm^3$$

$$(\frac{0.77g}{cm^3})(\frac{116{,}423LOrganics}{yr})(\frac{10^6cm^3}{1000L})=8.96E+07gOrganics/yr$$

$$(8.96E+07gOrganics/yr)(0.915)=8.20E+07gdodecane/yr$$

$$(\frac{8.20E+07gdodecane}{yr})(\frac{mole}{170g})=4.82E+05molesdodecane/yr$$

$$(8.96E+07gOrganics/yr)(0.085)=7.62E+06gTBP/yr$$

$$(\frac{7.621E+06gTBP}{yr})(\frac{mole}{266g})=2.86E+04molesTBP/yr$$

Total Moles

$$(4.82E+05molesdodecane/yr)+(2.86E+04molesTBP/yr)=5.11E+05moles$$

Constituent	Mole fraction
TBP	0.06
Dodecane (N-Paraffin)	0.94

Raoult's Law:

$$p_i=(x_i)(p_i^*)$$

where: p_i = pressure of component *i*

x_i = mole fraction of component *i* in solution

p_i^* = vapor pressure of the pure substance *I* (TBP or N-Paraffin)

$$p_{TBP}=(0.06)(0.4893\text{mm Hg})=0.029mmHg$$

$$p_{dodecane}=(0.94)(0.6803\text{mm Hg})=0.64mmHg$$

The number of moles of TBP and dodecane in the vapor can be calculated from the ideal gas law.

$$n=\frac{PV}{RT}$$

where:
- n = Number moles of TBP/dodecane in vapor
- V = Volume
- R = Universal Gas Constant, 62.36L mmHg/molK
- T = Temperature, 45C = 318.15K
- P = Partial Pressure of TBP or N-Paraffin

$$V = (57cfm)(60\min/hr)(8760hour/year)(1000L/35.3145ft^3) = 8.48E+08L/yr$$

$$\frac{(0.029mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(318.15K)} = 1.24E+03moleTBP/yr$$

$$(\frac{1.24E+03moleTBP}{yr})(\frac{266g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 3.64E-01tonsTBP/yr$$

$$(\frac{3.64E-01tonsTBP}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 8.31E-02lbTBP/hr$$

$$(\frac{8.31E-02lbTBP}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 1.05E-02gTBP/\sec$$

$$\frac{(0.64mmHg)(8.48E+08L/yr)}{(62.36LmmHg/molK)(318.15K)} = 2.74E+04moledodecane/yr$$

$$(\frac{2.74E+04moledodecane}{yr})(\frac{170g}{mole})(\frac{lb}{453.593g})(\frac{ton}{2000lb}) = 5.13E+00tonsdodecane/yr$$

$$(\frac{5.13E+00tonsdodecane}{yr})(\frac{2000lb}{ton})(\frac{yr}{8760hours}) = 1.17E+00lbdodecane/hr$$

$$(\frac{1.17E+00lbdodecane}{hr})(\frac{453.593g}{lb})(\frac{hr}{60\min})(\frac{\min}{60\sec}) = 1.47E-01gdodecane/\sec$$

Constituent	Lb/hr	TPY	g/sec
TBP	8.31E-02	3.64E-01	1.05E-02
N-Paraffin (dodecane)	1.17E+00	5.13E+00	1.47E-01

IV. RESULTS

The emission calculations based on heated temperatures within the canyon process at less than 100% TBP and N-Paraffin resulted in the highest emission rates. They will be used as the bounding emission rate for VOC from the canyon process.

Constituent	Lb/hr	TPY	g/sec
TBP	8.31E-02	3.64E-01	1.05E-02
N-Paraffin (dodecane)	1.17E+00	5.13E+00	1.47E-01
VOC	1.25E+00	5.49E+00	1.58E-01

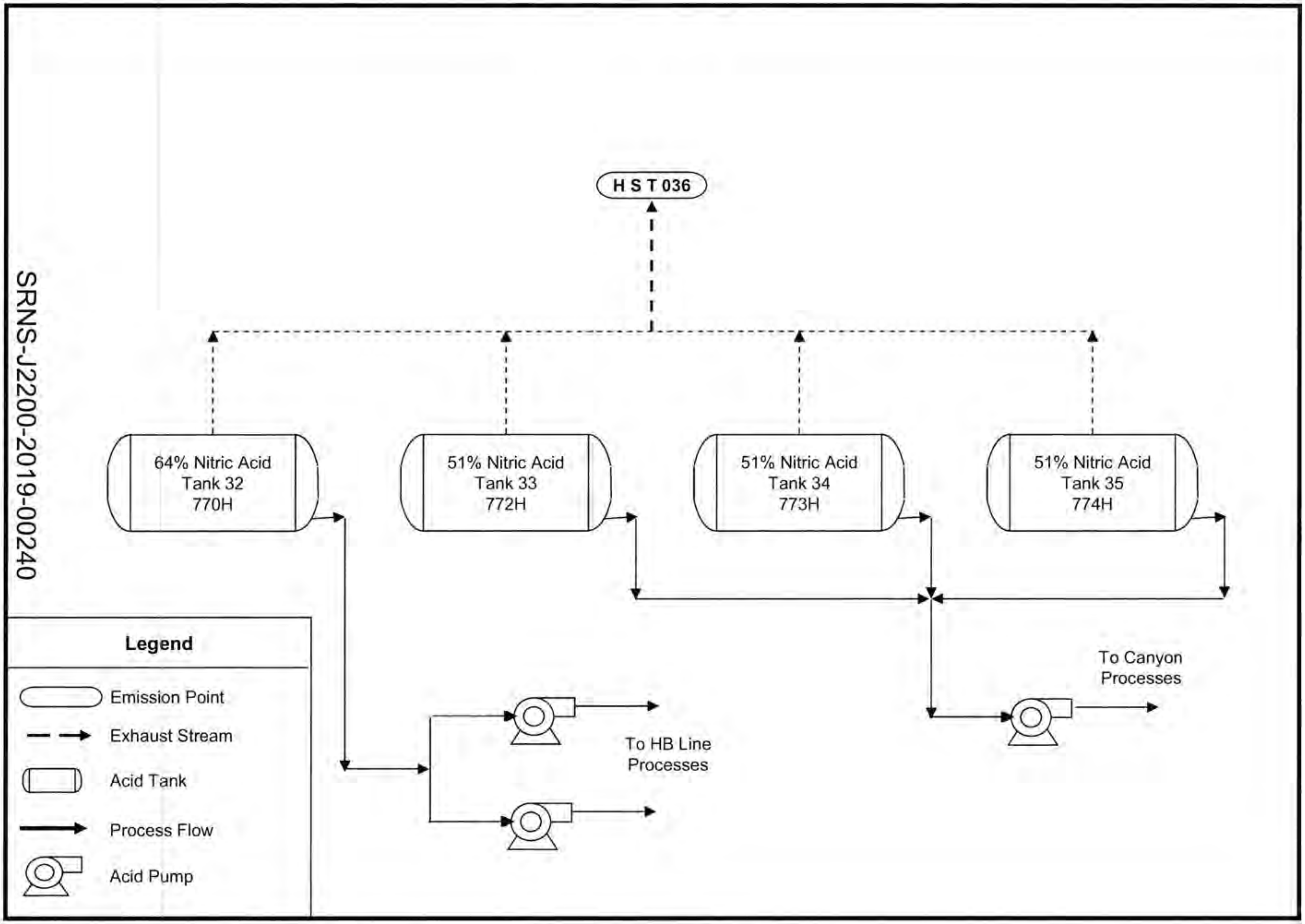
	A	B	C	D	E	F	G	H	I	J	K
1	Begin Date	Name	DHECID	PermitType (None)	PTC_Nitrogen Dioxide (NO2) (ton/yr)	PTC_NOx (ton/yr)	PTC_VOC (ton/yr)	PTC_Ammonia (ton/yr)	PTC_nitric acid (ton/yr)	Hg (TPY)	
2	1/1/2012 12:00:00 AM	H-SP0002	99CH	Title V non-exempt	1.59E+02	1.59E+02	5.49E+00		1.63E+02	1.33E-03	
17	1/1/2012 12:00:00 AM	H-SP0002~1	15DH	Emission Lvl	2.36E-01	2.36E-01		5.23E-01			
19	1/1/2012 12:00:00 AM	H-SP0002~1	14DH	Emission Lvl	8.10E-01	8.10E-01					
28		H-SP0002~1	41DH	Emission Lvl					1.38E-02		
29		H-SP0002~1	40DH	Emission Lvl					1.82E-03		
30											
31											
32	Total TPY				1.60E+02	1.60E+02	5.49E+00	5.23E-01	1.63E+02	1.33E-03	
33	wt%				48.6	48.6	1.7	0.2	49.5	0.0	100.00
34	Trace				No	No	No	Yes	No	Yes	
35								non-carcinogen			
36											
37											
38											
39	H-SP0002 99CH represents all the Canyon Process Emissions. H-SP0002~1 is the HB-Line Process Emissions.										
40											
41											
42	Conclusion: Only NO2/NOx, VOC and Nitric Acid must be reported from H-SP0002. HB-Line (H-SP0002~ is an IA).										

SRNS-J2000-2013-00099

Title V Permit Application
Emission Unit H-015
Process Description

The purpose of the Nitric Acid Cold Chemical Storage Tanks is to receive, store, and transfer nitric acid for use in the H Canyon (51%) and HB-Line processes (64%).

Emission Unit H-015



SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
H-015	211-H NITRIC ACID TANKS	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

H-015			RADIOACTIVE MATERIALS	2819 - 325188	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
H-015	770H	64% NITRIC ACID TANK 32	1953		N/A	H S T 036	17700 GAL
H-015	772H	51% NITRIC ACID TANK 33	1953		N/A	H S T 036	17700 GAL
H-015	773H	51% NITRIC ACID TANK 34	1953		N/A	H S T 036	17700 GAL
H-015	774H	51% NITRIC ACID TANK 35	1953		N/A	H S T 036	17700 GAL

EQUIPMENT DESCRIPTION (CONTINUED)

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
H-015	N/A	N/A	GRANDFATHERED	NONE

SRNS-J2200-2019-00240

South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

Please Refer to Instruction / Definitions Pages Before Completing This Form

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
H-015	H S T 036	NITRIC ACID	7697 37 2	TAP	1.26E-01	3.65E-01	1.26E-01	3.65E-01

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
H-015	H S T 036	NITRIC ACID	EPA AP-42	N/A

SRNS-J2200-2019-00240

South Carolina Department of Health and Environmental Control

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
NITRIC ACID SOLUTION	226,168 GALLONS		2819 - 325188	

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
211-H NITRIC ACID TANKS	H-015	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	40% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
H-015	SC 61-62.5, Std. 4, Sect. IX	Y	CLB	Apr-03	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
H-015	N/A	N/A	N/A	N/A	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
H-015	N/A	N/A	N/A	N/A	N	N/A

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III
(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
H-015	N/A	N/A	NO APPLICIABLE REQUIREMENTS	NONE

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)										
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			25. Reason Exempt?
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	
H-015	211-H NITRIC ACID TANKS	NITRIC ACID	3.65E-01		3.65E-01		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

H-015 Summary of Tanks 4.09d outputs and conversions

SCDHEC ID	Nitric Acid Concentration (%)	Water Emissions lb/yr	Nitric Acid Emissions (lb/yr)	Nitric Acid Emissions (TPY)	Average Nitric Acid Emissions (lb/hr)	Highest total monthly emission rate (total lb/month)	Maximum Nitric Acid Emissions (lb/hr)
770H	64	48.36	220.05	1.10E-01	2.51E-02	34.1471	3.83E-02
772H	51	63.79	170.03	8.50E-02	1.94E-02	29.2775	2.92E-02
773H	51	63.79	170.03	8.50E-02	1.94E-02	29.2775	2.92E-02
774H	51	63.79	170.03	8.50E-02	1.94E-02	29.2775	2.92E-02
Total				3.65E-01	8.33E-02		1.26E-01

Example of Maxium Nitric Acid Emissions (lb/hr) calculation for 770H:

(34.1471lbtotal/month of July)(12month/yr)(yr/8760hr)(220.05lbnitric acid/(220.05lbs nitric acid+48.36lb water))=3.83E-02lb/hr nitric acic

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	770H
City:	Aiken
State:	South Carolina
Company:	SRNS
Type of Tank:	Horizontal Tank
Description:	H-ST0036-0002 Nitric Acid Storage Tank 32 (64%), 17,700 gal

Tank Dimensions

Shell Length (ft):		36.00
Diameter (ft):		9.00
Volume (gallons):		17,700.00
Turnovers:		0.56
Net Throughput(gal/yr):		10,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition:	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

770H - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Nitric Acid Solution	Jan	60.90	52.65	69.15	66.26	0.4163	0.3140	0.5465	43.9995			33.18	
Nitric Acid						0.7133	0.5443	0.9252	63.0100	0.8400	0.8269	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.2654	0.1989	0.3539	18.0200	0.3600	0.1731	18.02	Option 2: A=8.056, B=1723.84, C=233.08
Nitric Acid Solution	Feb	63.92	54.07	73.77	66.26	0.4605	0.3299	0.6337	43.8874			33.18	
Nitric Acid						0.7855	0.5707	1.0859	63.0100	0.8400	0.8255	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.2952	0.2074	0.4139	18.0200	0.3600	0.1745	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Mar	69.22	57.61	80.82	66.26	0.5477	0.3726	0.7898	43.6925			33.18	
Nitric Acid						0.9273	0.6414	1.3153	63.0100	0.8400	0.8229	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.3547	0.2360	0.5226	18.0200	0.3600	0.1771	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Apr	74.35	60.71	87.99	66.26	0.6455	0.4138	0.9814	43.5058			33.18	
Nitric Acid						1.0648	0.7091	1.6160	63.0100	0.8400	0.8204	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.4221	0.2637	0.6578	18.0200	0.3600	0.1796	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	May	78.64	64.65	92.63	66.26	0.7383	0.4717	1.1256	43.3516			33.18	
Nitric Acid						1.2333	0.8038	1.8437	63.0100	0.8400	0.8184	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.4888	0.3028	0.7605	18.0200	0.3600	0.1816	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jun	82.01	68.15	95.86	66.26	0.8190	0.5291	1.2384	43.2315			33.18	
Nitric Acid						1.3818	0.8970	2.0181	63.0100	0.8400	0.8168	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.5431	0.3420	0.8400	18.0200	0.3600	0.1832	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jul	83.01	69.91	96.12	66.26	0.8446	0.5601	1.2455	43.1957			33.18	
Nitric Acid						1.4023	0.9474	2.0302	63.0100	0.8400	0.8163	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.5811	0.3633	0.8465	18.0200	0.3600	0.1837	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Aug	81.61	69.43	93.78	66.26	0.8090	0.5515	1.1640	43.2457			33.18	
Nitric Acid						1.3459	0.9334	1.9036	63.0100	0.8400	0.8169	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.5381	0.3573	0.7880	18.0200	0.3600	0.1831	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Sep	78.00	66.70	89.29	66.26	0.7237	0.5047	1.0201	43.3746			33.18	
Nitric Acid						1.2100	0.8574	1.8787	63.0100	0.8400	0.8187	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.4764	0.3253	0.6852	18.0200	0.3600	0.1813	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Oct	72.11	61.11	83.12	66.26	0.6011	0.4193	0.8472	43.5871			33.18	
Nitric Acid						1.0134	0.7181	1.4084	63.0100	0.8400	0.8215	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.3914	0.2673	0.5629	18.0200	0.3600	0.1785	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Nov	66.38	57.08	75.68	66.26	0.4990	0.3656	0.6726	43.7975			33.18	
Nitric Acid						0.8482	0.6298	1.1283	63.0100	0.8400	0.8243	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.3214	0.2312	0.4409	18.0200	0.3600	0.1757	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Dec	62.03	53.88	70.17	66.26	0.4324	0.3278	0.5646	43.9575			33.18	
Nitric Acid						0.7398	0.5672	0.9550	63.0100	0.8400	0.8264	63.01	Option 2: A=7.584, B=1431.75, C=222.686
Water						0.2762	0.2060	0.3865	18.0200	0.3600	0.1736	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

770H - Horizontal Tank
Aiken, South Carolina

Month	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)	10.1834	12.2314	19.0621	25.7035	31.2208	33.2259	33.4232	29.6338	23.6810	19.7737	13.3459	10.4217
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Vapor Density (lb/cu ft)	0.0033	0.0038	0.0042	0.0049	0.0055	0.0061	0.0063	0.0060	0.0054	0.0046	0.0039	0.0034
Vapor Space Expansion Factor	0.0755	0.0924	0.1130	0.1383	0.1466	0.1490	0.1417	0.1298	0.1166	0.1089	0.0881	0.0749
Vented Vapor Saturation Factor	0.9097	0.9010	0.8845	0.8666	0.8503	0.8366	0.8323	0.8383	0.8528	0.8748	0.8936	0.9065
Tank Vapor Space Volume												
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Effective Diameter (ft)	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Tank Shell Length (ft)	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Vapor Density												
Vapor Density (lb/cu ft)	0.0033	0.0038	0.0042	0.0049	0.0055	0.0061	0.0063	0.0060	0.0054	0.0046	0.0039	0.0034
Vapor Molecular Weight (lb/lb-mole)	43.9995	43.8874	43.6925	43.5058	43.3516	43.2315	43.1957	43.2457	43.3748	43.5871	43.7975	43.9575
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.4163	0.4805	0.5477	0.6455	0.7383	0.8190	0.8448	0.8090	0.7237	0.6011	0.4990	0.4324
Daily Avg. Liquid Surface Temp. (deg. R)	520.5670	523.5896	528.8887	534.0236	538.3091	541.6759	542.6846	541.2768	537.6666	531.7807	526.0271	521.6969
Daily Average Ambient Temp. (deg. F)	43.8500	47.4000	55.5000	62.6000	70.8000	77.4500	80.8000	79.7000	74.4000	63.7500	54.9500	47.1500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R)	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292
Tank Paint Solar Absorptance (Shell)	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day)	837.2755	1,109.1759	1,432.1566	1,806.5354	1,948.9896	2,014.6645	1,926.0498	1,756.0695	1,518.1370	1,294.7789	944.5128	777.3115
Vapor Space Expansion Factor												
Vapor Space Expansion Factor	0.0755	0.0924	0.1130	0.1383	0.1466	0.1490	0.1417	0.1298	0.1166	0.1089	0.0881	0.0749
Daily Vapor Temperature Range (deg. R)	33.0057	39.4087	46.4203	54.5584	55.9728	55.4232	52.4061	48.6999	45.1773	44.0206	37.2075	32.5640
Daily Vapor Pressure Range (psia)	0.2325	0.3038	0.4172	0.5676	0.6539	0.7073	0.6654	0.6125	0.5154	0.4280	0.3070	0.2371
Breather Vent Press. Setting Range(psia)	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.4163	0.4805	0.5477	0.6455	0.7383	0.8190	0.8448	0.8090	0.7237	0.6011	0.4990	0.4324
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.3140	0.3299	0.3726	0.4138	0.4717	0.5291	0.5801	0.5515	0.5047	0.4193	0.3656	0.3278
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.5465	0.6337	0.7898	0.9814	1.1256	1.2364	1.2455	1.1640	1.0201	0.8472	0.6726	0.5648
Daily Avg. Liquid Surface Temp. (deg R)	520.5670	523.5896	528.8887	534.0236	538.3091	541.6759	542.6846	541.2768	537.6666	531.7807	526.0271	521.6969
Daily Min. Liquid Surface Temp. (deg R)	512.3155	513.7379	517.2836	520.3847	524.3159	527.8201	529.5831	529.1019	526.3722	520.7755	516.7252	513.5506
Daily Max. Liquid Surface Temp. (deg R)	528.8184	533.4413	540.4937	547.6629	552.3023	555.5317	555.7861	553.4518	548.9609	542.7858	535.3289	529.8429
Daily Ambient Temp. Range (deg. R)	23.7000	25.4000	26.8000	28.0000	26.2000	23.7000	21.8000	21.2000	22.6000	26.9000	26.7000	24.7000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor	0.9097	0.9010	0.8845	0.8666	0.8503	0.8366	0.8323	0.8383	0.8528	0.8748	0.8936	0.9065
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.4163	0.4805	0.5477	0.6455	0.7383	0.8190	0.8448	0.8090	0.7237	0.6011	0.4990	0.4324
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Working Losses (lb)	0.3635	0.4010	0.4748	0.5572	0.6350	0.7025	0.7239	0.6942	0.6226	0.5198	0.4336	0.3771
Vapor Molecular Weight (lb/lb-mole)	43.9995	43.8874	43.6925	43.5058	43.3516	43.2315	43.1957	43.2457	43.3748	43.5871	43.7975	43.9575
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.4163	0.4805	0.5477	0.6455	0.7383	0.8190	0.8448	0.8090	0.7237	0.6011	0.4990	0.4324
Net Throughput (gal/mo.)	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333	833.3333
Annual Turnovers	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650	0.5650
Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Working Loss Product Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb)	10.5469	12.6324	19.5369	26.2607	31.8558	33.9284	34.1471	30.3280	24.3036	20.2935	13.7795	10.7988

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

770H - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Solution	6.51	261.91	268.41
Nitric Acid	5.34	214.72	220.05
Water	1.17	47.19	48.36

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	772H	
City:	Aiken	
State:	South Carolina	
Company:	SRNS	
Type of Tank:	Horizontal Tank	
Description:	H-ST0036-0003 Nitric Acid Storage Tank 33 (51%), 17,700 gal	
Tank Dimensions		
Shell Length (ft):		36.00
Diameter (ft):		9.00
Volume (gallons):		17,700.00
Turnovers:		4.20
Net Throughput(gal/yr):		72,056.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Medium	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

772H - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Nitric Acid Solution	Jan	60.90	52.65	69.15	66.26	0.3681	0.2766	0.4849	38.0167			28.34	
Nitric Acid						0.7133	0.5443	0.9252	63.0100	0.5100	0.7367	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.2654	0.1969	0.3539	18.0200	0.4900	0.2633	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Feb	63.92	54.07	73.77	66.26	0.4077	0.2906	0.5635	37.9034			28.34	
Nitric Acid						0.7855	0.5707	1.0659	63.0100	0.5100	0.7347	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.2952	0.2074	0.4139	18.0200	0.4900	0.2653	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Mar	69.22	57.61	80.82	66.26	0.4661	0.3289	0.7045	37.7072			28.34	
Nitric Acid						0.9273	0.6414	1.3153	63.0100	0.5100	0.7312	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.3547	0.2380	0.5226	18.0200	0.4900	0.2688	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Apr	74.35	60.71	87.99	66.26	0.5741	0.3658	0.8760	37.5201			28.34	
Nitric Acid						1.0648	0.7091	1.6180	63.0100	0.5100	0.7279	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.4221	0.2637	0.6576	18.0200	0.4900	0.2721	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	May	78.84	64.65	92.83	66.26	0.6579	0.4177	1.0090	37.3881			28.34	
Nitric Acid						1.2333	0.8038	1.6437	63.0100	0.5100	0.7251	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.4866	0.3028	0.7606	18.0200	0.4900	0.2749	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jun	82.01	68.15	95.68	66.26	0.7309	0.4693	1.1096	37.2486			28.34	
Nitric Acid						1.3616	0.8970	2.0161	63.0100	0.5100	0.7230	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.5431	0.3420	0.8400	18.0200	0.4900	0.2770	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jul	83.01	69.91	96.12	66.26	0.7541	0.4972	1.1181	37.2111			28.34	
Nitric Acid						1.4023	0.9474	2.0302	63.0100	0.5100	0.7223	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.5611	0.3633	0.8485	18.0200	0.4900	0.2777	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Aug	81.61	69.43	93.78	66.26	0.7219	0.4895	1.0439	37.2607			28.34	
Nitric Acid						1.3459	0.9334	1.9038	63.0100	0.5100	0.7232	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.5361	0.3573	0.7860	18.0200	0.4900	0.2768	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Sep	76.00	66.70	89.29	66.26	0.6447	0.4474	0.9131	37.3691			28.34	
Nitric Acid						1.2100	0.8574	1.6787	63.0100	0.5100	0.7255	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.4764	0.3253	0.6852	18.0200	0.4900	0.2745	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Oct	72.11	61.11	83.12	66.26	0.5341	0.3707	0.7564	37.6014			28.34	
Nitric Acid						1.0134	0.7181	1.4064	63.0100	0.5100	0.7293	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.3914	0.2673	0.5629	18.0200	0.4900	0.2707	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Nov	66.36	57.06	75.66	66.26	0.4423	0.3227	0.5966	37.8128			28.34	
Nitric Acid						0.8482	0.6296	1.1283	63.0100	0.5100	0.7331	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.3214	0.2312	0.4409	18.0200	0.4900	0.2669	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Dec	62.03	53.86	70.17	66.26	0.3825	0.2869	0.5015	37.9742			28.34	
Nitric Acid						0.7396	0.5672	0.9550	63.0100	0.5100	0.7359	63.01	Option 2: A=7.564, B=1431.75, C=222.666
Water						0.2762	0.2060	0.3685	18.0200	0.4900	0.2641	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

772H - Horizontal Tank
Aiken, South Carolina

Month	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)	7.8822	9.2307	14.3930	19.4170	23.5933	25.1154	25.2660	22.3978	17.8925	14.9332	10.0732	7.8625
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Vapor Density (lb/cu ft)	0.0025	0.0026	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0026
Vapor Space Expansion Factor	0.0738	0.0902	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Vented Vapor Saturation Factor	0.9193	0.9114	0.8961	0.8798	0.8644	0.8516	0.8478	0.8531	0.8667	0.8870	0.9046	0.9184
Tank Vapor Space Volume												
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Effective Diameter (ft)	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Tank Shell Length (ft)	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Vapor Density												
Vapor Density (lb/cu ft)	0.0025	0.0028	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0026
Vapor Molecular Weight (lb/lb-mole)	38.0167	37.9034	37.7072	37.5201	37.3661	37.2466	37.2111	37.2607	37.3891	37.6014	37.8128	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3661	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3625
Daily Avg. Liquid Surface Temp. (deg. R)	520.5870	523.5896	528.8887	534.0238	538.3091	541.6759	542.6846	541.2788	537.6666	531.7507	526.0271	521.6969
Daily Average Ambient Temp. (deg. F)	43.8500	47.4000	55.5000	62.6000	70.6000	77.4500	80.8000	79.7000	74.4000	63.7500	54.9500	47.1500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R)	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292
Tank Paint Solar Absorptance (Shell)	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day)	837.2755	1,109.1759	1,432.1568	1,808.5354	1,948.9896	2,014.8845	1,928.0498	1,758.0895	1,518.1370	1,294.7789	944.5128	777.3115
Vapor Space Expansion Factor												
Vapor Space Expansion Factor	0.0738	0.0902	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Daily Vapor Temperature Range (deg. R)	33.0057	39.4087	48.4203	54.5564	55.9728	55.4232	52.4081	48.6999	45.1773	44.0206	37.2075	32.5840
Daily Vapor Pressure Range (psia)	0.2084	0.2727	0.3755	0.5122	0.5912	0.6405	0.6208	0.5544	0.4657	0.3857	0.2759	0.2126
Breather Vent Press. Setting Range(psia)	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3661	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3625
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.2768	0.2908	0.3289	0.3658	0.4177	0.4693	0.4972	0.4695	0.4474	0.3707	0.3227	0.2889
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.4849	0.5835	0.7045	0.8780	1.0090	1.1098	1.1181	1.0439	0.9131	0.7564	0.5986	0.5015
Daily Avg. Liquid Surface Temp. (deg R)	520.5870	523.5896	528.8887	534.0238	538.3091	541.6759	542.6846	541.2788	537.6666	531.7807	526.0271	521.6969
Daily Min. Liquid Surface Temp. (deg R)	512.3155	513.7379	517.2836	520.3847	524.3159	527.8201	529.5831	529.1019	526.3722	520.7755	516.7252	513.5508
Daily Max. Liquid Surface Temp. (deg R)	528.8184	533.4413	540.4937	547.6629	552.3023	555.5317	555.7861	553.4518	548.9609	542.7856	535.3289	529.8429
Daily Ambient Temp. Range (deg. R)	23.7000	25.4000	26.6000	28.0000	26.2000	23.7000	21.6000	21.2000	22.6000	26.9000	26.7000	24.7000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor	0.9193	0.9114	0.8961	0.8798	0.8644	0.8516	0.8476	0.8531	0.8667	0.8870	0.9046	0.9164
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3661	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3625
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Working Losses (lb)	2.0008	2.2093	2.6203	3.0797	3.5144	3.8919	4.0116	3.8454	3.4461	2.8712	2.3909	2.0767
Vapor Molecular Weight (lb/lb-mole)	38.0167	37.9034	37.7072	37.5201	37.3661	37.2466	37.2111	37.2607	37.3891	37.6014	37.8126	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3661	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3625
Net Throughput (gal/mo.)	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667
Annual Turnovers	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000
Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Working Loss Product Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	9.8830	11.4400	17.0133	22.4967	27.1077	29.0073	29.2775	26.2432	21.3386	17.8044	12.4641	9.9392

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

772H - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Solution	35.96	197.86	233.82
Nitric Acid	26.17	143.86	170.03
Water	9.79	54.00	63.79

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	773H
City:	Aiken
State:	South Carolina
Company:	SRNS
Type of Tank:	Horizontal Tank
Description:	H-ST0036-0004 Nitric Acid Storage Tank 34 (51%), 17,700 gal
Tank Dimensions	
Shell Length (ft):	36.00
Diameter (ft):	9.00
Volume (gallons):	17,700.00
Turnovers:	4.20
Net Throughput(gal/yr):	72,056.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

773H - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Nitric Acid Solution	Jan	60.90	52.65	69.15	66.26	0.3681	0.2766	0.4849	38.0167			28.34	
Nitric Acid						0.7133	0.5443	0.9252	63.0100	0.5100	0.7367	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2654	0.1969	0.3539	18.0200	0.4900	0.2633	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Feb	63.92	54.07	73.77	66.26	0.4077	0.2908	0.5635	37.8034			28.34	
Nitric Acid						0.7855	0.5707	1.0859	63.0100	0.5100	0.7347	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2952	0.2074	0.4139	18.0200	0.4900	0.2653	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Mar	69.22	57.61	80.82	66.26	0.4861	0.3289	0.7045	37.7072			28.34	
Nitric Acid						0.9273	0.6414	1.3153	63.0100	0.5100	0.7312	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3547	0.2380	0.5226	18.0200	0.4900	0.2688	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Apr	74.35	60.71	87.99	66.26	0.5741	0.3656	0.8780	37.5201			28.34	
Nitric Acid						1.0848	0.7091	1.6180	63.0100	0.5100	0.7279	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4221	0.2637	0.6578	18.0200	0.4900	0.2721	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	May	78.64	64.65	92.63	66.26	0.6579	0.4177	1.0090	37.3861			28.34	
Nitric Acid						1.2333	0.8038	1.8437	63.0100	0.5100	0.7251	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4686	0.3028	0.7605	18.0200	0.4900	0.2749	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jun	82.01	68.15	95.88	66.26	0.7309	0.4693	1.1098	37.2486			28.34	
Nitric Acid						1.3616	0.8970	2.0161	63.0100	0.5100	0.7230	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5431	0.3420	0.8400	18.0200	0.4900	0.2770	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jul	83.01	69.91	96.12	66.26	0.7541	0.4972	1.1181	37.2111			28.34	
Nitric Acid						1.4023	0.9474	2.0302	63.0100	0.5100	0.7223	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5611	0.3633	0.6465	18.0200	0.4900	0.2777	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Aug	81.61	69.43	93.76	66.26	0.7219	0.4895	1.0439	37.2807			28.34	
Nitric Acid						1.3459	0.9334	1.9036	63.0100	0.5100	0.7232	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5361	0.3573	0.7680	18.0200	0.4900	0.2768	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Sep	78.00	66.70	89.29	66.26	0.6447	0.4474	0.9131	37.3891			28.34	
Nitric Acid						1.2100	0.8574	1.6767	63.0100	0.5100	0.7255	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4764	0.3253	0.6852	18.0200	0.4900	0.2745	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Oct	72.11	61.11	83.12	66.26	0.5341	0.3707	0.7564	37.6014			28.34	
Nitric Acid						1.0134	0.7181	1.4064	63.0100	0.5100	0.7293	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3914	0.2673	0.5629	18.0200	0.4900	0.2707	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Nov	66.36	57.06	75.66	66.26	0.4423	0.3227	0.5986	37.8128			28.34	
Nitric Acid						0.8482	0.6298	1.1283	63.0100	0.5100	0.7331	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3214	0.2312	0.4406	18.0200	0.4900	0.2669	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Dec	62.03	53.88	70.17	66.26	0.3825	0.2889	0.5015	37.9742			28.34	
Nitric Acid						0.7396	0.5672	0.9550	63.0100	0.5100	0.7359	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2782	0.2060	0.3665	18.0200	0.4900	0.2641	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

773H - Horizontal Tank
Aiken, South Carolina

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	7.6822	9.2307	14.3930	19.4170	23.5933	25.1154	25.2860	22.3978	17.8925	14.9332	10.0732	7.8825
Vapor Space Volume (cu ft):	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Vapor Density (lb/cu ft):	0.0025	0.0028	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0026
Vapor Space Expansion Factor:	0.0738	0.0802	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Vented Vapor Saturation Factor:	0.9193	0.9114	0.8961	0.8796	0.8644	0.8516	0.8476	0.8531	0.8667	0.8870	0.9048	0.9164
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Tank Diameter (ft):	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Effective Diameter (ft):	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160
Vapor Space Outage (ft):	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Tank Shell Length (ft):	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0025	0.0028	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0026
Vapor Molecular Weight (lb/lb-mole):	38.0167	37.9034	37.7072	37.5201	37.3861	37.2466	37.2111	37.2607	37.3691	37.6014	37.8126	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.3681	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Daily Avg. Liquid Surface Temp. (deg. R):	520.5670	523.5696	528.6887	534.0238	538.3091	541.6759	542.6846	541.2768	537.6666	531.7807	526.0271	521.6969
Daily Average Ambient Temp. (deg. F):	43.8500	47.4000	55.5000	62.6000	70.8000	77.4500	80.8000	79.7000	74.4000	63.7500	54.9500	47.1500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292
Tank Paint Solar Absorptance (Shell):	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	837.2755	1,109.1759	1,432.1588	1,806.5354	1,948.9896	2,014.8645	1,928.0498	1,756.0895	1,518.1370	1,294.7789	944.5128	777.3115
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0738	0.0802	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Daily Vapor Temperature Range (deg. R):	33.0057	39.4087	46.4203	54.5584	55.9728	55.4232	52.4061	48.6999	45.1773	44.0206	37.2075	32.5840
Daily Vapor Pressure Range (psia):	0.2064	0.2727	0.3755	0.5122	0.5912	0.6405	0.6208	0.5544	0.4657	0.3857	0.2759	0.2126
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.3681	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.2766	0.2908	0.3269	0.3658	0.4177	0.4693	0.4972	0.4895	0.4474	0.3707	0.3227	0.2689
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.4849	0.5635	0.7045	0.8780	1.0090	1.1098	1.1181	1.0439	0.9131	0.7564	0.5986	0.5015
Daily Avg. Liquid Surface Temp. (deg R):	520.5670	523.5696	528.6887	534.0238	538.3091	541.6759	542.6846	541.2768	537.6666	531.7807	526.0271	521.6969
Daily Min. Liquid Surface Temp. (deg R):	512.3155	513.7379	517.2836	520.3847	524.3159	527.8201	529.5631	529.1019	526.3722	520.7755	516.7252	513.5508
Daily Max. Liquid Surface Temp. (deg R):	528.8184	533.4413	540.4937	547.6629	552.3023	555.5317	555.7861	553.4518	548.9609	542.7858	535.3289	529.8429
Daily Ambient Temp. Range (deg. R):	23.7000	25.4000	26.8000	28.0000	26.2000	23.7000	21.8000	21.2000	22.6000	26.9000	26.7000	24.7000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9193	0.9114	0.8961	0.8796	0.8644	0.8516	0.8476	0.8531	0.8667	0.8870	0.9048	0.9164
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.3681	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Vapor Space Outage (ft):	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Working Losses (lb):	2.0008	2.2093	2.6203	3.0797	3.5144	3.8919	4.0116	3.8454	3.4461	2.8712	2.3909	2.0787
Vapor Molecular Weight (lb/lb-mole):	38.0167	37.9034	37.7072	37.5201	37.3861	37.2466	37.2111	37.2607	37.3691	37.6014	37.8128	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.3681	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Net Throughput (gal/mo.):	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667	6,004.6667
Annual Turnovers:	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft):	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	9.6830	11.4400	17.0133	22.4967	27.1077	29.0073	29.2775	26.2432	21.3386	17.8044	12.4641	9.9392

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

773H - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Solution	35.96	197 86	233.82
Nitric Acid	26.17	143 86	170.03
Water	9.79	54 00	63 79

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification	774H
City	Aiken
State	South Carolina
Company	SRNS
Type of Tank	Horizontal Tank
Description	H-ST0036-0005 Nitric Acid Storage Tank 35 (51%), 17,700 gal
Tank Dimensions	
Shell Length (ft)	36.00
Diameter (ft)	9.00
Volume (gallons)	17,700.00
Turnovers	4.20
Net Throughput(gal/yr)	72,056.00
Is Tank Heated (y/n)	N
Is Tank Underground (y/n)	N
Paint Characteristics	
Shell Color/Shade	Gray/Medium
Shell Condition	Good
Breather Vent Settings	
Vacuum Settings (psig)	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

774H - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Nitric Acid Solution	Jan	60.90	52.65	69.15	66.26	0.3681	0.2766	0.4849	38.0167			28.34	
Nitric Acid						0.7133	0.5443	0.9252	63.0100	0.5100	0.7367	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2654	0.1969	0.3539	18.0200	0.4900	0.2633	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Feb	63.92	54.07	73.77	66.26	0.4077	0.2906	0.5635	37.9034			28.34	
Nitric Acid						0.7655	0.5707	1.0659	63.0100	0.5100	0.7347	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2952	0.2074	0.4139	18.0200	0.4900	0.2653	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Mar	69.22	57.81	80.82	66.26	0.4661	0.3289	0.7045	37.7072			28.34	
Nitric Acid						0.9273	0.6414	1.3153	63.0100	0.5100	0.7312	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3547	0.2360	0.5226	18.0200	0.4900	0.2688	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Apr	74.35	60.71	87.99	66.26	0.5741	0.3858	0.8760	37.5201			28.34	
Nitric Acid						1.0646	0.7091	1.6180	63.0100	0.5100	0.7279	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4221	0.2837	0.6578	18.0200	0.4900	0.2721	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	May	78.64	64.85	92.83	66.26	0.6579	0.4177	1.0090	37.3661			28.34	
Nitric Acid						1.2333	0.6038	1.8437	63.0100	0.5100	0.7251	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4868	0.3026	0.7605	18.0200	0.4900	0.2749	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jun	82.01	68.15	95.86	66.26	0.7309	0.4693	1.1098	37.2488			28.34	
Nitric Acid						1.3616	0.6970	2.0161	63.0100	0.5100	0.7230	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5431	0.3420	0.8400	18.0200	0.4900	0.2770	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Jul	83.01	69.91	96.12	66.26	0.7541	0.4972	1.1181	37.2111			28.34	
Nitric Acid						1.4023	0.9474	2.0302	63.0100	0.5100	0.7223	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5611	0.3633	0.8465	18.0200	0.4900	0.2777	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Aug	81.61	69.43	93.78	66.26	0.7219	0.4895	1.0439	37.2607			28.34	
Nitric Acid						1.3459	0.9334	1.9036	63.0100	0.5100	0.7232	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.5361	0.3573	0.7880	18.0200	0.4900	0.2768	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Sep	78.00	66.70	89.29	66.26	0.6447	0.4474	0.9131	37.3891			28.34	
Nitric Acid						1.2100	0.8574	1.8787	63.0100	0.5100	0.7255	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.4764	0.3253	0.6852	18.0200	0.4900	0.2745	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Oct	72.11	61.11	83.12	66.26	0.5341	0.3707	0.7564	37.6014			28.34	
Nitric Acid						1.0134	0.7181	1.4064	63.0100	0.5100	0.7293	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3914	0.2673	0.5629	18.0200	0.4900	0.2707	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Nov	66.36	57.06	75.66	66.26	0.4423	0.3227	0.5986	37.6128			28.34	
Nitric Acid						0.8482	0.6298	1.1283	63.0100	0.5100	0.7331	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.3214	0.2312	0.4409	18.0200	0.4900	0.2669	18.02	Option 2: A=8.056, B=1723.64, C=233.08
Nitric Acid Solution	Dec	62.03	53.88	70.17	66.26	0.3825	0.2889	0.5015	37.9742			28.34	
Nitric Acid						0.7398	0.5672	0.9550	63.0100	0.5100	0.7359	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Water						0.2782	0.2060	0.3665	18.0200	0.4900	0.2641	18.02	Option 2: A=8.056, B=1723.64, C=233.08

SRNS-J2200-2019-00240

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

774H - Horizontal Tank
Aiken, South Carolina

Month	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)	7.8822	9.2307	14.3930	19.4170	23.5933	25.1154	25.2860	22.3978	17.8925	14.9332	10.0732	7.8825
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Vapor Density (lb/cu ft)	0.0025	0.0028	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0028
Vapor Space Expansion Factor	0.0738	0.0802	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Vented Vapor Saturation Factor	0.9193	0.9114	0.8961	0.8796	0.8644	0.8518	0.8478	0.8531	0.8667	0.8870	0.9046	0.9164
Tank Vapor Space Volume												
Vapor Space Volume (cu ft)	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395	1,458.7395
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Effective Diameter (ft)	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160	20.3160
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Tank Shell Length (ft)	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Vapor Density												
Vapor Density (lb/cu ft)	0.0025	0.0028	0.0032	0.0038	0.0043	0.0047	0.0048	0.0046	0.0042	0.0035	0.0030	0.0028
Vapor Molecular Weight (lb/lb-mole)	38.0187	37.9034	37.7072	37.5201	37.3881	37.2466	37.2111	37.2607	37.3891	37.6014	37.8128	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3881	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Daily Avg. Liquid Surface Temp. (deg. R)	520.5870	523.5896	528.8887	534.0238	538.3091	541.6759	542.6848	541.2788	537.8666	531.7807	526.0271	521.6969
Daily Average Ambient Temp. (deg. F)	43.8500	47.4000	55.5000	62.6000	70.6000	77.4500	80.6000	79.7000	74.4000	63.7500	54.9500	47.1500
Ideal Gas Constant R (psia cuft / (lb-mol-deg R))	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R)	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292	525.9292
Tank Paint Solar Absorptance (Shell)	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day)	837.2755	1,109.1759	1,432.1588	1,806.5354	1,948.9898	2,014.6645	1,928.0498	1,756.0895	1,518.1370	1,294.7789	944.5128	777.3115
Vapor Space Expansion Factor												
Vapor Space Expansion Factor	0.0738	0.0802	0.1100	0.1342	0.1418	0.1439	0.1368	0.1254	0.1129	0.1058	0.0859	0.0731
Daily Vapor Temperature Range (deg. R)	33.0057	39.4067	46.4203	54.5564	56.9728	55.4232	52.4061	48.6999	45.1773	44.0206	37.2075	32.5840
Daily Vapor Pressure Range (psia)	0.2064	0.2727	0.3755	0.5122	0.5912	0.6405	0.6208	0.5544	0.4657	0.3857	0.2759	0.2126
Breather Vent Press. Setting Range(psia)	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3881	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)	0.2766	0.2908	0.3289	0.3658	0.4177	0.4693	0.4972	0.4895	0.4474	0.3707	0.3227	0.2889
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.4849	0.5835	0.7045	0.8780	1.0090	1.1096	1.1181	1.0439	0.9131	0.7584	0.5986	0.5015
Daily Avg. Liquid Surface Temp. (deg R)	520.5870	523.5896	528.8887	534.0238	538.3091	541.6759	542.6848	541.2788	537.8666	531.7807	526.0271	521.6969
Daily Min. Liquid Surface Temp. (deg R)	512.3155	513.7379	517.2836	520.3847	524.3159	527.8201	529.5831	529.1019	526.3722	520.7755	516.7252	513.5508
Daily Max. Liquid Surface Temp. (deg R)	528.8184	533.4413	540.4937	547.6629	552.3023	555.5317	555.7861	553.4518	548.9609	542.7858	535.3289	529.8429
Daily Ambient Temp. Range (deg. R)	23.7000	25.4000	26.6000	28.0000	26.2000	23.7000	21.6000	21.2000	22.6000	26.9000	26.7000	24.7000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor	0.9193	0.9114	0.8961	0.8796	0.8644	0.8518	0.8478	0.8531	0.8667	0.8870	0.9046	0.9164
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3881	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Vapor Space Outage (ft)	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
Working Losses (lb)	2.0008	2.2093	2.6203	3.0797	3.5144	3.8919	4.0116	3.8454	3.4461	2.8712	2.3909	2.0767
Vapor Molecular Weight (lb/lb-mole)	38.0187	37.9034	37.7072	37.5201	37.3881	37.2466	37.2111	37.2607	37.3891	37.6014	37.8128	37.9742
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	0.3881	0.4077	0.4861	0.5741	0.6579	0.7309	0.7541	0.7219	0.6447	0.5341	0.4423	0.3825
Net Throughput (gal/mo.)	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667	8,004.6667
Annual Turnovers	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000	4.2000
Turnover Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tank Diameter (ft)	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000	9.0000
Working Loss Product Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb)	9.8830	11.4400	17.0133	22.4967	27.1077	29.0073	29.2775	26.2432	21.3386	17.8044	12.4641	9.9392

SRNS-J2200-2019-00240

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

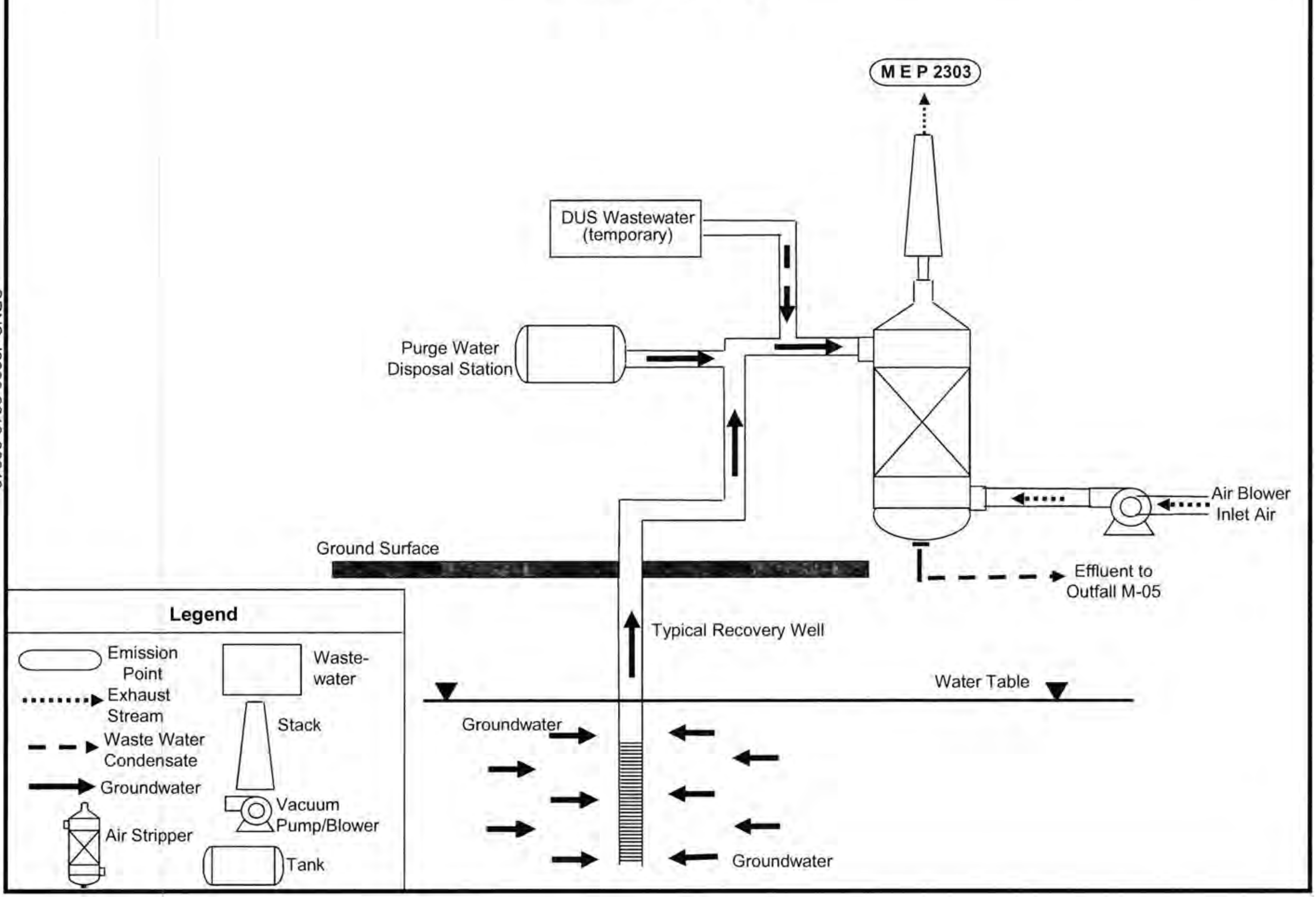
774H - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitic Acid Solution	35.96	197.86	233.82
Nitric Acid	26.17	143.86	170.03
Water	9.79	54.00	63.79

Title V Permit Application
Emission Unit M-005
Process Description

The M-1 Groundwater Air Stripper is used to remove organic solvents, primarily TCE and PCE, from contaminated wells. Treatable wastewater from sitewide operations is transported to the M Area Purge Water Tank, which intermittently feeds the air stripper. The M-1 Stripper is also temporarily receiving wastewater from the Dynamic Underground Stripping (DUS) process. The Air Stripper operates continuously and is permitted by the SCDHEC Industrial Wastewater Treatment Permit to operate at 610 GPM maximum. The contaminated groundwater is pumped from a series of recovery wells and the purge water tank through the air stripper, where the contaminants are separated from the water and released to the atmosphere via a stack. Uncontrolled air emissions are released through emission point M-EP2303. The treated groundwater is discharged to a National Pollutant Discharge Elimination System (NPDES) permitted outfall. The maximum potential emissions are calculated in Q-CLC-M-00086 (trichloroethylene, perchloroethylene, and volatile organic compounds) and SRNS-J2230-2017-00017 (methylene chloride).

Emission Unit M-005



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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
M-005	323-M M-1 GROUNDWATER AIR STRIPPER	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
M-005	N/A	610 GPM	TREATED GROUNDWATER	4959 - 562910	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
M-005	529M	M-1 AIR STRIPPER	7/1984 – install 9/1985 – initial operation	NONE	N/A	M E P 2303	320,616,000 GALLONS

EQUIPMENT DESCRIPTION (CONTINUED)

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
529M	N/A	N/A	0080-0041-M-CK	NONE

SRNS-J2200-2019-00240

D H E C

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
M-005	M E P 2303	VOC (OZONE PRECURSORS)		CRITERIA	1.83E+00	8.05E+00	1.83E+00	8.05E+00
M-005	M E P 2303	DICHLOROMETHANE (METHYLENE CHLORIDE)	75 09 2	HAP TAP	2.12E-02	9.30E-02	2.12E-02	9.30E-02
M-005	M E P 2303	TRICHLOROETHYLENE (TCE)	79 01 6	HAP TAP	1.83E+00	8.03E+00	1.83E+00	8.03E+00
M-005	M E P 2303	TETRACHLOROETHYLENE (PERCHLOROETHYLENE)	127 18 4	HAP TAP	6.72E+00	2.94E+01	6.72E+00	2.94E+01

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
M-005	M E P 2303	VOC (OZONE PRECURSORS)	COMPUTER SUM OF CONSTITUENTS	N/A
M-005	M E P 2303	DICHLOROMETHANE (METHYLENE CHLORIDE)	ENGINEERING CALCULATIONS	N/A
M-005	M E P 2303	TRICHLOROETHYLENE (TCE)	ENGINEERING CALCULATIONS	N/A
M-005	M E P 2303	TETRACHLOROETHYLENE (PERCHLOROETHYLENE)	ENGINEERING CALCULATIONS	N/A

SRNS-J2200-2019-00240

Facility Wide Raw Materials and Products				
1. Raw Materials	**2. Quantity**	**3. Products (List Products in order of major to minor)**	**4. SIC/NAICS Code**	**5. Production Rate**
CONTAMINATED GROUNDWATER	N/A	TREATED GROUNDWATER	4959 - 562910	320,616,000 GALLONS

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Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
323-M-1 GROUNDWATER AIR STRIPPER	M-005	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	40% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.A
323-M-1 GROUNDWATER AIR STRIPPER	M-005	SYNTHETIC MINOR CONSTRUCTION PERMITS	< 1.83 LB / HR VOC	40 CFR 136.3 METHOD 8260B	SC 61-62.1, Section II(E)

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
M-005	SC 61-62.5, Std. 4, Sect. IX.A	Y	CLB	Apr-03	
M-005	SC 61-62.1, Section II(E)	Y	CLB	Apr-03	

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
M-005	VOC EMISSIONS	< 1.83 LB / HR VOC	SAMPLING	MONTHLY	QUARTERLY
M-005	VOC EMISSIONS	< 8.05 TON / YR VOC	SAMPLING	MONTHLY	QUARTERLY

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test Y/N	17.Stack Test Frequency
M-005	VOC EMISSIONS	< 1.83 LB / HR VOC	MONTHLY	12-MONTH ROLLING SUM	N	N/A
M-005	VOC EMISSIONS	< 8.05 TON / YR VOC	MONTHLY	12-MONTH ROLLING SUM	N	N/A

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III
(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
M-005	VOC EMISSIONS	< 1.83 LB / HR VOC	MONITORING REQUIRED SEE PARTS I AND II	NONE
M-005	VOC EMISSIONS	< 8.05 TON / YR VOC	MONITORING REQUIRED SEE PARTS I AND II	NONE

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
M-005	323-M M-1 GROUNDWATER AIR STRIPPER	VOC (OZONE PRECURSORS)	8.05E+00		8.05E+00		X	N	
M-005	323-M M-1 GROUNDWATER AIR STRIPPER	TRICHLOROETHYLENE (TCE)	8.03E+00		8.03E+00		X	N	
M-005	323-M M-1 GROUNDWATER AIR STRIPPER	TETRACHLOROETHYLENE (PERCHLOROETHYLENE)	2.94E+01		2.94E+01		X	N	
M-005	323-M M-1 GROUNDWATER AIR STRIPPER	DICHLOROMETHANE (METHYLENE CHLORIDE)	9.30E-02		9.30E-02		X	N	

NOTE* If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64

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FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V

(This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)

2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI

(This section allows for additional information or requirements for sources subject to a MACT Standard)

2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

SRNS-J2200-2019-00240

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII

(This section allows for additional requirements for sources subject to a MACT Standard)

2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

OSR 45-24# (Rev 8-26-2002)

Calculation Cover Sheet

Project	Calculation No.	Project No.
A/M-Area Environmental Restoration Division Remediation Units	Q-CLC-M-00086	CA 1706/1702
Title Potential Maximum Air Emissions Calculation for the M-1 and A-2 Air Strippers	Functional Classification: GS	Sheet 1 of 7
	Discipline: Environmental	

☐ Preliminary ☒ Confirmed

Computer Program No.		Version/Release No.
Mathcad	☐ N/A	2001 Professional

Purpose and Objective

Purpose:

Determine the maximum potential emissions from the M-1 and A-2 Air Strippers for the Air Quality Control Permit Application Modification.

Objective:

Estimate the maximum air emissions which will be produced by the air strippers for each constituent of concern: trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1-dichloroethylene (DCE11) and 1,2-dichloroethylene (DCE12).

Summary of Conclusion

otential Emission Rates for M-1 and A-2 Air Strippers:

Constituent	**M-1 Air Stripper** lb/hr	ton/yr	**A-2 Air Stripper (lb/hr)** lb/hr	ton/yr
TCE	1.83	8.03	0.267	1.17
DCE11	5.34x10-4	2.34x10-3	Trace	Trace
DCE12	3.14x10-3	1.38x10-2	Trace	Trace
PCE	6.72	29.4	0.002	0.010
Total VOCs	1.83	8.05	0.267	1.17

The emissions are below the current permitted limits for these units and do not exceed 40 ton/yr. Level II Air Modelling was performed for the constituents for each unit, the results indicate that the concentrations of Hazardous Air Pollutants (HAPs) will not exceed their boundary thresholds.

Revisions

Rev No.	Revision Description
0	Initial Issue

Sign Off

Rev No.	Originator (Print) Sign/Date	Verification/ Checking Method	Verifier/Checker (Print) Sign/Date	Manager (Print) Sign//Date
0	Cassandra L. Bayer Cassandra L Bayer 12/16/02	Checked	Daniel Williams D. W. Will 12-17-02	EPS / T. F. GAUGHAN EPS / T. F. Gaughan 12/18/02

Design Authority — (Print)	Signature	Date
Cassandra L. Bayer	Cassandra L Bayer	12/16/02
Release to Outside Agency – (Print)	**Signature**	**Date**
Cassandra L. Bayer	Cassandra L Bayer	12/16/02

Security Classification of the Calculation

U

Calculation Sheet

SRS	Project A/M-Area Environmental Restoration Division Remediation Units						Calculation No. Q-CLC-M-00086		
	Subject Potential Maximum Air Emissions Calculation for the M-1 and A-2 Air Strippers							Sheet No. 2 of 7	
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	C. R. Bayer	12/16/02	D.W. Wilt	12-17-02	0				

I. OBJECTIVE

Estimate the maximum potential air emisions which will be produced by the A-2 and M-1 Air Strippers for each constituent:

acronym	constituent	CAS number	regulated
TCE	trichloroethylene	79-01-6	VOC, Standard 8
DCE11	1,1-dichloroethylene	75-35-4	VOC, Standard 8
DCE12	1,2-dichloroethylene	540-59-0	VOC
PCE	tetrachloroethylene	127-18-4	Standard 8

II. DATA/GIVEN

1. The contaminant concentrations used for both air strippers are from the SRS Environmental Restoration Data Management System (ERDMS).

2. The air strippers are not equipped with off-gas treatment.

3. The maximum water flow rate for the M-1 and A-2 Air Strippers is 610 gpm and 320 gpm, respectively.

4. Density of groundwater (ρ) at 60 F is 8.34 pounds per gallon.

5. The following constituents are present in trace levels in the groundwater and purge water: benzene, carbon tetrachloride, chlorobenzene, chloroform, dichlorobenzene, 1,1-dichloroethane, 1,1-dichloroethylene, ethyl benzene, ethyl chloride, ethylene chloride, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, vinyl chloride, mercury, polychlorinated biphenyls (PCBs), and xylene (References 1 and 2).

6. The maximum concentrations include the projected input from the new Western Sector Dynamic Underground Stripping Project wastewater stream.

7. Level II Analysis Air Modeling provides an estimation of SRS boundary concentrations for Standard 8 Hazardous Air Pollutants (HAPs). The maximum boundary concentration limits per SCDHEC Air Pollution Control Regulations and Standards, 61-62.5, Standard No. 8, for TCE, PCE, and DCE11 are 6750 $\mu g/m^3$, 3350 $\mu g/m^3$, and 99 $\mu g/m^3$, respectively. 1,2-dichloroethylene is not considered a hazardous air pollutant per Standard 8.

8. Air modeling equation and air emission modeling factors provided by Reference 3.

SRS	Project: A/M-Area Environmental Restoration Division Remediation Units					Calculation No. Q-CLC-M-00086			
	Subject: Potential Maximum Air Emissions Calculation for the M-1 and A-2 Air Strippers							Sheet No. 3 of 7	
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	C. L. Bayer	12/16/02	D. W. Will	12-17-02	0				

Water flow through the M1 and A2 Air Strippers:

$V_{M1} := 610 \cdot \frac{gal}{min}$ $\quad$ $V_{A2} := 320 \cdot \frac{gal}{min}$

1 ppm of each constituent (in ppm) (References 1 and 2):

M-1 Air Stripper

$DCE11_{M1} := 0.00175$

$DCE12_{M1} := 0.0103$

$PCE_{M1} := 22.0$

$TCE_{M1} := 6.0$

A-2 Air Stripper

$PCE_{A2} := 0.0134$

$TCE_{A2} := 1.67$

$\rho := 8.34 \frac{lb}{gal}$

III. ASSUMPTIONS

1. Conservatively assume 100% of the contaminant is stripped from the inlet groundwater.
2. The air strippers are no longer equipped with offgas treatment. Therefore, the controlled and uncontrolled emissions will be equal.
3. The maximum concentration values are based on inlet water sampling from 1985 through 2002 and the addition of the new DUS system. (References 1 and 2)
4. Emissions estimates are based on a 24 hours/day, 365 days/year operating schedule. Actual operation will have some downtime (10-20%) for maintenance, inspections, and upgrades.

IV. CALCULATION

A. M-1 Air Stripper: Potential Maximum Emissions

Trichloroethylene

$$Q_{TCEM1} := \frac{TCE_{M1}}{10^6} \cdot V_{M1} \cdot \rho$$

$Q_{TCEM1} = 1.83 \frac{lb}{hr}$ $\quad$ $Q_{TCEM1} = 8.03 \frac{ton}{yr}$

1,1-Dichloroethylene

$$Q_{DCE11M1} := \frac{DCE11_{M1}}{10^6} \cdot V_{M1} \cdot \rho$$

$Q_{DCE11M1} = 5.34 \times 10^{-4} \frac{lb}{hr}$ $\quad$ $Q_{DCE11M1} = 2.34 \times 10^{-3} \frac{ton}{yr}$

1,2-Dichloroethylene

$$Q_{DCE12M1} := \frac{DCE12_{M1}}{10^6} \cdot V_{M1} \cdot \rho$$

$Q_{DCE12M1} = 3.14 \times 10^{-3} \frac{lb}{hr}$ $\quad$ $Q_{DCE12M1} = 1.38 \times 10^{-2} \frac{ton}{yr}$

Tetrachloroethylene

$$Q_{PCEM1} := \frac{PCE_{M1}}{10^6} \cdot V_{M1} \cdot \rho$$

$Q_{PCEM1} = 6.72 \frac{lb}{hr}$ $\quad$ $Q_{PCEM1} = 29.43 \frac{ton}{yr}$

M-1 Air Stripper regulated VOC emissions:

$$Q_{reg\_VOC\_M1} := Q_{TCEM1} + Q_{DCE11M1} + Q_{DCE12M1}$$

$Q_{reg\_VOC\_M1} = 1.83 \frac{lb}{hr}$ $\quad$ $Q_{reg\_VOC\_M1} = 8.05 \frac{ton}{yr}$

B. A-2 Air Stripper: Potential Maximum Emissions

Trichloroethylene

$$Q_{TCEA2} := \frac{TCE_{A2}}{10^6} \cdot V_{A2} \cdot \rho$$

$$Q_{TCEA2} = 0.267 \frac{lb}{hr} \qquad Q_{TCEA2} = 1.17 \frac{ton}{yr}$$

Tetrachloroethylene

$$Q_{PCEA2} := \frac{PCE_{A2}}{10^6} \cdot V_{A2} \cdot \rho$$

$$Q_{PCEA2} = 0.002 \frac{lb}{hr} \qquad Q_{PCEA2} = 0.01 \frac{ton}{yr}$$

A-2 Air Stripper regulated VOC emissions:

$$Q_{reg\_VOC\_A2} := Q_{TCEA2}$$

$$Q_{reg\_VOC\_A2} = 0.267 \frac{lb}{hr} \qquad Q_{reg\_VOC\_A2} = 1.17 \frac{ton}{yr}$$

D. Level II Analysis for Air Modeling

M-1 Air Stripper

$$TCE_{M1\_boundary} := Q_{TCEM1} \cdot 0.771 \frac{\left(\frac{\mu g}{m^3}\right)}{\left(\frac{lb}{day}\right)}$$

$$TCE_{M1\_boundary} = 33.89 \frac{\mu g}{m^3}$$

$$PCE_{M1\_boundary} := Q_{PCEM1} \cdot 0.771 \frac{\left(\frac{\mu g}{m^3}\right)}{\left(\frac{lb}{day}\right)}$$

$$PCE_{M1\_boundary} = 124.26 \frac{\mu g}{m^3}$$

$$DCE11_{M1\_boundary} := Q_{DCE11M1} \cdot 0.771 \frac{\left(\frac{\mu g}{m^3}\right)}{\left(\frac{lb}{day}\right)}$$

$$DCE11_{M1\_boundary} = 0.01 \frac{\mu g}{m^3}$$

A-2 Air Stripper

$$TCE_{A2\_boundary} := Q_{TCEA2} \cdot 2.10 \frac{\left(\frac{\mu g}{m^3}\right)}{\left(\frac{lb}{day}\right)}$$

$$TCE_{A2\_boundary} = 13.48 \frac{\mu g}{m^3}$$

$$PCE_{A2\_boundary} := Q_{PCEA2} \cdot 2.10 \frac{\left(\frac{\mu g}{m^3}\right)}{\left(\frac{lb}{day}\right)}$$

$$PCE_{A2\_boundary} = 0.11 \frac{\mu g}{m^3}$$

V. CONCLUSION

			Air Strippers						
			M-1 Air Stripper			A-2 Air Stripper			Boundary Conc. Limit (µg/m³)
			Modified (lb/hr & ton/yr)	Current (lb/hr & ton/yr)	Boundary Conc. (µg/m³)	Modified (lb/hr & ton/yr)	Current (lb/hr & ton/yr)	Boundary Conc. (µg/m³)	
Constituents	Std. 8 HAP and VOCs	TCE	1.83	1.84	33.9	0.267	0.495	13.5	6750
			8.03	8.07		1.17	2.17		
		DCE11*	$5.34x10^{-4}$	$2.76x10^{-4}$	0.01	Trace	0.00	Not Applicable	99
			$2.34x10^{-3}$	$1.21x10^{-3}$			0.00		
		DCE12*	$3.14x10^{-3}$	$2.76x10^{-4}$	Not Applicable	Trace	0.00	Not Applicable	Not Applicable
			$1.38x10^{-2}$	$1.21x10^{-3}$			0.00		
		Total VOCs	1.83	1.85	Not Applicable	0.267	0.495	Not Applicable	Not Applicable
			8.05	8.07		1.17	2.17		
	Std. 8 HAP Only	PCE	6.72	6.72	124.3	0.002	6.4	0.11	3350
			29.4	29.4		0.010	28.0		

* The air stream contains both 1,1-dichloroethylene and 1,2-dichloroethylene; previously these values have been incorrectly reported and permitted as either one constituent or the other and not both.

The calculated maximum emissions are below or at the current permitted limits for M-1 and A-2 Air Strippers. In addition, the SCDHEC Level II Analysis indicates that concentrations at the site boundary are below the SCDHEC Boundary Concentration Limits for Standard 8 Hazardous Air Pollutants, TCE, PCE, and DCE11, therefore additional modeling is not necessary.

VI. REFERENCES

1. Environmental Restoration Data Management System (ERDMS)

2. Air Emission Inventory Database (1997 - 2001)

3. SCDHEC, "*Air Quality Modeling Guidelines*", South Carolina Department of Health and Environmental Control, Bureau of Air Quality, July 2001

Given/Assumptions

1) The expired permit includes a limit of 610 gpm flow rate for this unit. This maximum flow rate is used in this calculation.
2) Continuous operation for 8760 hrs per year is assumed.
3) Per the M1 Air Stripper Design Authority, the highest concentrations recently were from December 2016. The PCE and TCE concentrations from the stripper inlet (STR312I) for December 2016 were used. However, for conservativism, the concentrations were multiplied by a factor of 2.5. This conservatism is intended to account for the potential for increasing concentrations due to plume movement.
4) Stripper inlet (STR312I) December 2016 results in µg/L:

ANALYTE_NAME	ANALYTE_ID	RESULT
TETRACHLOROETHYLENE (PCE)	127-18-4	4750
TRICHLOROETHYLENE (TCE)	79-01-6	2400

5) Trace constituents: Constituents, in small amounts, are also detected at STR312I occasionally. However, for modeling purposes (Air Quality Modeling Guidelines), if constituents are considered trace constituents, they need not be modeled. Trace constituents are less than 0.1% of the air emissions by weight if the constituent is an OSHA carcinogen or less than 1% of the air emissions by weight if not identified as a carcinogen. Since the combined TCE and PCE concentration is 7150 µg/L, a carcinogenic constituent would need to have a concentration greater than 7.15 µg/L to not be trace. A non-carcinogen would need to have a concentration greater than 71.5 µg/L. The constituents shown below exceeded 7.15 µg/L at least once from January 2015 through June 2017 (BEIDMS data pull). All detected results above 7.15 µg/L are shown below. [Note: Detection Limit (DL) and Sample Quantitation Limit (SQL)]

COLLECTION_DATE	ANALYTE_NAME	ANALYTE_ID	RESULT	DL	SQL	RESULT_UNITS	LAB_QUALIFIER
06-Feb-17	CIS-1,2-DICHLOROETHYLENE	156-59-2	7.48	0.333	1	µg/L	
03-Nov-16	CIS-1,2-DICHLOROETHYLENE	156-59-2	7.42	0.333	1	µg/L	
04-May-15	DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	27.8	25	125	µg/L	J
20-Jul-15	DICHLOROMETHANE (METHYLENE CHLORIDE)	75-09-2	25.8	25	125	µg/L	J
27-Apr-16	ZINC	7440-66-6	10	4	40	µg/L	J
29-Feb-16	ZINC	7440-66-6	8.07	4	40	µg/L	J

Referring to the TRI listing, from the above table, only DCM is considered a carcinogen. This is the only constituent (other than TCE and PCE) that may need to be considered non-trace. No constituents, other than TCE and PCE, exceeded 71.5 µg/L. Additionally, zinc is not expected volatilize from water. The DCM maximum detected concentration of 27.8 µg/L is used in this calculation.

6) As with TCE and PCE above, for conservativism, the DCM concentration was multiplied by a factor of 2.5. This conservatism is intended to account for the potential for increasing concentrations due to plume movement.
7) The M1 Air Stripper limits from the expired permit are 1.84 lb/hr TCE, 6.72 lb/hr PCE and <5E-4 lb/hr DCM.
8) TCE is regulated as a VOC. TCE, PCE and DCM are regulated as Standard 8 pollutants.
9) It is conservatively assumed that all the contaminant loading measured in the stripper inlet is released to the air.
10) There are no control devices so controlled and uncontrolled emissions are equal.

Computations

$$Q_{water} := 610 \cdot \frac{gal}{min} \qquad HrsOps := 8760 \cdot \frac{hr}{yr}$$

$$concTCE := 2400 \cdot \frac{\mu g}{L} \qquad concPCE := 4750 \cdot \frac{\mu g}{L} \qquad concDCM := 27.8 \cdot \frac{\mu g}{L}$$

$$TCE\_emission\_lb\_hr := Q_{water} \cdot 2.5 \cdot concTCE \cdot \frac{3.785 \cdot liter}{gal} \cdot \frac{gm}{10^6 \cdot \mu g} \cdot \frac{lb}{453.592 \cdot gm} \cdot \frac{60 \cdot min}{hr}$$

$$TCE\_emission\_lb\_hr = 1.83E{-}000 \cdot \frac{lb}{hr}$$

$$TCE\_emissions\_tpy := TCE\_emission\_lb\_hr \cdot \frac{ton}{2000 \cdot lb} \cdot HrsOps$$

$$TCE\_emissions\_tpy = 8.03E{-}000 \cdot \frac{ton}{yr}$$

$$TCE\_emissions\_month := \frac{TCE\_emissions\_tpy}{\left(\frac{12 \cdot month}{yr}\right)} \cdot \frac{2000 \cdot lb}{ton}$$

$$TCE\_emissions\_month = 1.338 \times 10^3 \cdot \frac{lb}{month}$$

$$PCE\_emission\_lb\_hr := Q_{water} \cdot 2.5 \cdot concPCE \cdot \frac{3.785 \cdot liter}{gal} \cdot \frac{gm}{10^6 \cdot \mu g} \cdot \frac{lb}{453.592 \cdot gm} \cdot \frac{60 \cdot min}{hr}$$

$$PCE\_emission\_lb\_hr = 3.63E{-}000 \cdot \frac{lb}{hr}$$

$$PCE\_emissions\_tpy := PCE\_emission\_lb\_hr \cdot \frac{ton}{2000 \cdot lb} \cdot HrsOps$$

$$PCE\_emissions\_tpy = 1.59E{-}001 \cdot \frac{ton}{yr}$$

$$PCE\_emissions\_month := \frac{PCE\_emissions\_tpy}{\left(\frac{12 \cdot month}{yr}\right)} \cdot \frac{2000 \cdot lb}{ton}$$

$$PCE\_emissions\_month = 2.648 \times 10^3 \cdot \frac{lb}{month}$$

$$DCM\_emission\_lb\_hr := Q_{water} \cdot 2.5 \cdot concDCM \cdot \frac{3.785 \cdot liter}{gal} \cdot \frac{gm}{10^6 \cdot \mu g} \cdot \frac{lb}{453.592 \cdot gm} \cdot \frac{60 \cdot min}{hr}$$

$$DCM\_emission\_lb\_hr = 2.12E\text{-}002 \cdot \frac{lb}{hr}$$

$$DCM\_emissions\_tpy := DCM\_emission\_lb\_hr \cdot \frac{ton}{2000 \cdot lb} \cdot HrsOps$$

$$DCM\_emissions\_tpy = 9.30E\text{-}002 \cdot \frac{ton}{yr}$$

$$DCM\_emissions\_month := \frac{DCM\_emissions\_tpy}{\left(\frac{12 \cdot month}{yr}\right)} \cdot \frac{2000 \cdot lb}{ton}$$

$$DCM\_emissions\_month = 1.549 \times 10^1 \cdot \frac{lb}{month}$$

Results

Controlled and Uncontrolled Maximum Potential to Emit:

Pollutant	CAS	lb/hr	tons per year (tpy)	lb/month
TCE	79-01-6	1.83 E+00	8.03 E+00	1.338 E+03
PCE	127-18-4	3.63 E+00	1.59 E+01	2.648 E+03
DCM	75-09-2	2.12 E-02	9.30 E-02	1.549 E+01

Conclusion

With conservatively estimated emissions as shown in the table above, increased TCE and PCE emissions due to anticipated upgrades and plume movement will not exceed the existing expired permit limits. Also, DCM has been determined to be above trace levels with a maximum potential to emit of 2.12E-02 lb/hr.

Signatures

Originator (print/sign/date)	Martha Thompson Martha Thompson	8/16/2017
Contributing Reviewer (print/sign/date)	John Bradley J. Bradley	08-16-2017
Independent Reviewer (print/sign/date)	James Ullery James Ullery	8/16/2017
Manager (print/sign/date)	Manuel Terronez Manuel A. Terronez	08/16/2017

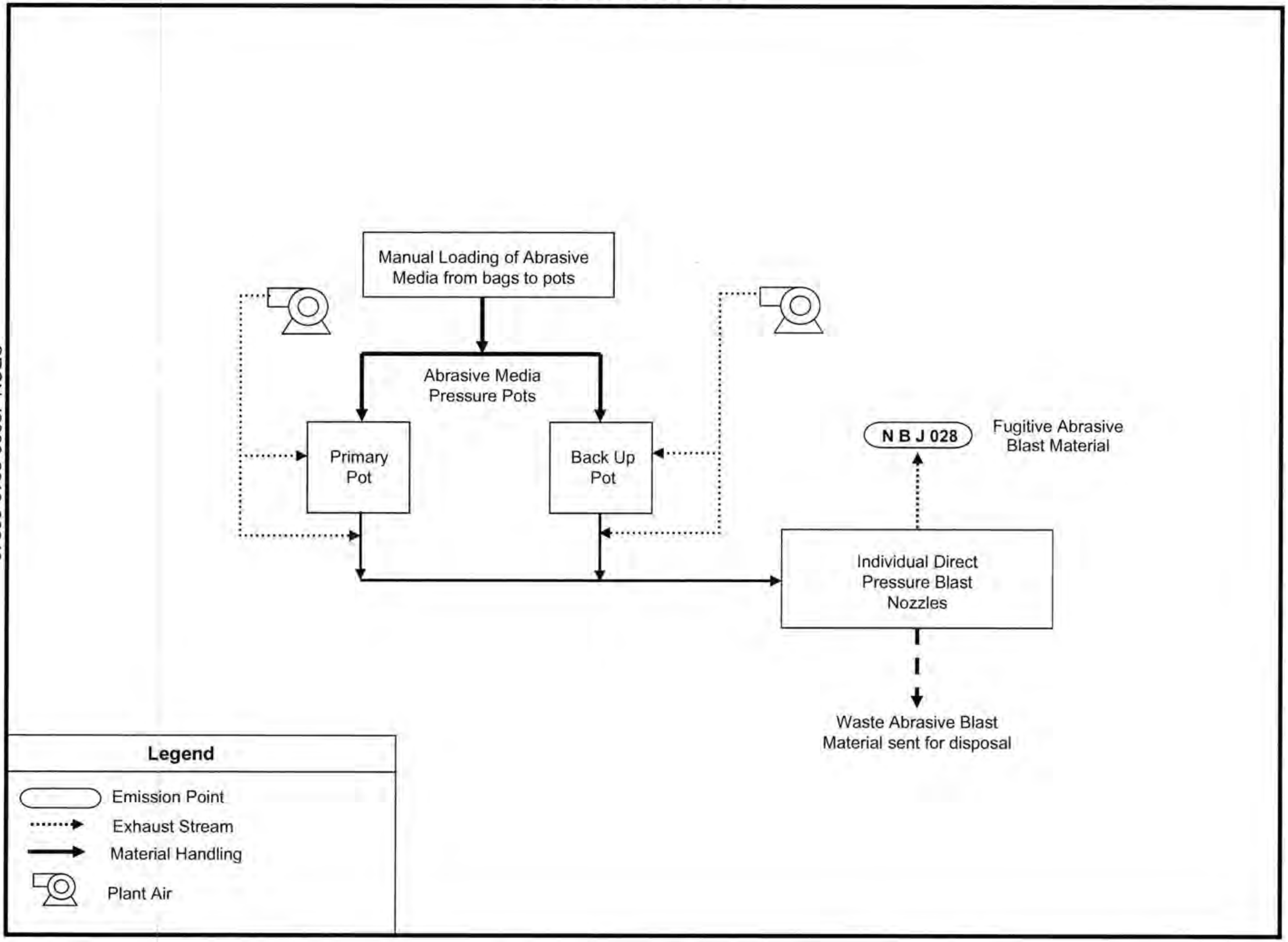
Title V Permit Application
Emission Unit N-001
Process Description

Emission Unit N-001 is the Abrasive Blasting facility located in N-Area between Buildings 725-1N and 725-2N. The area is commonly referred to as the Sand Blast Yard.

This operation consists of Primary and Secondary Pressure Pots and the abrasive blasting hose and nozzle. The abrasive media is combined with compressed air and fed thru a nozzle where it is directed at the surface to be prepared. The operation is used to obtain an acceptable surface preparation and surface profile prior to the application of coatings.

The resulting emissions from this operation would be considered fugitive in nature.

Emission Unit N-001



SRSN-J2200-2019-00240

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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
N-001	725-1N ABRASIVE BLASTING	NONE

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
N-001	1.649	1.649 tons/hr	SURFACE PREPARATION	3471 - 332813	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
N/A			

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
N/A							

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
N-001	370N	ABRASIVE METAL CLEANING	1/1975	NONE	N/A	N B J 028	1.649 tons/hr

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EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
370N	N/A	N/A	0080-0041-CS-CA	NONE

SRNS-J2200-2019-00240

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
N-001	N B J 028	TOTAL PARTICULATE MATTER		CRITERIA	5.00E+00	2.10E+01	5.00E+00	2.10E+01
N-001	N B J 028	PARTICULATE MATTER (10 MICRONS)		CRITERIA	4.80E+00	2.10E+01	4.80E+00	2.10E+01
N-001	N B J 028	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	9.60E-01	4.21E+00	9.60E-01	4.21E+00
N-001	N B J 028	MANGANESE COMPOUNDS		HAP TAP	5.76E-02	2.50E-01	5.76E-02	2.50E-01

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
N-001	N B J 028	TOTAL PARTICULATE MATTER	AP-42	N/A
N-001	N B J 028	PARTICULATE MATTER (10 MICRONS)	AP-42	N/A
N-001	N B J 028	PARTICULATE MATTER (2.5 MICRONS)	AP-42	N/A
N-001	N B J 028	MANGANESE COMPOUNDS	AP-42	N/A

SRNS-J2200-2019-00240

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	**2. Quantity**	**3. Products (List Products in order of major to minor)**	**4. SIC/NAICS Code**	**5. Production Rate**
SHOT TYPE OF ABRASIVES	6.48E06 LB/YR	VARIOUS ABRASIVE BLASTED ITEMS	3471 - 332813	VARIES
METALLIC GRIT TYPE OF ABRASIVES	6.48E06 LB/YR	VARIOUS ABRASIVE BLASTED ITEMS	3471 - 332813	VARIES
SAND TYPE OF ABRASIVES	1.92E05 LB/YR	VARIOUS ABRASIVE BLASTED ITEMS	3471 - 332813	VARIES

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
725-1N ABRASIVE BLASTING	N-001	EMISSIONS FROM PROCESS INDUSTRIES - OTHER MANUFACTURING	6.57 LB / HR PM FOR METALLIC GRIT AND SHOT ABRASIVES 5.94 LB/HR PM FOR SAND ABRASIVES	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 4, Sect. VIII
725-1N ABRASIVE BLASTING	N-001	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	40% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.A

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
N-001	SC 61-62.5, Std. 4, Sect. VIII	Y	CLB	Apr-03	
N-001	SC 61-62.5, Std. 4, Sect. IX.A	Y	CLB	Apr-03	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
N-001	HOURS OF OPERATION	1,040 HR / YR FOR SAND TYPE ABRASIVE USE ONLY	RECORDKEEPING	PER OCCURRENCE	ON SITE
N-001	MATERIAL USAGE	192,000 LB / YR FOR SAND TYPE ABRASIVE USE ONLY	RECORDKEEPING	ANNUAL	ON SITE
N-001	VISIBLE INSPECTIONS (VI)	N/A	RECORDKEEPING	DAILY	SEMIANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
N-001	HOURS OF OPERATION	1,040 HR / YR FOR SAND TYPE ABRASIVE USE ONLY	PER OCCURRENCE	ANNUAL	N	N/A
N-001	MATERIAL USAGE	192,000 LB / YR FOR SAND TYPE ABRASIVE USE ONLY	ANNUAL	ANNUAL	N	N/A
N-001	VISIBLE INSPECTIONS (VI)	N/A	DAILY	N/A	N	N/A

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III
(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
N-001	HOURS OF OPERATION	1,040 HR / YR FOR SAND TYPE ABRASIVE USE ONLY	MONITORING REQUIRED SEE PARTS I AND II	NONE
N-001	MATERIAL USAGE	192,000 LB / YR FOR SAND TYPE ABRASIVE USE ONLY	MONITORING REQUIRED SEE PARTS I AND II	NONE
N-001	VISIBLE INSPECTIONS (VI)	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
N-001	725-1N ABRASIVE BLASTING	TOTAL PARTICULATE MATTER	2.10E+01		2.10E+01		X	N	
N-001	725-1N ABRASIVE BLASTING	PARTICULATE MATTER (10 MICRONS)	2.10E+01		2.10E+01		X	N	
N-001	725-1N ABRASIVE BLASTING	PARTICULATE MATTER (2.5 MICRONS)	4.21E+00		4.21E+00		X	N	

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SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
N-001	725-1N ABRASIVE BLASTING	MANAGNESE COMPOUNDS	2.50E-01		2.50E-01		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V

(This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)

2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI

(This section allows for additional information or requirements for sources subject to a MACT Standard)

2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII

(This section allows for additional requirements for sources subject to a MACT Standard)

2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

N Area Sand Blast Yard

BJ0028, Emission Unit N-001, SCDHEC ID 370N

Assumptions/Basis:

1. Abrasive blasting at Emissions Unit N-001 is performed on metal surfaces.
2. The maximum abrasive usage based on nozzle maximum function is 740 lbs/hr or 0.37 tons/hr.
3. Items that are blasted will not have significant quantities of paint on them.
4. There is no control equipment present in the blasting area, which is performed outdoors. Therefore, uncontrolled emissions equal controlled emissions.
5. Cast Steel Grit and/or Cast Steel Shot are used as the abrasive material for surface preparation.
6. Abrasive selection is dependent on the material being blasted and the purpose of the blasting. This calculation addresses 4 types of abrasive matecrial and their Material Data Safety Sheets are attached. Different abrasives may be utilized at the blast yard as long as any emissions rate of Toxic Air Pollutant (TAP) and Particulate matter emissions are bounded by this calculation.
7. The cast steel shot and cast steel grit will consist of iron, manganese, carbon and silicon. Manganese is a hazardous air pollutant (HAP) and toxic air pollutant (TAP) (manganese compounds). No other constituents of the cast steel shot and cast steel grit are regulated as HAPs or TAPs.
8. The impact beads are 100% glass oxide. There are no regulated HAPs or TAPs associated with this abrasive. Impact beads will be considered as shot for purposes of this calculation.
9. The Aluminum oxide will consist of aluminum oxide, titanium dioxide, and silicon dioxide. None of these constituents are TAPs or HAPs. Aluminum oxide will be considered to be similar to sand for purposes of this calculation.
10. Abrasive material will be procured and brought on site in prepackaged bags. The material will then be manually loaded from the bags into a pressure blast pot. Manual loading cannot occur at the same time the blaster is in use. Emissions from actual blasting will exceed the emissions from manually loading the blast pot; therefore emissions from manual loading are not considered.
11. Per SRNL-RP-2014-00139, the average annual 2013 wind speed was 4.0 miles per hour.
12. Emissions factors are taken from EPA's AP-42, 5th Edition, Chapter 13.2.6: Abrasive Blasting, Sept 1997, Table 13.2.6-1 Particulate Emission Factors for Abrasive Blasting.
13. EPA's AP-42, 5th Edition, Section 13.2.6.3 using grit or shot instead of sand as the abrasive media reduces total PM emissions by 76% and 90%, respectively. This calculation will be in two main parts. The first part will address emissions from abrasive materials that behave like metallic shot (e.g., glass shot and cast steel shot) and grit (e.g., cast steel grit). Since only the cast steel grit contains a TAP the first part of this calculation will conservatively utilize factors applicable to cast steel grit.

The second part of this calculation will evaluate abrasive materials that behave like sand (e.g., aluminum oxide).

14. Since no EPA published values or correction factors for PM10 andPM2.5 could be located when using steel grit it will conservatively be assumed that PM corrected for steel grit=PM10 corrected for steel grit Also, no correction factor for steel grit use will be applied PM2.5 emissions.
15. It will conservatively be assumed the Manganese is 1.2 wt % of the TPM emitted from cast steel grit. This assumption is based on the MSDS from Metaltec Steel Abrasive Company for Cast Steel Grit dated 1/1/2010.
16. The following table provides a breakdown of past shop orders that have been performed at this emission source. These values were originally reported in a calculation submitted in a 11/15/02 email from Carl Cook to Brett Caswell:

Shop Order	Weight of item	Blast Time	Avg. weight
S2775- lifting yoke	3,300 lbs.	1 hours	3,300 lbs/hr
Y3211- lifting yoke (3 each)	12,000lbs.	4.5 hours	2,666 lbs/hr
Melter Box	140,000 lbs.	36 hours	3,888 lbs/hr
S2791- Jumper box	25,000 lbs.	10 hours	2,500 lbs/hr
U135- Burial Box	10,000 lbs.	10 hours	1,000 lbs/hr
Y3152- Coffer dam	19,300 lbs.	3 hours	6,433 lbs/hr
		Total average process weight	3,298 lbs/hr

Based on the above processing weight the weight of the base material process per hour was an average of 3,298 lb/hr or 1.649 tons/hr.

Part 1 – Maximum Emissions from abrasives characterized as shot or metallic grit

	Emission Factor, lb/1000 lb abrasive	Max. Emissions Lb/hr	Max. Emissions Ton/yr
Pollutants	$[A]$	$[B]$	$[C]$
TPM	6.48	4.80	21.00
PM_{10}	6.48	4.80	21.00
$PM_{2.5}$	1.3	0.96	4.21
Managanese		5.76E-02	0.25

Example calculation equations:

TPM factor calculation:
(27 lb TPM/1,000 lb sand abrasive)(0.24) = 6.48 lb TPM/1,000 lb metal grit

$$\mathbf{740}\ \frac{lbsabrasives}{hr} \times [A]\ \frac{lbsTPM}{1000lbsabrasives} = [B]\ \frac{MaxlbsTPM}{hr}$$

$$[B]\ \frac{MaxlbsTPM}{hr} \ \text{x}\ 8760\ \frac{hr}{yr}\ \text{x}\ \frac{ton}{2000lbs} = [C]\ \frac{MaxTonsTPM}{yr}$$

Allowable particulate matter emission rate:
From SCDHEC R. 61- 62.5, Standard 4, Section VIII:

$E = (F)\ 4.10\ P^{0.67}$

Where: E = the allowable emission rate in pounds per hour
P = process weight rate in tons per hour
F = effect factor from Table B

From Table B of the regulations metallic grit and shot would be considered all material not specifically listed hereunder with F=1.0
P = (1.649 tons base material/hr) + (0.37 tons abrasive/hr) = 2.02 tons/hr
$E = (1)(4.10)(\ 2.02\ \text{tons/hr})^{0.67}$
E = 6.57 lbs/hr

Part 1 Conclusion:

When this unit was originally permitted it only utilized slag types of materials and had two administrative controls; operations limited to 1,040 hrs/yr and total abrasive usage limited to 192,000 lbs/yr. The value of 192,000 lbs/yr was based on a calculated actual average use rate of 185 lb/hr transmitted in the 11/15/02 email from Carl Cook to Brett Caswell. Since part 1 of this calculation utilizes the maximum nozzle rate of 740 lb/hr and 8760 hrs/year without exceeding the allowable particulate matter emission rate these administrative limits should not apply to the use of shot and metallic grit once the Title V renewal application is issued.

Part 2 – Maximum Emissions from abrasives characterized as sand

	Emission Factor, lb/1000 lb abrasive	**Max. Emissions Lb/hr**	**Max. Emissions Ton/yr**
Pollutants	$[A]$	$[B]$	$[C]$
TPM	27	5.00	2.60
PM_{10}	13	2.41	1.25
$PM_{2.5}$	1.3	0.24	0.12

When this unit was originally permitted it only utilized slag types of materials, the AP-42 factors for sand, and had two administrative controls; operations limited to 1,040 hrs/yr and total abrasive usage limited to 192,000 lbs/yr. The value of 192,000 lbs/yr was based on a calculated actual average use rate of 185 lb/hr (0.092 tons/ hr) transmitted in the 11/15/02 email from Carl Cook to Brett Caswell. The AP-42 factors for sand have not changed since the administrative limits were put into place and the processing weight is assumed to remain the same. Therefore, in order to comply with the calculated allowable emission rate it is assumed the administrative limits currently in place for use of abrasives characterized as sand will remain.

$$185 \ \frac{lbsabrasives}{hr} \ \text{x} \ [A] \ \frac{lbsTPM}{1000lbsabrasives} = [B] \ \frac{MaxlbsTPM}{hr}$$

$$[B] \ \frac{MaxlbsTPM}{hr} \ \text{x} \ 1{,}040 \ \frac{hr}{yr} \ \text{x} \ \frac{ton}{2000lbs} = [C] \ \frac{MaxTonsTPM}{yr}$$

Allowable particulate matter emission rate:
From SCDHEC R. 61- 62.5, Standard 4, Section VIII:

$E = (F)\ 4.10\ P^{0.67}$

Where: E = the allowable emission rate in pounds per hour
P = process weight rate in tons per hour
F = effect factor from Table B

From Table B of the regulations sand would be considered all material not specifically listed hereunder with F=1.0
P = (1.649 tons base material/hr) + (0.092 tons abrasive/hr) = 1.74 tons/hr
$E = (1)(4.10)(\ 1.74\ \text{tons/hr})^{0.67}$
E = 5.94 lbs/hr

Part 2 Conclusion:

When this unit was originally permitted it only utilized slag types of materials and had two administrative controls; operations limited to 1,040 hrs/yr and total abrasive usage limited to 192,000 lbs/yr. The value of 192,000 lbs/yr was based on a calculated actual average use rate of 185 lb/hr transmitted in the 11/15/02 email from Carl Cook to Brett Caswell. It is necessary to maintain the administrative controls at the blast yard when abrasive that are characterized as sand are utilized.

Total Conclusion:

This emission unit emits more than 5 tons/year criteria pollutant so it is a significant activity. The emissions of PM2.5 are exempt from modeling requirements per SCDHEC's Updated Standards 2 and 7 Exemption and Deferral Guidelines dated 11/24/2010. The maximum emission rate of 5.0 lb/hr and 21.00 TPY for TPM will be utilized for this unit. The maximum emission rate of 4.80 lb/hr and 21.00 TPY for PM10 will be utilized for this unit. The maximum emission rate of 0.96 lb/hr and 4.21 TPY will be utilized for PM2.5. The maximum emission rate of 5.76E-02 lb/hr and 0.25 TPY for manganese will be utilized.

The two administrative controls; operations limited to 1,040 hrs/yr and total abrasive usage limited to 192,000 lbs/yr should only apply to the use of abrasive categorized as sand. Other abrasive not specifically mentioned in this calculation may be utilized as long as the bounds of the maximum emissions rates are not exceeded.

Kim A. Wolfe 10/23/2014
Calculation Originator

J.D. Hope 10/23/14
Reviewer

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier
Product Name **BALLOTINI IMPACT BEADS**

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified use(s) Impact abrasive

1.3 Details of the supplier of the safety data sheet
Company Identification Potters Industries LLC
P. O. Box 841
Valley Forge, PA 19482 USA
Telephone +1 610-651-4700
E-Mail (competent person) sds.uk@pqcorp.com

1.4 Emergency telephone number
Emergency Phone No. Potters Industries LLC +1 610-651-4200
ChemTrec (800) 424-9300

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
GHS Classification Not classified as dangerous for supply/use.

EC Classification Not classified as dangerous for supply/use.

Hazards summary Dust may cause irritation. Caution - spillages may be slippery. When used for abrasive blasting, this material can rebound or fragment into sharp particles which are hazardous to the eyes and skin. Noise is a major hazard in abrasive blasting processes. Abrasive blasting can generate heat, sparks, and static electrical charge.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Regulation (EC) No. 1272/2008 (CLP)

Ingredient(s)	%W/W	CAS No.	EINECS No. / REACH Registration	Hazard symbol(s) and hazard statement(s)
Glass oxide; Glass	100	65997-17-3	2660460	Not classified.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures
Eye Contact: Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. If symptoms persist, obtain medical attention.
Skin Contact: Wash affected skin with plenty of water. If symptoms occur obtain medical attention.
Inhalation: In case of accident by inhalation: remove casualty to fresh air and keep at rest. If symptoms develop, obtain medical attention.
Ingestion: Do not induce vomiting. Get immediate medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed — Dust may cause irritation. Caution - spillages may be slippery. Dust may cause discomfort and mild irritation.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing Media — As appropriate for surrounding fire.

Unsuitable extinguishing Media — None known.

5.2 Special hazards arising from the substance or mixture — Non-combustible.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures — Wear suitable protective clothing. Wear eye/face protection.

6.3 Methods and materials for containment and cleaning up — Caution - spillages may be slippery. Avoid generation of dust. Sweep or preferably vacuum up and collect in suitable containers for recovery or disposal.

6.4 Reference to other sections — Not applicable.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling — Avoid contact with eyes, skin and clothing. Avoid generation of dust. Wash thoroughly after handling.
Wear protective equipment to comply with good occupational hygiene practice.
Do not eat, drink or smoke at the work place.

7.2 Conditions for safe storage, including any incompatibilities — Keep container tightly closed and dry.

7.3 Specific end use(s) — Not applicable.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

SUBSTANCE.	Occupational Exposure Limits
Glass oxide; Glass	No Occupational Exposure Limit assigned. 15mg/m3 total dust 5mg/m3 respirable (Particulates Not Otherwise Regulated)

8.2 Exposure controls

8.2.1 Appropriate engineering controls — Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (dilution and local exhaust), and control of process conditions.

8.2.2 Personal Protection

Respiratory protection — Wear suitable respiratory protective equipment if working in confined spaces with inadequate ventilation or where there is any risk of the exposure limits being exceeded. Observe OSHA regulations for abrasive blasting (29 CFR 1910.94) respirator use (29 C.F.R. §1910.134).

Eye/face protection — Goggles.

Skin protection — Wear suitable protective clothing and gloves. For example cotton or rubber .

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Glass Powder . White.
Odour	Odourless.
Odour Threshold (ppm)	Not applicable.
pH (Value)	Not applicable.
Freezing Point (°C)	Not applicable.
Melting Point (°C)	Approx 730 C
Boiling Point (°C)	Not applicable.
Flash Point (°C) [Closed cup]	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Non-combustible.
Vapour Pressure (mm Hg)	Not applicable.
Vapour Density (Air=1)	Not applicable.
Solubility (Water)	Insoluble.
Partition Coefficient	Not applicable.
Auto Ignition Point (°C)	Not applicable.
Decomposition Temperature (°C)	Not applicable.
Viscosity (mPa. s)	Not applicable.
Explosive properties	Not applicable.
Oxidising Properties	Not applicable.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	Avoid contact with strong acids
10.2 Chemical stability	Stable.
10.3 Possibility of hazardous reactions	Not applicable.
10.4 Conditions to avoid	Not applicable.
10.6 Hazardous decomposition product(s)	None known.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Ingestion	The acute oral toxicity of this product has not been tested. A similar material was nontoxic to rats at 5,000 mg/kg.
Inhalation	May cause irritation to the respiratory system.
Skin Contact	Dust may cause mechanical irritation.
Eye Contact	Dust may cause mechanical irritation.
Sensitisation	Not sensitising.
Carcinogenicity	There are no known reports of carcinogenicity of nonfibrous glass. Components are not listed by IARC, NTP or OSHA as carcinogens.
Reproductive toxicity	No evidence of reproductive toxicity or developmental toxicity.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity	No environmental hazards have been reported or known.
12.2 Persistence and degradability	This material is persistent but inert in aquatic systems. It will not bioconcentrate up the food chain.
12.5 Results of PBT and vPvB assessment	Not classified as PBT or vPvB.
12.6 Other adverse effects	Not applicable

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods Product as supplied: The waste is considered to be non hazardous. Disposal should be in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

14.2 Proper Shipping Name NOT CLASSED AS DANGEROUS FOR TRANSPORT.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

TSCA Inventory Status: Reported/Included.
AICS Inventory Status: Reported/Included.
DSL/NDSL Inventory Status: Reported/Included.
There is no CERCLA Reportable Quantity for this material.
Contains no SARA Title III, Section 313 notification chemical present at or above the deminimus concentration.
German Water Hazard Classification VwVwS: WGK class 1 (low hazard to water).
HMIS: 0,0,0

SECTION 16: OTHER INFORMATION

This SDS was last reviewed: 01/2014
The following sections contain revisions or new statements: All sections.

EC Classification No. 67/548/EEC Not classified as dangerous for supply/use.

GHS Classification Not classified as dangerous for supply/use.

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Potters Industries gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Potters Industries accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Material Safety Data Sheet

FORD TOX #: 135423

Manufacturer's Name:	Metaltec Steel Abrasive Company
Address:	41155 Joy Road
City, State, ZIP	Canton, MI 48187
Telephone / Fax #:	(734) 459-7900 / (734) 459-7907
Emergency:	(734) 454-1840
Product Names:	Cast Steel Shot Low Carbon Cast Steel Shot
Chemical Family:	Ferrous January 1, 2009
Signature:	Martin Schendel

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS NUMBER	% WEIGHT	OSHA TWA	ACGIH TWA
Iron	1309-37-1	>96	10 mg/m^3 (as nuisance dust)	5 mg/m^3
Manganese	74-39-96-5	0.60-0.90	5 mg/m^3	5 mg/m^3 C*
Carbon	7440-44-0	0.08-0.15	none est.	none est.
Silicon	7440-21-3	0.10-0.30	15 mg/m^3 (as nuisance dust)	10 mg/m^3

C* = ceiling limit, shall not be exceeded even for a short time.

SECTION III - PHYSICAL DATA

Melting Point:	1371- 1482C	Vapor Pressure:	not applicable
Evaporation Rate:	not applicable	Vapor Density:	not applicable
Boiling Point:	2850 - 3150C	% Solid by Weight:	100%
Solubility in Water:	not applicable	pH:	not applicable
Appearance and Odor:	Steel shot is near spherical in shape and light gray to silver in color		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point: not applicable

Auto Ignition Temperature: (solid iron exposed to oxygen) 930C

Cast Steel Shot will not burn or explode

The solid form of material is not combustible. Fire explosion hazards are moderate when material is in the form of dust and exposed to heat of flames, chemical reaction, or contact with powerful oxidizers.

Fire Extinguishing Method: Use dry chemicals or sand to exclude air.

SECTION V – HEALTH HAZARD DATA

Threshold Limit: See Section II

Carcinogenicity: None of the ingredients listed by N.T.P., IARC or OSHA

Permissible Exposure Limit: See Section II

Primary Routes of Entry: Inhalation of dust or fumes created during use, or dust particulate in eyes.

Overexposure to dust containing the component elements of cast steel shot may cause skin, nose, mouth and eye irritation.

EMERGENCY AND FIRST AID PROCEDURE

Eye Contact: Flush with running water to remove particles. Seek additional medical attention if necessary.

Skin Contact: Brush off excess dust, wash area with soap and water.

Inhalation: Remove to fresh air. Seek medical attention

Ingestion: Seek medical help if large quantities of material have been ingested.

SECTION VI – REACTION DATA

Stability: Stable Hazardous Polymerization: will not occur

Hazardous Decomposition Products: None Cast Steel Shot will wear away at a controlled rate through normal use.

SECTION VII - SPILL AND LEAK PROCEDURE

Cast Steel Shot spilled or leaked onto floors can cause hazardous walking conditions. Spills or leaks should be vacuumed or swept from working areas. When cleaning up large quantities of dust, a NIOSH approved respirator should be worn. Spilled Cast Steel Shot can be reused or disposed of as a non-hazardous waste. Collected dust from blast cleaning or shot peening operations always contain contaminants from the surface of the parts being processed, and therefore the dust may be classified as a hazardous waste an, as such, must be disposed of according to appropriate Local, State or Federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation: General and local exhaust ventilation should be provided to keep the dust levels below TLV's shown in Section II.

Respiratory Protection:
If dust created by use exceeds the TLV's indicated in Section II, a NIOSH approved respirator should be worn.

Eye Protection:
Approved safety glasses with side shields should be worn at all times. Safety eyewash stations should be provided in close proximity to the work area.

Other Protection Equipment:
None required.

SECTION IX - SPECIAL PRECAUTIONS

Handling and Storage Precautions:
Store material away from incompatible materials and keep dust away from sources of ignition. Keep dry to reduce rusting. Observe maximum floor loading limitations.

Other Precautions:
The company has no control over this product or its use after it leaves our facility. The Company assumes no liability for loss or damage from the proper or improper use of this product. The information presented here has been compiled from sources considered to be reliable and accurate to the best of our knowledge and belief, but is not guaranteed to be so.

Material Safety Data Sheet

Manufacturer's Name:	Metaltec Steel Abrasive Company
Address:	41155 Joy Road
City, State, ZIP	Canton, MI 48187
Telephone / Fax #:	(734) 459-7900 / (734) 459-7907
Emergency:	(734) 454-1840
Product Names:	Cast Steel Grit High Carbon Cast Steel Grit
Chemical Family:	Ferrous January 1, 2010
Signature:	Martin Schandel

SECTION II - HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS NUMBER	% WEIGHT	OSHA TWA	ACGIH TWA
Iron	1309-37-1	>96	10 mg/m^3 (as nuisance dust)	5 mg/m^3
Manganese	74-39-96-5	0.60 - 1.20	5 mg/m^3	5 mg/m^3 C*
Carbon	7440-44-0	0.80 - 1.20	none est.	none est.
Silicon	7440-21-3	0.40 - 1.00	15 mg/m^3 (as nuisance dust)	10 mg/m^3

C* = ceiling limit, shall not be exceeded even for a short time.

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Melting Point:	1371- 1482C	Vapor Pressure:	not applicable
Evaporation Rate:	not applicable	Vapor Density:	not applicable
Boiling Point:	2850 - 3150C	% Solid by Weight:	100%
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Appearance and Odor:	Steel shot is near spherical in shape and light gray to silver in color		

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Eye Protection:
Approved safety glasses with side shields should be worn at all times. Safety eyewash stations should be provided in close proximity to the work area.

Other Protection Equipment:
None required.

SECTION IX - SPECIAL PRECAUTIONS

Handling and Storage Precautions:
Store material away from incompatible materials and keep dust away from sources of ignition. Keep dry to reduce rusting. Observe maximum floor loading limitations.

Other Precautions:
The company has no control over this product or its use after it leaves our facility. The Company assumes no liability for loss or damage from the proper or improper use of this product. The information presented here has been compiled from sources considered to be reliable and accurate to the best of our knowledge and belief, but is not guaranteed to be so.

Illinois Valley Minerals, L.L.C.

575 N. 18th Mile Road Tonica, IL 61370 * PHONE 815-442-8402 * FAX 815-442-8408

MATERIAL SAFETY DATA SHEET

Product/Substance Identification Fused Aluminum Oxide

Chemical Family: Metal Oxides

Trade Names/Synonyms: Alundum; alumina; Dialuminum Trioxide; Aluminum Sesquioxide; Alpha-Alumina; Beta-Alumina; Gamma-Alumina; Corundum; Alumite; Almite; Martoxin; Baikalox Polishing Chemicals (Baikowski International Co.); Tabular Alumina (ALCOA); Aluminum Oxide (AL2O3); Aluminum Trioxide; Linde A,B,C (Union Carbide Corporation); D Alumina Powders (Union Carbide Corporation); 420003704; WESGO Alumina Ceramics; AL2O3; CMC00950;

Company Name:	Illinois Valley Minerals LLC. 575 N 18th Mile Road Tonica, Illinois 61370
Company Emergency Telephone No:	815-442-8402
CHEMTREC ®	800-424-9300
HMIS Number	1

Composition Ingredients Information

Hazardous Component	CAS <	OSHA PEL(1)	ACGIH TLV(2)	NIOSH
Aluminum Oxide 94 -100%	1344-28-1	15Mg/M3 (Total dust) 5Mg/M3 (resp fraction)	10 Mg/M3	(RTECS) BD1200000
Titanium Dioxide 0 - 4%	13463-67-7	15Mg/M3 (Total dust) 5Mg/M3 (resp fraction)	10 Mg/M3	(RTECS) XR2275000
Silicon Dioxide 0 - 1.3%	7631-86-9	20 mppcf (80mg/m3/%SiO2)	10 Mg/M3	(RTECS) VV731000 REL=TWA 6Mg/M3

1 Occupation Safety and Health Administration final rule permissible exposure limits.
2 American Conference of Governmental Industrial Hygienists threshold limit values.

Physical & Chemical Characteristics

Appearance and odor:	White to Gray/Brown crystals or powder, Odorless.		
Boiling Point:	5396F, 2980C	Melting Point:	3727-3762F, 2053-2072C
Vapor Pressures:	1 mmHg @ 2158 C	Vapor Density:	NA
PH:	NA	Specific Gravity:	(H20 = 1) 3.965 @ 25 C
Molecular weight:	101.96	Evaporation Rate:	NA
Solubility in water:	Insoluble	Volatility:	<0.5%
Solvent Solubility:	Slightly soluble: mineral acids, strong alkali Practically Insoluble: nonpolar organic solvents		

Fire and Explosion Hazard Data

Flash Point:	NA
Flammable Limits:	NA
Extinguishing Media:	Water spray, Dry Chemical, Carbon Dioxide (CO2), Foam
Lower/Upper Explosion Limits:	NA
Special Fire Fighter Procedures:	Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.
Unusual F & E Hazards:	None (Material NOT combustible)

Incompatibilities and Reactivity Data

Stability:	Stable
Incompatibility:	Halo carbons, halogens, combustible materials, oxidizing materials Chlorinated rubber (Hot), Chlorine Trifluoride (Violent reaction & possible ignition), Ethylene Oxide (may initiate explosive polymerization), Halocarbons (Exothermic reaction above 200 C), Halocarbons + Metals (Exothermic reaction at ambient temperatures), Oxygen Difluoride (Exothermic reation), Sodium Nitrate (may form explosive mixture), Vinyl acetate (Possible vigorous reations).

Hazardous Decomposition or By-Products: Thermal decomposition products: miscellaneous decomposition products.

Conditions to avoid: Generating dust

First Aid measures

Inhalation:	Move to fresh air. If difficulty-breathing oxygen may be administers. Seek medical attention if needed.
Skin contact:	Wash exposed areas with soap and water use. If irritation persists, seek medical attention.
Eye contact:	Flush with water. If irritation persists, seek medical attention.
Ingestion:	Seek medical attention if needed.

Precautions for Safe Handling and Use

Steps to be taken in case material is released or spilled: Sweep, shovel or vacuum materials.
Limit exposure to dust.
Waste Disposal method: Comply with all state, federal and local regulations.
Precautions to be taken in handling and storing: Limit generation of dust. Keep separate from incompatible substances.

Control Measures

Respiratory Protection:	As needed. NIOSH approved dust respirator recommended for limiting exposure. Similar respiratory protection required at concentrations above PEL.
Ventilation:	Adequate local exhaust.
Protective Gloves:	As needed
Eye Protection:	Safety Goggles as needed.

Sara Title III Reporting

To the best of our knowledge, this product does not contain any substance requiring on the SARA, Title III, Section 313 list.

Reviewed and Approved - 2014

221-S Vitrification Process (S-001)

The purpose of the Defense Waste Processing Facility (DWPF) is to stabilize high level radioactive waste. This is achieved by mixing the radioactive waste with silica sand, melting the mixture, and pouring the mixture into stainless steel canisters.

Sludge conditioning is conducted in the Chemical Process Cell (CPC) prior to feeding into the DWPF melter. The CPC is located in the 221-S Vitrification Building and consists of an 11,000-gallon Sludge Receipt and Adjustment Tank (SRAT) (267S) and an 11,000-gallon Surry Mix Evaporator (SME) (266S). These are the main process vessels.

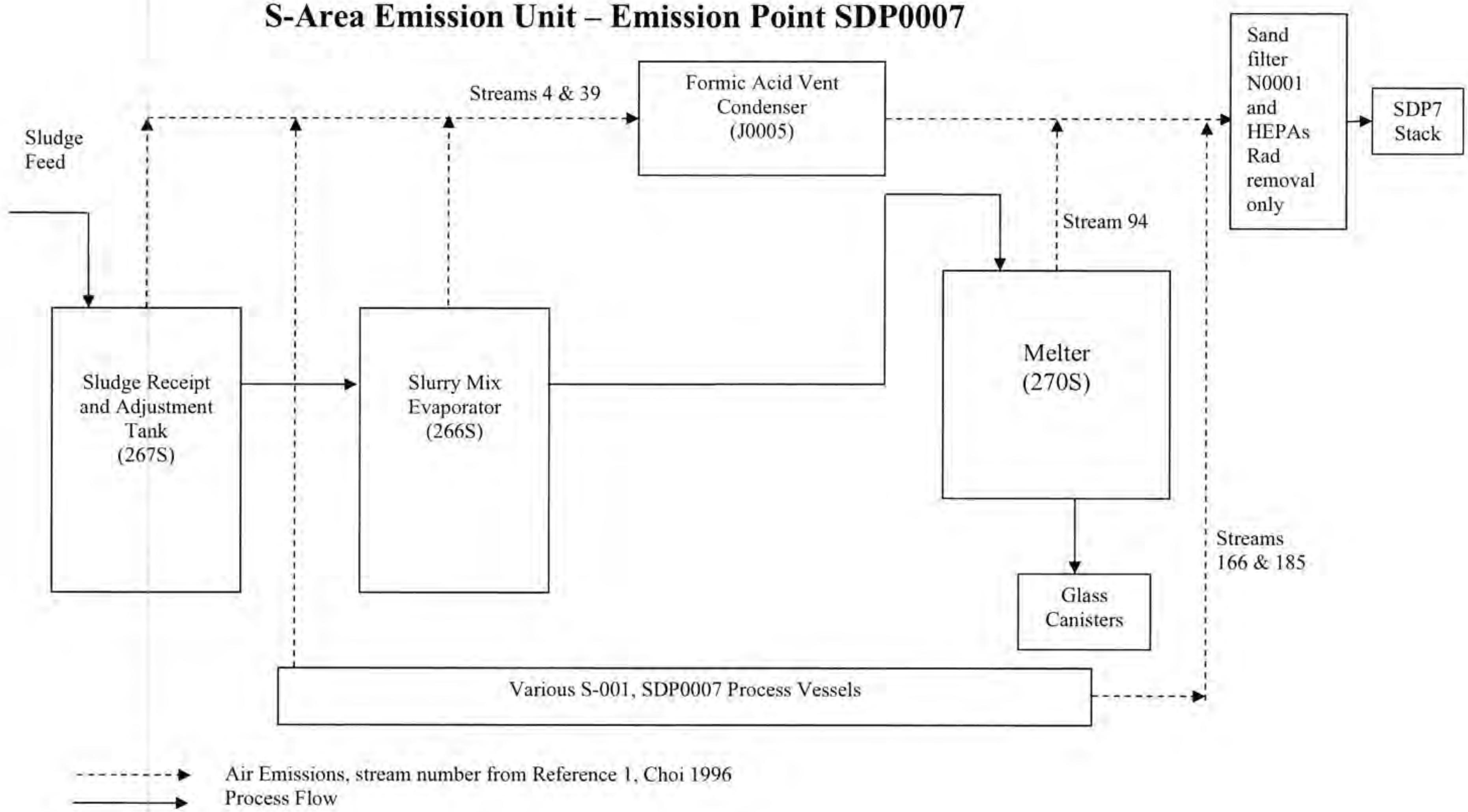
There are numerous other vessels associated with DWPF. The June 15, 1999 SCDHEC Guidance Document for Standard 4, Section VIII – PM Emission Limitations was utilized to determine which vessels must be included in the S-001 emission unit and which are not part of the process. The calculation sheet, contained within the S-001 tab, details this evaluation process. It was determined that SCDHEC IDs associated with emission points SDP0001, SDP0007, SDP0009, and SDP0019 are part of the S-001 emission unit (i.e. part of the DWPF process).

The J0005 Formic Acid Vapor Condenser (FAVC)is the only control device credited for the control of non-radiological emissions. J0005 controls both mercury emissions and formic acid emissions that are emitted to emission point SDP0007.

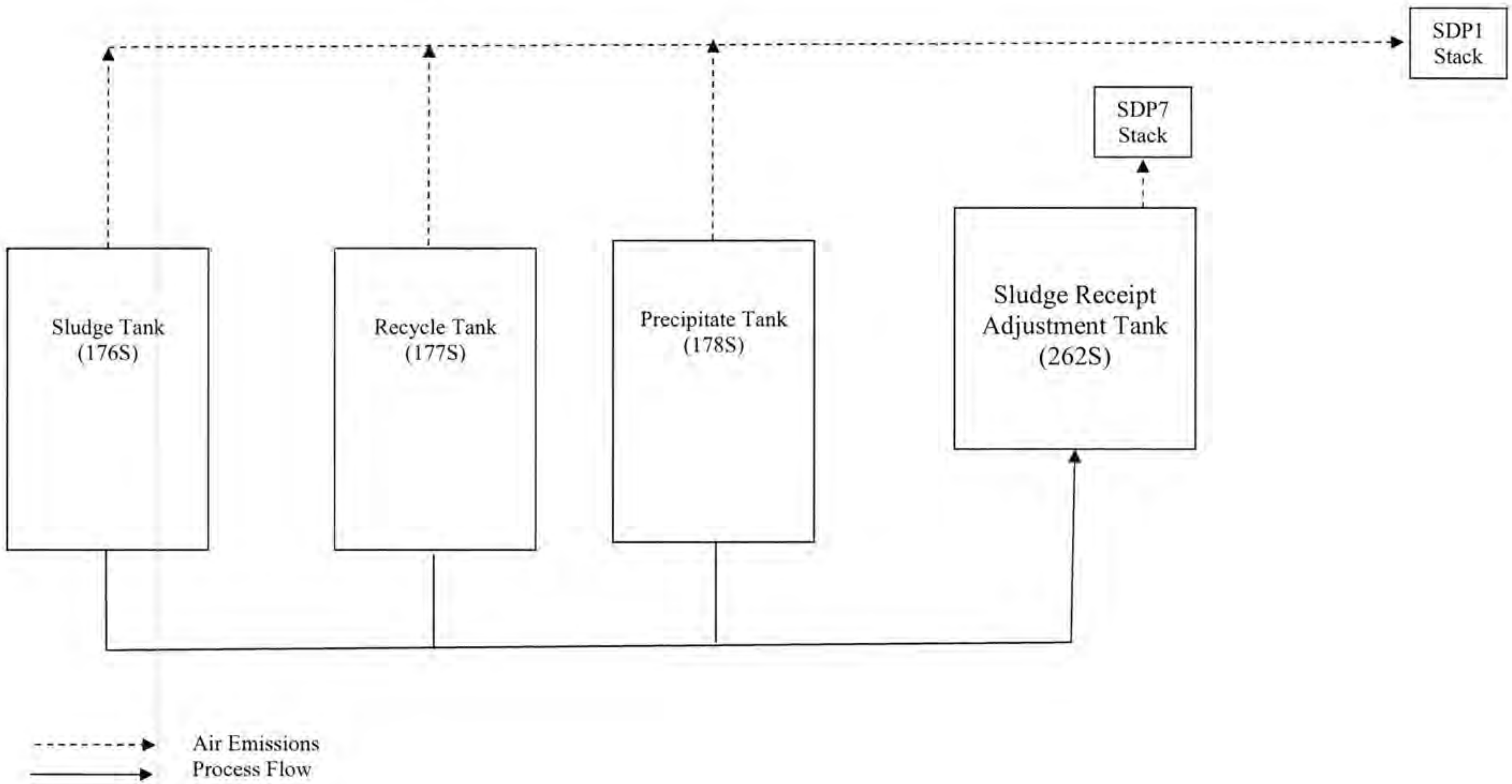
The following is an overview of S-001 process. A batch of sludge is pumped into the SRAT. The SRAT is heated and formic acid is added to reduce residual mercury back to its elemental state. The contents are then concentrated by distillation. The condensate is collected in the Slurry Mix Evaporator Condensate Tank (SMECT, vessel is vented to the FAVC) and the reaction is continued to the correct endpoint. The contents of the SRAT are transferred to the SME where glass frit is added and further evaporation takes place to adjust the solids concentration to the correct specification before transfer to the Melter Feed Tank (MFT, vessel is vented to the FAVC).

The MFT continues to preheat the high-level waste / glass frit solution and continuously feeds the 221-S Melter (270S). Under normal operation, a pool of molten glass exists inside the melter. As the frit and waste mixture is poured onto the pool surface, the water evaporates, and the molten glass dissolves the fresh glass frit with the waste. Molten glass is continuously poured from the Melter pour spout into stainless steel canisters. Significant quantities of particulates, steam, and non-condensable gases are evolved from the melter surface during vitrification. The primary and backup off-gas systems are installed to capture these emissions. The gases leaving the melter are first cooled from 1120 °F to 660 °F by a film cooler with secondary cooling to 100 °F by a water quench. The non-condensed off gas is further cleaned by a train consisting of steam atomized scrubbers, condenser, HEME, gas heater and two stage HEPA filtration. The gas leaves the vitrification building via the exhaust tunnel. It is mixed with other process exhausts and passes through a sand filter prior to discharge into the ambient air. The Sand Filter and HEPA filters associated with SDP0001 are present to control radionuclides and are not credited for the reduction of non-radioactive emissions. Emission point SDP0007 is not a Potential Impact Category 1 or 2 radiological air emission source; therefore, neither of these control devices are listed or described in the renewal application forms.

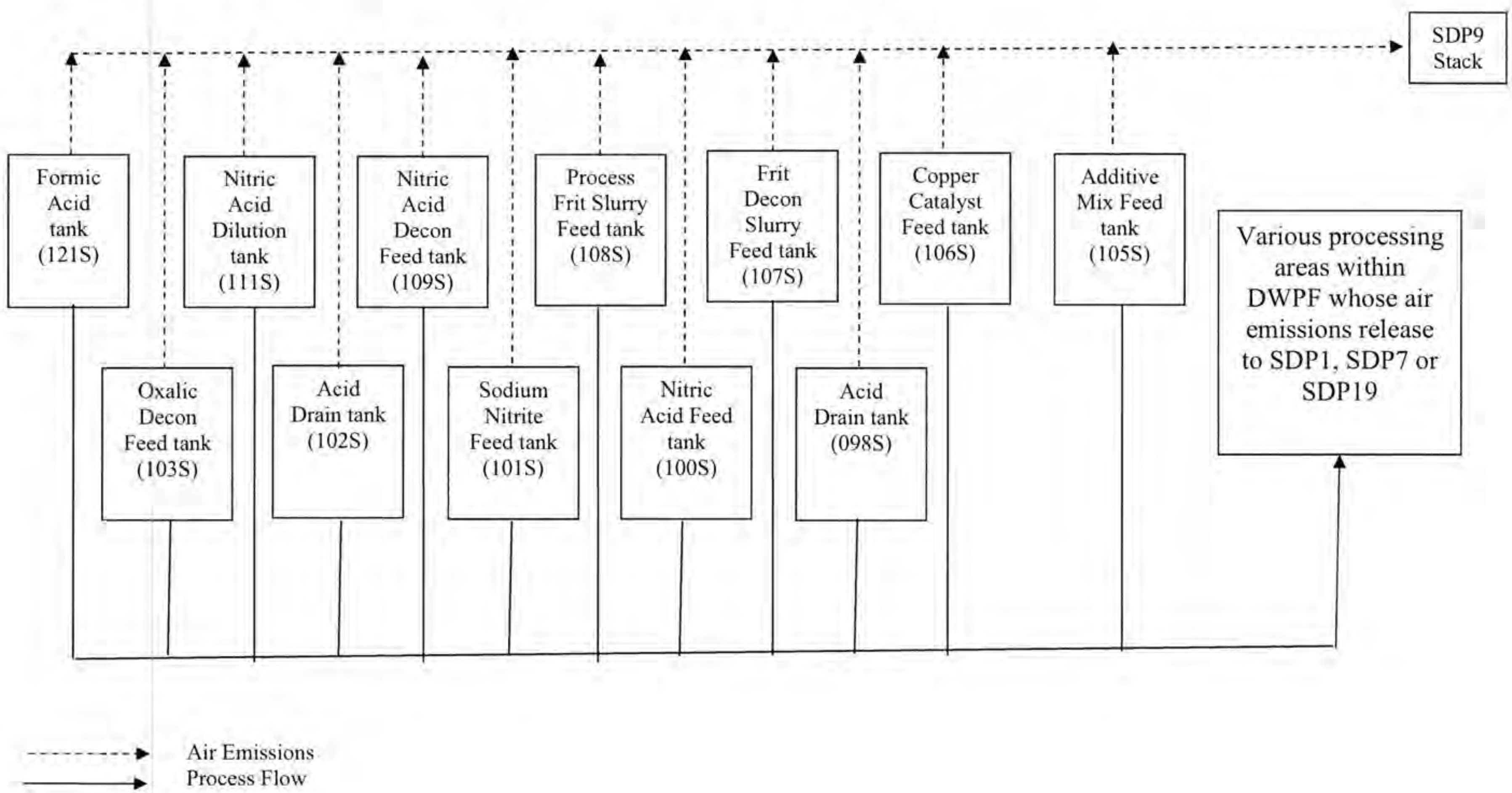
S-Area Emission Unit – Emission Point SDP0007



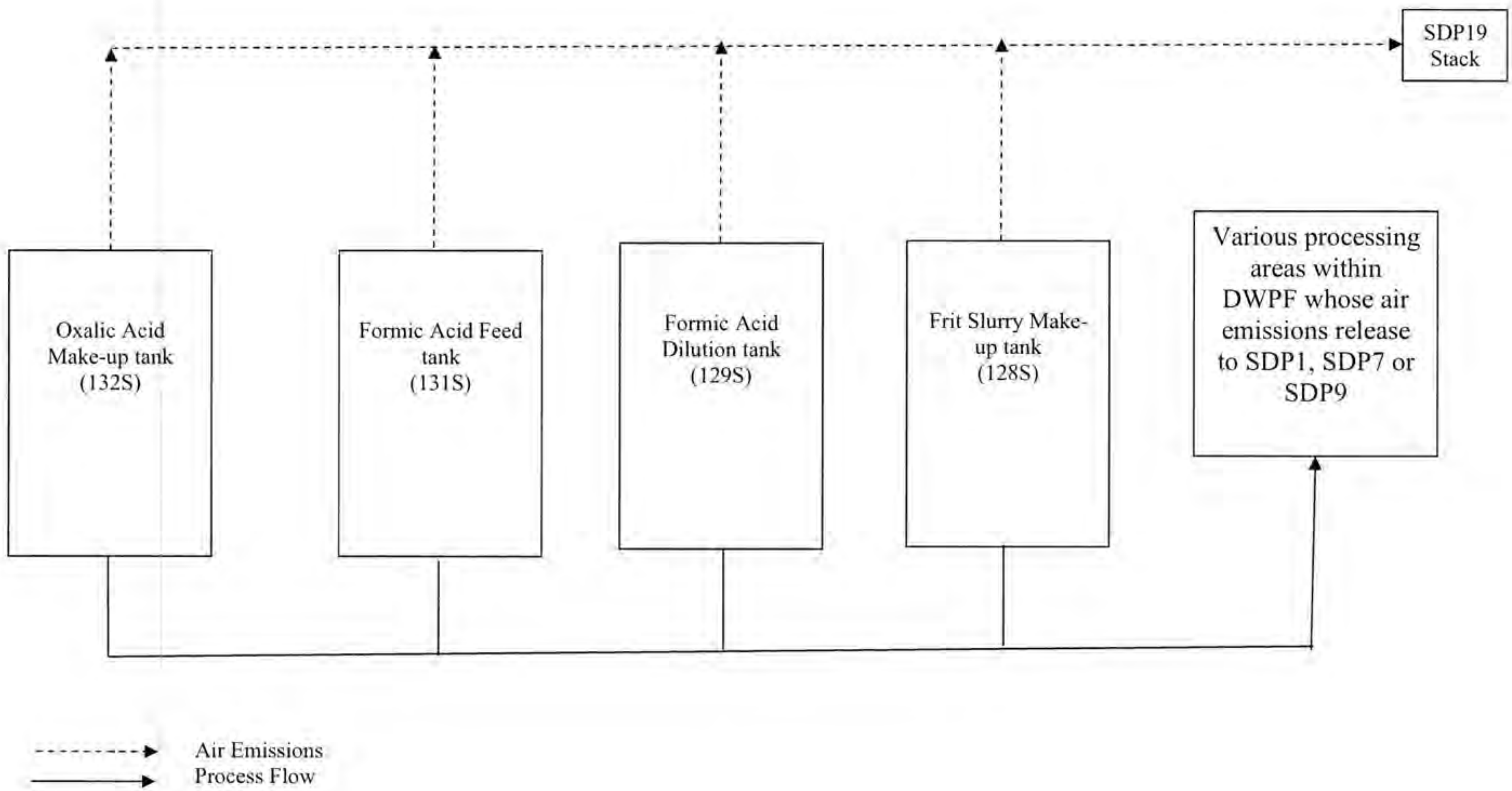
S-Area Emission Unit – Emission Point SDP0001



S-Area Emission Unit – Emission Point SDP0009



S-Area Emission Unit – Emission Point SDP0019



D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION UNIT DESCRIPTION
(Table is a description of emission units located at this facility)

1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Emission Unit Description/Purpose	3. Control Device
S-001	221-S VITRIFICATION PROCESS	CONDENSER

EMISSION UNIT PROCESS DESCRIPTION
(For each emission unit listed above, provide the following emission unit process description information)

1. Emission Unit ID	4. Process Weight Rate (tons/hr)	5. Production Rate (units per time period)	6. Major Product	7. SIC/NAICS Code	8. Comments (Special permit limits, etc.)
S-001	0.24	420 CANISTERS	HIGH LEVEL WASTE GLASS CANISTER	4953 - 562211	NONE

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
J 0005	CONDENSER---MITTERNIGHT BOILER WORKS, 31-60, NONE	Feb-93	MERCURY (ELEMENTAL) FORMIC ACID

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
J 0005	INDUCED DRAFT	100 100	96 91	VENDOR DATA	PRESSURE DROP	S DP 0007	MERCURY (ELEMENTAL) FORMIC ACID

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
S-001	266S	SLURRY MIX EVAPORATOR (SME)	1988	NONE	J 0005	S D P 0007	60 BATCHES
S-001	270S	MELTER	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	267S	SLUDGE RECEIPT AND ADJUSTMENT TANK (SRAT)	1988	NONE	J 0005	S D P 0007	60 BATCHES
S-001	275S	PRECIPITATE REACTOR FEED TANK	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	264S	DECONTAMINATION WASTE TREATMENT TANK	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	256S	SME ISOLATION POT	1988	NONE	J 0005	S D P 0007	60 BATCHES
S-001	278S	OFFGAS CONDENSATE TANK 1	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	488S	OFFGAS CONDENSATE TANK 2	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	388S	CRANE DECON FEED TANK	1988	NONE	NA	S D P 0007	60 BATCHES
S-001	176S	SLUDGE TANK	1988	NONE	NA	S D P 0001	60 BATCHES
S-001	177S	RECYCLE TANK	1988	NONE	NA	S D P 0001	60 BATCHES
S-001	178S	PRECIPITATE TANK	1988	NONE	NA	S D P 0001	60 BATCHES
S-001	121S	FORMIC ACID TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	111S	NITRIC ACID DILUTION TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	109S	NITRIC ACID DECON FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	108S	PROCESS FRIT SLURRY FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	107S	FRIT DECON SLURRY FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	106S	COPPER CATALYST FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	105S	ADDITIVE MIX FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	103S	OXALIC DECON FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	102S	ACID DRAIN TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	101S	SODIUM NITRITE FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES

SRNS-J2200-2019-00240

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
S-001	100S	NITRIC ACID FEED TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	098S	ACID DRAIN CATCH TANK	1988	NONE	NA	S D P 0009	60 BATCHES
S-001	132S	OXALIC ACID MAKE-UP TANK	1988	NONE	NA	S D P 0019	60 BATCHES
S-001	131S	FORMIC ACID FEED TANK	1988	NONE	NA	S D P 0019	60 BATCHES
S-001	129S	FORMIC ACID DILUTION TANK	1988	NONE	NA	S D P 0019	60 BATCHES
S-001	128S	FRIT SLURRY MAKE-UP TANK	1988	NONE	NA	S D P 0019	60 BATCHES

EQUIPMENT DESCRIPTION (CONTINUED)

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
266S	N/A	N/A	0080-0066-CB	NONE
267S	N/A	N/A	0080-0066-CB	NONE
270S	N/A	N/A	0080-0066-CB	NONE
275S	N/A	N/A	0080-0066-CB	NONE
264S	N/A	N/A	0080-0066-CB	NONE
256S	N/A	N/A	0080-0066-CB	NONE
278S	N/A	N/A	0080-0066-CB	NONE
488S	N/A	N/A	0080-0066-CB	NONE
388S	N/A	N/A	0080-0066-CB	NONE
176S	N/A	N/A	0080-0066-CB	NONE
177S	N/A	N/A	0080-0066-CB	NONE
178S	N/A	N/A	0080-0066-CB	NONE
121S	N/A	N/A	0080-0066-CB	NONE
111S	N/A	N/A	0080-0066-CB	NONE
109S	N/A	N/A	0080-0066-CB	NONE

SRNS-J2220-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

Equipment Description (Continued)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
108S	N/A	N/A	0080-0066-CB	NONE
107S	N/A	N/A	0080-0066-CB	NONE
106S	N/A	N/A	0080-0066-CB	NONE
105S	N/A	N/A	0080-0066-CB	NONE
103S	N/A	N/A	0080-0066-CB	NONE
102S	N/A	N/A	0080-0066-CB	NONE
101S	N/A	N/A	0080-0066-CB	NONE
100S	N/A	N/A	0080-0066-CB	NONE
098S	N/A	N/A	0080-0066-CB	NONE
132S	N/A	N/A	0080-0066-CB	NONE
131S	N/A	N/A	0080-0066-CB	NONE
129S	N/A	N/A	0080-0066-CB	NONE
128S	N/A	N/A	0080-0066-CB	NONE

SRNS-J2220-2019-00240

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PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
S-001	S D P 0001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	6.85E-05	3.00E-04	6.85E-05	3.00E-04
S-001	S D P 0001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	6.85E-05	3.00E-04	6.85E-05	3.00E-04
S-001	S D P 0001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	6.85E-05	3.00E-04	6.85E-05	3.00E-04
S-001	S D P 0001	MANGANESE COMPOUNDS		HAP TAP	3.42E-06	1.50E-05	3.42E-06	1.50E-05
S-001	S D P 0007	NITRIC ACID	7697 37 2	TAP	1.16E+00	2.99E+00	1.16E+00	2.99E+00
S-001	S D P 0007	TOTAL PARTICULATE MATTER (PM)		CRITERIA	1.18E-01	3.28E-01	1.18E-01	3.28E-01
S-001	S D P 0007	PARTICULATE MATTER (10 MICRONS)		CRITERIA	1.18E-01	3.28E-01	1.18E-01	3.28E-01
S-001	S D P 0007	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	1.18E-01	3.28E-01	1.18E-01	3.28E-01
S-001	S D P 0007	NITROGEN DIOXIDE	10102 44 0	CRITERIA	1.32E+01	4.29E+01	1.32E+01	4.29E+01
S-001	S D P 0007	VOC		CRITERIA	1.62E-02	4.17E-02	1.46E-03	3.76E-03
S-001	S D P 0007	LEAD COMPOUNDS LEAD	7439 92 1	HAP CRITERIA	1.69E-06	5.82E-06	1.69E-06	5.82E-06
S-001	S D P 0007	FORMIC ACID	64 18 6	TAP	1.62E-02	4.17E-02	1.46E-03	3.76E-03
S-001	S D P 0009	TOTAL PARTICULATE MATTER (PM)		CRITERIA	1.50E-03	6.58E-03	1.50E-03	6.58E-03
S-001	S D P 0009	PARTICULATE MATTER (10 MICRONS)		CRITERIA	1.50E-03	6.58E-03	1.50E-03	6.58E-03

SRNS-J2200-2019-00240

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
S-001	S D P 0009	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	1.50E-03	6.58E-03	1.50E-03	6.58E-03
S-001	S D P 0009	MANGANESE COMPOUNDS		HAP TAP	1.14E-06	5.00E-06	1.14E-06	5.00E-06
S-001	S D P 0009	VOC		CRITERIA	3.01E-03	1.32E-02	3.01E-03	1.32E-02
S-001	S D P 0009	FORMIC ACID	64 18 6	TAP	2.99E-03	1.31E-02	2.99E-03	1.31E-02
S-001	S D P 0009	NITRIC ACID	7697 37 2	TAP	7.23E-03	3.17E-02	7.23E-03	3.17E-02
S-001	S D P 0009	OXALIC ACID	144 62 17	TAP	1.47E-03	6.44E-03	1.47E-03	6.44E-03
S-001	S D P 0019	TOTAL PARTICULATE MATTER (PM)		CRITERIA	3.20E-05	1.40E-04	3.20E-05	1.40E-04
S-001	S D P 0019	PARTICULATE MATTER (10 MICRONS)		CRITERIA	3.20E-05	1.40E-04	3.20E-05	1.40E-04
S-001	S D P 0019	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	3.20E-05	1.40E-04	3.20E-05	1.40E-04
S-001	S D P 0019	VOC		CRITERIA	2.15E-04	9.40E-04	2.15E-04	9.40E-04
S-001	S D P 0019	FORMIC ACID	64 18 6	TAP	2.15E-04	9.40E-04	2.15E-04	9.40E-04
S-001	S D P 0019	OXALIC ACID	144 62 17	TAP	3.20E-05	1.40E-04	3.20E-05	1.40E-04

SRNS-J2200-2019-00240

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
S-001	S D P 0001	TOTAL PARTICULATE MATTER (PM)	TANKS 4.0.9D	N/A
S-001	S D P 0001	PARTICULATE MATTER (10 MICRONS)	TANKS 4.0.9D	N/A
S-001	S D P 0001	PARTICULATE MATTER (2.5 MICRONS)	TANKS 4.0.9D	N/A

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
S-001	S D P 0001	MANGANESE COMPOUNDS	TANKS 4.0.9D	N/A
S-001	S D P 0007	NITRIC ACID	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	TOTAL PARTICULATE MATTER (PM)	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	PARTICULATE MATTER (10 MICRONS)	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	PARTICULATE MATTER (2.5 MICRONS)	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	NITROGEN DIOXIDE	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	VOC	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	LEAD COMPOUNDS LEAD	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0007	FORMIC ACID	ENGINEERING CALCULATIONS	N/A
S-001	S D P 0009	TOTAL PARTICULATE MATTER (PM)	TANKS 4.0.9D	N/A
S-001	S D P 0009	PARTICULATE MATTER (10 MICRONS)	TANKS 4.0.9D	N/A
S-001	S D P 0009	PARTICULATE MATTER (2.5 MICRONS)	TANKS 4.0.9D	N/A
S-001	S D P 0009	MANGANESE COMPOUNDS	TANKS 4.0.9D	N/A

SRNS-J2200-2019-00240

DHEC
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South Carolina Department of Health and Environmental Control

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
S-001	S D P 0009	VOC	TANKS 4.0.9D	N/A
S-001	S D P 0009	FORMIC ACID	TANKS 4.0.9D	N/A
S-001	S D P 0009	NITRIC ACID	TANKS 4.0.9D	N/A
S-001	S D P 0009	OXALIC ACID	TANKS 4.0.9D	N/A
S-001	S D P 0019	TOTAL PARTICULATE MATTER (PM)	TANKS 4.0.9D	N/A
S-001	S D P 0019	PARTICULATE MATTER (10 MICRONS)	TANKS 4.0.9D	N/A
S-001	S D P 0019	PARTICULATE MATTER (2.5 MICRONS)	TANKS 4.0.9D	N/A
S-001	S D P 0019	VOC	TANKS 4.0.9D	N/A
S-001	S D P 0019	FORMIC ACID	TANKS 4.0.9D	N/A
S-001	S D P 0019	OXALIC ACID	TANKS 4.0.9D	N/A

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	**2. Quantity**	**3. Products (List Products in order of major to minor)**	**4. SIC/NAICS Code**	**5. Production Rate**
DOW C 544 ANTIFOAM	4440 GALLONS	HLW GLASS	4964 - 562211	1554000 POUNDS
FORMIC ACID	30500 GALLONS	SLURRY MIX TO MFT	4953 - 562211	166500 GALLONS
LAB WASTE	116180 GALLONS		4958 - 562211	
NEW FRIT	166500 GALLONS		4963 - 562211	
NITRIC ACID	7400 GALLONS		4965 - 562211	
SLUDGE	222000 GALLONS		4966 - 562211	
SODIUM NITRATE	46250 GALLONS		4967 - 562211	
MELTER FEED	166500 GALLONS		4967 - 562211	
CAUSTIC FEED	77700 GALLONS		4967 - 562211	

SRNS-J2200-2019-00240

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS

(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
221-S VITRIFICATION PROCESS	S-001	EMISSIONS FROM PROCESS INDUSTRIES - OTHER MANUFACTURING	1.6 LB / HR PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 4, Sect. VIII
221-S VITRIFICATION PROCESS	S-001	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.B
221-S VITRIFICATION PROCESS	S-001	FORMIC ACID	CONDENSER PERFORMANCE	NA	SC 61-62.1, Section II(J)(2)
221-S VITRIFICATION PROCESS	S-001	MERCURY	CONDENSER PERFORMANCE	NA	SC 61-62.1, Section II(J)(2)

COMPLIANCE AND PERMIT REQUIREMENTS

(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
S-001	SC 61-62.5, Std. 4, Sect. VIII	Y	CLB	Apr-03	
S-001	SC 61-62.5, Std. 4, Sect. IX.B	Y	CLB	Apr-03	
S-001	SC 61-62.1, Section II(J)(2)	Y	CLB	Apr-03	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I

(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
S-001	FORMIC ACID	N/A	RECORDKEEPING	DAILY	SEMIANNUAL
S-001	MERCURY	N/A	RECORDKEEPING	DAILY	SEMIANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II

(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
S-001	FORMIC ACID	N/A	DAILY	N/A	N	N/A
S-001	MERCURY	N/A	DAILY	N/A	N	N/A

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PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III (This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)				
2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
S-001	FORMIC ACID	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
S-001	MERCURY	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV (This section summarizes the monitoring and reporting requirements)									
2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
S-001	221-S VITRIFICATION PROCESS	OXALIC ACID	6.58E-03		6.58E-03		X	N	
S-001	221-S VITRIFICATION PROCESS	FORMIC ACID	5.58E-02		1.78E-02		X	N	
S-001	221-S VITRIFICATION PROCESS	NITRIC ACID	3.02E+00		3.02E+00		X	N	
S-001	221-S VITRIFICATION PROCESS	TOTAL PARTICULATE MATTER (PM)	3.35E-01		3.35E-01		X	N	
S-001	221-S VITRIFICATION PROCESS	PARTICULATE MATTER (10 MICRONS)	3.35E-01		3.35E-01		X	N	
S-001	221-S VITRIFICATION PROCESS	PARTICULATE MATTER (2.5 MICRONS)	3.35E-01		3.35E-01		X	N	
S-001	221-S VITRIFICATION PROCESS	NITROGEN DIOXIDE (NO2)	4.29E+01		4.29E+01		X	N	
S-001	221-S VITRIFICATION PROCESS	VOC	5.59E-02		1.79E-02		X	N	
S-001	221-S VITRIFICATION PROCESS	LEAD COMPOUNDS (LEAD)	5.82E-06		5.82E-06		X	N	
S-001	221-S VITRIFICATION PROCESS	MANGANESE COMPOUNDS	2.80E-04		2.80E-04		X	N	

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South Carolina Department of Health and Environmental Control

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	**11. Pollutant/Parameter**	**4. Limit (Facility-Wide)**	**26. Parameter to Monitor**	**27. Applicable Regulation Avoidance**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	**28. New or Existing Equipment**	**29. Control Equip ID**	**30. List any unit/equipment which is specifically exempt from MACT standards and state why.**

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	**31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.**

SRNS-J2200-2019-00240

PURPOSE:

The Defense Waste Process Facility (DWPF) processes high level waste into a stable glass form. This is achieved by mixing the radioactive waste with silica sand, melting the mixture and pouring the mixture into stainless steel canisters.

The process consists of several process units. The June 15, 1999 SCDHEC guidance titled, "Guidance document for Standard 4, Section VIII – PM Emission Limitations" was used to identify which pieces of equipment is part of the DWPF process and which pieces are not. The following summarizes this review.

Emission point	SCDHEC IDs	Description	Part of Process (Y/N)	Basis for exemption If not exempt - basis for emissions
SDJ0001	349S, 351S, 352S, 354S	Frit Transfer (Material Handling)	N	Raw material storage
SDP0001	176S	5800 GALLON SLUDGE TANK (5800 gallons)	Y	SRNS-J2210-2013-00050
SDP0001	177S	5800 GALLON RECYCLE TANK (5800 gallons)	Y	SRNS-J2210-2013-00050
SDP0001	178S	5800 GALLON PRECIPITATE TANK (5800 gallons)	Y	SRNS-J2210-2013-00050
SDP0007	275S	Precipitate Reactor Feed Tank	Y	WSRC-TR-95-0247
SDP0007	264S	Decontamination Waste Treatment Tank	Y	WSRC-TR-95-0247
SDP0007	256S	CDC-SME isolation pot	Y	WSRC-TR-95-0247
SDP0007	278S	Offgas Condensate Tank 1	Y	WSRC-TR-95-0247
SDP0007	488S	Offgas Condensate Tank 2	Y	WSRC-TR-95-0247
SDP0007	388S	Crane Decon Feed Tank	Y	WSRC-TR-95-0247
SDP0007	267S	Sludge Receipt Tank (SRAT)	Y	WSRC-TR-95-0247
SDP0007	266S	Slurry Mix Evaporator (SME)	Y	WSRC-TR-95-0247
SDP0007	270S	Melter	Y	WSRC-TR-95-0247
SDP0009	121S	90% FORMIC ACID FEED TANK, 600 GAL (600 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	111S	NITRIC ACID DILUTION TANK, 100 GAL (100 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	109S	NITRIC ACID DECON FEED TANK, 1100 GAL (1100 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	108S	PROCESS FRIT SLURRY FEED TANK, 2800 GAL (2800 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	107S	FRIT DECON SLURRY FEED TANK (780 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	106S	COPPER CATALYST FEED TANK (180 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	105S	ADDITIVE MIX FEED TANK (180 gallons)	Y	SRNS-J2210-2013-00050

SDP0009	103S	221-S Vitrification Process Oxalic Decon Feed Tank (1100 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	102S	ORGANIC ACID DRAIN TANK, 1200 GAL (1200 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	101S	SODIUM NITRITE FEED TANK, 600 GAL (600 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	100S	NITRIC ACID FEED TANK, 600 GAL (600 gallons)	Y	SRNS-J2210-2013-00050
SDP0009	098S	ACID DRAIN CATCH TANK, 1200 GAL (1200 gallons)	Y	SRNS-J2210-2013-00050
SDP0019	132S	OXALIC ACID MAKE UP TANK, 1300 GAL (1300 gallons)	Y	SRNS-J2210-2013-00050
SDP0019	131S	DILUTE FORMIC ACID FEED TANK, 2000 GAL (2000 gallons)	Y	SRNS-J2210-2013-00050
SDP0019	129S	FORMIC ACID DILUTION TANK, 2000 GAL (2000 gallons)	Y	SRNS-J2210-2013-00050
SDP0019	128S	FRIT SLURRY MAKE-UP TANK (2300 gallons)	Y	SRNS-J2210-2013-00050
SDP0067	286S	POTASSIUM NITRATE MAKE-UP TANK, 160 GAL (160 gallons)	N	Raw material storage
SDP0067	288S	CATALYST MAKE-UP TANK (550 gallons)	N	Raw material storage
SDP0067	291S	NITRIC ACID DECON MAKE-UP TANK, 1300 GAL (1300 gallons)	N	Raw material storage
SDP0067	289S	SODIUM NITRITE MAKE-UP TANK, 540 GAL (540 gallons)	N	Raw material storage
SDP0067	293S	50% NITRIC ACID STORAGE TANK, 1000 GAL (1000 gallons)	N	Raw material storage
SDT0028	335S	NITRIC ACID WASTE HOLD TANK (2100 gallons)	N	Waste/Chemical Treatment
SDT0029	192S	8% NITRIC ACID MIX DAY TANK (375 gallons)	N	Waste/Chemical Treatment
SDT0035	079S	ORGANIC WASTE/NEUT TANK #1 (3150 gallons)	N	Waste/Chemical Treatment
SDT0036	020S	ORGANIC WASTE/NEUT TANK #2 (3150 gallons)	N	Waste/Chemical Treatment
SDT0043	298S	FORMIC ACID STORAGE TANK #2, 6500 GAL (6500 gallons)	N	Raw material storage
SDT0046	374S	FORMIC ACID STORAGE TANK #1, 6500 GAL (6500	N	Raw material storage

		gallons)		
SDT0047	407S	OXALIC ACID STORAGE TANK (6000 gallons)	N	Raw material storage

The SCDHEC IDS that are not included in the DWPF process that emit regulated pollutants are listed on Form G of this application.

ASSUMPTIONS:

1. The DWPF is a "batch" designed process
2. One (1) batch of waste produces seven (7) canisters of glass
3. Maximum annual capacity is 60 batches per year (420 canisters)
4. Canister holds approximately 3700 pounds of glass
5. Uncontrolled emissions from SDP0007 are from Reference 1 streams 39, 166, 185, 94, and 4.
6. SRAT batch process time is 86 hours (Reference 1).
7. SME batch process time is 86 hours (Reference 1).
8. Melter batch process time is 115 hours.
9. Emissions will occur from either the melter OG (Off Gas) or the melter BUOG (Back Up Off Gas) systems, but not both.
10. Trace emission evaluation is performed as described in SCDHEC Air Quality Modeling Guidelines dated October 2018 (Revised 4/15/2019). Trace determination is performed at the outlet of each stack, e.g. SDP7 stack (controlled).
11. The organic emissions contained in reference 1 are not valid since this document was generated when In Tank Precipitation (ITP) would be utilized. ITP will not be implemented and without there is no expectation for any significant VOCs to be emitted from the SDP7 emission point.
12. Mercury (Hg) and Mercury compounds were conservatively included as Particulate Matter.
13. Streams 39 and 4 contained in Reference 1 go through the formic acid vent condenser (FAVC).
14. The FAVC (J0005) has a capture efficiency of 100% and has a 91% formic acid removal rate and a 96% mercury removal rate.
15. The HEPA filter (N0001) is for radiological PM removal only and is not credited for non-radiological emissions control.
16. The composition of Group A and Group B components are located on page 43 of Reference 1.
17. Conservatively assumed Particulate Matter PM2.5 equates PM10 and equates Total PM.
18. There are no control devices associated with SDP0001, SDP0009, and SDP0019.

CALCULATION:

Table 1 is the maximum uncontrolled emission in lb/hr for the streams pulled from Reference 1:

CAS #		WSRC-TR-95-0247 (Choi) Stream		MW lb/lb-mol	39 Inlet vapor to FAVC flows (lb/hr)	166 outlet from Decontamination Waste Treatment Tank flows (lb/hr)	185 outlet from decontamination chamber flows (lb/hr)	94 melter flows (lb/hr)	4 Precipitate Reactor Bottoms Tank to FAVC flows (lb/hr)	Total Uncontrolled SDP? flows (lb/hr)
7440-22-4	S	Silver	Ag	107.87	1.44E-17	0.00E+00	0.00E+00	0	0.00E+00	1.44E-17
20667-12-3	S	Silver Oxide	Ag2O	231.74	1.74E-24	2.02E-14	0.00E+00	0	0.00E+00	2.02E-14
90669-87-8	S	Aluminum oxide	Al2O3	101.96	3.04E-13	5.76E-19	0.00E+00	2.01E-04	0.00E+00	2.01E-04
1303-86-2	S	Boron oxide	B2O3	69.62	1.18E-13	2.20E-19	2.28E-07	3.29E-04	0.00E+00	3.29E-04
1304-28-5	S	Barium oxide	BaO	153.33	2.83E-21	0.00E+00	0.00E+00	3.19E-07	0.00E+00	3.19E-07
7727-43-7	S	Barium Sulfate	BaSO4	233.39	7.50E-15	1.40E-20	0.00E+00	4.37E-06	0.00E+00	4.37E-06
124-38-9	G	Carbon dioxide	CO2	44.01	8.90E+00	4.37E-01	0.00E+00	2.42E+01	6.13E-07	3.33E+01
	G		CO2 (C14)	–	8.23E-08	0.00E+00	0.00E+00	0	3.68E-17	8.23E-08
544-17-2	S	Calcium formate	Ca(COOH)2	130.11	9.27E-16	0.00E+00	0.00E+00	0	0.00E+00	9.27E-16
10124-37-5	S	Calcium nitrate	Ca(NO3)2	164.09	9.50E-14	1.78E-19	0.00E+00	0	0.00E+00	9.50E-14
7758-87-4	S	Tribasic Calcium phosphate	Ca3(PO4)2	310.18	6.16E-14	1.53E-19	0.00E+00	5.32E-05	0.00E+00	5.32E-05
563-72-4	S	Calcium oxalate	CaC2O4	128.1	1.66E-15	3.10E-21	0.00E+00	0	0.00E+00	1.66E-15
7789-75-5	S	Calcium fluoride	CaF2	78.07	4.97E-16	9.30E-22	0.00E+00	0	0.00E+00	4.97E-16
1305-78-8	S	Calcium oxide	CaO	56.08	1.52E-16	1.01E-21	0.00E+00	2.23E-05	0.00E+00	2.23E-05
7778-18-9	S	Calcium Sulfate	CaSO4	136.14	1.64E-15	3.06E-21	0.00E+00	9.59E-07	0.00E+00	9.59E-07
544-18-3	S	Cobalt formate	Co(COOH)2	148.97	4.11E-18	0.00E+00	0.00E+00	0	0.00E+00	4.11E-18
1307-96-6	S	Cobalt(II) oxide	CoO	74.93	5.81E-19	5.52E-24	0.00E+00	1.91E-09	0.00E+00	1.91E-09
1308-38-9	S	Chromium(III) oxide	Cr2O3	151.99	5.42E-15	1.02E-20	3.35E-10	3.55E-05	0.00E+00	3.55E-05
20281-00-9	S	Cesium oxide	Cs2O	281.81	4.91E-18	9.20E-24	0.00E+00	2.98E-06	0.00E+00	2.98E-06
3495-36-1	S	Cesium Formate	CsCOOH	177.92	5.48E-15	0.00E+00	0.00E+00	0	0.00E+00	5.48E-15
7789-18-6	S	Cesium nitrate	CsNO3	194.91	6.97E-19	1.31E-24	0.00E+00	0	0.00E+00	6.97E-19
21351-79-1	S	Cesium hydroxide	CsOH	149.91	3.13E-19	1.02E-20	0.00E+00	0	0.00E+00	3.23E-19
544-19-4	S	Copper formate	Cu(COOH)2	153.58	1.36E-15	0.00E+00	0.00E+00	0	0.00E+00	1.36E-15
3251-23-8	S	Copper nitrate	Cu(NO3)2	187.56	6.75E-14	1.26E-19	0.00E+00	0	0.00E+00	6.75E-14
1317-38-0	S	Copper oxide	CuO	79.55	6.01E-16	1.26E-21	0.00E+00	1.90E-05	0.00E+00	1.90E-05
1309-37-1	S	Iron(III) oxide	Fe2O3	159.69	7.50E-13	1.43E-18	1.31E-10	4.88E-04	0.00E+00	4.88E-04
1345-25-1	S	Iron(II) oxide	FeO	71.85	7.50E-14	1.40E-19	0.00E+00	4.89E-05	0.00E+00	4.89E-05
			Group A	–	9.56E-18	1.23E-21	0.00E+00	4.06E-07	0.00E+00	4.06E-07
			Group B	–	3.17E-15	5.91E-21	0.00E+00	2.07E-06	0.00E+00	2.07E-06
1333-74-0	G	hydrogen	H2	2.02	3.14E-02	0.00E+00	0.00E+00	0	4.50E-25	3.14E-02
144-62-7	S	Oxalic acid	H2C2O4	90.04	4.57E-15	0.00E+00	0.00E+00	0	0.00E+00	4.57E-15
10043-35-3	S	Boric acid	H3BO3	61.83	2.40E-13	0.00E+00	0.00E+00	0	0.00E+00	2.40E-13
64-18-6	S	Formic acid	HCOOH	46.03	0	0.00E+00	0.00E+00	0	1.62E-02	1.62E-02
7664-39-3	S	hydrofluoric acid	HF	20.01	0	0.00E+00	0.00E+00	1.58E-03	0.00E+00	1.58E-03
7697-37-2	G	nitric acid	HNO3	63.01	1.15E+00	0.00E+00	0.00E+00	1.02E-02	0.00E+00	1.16E+00
7439-97-6	S	mercury	Hg	200.59	2.23E-03	0.00E+00	0.00E+00	2.12E-02	2.88E-08	2.40E-02
10045-94-0	S	mercury(II) nitrate	Hg(NO3)2	324.6	1.08E-12	0.00E+00	0.00E+00	0	0.00E+00	1.08E-12
10112-91-1	S	mercury(I) chloride	Hg2Cl2	472.09	0	0.00E+00	0.00E+00	1.48E-05	0.00E+00	1.48E-05
15385-57-6	S	mercury(I) iodide	Hg2I2	654.99	0	0.00E+00	0.00E+00	3.71E-10	0.00E+00	3.71E-10
7487-94-7	S	mercury(II) chloride	HgCl2	271.5	0	0.00E+00	0.00E+00	3.64E-16	0.00E+00	3.64E-16
21908-53-2	S	mercury(II) oxide	HgO	216.59	3.76E-13	8.82E-13	0.00E+00	0	0.00E+00	8.82E-13
7553-56-2	S	Iodine	I2	253.81	0	0.00E+00	0.00E+00	7.29E-10	0.00E+00	7.26E-10
12136-45-7	S	potassium oxide	K2O	94.2	4.77E-15	8.94E-21	0.00E+00	1.14E-04	0.00E+00	1.14E-04
590-29-4	S	potassium formate	KCOOH	84.12	3.05E-13	0.00E+00	0.00E+00	0	0.00E+00	3.05E-13
7757-79-1	S	potassium nitrate	KNO3	101.1	9.24E-16	1.73E-21	0.00E+00	0	0.00E+00	9.24E-16
1310-58-3	S	potassium hydroxide	KOH	56.11	1.05E-16	2.27E-08	0.00E+00	0	0.00E+00	2.27E-08
12057-24-8	S	lithium oxide	Li2O	29.88	1.03E-13	1.93E-19	2.00E-07	2.13E-04	0.00E+00	2.13E-04
557-39-1	S	magnesium formate	Mg(COOH)2	114.34	1.09E-13	0.00E+00	0.00E+00	0	0.00E+00	1.09E-13
1309-48-4	S	magnesium oxide	MgO	40.3	1.90E-14	1.45E-19	5.71E-08	9.20E-05	0.00E+00	9.21E-05
3251-90-6	S	manganese formate	Mn(COOH)2	144.98	7.88E-14	0.00E+00	0.00E+00	0	0.00E+00	7.88E-14
1317-34-6	S	manganese(III) oxide	MnO	70.94	6.38E-19	7.21E-20	0.00E+00	6.14E-05	0.00E+00	6.14E-05
1313-13-9	S	manganese dioxide	MnO2	86.94	5.82E-14	3.51E-08	0.00E+00	0	0.00E+00	3.51E-08
18868-43-4	S	molybdenum(IV) oxide	MoO2	127.94	4.60E-17	8.60E-23	0.00E+00	3.00E-08	0.00E+00	3.00E-08
7727-37-9	G	nitrogen	N2	28.01	1.33E+03	5.48E+01	5.17E+02	1.40E+03	5.48E+01	3.35E+03
10024-97-2	G	nitrous oxide	N2O	44.01	3.17E-19	0.00E+00	0.00E+00	0	3.16E-19	6.33E-19
7664-41-7	G	ammonia	NH3	17.03	1.09E-03	1.14E-16	0.00E+00	0	1.30E-07	1.09E-03
6484-52-2	S	ammonium nitrate	NH4NO3	80.04	9.38E-09	1.75E-14	0.00E+00	0	0.00E+00	9.38E-09
1336-21-6	G	ammonium hydroxide	NH4OH	35.05	0	2.87E-21	0.00E+00	0	0.00E+00	2.87E-21
10102-43-9	G	nitric oxide	NO	30.01	0	0.00E+00	0.00E+00	2.91E+00	3.88E-12	2.91E+00
10102-44-0	G	nitrogen dioxide	NO2	46.01	2.89E+00	1.98E-11	0.00E+00	5.83E+00	1.04E-20	8.72E+00
71377-02-1	S	sodium borate decahydrate	Na2B4O7	201.22	2.12E-19	3.98E-19	0.00E+00	0	0.00E+00	2.49E-19
62-76-0	S	sodium oxalate	Na2C2O4	134	1.41E-18	1.64E-06	0.00E+00	0	0.00E+00	1.64E-06
497-19-8	S	sodium carbonate	Na2CO3	105.99	1.40E-13	2.52E-19	0.00E+00	0	0.00E+00	1.40E-13
1313-59-3	S	sodium oxide	Na2O	61.98	1.71E-13	3.21E-19	1.52E-07	5.05E-04	0.00E+00	5.05E-04
7757-82-6	S	sodium sulfate	Na2SO4	142.04	9.54E-16	1.79E-20	0.00E+00	1.05E-05	0.00E+00	1.06E-05
7601-54-9	S	sodium phosphate	Na3PO4	163.94	2.40E-18	4.49E-22	0.00E+00	1.56E-07	0.00E+00	1.56E-07
141-53-7	S	sodium formate	NaCOOH	68.01	2.78E-14	9.06E-19	4.22E-08	0	0.00E+00	4.22E-08
7647-14-5	S	sodium chloride	NaCl	58.44	5.73E-16	1.07E-21	0.00E+00	1.86E-07	0.00E+00	1.86E-07
7681-49-4	S	sodium fluoride	NaF	41.99	1.18E-15	2.21E-21	0.00E+00	7.48E-07	0.00E+00	7.49E-07
7681-82-5	S	sodium iodide	NaI	149.89	2.63E-19	4.93E-25	0.00E+00	0	0.00E+00	2.63E-19
7632-00-0	S	sodium nitrite	NaNO2	68.99	1.80E-16	3.37E-22	0.00E+00	0	0.00E+00	1.80E-16
7631-99-4	S	sodium nitrate	NaNO3	84.99	8.10E-13	1.38E-06	0.00E+00	0	0.00E+00	1.38E-06
1310-73-2	S	sodium hydroxide	NaOH	40	0	8.18E-08	0.00E+00	0	0.00E+00	8.18E-08
3349-06-2	S	Nickel formate	Ni(COOH)2	148.73	1.14E-15	0.00E+00	0.00E+00	0	0.00E+00	1.14E-15
1313-99-1	S	Nickel oxide	NiO	74.69	6.71E-16	1.74E-20	1.35E-09	6.12E-06	0.00E+00	6.12E-06
7782-44-7	G	Oxygen	O2	32	4.30E+02	1.65E+01	1.38E+02	4.29E+02	1.66E+01	1.02E+03
10099-74-8	S	Lead(II) nitrate	Pb(NO3)2	331.21	1.50E-18	2.80E-24	0.00E+00	0	0.00E+00	1.50E-18
598-63-0	S	Lead carbonate	PbCO3	267.21	1.22E-17	2.28E-23	0.00E+00	0	0.00E+00	1.22E-17
1317-36-8	S	Lead oxide	PbO	223.2	8.02E-22	0.00E+00	0.00E+00	9.13E-08	0.00E+00	9.13E-08
7446-14-2	S	Lead sulfate	PbSO4	303.26	3.50E-15	6.53E-21	0.00E+00	2.17E-06	0.00E+00	2.17E-06
7440-05-3	S	Palladium	Pd	106.42	5.77E-19	0.00E+00	0.00E+00	0	0.00E+00	5.77E-19
1314-08-5	S	Palladium oxide	PdO	122.42	0	9.43E-16	0.00E+00	0	0.00E+00	9.43E-16
12059-95-9	S	Plutonium dioxide	PuO2	276	3.08E-16	5.76E-22	0.00E+00	2.03E-07	0.00E+00	2.03E-07
	S	Plutonium Oxide/Sodium T	PuO2/NaTOD	873.49	7.70E-18	1.44E-23	0.00E+00	0	0.00E+00	7.70E-18
7440-16-6	S	Rhodium	Rh	102.91	1.51E-18	0.00E+00	0.00E+00	0	0.00E+00	1.51E-18
12137-27-8	S	Rhodium dioxide	RhO2	134.9	2.43E-25	2.84E-15	0.00E+00	0	0.00E+00	2.84E-15
7440-18-8	S	Ruthenium	Ru	101.07	2.43E-16	4.54E-22	0.00E+00	0	0.00E+00	2.43E-16
7647-17-8		Cesium chloride	Semi-vol CsCl	168.36	0	0.00E+00	0.00E+00	3.96E-04	0.00E+00	3.96E-04
			Semi-Vol Cs	–	0	0.00E+00	0.00E+00	2.14E-05	0.00E+00	2.14E-05
71377-02-1		sodium borate decahydrate	Semi-vol Na2	201.22	0	0.00E+00	0.00E+00	2.39E-03	0.00E+00	2.39E-03
7681-49-4		sodium fluoride	Semi-vol NaF	41.99	0	0.00E+00	0.00E+00	2.77E-04	0.00E+00	2.77E-04
7681-82-5		sodium iodide	Semi-Vol NaI	149.89	0	0.00E+00	0.00E+00	1.70E-07	0.00E+00	1.70E-07
7631-86-9	S	Silicon dioxide	SiO2	60.08	1.18E-12	2.22E-18	2.20E-06	2.37E-03	0.00E+00	2.38E-03
592-89-2	S	Strontium formate	Sr(COOH)2	177.66	1.22E-18	0.00E+00	0.00E+00	0	0.00E+00	1.22E-18
10042-76-9	S	Strontium nitrate	Sr(NO3)2	211.63	9.61E-16	1.80E-21	0.00E+00	0	0.00E+00	9.61E-16
	S	Strontium Sodium Titanate	SrNaT(OD)2	486.11	2.17E-18	4.05E-24	0.00E+00	0	0.00E+00	2.17E-18
1314-11-0	S	Strontium oxide	SrO	103.62	2.70E-21	1.34E-24	0.00E+00	3.08E-07	0.00E+00	3.08E-07
12036-16-7	S	Technetium dioxide	TcO2	130	9.29E-17	1.74E-22	0.00E+00	8.79E-08	0.00E+00	8.79E-08
1314-20-1	S	Thorium dioxide	ThO2	264.04	3.89E-15	5.90E-21	0.00E+00	2.41E-06	0.00E+00	2.41E-06
13463-67-7	S	Titanium dioxide	TiO2	79.86	2.44E-14	4.57E-20	0.00E+00	1.98E-05	0.00E+00	1.98E-05
10028-17-8	G	tritium	Tritium	3	1.41E-10	1.36E-19	0.00E+00	3.90E-12	6.31E-13	1.45E-10
1317-99-3	S	triuranium octoxide	U3O8	842.08	7.58E-14	1.42E-19	0.00E+00	4.94E-05	0.00E+00	4.94E-05
16984-59-1	S	uranyl formate	UO2(COOH)2	360.05	2.25E-21	0.00E+00	0.00E+00	0	0.00E+00	2.25E-21
10102-06-4	S	uranyl nitrate	UO2(NO3)2	394.04	3.30E-18	6.18E-24	0.00E+00	0	0.00E+00	3.30E-18
19031-71-2	S	yttrium formate	Y(COOH)3	223.96	1.98E-19	0.00E+00	0.00E+00	0	0.00E+00	1.98E-19
13768-67-7	S	yttrium nitrate	Y(NO3)3	274.92	3.32E-16	6.22E-22	0.00E+00	0	0.00E+00	3.32E-16
1314-36-9	S	yttrium(III) oxide	Y2O3	225.81	4.42E-19	1.02E-24	0.00E+00	8.94E-08	0.00E+00	8.94E-08
	S		Zeolite	–	7.24E-15	1.36E-21	0.00E+00	0	0.00E+00	7.24E-15
557-41-5	S	zinc formate	Zn(COOH)2	155.43	1.94E-15	0.00E+00	0.00E+00	0	0.00E+00	1.94E-15
1314-13-2	S	zinc oxide	ZnO	81.39	2.32E-15	6.24E-21	0.00E+00	2.17E-06	0.00E+00	2.17E-06
	G		hydrate H2O	17.01	1.05E-13	1.71E-15	0.00E+00	0	0.00E+00	1.05E-13
7732-18-5	G	water	water	18.01	1.47E+02	1.22E+00	1.84E+01	2.56E+01	4.89E+00	1.97E+02

Table 2 presents the Particulate Matter (PM), NOx (as NO_2), VOC and metal compound calculated values based on Table 1 contents.

Table 2

WSRC-TR-95-0247 (Choi Stream)			39	166	185	94	4	
			Inlet vapor to FAVC	outlet from Decontamination Waste Treatement Tank	outlet from can decontamintaion chamber	melter	Precipitate Reactor Bottoms Tank to FAVC	Total Uncontrolled SDP7 (lb/hr)
Total Particulate			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01
PM-10			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01
PM-2.5			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01
Sulfur oxides (SO_2) [MW = 64.06]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrogen oxides (NO_2) [MW=46.01]			2.89E+00	1.98E-11	0.00E+00	1.03E+01	5.19E-12	1.32E+01
VOC			0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-02	1.62E-02
Antimony Compounds (Sb_2O_3)			3.00E-18	5.61E-24	0.00E+00	1.96E-09	0.00E+00	1.96E-09
Cadmium compounds (CdO)			6.50E-18	1.22E-23	0.00E+00	2.16E-07	0.00E+00	2.16E-07
Chromium compounds (Cr_2O_3)			5.42E-15	1.02E-20	3.35E-10	3.55E-06	0.00E+00	3.55E-06
Cobalt compounds (CoO)			6.57E-18	1.23E-23	0.00E+00	4.27E-09	0.00E+00	4.27E-09
Lead compounds (PbO)			2.59E-15	4.84E-21	0.00E+00	1.69E-06	0.00E+00	1.69E-06
Manganese compounds (MnO_2)			1.15E-13	3.51E-08	0.00E+00	7.53E-05	0.00E+00	7.53E-05
Mercury compounds (HgO)			9.97E-02	8.82E-13	0.00E+00	2.29E-02	3.10E-08	1.23E-01
Nickel compounds (NiO)			9.28E-15	1.74E-20	1.35E-09	6.12E-06	0.00E+00	6.12E-06
Selenium compounds (SeO_2)			1.08E-17	2.03E-23	0.00E+00	3.60E-07	0.00E+00	3.60E-07

If an "S" is in the second column of table 1, the constituent was included in PM emissions. NOx (as NO_2) is

((6.33E-19 lb/hr N_2O)/(44.01 lb N_2O/lb mol) + (2.91E+00 lb/hr NO)/(30.01 lb NO/lb mol) + (8.72E+00 lb/hr NO_2)/(46.01 lb NO_2 lb/lb mol)) * 46.01 lb/lb mol NO_2 = 1.32E+01 lb/hr NOx as NO_2

The only VOC emitted at SDP0007 is Formic Acid.

The total emission rate from SDP0007 is the sum of formic acid, hydrofluoric acid, nitric acid, nitrous oxide, ammonia, ammonium hydroxide, nitric oxide, nitrogen dioxide, and total Particulate for purposes of trace determination. This equates to 4.09E+01 TPY.

The FAVC controls mercury and formic acid. The only source of formic acid at SDP0001 is steam 4. The controlled emission rates for formic acid is calculated in the following manner.

((4.17E-02 TPY)*(100-91))/100 = 3.76E-03 TPY formic acid

It should be noted that mercury and mercury compounds meet the definition of trace in their uncontrolled emissions.

(3.36E-01TPY Hg cmpds)/(40.9 TPY total emission from SDP0001) *100 = 0.82% (Hg compounds are non-carcinogens)

Table 3 presents the tons/year and trace determination for SDP0007 emissions.

The following is an example of the ton/year controlled determination for oxalic acid:
(4.57E-15lb/hr)(86hr/SRAT)(60 batches/yr)(1ton/2000lb) + (0lb/hr)(86 hr/SRAT) (60 batches/yr)(1 ton/2000lb) + (0lb/hr)(115 hour/melter) (60 batches/yr)(1ton/2000lb) + (0lb/hr)(115 hour/melter) (60 batches/yr)(1ton/2000lb) + (0lb/hr)(86 hr/SRAT) (60 batches/yr)(1 ton/2000lb) = 1.18E-14 TPY oxalic acid

Table 3:

				Goes to FAVC				Goes to FAVC									
				SRAT limited	SRAT limited	melter limite	melter limited	SRAT limited	Uncontrolled		Controlled						
	WSRC-TR-95-0247 (Choi Stream)			39	166	185	94	4									
				Inlet vapor to FAVC	outlet from Decontamination Waste Treatement Tank	outlet from can decontamintaion chamber	melter	Precipitate Reactor Bottoms Tank to FAVC	Total Uncontrolled SDP7 (lb/hr)	Total Uncontrolled SDP7	Total SDP7	Total SDP7	wt % to determine trace		Carcinogen (Y/N)	Trace?	
CAS #			MW lb/lb-mol	flows (lb/hr)	flows (lb/hr)	flows (lb/hr)	flows (lb/	flows (lb/hr)	(lb/hr)	(TPY)	(lb/hr)	(TPY)					
124-38-9	Carbon dioxide (GHG)	CO2	44.01	8.50E+00	4.27E-01	0.00E+00	1.42E+01	6.13E-07	2.31E+01	7.19E+01	2.31E+01	7.19E+01	NA			NA	
	(GHG)	CO2 (C14)		6.33E-08	0.00E+00	0.00E+00	0.00E+00	3.38E-17	6.33E-08	1.63E-07	6.33E-08	1.63E-07	NA			NA	
144-62-7	Oxalic acid	H2C2O4	90.04	4.57E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.57E-15	1.18E-14	4.57E-15	1.18E-14	0.00	TAP	N	y	
64-18-6	Formic acid	HCOOH	46.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-02	1.62E-02	4.17E-02	1.46E-03	3.76E-03	0.01	TAP	N	y	
7664-39-3	hydrofluoric acid	HF	20.01	0.00E+00	0.00E+00	0.00E+00	1.58E-03	0.00E+00	1.58E-03	5.43E-03	1.58E-03	5.43E-03	0.01	TAP&HAP	N	y	
7697-37-2	nitric acid	HNO3	63.01	1.15E+00	0.00E+00	0.00E+00	1.02E-02	0.00E+00	1.16E+00	2.99E+00	1.16E+00	2.99E+00	7.30	TAP	N	n	
7439-97-6	mercury	Hg	200.59	9.23E-02	0.00E+00	0.00E+00	2.12E-02	2.88E-08	1.14E-01	3.11E-01	4.54E-03	1.25E-02	0.03	TAP	N	y	
1024-97-2	nitrous oxide	N2O	44.01	3.17E-19	0.00E+00	0.00E+00	0.00E+00	3.16E-19	6.33E-19	1.63E-18	6.33E-19	1.63E-18	0.00			NA	
7664-41-7	ammonia	NH3	17.03	1.09E-03	1.14E-16	0.00E+00	0.00E+00	3.30E-07	1.09E-03	2.81E-03	1.09E-03	2.81E-03	0.01			NA	
6484-52-2	ammonium nitrate	NH4NO3	80.04	9.38E-09	1.76E-14	0.00E+00	0.00E+00	0.00E+00	9.38E-09	2.42E-08	9.38E-09	2.42E-08	0.00			NA	
1336-21-6	ammonium hydroxide	NH4OH	35.05	0.00E+00	2.87E-21	0.00E+00	0.00E+00	0.00E+00	2.87E-21	7.40E-21	2.87E-21	7.40E-21	0.00		N	y, Ammonia compounds =	0.01
10102-43-9	nitric oxide	NO	30.01	0.00E+00	0.00E+00	0.00E+00	2.91E+00	3.38E-12	2.91E+00	1.00E+01	2.91E+00	1.00E+01	24.49			NA	
10102-44-0	nitrogen dioxide	NO2	46.01	2.89E+00	1.98E-11	0.00E+00	5.83E+00	1.04E-20	8.72E+00	2.76E+01	8.72E+00	2.76E+01	67.37			NA	
1310-73-2	sodium hydroxide	NaOH	40	0.00E+00	8.18E-08	0.00E+00	0.00E+00	0.00E+00	8.18E-08	2.11E-07	8.18E-08	2.11E-07	0.00	TAP	N	y	
1313-99-1	Nickel oxide	NiO	74.69	8.71E-15	1.74E-20	1.35E-09	6.12E-06	0.00E+00	6.12E-06	2.11E-05	6.12E-06	2.11E-05	0.00	TAP	Y	NA nickel compounds	
	Total Particulate			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01	3.28E-01	1.18E-01	3.28E-01	NA	Criteria		NA	
	PM-10			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01	3.28E-01	1.18E-01	3.28E-01	NA	Criteria		NA	
	PM-2.5			9.23E-02	3.16E-06	2.88E-06	2.59E-02	2.88E-08	1.18E-01	3.28E-01	1.18E-01	3.28E-01	NA	Criteria		NA	
	Sulfur oxides (SO2) [MW = 64.06]			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	Criteria		NA	
	Nitrogen oxides (NO2) [MW=46.01]			2.89E+00	1.98E-11	0.00E+00	1.03E+01	5.19E-12	1.32E+01	4.29E+01	1.32E+01	4.29E+01	NA	Criteria		NA	
	VOC			0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-02	1.62E-02	4.17E-02	1.46E-03	3.76E-03	NA	Criteria		NA	
	Antimony Compounds (Sb2O3)			3.00E-18	5.61E-24	0.00E+00	1.96E-09	0.00E+00	1.96E-09	6.75E-09	1.96E-09	6.75E-09	0.00	TAP& HAP	N	y	
	Cadmium compounds (CdO)			6.50E-18	1.22E-23	0.00E+00	2.16E-07	0.00E+00	2.16E-07	7.46E-07	2.16E-07	7.46E-07	0.00	HAP & Cd is TAP	Y	y	
	Chromium compounds (Cr2O3)			5.42E-15	1.02E-20	3.35E-10	3.55E-06	0.00E+00	3.55E-06	1.23E-05	3.55E-06	1.23E-05	0.00	HAP, Cr6 cmpds is TAP	Y	y, conservative Cr 6	
	Cobalt compounds (CoO)			6.57E-18	1.23E-23	0.00E+00	4.27E-09	0.00E+00	4.27E-09	1.47E-08	4.27E-09	1.47E-08	0.00	HAP & TAP	Y	y	
	Lead compounds (PbO)			2.59E-15	4.84E-21	0.00E+00	1.69E-06	0.00E+00	1.69E-06	5.82E-06	1.69E-06	5.82E-06	0.00	Standard 2 (Pb)	NA	NA	
	Manganese compounds (MnO2)			1.15E-13	3.51E-08	0.00E+00	7.53E-05	0.00E+00	7.53E-05	2.60E-04	7.53E-05	2.60E-04	0.00	HAP & TAP	N	y	
	Mercury compounds (HgO)			9.97E-02	8.82E-13	0.00E+00	2.29E-02	3.10E-08	1.23E-01	3.36E-01	4.91E-03	1.35E-02	0.03	HAP and Hg is TAP	N	y	
	Nickel compounds (NiO)			9.28E-15	1.74E-20	1.35E-09	6.12E-06	0.00E+00	6.12E-06	2.11E-05	6.12E-06	2.11E-05	0.00	HAP and Ni is TAP	Y	y	
	Selenium compounds (SeO2)			1.08E-17	2.03E-23	0.00E+00	3.60E-07	0.00E+00	3.60E-07	1.24E-06	3.60E-07	1.24E-06	0.00	HAP & TAP	N	y	

Tables 4 through 6 represents the emissions from SDP0001, SDP0009, and SDP0019 based from the Tanks calculation contained in Appendix 1.

Table 4 SDP0001

Constituent	176S lb/yr	177S lb/yr	178S lb/yr	SDP1 Total lb/yr	SDP1 lb/hr	SDP1 Total TPY
Water	69.87		37.75	1.08E+02	1.23E-02	5.38E-02
Nitrogen	8.36			8.36E+00	9.54E-04	4.18E-03
Iron Oxide	0.25			2.50E-01	2.85E-05	1.25E-04
Sodium Nitrite	0.09	0.01		1.00E-01	1.14E-05	5.00E-05
Sodium Nitrate			0.03	3.00E-02	3.42E-06	1.50E-05
Sodium Oxalate		0.01	0.01	2.00E-02	2.28E-06	1.00E-05
Sodium Carbonate	0.07			7.00E-02	7.99E-06	3.50E-05
Uranium Oxide	0.03			3.00E-02	3.42E-06	1.50E-05
Manganese Dioxide	0.03			3.00E-02	3.42E-06	1.50E-05
Calcium Carbonate	0.02			2.00E-02	2.28E-06	1.00E-05
Water		69.45		6.95E+01	7.93E-03	3.47E-02
Sodium Formate		0.02		2.00E-02	2.28E-06	1.00E-05
Sodium Nitrate		0.01		1.00E-02	1.14E-06	5.00E-06
Magnesium Oxide	0.01			1.00E-02	1.14E-06	5.00E-06
Sodium Monoxide	0.01			1.00E-02	1.14E-06	5.00E-06
Formic Acid						
Nitric Aid						
Potassium Permanganate						
Copper Oxalate Hemihydrate						
Dimethyl Methyl Siloxane						
Poly Monoallyl Ether Acetate						
Oxalic Acid						

Table 5 SDP0009

													SDP9 Total	SDP9 Total	SDP9 Total
	121S	111S	109S	108S	107S	106S	105S	103S	102S	101S	100S	98S			
Constituent	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/hr	TPY
Water	1.4	1.59	13.33	31.93	17.16	2.2	1.78	13.5	379.02	9.14	6.35	16.09	4.93E+02	5.63E-02	2.47E-01
Nitrogen															
Iron Oxide															
Sodium Nitrite										0.25			2.50E-01	2.85E-05	1.25E-04
Sodium Nitrate															
Sodium Oxalate															
Sodium Carbonate															
Uranium Oxide															
Manganese Dioxide															
Calcium Carbonate															
Water															
Sodium Formate															
Sodium Nitrate															
Magnesium Oxide															
Sodium Monoxide															
Formic Acid	23.4			2.28	0.49								2.62E+01	2.99E-03	1.31E-02
Nitric Aid		0.56	4.74								16.41	41.59	6.33E+01	7.23E-03	3.17E-02
Potassium Permanganate			0.01										1.00E-02	1.14E-06	5.00E-06
Copper Oxalate Hemihydrate						0.01							1.00E-02	1.14E-06	5.00E-06
Dimethyl Methyl Siloxane							0.13						1.30E-01	1.48E-05	6.50E-05
Poly Monoallyl Ether Acetate							0.08						8.00E-02	9.13E-06	4.00E-05
Oxalic Acid								0.44	12.44				1.29E+01	1.47E-03	6.44E-03

Table 6 SDP19

					SDP19 Total	SDP19 Total	SDP19 Total
	132S	131S	129S	128S			
Constituent	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/hr	TPY
Water	8.4	28.18	28.18	40.18	104.94	1.20E-02	5.25E-02
Nitrogen							
Iron Oxide							
Sodium Nitrite							
Sodium Nitrate							
Sodium Oxalate							
Sodium Carbonate							
Uranium Oxide							
Manganese Dioxide							
Calcium Carbonate							
Water							
Sodium Formate							
Sodium Nitrate							
Magnesium Oxide							
Sodium Monoxide							
Formic Acid		0.8	0.8	0.28	1.88	2.15E-04	9.40E-04
Nitric Aid							
Potassium Permanganate							
Copper Oxalate Hemihydrate							
Dimethyl Methyl Siloxane							
Poly Monoallyl Ether Acetate							
Oxalic Acid	0.28				2.80E-01	3.20E-05	1.40E-04

Table 7 through 9 present the regulated emissions from SDP0001, SDP0009, and SDP0019

Table 7

SDP1 REGULATED COMPOUNDS

	176S	177S	178S	SDP1 Total	SDP1	SDP1 Total
	lb/yr	lb/yr	lb/yr	lb/yr	lb/hr	TPY
PM	5.10E-01	5.00E-02	4.00E-02	6.00E-01	6.85E-05	3.00E-04
PM10	5.10E-01	5.00E-02	4.00E-02	6.00E-01	6.85E-05	3.00E-04
PM2.5	5.10E-01	5.00E-02	4.00E-02	6.00E-01	6.85E-05	3.00E-04
Manganese Cmpds	3.00E-02	0.00E+00	0.00E+00	3.00E-02	3.42E-06	1.50E-05

Table 8

SDP9 REGULATED COMPOUNDS

	121S	111S	109S	108S	107S	106S	105S	103S	102S	101S	100S	98S	SDP9 Total	SDP9 Total	SDP9 Total
	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/hr	TPY
PM			1.00E-02			1.00E-02		4.40E-01	1.24E+01	2.50E-01			1.32E+01	1.50E-03	6.58E-03
PM10			1.00E-02			1.00E-02		4.40E-01	1.24E+01	2.50E-01			1.32E+01	1.50E-03	6.58E-03
PM2.5			1.00E-02			1.00E-02		4.40E-01	1.24E+01	2.50E-01			1.32E+01	1.50E-03	6.58E-03
Manganese Cmpds	0	0	0.01	0	0	0	0	0	0	0	0	0	1.00E-02	1.14155E-06	0.000005
VOC	2.34E+01	0.00E+00	0.00E+00	2.28E+00	4.90E-01	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E+01	3.01E-03	1.32E-02
formic acid	2.34E+01	0.00E+00	0.00E+00	2.28E+00	4.90E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E+01	2.99E-03	1.31E-02
nitric acid	0.00E+00	5.60E-01	4.74E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E+01	4.16E+01	6.33E+01	7.23E-03	3.17E-02
oxalic acid								0.44	12.44				1.29E+01	1.47E-03	6.44E-03

Table 9

SDP19 REGULATED COMPOUNDS

	132S	131S	129S	128S	SDP19 Total	SDP19 Total	SDP19 Total
	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/hr	TPY
PM	0.28				2.80E-01	3.20E-05	1.40E-04
PM10	0.28				2.80E-01	3.20E-05	1.40E-04
PM2.5	0.28				2.80E-01	3.20E-05	1.40E-04
Manganese Cmpds							
VOC	0	0.8	0.8	0.28	1.88E+00	2.15E-04	9.40E-04
formic acid		0.8	0.8	0.28	1.88E+00	2.15E-04	9.40E-04
nitric acid							
oxalic acid	0.28	0	0	0	2.80E-01	3.20E-05	1.40E-04

Table 10 represents all the non-SDP0007 regulated emissions for the DWPF process

Table 10

	lb/hr	TPY
PM	1.60E-03	7.02E-03
PM10	1.60E-03	7.02E-03
PM2.5	1.60E-03	7.02E-03
Manganese Cmpds	4.57E-06	2.00E-05
VOC	3.23E-03	1.41E-02
formic acid	3.20E-03	1.40E-02
nitric acid	7.23E-03	3.17E-02
oxalic acid	1.50E-03	6.58E-03

Table 11 is the result of combining Tables 3 and 10

Table 11

		Uncontrolled						Controlled					
		SDP7	SDP7	other IAs	other IAs	Total DWPF process		SDP7	SDP7	other IAs	other IAs	Total DWPF process	
CAS #		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
124-38-9	Carbon dioxide (GHG)	2.31E+01	7.19E+01	0.00E+00	0.00E+00	2.31E+01	7.19E+01	2.31E+01	7.19E+01	0.00E+00	0.00E+00	2.31E+01	7.19E+01
144-62-7	Oxalic acid	4.57E-15	1.18E-14	1.50E-03	6.58E-03	1.50E-03	6.58E-03	4.57E-15	1.18E-14	1.50E-03	6.58E-03	1.50E-03	6.58E-03
64-18-6	Formic acid	1.62E-02	4.17E-02	3.20E-03	1.40E-02	1.94E-02	5.58E-02	1.46E-03	3.76E-03	3.20E-03	1.40E-02	4.66E-03	1.78E-02
7697-37-2	nitric acid	1.16E+00	2.99E+00	7.23E-03	3.17E-02	1.16E+00	3.02E+00	1.16E+00	2.99E+00	7.23E-03	3.17E-02	1.16E+00	3.02E+00
1024-97-2	nitrous oxide (GHG)	6.33E-19	1.63E-18	0.00E+00	0.00E+00	6.33E-19	1.63E-18	6.33E-19	1.63E-18	0.00E+00	0.00E+00	6.33E-19	1.63E-18
	Total Particulate	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01
	PM-10	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01
	PM-2.5	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01	1.18E-01	3.28E-01	1.60E-03	7.02E-03	1.20E-01	3.35E-01
	Nitrogen oxides (NO2) [MW=46.01]	1.32E+01	4.29E+01	0.00E+00	0.00E+00	1.32E+01	4.29E+01	1.32E+01	4.29E+01	0.00E+00	0.00E+00	1.32E+01	4.29E+01
	VOC	1.62E-02	4.17E-02	3.23E-03	1.41E-02	1.94E-02	5.59E-02	1.46E-03	3.76E-03	3.23E-03	1.41E-02	4.68E-03	1.79E-02
	Lead compounds (PbO)	1.69E-06	5.82E-06	0.00E+00	0.00E+00	1.69E-06	5.82E-06	1.69E-06	5.82E-06	0.00E+00	0.00E+00	1.69E-06	5.82E-06
	Manganese compounds (MnO2)	7.53E-05	2.60E-04	4.57E-06	2.00E-05	7.99E-05	2.80E-04	7.53E-05	2.60E-04	4.57E-06	2.00E-05	7.99E-05	2.80E-04

Table 11 is the total emissions from the DWPF process. Note that formic acid is carried though to this table since it is not trace while uncontrolled. Mercury is not included in this table since it is trace both controlled and uncontrolled.

SIGNATURES:

Kim A. Wolfe   10/3/2019
Calculation Performed by and date

PAUL J. ROWAN Paul J. Rowan   22 OCT 19
Calculation Reviewed by and date

REFERENCES:

1. Choi, A.S., Lee, L.M., Title V Projected Atmospheric Emissions From the Defense Waste Processing Facility, WSRC-TR-95-0247, Rev. 0, Westinghouse Savannah River Company, January, 1996.

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	176S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank	Vertical Fixed Roof Tank
Description:	S-DP0001-0001 511-S Sludge Tank (5,800 gal)
Tank Dimensions	
Shell Height (ft):	12.00
Diameter (ft):	10.50
Liquid Height (ft) :	8.50
Avg. Liquid Height (ft):	6.00
Volume (gallons):	5,800.00
Turnovers:	93.00
Net Throughput(gal/yr):	540,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.50
Slope (ft/ft) (Cone Roof)	1.62
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

176S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Sludge Mixture	All	72.68	61.33	84.03	66.26	0.3867	0.2487	0.6327	18.8345			20.73	
Calcium Carbonate						0.0203	0.0203	0.0203	100.0870	0.0051	0.0003	100.09	Option 1: VP70 = .0203 VP80 = .0203
Iron Oxide						0.0203	0.0203	0.0203	159.6900	0.0645	0.0031	159.69	Option 1: VP70 = .0203 VP80 = .0203
Maganese Dioxide						0.0203	0.0203	0.0203	86.9400	0.0081	0.0004	86.94	Option 1: VP70 = .0203 VP80 = .0203
Magnesium Oxide						0.0203	0.0203	0.0203	40.3040	0.0030	0.0002	40.30	Option 1: VP70 = .0203 VP80 = .0203
Nitrogen						0.3782	0.0850	1.4808	28.0100	0.0989	0.1082	28.01	Option 2: A=6.49457, B=255.68, C=266.55
Sodium Carbonate						0.0203	0.0203	0.0203	105.9900	0.0152	0.0008	105.99	Option 1: VP70 = .0203 VP80 = .0203
Sodium Hydroxide (caustic soda)						0.0000	0.0000	0.0000	40.0000	0.0041	0.0000	40.00	Option 2: A=7.465, B=7808.44, C=280.16
Sodium Monoxide						0.0203	0.0203	0.0203	61.9800	0.0020	0.0001	61.98	Option 1: VP70 = .0203 VP80 = .0203
Sodium Nitrite						0.0203	0.0203	0.0203	68.9950	0.0194	0.0011	69.00	Option 1: VP70 = .0203 VP80 = .0203
Uranium Oxide						0.0203	0.0203	0.0203	270.0300	0.0083	0.0004	270.03	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5796	18.0200	0.7854	0.8874	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

176S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Sludge Mixture	46.05	32.68	78.73
Water	40.87	29.00	69.87
Nitrogen	4.89	3.47	8.36
Iron Oxide	0.14	0.10	0.25
Sodium Nitrite	0.05	0.04	0.09
Sodium Carbonate	0.04	0.03	0.07
Uranium Oxide	0.02	0.01	0.03
Maganese Dioxide	0.02	0.01	0.03
Calcium Carbonate	0.01	0.01	0.02
Sodium Hydroxide (caustic soda)	0.00	0.00	0.00
Magnesium Oxide	0.01	0.01	0.01
Sodium Monoxide	0.01	0.00	0.01

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	177S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0001-0002 511-S Recycle Tank (5,600 gal)
Tank Dimensions	
Shell Height (ft):	12.00
Diameter (ft):	10.50
Liquid Height (ft) :	8.50
Avg. Liquid Height (ft):	6.00
Volume (gallons):	5,800.00
Turnovers:	62.07
Net Throughput(gal/yr)	360,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.50
Slope (ft/ft) (Cone Roof)	1.62
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

177S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Caustic Soda Mixture	All	72.88	61.33	84.03	66.26	0.3933	0.2658	0.5714	18.0314			18.48	
Silicon Dioxide						0.0203	0.0203	0.0203	60.0600	0.0004	0.0000	60.08	Option 1: VP70 = .0203 VP80 = .0203
Sodium Formate						0.0203	0.0203	0.0203	68.0100	0.0081	0.0003	68.01	Option 1: VP70 = .0203 VP80 = .0203
Sodium Hydroxide (caustic soda)						0.0000	0.0000	0.0000	40.0000	0.0233	0.0000	40.00	Option 2: A=7.465, B=7608.44, C=280.16
Sodium Nitrate						0.0203	0.0203	0.0203	84.9970	0.0039	0.0002	85.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Nitrite						0.0203	0.0203	0.0203	68.9950	0.0029	0.0002	69.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Oxalate						0.0203	0.0203	0.0203	134.0000	0.0023	0.0001	134.00	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5798	18.0200	0.9611	0.9992	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

177S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Caustic Soda Mixture	39.51	30.00	69.51
Sodium Nitrite	0.01	0.00	0.01
Sodium Oxalate	0.00	0.00	0.01
Water	39.48	29.97	69.45
Sodium Hydroxide (caustic soda)	0.00	0.00	0.00
Sodium Formate	0.01	0.01	0.02
Sodium Nitrate	0.01	0.01	0.01
Silicon Dioxide	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	178S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0001-0003 511-S Precipitate Tank (5,800 gal)
Tank Dimensions	
Shell Height (ft):	12.00
Diameter (ft):	10.50
Liquid Height (ft) :	8.50
Avg. Liquid Height (ft):	8.00
Volume (gallons):	5,500.00
Turnovers:	15.00
Net Throughput(gal/yr):	80,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.50
Slope (ft/ft) (Cone Roof)	1.62
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

178S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Precipitate Mixture	All	72.68	61.33	84.03	69.28	0.3953	0.2871	0.5747	18.0374			18.48	
Aluminum Oxide						0.0203	0.0203	0.0203	101.9600	0.0000	0.0000	101.96	Option 1: VP70 = .0203 VP80 = .0203
Barium Sulfate						0.0203	0.0203	0.0203	233.4300	0.0000	0.0000	233.43	Option 1: VP70 = .0203 VP80 = .0203
Calcium Phosphate Dibasic						0.0203	0.0203	0.0203	136.0600	0.0000	0.0000	136.06	Option 1: VP70 = .0203 VP80 = .0203
Lead Oxide						0.0203	0.0203	0.0203	223.2000	0.0000	0.0000	223.20	Option 1: VP70 = .0203 VP80 = .0203
Mercury Oxide						0.0203	0.0203	0.0203	216.5900	0.0000	0.0000	216.59	Option 1: VP70 = .0203 VP80 = .0203
Nickel Oxide						0.0203	0.0203	0.0203	74.6930	0.0000	0.0000	74.69	Option 1: VP70 = .0203 VP80 = .0203
Potassium Nitrate						0.0203	0.0203	0.0203	101.1030	0.0020	0.0001	101.10	Option 1: VP70 = .0203 VP80 = .0203
Sodium Flouride						0.0203	0.0203	0.0203	41.9900	0.0000	0.0000	41.99	Option 1: VP70 = .0203 VP80 = .0203
Sodium Hydroxide (caustic soda)						0.0000	0.0000	0.0000	40.0000	0.0098	0.0000	40.00	Option 2: A=7.465, B=7606.44, C=280.16
Sodium Nitrate						0.0203	0.0203	0.0203	84.9970	0.0140	0.0007	85.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Nitrite						0.0203	0.0203	0.0203	68.9950	0.0004	0.0000	69.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Oxalate						0.0203	0.0203	0.0203	134.0000	0.0061	0.0003	134.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Sulfate						0.0203	0.0203	0.0203	142.0400	0.0000	0.0000	142.04	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2685	0.5798	18.0200	0.9678	0.9984	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

178S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Precipitate Mixture	13.59	24.21	37.80
Sodium Hydroxide (caustic soda)	0.00	0.00	0.00
Sodium Nitrate	0.01	0.02	0.03
Sodium Nitrite	0.00	0.00	0.00
Sodium Oxalate	0.00	0.01	0.01
Water	13.57	24.18	37.75
Aluminum Oxide	0.00	0.00	0.00
Calcium Phosphate Dibasic	0.00	0.00	0.00
Mercury Oxide	0.00	0.00	0.00
Potassium Nitrate	0.00	0.00	0.00
Sodium Sulfate	0.00	0.00	0.00
Sodium Flouride	0.00	0.00	0.00
Nickel Oxide	0.00	0.00	0.00
Lead Oxide	0.00	0.00	0.00
Barium Sulfate	0.00	0.00	0.00

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	098S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0039 221-S Acid Drain Catch Tank (1,200 gal)
Tank Dimensions	
Shell Height (ft):	9.80
Diameter (ft):	5.00
Liquid Height (ft) :	8.00
Avg. Liquid Height (ft):	6.00
Volume (gallons):	1,200.00
Turnovers:	255.00
Net Throughput(gal/yr):	306,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	9.80
Slope (ft/ft) (Cone Roof)	0.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

098S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Nitric Acid Mixture	All	72.88	61.33	84.03	68.29	0.5398	0.3704	0.7720	37.1397			28.03	
Nitric Acid						1.0311	0.7232	1.4442	63.0100	0.5000	0.7210	63.01	Option 2: A=7.564, B=1431.75, C=222.888
Water						0.3990	0.2695	0.5798	18.0200	0.5000	0.2790	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

098S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Water	11.58	4.51	16.09
Nitric Acid	29.93	11.66	41.59
Nitric Acid Mixture	41.51	16.17	57.69

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	100S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0036 221-S Nitrate Acid Feed Tank (600 gal)
Tank Dimensions	
Shell Height (ft):	6.70
Diameter (ft):	4.50
Liquid Height (ft) :	5.00
Avg. Liquid Height (ft)	3.00
Volume (gallons):	600.00
Turnovers:	60.00
Net Throughput(gal/yr)	36,000.00
Is Tank Heated (y/n)	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	6.70
Slope (ft/ft) (Cone Roof)	2.98
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

100S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Nitric Acid Mixture	All	72.68	61.33	84.03	68.26	0.5396	0.3704	0.7720	37.1397			28.03	
Nitric Acid						1.0311	0.7232	1.4442	63.0100	0.5000	0.7210	63.01	Option 2: A=7.564, B=1431.75, C=222.686
Water						0.3990	0.2695	0.5796	18.0200	0.5000	0.2790	18.02	Option 2: A=8.050, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

100S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Mixture	11.45	11.31	22.76
Water	3.19	3.15	6.35
Nitric Acid	8.26	8.15	16.41

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	101S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0035 221-S Sodium Nitrite Feed Tank (600 gal)
Tank Dimensions	
Shell Height (ft):	7.00
Diameter (ft):	4.50
Liquid Height (ft) :	5.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	600.00
Turnovers:	188.00
Net Throughput(gal/yr):	112,500.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	7.00
Slope (ft/ft) (Cone Roof)	3.11
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

101S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Sodium Nitrate Mixture	All	72.68	61.33	84.03	66.28	0.3523	0.2367	0.5108	18.3821			24.30	
Sodium Nitrite						0.0203	0.0203	0.0203	68.9950	0.3500	0.0267	69.00	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5798	18.0200	0.6500	0.9733	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

101S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Sodium Nitrate Mixture	5.66	3.73	9.39
Water	5.51	3.63	9.14
Sodium Nitrite	0.15	0.10	0.25

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	102S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0033 221-S Organic Acid Drain Tank #1 (1,200 gal)
Tank Dimensions	
Shell Height (ft):	9.80
Diameter (ft):	5.00
Liquid Height (ft) :	8.00
Avg. Liquid Height (ft):	5.00
Volume (gallons):	1,200.00
Turnovers:	10,950.00
Net Throughput(gal/yr):	13,140,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	9.80
Slope (ft/ft) (Cone Roof)	3.92
Breather Vent Settings	
Vacuum Settings (psig)	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

102S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Oxalic Acid Mixture	All	72.68	61.33	84.03	66.26	0.3829	0.2002	0.5697	18.4901			18.59	
Oxalic Acid						0.1179	0.1179	0.1179	90.0300	0.1000	0.0318	90.03	Option 1: VP70 = .117696 VP80 = .117696
Water						0.3990	0.2696	0.5798	18.0200	0.9000	0.9682	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

102S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Oxalic Acid Mixture	385.02	6.44	391.46
Water	372.78	6.24	379.02
Oxalic Acid	12.24	0.20	12.44

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	103S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Horizontal Tank
Description:	S-OP0009-0032 221-S Vitrivication Process Oxalic Decon Feed Tank (1,100 gal)

Tank Dimensions

Shell Length (ft):	9.00
Diameter (ft):	5.50
Volume (gallons):	1,100.00
Turnovers:	65.00
Net Throughput(gal/yr):	72,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

103S - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Oxalic Acid Mixture	All	72.66	61.33	84.03	66.26	0.3929	0.2662	0.5697	18.4901			19.59	
Oxalic Acid						0.1179	0.1179	0.1179	90.0300	0.1000	0.0318	90.03	Option 1: VP70 = 117698 VP80 = 117698
Water						0.3990	0.2695	0.5798	18.0200	0.9000	0.9682	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

103S - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Oxalic Acid Mixture	7.82	6.12	13.94
Water	7.57	5.92	13.50
Oxalic Acid	0.25	0.19	0.44

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	105S	
City:	Aiken	
State:	South Carolina	
Company:	SRR	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	S-DP0009-0030 221-S Additive Mix Feed Tank (100 gal)	
Tank Dimensions		
Shell Height (ft):		5.00
Diameter (ft):		2.50
Liquid Height (ft) :		5.00
Avg. Liquid Height (ft):		2.50
Volume (gallons):		180.00
Turnovers:		120.00
Net Throughput(gal/yr):		21,600.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Medium	
Shell Condition	Good	
Roof Color/Shade:	Gray/Medium	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		5.00
Slope (ft/ft) (Cone Roof)		4.00
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

105S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Poly Monoallyl Ether Acetate Mixture	All	72.68	61.33	84.03	66.26	0.3009	0.2049	0.4348	19.8069			44.51	
Dimethyl Methyl Siloxane						0.0203	0.0203	0.0203	89.0000	0.4400	0.0667	89.00	Option 1: VP70 = .0203 VP80 = .0203
Poly Monoallyl Ether Acetate						0.0203	0.0203	0.0203	298.4500	0.2600	0.0394	298.45	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5798	18.0200	0.3000	0.8938	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

105S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Poly Monoallyl Ether Acetate Mixture	1.28	0.71	1.99
Dimethyl Methyl Siloxane	0.09	0.05	0.13
Water	1.14	0.63	1.78
Poly Monoallyl Ether Acetate	0.05	0.03	0.08

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	106S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0029 221-S Copper Catalyst Tank (100 gal)
Tank Dimensions	
Shell Height (ft):	7.00
Diameter (ft):	2.50
Liquid Height (ft) :	6.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	180.00
Turnovers:	30.00
Net Throughput(gal/yr):	5,400.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	7.00
Slope (ft/ft) (Cone Roof)	5.60
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

106S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Cupric Formate Mixture	All	72.68	61.33	84.03	66.26	0.3962	0.2678	0.5757	18.0697			18.99	
Copper Oxalate Hemihydrate						0.0203	0.0203	0.0203	151.5700	0.0580	0.0031	151.57	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5798	18.0200	0.9420	0.9969	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

108S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Cupric Formate Mixture	0.92	1.29	2.21
Water	0.92	1.28	2.20
Copper Oxalate Hemihydrate	0.00	0.00	0.01

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	107S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0028 221-S Frit Decon Feed Tank (800 gal)
Tank Dimensions	
Shell Height (ft):	8.80
Diameter (ft):	5.00
Liquid Height (ft) :	5.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	780.00
Turnovers:	288.00
Net Throughput(gal/yr):	225,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.80
Slope (ft/ft) (Cone Roof)	3.52
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

107S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Formic Acid Mixture	All	72.68	61.33	84.03	66.26	0.4010	0.2711	0.5823	18.3264			18.19	
Formic acid						0.7404	0.5407	1.0002	46.0300	0.0150	0.0275	46.03	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3900	0.2895	0.5798	18.0200	0.9850	0.9725	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

107S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Formic Acid Mixture	10.66	6.99	17.65
Water	10.37	6.79	17.16
Formic acid	0.29	0.19	0.49

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	108S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0027 221-S Frit Slurry Tank (2,800 gal)
Tank Dimensions	
Shell Height (ft):	8.00
Diameter (ft):	8.00
Liquid Height (ft) :	8.00
Avg. Liquid Height (ft):	6.70
Volume (gallons):	2,800.00
Turnovers:	129.00
Net Throughput(gal/yr):	360,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	6.70
Slope (ft/ft) (Cone Roof)	1 68
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

108S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Formic Acid Mixture	All	72.68	61.33	84.03	66.29	0.4041	0.2735	0.5660	18.7603			18.43	
Formic acid						0.7404	0.5407	1.0002	46.0000	0.0370	0.0666	46.00	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3990	0.2696	0.5796	18.0200	0.9630	0.9334	18.02	Option 2: A=8.058, B=1723.84, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

108S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Formic Acid Mixture	25.97	8.24	34.21
Water	24.24	7.69	31.93
Formic acid	1.73	0.55	2.28

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	109S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Horizontal Tank
Description:	S-DP0009-0026 221-S Nitric Acid Decon Tank (1,100)

Tank Dimensions

Shell Length (ft):		9.00
Diameter (ft):		5.50
Volume (gallons):		1,100.00
Turnovers:		65.00
Net Throughput(gal/yr):		72,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n)	N	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

109S - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Nitric Acid Mixture	All	72.68	61.33	84.03	68.28	0.4225	0.2884	0.6119	22.1773			19.85	
Nitric Acid						1.0311	0.7232	1.4442	63.0100	0.1200	0.2621	63.01	Option 2: A=7.564, B=1431.75, C=222.866
Potassium Permanganate						0.0203	0.0203	0.0203	158.0340	0.0075	0.0003	158.03	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3990	0.2695	0.5798	18.0200	0.8725	0.7375	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

109S - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Mixture	10.09	7.98	18.07
Water	7.44	5.89	13.33
Nitric Acid	2.65	2.09	4.74
Potassium Permanganate	0.00	0.00	0.01

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	111S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Horizontal Tank
Description:	S-DP0009-0024 221-S Nitric Acid Dilution Tank (100 gal)

Tank Dimensions

Shell Length (ft):		5.00
Diameter (ft):		3.00
Volume (gallons):		100.00
Turnovers:		36.00
Net Throughput(gal/yr):		3,600.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

111S - Horizontal Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max	Vapor Mol Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Nitric Acid Mixture	All	72.68	61.33	84.03	66.26	0.4227	0.2865	0.6122	22.1390			19.71	
Nitric Acid						1.0311	0.7232	1.4442	63.0100	0.1200	0.2606	63.01	Option 2: A=7.564, B=1431.75, C=222.868
Water						0.3990	0.2695	0.5798	18.0200	0.6800	0.7394	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

111S - Horizontal Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Nitric Acid Mixture	0.80	1.35	2.16
Water	0.59	1.00	1.59
Nitric Acid	0.21	0.35	0.56

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	121S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0009-0001 221-S 90% Formic Acid Feed Tank (600 gal)
Tank Dimensions	
Shell Height (ft):	5.00
Diameter (ft):	4.50
Liquid Height (ft) :	5.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	600.00
Turnovers:	36.00
Net Throughput(gal/yr):	21,600.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	5.00
Slope (ft/ft) (Cone Roof)	0.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

121S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
221-S 90% Formic Acid Feed Tank (800 gal)	All	72.68	61.33	84.03	68.26	0.6650	0.4807	0.9073	42.2904			39.82	
Formic acid						0.7404	0.5407	1.0002	46.0000	0.9000	0.9435	46.00	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3990	0.2895	0.5798	18.0200	0.1000	0.0565	18.02	Option 2: A=8.058, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

121S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
221-S 90% Formic Acid Feed Tank (600 gal)	14.46	10.34	24.80
Water	0.82	0.58	1.40
Formic acid	13.65	9.76	23.40

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	128S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0019-0004 221-S Frit Slurry Makeup Tank (2,300 gal)
Tank Dimensions	
Shell Height (ft):	10.50
Diameter (ft):	8.50
Liquid Height (ft):	5.00
Avg. Liquid Height (ft):	3.98
Volume (gallons):	2,300.00
Turnovers:	83.00
Net Throughput(gal/yr):	200,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition:	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft):	10.50
Slope (ft/ft) (Cone Roof):	0.06
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.59 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

128S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Formic Acid	All	72.68	61.33	84.03	66.26	0.3995	0.2898	0.5604	18.0953			18.06	Option 2: A=7.581, B=1699.2, C=260.7
Formic acid						0.7404	0.5407	1.0002	46.0000	0.0037	0.0068	46.00	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3990	0.2895	0.5798	18.0200	0.9963	0.9932	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

128S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Formic Acid	18.18	22.28	40.46
Water	18.06	22.13	40.18
Formic acid	0.12	0.15	0.28

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	129S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-OP0019-0003 422-S Formic Acid Dilution Tank (2,000 gal)
Tank Dimensions	
Shell Height (ft):	8.00
Diameter (ft):	7.00
Liquid Height (ft) :	7.00
Avg. Liquid Height (ft):	3.50
Volume (gallons):	2,000.00
Turnovers:	118.50
Net Throughput(gal/yr):	237,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.00
Slope (ft/ft) (Cone Roof)	0.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

129S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Formic Acid Mixture	All	72.68	61.33	84.03	66.26	0.4010	0.2711	0.5823	18.3264			18.19	
Formic acid						0.7404	0.5407	1.0002	46.0000	0.0150	0.0275	46.03	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3990	0.2585	0.5798	18.0200	0.9850	0.9725	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

129S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Formic Acid Mixture	17.41	11.56	28.97
Water	16.93	11.24	28.18
Formic acid	0.48	0.32	0.80

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	131S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0019-0002 422-S Formic Acid Feed Tank (2,000 gal)
Tank Dimensions	
Shell Height (ft):	8.00
Diameter (ft):	7.00
Liquid Height (ft) :	7.00
Avg. Liquid Height (ft):	3.50
Volume (gallons):	2,000.00
Turnovers:	118.50
Net Throughput(gal/yr):	237,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	8.00
Slope (ft/ft) (Cone Roof)	2.29
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

131S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Formic Acid Mixture	All	72.68	61.33	84.03	66.26	0.4010	0.2711	0.5823	18.3264			18.19	
Formic acid						0.7404	0.5407	1.0002	46.0000	0.0150	0.0275	46.00	Option 2: A=7.581, B=1699.2, C=260.7
Water						0.3990	0.2696	0.5798	18.0200	0.9850	0.9725	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

131S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Formic Acid Mixture	17.41	11.56	28.97
Water	16.93	11.24	28.18
Formic acid	0.48	0.32	0.80

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	132S
City:	Aiken
State:	South Carolina
Company:	SRR
Type of Tank:	Vertical Fixed Roof Tank
Description:	S-DP0019-0001 422-S Oxalic Acid Makeup Tank (1,300 gal)
Tank Dimensions	
Shell Height (ft):	6.00
Diameter (ft):	6.00
Liquid Height (ft) :	6.00
Avg. Liquid Height (ft):	3.00
Volume (gallons):	1,300.00
Turnovers:	12.00
Net Throughput(gal/yr):	15,000.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	6.00
Slope (ft/ft) (Cone Roof)	2.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

132S - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min	Max	Vapor Mol Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol Weight	Basis for Vapor Pressure Calculations
Oxalic Acid Mixture	All	72.68	61.33	84.03	66.26	0.3929	0.2862	0.5697	18.4901			19.59	
Oxalic Acid						0.1179	0.1179	0.1179	90.0300	0.1000	0.0318	90.03	Option 1: VP70 = .117896 VP80 = .117896
Water						0.3990	0.2895	0.5796	18.0200	0.9000	0.9682	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

132S - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Oxalic Acid Mixture	2.59	6.08	8.68
Water	2.51	5.89	8.40
Oxalic Acid	0.08	0.19	0 28

Saltstone Facility Emission Unit (Z-001)

Process Description:

The 205-Z Raw Material Storage and Handling emission unit (Z-001) treats radioactively contaminated salt solution. A mixer is used to blend dry materials with a salt solution to form a grout that is pumped to the Saltstone Disposal Facility (SDF) units (i.e., Saltstone Disposal Units (SDUs)) where the grout is allowed to harden into a concrete-like solid waste called "saltstone."

The saltstone process is similar to EPA's AP-42 11-12 Concrete Batching. The process is composed essentially of radioactively contaminated salt solution and dry materials.

The equipment consists of four dry material storage silos (071Z, 072Z, 073Z, and 076Z), a weigh hopper (075Z), two dry mix blenders (069Z, 074Z) and a feed hopper/mixer (052Z). The Salt Feed Tank (091Z) is also considered part of the process since it can receive material back from the process and not used solely to store feed material. Six baghouses (B-011, B-017, B-013, B-014, B-015, B-016) control particulate emissions during the dry material handling. HEPAs are present on the Salt Feed Tank, but purely for radioactive emissions and no credit is taken for them from a non-radiological emission perspective.

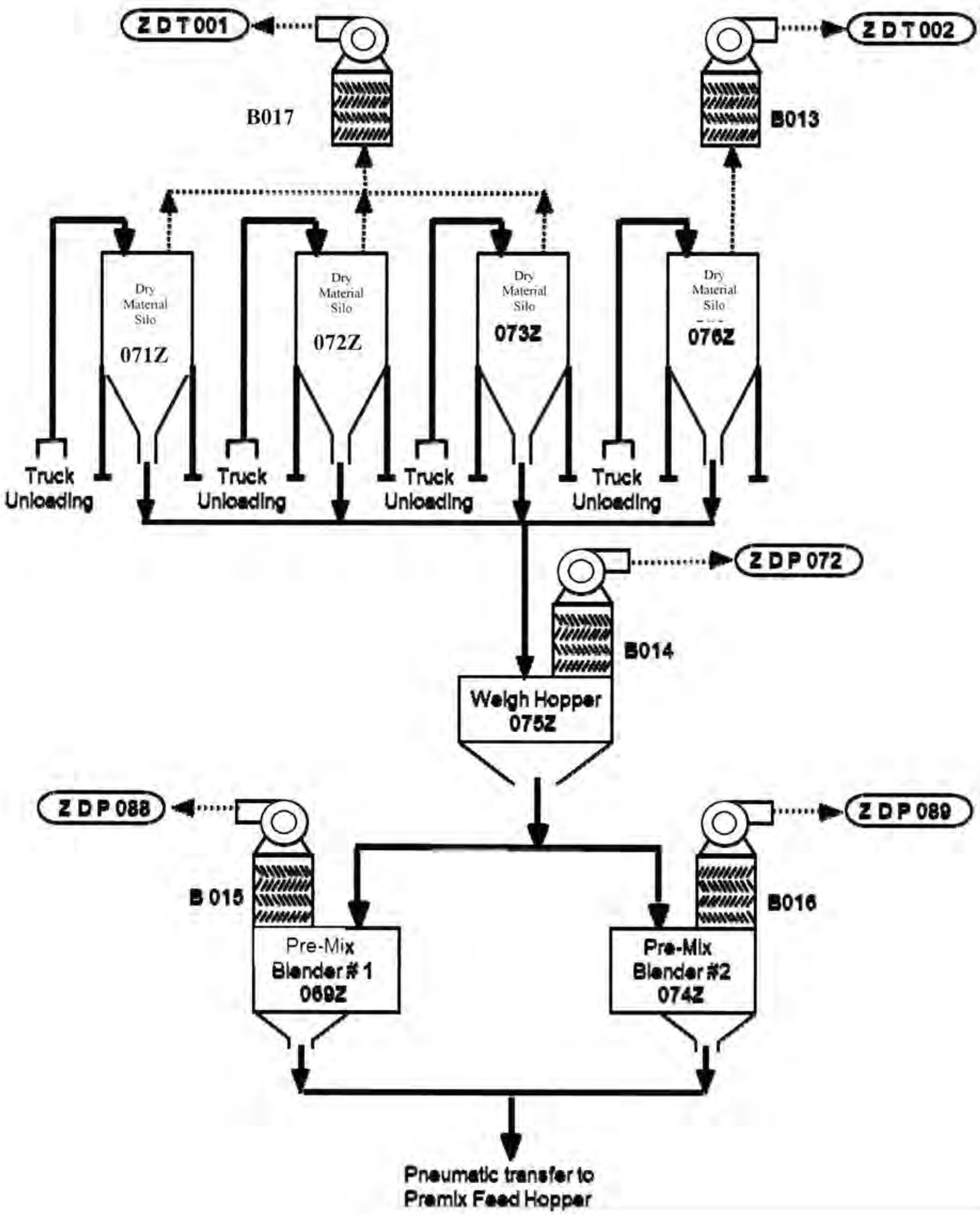
Dry materials can consist of varying compositions of flyash, slag, and/or cement. The dry materials may be delivered in predetermined compositions of the constituents above. Any of the four dry material silos can be used to receive and store dry materials. 25-ton dry bulk cargo trailers (trucks) deliver the dry materials. The pneumatic unloading takes approximately 1.5 hours with a transfer rate of 16.67 tons per hour. Four dry materials trucks can be unloaded simultaneously. The consumption rate for dry material is approximately 40 tons per hour. The design emissions for unloading dry materials are based on 8760 hours for the four dry material silos.

The process weight range for saltstone is 35-40 tons per hour. The operating permit limits are conservatively calculated on the low end of this range, 35 tons per hour. The modeled emission rates are conservatively calculated based on the upper end of the range, 40 tons per hour.

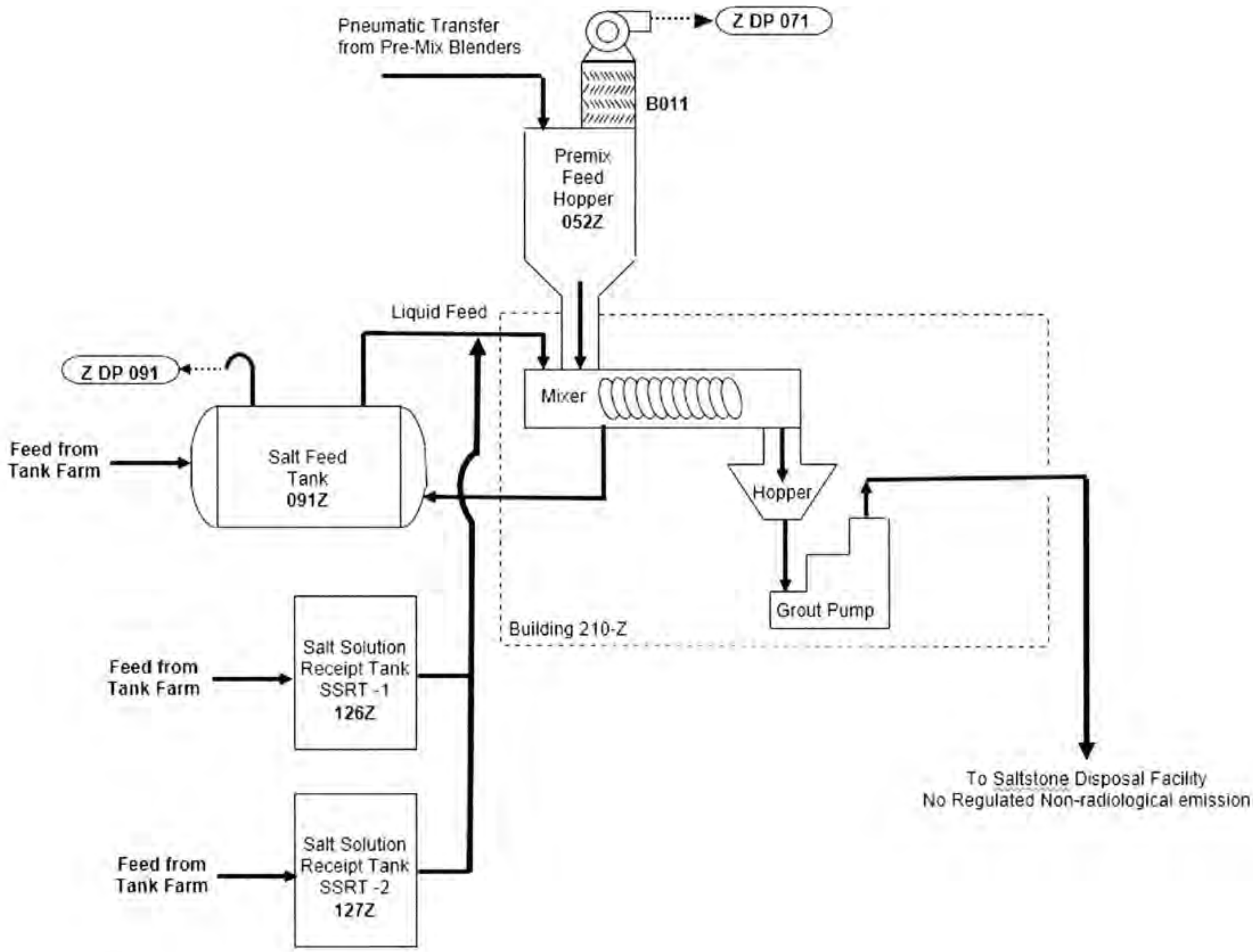
The dry materials are transferred from the various silos to the weigh hopper and then transferred to one of two blenders at a rate of approximately 40 tons per hour. The blenders may blend materials simultaneously, but only one batch of dry materials can be pneumatically transferred to the feed hopper (052Z) at a time, which limits the dry materials rate to approximately 40 tons per hours. The dry materials are fed from the feed hopper through a chute to the mixer, where the dry materials are blended with the salt solution to form a grout.

There are two Salt Solution Receipt Tanks (SSRT-1 and SSRT-2) with DHEC IDs 126Z and 127Z respectively. These tanks are only used for feed receipt and are viewed as raw material bulk storage and their activities are not included in the Saltstone Process. The product from the Saltsone Process is saltsone that is pumped to the Saltstone Disposal Facility. Since this portion of the activity is final shipping/storage operations the Saltstone Disposal Facility is not included in the Saltstone Process. This is consistent with the June 15, 1999 SCDHEC Guidance Document for Standard 4, Section VIII – PM Emission Limitations.

Saltstone Facility Flow Diagram



Saltstone Facility Flow Diagram (continued)



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Title V Permit Application
Emission Unit & Equipment Information – Form C
Bureau of Air Quality

EMISSION UNIT DESCRIPTION (Table is a description of emission units located at this facility)		
1. Emission Unit ID (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	**2. Emission Unit Description/Purpose**	**3. Control Device**
Z-001	SALTSTONE FACILITY (SF)	BAGHOUSES B011, B013, B014, B015, B016, B017

EMISSION UNIT PROCESS DESCRIPTION (For each emission unit listed above, provide the following emission unit process description information)					
1. Emission Unit ID	**4. Process Weight Rate (tons/hr)**	**5. Production Rate (units per time period)**	**6. Major Product**	**7. SIC/NAICS Code**	**8. Comments (Special permit limits, etc.)**
Z-001	35.0	4350000 CU FT	GROUT	4953 - 562211	NONE

CONTROL DEVICE INFORMATION (Table is a description of control devices located at this facility)			
3. Control Device ID	**9. Control Device Description (Manufacturer, Name, Model #, etc.)**	**10. Installation Date**	**11. Pollutant(s) Controlled**
B 0011	BAGHOUSE---FLEX KLEEN, 84-NRBS-48 IIG, 10-83-30-106	Jun-90	TOTAL PARTICULATE MATTER (PM)
B 0011	BAGHOUSE---FLEX KLEEN, 84-NRBS-48 IIG, 10-83-30-106	Jun-90	PARTICULATE MATTER (10 MICRONS)
B 0011	BAGHOUSE---FLEX KLEEN, 84-NRBS-48 IIG, 10-83-30-106	Jun-90	PARTICULATE MATTER (2.5 MICRONS)
B 0011	BAGHOUSE---FLEX KLEEN, 84-NRBS-48 IIG, 10-83-30-106	Jun-90	LEAD
B 0017	BAGHOUSE---HALLIBURTON SERVICES, Cam-Fil Farr GS-4X or approved equal model, Z-205000-BMH-DCOL-0001	Feb-20	TOTAL PARTICULATE MATTER (PM)
B 0017	BAGHOUSE---HALLIBURTON SERVICES, Cam-Fil Farr GS-4X or approved equal model, Z-205000-BMH-DCOL-0001	Feb-20	PARTICULATE MATTER (10 MICRONS)
B 0017	BAGHOUSE---HALLIBURTON SERVICES, Cam-Fil Farr GS-4X or approved equal model, Z-205000-BMH-DCOL-0001	Feb-20	PARTICULATE MATTER (2.5 MICRONS)
B 0017	BAGHOUSE---HALLIBURTON SERVICES, Cam-Fil Farr GS-4X or approved equal model, Z-205000-BMH-DCOL-0001	Feb-20	LEAD
B 0013	BAGHOUSE---HALLIBURTON SVCS, HPJ-55, ITEM # 1I	Jun-90	TOTAL PARTICULATE MATTER (PM)
B 0013	BAGHOUSE---HALLIBURTON SVCS, HPJ-55, ITEM # 1I	Jun-90	PARTICULATE MATTER (10 MICRONS)
B 0013	BAGHOUSE---HALLIBURTON SVCS, HPJ-55, ITEM # 1I	Jun-90	PARTICULATE MATTER (2.5 MICRONS)

SRNS-J2200-2019-00240

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SRNS-J2200-2019-00240

CONTROL DEVICE INFORMATION
(Table is a description of control devices located at this facility)

3. Control Device ID	9. Control Device Description (Manufacturer, Name, Model #, etc.)	10. Installation Date	11. Pollutant(s) Controlled
B 0013	BAGHOUSE---HALLIBURTON SVCS, HPJ-55, ITEM # 1I	Jun-90	LEAD
B 0014	BAGHOUSE---FLEX KLEEN, 84-BVBS-9IIG, 10-52-30104	Jun-90	TOTAL PARTICULATE MATTER (PM)
B 0014	BAGHOUSE---FLEX KLEEN, 84-BVBS-9IIG, 10-52-30104	Jun-90	PARTICULATE MATTER (10 MICRONS)
B 0014	BAGHOUSE---FLEX KLEEN, 84-BVBS-9IIG, 10-52-30104	Jun-90	PARTICULATE MATTER (2.5 MICRONS)
B 0015	BAGHOUSE---FLEX KLEEN, 58-BVBS-25II, 10-52-30105	Jun-90	TOTAL PARTICULATE MATTER (PM)
B 0015	BAGHOUSE---FLEX KLEEN, 58-BVBS-25II, 10-52-30105	Jun-90	PARTICULATE MATTER (10 MICRONS)
B 0015	BAGHOUSE---FLEX KLEEN, 58-BVBS-25II, 10-52-30105	Jun-90	PARTICULATE MATTER (2.5 MICRONS)
B 0015	BAGHOUSE---FLEX KLEEN, 58-BVBS-25II, 10-52-30105	Jun-90	LEAD
B 0016	BAGHOUSE---FLEX KLEEN, 58-BVBV-25II, 10-52-30104	Jun-90	TOTAL PARTICULATE MATTER (PM)
B 0016	BAGHOUSE---FLEX KLEEN, 58-BVBV-25II, 10-52-30104	Jun-90	PARTICULATE MATTER (10 MICRONS)
B 0016	BAGHOUSE---FLEX KLEEN, 58-BVBV-25II, 10-52-30104	Jun-90	PARTICULATE MATTER (2.5 MICRONS)
B 0016	BAGHOUSE---FLEX KLEEN, 58-BVBV-25II, 10-52-30104	Jun-90	LEAD

CONTROL DEVICE INFORMATION (CONTINUED)

3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
B 0011	BAGHOUSE	100	99.0	OTHER	PRESSURE DROP GAUGE	Z DP 071	
B 0017	BAGHOUSE	100	99.9	VENDOR DATA	PRESSURE DROP GAUGE	Z DT 001	
B 0013	BAGHOUSE	100	99.0	VENDOR DATA	PRESSURE DROP GAUGE	Z DT 002	

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	CONTROL DEVICE INFORMATION (CONTINUED)						
3. Control Device ID	12. Capture System	13. Capture (%)	14. Removal/ Destruction (%)	15. Removal/ Destruction (Method Used to Determine)	16. Parameter Monitored	17. Exhaust ID	18. Comments (special permit limitations, Fuel info., different capture systems, etc.)
B 0014	BAGHOUSE	100	98.5	OTHER	PRESSURE DROP GAUGE	Z DP 072	
B 0015	BAGHOUSE	100	95.0	OTHER	PRESSURE DROP GAUGE	Z DP 088	
B 0016	BAGHOUSE	100	95.0	OTHER	PRESSURE DROP GAUGE	Z DP 089	

SRNS-J2200-2019-00240

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SRNS-J2200-2019-00044

EQUIPMENT DESCRIPTION
(For each emission unit please provide a description of the all equipment located at this facility)

1. Emission Unit ID	19. Equipment ID	20. Equipment Description	21. Installation Date (Original and Manufacturer Date and Modification Date)	22. Modification Description	3. Control Device ID	17. Exhaust ID	23. Design Capacity (units)
Z-001	052Z	PRE-MIX FEED HOPPER/MIXER	01/1986 12/2019	0080-0041-C3	B 0011	Z D P 071	350400 TONS
Z-001	069Z	PRE-MIX BLENDER #1	01/1986 12/2019	0080-0041-C3	B 0015	Z D P 088	350400 TONS
Z-001	071Z	DRY MATERIAL SILO	01/1986 12/2019	0080-0041-C3	B 0017	Z D T 001	146029 TONS
Z-001	072Z	DRY MATERIAL SILO	01/1986 12/2019	0080-0041-C3	B 0017	Z D T 001	146029 TONS
Z-001	073Z	DRY MATERIAL SILO	01/1986 12/2019	0080-0041-C3	B 0017	Z D T 001	146029 TONS
Z-001	074Z	PREMIX BLENDER # 2	01/1986 12/2019	0080-0041-C3	B 0016	Z D P 089	350400 TONS
Z-001	075Z	WEIGH HOPPER	01/1986 12/2019	0080-0041-C3	B 0014	Z D P 072	350400 TONS
Z-001	076Z	DRY MATERIAL SILO	01/1986 12/2019	0080-0041-C3	B 0013	Z D T 002	146029 TONS
Z-001	091Z	SALT FEED TANK	01/1986		N/A	ZDP0091	5.20E+06 GAL/YR

EQUIPMENT DESCRIPTION (CONTINUED)

19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
052Z	N/A	N/A	0080-0080-CA, 0080-0041-C3	NONE
069Z	N/A	N/A	0080-0080-CD, 0080-0041-C3	NONE
071Z	N/A	N/A	0080-0080-CB, 0080-0041-C3	NONE
072Z	N/A	N/A	0080-0080-CB, 0080-0041-C3	NONE
073Z	N/A	N/A	0080-0080-CB, 0080-0041-C3	NONE
074Z	N/A	N/A	0080-0080-CD, 0080-0041-C3	NONE
075Z	N/A	N/A	0080-0080-CC, 0080-0041-C3	NONE
076Z	N/A	N/A	0080-0080-CH, 0080-0041-C3	NONE

EQUIPMENT DESCRIPTION (CONTINUED)				
19. Equipment ID	24. Primary Fuel Combusted (If Applicable)	25. Secondary Fuel Combusted (If Applicable)	26. Construction Permit ID or Exemption Date (if applicable)	27. Comments (list special permit limitations, fuel info, etc.)
091Z	N/A	N/A	0080-0081-CI, 0080-0041-C3	NONE

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Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
Z-001	Z D P 0071	TOTAL PARTICULATE MATTER (PM)		CRITERIA	8.80E+00	3.85E+01	8.80E-02	3.85E-01
Z-001	Z D P 0071	PARTICULATE MATTER (10 MICRONS)		CRITERIA	3.12E+00	1.37E+01	3.12E-02	1.37E-01
Z-001	Z D P 0071	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	3.12E+00	1.37E+01	3.12E-02	1.37E-01
Z-001	Z D P 0071	LEAD	7439 92 1	CRITERIA HAP	1.53E-05	6.69E-05	1.53E-07	6.69E-07
Z-001	Z D P 0072	TOTAL PARTICULATE MATTER (PM)		CRITERIA	2.04E-01	8.94E-01	3.06E-03	1.34E-02
Z-001	Z D P 0072	PARTICULATE MATTER (10 MICRONS)		CRITERIA	9.60E-02	4.20E-01	1.44E-03	6.31E-03
Z-001	Z D P 0072	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	9.60E-02	4.20E-01	1.44E-03	6.31E-03
Z-001	Z D P 0088	TOTAL PARTICULATE MATTER (PM)		CRITERIA	8.80E+00	3.85E+01	4.40E-01	1.93E+00
Z-001	Z D P 0088	PARTICULATE MATTER (10 MICRONS)		CRITERIA	3.12E+00	1.37E+01	1.56E-01	6.83E-01
Z-001	Z D P 0088	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	3.12E+00	1.37E+01	1.56E-01	6.83E-01
Z-001	Z D P 0088	LEAD	7439 92 1	CRITERIA HAP	1.53E-05	6.69E-05	7.64E-07	3.35E-06
Z-001	Z D P 0089	TOTAL PARTICULATE MATTER (PM)		CRITERIA	8.80E+00	3.85E+01	4.40E-01	1.93E+00

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
Z-001	Z D P 0089	PARTICULATE MATTER (10 MICRONS)		CRITERIA	3.12E+00	1.37E+01	1.56E-01	6.83E-01
Z-001	Z D P 0089	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	3.12E+00	1.37E+01	1.56E-01	6.83E-01
Z-001	Z D P 0089	LEAD	7439 92 1	CRITERIA HAP	1.53E-05	6.69E-05	7.64E-07	3.35E-06
Z-001	Z D T 0001	TOTAL PARTICULATE MATTER (PM)		CRITERIA	1.57E+02	6.88E+02	1.57E-01	6.88E-01
Z-001	Z D T 0001	PARTICULATE MATTER (10 MICRONS)		CRITERIA	5.50E+01	2.41E+02	5.50E-02	2.41E-01
Z-001	Z D T 0001	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	5.50E+01	2.41E+02	5.50E-02	2.41E-01
Z-001	Z D T 0001	LEAD	7439 92 1	CRITERIA HAP	2.60E-02	1.14E-01	2.60E-05	1.14E-04
Z-001	Z D T 0002	TOTAL PARTICULATE MATTER (PM)		CRITERIA	5.23E+01	2.29E+02	5.23E-01	2.29E+00
Z-001	Z D T 0002	PARTICULATE MATTER (10 MICRONS)		CRITERIA	1.83E+01	8.03E+01	1.83E-01	8.03E-01
Z-001	Z D T 0002	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	1.83E+01	8.03E+01	1.83E-01	8.03E-01
Z-001	Z D T 0002	LEAD	7439 92 1	CRITERIA HAP	8.67E-04	3.80E-03	8.67E-06	3.80E-05
Z-001	Z D P 0091	TOTAL PARTICULATE MATTER (PM)		CRITERIA	3.78E-04	1.66E-03	3.78E-04	1.66E-03

SRNS-J2200-2019-0240

Title V Permit Application
Emission Data for Regulated Pollutants – Form D
Bureau of Air Quality

1. Emission Unit ID: (If the emission unit is on the Insignificant Activity List proceed to Forms G & F)	2. Exhaust Point ID (if applicable)	3. Pollutant:	4. CAS Number (if applicable):	5. Type of Pollutant:	6. Maximum Uncontrolled		7. Maximum Controlled	
					(lb/hr)	(TPY)	(lb/hr)	(TPY)
Z-001	Z D P 0091	PARTICULATE MATTER (10 MICRONS)		CRITERIA	3.78E-04	1.66E-03	3.78E-04	1.66E-03
Z-001	Z D P 0091	PARTICULATE MATTER (2.5 MICRONS)		CRITERIA	3.78E-04	1.66E-03	3.78E-04	1.66E-03
Z-001	Z D P 0091	METHYL ETHYL KETONE	78 93 3	TAP	2.44E-04	1.07E-03	2.44E-04	1.07E-03
Z-001	Z D P 0091	BENZENE	71 43 2	TAP	2.63E-05	1.15E-04	2.63E-05	1.15E-04
Z-001	Z D P 0091	CHLOROFORM	67 66 3	TAP	2.63E-05	1.15E-04	2.63E-05	1.15E-04
Z-001	Z D P 0091	TRICHLOROETHYLENE	79 01 6	TAP	9.13E-06	4.00E-05	9.13E-06	4.00E-05
Z-001	Z D P 0091	TETRACHLOROETHYLENE	127 18 4	TAP	2.28E-06	1.00E-05	2.28E-06	1.00E-05
Z-001	Z D P 0091	VOC (OZONE PRECURSORS)		CRITERIA	3.06E-04	1.34E-03	3.06E-04	1.34E-03

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
Z-001	Z D P 0071	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0071	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0071	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0071	LEAD	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0072	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A

SRNS-J2200-2019-00240

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1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
Z-001	Z D P 0072	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0072	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0088	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0088	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0088	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0088	LEAD	EPA AP-42/WEBFIRE	N/A
				N/A
Z-001	Z D P 0089	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0089	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0089	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0089	LEAD	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0001	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0001	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A

SRNS-J2200-2019-00240

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

1. Emission Unit ID:	2. Exhaust Point ID (if applicable)	3. Pollutant:	8. Estimation Method:	9. Comments:
Z-001	Z D T 0001	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0001	LEAD	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0002	TOTAL PARTICULATE MATTER (PM)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0002	PARTICULATE MATTER (10 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0002	PARTICULATE MATTER (2.5 MICRONS)	EPA AP-42/WEBFIRE	N/A
Z-001	Z D T 0002	LEAD	EPA AP-42/WEBFIRE	N/A
Z-001	Z D P 0091	TOTAL PARTICULATE MATTER (PM)	TANKS 4.0	N/A
Z-001	Z D P 0091	PARTICULATE MATTER (10 MICRONS)	TANKS 4.0	N/A
Z-001	Z D P 0091	PARTICULATE MATTER (2.5 MICRONS)	TANKS 4.0	N/A
Z-001	Z D P 0091	METHYL ETHYL KETONE	TANKS 4.0	N/A
Z-001	Z D P 0091	BENZENE	TANKS 4.0	N/A
Z-001	Z D P 0091	CHLOROFORM	TANKS 4.0	N/A
Z-001	Z D P 0091	TRICHLOROETHYLENE	TANKS 4.0	N/A
Z-001	Z D P 0091	TETRACHLOROETHYLENE	TANKS 4.0	N/A
Z-001	Z D P 0091	VOC (OZONE PRECURSORS)	TANKS 4.0	N/A

SRNS-J2200-2019-00240

Title V Permit Application
Facility Wide Information – Form E
Bureau of Air Quality

FACILITY WIDE RAW MATERIALS AND PRODUCTS				
1. Raw Materials	2. Quantity	3. Products (List Products in order of major to minor)	4. SIC/NAICS Code	5. Production Rate
SALT SOLUTION	28 TONS	GROUT	4953 - 562211	68 TONS
DRY FEED MATERIAL	40 TONS			

SRNS-J2200-2019-00240

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South Carolina Department of Health and Environmental Control

Title V Permit Application
Regulatory Information – Form I
Bureau of Air Quality

SRNS-J2200-2019-00240

EMISSION LIMITS AND STANDARDS
(This section summarizes the emission unit emission limits and standards)

1. Emission Unit	2. Unit ID	3. Pollutant/Standard	4. Limit	5. Reference Method	6. Applicable Regulation (Regulation Citation/Condition)
205-Z RAW MATERIAL STORAGE & HANDLING	Z-001	EMISSIONS FROM PROCESS INDUSTRIES - OTHER MANUFACTURING	41.3 LB / HR PM	40 CFR 60, APPENDIX A, METHOD 005	SC 61-62.5, Std. 4, Sect. VIII
205-Z RAW MATERIAL STORAGE & HANDLING	Z-001	EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	20% OPACITY	40 CFR 60, APPENDIX A, METHOD 009	SC 61-62.5, Std. 4, Sect. IX.B

COMPLIANCE AND PERMIT REQUIREMENTS
(This section summarizes the emission unit compliance requirements)

2. Unit ID	6. Applicable Regulation (Regulation Citation/Condition)	7. In Compliance (Y/N)	8. Compliance Statement	9. Compliance Date	10. First Submittal
Z-001	SC 61-62.5, Std. 4, Sect. VIII	Y	CLB	Apr-03	
Z-001	SC 61-62.5, Std. 4, Sect. IX.B	Y	CLB	Apr-03	

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART I
(This section summarizes the monitoring and reporting requirements. Parts I, II, III, and IV must be completed for each emission unit).

2. Unit ID	11. Pollutant/Parameter	4. Limit	12. Required Monitoring	13. Monitoring Frequency	14. Reporting Frequency
Z-001	BAGHOUSE PERFORMANCE	N/A	PRESSURE DROP	DAILY	SEMIANNUAL
Z-001	VISIBLE INSPECTIONS (VI)	N/A	RECORDKEEPING	DAILY	SEMIANNUAL

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART II
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	3. or 11. Pollutant/Standard or Pollutant/Parameter	4. Limit	15. Recordkeeping Frequency	16. Averaging Time	17.Stack Test	
					Y/N	Frequency
Z-001	BAGHOUSE PERFORMANCE	N/A	DAILY	N/A	N	N/A
Z-001	VISIBLE INSPECTIONS (VI)	N/A	DAILY	N/A	N	N/A

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SRNS-J2200-2019-00240

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART III
(This section summarizes the monitoring and reporting requirements not described in Parts I & II. Also summarizes applicable regulations that no Monitoring and Reporting is needed.)

2. Unit ID	11. Pollutant/Parameter	4. Limit	18. If no monitoring required, why?	19. List any monitoring requirements not listed above
Z-001	BAGHOUSE PERFORMANCE	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE
Z-001	VISIBLE INSPECTIONS (VI)	N/A	MONITORING REQUIRED SEE PARTS I AND II	NONE

MONITORING/APPLICABLE REGULATION AND PERMIT/RULE REQUIREMENTS-PART IV
(This section summarizes the monitoring and reporting requirements)

2. Unit ID	20. Description (include equip/process ID)	21. Potential Uncontrolled Emissions		22. Control Equip ID	23. Potential Controlled Emissions	24. Subject to CAM Rule (40 CFR 64)?			
		Pollutant	Tons/Year		Tons/Year	Yes*	No	Exempt	25. Reason Exempt?
Z-001	205-Z RAW MATERIAL STORAGE & HANDLING	TOTAL PARTICULATE MATTER (PM)	1.03E+03	B0011, B0017, B0013, B0014, B0015, B0016	7.24E+00	X		N	
Z-001	205-Z RAW MATERIAL STORAGE & HANDLING	PARTICULATE MATTER (10 MICRONS)	3.63E+02	B0011, B0017, B0013, B0014, B0015, B0016	2.56E+00	X		N	
Z-001	205-Z RAW MATERIAL STORAGE & HANDLING	PARTICULATE MATTER (2.5 MICRONS)	3.63E+02	B0011, B0017, B0013, B0014, B0015, B0016	2.56E+00	X		N	
Z-001	205-Z RAW MATERIAL STORAGE & HANDLING	LEAD	1.18E-01	B0011, B0017, B0014, B0015, B0016	1.59E-04		X	N	

NOTE* **If yes, the applicant must submit additional information in the form of a CAM plan as required under 40 CFR 64**

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SRNS-J2200-2019-00240

FACILITY-WIDE LIMITS FOR REGULATORY AVOIDANCE-PART V (This section summarizes emission unit(s) covered under a limit to avoid an applicable regulation)				
2. Unit ID (emission unit covered under the limit)	11. Pollutant/Parameter	4. Limit (Facility-Wide)	26. Parameter to Monitor	27. Applicable Regulation Avoidance

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VI (This section allows for additional information or requirements for sources subject to a MACT Standard)			
2. Unit ID	28. New or Existing Equipment	29. Control Equip ID	30. List any unit/equipment which is specifically exempt from MACT standards and state why.

ADDITIONAL INFORMATION FOR MACT SOURCES-PART VII (This section allows for additional requirements for sources subject to a MACT Standard)	
2. Unit ID	31. List Other MACT Requirements: Operation examples, such as, maintenance and monitoring, operational/maintenance & malfunction (OM &M) plan, startup, shutdown, and malfunction (SSM) Plan, leak detection and repair (LDAR), wastewater unit requirements, etc.

Maximum Potential to Emit Calculations

Assumptions/Basis:

1. The 1996 emission calculations that supported the original Title V permit application for saltstone utilized emission equations from EPA AP-42, Supplement B, Section 11.2.3.3, Aggregate Handling and Storage Piles to determine maximum emission rates for many of the sources involved in the saltstone process. These emission factors are not as accurate as the emission factors utilized to calculate actual emissions required during the 2017 air emission inventory process (see assumption 2). The following calculations incorporate the more accurate WebFIRE emission factors (see assumption 2) throughout the equipment that makes up the saltstone process.

2. Emission factors are based on the emission factors utilized by South Carolina Department of Health and Environmental Control (SCDHEC) State and Local Emissions Inventory System (SLEIS) (https://sleisprod.dhec.sc.gov/SLEIS), a web-based application that allows permitted facilities to compile and submit point source emissions inventory data. SLEIS utilized WebFIRE emission factors based on Source Classification Codes (SCC). WebFIRE is EPA's online database that contains emission factors for criteria and hazardous air pollutants (HAP). SLEIS utilizes uncontrolled emission factors, if available, and then applies control device efficiency to determine controlled emissions. If uncontrolled emission factors are not available then SLEIS will default to controlled emission factors. In September 2019, the SCDHEC permit engineer informed the facility PM2.5 emissions must be included in the emission calculations even in cases where WebFIRE and SLEIS do not provide PM2.5 factors. Typically, facilities assume PM2.5 emissions are the same as PM10 emissions. This approach has been adopted in this calculation.

3. The design emissions for unloading dry materials are based on 8760 hours for the four dry material silos based on a surrogate material that contains the highest emission factors from the two Source Classification Codes (SCC) for the materials that can be stored in the 4 silos (3-05-011-17 and3-05-011-07). This is considered worst case. 40 tons/hr is the process rate for saltstone. It was identified in August 2019 the SLEIS factor table for SCC 3-05-011-17 did not contain an emission factor for lead, but WebFIRE and AP 42 do provide a controlled emission factor (fabric filter) for lead within this SCC code (5.20E-07 lb lead/ton material). This calculation utilizes the WebFIRE controlled emission factor for lead.

4. The blenders may blend materials simultaneously, but only one batch of dry materials can be pneumatically transferred to the feed hopper (052Z) at a time, which limits the dry materials rate to approximately 40 tons per hour. Calculations assume both blenders are running.

5. Dry materials can consist of varying compositions of flyash, slag, and/or cement. The dry materials may be delivered in predetermined compositions of the constituents above. Any of the four dry material silos can be used to receive and store dry materials.

6. Dry material is fed into the pre-mix blenders (069Z and 074Z) and pre-mix feed hopper (052Z) at a 40 ton/hr rate. SLEIS provides controlled and uncontrolled emission factors for PM and PM10 for SCC 3-05-011-09. WebFIRE marked the controlled PM10, controlled PM and uncontrolled PM factors as revoked, but did not replace them with other values. This evaluation utilizes the SLEIS provided uncontrolled emission factors for PM and PM10 and applies the baghouse efficiencies to obtain the controlled emission for these pieces of equipment.
7. SLEIS provides only uncontrolled emission factors for PM and PM10 for SCC 3-05-011-08 (075Z). WebFIRE provides uncontrolled factors for cadmium, chromium, Chromium VI, cobalt, copper, and nickel. This calculation utilizes these uncontrolled factors for 075Z and applies the baghouse efficiency to obtain controlled emissions for 075Z for these metals.
8. Dry materials are delivered via 25-ton dry bulk cargo trailers.
9. Pneumatic unloading takes 1.5 hours with a transfer rate of 16.67 tons/hr.
10. Salt flow rate into the mixer is 110 gal/min (6,600 gal/hr).
11. Dry material throughput to solidify 6,600 gals of salt solution is 40 tons (grout design blend is 41% salt solution, and 59% dry materials by weight).
12. The appropriate control device removal efficiency was utilized to determine uncontrolled emission rates where SLEIS/ WebFIRE only reported emission factors based on control devices being present.
13. Trace determination for metals is based on October 2018 SCDHEC Air Quality Modeling Guidelines for Air Quality Permits (https://www.scdhec.gov/sites/default/files/media/document/Air-Modeling-Guidelines-2018.10.15.pdf).
14. Chromium (Cr) emissions of Cr III versus Cr VI were calculated in the same manner as they were in SLEIS. SLEIS assumes 99.5% of Cr emissions to be Cr III and the remainder to be Cr VI.
15. Emission from the Salt Feed Tank (091Z) are emitted to ZDP0091. Maximum emissions were determined using Tanks 4.09d. The TANKS 4.0 Report is included in this document.
16. A process weight of 35 tons/hr (as opposed to 40 tons/hr used to determine maximum PTE) was conservatively utilized in determining the PM emission limit contained in R 61-62.5, Standard No. 4, Emissions from Process Industries.

Dry material unloading max throughput:

Dry Material Mixture
8760 hrs/yr * 16.67 tons/hr * 3 trucks unloading sim = 438,088 tons/yr at ZDT001
16.67 ton/hr * 3 trucks unloading simultaneously = 50.01 tons/hr dry material at ZDT001
8760 hrs/yr * 16.67 tons/hr * 1 trucks unloading sim = 146,029 tons/yr at ZDT002
16.67 ton/hr * 1 truck unloading at ZDT0002 = 16.67 tons/hr dry material at ZDT002

Equipment ID	Control Device & Removal	SCC Code
Dry Material Silo 072Z	B017 99.9%	surrogate worse case 3-05-011-17 & 3-05 011-07
Dry Material Silo 071Z	B017 99.9%	surrogate worse case 3-05-011-17 & 3-05 011-07
Dry Material Silo 073Z	B017 99.9%	surrogate worse case 3-05-011-17 & 3-05 011-07
Dry Material Silo 076Z	B013 99.0%	3-05-011-17
Weigh Hopper 075Z	B014 98.5%	3-05-011-08
Pre-Mix Blender #1 069Z	B015 95.0%	3-05-011-09
Pre-Mix Blender #2 074Z	B016 95.0%	3-05-011-09
Premix Feed Hopper 052Z	B011 99.0%	3-05-011-09

Emission Factors for SCC Code 3-05-011-17 from SLEIS Factor Table 2017

SCC	Calc Method Code	Pollutant	Pollutant Description	Factor	Unit of Measure Numerator	Unit of Measure Denominator	ASH_IND	SULFUR_IND	Notes
30501117	9	7439965	Manganese	2.56E-07	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7440020	Nickel	2.28E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7440382	Arsenic	1.00E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7440417	Beryllium	9.04E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7440439	Cadmium	1.98E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7440473	Chromium VI*	6.10E-09	LB	TON	0	0	AP-42 Webfire Fabric Filter 99.5% Chromium
30501117	9	7723140	Phosphorus	3.54E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	7782492	Selenium	7.24E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	9	16065831	Chromium III	1.21E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter 99.5% Chromium
30501117	9	PM10-FIL	PM10 Filterable	0.0049	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	29	PM10-FIL	PM10 Filterable	1.1	LB	TON	0	0	AP-42 Webfire
30501117	9	PM-FIL	PM Filterable	0.0089	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501117	29	PM-FIL	PM Filterable	3.14	LB	TON	0	0	AP-42 Webfire

* SLEIS only listed Cr III. Added Cr VI.

Controlled Emission Factor for SCC Code 3-05-011-17 from WebFIRE (not currently listed in SLEIS)

✓ SCC 30501117 Details
Industrial Processes > Mineral Products > Concrete Batching > Cement Supplement Unloading to Elevated Storage Silo
POLLUTANT Lead NEI 7439921 CAS 7439-92-1
Primary Control Secondary Control FABRIC FILTER,
Emission Factor — 5.200E-7 Lb per Tons Material Processed
Quality E Emissions Factors Applicability

Emission Factors for SCC Code 3-05-011-07 from SLEIS Factor Table 2017

SCC	Calc Method Code	Pollutant	Pollutant Description	Factor	Unit of Measure Numerator	Unit of Measure Denominator	ASH_IND	SULFUR_IND	Notes
30501107	9	7439921	Lead	1.09E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7439921	Lead	7.36E-07	LB	TON	0	0	AP-42 Webfire
30501107	9	7439965	Manganese	1.17E-07	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7439965	Manganese	0.000202	LB	TON	0	0	AP-42 Webfire
30501107	9	7440020	Nickel	4.18E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7440020	Nickel	1.76E-06	LB	TON	0	0	AP-42 Webfire
30501107	9	7440382	Arsenic	4.24E-09	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7440382	Arsenic	1.68E-06	LB	TON	0	0	AP-42 Webfire
30501107	9	7440417	Beryllium	4.86E-10	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7440417	Beryllium	1.79E-08	LB	TON	0	0	AP-42 Webfire
30501107	9	7440439	Cadmium	4.86E-10	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	7440439	Cadmium	2.34E-07	LB	TON	0	0	AP-42 Webfire
30501107	29	7723140	Phosphorus	1.18E-05	LB	TON	0	0	AP-42 Webfire
30501107	9	16065831	Chromium III	2.89E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter 99.5% Chromium
30501107	29	16065831	Chromium III	2.51E-07	LB	TON	0	0	AP-42 Webfire 99.5% Chromium
30501107	9	18540299	Chromium (VI)	1.45E-10	LB	TON	0	0	AP-42 Webfire Fabric Filter 0.5% Chromium
30501107	29	18540299	Chromium (VI)	1.26E-09	LB	TON	0	0	AP-42 Webfire 0.5% Chromium
30501107	9	PM10-FIL	PM10 Filterable	0.00034	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	PM10-FIL	PM10 Filterable	0.46	LB	TON	0	0	AP-42 Webfire
30501107	9	PM-FIL	PM Filterable	0.00099	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501107	29	PM-FIL	PM Filterable	0.72	LB	TON	0	0	AP-42 Webfire

The Uncontrolled emission factor for PM and PM10 are largest for SCC 30501117. SCC 30501117 doesn't provide any uncontrolled emission factors for any of the metals. The metals controlled emission factors from SCC 30501117 were all greater than the metals controlled emission factors from SCC 30501107. Therefore, the metals emission factors from SCC 30501117 will be utilized for the surrogate feed.

Emission Factors for Surrogate at 071Z, 072Z, 073Z, and 076Z

SCC	Calc Method Code	Pollutant	ollutant Descriptic	Factor	Unit of Measure Numerator	Unit of Measure Denominator	
30501117	9	7439965	Manganese	2.56E-07	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7440020	Nickel	2.28E-06	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7440382	Arsenic	1.00E-06	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7440417	Beryllium	9.04E-08	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7440439	Cadmium	1.98E-08	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7440473	Chromium VI*	6.10E-09	LB	TON	AP-42 Webfire Fabric Filter 99.5% Chromium
30501117	9	7723140	Phosphorus	3.54E-06	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	7782492	Selenium	7.24E-08	LB	TON	AP-42 Webfire Fabric Filter
30501117	9	16065831	Chromium III	1.21E-06	LB	TON	AP-42 Webfire Fabric Filter 99.5% Chromium
30501117	9	PM10-FIL	PM10 Filterable	0.0049	LB	TON	AP-42 Webfire Fabric Filter
30501117	29	PM10-FIL	PM10 Filterable	1.1	LB	TON	AP-42 Webfire
30501117	9	PM-FIL	PM Filterable	0.0089	LB	TON	AP-42 Webfire Fabric Filter
30501117	29	PM-FIL	PM Filterable	3.14	LB	TON	AP-42 Webfire
30501117	9	7439921	Lead	5.20E-07	LB	TON	Webfire (not currently in SLEIS)

071Z, 072Z, 073Z (ZDT001)				
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Chromium III	6.07E-02	2.66E-01	6.07E-05	2.66E-04
Manganese	1.28E-02	5.61E-02	1.28E-05	5.61E-05
Nickel	1.14E-01	4.99E-01	1.14E-04	4.99E-04
Arsenic	5.00E-02	2.19E-01	5.00E-05	2.19E-04
Beryllium	4.52E-03	1.98E-02	4.52E-06	1.98E-05
Cadmium	9.90E-04	4.34E-03	9.90E-07	4.34E-06
Chromium VI	3.05E-04	1.34E-03	3.05E-07	1.34E-06
Phosphorus	1.77E-01	7.75E-01	1.77E-04	7.75E-04
Selenium	3.62E-03	1.59E-02	3.62E-06	1.59E-05
PM2.5	5.50E+01	2.41E+02	5.50E-02	2.41E-01
PM10	5.50E+01	2.41E+02	5.50E-02	2.41E-01
PM	1.57E+02	6.88E+02	1.57E-01	6.88E-01
Lead	2.60E-02	1.14E-01	2.60E-05	1.14E-04

076Z (ZDT002)				
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Chromium III	2.02E-03	8.86E-03	2.02E-05	8.86E-05
Manganese	4.27E-04	1.87E-03	4.27E-06	1.87E-05
Nickel	3.80E-03	1.66E-02	3.80E-05	1.66E-04
Arsenic	1.67E-03	7.30E-03	1.67E-05	7.30E-05
Beryllium	1.51E-04	6.60E-04	1.51E-06	6.60E-06
Cadmium	3.30E-05	1.45E-04	3.30E-07	1.45E-06
Chromium VI	1.02E-05	4.45E-05	1.02E-07	4.45E-07
Phosphorus	5.90E-03	2.58E-02	5.90E-05	2.58E-04
Selenium	1.21E-04	5.29E-04	1.21E-06	5.29E-06
PM2.5	1.83E+01	8.03E+01	1.83E-01	8.03E-01
PM10	1.83E+01	8.03E+01	1.83E-01	8.03E-01
PM	5.23E+01	2.29E+02	5.23E-01	2.29E+00
Lead	8.67E-04	3.80E-03	8.67E-06	3.80E-05

Individual Emission Rates from each 071Z, 072Z, & 073Z				
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Chromium III	2.02E-02	8.86E-02	2.02E-05	8.86E-05
Manganese	4.27E-03	1.87E-02	4.27E-06	1.87E-05
Nickel	3.80E-02	1.66E-01	3.80E-05	1.66E-04
Arsenic	1.67E-02	7.30E-02	1.67E-05	7.30E-05
Beryllium	1.51E-03	6.60E-03	1.51E-06	6.60E-06
Cadmium	3.30E-04	1.45E-03	3.30E-07	1.45E-06
Chromium VI	1.02E-04	4.45E-04	1.02E-07	4.45E-07
Phosphorus	5.90E-02	2.58E-01	5.90E-05	2.58E-04
Selenium	1.21E-03	5.29E-03	1.21E-06	5.29E-06
PM2.5	1.83E+01	8.03E+01	1.83E-02	8.03E-02
PM10	1.83E+01	8.03E+01	1.83E-02	8.03E-02
PM	5.23E+01	2.29E+02	5.23E-02	2.29E-01
Lead	8.67E-03	3.80E-02	8.67E-06	3.80E-05

Example Calculation:

Manganese Controlled and Uncontrolled at ZDT001 (total emissions from 071Z, 072Z. and 073Z):

(50.01 ton material/hr)(2.56E-07 lb Manganese/ton material) = 1.28E-05 lb Manganese/hr controlled

(1.28E-05 lb Manganese/hr)(8760 hr/yr)(1 ton/2000 lb) = 5.61E-05 ton Manganese/yr controlled

(1.28E-05 lb Manganese/hr)/(1-0.999) = 1.28E-02 lb Manganese/hr uncontrolled

(1.28E-02 lb Manganese/hr)(8760 hr/yr)(1 ton/2000 lb) = 5.61E-02 ton Manganese/yr uncontrolled

PM Controlled at ZDT001 (total emission from 071Z, 072Z and 073Z):

(1.57E+02 lb PM/hr uncontrolled)(1-0.999) = 1.57E-01 lb PM/hr controlled

Emission Factors for SCC Code 3-05-011-08 (075Z)

SCC	Calc Method Code	Pollutant	Pollutant Description	Factor	Unit of Measure Numerator	Unit of Measure Denominator	ASH_IND	SULFUR_IND	Notes
30501108	29	PM10-FIL	PM10 Filterable	2.40E-03	LB	TON	0	0	AP-42 Webfire
30501108	29	PM-FIL	PM Filterable	5.10E-03	LB	TON	0	0	AP-42 Webfire
30501108	uncontrolled		cadmium	5.30E-11	LB	TON			Webfire, not in SLEIS
30501108	uncontrolled		chromium	2.50E-09	LB	TON			Webfire, not in SLEIS
30501108	uncontrolled		chromium VI	7.10E-10	LB	TON			Webfire, not in SLEIS
30501108	uncontrolled		cobalt	3.70E-10	LB	TON			Webfire, not in SLEIS
30501108	uncontrolled		copper	7.20E-09	LB	TON			Webfire, not in SLEIS
30501108	uncontrolled		nickel	1.20E-09	LB	TON			Webfire, not in SLEIS

	075Z			
	Unctontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
PM2.5	9.60E-02	4.20E-01	1.44E-03	6.31E-03
PM10	9.60E-02	4.20E-01	1.44E-03	6.31E-03
PM	2.04E-01	8.94E-01	3.06E-03	1.34E-02
cadmium	2.12E-09	9.29E-09	3.18E-11	1.39E-10
chromium	1.00E-07	4.38E-07	1.50E-09	6.57E-09
chromium VI	2.84E-08	1.24E-07	4.26E-10	1.87E-09
cobalt	1.48E-08	6.48E-08	2.22E-10	9.72E-10
copper	2.88E-07	1.26E-06	4.32E-09	1.89E-08
nickel	4.80E-08	2.10E-07	7.20E-10	3.15E-09

Example Calculation:

PM10 Controlled and Uncontrolled at 075Z:

(40 tons material/hr)(2.4E-03 lb PM10/ton material) = 9.60E-02 lb PM10/hr uncontrolled

(9.60E-02 lb PM10/hr)(8760 hour/yr)(1 ton/2000 lb) = 4.20E-01 ton PM10/yr uncontrolled

(9.60E-02 lb PM10/hr)(1-0.985) = 1.44E-03 lb PM10/hr controlled

(1.44E-03 lb PM10/hr)(8760 hour/yr)(1 ton/2000 lb) = 6.31E-03 ton PM10/yr controlled

Emission Factors for SCC Code 3-05-011-09 (069Z, 074Z, and 052Z) from SLEIS Factor Table 2017

SCC	Calc Method Code	Pollutant	Pollutant Description	Factor	Unit of Measure Numerator	Unit of Measure Denominator	ASH_IND	SULFUR_IND	Notes
30501109	9	7439921	Lead	3.66E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7439921	Lead	3.82E-07	LB	TON	0	0	AP-42 Webfire
30501109	9	7439965	Manganese	3.78E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7439965	Manganese	6.12E-05	LB	TON	0	0	AP-42 Webfire
30501109	9	7440020	Nickel	2.48E-07	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7440020	Nickel	3.28E-06	LB	TON	0	0	AP-42 Webfire
30501109	9	7440382	Arsenic	1.87E-08	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7440382	Arsenic	2.32E-07	LB	TON	0	0	AP-42 Webfire
30501109	9	7440439	Cadmium	7.10E-10	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7440439	Cadmium	1.18E-08	LB	TON	0	0	AP-42 Webfire
30501109	9	7723140	Phosphorus	1.20E-06	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	7723140	Phosphorus	2.02E-05	LB	TON	0	0	AP-42 Webfire
30501109	9	16065831	Chromium III	1.26E-07	LB	TON	0	0	AP-42 Webfire Fabric Filter 99.5% Chromium
30501109	29	16065831	Chromium III	1.41E-06	LB	TON	0	0	AP-42 Webfire 99.5% Chromium
30501109	9	18540299	Chromium (VI)	6.35E-10	LB	TON	0	0	AP-42 Webfire Fabric Filter 0.5% Chromium
30501109	29	18540299	Chromium (VI)	7.10E-09	LB	TON	0	0	AP-42 Webfire 0.5% Chromium
30501109	9	PM10-FIL	PM10 Filterable	0.0038	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	PM10-FIL	PM10 Filterable	0.078	LB	TON	0	0	AP-42 Webfire
30501109	9	PM-FIL	PM Filterable	0.011	LB	TON	0	0	AP-42 Webfire Fabric Filter
30501109	29	PM-FIL	PM Filterable	0.22	LB	TON	0	0	AP-42 Webfire

	069Z			
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Lead	1.53E-05	6.69E-05	7.64E-07	3.35E-06
Manganese	2.45E-03	1.07E-02	1.22E-04	5.36E-04
Nickel	1.31E-04	5.75E-04	6.56E-06	2.87E-05
Arsenic	9.28E-06	4.06E-05	4.64E-07	2.03E-06
Cadmium	4.72E-07	2.07E-06	2.36E-08	1.03E-07
Phosphorus	8.08E-04	3.54E-03	4.04E-05	1.77E-04
Chromium III	5.65E-05	2.48E-04	2.83E-06	1.24E-05
Chromium (VI)	2.84E-07	1.24E-06	1.42E-08	6.22E-08
PM2.5	3.12E+00	1.37E+01	1.56E-01	6.83E-01
PM10	3.12E+00	1.37E+01	1.56E-01	6.83E-01
PM	8.80E+00	3.85E+01	4.40E-01	1.93E+00

	074Z			
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Lead	1.53E-05	6.69E-05	7.64E-07	3.35E-06
Manganese	2.45E-03	1.07E-02	1.22E-04	5.36E-04
Nickel	1.31E-04	5.75E-04	6.56E-06	2.87E-05
Arsenic	9.28E-06	4.06E-05	4.64E-07	2.03E-06
Cadmium	4.72E-07	2.07E-06	2.36E-08	1.03E-07
Phosphorus	8.08E-04	3.54E-03	4.04E-05	1.77E-04
Chromium III	5.65E-05	2.48E-04	2.83E-06	1.24E-05
Chromium (VI)	2.84E-07	1.24E-06	1.42E-08	6.22E-08
PM2.5	3.12E+00	1.37E+01	1.56E-01	6.83E-01
PM10	3.12E+00	1.37E+01	1.56E-01	6.83E-01
PM	8.80E+00	3.85E+01	4.40E-01	1.93E+00

	052Z			
	Uncontrolled		Controlled	
Pollutant	lb/hr	TPY	lb/hr	TPY
Lead	1.53E-05	6.69E-05	1.53E-07	6.69E-07
Manganese	2.45E-03	1.07E-02	2.45E-05	1.07E-04
Nickel	1.31E-04	5.75E-04	1.31E-06	5.75E-06
Arsenic	9.28E-06	4.06E-05	9.28E-08	4.06E-07
Cadmium	4.72E-07	2.07E-06	4.72E-09	2.07E-08
Phosphorus	8.08E-04	3.54E-03	8.08E-06	3.54E-05
Chromium III	5.65E-05	2.48E-04	5.65E-07	2.48E-06
Chromium (VI)	2.84E-07	1.24E-06	2.84E-09	1.24E-08
PM2.5	3.12E+00	1.37E+01	3.12E-02	1.37E-01
PM10	3.12E+00	1.37E+01	3.12E-02	1.37E-01
PM	8.80E+00	3.85E+01	8.80E-02	3.85E-01

Example Calculation:

PM Controlled and Uncontrolled at 074Z:

(40 tons material/hr)(2.2E-01 lb PM/ton material) = 8.8E+00 lb PM/hr uncontrolled

(8.8E+00 lb PM/hr uncontrolled)(8760 hr/yr)(1ton/2000 lb) = 3.85E+01 ton PM/yr uncontrolled

(8.8E+00 lb PM/hr uncontrolled)(1-0.95) = 4.40E-01 lb PM/hr controlled

(4.40E-01 ton PM/hr uncontrolled)(8760 hr/yr)(1ton/2000 lb) = 1.93E+00 ton PM/yr controlled

Salt Feed Tank (091Z), Emission Point ZDP0091

In 2013 the maximum potential emissions from 091Z was calculated using TANKS 4.0 (SRNS-J2210-2013-00050). The following is the TANKS 4.0 Report:

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	091Z	
City:	Aiken	
State:	South Carolina	
Company:	SRR	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	Z-DP0091-0003 210Z Sodium Nitrate Tank	
Tank Dimensions		
Shell Height (ft):		8.90
Diameter (ft):		12.00
Liquid Height (ft) :		8.90
Avg. Liquid Height (ft):		6.00
Volume (gallons):		7,500.00
Turnovers:		693.00
Net Throughput(gal/yr):		5,200,000.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Medium	
Shell Condition	Good	
Roof Color/Shade:	Gray/Medium	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		8.90
Slope (ft/ft) (Cone Roof)		1.48
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Augusta, Georgia (Avg Atmospheric Pressure = 14.69 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

091Z - Vertical Fixed Roof Tank
Aiken, South Carolina

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Sodium Nitrate Mixture	All	72.88	61.33	84.03	66.28	0.3811	0.2443	0.5239	18.4544			23.13	
Ammonia						0.0203	0.0203	0.0203	17.0310	0.0001	0.0000	17.03	Option 1: VP70 = .0203 VP80 = .0203
Benzene						1.6432	1.2115	2.1946	78.1100	0.0002	0.0011	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cesium Nitrate						0.0203	0.0203	0.0203	194.9100	0.0007	0.0000	194.91	Option 1: VP70 = .0203 VP80 = .0203
Chloroform						3.3742	2.5229	4.4398	119.3900	0.0001	0.0012	119.39	Option 2: A=6.493, B=929.44, C=196.03
Methyl ethyl ketone						1.5481	1.1248	2.0849	72.1000	0.0020	0.0107	72.10	Option 2: A=6.8645, B=1150.207, C=209.246
n-Butyl Alcohol						0.0203	0.0203	0.0203	74.1200	0.0001	0.0000	74.12	Option 1: VP70 = .0203 VP80 = .0203
Paraffin						0.0203	0.0203	0.0203	170.0000	0.0002	0.0000	170.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium						0.0203	0.0203	0.0203	22.9900	0.0020	0.0001	22.99	Option 1: VP70 = .0203 VP80 = .0203
Sodium Carbonate						0.0203	0.0203	0.0203	105.9900	0.0100	0.0007	105.99	Option 1: VP70 = .0203 VP80 = .0203
Sodium Chloride						0.0203	0.0203	0.0203	58.4400	0.0010	0.0001	58.44	Option 1: VP70 = .0203 VP80 = .0203
Sodium Flouride						0.0203	0.0203	0.0203	41.9900	0.0010	0.0001	41.99	Option 1: VP70 = .0203 VP80 = .0203
Sodium Hydroxide (caustic soda)						0.0000	0.0000	0.0000	40.0000	0.0590	0.0000	40.00	Option 2: A=7.466, B=7808.44, C=280.18
Sodium Nitrate						0.0203	0.0203	0.0203	84.9970	0.1820	0.0114	85.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Nitrite						0.0203	0.0203	0.0203	68.9950	0.0410	0.0029	69.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Oxalate						0.0203	0.0203	0.0203	134.0000	0.0010	0.0001	134.00	Option 1: VP70 = .0203 VP80 = .0203
Sodium Sulfate						0.0203	0.0203	0.0203	142.0400	0.0180	0.0013	142.04	Option 1: VP70 = .0203 VP80 = .0203
Tetrachloroethylene						0.3095	0.2182	0.4350	165.8300	0.0001	0.0001	165.83	Option 2: A=6.98, B=1386.92, C=217.53
Tributyl Phosphate						0.0203	0.0203	0.0203	266.3100	0.0003	0.0000	266.31	Option 1: VP70 = .0203 VP80 = .0203
Trichloroethylene						1.1839	0.8527	1.8141	131.4000	0.0001	0.0004	131.40	Option 2: A=6.518, B=1018.6, C=192.7
Trisodium Phosphate						0.0203	0.0203	0.0203	163.9400	0.0010	0.0001	163.94	Option 1: VP70 = .0203 VP80 = .0203
Vinyl Chloride						0.0203	0.0203	0.0203	62.4980	0.0001	0.0000	62.50	Option 1: VP70 = .0203 VP80 = .0203
Water						0.3090	0.2895	0.5798	18.0200	0.7300	0.9898	18.02	Option 2: A=8.056, B=1723.64, C=233.08

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

091Z - Vertical Fixed Roof Tank
Aiken, South Carolina

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Sodium Nitrate Mixture	173.21	25.55	198.76
Sodium Nitrate	1.98	0.29	2.27
Sodium Hydroxide (caustic soda)	0.00	0.00	0.00
Sodium Nitrite	0.50	0.07	0.57
Sodium Carbonate	0.12	0.02	0.14
Sodium	0.02	0.00	0.03
Methyl ethyl ketone	1.86	0.27	2.14
Sodium Oxalate	0.01	0.00	0.01
Sodium Chloride	0.01	0.00	0.01
Trisodium Phosphate	0.01	0.00	0.01
Cesium Nitrate	0.01	0.00	0.01
Tributyl Phospate	0.00	0.00	0.00
Paraffin	0.00	0.00	0.00
Benzene	0.20	0.03	0.23
Trichloroethylene	0.07	0.01	0.08
Chloroform	0.20	0.03	0.23
Tetrachloroethylene	0.02	0.00	0.02
Ammonia	0.00	0.00	0.00
n-Butyl Alcohol	0.00	0.00	0.00
Sodium Sulfate	0.22	0.03	0.25
Sodium Flouride	0.01	0.00	0.01
Water	167.94	24.78	192.72
Vinyl Chloride	0.00	0.00	0.00

TANKS 4.0 Report

Page 4 of 4

Note the page 4 of 4 of the TANKS 4.0 Report is void of any information/data.

The following table summarizes the maximum potential controlled and uncontrolled emissions from 091Z emitted to ZDP0091.

	lb/year	TPY	lb/hr
Sodim Nitrate	2.27	1.14E-03	2.59E-04
Sodium Nitrite	0.57	2.85E-04	6.51E-05
Sodium Carbonate	0.14	7.00E-05	1.60E-05
Sodium	0.03	1.50E-05	3.42E-06
Methyl Ethyl Ketone	2.14	1.07E-03	2.44E-04
Sodium Oxalate	0.01	5.00E-06	1.14E-06
Sodium Chloride	0.01	5.00E-06	1.14E-06
Trisodium Phosphate	0.01	5.00E-06	1.14E-06
Cesium Nitrate	0.01	5.00E-06	1.14E-06
Benzene	0.23	1.15E-04	2.63E-05
Trichloroethylene	0.08	4.00E-05	9.13E-06
Chloroform	0.23	1.15E-04	2.63E-05
Tetrachloroethylene	0.02	1.00E-05	2.28E-06
Sodium Sulfate	0.25	1.25E-04	2.85E-05
Sodium Flouride	0.01	5.00E-06	1.14E-06
Water	192.72	9.64E-02	2.20E-02
PM	3.31	1.66E-03	3.78E-04
PM10	3.31	1.66E-03	3.78E-04
PM2.5	3.31	1.66E-03	3.78E-04
VOC	2.68	1.34E-03	3.06E-04

Trace Determination

Based on October 2018 SCDHEC Air Quality Modeling Guidelines for Air Quality Permits (https://www.scdhec.gov/sites/default/files/media/document/Air-Modeling-Guidelines-2018.10.15.pdf), a trace determination was made for the non-criteria pollutants emitted from the saltstone process emission points. The following tables document the trace determinations.

	ZDT1		
	lb/hr controlled		
Pollutant	071, 072Z & 073	wt %	Trace?
Lead	2.60E-05	NA	NA
Manganese	1.28E-05	0.01	yes
Nickel	1.14E-04	0.07	yes
Arsenic	5.00E-05	0.03	yes
Berrylium	4.52E-06	0.00	yes
Cadmium	9.90E-07	0.00	yes
Phosphorus	1.77E-04	0.11	yes
Chromium III	6.07E-05	0.04	yes
Chromium (VI)	3.05E-07	0.00	yes
Selenium	3.62E-06	0.00	yes
PM2.5	5.50E-02	NA	NA
PM10	5.50E-02	NA	NA
PM	1.57E-01	NA	NA

phosphorus is not a carcinogen

	ZDT2		
	lb/hr controlled		
Pollutant	076Z	wt%	Trace?
Chromium III	2.02E-05	0.00	yes
Manganese	4.27E-06	0.00	yes
Nickel	3.80E-05	0.01	yes
Arsenic	1.67E-05	0.00	yes
Beryllium	1.51E-06	0.00	yes
Cadmium	3.30E-07	0.00	yes
Chromium VI	1.02E-07	0.00	yes
Phosphorus	5.90E-05	0.01	yes
Selenium	1.21E-06	0.00	yes
PM2.5	1.83E-01	NA	NA
PM10	1.83E-01	NA	NA
PM	5.23E-01	NA	NA
Lead	8.67E-06	NA	NA

ZDP72			
	lb/hr controlled		
Pollutant	075Z	wt%	Trace?
PM2.5	1.44E-03	NA	NA
PM10	1.44E-03	NA	NA
PM	3.06E-03	NA	NA
cadmium	3.18E-11	0.00	yes
chromium	1.50E-09	0.00	yes
chromium VI	4.26E-10	0.00	yes
cobalt	2.22E-10	0.00	yes
copper	4.32E-09	0.00	yes
nickel	7.20E-10	0.00	yes

ZDP88			
	lb/hr controlled		
Pollutant	069Z	wt%	Trace?
Lead	7.64E-07	NA	NA
Manganese	1.22E-04	0.03	yes
Nickel	6.56E-06	0.00	yes
Arsenic	4.64E-07	0.00	yes
Cadmium	2.36E-08	0.00	yes
Phosphorus	4.04E-05	0.01	yes
Chromium III	2.83E-06	0.00	yes
Chromium (VI)	1.42E-08	0.00	yes
PM2.5	1.56E-01	NA	NA
PM10	1.56E-01	NA	NA
PM	4.40E-01	NA	NA

ZDP89			
	lb/hr controlled		
Pollutant	074Z	wt%	Trace?
Lead	7.64E-07	NA	NA
Manganese	1.22E-04	0.03	yes
Nickel	6.56E-06	0.00	yes
Arsenic	4.64E-07	0.00	yes
Cadmium	2.36E-08	0.00	yes
Phosphorus	4.04E-05	0.01	yes
Chromium III	2.83E-06	0.00	yes
Chromium (VI)	1.42E-08	0.00	yes
PM2.5	1.56E-01	NA	NA
PM10	1.56E-01	NA	NA
PM	4.40E-01	NA	NA

ZDP71			
lb/hr controlled			
Pollutant	052Z	wt%	Trace?
Lead	1.53E-07	NA	NA
Manganese	2.45E-05	0.03	yes
Nickel	1.31E-06	0.00	yes
Arsenic	9.28E-08	0.00	yes
Cadmium	4.72E-09	0.00	yes
Phosphorus	8.08E-06	0.01	yes
Chromium III	5.65E-07	0.00	yes
Chromium (VI)	2.84E-09	0.00	yes
PM2.5	3.12E-02	NA	NA
PM10	3.12E-02	NA	NA
PM	8.80E-02	NA	NA

ZDP91

	lb/year	TPY	lb/hr	wt%
Sodim Nitrate	2.27	1.14E-03	2.59E-04	NA
Sodium Nitrite	0.57	2.85E-04	6.51E-05	NA
Sodium Carbonate	0.14	7.00E-05	1.60E-05	NA
Sodium	0.03	1.50E-05	3.42E-06	NA
Methyl Ethyl Ketone	2.14	1.07E-03	2.44E-04	35.73
Sodium Oxalate	0.01	5.00E-06	1.14E-06	NA
Sodium Chloride	0.01	5.00E-06	1.14E-06	NA
Trisodium Phosphate	0.01	5.00E-06	1.14E-06	NA
Cesium Nitrate	0.01	5.00E-06	1.14E-06	NA
Benzene	0.23	1.15E-04	2.63E-05	3.84
Trichloroethylene	0.08	4.00E-05	9.13E-06	1.34
Chloroform	0.23	1.15E-04	2.63E-05	3.84
Tetrachloroethylene	0.02	1.00E-05	2.28E-06	0.33
Sodium Sulfate	0.25	1.25E-04	2.85E-05	NA
Sodium Flouride	0.01	5.00E-06	1.14E-06	NA
Water	192.72	9.64E-02	2.20E-02	NA
PM	3.31	1.66E-03	3.78E-04	NA
PM10	3.31	1.66E-03	3.78E-04	NA
PM2.5	3.31	1.66E-03	3.78E-04	NA
VOC	2.68	1.34E-03	3.06E-04	NA

Note: There is no de minimis for lead, PM, or PM10.

Example Calculation:

Manganese at ZDP89 (074Z):

((1.22E-04 lb Manganese/hr)/(4.40E-01 total PM)(100)) = 0.03%

This value is below 0.1% therefore it is a trace emission and will not be included in the site modeling demonstration. Note that all of the individual pollutants are emitted as particulate matter.

R 61-62.5, Standard No. 4, Section VIII Particulate Matter Emissions

$$E = (F)(55.0\,P^{0.11} - 40)$$

Where: E = the allowable emission rate in pounds per hour
P = process weight rate in tons per hour
F = effect factor from Table B

E=(1)(55.0*35tons/hr^0.11-40) = 41.3 lb/hr PM

Kim A. Wolfe 12/11/2019

Calculation Performed by and date

Keith Liner 12/12/19

Calculation Reviewed by and date

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Facility Wide Total Emissions – Form F
Bureau of Air Quality

FACILITY WIDE TOTAL EMISSIONS			
1. Pollutant	2. CAS No. (If Applicable)	3. Uncontrolled Emissions (TPY)	4. Controlled Emissions (TPY)
STANDARD 2 (CRITERIA) POLLUTANTS			
CO	630-08-0	6.59E+02	6.59E+02
Nitrogen Dioxide (NO2)	10102-44-0	8.50E+02	6.83E+02
NOx	NA	9.72E+02	8.05E+02
Pb	7439-92-1	3.57E-01	2.39E-01
PM	NA	2.73E+03	2.75E+02
PM10	NA	2.04E+03	2.68E+02
PM2.5	NA	2.01E+03	2.46E+02
SO2	7446-09-5	2.80E+03	5.61E+02
VOC	NA	1.98E+02	1.98E+02
STANDARD 8 (TOXIC AND HAZARDOUS) POLLUTANTS			
1,1,1-Trichloroethane (Methy	71-55-6	1.25E-01	1.25E-01
1,1-dichloroethylene (vinyli	75-35-4	1.33E-02	1.33E-02
1,4-Dioxane	123-91-1	4.51E-02	4.51E-02
Acetaldehyde	75-07-0	4.02E-01	4.02E-01
Acrylonitrile	107-13-1	2.60E-10	2.60E-10
Antimony Compounds	NA	1.82E-02	1.82E-02
Benzene	71-43-2	4.64E+00	4.64E+00
Carbon Disulfide	75-15-0	1.42E-05	1.42E-05
Carbon Tetrachloride	56-23-5	2.50E-01	2.50E-01
Chlorine	7782-50-5	2.25E+00	2.25E+00
Chloroform	67-66-3	6.91E-02	6.91E-02
Chromium Compounds	NA	3.31E-01	3.31E-01
Cumene	98-82-8	1.72E-02	1.72E-02
Ethylbenzene	100-41-4	3.87E-01	3.87E-01
Formaldehyde	75-12-7	3.64E+00	3.64E+00
Formic Acid	64-18-6	1.78E-01	1.40E-01
Hexane	110-54-3	2.08E-01	2.08E-01
Hydrochloric Acid	7647-01-0	2.85E+01	1.36E+01
Hydrogen Cyanide	74-90-8	1.07E-02	1.07E-02
Hydrogen Sulfide	7783-06-4	2.96E-04	2.96E-04
Lead Compounds	NA	6.71E-05	6.71E-05
Manganese Compounds	NA	1.79E+00	1.79E+00
Mercury	7439-97-6	1.79E-01	1.79E-01
Methanol	67-56-1	9.42E-01	9.42E-01

Methyl Ethyl Ketone	78-93-3	6.22E-03	6.22E-03
Methyl Isobutyl Ketone	108-10-1	1.58E-02	1.58E-02
Methylene Chloride (Dichloro	75-09-2	6.77E-01	6.77E-01
Nickel Compounds	NA	1.77E-01	1.77E-01
Nickel Oxide	1313-99-1	1.53E-04	1.53E-04
Nickel	7440-02-0	2.11E-01	2.11E-01
Nitric Acid	7697-37-2	1.67E+02	1.67E+02
Oxalic Acid	144-62-7	1.05E-01	1.05E-01
Sodium Hydroxide	1310-73-2	1.19E+00	1.19E+00
Styrene	100-42-5	1.41E+00	1.41E+00
Tetrachloroethylene (Perchl	127-18-4	4.96E+01	4.96E+01
Toluene	108-88-3	3.59E+00	3.59E+00
Trichloroethylene	79-01-6	1.85E+01	1.85E+01
Vinyl Chloride	75-01-4	4.65E-02	4.65E-02
Xylene (m-)	108-38-3	2.47E+00	2.47E+00
Xylene (o-)	95-47-6	6.57E-02	6.57E-02
Xylenes	1330-20-7	1.78E-02	1.78E-02
Acenaphthene (POM)	83-32-9	2.09E-03	2.09E-03
Acenaphthylene (POM)	208-96-8	1.15E-02	1.15E-02
Acetophenone	98-86-2	7.37E-06	7.37E-06
Acrolein	107-02-8	3.87E+00	3.87E+00
Anthracene (POM)	120-12-7	6.91E-03	6.91E-03
Benzo(a)anthracene (POM, PAH)	56-55-3	1.50E-04	1.50E-04
Benzo(a)pyrene (POM, PAH)	50-32-8	5.99E-03	5.99E-03
Benzo(b)fluoranthene (POM, PAH)	205-99-2	2.30E-04	2.30E-04
Benzo(b,k)fluoranthene (POM, PAH)	207-08-9	1.92E-05	1.92E-05
Benzo(e)pyrene	192-97-2	5.99E-06	5.99E-06
Benzo(g,h,i)perylene (POM)	191-24-2	2.14E-04	2.14E-04
Benzo(j,k)fluoranthene	205-82-3	3.68E-04	3.68E-04
Benzo(k)fluoranthene (POM)	207-08-9	8.29E-05	8.29E-05
Bis(2-Ethylhexyl)phthalate (DEHP)	117-91-7	1.08E-04	1.08E-04
Bromomethane (methyl bromide)	74-83-9	3.45E-02	3.45E-02
Chlorobenzene	108-90-7	7.60E-02	7.60E-02
Chloromethane (Methyl chloride)	74-87-3	5.30E-02	5.30E-02
Chrysene (POM)	218-01-9	8.75E-05	8.75E-05
Dibenzo(a,h)anthracene (POM)	53-70-3	2.74E-05	2.74E-05
1,2-Dichloroethane (Ethylene dichloride)	107-06-2	6.68E-02	6.68E-02
1,2-Dichloropropane (Propylene dichloride)	78-87-5	7.60E-02	7.60E-02

2,4-Dinitrophenol	51-28-5	4.14E-04	4.14E-04
Fluoranthene (POM)	206-44-0	3.68E-03	3.68E-03
Fluorene (POM)	86-73-7	7.83E-03	7.83E-03
Heptachlorodibenzo-p-dioxins	37871-00-4	4.60E-06	4.60E-06
Heptachlorodibenzo-p-furans	38998-75-3	5.53E-07	5.53E-07
Hexachlorodibenzo-p-dioxins	34465-46-8	3.68E-03	3.68E-03
Hexachlorodibenzo-p-furans	55684-94-1	6.45E-07	6.45E-07
Octachlorodibenzo-p-dioxins	114423-97-1	1.52E-04	1.52E-04
Octachlorodibenzo-p-furans	39001-02-0	2.03E-07	2.03E-07
Pentachlorodibenzo-p-dioxins	36088-22-9	3.45E-06	3.45E-06
Pentachlorodibenzo-p-furans	30402-15-4	9.67E-07	9.67E-07
2,3,7,8-Tetrachlorodibenzo-p-furans	51207-31-9	2.07E-07	2.07E-07
Tetrachlorodibenzo-p-furans	30402-14-3	1.73E-06	1.73E-06
Indeno(1,2,3,c,d)pyrene (POM, PAH)	193-39-5	2.00E-04	2.00E-04
Naphthalene	81-20-3	2.23E-01	2.23E-01
4-Nitrophenol	100-02-7	2.53E-04	2.53E-04
Pentachlorophenol	87-86-5	1.17E-04	1.17E-04
Phenanthrene (POM)	85-01-8	1.61E-02	1.61E-02
Phenol	108-95-2	1.17E-01	1.17E-01
PCB (Polychlorinated Biphenyls)	NA	1.88E-05	1.88E-05
POM (Polycyclic Organic Matter)	NA	2.88E-01	2.88E-01
Propionaldehyde	123-38-6	1.40E-01	1.40E-01
Pyrene (POM)	129-00-0	8.52E-03	8.52E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxins	1746-01-6	3.98E-09	3.98E-09
Tetrachlorodibenzo-p-dioxins	41903-57-5	2.17E-07	2.17E-07
2,4,6-Trichlorophenol	88-06-2	5.06E-05	5.06E-05
Arsenic	7440-38-2	2.86E-02	2.86E-02
Beryllium	7440-41-7	6.64E-03	6.64E-03
Cadmium	7440-43-9	3.89E-02	3.89E-02
Chromium	7440-47-3	2.81E-02	2.81E-02
Chromium (Hex)	18540-29-9	8.06E-03	8.06E-03
Cobalt	7440-48-4	1.50E-02	1.50E-02
Manganese	7439-96-5	1.02E+00	1.02E+00
Phosphorus	7723-14-0	6.22E-02	6.22E-02
Selenium	7782-49-2	3.32E-02	3.32E-02
Total HAP/TAP		2.95E+02	2.80E+02
REGULATED POLLUTANTS			
CO2 EQUIVALENTS	NA	5.87E+05	5.87E+05

DHEC

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

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	EXTERNAL COMBUSTION INSIGNIFICANT ACTIVITIES					
014N	FUEL OIL HEATER #1 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
002N	FUEL OIL HEATER #10 (315000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
013N	FUEL OIL HEATER #11 (285000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
227N	FUEL OIL HEATER #12 (315000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH13	FUEL OIL HEATER #13 (285000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH14	FUEL OIL HEATER #14 (315000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
104N	FUEL OIL HEATER #15 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH16	FUEL OIL HEATER #16 (285000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
066N	FUEL OIL HEATER #17 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH18	FUEL OIL HEATER #18 (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
078N	FUEL OIL HEATER #19 (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
016N	FUEL OIL HEATER #2 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)

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SH20	FUEL OIL HEATER #20 (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
109N	FUEL OIL HEATER #28 (118000 BTU/HR)	1/1/1988	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
098N	FUEL OIL HEATER #29 (118000 BTU/HR)	1/1/1988	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH03	FUEL OIL HEATER #3 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
092N	FUEL OIL HEATER #30 (118000 BTU/HR)	1/1/1988	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
237N	FUEL OIL HEATER #31 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
322N	FUEL OIL HEATER #32 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
323N	FUEL OIL HEATER #33 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH04	FUEL OIL HEATER #4 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
204N	FUEL OIL HEATER #42 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
250N	FUEL OIL HEATER #43 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
201N	FUEL OIL HEATER #44 (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)

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259N	FUEL OIL HEATER #45 (285000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
200N	FUEL OIL HEATER #46 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
166N	FUEL OIL HEATER #47 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
330N	FUEL OIL HEATER #48. (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
297N	FUEL OIL HEATER #49 (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH05	FUEL OIL HEATER #5 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
293N	FUEL OIL HEATER #50. (252000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
275N	FUEL OIL HEATER #51 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH52	FUEL OIL HEATER #52 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
269N	FUEL OIL HEATER #53 (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
343N	FUEL OIL HEATER #54 (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
345N	FUEL OIL HEATER #55. (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)

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346N	FUEL OIL HEATER #56 (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
348N	FUEL OIL HEATER #57. (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, , VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
261N	FUEL OIL HEATER #58 (118000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH06	FUEL OIL HEATER #6 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
093N	FUEL OIL HEATER #61 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
047N	FUEL OIL HEATER #62 (280000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
046N	FUEL OIL HEATER #63 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
039N	FUEL OIL HEATER #64 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
064N	FUEL OIL HEATER #65 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
059N	FUEL OIL HEATER #66 (250000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
056N	FUEL OIL HEATER #69 (280000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
SH07	FUEL OIL HEATER #7 (230000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)

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023N	FUEL OIL HEATER #8 (225000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
019N	FUEL OIL HEATER #9 (280000 BTU/HR)	5/1/1983	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
003N	STEAM JENNY 01 (350000 BTU/HR)	1/1/2002	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
30EN	STEAM JENNY 02 (640000 BTU/HR)	06/2016	Y. B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
160B	735-1B LABORATORY SERVICE WATER HEATER (199000 BTU/HR)	09/2017	Y, B.1	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	Less Than 1.5E+06Btu/hr (1.5mmBtu/hr)
	FIXED ROOF TANKS INSIGNIFICANT ACTIVITIES					
58FH	DIESEL FUEL TANK (1700 GALLONS)	10/2002	Y (B.7)	VOC, HAPs	NA	Stores organic liquid and less than 10,000gallons
020S	ORGANIC WASTE/NEUT TANK #2 (3150 GALLONS)	5/1/1986	N	PTE_VOC (ton/yr)	4.18E-03	Less Than 5 TPY
				PTE_formic acid (ton/yr)	4.18E-03	Less than 1000 lb/month
022F	CAUSTIC TANK (2760 GALLONS)	1/1/1978	N	PTE_PM (ton/yr)	3.15E-04	Less Than 5 TPY
				PTE_PM10 (ton/yr)	3.15E-04	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	3.15E-04	Less Than 5 TPY
025B	12,000 GAL. DBL. WALL UNDERGROUND TANK (12000 GALLONS)	6/1/1984	N	PTE_VOC (ton/yr)	4.23E-02	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.90E-04	Less than 1000 lb/month

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				PTE_Ethylbenzene (ton/yr)	8.70E-04	Less than 1000 lb/month
				PTE_Hexane (ton/yr)	5.90E-04	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.75E-03	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	1.77E-03	Less than 1000 lb/month
03KF	COLD CHEMICAL STORAGE. 50% NITRIC ACID TANK. (300 GALLONS)	7/1/2012	N	PTE_nitric acid (ton/yr)	1.69E-03	Less than 1000 lb/month
079S	ORGANIC WASTE/NEUT TANK #1 (3150 GALLONS)	5/1/1992	N	PTE_VOC (ton/yr)	4.20E-03	Less Than 5 TPY
				PTE_formic acid (ton/yr)	4.20E-03	Less than 1000 lb/month
138S	UNDERGROUND DIESEL TANK (15000 GALLONS)	1/1/1985	N	PTE_VOC (ton/yr)	7.77E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.50E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	1.80E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	4.50E-04	Less than 1000 lb/month
192S	8% NITRIC ACID MIX DAY TANK (375 GALLONS)	5/1/1986	N	PTE_nitric acid (ton/yr)	4.15E-02	Less than 1000 lb/month
239S	UNDERGROUND DIESEL TANK (15000 GALLONS)	1/1/1985	N	PTE_VOC (ton/yr)	7.77E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.50E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	1.80E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	4.50E-04	Less than 1000 lb/month

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286S	POTASSIUM NITRATE MAKE-UP TANK, 160 GAL (160 GALLONS)	10/1/1986	N	PTE_PM (ton/yr)	5.00E-06	Less Than 5 TPY
				PTE_PM10 (ton/yr)	5.00E-06	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	5.00E-06	Less Than 5 TPY
288S	CATALYST MAKE-UP TANK (550 GALLONS)	10/1/1986	N	PTE_PM (ton/yr)	4.50E-05	Less Than 5 TPY
				PTE_PM10 (ton/yr)	4.50E-05	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	4.50E-05	Less Than 5 TPY
289S	SODIUM NITRITE MAKE-UP TANK, 540 GAL (540 GALLONS)	10/1/1986	N	PTE_PM (ton/yr)	8.50E-05	Less Than 5 TPY
				PTE_PM10 (ton/yr)	8.50E-05	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.50E-05	Less Than 5 TPY
291S	NITRIC ACID DECON MAKE-UP TANK, 1300 GAL (1300 GALLONS)	10/1/1986	N	PTE_nitric acid (ton/yr)	1.85E-03	Less than 1000 lb/month
298S	FORMIC ACID STORAGE TANK #2, 6500 GAL (6500 GALLONS)	8/1/1986	N	PTE_VOC (ton/yr)	4.96E-02	Less Than 5 TPY
				PTE_formic acid (ton/yr)	4.96E-02	Less than 1000 lb/month
31BH	CHEMICAL ADDITION TANK (150 GALLONS)	1/1/1995	N	PTE_nitric acid (ton/yr)	1.68E-03	Less than 1000 lb/month
				PTE_Oxalic Acid (ton/yr)	1.90E-04	Less than 1000 lb/month
				PTE_PM (ton/yr)	1.90E-04	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.90E-04	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.90E-04	Less Than 5 TPY

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335S	NITRIC ACID WASTE HOLD TANK (2100 GALLONS)	5/1/1986	N	PTE_nitric acid (ton/yr)	5.48E-02	Less than 1000 lb/month
374S	FORMIC ACID STORAGE TANK #1, 6500 GAL (6500 GALLONS)	8/1/1985	N	PTE_VOC (ton/yr)	6.42E-02	Less Than 5 TPY
				PTE_formic acid (ton/yr)	6.42E-02	Less than 1000 lb/month
40DH	HB LINE SCRAP RECOVERY CFP (133 GALLONS)	1/1/1983	N	PTE_nitric acid (ton/yr)	1.82E-03	Less than 1000 lb/month
415H	241-32H COLD FEEDS AREA - OXALIC ACID STORAGE TANK (5700 GALLONS)	6/1/1985	N	PTE_Oxalic Acid (ton/yr)	1.29E-02	Less than 1000 lb/month
				PTE_PM (ton/yr)	1.29E-02	Less than 0.5 TPY
				PTE_PM10 (ton/yr)	1.29E-02	Less than 0.5 TPY
				PTE_PM2.5 (ton/yr)	1.29E-02	Less than 0.5 TPY
417H	241-32H COLD FEEDS AREA - NAOH STORAGE TANK (10000 GALLONS)	6/1/1985	N	PTE_PM (ton/yr)	1.59E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.59E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.59E-03	Less Than 5 TPY
418H	241-32H COLD FEEDS AREA - NAOH WASHWATER TANK (7200 GALLONS)	6/1/1985	N	PTE_nitric acid (ton/yr)	8.00E-04	Less than 1000 lb/month
41DH	HB LINE NP/PU OXIDE CFP (528 GALLONS)	1/1/1985	N	PTE_nitric acid (ton/yr)	1.38E-02	Less than 1000 lb/month
42GH	NITRIC STRIP FEED TANK (4900 GALLONS)	1/1/2006	N	PTE_nitric acid (ton/yr)	3.00E-05	Less than 1000 lb/month
489H	SODIUM NITRATE MIX TANK (15.5% SOLUTION) - 241-54H (4000 GALLONS)	1/1/1988	N	PTE_PM (ton/yr)	3.57E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	3.57E-03	Less Than 5 TPY

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				PTE_PM2.5 (ton/yr)	3.57E-03	Less Than 5 TPY
490H	HNO3 DAY TANK 241-54H (12600 GALLONS)	1/1/1988	N	PTE_nitric acid (ton/yr)	2.66E-01	Less than 1000 lb/month
50FH	MERCURY REMOVAL TANK (562 GALLONS)	1/1/1994	N	PTE_VOC (ton/yr)	1.00E-05	Less Than 5 TPY
563H	REVERSE OSMOSIS CLEAN SOLUTION TANK (R/O-TK-4) (374 GALLONS)	1/1/1988	N	PTE_nitric acid (ton/yr)	9.22E-03	Less than 1000 lb/month
				PTE_Oxalic Acid (ton/yr)	2.10E-03	Less than 1000 lb/month
				PTE_PM (ton/yr)	2.10E-03	Less than 0.5 TPY
				PTE_PM10 (ton/yr)	2.10E-03	Less than 0.5 TPY
				PTE_PM2.5 (ton/yr)	2.10E-03	Less than 0.5 TPY
583H	FILTER CLEANING TANK (FT-TK-2) (2434 GALLONS)	1/1/1988	N	PTE_Oxalic Acid (ton/yr)	7.53E-02	Less than 1000 lb/month
				PTE_PM (ton/yr)	7.53E-02	Less than 0.5 TPY
				PTE_PM10 (ton/yr)	7.53E-02	Less than 0.5 TPY
				PTE_PM2.5 (ton/yr)	7.53E-02	Less than 0.5 TPY
77BH	ANTI-FOAM TANK (20 GALLONS)	1/1/1978	N	PTE_Toluene (ton/yr)	5.00E-06	Less than 1000 lb/month
				PTE_VOC (ton/yr)	5.00E-06	Less Than 5 TPY
28EN	DIESEL EXHAUST FLUID TANK ADJACENT TO 715-N (750 GAL)	10/2015	Y (B.7)	VOCs	NA	Stores Organic Liquids and Less than 10,000 Gallons
126Z	SALT SOLUTION RECEIPT TANK (SSRT-1)(60,000 GAL)	07/2016	N	PTE_nitric acid (ton/yr)	4.56E-02	Less than 1000 lb/month
127Z	SALT SOLUTION RECEIPT TANK (SSRT-2)(60,000 GAL)	07/2016	N	PTE_nitric acid (ton/yr)	4.56E-02	Less than 1000 lb/month

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11KF	DIESEL FUEL TANK (20,000 GAL)	08/2016	N	PTE_VOC (ton/yr)	1.83E-02	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.08E-03	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	4.05E-04	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	8.42E-03	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	6.04E-03	Less than 1000 lb/month
12KF	DIESEL FUEL TANK (20,000 GAL)	08/2016	N	PTE_VOC (ton/yr)	1.83E-02	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.08E-03	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	4.05E-04	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	8.42E-03	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	6.04E-03	Less than 1000 lb/month
357G	HUMATE INJECTION PILOT TEST TANKS AND VALVE (2 BATCH TANKS EACH 4, 995 GAL AND 1 MIXING TANK 550 GAL)	01/2017	N	PTE_VOC (ton/yr)	1.55E+00	Less Than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	3.32E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.55E+00	Less than 1000 lb/month
				PTE_PM (ton/yr)	3.01E-05	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.76E-05	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.76E-05	Less Than 5 TPY

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	HORIZONTAL TANK INSIGNIFICANT ACTIVITIES					
596A	DIESEL FUEL TANK - STORAGE TANK (5000 GALLONS)	1/1/1992	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
545A	UNDERGROUND DIESEL FUEL TANK (5000 GALLONS)	12/1/1989	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
547A	UNDERGROUND GASOLINE TANK # 1 (5000 GALLONS)	2/1/1990	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
549A	UNDERGROUND GASOLINE TANK # 2 (5000 GALLONS)	2/1/1990	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
168G	DIESEL FUEL TANK (1000 GALLONS)	1/1/1994	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
163K	UNDERGROUND GASOLINE FUEL TANK (5000 GALLONS)	8/1/1989	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
125L	UNDERGROUND GASOLINE FUEL TANK (5000 GALLONS)	5/1/1989	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
165G	UNDERGROUND DIESEL FUEL TANK # 2 (2000 GALLONS)	2/1/1995	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
191G	UNDERGROUND GASOLINE FUEL TANK # 1 (2000 GALLONS)	2/1/1995	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
042Z	DIESEL FUEL STORAGE TANK (1500 GALLONS)	6/1/1986	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
95BN	FUEL OIL STORAGE TANK (2000 GALLONS)	4/1/1995	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons

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540N	FUEL OIL STORAGE TANK (2000 GALLONS)	4/1/1995	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
543N	FUEL OIL STORAGE TANK (1000 GALLONS)	4/1/1995	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
98JF	3500 GALLON DIESEL FUEL TANK (3500 GALLONS)	10/1/2011	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
48FA	A-AREA E-85 ETHANOL TANK (10000 GALLONS)	10/1/1999	N	PTE_VOC (ton/yr)	1.34E+00	Less Than 5 TPY
				PTE_Benzene (ton/yr)	7.21E-03	Less than 1000 lb/month
70GA	FUEL OIL TANK, 25K GALLON (25000 GALLONS)	10/1/2007	N	PTE_VOC (ton/yr)	3.32E-02	Less Than 5 TPY
				PTE_Benzene (ton/yr)	6.50E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	1.05E-04	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	7.65E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	1.93E-03	Less than 1000 lb/month
022G	UNDERGROUND GASOLINE FUEL TANK # 1 (10000 GALLONS)	4/1/1984	N	PTE_VOC (ton/yr)	3.87E+00	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.48E-02	Less than 1000 lb/month
139G	UNDERGROUND GASOLINE FUEL TANK (10000 GALLONS)	1/1/1989	N	PTE_VOC (ton/yr)	3.87E+00	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.48E-02	Less than 1000 lb/month
305G	H-AREA E-85 ETHANOL TANK (10000 GALLONS)	10/1/1999	N	PTE_VOC (ton/yr)	1.36E+00	Less Than 5 TPY
				PTE_Benzene (ton/yr)	7.31E-03	Less than 1000 lb/month

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547N	DIESEL STORAGE TANK (10000 GALLONS)	2/1/1995	N	PTE_VOC (ton/yr)	5.99E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.00E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.00E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	1.40E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	3.50E-04	Less than 1000 lb/month
545N	DIESEL STORAGE TANK (10000 GALLONS)	2/1/1995	N	PTE_VOC (ton/yr)	5.99E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.00E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.00E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	1.40E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	3.50E-04	Less than 1000 lb/month
16CN	GASOLINE STORAGE TANK (10000 GALLONS)	2/1/1995	N	PTE_VOC (ton/yr)	2.33E+00	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.52E-02	Less than 1000 lb/month
080N	UNDERGROUND DIESEL FUEL TANK (10000 GALLONS)	3/1/1990	N	PTE_VOC (ton/yr)	1.11E-02	Less Than 5 TPY
				PTE_Benzene (ton/yr)	2.00E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	3.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.55E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	6.45E-04	Less than 1000 lb/month
101N	UNDERGROUND GASOLINE FUEL TANK (10000 GALLONS)	3/1/1990	N	PTE_VOC (ton/yr)	3.87E+00	Less Than 5 TPY

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				PTE_Benzene (ton/yr)	2.48E-02	Less than 1000 lb/month
536H	TRI-BUTYL PHOSPHATE TANK 11 (17700 GALLONS)	1/1/1953	N	PTE_VOC (ton/yr)	1.95E-01	Less Than 5 TPY
538H	N-PARAFFIN TK 21 (17700 GALLONS)	1/1/1954	N	PTE_VOC (ton/yr)	1.37E-02	Less Than 5 TPY
547H	N-PARAFFIN TANK 22 (17700 GALLONS)	1/1/1953	N	PTE_VOC (ton/yr)	1.37E-02	Less Than 5 TPY
86EH	UNDERGROUND DIESEL FUEL TANK (20000 GALLONS)	5/1/1997	N	PTE_VOC (ton/yr)	1.51E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	5.00E-06	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	5.00E-06	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	3.50E-05	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	8.50E-05	Less than 1000 lb/month
88EH	UNDERGROUND DIESEL FUEL TANK (20000 GALLONS)	5/1/1997	N	PTE_VOC (ton/yr)	1.51E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	5.00E-06	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	5.00E-06	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	3.50E-05	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	8.50E-05	Less than 1000 lb/month
114B	FUEL OIL STORAGE TANK #1 (15000 GALLONS)	10/1/1998	N	PTE_VOC (ton/yr)	8.71E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.50E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.00E-04	Less than 1000 lb/month

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				PTE_Xylene (m-) (ton/yr)	5.05E-04	Less than 1000 lb/month
115B	FUEL OIL STORAGE TANK #2 (15000 GALLONS)	10/1/1998	N	PTE_VOC (ton/yr)	8.71E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.50E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	2.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.00E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	5.05E-04	Less than 1000 lb/month
72DH	607-H NEW SOLVENT STORAGE TANK H33 (30000 GALLONS)	8/1/1995	N	PTE_VOC (ton/yr)	1.31E-02	Less Than 5 TPY
73DH	607-H NEW SOLVENT STORAGE TANK H34 (30000 GALLONS)	8/1/1995	N	PTE_VOC (ton/yr)	1.30E-02	Less Than 5 TPY
74DH	607-H NEW SOLVENT STORAGE TANK H35 (30000 GALLONS)	8/1/1995	N	PTE_VOC (ton/yr)	1.30E-02	Less Than 5 TPY
75DH	607-H NEW SOLVENT STORAGE TANK H36 (30000 GALLONS)	8/1/1995	N	PTE_VOC (ton/yr)	1.30E-02	Less Than 5 TPY
32GH	MCU EXTRACTION PROCESS	2/1/2007	N	PTE_PM (ton/yr)	1.94E-01	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.94E-01	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.94E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.38E+00	Less Than 5 TPY
				PTE_Mercury (ton/yr)	1.71E-01	Less than 1000 lb/month
				PTE_Sodium Hydroxide (ton/yr)	1.94E-01	Less than 1000 lb/month

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				PTE_Lead Compounds (ton/yr)	1.31E-04	Less than 1000 lb/month
455H	ACID STORAGE TANK (40% NITRIC ACID) (9400 GALLONS)	1/1/1988	N	PTE_nitric acid (ton/yr)	4.04E-02	Less than 1000 lb/month
293S	50% NITRIC ACID STORAGE TANK, 1000 GAL (1000 GALLONS)	4/1/1988	N	PTE_nitric acid (ton/yr)	1.46E-02	Less than 1000 lb/month
407S	OXALIC ACID STORAGE TANK (6000 GALLONS)	12/1/1995	N	PTE_Oxalic Acid (ton/yr)	7.77E-03	Less than 1000 lb/month
				PTE_PM (ton/yr)	86eh	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.77E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.77E-03	Less Than 5 TPY
546N	FUEL OIL STORAGE TANK (10000 GALLONS)	2/1/1995	N	PTE_VOC (ton/yr)	4.73E-03	Less Than 5 TPY
				PTE_Benzene (ton/yr)	1.00E-05	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	1.50E-05	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	1.10E-04	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	2.75E-04	Less than 1000 lb/month
004J	ULSD PROTECTED ABOVE GROUND TANK (9500 GALLONS MAXIMUM USABLE CAPACITY)	8/19/2014	Y (B.7)	VOCs, Total HAPs	NA	Stores Organic Liquids and Less than 10,000 Gallons
005J	COLD CHEMICAL RUNS AT SWPF (SIX – 19,740 GAL TANKS)	05/2017	N	PTE_PM (ton/yr)	1.74E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.08E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.08E-02	Less Than 5 TPY

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				PTE_VOC (ton/yr)	4.50E-09	Less Than 5 TPY
				PTE_Sodium Hydroxide (ton/yr)	1.58E-02	Less Than 1000 lb/month
	ICE – DIESELS INSIGNIFICANT ACTIVITIES					
340F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645987 (5987)) 557 BHP/415 KW	0080-0045-C 1/1984	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
709F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646004 (6004)) 235 BHP/175 KW	0080-0045-C 1/1984	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
715F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646005 (6005)) 235 BHP/175 KW	0080-0045-C 1/1984	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
176F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645988 (5988)) 402 BHP/300 KW	0080-0045-CF 1/1986	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
718F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645905 (5905)) 469 BHP/350 KW	1/1960	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
923F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646009 (6009)) 402 BHP/300 KW	0080-0045-CD 2/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
201K	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646565 (6565)) 375 BHP/280 KW	0080-0041 7/1992	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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089K	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645886 (5886)) 268 BHP/200 KW	0080-0047-CA 6/1986	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
010L	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645976 (5976)) 268 BHP/200 KW	0080-0049-CA 6/1986	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
92EH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645924 (5924)) 1073 BHP/800 KW	2/1990	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
93EH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645925 (5925)) 1073 BHP/800 KW	2/1990	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
618H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645991 (5991)) 1341 BHP/1000 KW	0080-0046-CC 7/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
56FH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10005 (10005)) 1207 BHP/900 KW	2/2002	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
546H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645874 (5874)) 402 BHP/300 KW	11/1983	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
61DN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5262 (5262)) 330 BHP/246 KW	6/1998	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
76DN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5232 (5232)) 335 BHP/250 KW	4/2000	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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78DN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (6933 (6933)) 335 BHP/250 KW	2/2014	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
505H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645995 (5995)) 402 BHP/300 KW	5/1988	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
743H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645996 (5996)) 268 BHP/200 KW	5/1980	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
915H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648413 (8413)) 1006 BHP/750 KW	6/1986	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
57FH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10008 (10008)) 1341 BHP/1000 KW	6/2001	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
940H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648414 (8414)) 610 BHP/455 KW	0080-0046-CJ 12/1987	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
574A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648411 (8411)) 1676 BHP/1250 KW	0080-0042-CD 1/1990	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
575A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648412 (8412)) 1676 BHP/1250 KW	0080-0042-CE 1/1990	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
25DA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648446 (8446)) 335 BHP/250 KW	1/1995	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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259C	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10014 (10014)) 480 BHP	4/2015	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
209C	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648447 (8447)) 154 BHP/115 KW	1/1995	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
535A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646029 (6029)) 644 BHP/480 KW	0080-0042-CC 12/1987	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
154B	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646019 (6019)) 27 BHP/20 KW	11/2011	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
056B	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645878 (5878)) 47 BHP/35 KW	1/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
327G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10010 (10010)) 113 BHP/84 KW	3/2005	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
334G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10012 (10012)) 101 BHP/75 KW	7/2006	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
079G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646253 (6253)) 20 BHP/15 KW	1/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
096G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645890 (5890)) 40 BHP/30 KW	1/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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18EN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64640209) 51 BHP/38 KW	2/2014	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
123A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646007 (6007)) 134 BHP/100 KW	1/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
104A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646021 (6021)) 268 BHP/200 KW	0080-0042-CA 07/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
73DA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646031 (6031)) 107 BHP/80 KW	4/1987	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
022B	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648442 (8442)) 375 BHP/280 KW	1/1993	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
49HF	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646566 (6566)) 443 BHP/330 KW	5/1994	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
50HF	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646567 (6567)) 443 BHP/330 KW	5/1994	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
15JF	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10001 (10001)) 201 BHP/150 KW	6/2001	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
168E	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645753 (5753)) 86 BHP/64 KW	1/21/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp

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064G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645877 (5877)) 134 BHP/100 KW	1/1985	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
078G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648406 (8406)) 107 BHP/80 KW	1/1990	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
065G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64648408 (8408)) 54 BHP/40 KW	1/1989	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
290G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (8450 (8450)) 54 BHP/40 KW	10/1998	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
723H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645989 (5989)) 192 BHP/143 KW	1/1979	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
911H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646568 (6568)) 330 BHP/246 KW	0080-0042-CI 3/1991	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
912H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646569 (6569)) 355 BHP/246 KW	0080-0042-CI 3/1991	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
522M	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646556 (6556)) 154 BHP	1/1991	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
001G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5837 (5837)) 370 BHP/276 KW	1/1991	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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84DN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10003 (10003)) 101 BHP/75 KW	10/2001	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
85DN	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10004 (10004)) 101 BHP/75 KW	10/2001	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
035Z	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (6026 (6026)) 141 BHP/105 KW	1/1986	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
21EA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646015 (6015)) 610 BHP/455 KW	10/1998	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
024A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646020 (6020)) 536 BHP/400 KW	0080-0042-CA 7/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
79GA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646095 (6095)) 1006 BHP/750 KW	10/2009	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
253S	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRO#6059) 174 BHP/130KW	01/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
241G	EMERGENCY BACKUP GENERATOR 95KW	01/1994	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
918F	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5983 (5983)) 469 BHP/ 350KW	0080-0045-CH 4/1987	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
462H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645981 (5981)) 671 BHP/500 KW	0080-0046-CI 4/1987	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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420H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645982 (5982)) 536 BHP/400 KW	0080-0046-CI 4/1987	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
64GH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE 69 BHP/51.4 KW	1/2015	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
80AH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646012 (6012)) 402 BHP/300 KW	3/1993	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
81AH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645993 (5993)) 402 BHP/300 KW	3/1993	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
181H	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645945 (5945)) 268 BHP/200 KW	5/1980	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
D501	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645949 (5949)) 2749 BHP/2050 KW	1/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
D504	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645950 (5950)) 2749 BHP/2050 KW	1/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
403S	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646051 (6051)) 174 BHP/130 KW	1/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
332S	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64645875 (5875)) 261 BHP/195 KW	0080-0066-CC 7/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency

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040Z	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646050 (6050)) 570 BHP/425 KW	0080-0080-CA 12/1985	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
74DA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64647732 (7732)) 125 KW	11/1996	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
72GA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (7903 (7903)) 207 BHP/154 KW	10/2002	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
784A	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64646035 (6035)) 150 KW	8/1993	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
137G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64647844 (7844)) 174 BHP/130 KW	4/1993	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
97JF	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (64641789 (1789)) 274 BHP/204 KW	10/2011	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
181E	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (F # 1JDXL06.8014) 110 BHP/75 KW	1/2014	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
78GH	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRO5904) 394 HP/294 KW	07/2017	Y(B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
291K	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10013 (10013)) 27 BHP/20 KW	4/2006	N	PTE_CO (ton/yr)	7.84E-01	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	7.28E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	3.64E+00	NA
				PTE_PM (ton/yr)	2.58E-01	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.58E-01	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.58E-01	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.41E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.95E-01	Less Than 5 TPY
169E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5575 (5575)) 40 BHP/30 KW	1/2014	N	PTE_CO (ton/yr)	1.17E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.09E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	5.43E+00	NA
				PTE_PM (ton/yr)	3.85E-01	Less Than 5 TPY
				PTE_PM10 (ton/yr)	3.85E-01	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	3.85E-01	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.59E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	4.40E-01	Less Than 5 TPY

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166E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5618 (5618)) 115 BHP/86 KW	1/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
167E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (5617 (5617)) 115 BHP/86 KW	1/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
173E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0002 (5503)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.81E+01	NA
				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
174E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0003 (5504)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.81E+01	NA
				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY

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				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
175E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0004 (5505)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.81E+01	NA
				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
176E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0005 (5506)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.81E+01	NA

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				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
178E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0007 (5508)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.81E+01	NA
				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
179E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0008 (5509)) 133 BHP/75 KW	1/2014	N	PTE_CO (ton/yr)	3.89E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.61E+00	Less Than 5 TPY

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				PTE_NOx (ton/yr)	1.81E+01	NA
				PTE_PM (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.28E+00	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.19E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.46E+00	Less Than 5 TPY
04KF	AIR COMPRESSOR (SRSR00156) 125HP	7/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
58GH	AIR COMPRESSOR (SRSR00157) 125HP	7/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
59GH	AIR COMPRESSOR (SRSR00158) 125HP	7/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
60GH	AIR COMPRESSOR (SRSR00159) 125HP	7/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
61GH	AIR COMPRESSOR (SRSR00160) 125HP	7/2014	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
182E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR0012) 99 BHP/74 KW	7/2014	N	PTE_CO (ton/yr)	1.64E+00	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	5.86E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	2.93E+00	NA
				PTE_PM (ton/yr)	1.36E-01	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.36E-01	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.36E-01	Less Than 5 TPY
				PTE_SO2 (ton/yr)	8.89E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.09E+00	Less Than 5 TPY
003J	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE 1474 BHP	08/2014	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
352G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE CENTRAL SANITARY WASTEWATER TREATMENT FACILITY 398BHP	09/2014	Y (B.4)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
06KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR AT 235-F 139 BHP/104 KW	7/2015	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
07KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR AT 235-F 139 BHP/104 KW	7/2015	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
65GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR AT (SRSR00245) 125 HP	10/2015	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp

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66GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR AT (SRSR00246) 125 HP	10/2015	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
67GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR AT (SRSR00271) 125 HP	10/2015	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
128Z	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (25.7KW/34.7HP)	01/2017	N	PTE_CO (ton/yr)	1.33E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.33E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.17E+00	NA
				PTE_PM (ton/yr)	7.00E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.00E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.00E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.12E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.81E-01	Less Than 5 TPY
14KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (25KW/33.5HP)	01/2017	N	PTE_CO (ton/yr)	1.33E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.27E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.13E+00	NA
				PTE_PM (ton/yr)	7.24E-03	Less Than 5 TPY

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				PTE_PM10 (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
72GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (25KW/33.5HP)	01/2017	N	PTE_CO (ton/yr)	1.33E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.27E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.13E+00	NA
				PTE_PM (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
73GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00415) (20KW/34.5HP)	05/2017	N	PTE_CO (ton/yr)	9.66E-01	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.82E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	9.08E-01	NA
				PTE_PM (ton/yr)	5.79E-03	Less Than 5 TPY

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				PTE_PM10 (ton/yr)	5.79E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	5.79E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.10E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.79E-01	Less Than 5 TPY
75GH	122 HP 91 KW AIR COMPRESSOR	05/2017	Y	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
76GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00390) (25.6KW/34.3HP)	05/2017	N	PTE_CO (ton/yr)	1.24E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.98E-02	Less Than 5 TPY
				PTE_NOx (ton/yr)	9.89E-01	NA
				PTE_PM (ton/yr)	7.42E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.42E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.42E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.08E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.77E-01	Less Than 5 TPY
79GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR (SRSR00427) 155 HP	09/2017	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp

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80GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE UTILIZED TO DRIVE AIR COMPRESSOR (SRSR00428) 155 HP	09/2017	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive pump with mechanical power less than 200Bhp
81GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00445) (25.7KW/34.5HP)	09/2017	N	PTE_CO (ton/yr)	1.24E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.33E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.17E+00	NA
				PTE_PM (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.10E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.79E-01	Less Than 5 TPY
82GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00446) (80KW/107HP)	09/2017	N	PTE_CO (ton/yr)	3.86E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	6.18E-02	Less Than 5 TPY
				PTE_NOx (ton/yr)	3.09E-01	NA
				PTE_PM (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.54E-02	Less Than 5 TPY

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				PTE_PM2.5 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	9.61E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.18E+00	Less Than 5 TPY
83GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50315) (50KW/67HP)	11/2017	N	PTE_CO (ton/yr)	2.41E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	4.54E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	2.27E+00	NA
				PTE_PM (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	6.02E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	7.37E-01	Less Than 5 TPY
513S	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00503) (30KW/33.5HP)	03/2018	N	PTE_CO (ton/yr)	1.45E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.72E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.36E+00	NA
				PTE_PM (ton/yr)	8.69E-03	Less Than 5 TPY

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				PTE_PM10 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
512S	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50026) (38KW/67HP)	01/2018	N	PTE_CO (ton/yr)	1.83E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.45E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.72E+00	NA
				PTE_PM (ton/yr)	1.10E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.10E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.10E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	6.02E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	7.37E-01	Less Than 5 TPY
85GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50416) (20KW/27HP)	01/2018	N	PTE_CO (ton/yr)	9.66E-01	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.82E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	9.08E-01	NA

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				PTE_PM (ton/yr)	5.79E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	5.79E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	5.79E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.42E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.97E-01	Less Than 5 TPY
06HA	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE FIRE PUMP 192 HP	9/2019	(B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive emergency fire pump
95GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00628) (34.5KW/25.7HP)	08/2019	N	PTE_CO (ton/yr)	1.24E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.33E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.17E+00	NA
				PTE_PM (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.10E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.79E-01	Less Than 5 TPY
96GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00630) (24.8KW/18.3HP)	08/2019	N	PTE_CO (ton/yr)	1.17E+00	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.65E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.33E+00	NA
				PTE_PM (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.23E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.73E-01	Less Than 5 TPY
97GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00631) (24.8KW/18.3HP)	08/2019	N	PTE_CO (ton/yr)	1.17E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.65E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.33E+00	NA
				PTE_PM (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.07E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.23E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.73E-01	Less Than 5 TPY

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19KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00646) (40.2KW/30HP)	08/2019	N	PTE_CO (ton/yr)	1.45E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.72E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.36E+00	NA
				PTE_PM (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.61E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	4.42E-01	Less Than 5 TPY
94GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00594) (40.2KW/29.9HP)	03/2019	N	PTE_CO (ton/yr)	1.44E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.71E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.36E+00	NA
				PTE_PM (ton/yr)	8.66E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	8.66E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.66E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.61E-01	Less Than 5 TPY

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				PTE_VOC (ton/yr)	4.42E-01	Less Than 5 TPY
129Z	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00595) (24.5HP/25.7KW)	03/2019	N	PTE_CO (ton/yr)	1.24E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.33E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.17E+00	NA
				PTE_PM (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.44E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.10E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.79E-01	Less Than 5 TPY
514S	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50391) (33.5KW/25HP)	03/2019	N	PTE_CO (ton/yr)	1.21E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.27E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.13E+00	NA
				PTE_PM (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	7.24E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	7.24E-03	Less Than 5 TPY

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				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
93GH	AIR COMPRESSOR (SRSR00271T) 140HP	01/2019	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
92GH	AIR COMPRESSOR (SRSR00581) 139HP	12/2018	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
009J	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (887420RA) (80KW/169HP)	10/2018	N	PTE_CO (ton/yr)	3.86E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	6.18E-02	Less Than 5 TPY
				PTE_NOx (ton/yr)	3.09E-01	NA
				PTE_PM (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.52E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.86E+00	Less Than 5 TPY
010J	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (907530RA) (80KW/169HP)	10/2018	N	PTE_CO (ton/yr)	3.86E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	6.18E-02	Less Than 5 TPY

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				PTE_NOx (ton/yr)	3.09E-01	NA
				PTE_PM (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.52E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.86E+00	Less Than 5 TPY
011J	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10416227) (31.5KW/19.5HP)	10/2018	N	PTE_CO (ton/yr)	1.52E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.86E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.43E+00	NA
				PTE_PM (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.75E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.14E-01	Less Than 5 TPY
012J	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (10592594) (31.5KW/19.5HP)	10/2018	N	PTE_CO (ton/yr)	1.52E+00	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.86E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.43E+00	NA
				PTE_PM (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	9.13E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.75E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	2.14E-01	Less Than 5 TPY
90GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50446) (80KW/107HP)	10/2018	N	PTE_CO (ton/yr)	3.86E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	6.18E-02	Less Than 5 TPY
				PTE_NOx (ton/yr)	3.09E-01	NA
				PTE_PM (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.54E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	9.61E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.18E+00	Less Than 5 TPY

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18KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50451) (130KW/174HP)	10/2018	N	PTE_CO (ton/yr)	4.39E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.00E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	5.02E-01	NA
				PTE_PM (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.56E+00	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.91E+00	Less Than 5 TPY
91GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00559) (130KW/174HP)	10/2018	N	PTE_CO (ton/yr)	4.39E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.00E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	5.02E-01	NA
				PTE_PM (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.51E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.56E+00	Less Than 5 TPY

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				PTE_VOC (ton/yr)	1.91E+00	Less Than 5 TPY
187E	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (0000714991) (11.5KW/15.4HP)	09/2018	N	PTE_CO (ton/yr)	7.33E-01	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.67E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	8.33E-01	NA
				PTE_PM (ton/yr)	4.44E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	4.44E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	4.44E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	1.38E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.69E-01	Less Than 5 TPY
88GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00531) (30KW/40.2HP)	08/2018	N	PTE_CO (ton/yr)	1.45E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.72E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.36E+00	NA
				PTE_PM (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.69E-03	Less Than 5 TPY

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				PTE_SO2 (ton/yr)	3.61E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	4.42E-01	Less Than 5 TPY
89GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00532) (30KW/40.2HP)	08/2018	N	PTE_CO (ton/yr)	1.45E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.72E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	1.36E+00	NA
				PTE_PM (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	8.69E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.61E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	4.42E-01	Less Than 5 TPY
87GH	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00521) (22KW/33.5HP)	07/2018	N	PTE_CO (ton/yr)	1.06E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.00E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	9.98E-01	NA
				PTE_PM (ton/yr)	6.37E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	6.37E-03	Less Than 5 TPY

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				PTE_PM2.5 (ton/yr)	6.37E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
17KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR00522) (22KW/33.5HP)	07/2018	N	PTE_CO (ton/yr)	1.06E+00	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.00E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	9.98E-01	NA
				PTE_PM (ton/yr)	6.37E-03	Less Than 5 TPY
				PTE_PM10 (ton/yr)	6.37E-03	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	6.37E-03	Less Than 5 TPY
				PTE_SO2 (ton/yr)	3.01E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	3.68E-01	Less Than 5 TPY
86GH	AIR COMPRESSOR (SRSR50411) 173HP	07/2018	Y (B.6)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
99GH	AIR COMPRESSOR (SRSR00653) 125HP	11/2019	Y (B.6)	PM. PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	ICE used to drive compressor with mechanical power less than 200Bhp
20KF	NON-EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE (SRSR50559) (75KW/110HP)	11/2019	N	PTE_CO (ton/yr)	3.62E+00	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	5.79E-02	Less Than 5 TPY
				PTE_NOx (ton/yr)	2.90E-01	NA
				PTE_PM (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	1.45E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	9.88E-01	Less Than 5 TPY
				PTE_VOC (ton/yr)	1.21E+00	Less Than 5 TPY
084G	EMERGENCY DIESEL INTERNAL COMBUSTION ENGINE 15KW	01/1985	Y (B.3)	PM, PM10, PM2.5, SO2, NO2, NOx, VOCs, CO	NA	designated emergency
	ICE-GAS INSIGNIFICANT ACTIVITIES					
160E	LIMITED USE GASOLINE INTERNAL COMBUSTION ENGINE (SP 2) 5.5 BHP	1/2014	(B.6)	CO, NO2, NOx, PM, PM10, PM2.5, SO2, VOC	NA	ICE used to drive pump with less than 200 hp
161E	LIMITED USE GASOLINE INTERNAL COMBUSTION ENGINE (SP 3) 2.5 KW	1/2014	(B.6)	CO, NO2, NOx, PM, PM10, PM2.5, SO2, VOC	NA	ICE used to drive pump with less than 200 hp
162E	LIMITED USE GASOLINE INTERNAL COMBUSTION ENGINE (SP 5) 2.5 KW	1/2014	(B.6)	CO, NO2, NOx, PM, PM10, PM2.5, SO2, VOC	NA	ICE used to drive pump with less than 200 hp
163E	LIMITED USE GASOLINE INTERNAL COMBUSTION ENGINE (SP 6) 2.5 KW	1/2014	(B.6)	CO, NO2, NOx, PM, PM10, PM2.5, SO2, VOC	NA	ICE used to drive pump with less than 200 hp
164E	GASOLINE INTERNAL COMBUSTION ENGINE (5517) 7BHP	1/2014	No	PTE_CO (ton/yr)	2.44E-03	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.85E-03	Less Than 5 TPY
				PTE_NOx (ton/yr)	3.85E-03	NA
				PTE_PM (ton/yr)	2.52E-04	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.52E-04	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.52E-04	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.07E-04	Less Than 5 TPY
				PTE_VOC (ton/yr)	7.56E-03	Less Than 5 TPY
09KF	GASOLINE INTERNAL COMBUSTION ENGINE 8.4HP/6.3KW	03/2017	No	PTE_CO (ton/yr)	2.56E-01	Less Than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	4.87E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	4.87E-01	NA
				PTE_PM (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.2E-02	Less Than 5 TPY
				PTE_VOC (ton/yr)	7.94E-01	Less Than 5 TPY
10KF	GASOLINE INTERNAL COMBUSTION ENGINE 8.4HP/6.3KW	03/2017	No	PTE_CO (ton/yr)	2.56E-01	Less Than 5 TPY

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				PTE_Nitrogen Dioxide (NO2) (ton/yr)	4.87E-01	Less Than 5 TPY
				PTE_NOx (ton/yr)	4.87E-01	NA
				PTE_PM (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_PM10 (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_PM2.5 (ton/yr)	2.7E-02	Less Than 5 TPY
				PTE_SO2 (ton/yr)	2.2E-02	Less Than 5 TPY
				PTE_VOC (ton/yr)	7.94E-01	Less Than 5 TPY
	ICE-PROPANE INSIGNIFICANT ACTIVITIES					
09FA	EMERGENCY PROPANE INTERNAL COMBUSTION ENGINE SRSOC GENERATOR #1 106BHP/65KW	2/2014	Y (B.3)	NOx, NO2, CO, SO2, PM, PM10, PM2.5	NA	designated emergency
10FA	EMERGENCY PROPANE INTERNAL COMBUSTION ENGINE SRSOC GENERATOR #2 206BHP/65KW	2/2014	Y (B.3)	NOx, NO2, CO, SO2, PM, PM10, PM2.5	NA	designated emergency
	MATERIAL HANDLING INSIGNIFICANT ACTIVITIES					
124F	ASH BASIN (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	1.70E+00	Less than 5 TPY
				PTE_PM10 (ton/yr)	8.48E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.27E-01	Less than 5 TPY
21BH	MANGANOUS NITRATE (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	4.52E-01	Less than 5 TPY

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				PTE_PM10 (ton/yr)	1.58E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	2.39E-02	Less than 5 TPY
				PTE_Manganese Compounds (ton/yr)	4.52E-01	Less than 1000 lb/month
22EN	AGGREGATE HANDLING AND STORAGE AT THE RADIO TOWER YARD (MATERIAL HANDLING)	12/10/2013	N	PTE_PM (ton/yr)	2.79E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.01E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.29E-03	Less than 5 TPY
23EN	MATERIAL HANDLING AND STORAGE AT THE OLD ROCK YARD (TOP SOIL) (MATERIAL HANDLING)	12/10/2013	N	PTE_PM (ton/yr)	1.26E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	6.00E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	8.82E-03	Less than 5 TPY
24EN	MATERIAL HANDLING AND STORAGE AT THE OLD ROCK YARD (SAND) (MATERIAL HANDLING)	12/10/2013	N	PTE_PM (ton/yr)	1.26E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	6.00E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	8.82E-03	Less than 5 TPY
313G	632-G C&D LANDFILL AND BORROW PIT (MATERIAL HANDLING)	8/1/1997	N	PTE_PM (ton/yr)	2.82E+00	Less than 5 TPY
				PTE_PM10 (ton/yr)	8.09E-01	Less than 5 TPY

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				PTE_PM2.5 (ton/yr)	8.61E-02	Less than 5 TPY
349S, 351S, 352S, 354S	FRIT TRANSFER (MATERIAL HANDLING)	7/1985 10/1986 10/1986 10/1986	N	PTE_Pb (ton/yr)	1.60E-05	Less than 5 TPY
				PTE_PM (ton/yr)	3.72E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.30E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.97E-02	Less than 5 TPY
				PTE_Lead Compounds (ton/yr)	1.76E-05	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	3.99E-05	Less than 1000 lb/month
				PTE_nickel oxide (ton/yr)	3.99E-05	Less than 1000 lb/month
394N	MATERIAL HANDLING & STORAGE NEAR 632-G LANDFILL (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	2.38E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	7.65E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	9.20E-04	Less than 5 TPY
398N	MATERIAL HANDLING & STORAGE NEAR 632-G LANDFILL (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	2.38E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	7.65E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	9.20E-04	Less than 5 TPY
541H	SODIUM NITRITE (MATERIAL HANDLING)	1/1/1991	N	PTE_PM (ton/yr)	2.35E-01	Less than 5 TPY

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				PTE_PM10 (ton/yr)	8.22E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.25E-02	Less than 5 TPY
542H	POTASSIUM PERMANGANATE (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	3.68E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.29E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.95E-03	Less than 5 TPY
				PTE_Manganese Compounds (ton/yr)	3.68E-02	Less than 1000 lb/month
544H	BORIC ACID (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	3.49E-03	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.22E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.85E-04	Less than 5 TPY
545H	SODIUM CARBONATE (MATERIAL HANDLING)	1/1/1985	N	PTE_PM (ton/yr)	8.08E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	2.83E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	4.28E-03	Less than 5 TPY
279P	ASH REMOVAL AROUND P-AREA WETLAND (MATERIAL HANDLING)	07/2018	N	PTE_PM (ton/yr)	3.14E+00	Less than 5 TPY
				PTE_PM10 (ton/yr)	8.01E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	8.03E-02	Less than 5 TPY
358G	DRY OXIDANT ADDITION IN SUPPORT OF IN SITU CHEMICAL OXIDATION AT WESTERN SECTOR	04/2018	N	PTE_PM (ton/yr)	9.02E-05	Less Than 5 TPY
				PTE_PM10 (ton/yr)	5.28E-05	Less Than 5 TPY

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				PTE_PM2.5 (ton/yr)	5.28E-05	Less Than 5 TPY
	MISCELLANEOUS INSIGNIFICANT ACTIVITIES					
001J	SWPF BUILDING EXHAUST	1/20/2014	N	PTE_VOC (ton/yr)	1.70E+00	Less than 5 TPY
				PTE_Methanol (ton/yr)	2.00E-02	Less than 1000 lb/month
002J	SWPF COLD CHEMICAL EXHAUST FAN	1/20/2014	N	PTE_Nitrogen Dioxide (NO2) (ton/yr)	5.00E-02	Less than 5 TPY
				PTE_NOx (ton/yr)	5.00E-02	NA
				PTE_nitric acid (ton/yr)	7.00E-02	Less than 1000 lb/month
02KF	WASTE SOLIDIFICATION BUILDING SYSTEM	7/1/2012	N	PTE_Pb (ton/yr)	6.35E-08	Less than 5 TPY
				PTE_PM (ton/yr)	2.00E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	6.65E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	3.33E-05	Less than 5 TPY
				PTE_nitric acid (ton/yr)	3.19E-01	Less than 1000 lb/month
05EN & 31EN	LEAD MELTING POTS	8/8/2019 0080-0041-C2	N	PTE_Nitrogen Dioxide (NO2) (ton/yr)	3.17E-01	Less than 5 TPY
				PTE_NOx (ton/yr)	3.17E-01	NA
				PTE_VOC (ton/yr)	1.95E-02	Less than 5 TPY
				PTE_Pb (ton/yr)	2.01E-02	Less than 5 TPY
				PTE_PM (ton/yr)	8.73E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	8.73E-02	Less than 5 TPY

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				PTE_PM2.5 (ton/yr)	8.73E-02	Less than 5 TPY
				PTE_SO2 (ton/yr)	1.32E-03	Less than 5 TPY
				PTE_CO (ton/yr)	1.83E-01	Less than 5 TPY
10GH	METALLOGRAPHY HOOD	4/1/2004	N	PTE_Nitrogen Dioxide (NO2) (ton/yr)	9.41E-03	Less than 5 TPY
				PTE_NOx (ton/yr)	9.41E-03	NA
				PTE_VOC (ton/yr)	3.67E-02	Less than 5 TPY
				PTE_PM (ton/yr)	4.88E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	4.88E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	4.88E-01	Less than 5 TPY
				PTE_Chromium Compounds (ton/yr)	9.76E-02	Less than 1000 lb/month
				PTE_Manganese Compounds (ton/yr)	9.76E-03	Less than 1000 lb/month
				PTE_Nickel (ton/yr)	5.86E-02	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	5.86E-02	Less than 1000 lb/month
11GH	CUTTING HOOD	4/1/2004	N	PTE_PM (ton/yr)	7.51E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	7.51E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	7.51E-01	Less than 5 TPY

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				PTE_Chromium Compounds (ton/yr)	1.50E-01	Less than 1000 lb/month
				PTE_Manganese Compounds (ton/yr)	1.50E-02	Less than 1000 lb/month
				PTE_Nickel (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	9.01E-02	Less than 1000 lb/month
258G	INTERIM SANITARY LANDFILL	5/1/1993	N	PTE_VOC (ton/yr)	3.02E-02	Less than 5 TPY
268G	740-G OLD SANITARY LANDFILL	1/1/1974	N	PTE_VOC (ton/yr)	3.27E+00	Less than 5 TPY
508S	DRY FRIT OPERATION	6/1/2011	N	PTE_Pb (ton/yr)	4.50E-05	Less than 5 TPY
				PTE_PM (ton/yr)	4.50E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	4.50E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	4.50E-02	Less than 5 TPY
				PTE_Lead Compounds (ton/yr)	4.95E-05	Less than 1000 lb/month
				PTE_nickel oxide (ton/yr)	1.13E-04	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	1.13E-04	Less than 1000 lb/month
52BH	RESERVOIR FINISHING	10/1/1993	N	PTE_VOC (ton/yr)	2.73E+00	Less than 5 TPY
59FH	PARTS CLEANING	11/1/2000	N	PTE_VOC (ton/yr)	9.54E-01	Less than 5 TPY
874H	FINISHING OPERATIONS FOR RESERVOIRS	1/11/1956	N	PTE_VOC (ton/yr)	2.73E+00	Less than 5 TPY
902H	LATHE HOOD, RM. 1	11/1/1968	N	PTE_PM (ton/yr)	1.17E-01	Less than 5 TPY

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				PTE_PM10 (ton/yr)	1.17E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.17E-01	Less than 5 TPY
				PTE_Chromium Compounds (ton/yr)	2.35E-02	Less than 1000 lb/month
				PTE_Manganese Compounds (ton/yr)	2.35E-03	Less than 1000 lb/month
				PTE_Nickel (ton/yr)	1.41E-02	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	1.41E-02	Less than 1000 lb/month
906H	MILLING AND MACHINING HOOD, RM. 1	1/1/1968	N	PTE_PM (ton/yr)	1.17E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.17E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.17E-01	Less than 5 TPY
				PTE_Chromium Compounds (ton/yr)	2.35E-02	Less than 1000 lb/month
				PTE_Manganese Compounds (ton/yr)	2.35E-03	Less than 1000 lb/month
				PTE_Nickel (ton/yr)	1.41E-02	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	1.41E-02	Less than 1000 lb/month
14DH	HB LINE SCRAP RECOVERY	1/1/1985	N	PTE_Nitrogen Dioxide (NO2) (ton/yr)	8.10E-01	Less than 5 TPY
				PTE_NOx (ton/yr)	8.10E-01	NA

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15DH 16DH	HB LINE NEPTUNIUM OXIDE	1/1/1985	N	PTE_Nitrogen Dioxide (NO2) (ton/yr)	2.36E-01	Less than 5 TPY
				PTE_NOx (ton/yr)	2.36E-01	NA
26EN	AEROSOL CAN CRUSHING SYSTEM	2/2014	N	PTE_VOC (ton/yr)	1.97E+00	Less than 5 TPY
509S	PM FROM CUTTING THE CANISTER SUPPORTS IN SUPPORTS IN 250-S	06KF5/2015	N	PTE_PM (ton/yr)	3.00E+00	Less than 5 TPY
				PTE_PM10 (ton/yr)	3.00E+00	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	3.00E+00	Less than 5 TPY
27EN	DISCHARGING OF EXPIRED FIRE EXTINGUISHERS	4/2014	N	PTE_PM (ton/yr)	2.51E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	2.13E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	3.77E-03	Less than 5 TPY
008A	MISCELLANEOUS UNIT 785-A	10/2015	N	PTE_VOC (ton/yr)	7.46E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	1.12E-01TPY, 1.87E+01 lb/month	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	7.46E-01 TPY, 1.24E+02 lb/month	Less than 1000 lb/month
356G	LIQUID WASTE OPERATIONS (LWO) FIRE EXTINGUISHER TRAINING	03/2016	N	PTE_PM (ton/yr)	1.25E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.25E-01	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.25E-01	Less than 5 TPY

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970H, 971H, 972H	241-29H COOLING TOWERS 1, 2, & 3	09/2016	Y	PTE_VOC (ton/yr)	2.90E-01	Less than 5 TPY
01HH	285-11H COOLING TOWER	12/2019	N	PTE_PM (ton/yr)	1.00E+00	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.00E+00	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	1.00E+00	Less than 5 TPY
				PTE_Sodium Hydroxide (ton/yr)	1.00E+00	Less than 1000 lb/month
	ORDNANCE TRAINING INSIGNIFICANT ACTIVITIES					
347G	ARMY AND POTENTIALLY OTHER MILITARY TRAINING	5/1/2012	N	PTE_CO (ton/yr)	8.09E-03	Less than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	9.00E-06	Less than 5 TPY
				PTE_NOx (ton/yr)	6.61E-04	NA
				PTE_Pb (ton/yr)	5.14E-05	Less than 5 TPY
				PTE_PM (ton/yr)	1.21E-02	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.21E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	4.99E-04	Less than 5 TPY
				PTE_SO2 (ton/yr)	1.02E-05	Less than 5 TPY
				PTE_VOC (ton/yr)	1.62E-05	Less than 5 TPY
				PTE_Antimony Compounds (ton/yr)	1.46E-08	Less than 1000 lb/month
				PTE_Benzene (ton/yr)	1.84E-06	Less than 1000 lb/month

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				PTE_Chromium Compounds (ton/yr)	3.98E-07	Less than 1000 lb/month
				PTE_Hydrogen cyanide (ton/yr)	6.72E-09	Less than 1000 lb/month
				PTE_Methylene Chloride (Dichloro (ton/yr)	9.54E-05	Less than 1000 lb/month
				PTE_Lead Compounds (ton/yr)	5.14E-05	Less than 1000 lb/month
346G	WSI ODNANCE TRAINING	10/1/2011	N	PTE_CO (ton/yr)	1.20E+00	Less than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	4.95E-02	Less than 5 TPY
				PTE_NOx (ton/yr)	4.95E-02	NA
				PTE_Pb (ton/yr)	6.24E-03	Less than 5 TPY
				PTE_PM (ton/yr)	1.02E-01	Less than 5 TPY
				PTE_PM10 (ton/yr)	9.44E-02	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	6.46E-02	Less than 5 TPY
				PTE_SO2 (ton/yr)	1.21E-04	Less than 5 TPY
				PTE_VOC (ton/yr)	4.48E-07	Less than 5 TPY
				PTE_Benzene (ton/yr)	3.88E-04	Less than 1000 lb/month
				PTE_Chromium Compounds (ton/yr)	2.03E-05	Less than 1000 lb/month
				PTE_Hydrogen cyanide (ton/yr)	1.07E-02	Less than 1000 lb/month

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				PTE_Nickel (ton/yr)	9.80E-07	Less than 1000 lb/month
				PTE_Nickel Compounds (ton/yr)	9.80E-07	Less than 1000 lb/month
				PTE_Lead Compounds (ton/yr)	6.24E-03	Less than 1000 lb/month
345G	FBI DISPERSION DEVICE TRAINING	10/1/2011	N	PTE_CO (ton/yr)	5.23E-03	Less than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	1.30E-04	Less than 5 TPY
				PTE_NOx (ton/yr)	1.30E-04	NA
				PTE_Pb (ton/yr)	2.15E-05	Less than 5 TPY
				PTE_PM (ton/yr)	1.96E-03	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.39E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	2.52E-04	Less than 5 TPY
				PTE_SO2 (ton/yr)	3.21E-05	Less than 5 TPY
				PTE_VOC (ton/yr)	1.08E-04	Less than 5 TPY
				PTE_Acetaldehyde (ton/yr)	1.55E-06	Less than 1000 lb/month
				PTE_Acrylonitrile (ton/yr)	2.60E-10	Less than 1000 lb/month
				PTE_Antimony Compounds (ton/yr)	1.22E-08	Less than 1000 lb/month
				PTE_Benzene (ton/yr)	2.57E-07	Less than 1000 lb/month
				PTE_Carbon Disulfide (ton/yr)	1.42E-05	Less than 1000 lb/month
				PTE_Carbon Tetrachloride (ton/yr)	1.50E-06	Less than 1000 lb/month

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				PTE_Chlorine (ton/yr)	9.00E-06	Less than 1000 lb/month
				PTE_Formaldehyde (ton/yr)	2.30E-06	Less than 1000 lb/month
				PTE_Hydrogen cyanide (ton/yr)	1.30E-05	Less than 1000 lb/month
				PTE_Hydrogen Sulfide (ton/yr)	2.96E-04	Less than 1000 lb/month
				PTE_Methylene Chloride (Dichloro (ton/yr)	6.00E-04	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	1.40E-06	Less than 1000 lb/month
				PTE_Lead Compounds (ton/yr)	2.15E-05	Less than 1000 lb/month
353G	TESTING AND TRAINING ON DISRUPTING AN IMPROVISED NUCLEAR DEVICE/RADIOLOGICAL DISPERSAL DEVICE	2/2015	N	PTE_CO (ton/yr)	4.7E-04	Less than 5 TPY
				PTE_Nitrogen Dioxide (NO2) (ton/yr)	5.9E-05	Less than 5 TPY
				PTE_NOx (ton/yr)	5.9E-05	NA
				PTE_Pb (ton/yr)	6.1E-07	Less than 5 TPY
				PTE_PM (ton/yr)	3.2E-03	Less than 5 TPY
				PTE_PM10 (ton/yr)	1.3E-03	Less than 5 TPY
				PTE_PM2.5 (ton/yr)	9.2E-05	Less than 5 TPY
				PTE_VOC (ton/yr)	4.8E-02	Less than 5 TPY

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				PTE_Methylene Chloride (Dichloro (ton/yr)	1.4E-03	Less than 0.5 TPY
	PAINTING INSIGNIFICANT ACTIVITIES					
245G	USFS TREE MARKING	1/1/1995	N	PTE_VOC (ton/yr)	4.97E+00	Less than 5 TPY
				PTE_Ethylbenzene (ton/yr)	9.92E-03	Less than 1000 lb/month
	SOIL AND GROUNDWATER INSIGNIFICANT ACTIVITIES					
202D	DAOU BUBBLE TOWER MICROBLOWER	3/1/2010	N	PTE_VOC (ton/yr)	2.31E-01	Less than 5 TPY
				PTE_1,1,1-Trichloroethane (Methy (ton/yr)	2.68E-05	Less than 1000 lb/month
				PTE_Benzene (ton/yr)	2.16E-03	Less than 1000 lb/month
				PTE_Chloroform (ton/yr)	2.40E-05	Less than 1000 lb/month
				PTE_Cumene (ton/yr)	1.72E-02	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	1.70E-02	Less than 1000 lb/month
				PTE_Hexane (ton/yr)	8.61E-02	Less than 1000 lb/month
				PTE_Methylene Chloride (Dichloro (ton/yr)	6.83E-03	Less than 1000 lb/month
				PTE_Methyl Ethyl Ketone (ton/yr)	2.90E-03	Less than 1000 lb/month
				PTE_Methyl Isobutyl Ketone (ton/yr)	1.58E-02	Less than 1000 lb/month

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				PTE_Tetrachloroethylene (Perchl (ton/yr)	7.58E-02	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	5.37E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.39E-03	Less than 1000 lb/month
				PTE_Vinyl Chloride (ton/yr)	5.03E-03	Less than 1000 lb/month
				PTE_Xylene (o-) (ton/yr)	8.11E-03	Less than 1000 lb/month
				PTE_Xylenes (ton/yr)	1.78E-02	Less than 1000 lb/month
240C	CBRP MICROBLOWERS	12/1/2004	N	PTE_VOC (ton/yr)	3.30E-02	Less than 5 TPY
				PTE_Trichloroethylene (ton/yr)	3.30E-02	Less than 1000 lb/month
243P	PBRP BAROBALLS	6/1/2001	N	PTE_VOC (ton/yr)	7.00E-04	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	7.00E-04	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.00E-04	Less than 1000 lb/month
				PTE_1,1-dichloroethylene (vinyli (ton/yr)	3.00E-04	Less than 1000 lb/month
268P	P-AREA MICROBLOWERS	5/1/2010	N	PTE_VOC (ton/yr)	1.05E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	3.00E-03	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	5.70E-02	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	3.00E-03	Less than 1000 lb/month

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				PTE_Trichloroethylene (ton/yr)	8.11E-02	Less than 1000 lb/month
273G	MET LAB BAROBALLS	9/1/1997	N	PTE_VOC (ton/yr)	1.30E-01	Less than 5 TPY
				PTE_Trichloroethylene (ton/yr)	1.03E-01	Less than 1000 lb/month
280G	SOUTHERN SECTOR SSR-008	9/1/1998	N	PTE_VOC (ton/yr)	2.64E-02	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	3.65E-03	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.60E-02	Less than 1000 lb/month
281G	SOUTHERN SECTOR SSR-009	9/1/1998	N	PTE_VOC (ton/yr)	1.47E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	2.05E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.45E-01	Less than 1000 lb/month
308T	TNX MICROBLOWERS	12/1/2006	N	PTE_VOC (ton/yr)	3.47E-01	Less than 5 TPY
				PTE_Carbon Tetrachloride (ton/yr)	1.43E-01	Less than 1000 lb/month
				PTE_Chloroform (ton/yr)	3.49E-03	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	6.54E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.04E-01	Less than 1000 lb/month
54FA	A-AREA BURNING RUBBLE PIT (ABRP) #1	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month

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				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
55FA	ABRP #2	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
56FA	ABRP #3	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
57FA	ABRP #4	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
58FA	ABRP #5	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
59FA	ABRP #6	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month

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606M	M-AREA PROCESS SEWER BAROBALLS	10/1/2001	N	PTE_VOC (ton/yr) MVE-5 7.03E-03 MVE-6 3.17E-03 MVE-7 3.98E-03 MVE-8 9.36E-03 MVE-23 2.95E-03 MVE-24 1.05E-03 MVE-25 4.98E-02 MVE-26 4.98E-02 MVE-27 4.98E-02 MHV-6 3.21E-02 MHV-7 3.21E-02 MHV-8 3.21E-02 MHV-9 1.20E-02 AMH-2 1.96E-01 MVE-28 1.67E-02 MVE-29 1.67E-02 AMH-4 1.83E-02 AMH-5 1.83E-02	Total for all emission points under 606M 5.52E-01	Less than 5 TPY

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				PTE_Tetrachloroethylene (Perchl (ton/yr) MVE-5 1.97E-01 MVE-6 1.03E-01 MVE-7 1.24E-01 MVE-8 2.13E-01 MVE-23 6.50E-02 MVE-24 1.90E-02 MVE-25 8.79E-02 MVE-26 8.79E-02 MVE-27 8.79E-02 MHV-6 2.62E-02 MHV-7 2.62E-02 MHV-8 2.62E-02 MHV-9 1.52E-02 AMH-2 1.60E-01 MVE-28 5.13E-02 MVE-29 5.13E-02 AMH-4 2.31E-02 AMH-5 2.31E-02	Total for all emission points under 606M 1.39E+00	Less than 1000 lb/month

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				PTE_Trichloroethylene (ton/yr) MVE-5 7.03E-03 MVE-6 3.17E-03 MVE-7 3.98E-03 MVE-8 9.36E-03 MVE-23 2.95E-03 MVE-24 1.05E-03 MVE-25 4.98E-02 MVE-26 4.98E-02 MVE-27 4.98E-02 MHV-6 3.21E-02 MHV-7 3.21E-02 MHV-8 3.21E-02 MHV-9 1.20E-02 AMH-2 1.96E-01 MVE-28 1.67E-02 MVE-29 1.67E-02 AMH-4 1.83E-02 AMH-5 1.83E-02	Total for all emission points under 606M 5.52E-01	Less than 1000 lb/month
60FA	ABRP #7	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
615M	MIPSL MICROBLOWER/BAROBALLS	6/1/2008	N	PTE_VOC (ton/yr)	1.91E-01	Less than 5 TPY
				PTE_1,1,1-Trichloroethane (Methy (ton/yr)	5.37E-02	Less than 1000 lb/month

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				PTE_1,1-dichloroethylene (vinyli (ton/yr)	1.30E-02	Less than 1000 lb/month
				PTE_Carbon Tetrachloride (ton/yr)	2.06E-03	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	2.20E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.76E-01	Less than 1000 lb/month
616M	MAOU BAROBALLS (321-M)	1/1/2010	N	PTE_VOC (ton/yr)	1.59E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	2.00E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.59E-01	Less than 1000 lb/month
617M	MAOU BARO (HORIZ/PSVE CELL&VERT)	1/1/2010	N	PTE_VOC (ton/yr)	5.47E-02	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	3.00E-03	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	5.47E-02	Less than 1000 lb/month
618M	DUS1 MICROBLOWER	5/1/2011	N	PTE_VOC (ton/yr)	3.48E-03	Less than 5 TPY
				PTE_1,1,1-Trichloroethane (Methy (ton/yr)	1.25E-04	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	1.57E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	3.48E-03	Less than 1000 lb/month
619M	WESTERN SECTOR TREATMENT SYSTEM (WSTS) MICROBLOWER	4/1/2013	N	PTE_VOC (ton/yr)	2.18E-01	Less than 5 TPY

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				PTE_Tetrachloroethylene (Perchl (ton/yr)	5.50E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.18E-01	Less than 1000 lb/month
61FA	ABRP #8	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
62FA	ABRP #9	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
63FA	ABRP #10	9/1/2001	N	PTE_VOC (ton/yr)	2.41E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.01E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.14E-01	Less than 1000 lb/month
70DA	MCB MICROBLOWER/BAROBALL WELLS	8/1/1996	N	PTE_VOC (ton/yr)	1.45E-01	Less than 5 TPY
				PTE_Carbon Tetrachloride (ton/yr)	5.01E-04	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	1.14E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.45E-01	Less than 1000 lb/month

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83FA	ABRP MB/BAROBALLS (TRENCH AREA)	7/1/2002	N	PTE_VOC (ton/yr)	4.97E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	6.18E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.33E-01	Less than 1000 lb/month
271G	320 GPM AIR STRIPPER A-2 STRIPPER	2/1996 install &7/1996 operate	N	PTE_VOC (ton/yr)	4.58E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	7.19E-03	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.58E-01	Less than 1000 lb/month
349G	THE MWMF PHYTOREMEDIATION SYSTEM	7/1/2012	N	PTE_VOC (ton/yr)	6.98E-02	Less than 5 TPY
				PTE_1,4-Dioxane (ton/yr)	4.51E-02	Less than 1000 lb/month
				PTE_Chloroform (ton/yr)	2.25E-04	Less than 1000 lb/month
				PTE_Methyl Ethyl Ketone (ton/yr)	2.25E-03	Less than 1000 lb/month
				PTE_Methylene Chloride (Dichloro (ton/yr)	2.39E-04	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	3.72E-04	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.60E-03	Less than 1000 lb/month
				PTE_Vinyl Chloride (ton/yr)	4.06E-04	Less than 1000 lb/month
620M	MICROBLOWER™ WELLS MSB 67D AND MSB 68D	4/2015	N	PTE_VOC (ton/yr)	2.00E-01	Less than 5 TPY

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				PTE_Tetrachloroethylene (Perchl (ton/yr)	2.00E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.00E-01	Less than 1000 lb/month
02HA	MICROBLOWERS™ AND BAROBALLS™ LOCATED AT A-AREA BURNING RUBBLE PIT (ABRP)	5/2015	N	PTE_VOC (ton/yr)	2.99E-02	Less than 5 TPY
				PTE_Carbon Tetrachloride (ton/yr)	1.61E-04	Less than 1000 lb/month
				PTE_Chloroform (ton/yr)	8.11E-04	Less than 1000 lb/month
				PTE_Tetrachloroethylene (Perchl (ton/yr)	9.97E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	2.89E-02	Less than 1000 lb/month
03HA	19 MICROBLOWERS™ AT A-AREA MISC RUBBLE PILE	01/2017	N	PTE_VOC (ton/yr)	4.02E-02	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	7.85E-02	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	4.02E-02	Less than 1000 lb/month
621M	M AREA ABANDONED PROCESS SEWER LINE (MAPSL) MICROBLOWERS™ AND BAROBALLS™	08/2019	N	PTE_VOC (ton/yr)	1.60E+00	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	5.63E+00	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.60E+00	Less than 1000 lb/month
623M	MICROBLOWER™ AT MRS-34	06/2019	N	PTE_VOC (ton/yr)	7.94E-02	Less than 5 TPY

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				PTE_Tetrachloroethylene (Perchl (ton/yr)	5.00E-01	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	7.94E-02	Less than 1000 lb/month
622M	MICROBLOWER™ AT DUS II	06/2019	N	PTE_VOC (ton/yr)	1.17E+00	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	4.25E+00	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	1.17E+00	Less than 1000 lb/month
589M, 323G, 312G, 324G	FOUR SOIL VAPOR EXTRACTION UNITS PREVIOUSLY GROUPED UNDER EMISSION UNIT G004	07/2004	N	PTE_VOC (ton/yr)	8.38E-01	Less than 5 TPY
				PTE_Tetrachloroethylene (Perchl (ton/yr)	5.67E+00	Less than 1000 lb/month
				PTE_Trichloroethylene (ton/yr)	8.38E-01	Less than 1000 lb/month
	TANK FARM INSIGNIFICANT ACTIVITIES					
48HF	242-16F EVAPORATOR PROCESS	1/1/1960	N	PTE_VOC (ton/yr)	9.55E-02	Less than 5 TPY
028F	DIVERSION BOX #4	1/1/1978	N	PTE_VOC (ton/yr)	1.59E-02	Less than 5 TPY
140F	PUMP TANK (SUMP)	1/1/1985	N	PTE_VOC (ton/yr)	1.37E-02	Less than 5 TPY
378F	WASTE TANK 44 PURGE (FTNKE021)	1/1/1979	N	PTE_VOC (ton/yr)	1.82E-02	Less than 5 TPY
066F	WASTE TANK 45 PURGE (FTNKE022)	1/1/1979	N	PTE_VOC (ton/yr)	1.91E-02	Less than 5 TPY
117F	WASTE TANK 25 PURGE (FTNKE017)	1/1/1978	N	PTE_VOC (ton/yr)	1.96E-02	Less than 5 TPY
081F	WASTE TANK 46 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	1.85E-02	Less than 5 TPY

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353F	WASTE TANK 47 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	2.41E-02	Less than 5 TPY
49EF	OVERHEAD RECEIVER TANK	1/1/1978	N	PTE_VOC (ton/yr)	1.54E-04	Less than 5 TPY
118F	WASTE TANK 26 PURGE	1/1/1978	N	PTE_VOC (ton/yr)	2.11E-02	Less than 5 TPY
045F	WASTE TANK 27 PURGE	1/1/1978	N	PTE_VOC (ton/yr)	1.82E-02	Less than 5 TPY
149F	WASTE TANK 28 PURGE	1/1/1978	N	PTE_VOC (ton/yr)	1.88E-02	Less than 5 TPY
181F	WASTE TANK 1 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.45E-02	Less than 5 TPY
069F	WASTE TANK 2 PURGE	1/1/1953	N	PTE_VOC (ton/yr)	1.98E-02	Less than 5 TPY
183F	WASTE TANK 3 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	1.96E-02	Less than 5 TPY
092F	WASTE TANK 5 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.09E-02	Less than 5 TPY
071F	WASTE TANK 4 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	1.72E-02	Less than 5 TPY
145F	WASTE TANK 6 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.07E-02	Less than 5 TPY
125F	PUMP PIT TANK (CTS)	1/1/1990	N	PTE_VOC (ton/yr)	3.23E-02	Less than 5 TPY
041F	WASTE TANK 7 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.92E-02	Less than 5 TPY
135F	WASTE TANK 8 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.16E-02	Less than 5 TPY
358F	WASTE TANK 33 PURGE	1/1/1969	N	PTE_VOC (ton/yr)	1.46E-02	Less than 5 TPY
047F	WASTE TANK 34 PURGE	1/1/1972	N	PTE_VOC (ton/yr)	1.80E-02	Less than 5 TPY
528H	OVERHEADS RECEIVER TANK #1	1/1/1978	N	PTE_VOC (ton/yr)	3.11E-04	Less than 5 TPY
79DH	OVERHEADS RECEIVER TANK # 2	1/1/1978	N	PTE_VOC (ton/yr)	5.99E-04	Less than 5 TPY

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52DH	242-16H EVAPORATOR PROCESS	1/1/1978	N	PTE_VOC (ton/yr)	9.83E-02	Less than 5 TPY
99BH	STAINLESS STEEL WASTE TRANSFER TANK #7	1/1/1985	N	PTE_VOC (ton/yr)	1.45E-02	Less than 5 TPY
32FH	H-AREA DIVERSION BOX #8	1/1/1985	N	PTE_VOC (ton/yr)	8.40E-01	Less than 5 TPY
548H	PUMP TANK 5	1/1/1980	N	PTE_VOC (ton/yr)	2.45E-02	Less than 5 TPY
34BH	EVAPORATOR CELL	1/1/1991	N	PTE_VOC (ton/yr)	1.94E-01	Less than 5 TPY
54DH	242-25H ENCLOSURE BUILDING	1/1/1994	N	PTE_VOC (ton/yr)	5.18E-04	Less than 5 TPY
370H	WASTE TANK 21 PURGE	1/1/1958	N	PTE_VOC (ton/yr)	4.52E-02	Less than 5 TPY
365H	WASTE TANK 22 PURGE	1/1/1962	N	PTE_VOC (ton/yr)	4.52E-02	Less than 5 TPY
371H	WASTE TANK 23 PURGE	1/1/1962	N	PTE_VOC (ton/yr)	2.41E-02	Less than 5 TPY
391H	WASTE TANK 24 PURGE	1/1/1962	N	PTE_VOC (ton/yr)	1.36E-02	Less than 5 TPY
393H	WASTE TANK 29 PURGE	1/1/1970	N	PTE_VOC (ton/yr)	1.81E-02	Less than 5 TPY
399H	WASTE TANK 30 PURGE	1/1/1970	N	PTE_VOC (ton/yr)	1.24E-02	Less than 5 TPY
401H	WASTE TANK 31 PURGE	1/1/1970	N	PTE_VOC (ton/yr)	1.34E-02	Less than 5 TPY
404H	WASTE TANK 32 PURGE	1/1/1970	N	PTE_VOC (ton/yr)	1.22E-02	Less than 5 TPY
405H	WASTE TANK 35 PURGE	1/1/1976	N	PTE_VOC (ton/yr)	2.19E-02	Less than 5 TPY
406H	WASTE TANK 36 PURGE	1/1/1977	N	PTE_VOC (ton/yr)	2.14E-02	Less than 5 TPY
407H	WASTE TANK 37 PURGE	1/1/1977	N	PTE_VOC (ton/yr)	2.25E-02	Less than 5 TPY
336H	WASTE TANK 38 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	1.92E-02	Less than 5 TPY

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340H	WASTE TANK 39 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	1.60E-02	Less than 5 TPY
347H	WASTE TANK 40 PURGE	1/1/1980	N	PTE_VOC (ton/yr)	1.82E-02	Less than 5 TPY
354H	WASTE TANK 41 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	1.85E-02	Less than 5 TPY
356H	WASTE TANK 42 PURGE	1/1/1980	N	PTE_VOC (ton/yr)	2.44E-02	Less than 5 TPY
357H	WASTE TANK 43 PURGE	1/1/1979	N	PTE_VOC (ton/yr)	1.77E-02	Less than 5 TPY
66FH	WASTE STORAGE TANK 48	1/1/1981	N	PTE_VOC (ton/yr)	5.81E-02	Less than 5 TPY
65FH	TK 49 PURGE	1/1/1983	N	PTE_VOC (ton/yr)	5.81E-02	Less than 5 TPY
361H	WASTE STORAGE TANK 50	1/1/1981	N	PTE_VOC (ton/yr)	1.60E-02	Less than 5 TPY
362H	WASTE TANK 51 PURGE	1/1/1981	N	PTE_VOC (ton/yr)	1.98E-02	Less than 5 TPY
337H	WASTE TANK 9 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.16E-02	Less than 5 TPY
338H	WASTE TANK 10 PURGE	1/1/1952	N	PTE_VOC (ton/yr)	2.16E-02	Less than 5 TPY
368H	WASTE TANK 11 PURGE	1/1/1953	N	PTE_VOC (ton/yr)	1.51E-02	Less than 5 TPY
409H	WASTE TANK 12 PURGE	1/1/1953	N	PTE_VOC (ton/yr)	2.02E-02	Less than 5 TPY
364H	WASTE TANK 13 PURGE	1/1/1956	N	PTE_VOC (ton/yr)	1.27E-02	Less than 5 TPY
410H	WASTE TANK 14 PURGE	1/1/1956	N	PTE_VOC (ton/yr)	1.83E-02	Less than 5 TPY
422H	WASTE TANK 15 PURGE	1/1/1956	N	PTE_VOC (ton/yr)	2.36E-02	Less than 5 TPY
48EF	OVERHEAD RECEIVER TANK	1/1/1978	N	PTE_VOC (ton/yr)	1.54E-04	Less than 5 TPY
	FUEL DISPENSING INSIGNIFICANT ACTIVITIES					

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024B	HELIPORT FUEL DISPENSING 703-5B	1/1/1985	N	PTE_VOC (ton/yr)	1.28E+00	Less than 5 TPY
				PTE_Benzene (ton/yr)	5.98E-02	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	1.79E-01	Less than 1000 lb/month
				PTE_Hexane (ton/yr)	1.21E-01	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	5.62E-01	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	3.63E-01	Less than 1000 lb/month
714A	FUGITIVE EMISSION FUEL DISPENSING FACILITY GASOLINE 715-A	1/1/1954	N	PTE_VOC (ton/yr)	1.60E+00	Less than 5 TPY
				PTE_Benzene (ton/yr)	4.44E-01	Less than 1000 lb/month
546A	DIESEL FUEL DISPENSING STATION FUGITIVE EMISSIONS 715-A	1/1/1985	N	PTE_VOC (ton/yr)	1.54E+00	Less than 5 TPY
				PTE_Benzene (ton/yr)	1.97E-02	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	3.82E-02	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.71E-01	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	6.75E-01	Less than 1000 lb/month
021G	FUTITIVE EMISSIONS GASOLINE FUEL DISPENSING STATION 715-1G	1/1/1985	N	PTE_VOC (ton/yr)	5.32E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	1.48E-01	Less than 1000 lb/month
138G	GASOLINE FUEL DISPENSING STATION 715-2G	3/1/1989	N	PTE_VOC (ton/yr)	5.32E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	1.48E-01	Less than 1000 lb/month

1. Insig. Act. (IA) DHEC Unit ID:	2. Insignificant Activity Unit ID Description	3. Const. Permit or App. Date (if applic.):	4. On SC Insignificant Activity List (Y or N)	5. Pollutant(s)	6. Emission Rate (Uncontrolled)	7. Demin. Rate
187G	DIESEL FUEL DISPENSING STATION 620-G	2/1/1995	N	PTE_VOC (ton/yr)	1.34E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	1.71E-03	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	3.31E-03	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	2.35E-02	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	5.86E-02	Less than 1000 lb/month
188G	GASOLINE DISPENSING STATION 620-G	2/1/1995	N	PTE_VOC (ton/yr)	2.66E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	7.40E-02	Less than 1000 lb/month
128K	GASOLINE FUEL DISPENSING STATION FUGITIVE EMISSIONS 715-K	9/1/1980	N	PTE_VOC (ton/yr)	2.66E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	7.40E-02	Less than 1000 lb/month
138L	GASOLINE FUEL DISPENSING STATION FUGITIVE EMISSIONS 715-L	1/1/1985	N	PTE_VOC (ton/yr)	2.66E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	7.40E-02	Less than 1000 lb/month
082N	DIESEL FUEL DISPENSING STATION FUGITIVE EMISSIONS 715-N	1/1/1985	N	PTE_VOC (ton/yr)	3.09E+00	Less than 5 TPY
				PTE_Benzene (ton/yr)	3.93E-02	Less than 1000 lb/month
				PTE_Ethylbenzene (ton/yr)	7.63E-02	Less than 1000 lb/month
				PTE_Toluene (ton/yr)	5.41E-01	Less than 1000 lb/month
				PTE_Xylene (m-) (ton/yr)	1.35E+00	Less than 1000 lb/month

1. Insig. Act. (IA) DHEC Unit ID:	2. Insignificant Activity Unit ID Description	3. Const. Permit or App. Date (if applic.):	4. On SC Insignificant Activity List (Y or N)	5. Pollutant(s)	6. Emission Rate (Uncontrolled)	7. Demin. Rate
096N	FUGITIVE EMISSIONS GASOLINE DISPENSING STATION 715-N	1/1/1985	N	PTE_VOC (ton/yr)	5.32E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	1.48E-01	Less than 1000 lb/month
82GA	ETHANOL DISPENSING STATION 715-A	1/1/2011	N	PTE_VOC (ton/yr)	1.28E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	3.56E-03	Less than 1000 lb/month
344G	ETHANOL DISPENSING STATION 715-2G	1/1/2011	N	PTE_VOC (ton/yr)	1.28E-01	Less than 5 TPY
				PTE_Benzene (ton/yr)	3.56E-03	Less than 1000 lb/month

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Stack/Vent Information – Form H
Bureau of Air Quality

SRNS-J2000-2019-00240

STACK/VENT INFORMATION							
1. Exhaust Point ID	2. Emission/ SCDHEC Equipment ID	3. Stack Height (ft)	4. Stack Diameter (ft)	5. Stack Gas Exit Temp (degrees F)	6.Stack Gas Exhaust Velocity (ft/sec)	7. Non-Vertical Discharge (H) or Raincap (R)	8. Vertical component of Stack Exhaust Velocity (ft/sec)
A G P 0007	A-005: 794A	16	0.5	ambient	32.5	H	0.00328
A P F 0002	A-013 66GA	50	3	350	0.00328	R	0.00328
A P F 0003	A-014 67GA	45	2.5	458	47		47
B Q H 0001	B-005: 161B B-004: 159B B-003: 112B	33	2.2	500	0.00328	R	0.00328
H S P 0002	H-001: 01DH, 02DH, 03DH, 04DH, 05DH, 06DH, 07DH, 08DH, 09DH, 10DH, 12DH, 13DH, 20DH, 24DH, 26DH, S7DH, 28DH, 29DH, 30DH, 31DH, 32DH, 33DH, 34DH, 99CH	200	10	78	59.6		59.6
H S T 0036	H-015: 770H, 772H, 773H, 774H	0.5	0.33	ambient	0.00328	H	0.00328
M E P 2303	529M	63	0.995	65	0.00328	R	0.00328
N B J 0028	N-001: 370N	6	NA	NA	NA	NA	NA

Form H

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Title V Permit Application
Stack/Vent Information – Form H
Bureau of Air Quality

STACK/VENT INFORMATION							
1. Exhaust Point ID	2. Emission/ SCDHEC Equipment ID	3. Stack Height (ft)	4. Stack Diameter (ft)	5. Stack Gas Exit Temp (degrees F)	6.Stack Gas Exhaust Velocity (ft/sec)	7. Non-Vertical Discharge (H) or Raincap (R)	8. Vertical component of Stack Exhaust Velocity (ft/sec)
S D P 0007	S-001: 266S, 267S, 270S, 275S, 264S, 256S, 278S, 488S, 388S	147	5	80	85		85
S D P 0001	S-001 176S, 177S, 178S	11.5	3	ambient	33		33
S D P 0009	S-001 121S, 111S, 109S, 108S, 107S, 106S, 105S, 103S, 102S, 101S, 100S, 098S	144	8	80	45		45
S D P 0019	S-001 132S, 131S, 129S, 128S	27.5	0.33	ambient	0.00328	H	0.00328
Z D P 0071	Z-001: 052Z	75	0.886	ambient	0.00328	H	0.00328
Z D P 0072	Z-001: 075Z	46	1.214	ambient	0.00328	H	0.00328
Z D P 0088	Z-001: 069Z	36	1.214	ambient	0.00328	H	0.00328
Z D P 0089	Z-001: 074Z	36	1.214	ambient	0.00328	H	0.00328
Z D T 0001	Z-001: 071Z, 072Z, 073Z	109	0.919	ambient	0.00328	H	0.00328
Z D T 0002	Z-001: 076Z	109	0.64	ambient	0.00328	H	0.00328
Z D P 0091	Z-001: 091Z	42	2	ambient	32.5		32.5

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

SRNS-J2000-2019-00240

STACK/VENT INFORMATION (CONTINUED)							
1. Exhaust Point ID	9. UTM East	10. UTM North	11. Distance to Plant Boundary	12. Dimensions of Plume Obstructing Structure (ft)			13. Date last modeled (if Applicable)
				Height	Length	Width	
A G P 0007	431532.472	3689063.711	4318.013	30	132	62	04/05/2010 1/23/2014
A P F 0002	431530.377	3689174.302	4571.136	35	168	61	04/09/09 04/05/2010 1/23/2014
A P F 0003	431556.316	3689181.124	4589.934	40	68	35	04/09/09 04/05/2010 1/23/2014
B Q H 0001	431835.957	3682912.123	13698.55	22	144	122	04/09/09 04/05/2010 1/23/2014
H S P 0002	440464.949	3683436.787	37807.031	50	820	122	04/05/2010 1/23/2014
H S T 0036	440286.622	3683534.049	37806.849	50	820	122	01/01/1953 04/05/2010 1/23/2014
M E P 2303	431270.374	3688783.33	5428.057				
N B J 0028	439333.76	3679029.08	37177.733	NA	NA	NA	04/05/2010 1/23/2014
S D P 0007	440288.048	3684004.718	35857.466	125	465	164	04/05/2010 1/23/2014
S D P 0001	440567.647	3683857.234	36565.07				
S D P 0009	440450.483	3684122.774	35622.45				
S D P 0019	440501.371	3684146.063	35594.37				
Z D P 0071	440335.491	3685110.193	32404.969	74	96	96	04/05/2010 1/23/2014
Z D P 0072	440272.302	3685070.543	32473.364	10	18	12	04/05/2010 1/23/2014
Z D P 0088	440276.141	3685072.642	32468.503	10	18	12	04/05/2010 1/23/2014
Z D P 0089	440276.456	3685069.103	32479.944	10	18	12	04/05/2010 1/23/2014
Z D T 0001	440279.146	3685065.407	32494.044	10	18	12	04/05/2010 1/23/2014

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Stack/Vent Information (Continued)							
1. Exhaust Point ID	9. UTM East	10. UTM North	11. Distance to Plant Boundary	12. Dimensions of Plume Obstructing Structure (ft)			13. Date last modeled (if Applicable)
				Height	Length	Width	
Z D T 0002	440273.876	3685076.27	32455.005	10	18	12	04/05/2010 1/23/2014
Z D P 0091	440339.25	3685121.60	32371.97				

SRNS-J2000-2019-00240

Title V Permit Application
Permit Shield – Form K
Bureau of Air Quality

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS (NAAQS)	40 CFR 50	Y	D	
REQUIREMENTS FOR PREPARATION, ADOPTION AND SUBMITTAL OF IMPLEMENTATION PLANS	40 CFR 51	N	J	Applicable to States
APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS	40 CFR 52	N	J	Applicable to States
AMBIENT AIR MONITORING REFERENCE AND EQUIVALENT METHODS	40 CFR 53	N	A	
PRIOR NOTICE OF CITIZENS SUITS	40 CFR 54	N	J	Applicable to citizens, the EPA and States initiating civil actions.
OUTER CONTINENTAL SHELF AIR REGULATIONS	40 CFR 55	N	A	
REGIONAL CONSISTENCY	40 CFR 56	N	J	Applicable to States
PRIMARY NONFERROUS SMELTER ORDERS	40 CFR 57	N	A	
AMIBIENT AIR QUALITY SURVEILLANCE	40 CFR 58	N	J	Applicable to States
NATIONAL VOLATILE ORGANIC COMPOUND EMISSION STANDARDS FOR CONSUMER AND COMMERCIAL PRODUCTS	40 CFR 59	N	A	
STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES (NSPS)	40 CFR 60	Y	I	
GENERAL PROVISIONS	40 CFR 60, SUBPART A	Y	I	
STANDARDS OF PERFORMANCE FOR STEEL PLANTS: ELECTRIC ARC FURNACES CONSTRUCTED AFTER OCTOBER 21, 1974, AND ON OR BEFORE AUGUST 17, 1983	40 CFR 60, SUBPART AA	N	B	
STANDARDS OF PERFORMANCE FOR STEEL PLANTS: ELECTRIC ARC FURNACES AND ARGON-OXYGEN DECARBURIZATION VESSELS CONSTRUCTED AFTER AUGUST 7, 1983	40 CFR 60, SUBPART AA (a)	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS	40 CFR 60, SUBPART AAA	N	B	
STANDARDS OF PERFORMANCE FOR SMALL MUNICIPAL WASTE COMBUSTION UNITS FOR WHICH CONSTRUCTION IS COMMENCED AFTER AUGUST 30,1999 OR FOR WHICH MODIFICATION OR RECONSTRUCTION IS COMMENCED AFTER JUNE 6, 2001	40 CFR 60, SUBPART AAAA	N	B	
ADOPTION AND SUBMITTAL OF STATE PLANS FOR DESIGNATED FACILITIES	40 CFR 60, SUBPART B	N	J	Applicable to States
ADOPTION AND SUBMITTAL OF STATE PLANS FOR DESIGNATED FACILITIES	40 CFR, SUBPART B (a)	N	J	Applicable to States
STANDARDS OF PERFORMANCE FOR KRAFT PULP MILLS	40 CFR 60, SUBPART BB	N	B	
STANDARDS OF PERFORMANCE FOR KRAFT PULP MILLS	40 CFR 60, SUBPART BB (a)	N	B	
STANDARDS OF PERFORMANCE FOR THE RUBBER TIRE MANUFACTURING INDUSTRY	40 CFR 60, SUBPART BBB	N	B	
EMISSION GUIDELINES AND COMPLIANCE TIMES FOR SMALL MUNICIPAL WASTER COMBUSTION UNITS CONSTRUCTED ON OR BEFORE AUGUST 30, 1999	40 CFR 60, SUBPART BBBB	N	B	
EMISSION GUIDELINES AND COMPLIANCE TIMES	40 CFR 60, SUBPART C	N	B	
STANDARDS OF PERFORMANCE RESERVED	40 CFR 60, SUBPART C (a)	N	J	No regulation assigned to this Subpart
EMISSIONS GUIDELINES AND COMPLIANCE TIMES FOR LARGE MUNICIPAL WASTE COMBUSTORS THAT ARE CONSTRUCTED ON OR BEFORE SEPTEMBER 20, 1994	40 CFR 60, SUBPART C (b)	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
EMISSION GUIDLINES AND COMPLIANCE TIMES FOR MUNICIPAL SOLID WASTE LANDFILLS	40 CFR 60, SUBPART C (c)	N	B	
EMISSION GUIDELINES AND COMPLIANCE TIMES FOR SULFURIC ACID PRODUCTION UNITS	40 CFR 60, SUBPART C (d)	N	B	
EMISSION GUIDLINES AND COMPLIANCE TIMES FOR HOSPITAL/MEDICAL/INFECTIOUS WASTE INCINERATORS	40 CFR 60, SUBPART C (e)	N	B	
EMISSION GUIDELINES AND COMPLIANCE TIMES FOR MUNICIPAL SOLID WASTE LANDFILLS	40 CFR 60, SUBPART C (f)	N	B	
STANDARDS OF PERFORMANCE FOR GLASS MANUFACTURING PLANTS	40 CFR 60, SUBPART CC	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART CCC	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR COMMERCIAL AND INDUSTRIAL SOLID WASTE INCINERATION UNITS FOR WHICH CONSTRUCTION IS COMMENCED AFTER NOVEMBER 30, 1999 OR FOR WHICH MODIFICATION OR RECONSTRUCTION IS COMMENCED ON OR AFTER JUNE 1, 2001	40 CFR 60, SUBPART CCCC	N	B	
STANDARDS OF PERFORMANCE FOR FOSSIL-FUEL FIRED STEAM GENERATORS FOR WHICH CONSTRUCTION IS COMMENCED AFTER AUGUST 17, 1971	40 CFR 60, SUBPART D	N	B	
STANDARDS OF PERFORMANCE FOR ELECTRIC UTILITY STEAM GENERATING UNITS FOR WHICH CONSTRUCTION IS COMMENCED AFTER SEPTEMBER 18, 1978	40 CFR 60, SUBPART D (a)	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	40 CFR 60, SUBPART D (b)	N	B	
STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS	40 CFR 60, SUBPART D (c)	Y	I	
STANDARDS OF PERFORMANCE FOR GRAIN ELEVATORS	40 CFR 60, SUBPART DD	N	B	
STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM THE POLYMER MANUFACTURING INDUSTRY	40 CFR 60, SUBPART DDD	N	B	
EMISSION GUIDLINES AND COMPLIANCE TIMES FOR COMMERCIAL AND INDUSTRIAL SOLID WASTE INCINERATION UNITS THAT COMMENCED CONSTRUCTION ON OR BEFORE NOVEMBER 30, 1999	40 CFR 60, SUBPART DDDD	N	B	
STANDARDS OF PERFORMANCE FOR INCINERATORS	40 CFR 60, SUBPART E	N	B	
STANDARDS OF PERFORMANCE FOR MUNICIPAL WASTE COMBUSTORS FOR WHICH CONSTRUCTION IS COMMENCED AFTER DECEMBER 20, 1989 AND ON OR BEFORE SEPTEMBER 20, 1994	40 CFR 60, SUBPART E (a)	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR LARGE MUNICIPAL WASTE COMBUSTORS FOR WHICH CONSTRUCTION IS COMMENCED AFTER SEPTEMBER 20, 1994 OR FOR WHICH MODIFICATION OR RECONSTRUCTION IS COMMENCED AFTER JUNE 19, 1996	40 CFR 60, SUBPART E (b)	N	B	
STANDARDS OF PERFORMANCE FOR HOSPITAL/MEDICAL/INFECTIOUS WASTE INCINERATORS FOR WHICH CONSTRUCTION IS COMMENCED AFTER JUNE 20, 1996	40 CFR 60, SUBPART E (c)	N	B	
STANDARDS OF PERFORMANCE FOR SURFACE COATING OF METAL FURNITURE	40 CFR 60, SUBPART EE	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART EEE	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR OTHER SOLID WASTE INCINERATION UNITS FOR WHICH CONSTRUCTION IS COMMENCED AFTER DECEMBER 9, 2004 OR FOR WHICH MODIFICATION OR RECONSTRUCTION IS COMMENCED ON OR AFTER JUNE 16, 2006	40 CFR 60, SUBPART EEEE	N	B	
STANDARDS OF PERFORMANCE FOR PORTLAND CEMENT PLANTS	40 CFR 60, SUBPART F	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART FF	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR FLEXIBLE VINYL AND URETHANE COATING AND PRINTING	40 CFR 60, SUBPART FFF	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
EMISSION GUIDLINES AND COMPLIANCE TIMES FOR OTHER SOLID WASTE INCINERATION UNITS THAT COMMENCED CONSTRUCTION ON OR BEFORE DECEMBER 9, 2004	40 CFR 60, SUBPART FFFF	N	B	
STANDARDS OF PERFORMANCE FOR NITRIC ACID PLANTS	40 CFR 60, SUBPART G	N	B	
STANDARDS OF PERFORMANCE FOR NITRIC ACID PLANTS FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER OCTOBER 14, 2011	40 CFR 60, SUBPART G (a)	N	B	
STANDARDS OF PERFORMANCE FOR STATIONARY GAS TURBINES	40 CFR 60, SUBPART GG	N	B	
STANDARDS OF PERFORMANCE FOR EQUIPMENT LEAKS OF VOC IN PETROLEUM REFINERIES FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER JANUARY 4, 1983 AND ON OR BEFORE NOVEMBER 7, 2006.	40 CFR 60, SUBPART GGG	N	B	
STANDARDS OF PERFORMANCE FOR EQUIPMENT LEAKS OF VOC IN PETROLEUM REFINERIES FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER NOVEMBER 7, 2006	40 CFR 60, SUBPART GGG (a)	N	B	
STARNDARDS OF PERFORMANCE – RESERVED	40 CFR 60, SUBPART GGGG	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR SULFURIC ACID PLANTS	40 CFR 60, SUBPART H	N	B	
STANDARDS OF PERFORMANCE FOR LIME MANUFACTURING PLANTS	40 CFR 60, SUBPART HH	N	B	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
STANDARDS OF PERFORMANCE FOR SYNTHETIC FIBER PRODUCTION FACILITIES	40 CFR 60, SUBPART HHH	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART HHHH	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR HOT MIX ASPHALT FACILITIES	40 CFR 60, SUBPART I	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART II	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM THE SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY (SOCMI) AIR OXIDATION UNIT PROCESSES	40 CFR 60, SUBPART III	N	B	
STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES	40 CFR 60, SUBPART IIII	Y	D	
STANDARDS OF PERFORMANCE FOR PETROLEUM REFINERIES	40 CFR 60, SUBPART J	N	B	
STANDARDS OF PERFORMANCE FOR PETROLEUM REFINERIES FOR WHICH CONSTRUCTION, RECONSTRUCTION OR MODIFICATION COMMENCED AFTER MAY 14, 2007	40 CFR 60, SUBPART J (a)	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART JJ	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR PETROLEUM DRY CLEANERS	40 CFR 60, SUBPART JJJ	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR STATIONARY SPARK IGNITION INTERNAL COMBUSTION ENGINES	40 CFR 60, SUBPART JJJJ	Y	D	
STANDARDS OF PERFORMANCE FOR STORAGE VESSELS FOR PETROLEM LIQUIDS FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER JUNE 11, 1973 AND PRIOR TO MAY 19, 1978	40 CFR 60, SUBPART K	N	B	
STANDARDS OF PERFORMANCE FORSTORAGE VESSELS FOR PETROLEM LIQUIDS FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER MAY 18, 1978 AND PRIOR TO JULY 23, 1984	40 CFR 60, SUBPART K (a)	N	B	
STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC LIQUID STORAGE VESSELS (INCLUDING PETROLEUM LIQUID STORAGE VESSELS) FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER JULY 23, 1984	40 CFR 60, SUBPART K (b)	N	B	
STANDARDS OF PERFORMANCE FOR LEAD-ACID BATTERY MANUFACTURING PLANTS	40 CFR 60, SUBPART KK	N	B	
STANDARDS OF PERFORMANCE FOR EQUIPMENT LEAKS OF VOC FROM ONSHORE NATURAL GAS PROCESSING PLANTS	40 CFR 60, SUBPART KKK	N	B	
STANDARDS OF PERFORMANCE FOR STATIONARY COMBUSTION TURBINES	40 CFR 60, SUBPART KKKK	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR SECONDARY LEAD SMELTERS	40 CFR 60, SUBPART L	N	B	
STANDARDS OF PERFORMANCE FOR METALLIC MINERAL PROCESSING PLANTS	40 CFR 60, SUBPART LL	N	B	
STANDARDS OF PERFORMANCE FOR ONSHORE NATURAL GAS PROCESSING: SO2 EMISSIONS	40 CFR 60, SUBPART LLL	N	B	
STANDARDS OF PERFORMANCE FOR NEW SLUDGE INCINERATION UNITS	40 CFR 60, SUBPART LLLL	N	B	
STANDARDS OF PERFORMANCE FOR SECONDARY BRASS AND BRONZE PRODUCTION PLANTS	40 CFR 60, SUBPART M	N	B	
STANDARDS OF PERFORMANCE FOR AUTOMOBILE AND LIGHT-DUTY TRUCK SURFACE COATING OPERATIONS	40 CFR 60, SUBPART MM	N	B	
STANDARDS OF PERFORMANCE - RESERVE	40 CFR 60, SUBPART MMM	N	J	No regulation assigned to this Subpart
EMISSION GUIDELINES AND COMPLIANCE TIMES FOR EXISTING SEWAGE SLUDGE INCINERATION UNITS	40 CFR 60, SUBPART MMMM	N	B	
STANDARDS OF PERFORMANCE FOR PRIMARY EMISSIONS FROM BASIC OXYGEN PROCESS FURNACES FOR WHICH CONSTRUCTION IS COMMENCED AFTER JUNE 11, 1973	40 CFR 60, SUBPART N	N	B	
STANDARDS OF PERFORMANCE FOR SECONDARY EMISSIONS FROM BASIC OXYGEN PROCESS STEELMAKING FACILITIES FOR WHICH CONSTRUCTION IS COMMENCED AFTER JANUARY 20, 1983	40 CFR 60, SUBPART N (a)	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR PHOSPHATE ROCK PLANTS	40 CFR 60, SUBPART NN	N	B	
STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS ROM SYNTHETIC ORGANIC CHEMCIAL MANUFACTURING INDUSTRY (SOCMI) DISTILLATION OPERATIONS	40 CFR 60, SUBPART NNN	N	B	
STANDARDS OF PERFORMANCE FOR SEWAGE TREATMENT PLANTS	40 CFR 60, SUBPART O	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART OO	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR NONMETALLIC MINERAL PROCESSING PLANTS	40 CFR 60, SUBPART OOO	N	B	
STANDARDS OF PERFORMANCE FOR CRUDE OIL AND NATURAL GAS PRODUCTION, TRANSMISSION AND DISTRIBUTION FOR WHICH CONSTRUCTION, MODIFICATION OR RECONSTRUCTION COMMNECED AFTER AUGUST 23, 2011, AND ON OR BEFORE SEPTEMBER 18, 2015	40 CFR 60, SUBPART OOOO	N	B	
STANDARDS OF PERFORMANCE FOR CRUDE OIL AND NATURAL GAS PRODUCTION, TRANSMISSION AND DISTRIBUTION FOR WHICH CONSTRUCTION, MODIFICATION OR RECONSTRUCTION COMMNECED AFTER SEPTEMBER 18, 2015	40 CFR 60, SUBPART OOOO (a)	N	B	
STANDARDS OF PERFORMANCE FOR PRIMARY COPPER SMELTERS	40 CFR 60, SUBPART P	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR AMMONIUM SULFATE MANUFACTURE FACILITIES	40 CFR 60, SUBPART PP	N	B	
STANDARDS OF PERFORMANCE FOR WOOL FIBERGLASS INSULATION MANUFACTURING PLANTS	40 CFR 60, SUBPART PPP	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART PPPP	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR PRIMARY ZINC SMELTERS	40 CFR 60, SUBPART Q	N	B	
STANDARDS OF PERFORMANCE FOR THE GRAPHIC ARTS INDUSTRY: PUBLICATION ROTOGRAVURE PRINTING	40 CFR 60, SUBPART QQ	N	B	
STANDARDS OF PERFORMANCE FOR VOC EMISSIONS FROM PETROLEUM REFINERY WASTEWATER SYSTEMS	40 CFR 60, SUBPART QQQ	N	B	
STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES	40 CFR 60, SUBPART QQQQ	N	B	
STANDARDS OF PERFORMANCE FOR PRIMARY LEAD SMELTERS	40 CFR 60, SUBPART R	N	B	
STANDARDS OF PERFORMANCE FOR PRESSURE SENSITIVE TAPE AND LABEL SURFACE COATING OPERATIONS	40 CFR 60, SUBPART RR	N	B	
STANDARDS OF PERFORMANCE FOR VOLATILE ORGANIC COMPOUND EMISSIONS FROM SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY (SOCMI) REACTOR PROCESSES	40 CFR 60, SUBPART RRR	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART RRRR	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR PRIMARY ALUMINUM REDUCTION PLANTS	40 CFR 60, SUBPART S	N	B	
STANDARDS OF PERFORMANCE FOR INDUSTRIAL SURFACE COATING: LARGE APPLIANCES	40 CFR 60, SUBPART SS	N	B	
STANDARDS OF PERFORMANCE FOR MAGNETIC TAPE COATING FACILITIES	40 CFR 60, SUBPART SSS	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART SSSS	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR THE PHOSPHATE FERTILIZER INDUSTRY: WET-PROCESS PHOSPHORIC ACID PLANTS	40 CFR 60, SUBPART T	N	B	
STANDARDS OF PERFORMANCE FOR METAL COIL SURFACE COATING	40 CFR 60, SUBPART TT	N	B	
STANDARDS OF PERFORMANCE FOR INDUSTRIAL SURFACE COATING: SURFACE COATING OF PLASTIC PARTS FOR BUSINESS MACHINES	40 CFR 60, SUBPART TTT	N	B	
STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FOR ELECTRIC GENERATING UNITS	40 CFR 60, SUBPART TTTT	N	B	
STANDARDS OF PERFORMANCE FOR THE PHOSPHATE FERTILIZER INDUSTRY: SUPERPHOSPHORIC ACID PLANTS	40 CFR 60, SUBPART U	N	B	
STANDARDS OF PERFORMANCE FOR ASPHALT PROCESSING AND ASPHALT ROOFING MANUFACTURE	40 CFR 60, SUBPART UU	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR CALCINERS AND DRYERS IN MINERAL INDUSTRIES	40 CFR 60, SUBPART UUU	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART UUUU	N	J	No regulation assigned to this Subpart
EMISSION GUIDELINES FOR GREENHOUSE GAS EMISSIONS FROM EXISTING ELECTRIC UTILITY GENERATING UNITS	40 CFR 60, SUBPART UUUU (a)	N	B	
STANDARDS OF PERFORMANCE FOR THE PHOSPHATE FERTILIZER INDUSTRY: DIAMMONIUM PHOSPHATE PLANTS	40 CFR 60, SUBPART V	N	B	
STANDARDS OF PERFORMANCE FOR EQUIPMENT LEAKS OF VOC IN THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER JANUARY 5, 1981 AND ON OR BEFORE NOVEMBER 7, 2006	40 CFR 60, SUBPART VV	N	B	
STANDARDS OF PERFORMANCE FOR EQUIPMENT LEAKS OF VOC IN THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURING INDUSTRY FOR WHICH CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION COMMENCED AFTER NOVEMBER 7, 2006	40 CFR 60, SUBPART VV (a)	N	B	
STANDARDS OF PERFORMANCE FOR POLYMERIC COATING OF SUPPORTING SUBSTRATES FACILITIES	40 CFR 60, SUBPART VVV	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE FOR THE PHOSPHATE FERTILZER INDUSTRIES: TRIPLE SUPERPHOSPHATE PLANTS	40 CFR 60, SUBPART W	N	B	
STANDARDS OF PERFORMANCE FOR THE BEVERAGE CAN SURFACE COATING INDUSTRY	40 CFR 60, SUBPART WW	N	B	
STANDARDS OF PERFORMANCE FROM MUNICIPAL SOLID WASTE LANDFILLS	40 CFR 60, SUBPART WWW	N	B	
STANDARDS OF PERFORMANCE FOR THE PHOSPHATE FERTILZER INDUSTRY: GRANULAR TRIPLE SUPERPHOSPHATE STORAGE FACILITIES	40 CFR 60, SUBPART X	N	B	
STANDARDS OF PERFORMANCE FOR BULK GASOLINE TERMINALS	40 CFR 60, SUBPART XX	N	B	
STANDARDS OF PERFORMANCE FOR MUNICIPAL SOLID WASTE LANDFILLS THAT COMMENCED CONSTRUCTION, RECONSTRUCTION, OR MODIFICATION AFTER JULY 17, 2014	40 CFR 60, SUBPART XXX	N	B	
STANDARDS OF PERFORMANCE FOR COAL PREPARTION PLANTS	40 CFR 60, SUBPART Y	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART YY	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART YYY	N	J	No regulation assigned to this Subpart
STANDARDS OF PERFORMANCE FOR FERROALLOY PRODUCTION FACILITIES	40 CFR 60, SUBPART Z	N	B	
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART ZZ	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
STANDARDS OF PERFORMANCE - RESERVED	40 CFR 60, SUBPART ZZZ	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS	40 CFR 61	Y	I	
GENERAL PROVISIONS	40 CFR 61, SUBPART A	Y	I	
RESERVED	40 CFR 61, SUBPART AA	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR RADON EMISSIONS FROM UNDERGROUND URANIUM MINES	40 CFR 61, SUBPART B	N	B	
NATIONAL EMISSION STANDARDS FOR BENZENE EMISSIONS FROM BENZENE TRANSFER OPERATIONS	40 CFR 61, SUBPART BB	N	B	
NATIONAL EMISSION STANDARDS FOR BERYLLIUM	40 CFR 61, SUBPART C	N	B	
RESERVED	40 CFR 61, SUBPART CC	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR BERYLLIUM ROCKET MOTOR FIRING	40 CFR 61, SUBPART D	N	B	
RESERVED	40 CFR 61, SUBPART DD	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR MERCURY	40 CFR 61, SUBPART E	N	B	
RESERVED	40 CFR 61, SUBPART EE	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR VINYL CHLORIDE	40 CFR 61, SUBPART F	N	B	
NATIONAL EMISSION STANDARDS FOR BENZENE WASTE OPERATIONS	40 CFR 61, SUBPART FF	N	B	
RESERVED	40 CFR 61, SUBPART G	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR EMISSIONS OF RADIONUCLIDES OTHER THAN RADON FROM DEPARTMENT OF ENERGY FACILITIES	40 CFR 61, SUBPART H	Y	I	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR RADIONUCLIDES EMISSIONS FROM FEDERAL FACILITIES OTHER THAN NUCLEAR REGULATORY COMMISSION LICENSEES AND NOT COVERED BY SUBPART H	40 CFR 61, SUBPART I	N	B	
NATIONAL EMISSION STANDARDS FOR EQUIPMENT LEAKS (FUGITIVE EMISSION SOURCES) OF BENZENE	40 CFR 61, SUBPART J	N	B	
NATIONAL EMISSION STANDARDS FOR RADIONUCLIDE EMISSIONS FROM ELEMENTAL PHOSPHORUS PLANTS	40 CFR 61, SUBPART K	N	B	
NATIONAL EMISSION STANDARDS FOR BENZENE EMISSIONS FROM COKE BY-PRODUCT RECOVERY PLANTS	40 CFR 61, SUBPART L	N	B	
NATIONAL EMISSION STANDARDS FOR ASBESTOS	40 CFR 61, SUBPART M	Y	I	
NATIONAL EMISSION STANDARDS FOR INORGANIC ARSENIC EMISSIONS FROM GLASS MANUFACTURING PLANTS	40 CFR 61, SUBPART N	N	B	
NATIONAL EMISSION STANDARDS FOR INORGANIC ARSENIC EMISSIONS FROM PRIMARY COPPER SMELTERS	40 CFR 61, SUBPART O	N	B	
NATIONAL EMISSION STANDARDS FOR INORGANIC ARSENIC EMISSIONS FROM ARSENIC TRIOXIDE AND METALLIC ARSENIC PRODUCTION FACILITIES	40 CFR 61, SUBPART P	N	B	
NATIONAL EMISSION STANDARDS FOR RADON EMISSIONS FROM DEPARTMENT OF ENERGY FACILITIES	40 CFR 61, SUBPART Q	N	B	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR RADON EMISSIONS FROM PHOSPHOGYPSUM STACKS	40 CFR 61, SUBPART R	N	B	
RESERVED	40 CFR 61, SUBPART S	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR RADON EMISSIONS FROM THE DISPOSAL OF URANIUM MILL TAILINGS	40 CFR 61, SUBPART T	N	B	
RESERVED	40 CFR 61, SUBPART U	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR EQUIPMENT LEAKS (FUGITIVE EMISSION SOURCES)	40 CFR 61, SUBPART V	N	B	
NATIONAL EMISSION STANDARDS FOR RADON EMISSIONS FROM OPERATING MILL TAILINGS	40 CFR 61, SUBPART W	N	B	
RESERVED	40 CFR 61, SUBPART X	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR BENZENE EMISSIONS FROM BENZENE STORAGE VESSELS	40 CFR 61, SUBPART Y	N	B	
RESERVED	40 CFR 61, SUBPART Z	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES (NESHAP)	40 CFR 63	Y	I	
GENERAL PROVISIONS	40 CFR 63, SUBPART A	Y	I	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM PHOSPHORIC ACID MANUFACTURING PLANTS	40 CFR 63, SUBPART AA	N	B	
RESERVED	40 CFR 63, SUBPART AAA	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STNADARDS FOR HAZARDOUS AIR POLLUTANTS: MUNICIPAL SOLID WASTE LANDFILLS	40 CFR 63, SUBPART AAAA	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR LIME MANUFACTURING PLANTS	40 CFR 63, SUBPART AAAAA	N	B	
RESERVED	40 CFR 63, SUBPART AAAAAA	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: ASPHALT PROCESSING AND ASPHALT ROOFING MANUFACTURING	40 CFR 63, SUBPART AAAAAAA	N	A	
REQUIREMENTS FOR CONTROL TECHNOLOGY DETERMINATIONS FOR MAJOR SOURCES IN ACCORDANCE WITH CLEAN AIR ACT SECTIONS 112(G) AND 112(J)	40 CFR 63, SUBPART B	Y	D	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM PHOSPHATE FERTILIZERS PRODUCTION PLANTS	40 CFR 63, SUBPART BB	N	B	
RESERVED	40 CFR 63, SUBPART BBB	N	J	No regulation assigned to this Subpart
RESERVED	40 CFR 63, SUBPART BBBB	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SEMICONDUCTOR MANUFACTURING	40 CFR 63, SUBPART BBBBB	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORY: GASOLINE DISTRIBUTION BULK TERMINALS, BULK PLANTS, PIPELINE FACILITIES AND GASOLINE DISPENSING FACILITIES	40 CFR 63, SUBPART BBBBBB	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: CHEMICAL PREPARATIONS INDUSTRY	40 CFR 63, SUBPART BBBBBBB	N	A	
LIST OF HAZARDOUS AIR POLLUTANTS, PETITION PROCESS, LESSER QUANTITY DESIGNATIONS, SOURCE CATEGORY LIST	40 CFR 63, SUBPART C	Y	D	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM PETROLEUM REFINERIES	40 CFR 63, SUBPART CC	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STLLE PICKLING-HCL PROCESS FACILITIES AND HYDROCHLORIC ACID REGENERATION PLANTS	40 CFR 63, SUBPART CCC	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: MANUFACTURING OF NUTRITIONAL YEAST	40 CFR 63, SUBPART CCCC	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR COKE OVENS: PUSHING, QUENCHING, AND BATTERY STACKS	40 CFR 63, SUBPART CCCCC	N	B	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORY: GASOLINE DISPENSING FACILITIES	40 CFR 63, SUBPART CCCCCC	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: PAINTS AND ALLIED PRODUCTS MANUFACTURING	40 CFR 63, SUBPART CCCCCCC	N	A	
REGULATIONS GOVERNING COMPLIANCE EXTENSIONS FOR EARLY REDUCTIONS OF HAZARDOUS AIR POLLUTANTS	40 CFR 63, SUBPART D	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM OFF-SITE WASTE AND RECOVERY OPERATIONS	40 CFR 63 DD	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR MINERAL WOOL PRODUCTION	40 CFR 63, SUBPART DDD	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: PLYWOOD AND COMPOSITE WOOD PRODUCTS	40 CFR 63, SUBPART DDDD	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL BOILERS AND PROCESS HEATERS	40 CFR 63, SUBPART DDDDD	Y	I	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR POLYVINYL CHLORIDE AND COPOLYMERS PRODUCTION AREA SOURCES	40 CFR 63, SUBPART DDDDDD	N	B	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: PREPARED FEEDS MANUFACTURING	40 CFR 63, SUBPART DDDDDDD	N	A	
APPROVAL OF STATE PROGRAMS AND DELEGATION OF FEDERAL AUTHORITIES	40 CFR 63, SUBPART E	N	J	Applicable to States
NATIONAL EMISSION STANDARDS FOR MAGNETIC TAPE MANUFACTURING OPERATIONS	40 CFR 63, SUBPART EE	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM HAZARDOUS WASTE COMBUSTORS	40 CFR 63, SUBPART EEE	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: ORGANIC LIQUIDS DISTRIBUTION (NON-GASOLINE)	40 CFR 63, SUBPART EEEE	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR IRON AND STEEL FOUNDRIES	40 CFR 63, SUBPART EEEEE	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY COPPER SMELTING AREA SOURCES	40 CFR 63, SUBPART EEEEEE	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: GOLD MINE ORE PROCESSING AND PRODUCTION AREA SOURCE CATEGORY	40 CFR 63, SUBPART EEEEEEE	N	A	
NATIONAL EMISSION STANDARDS FOR ORGANIC HAZARDOUS AIR POLLUTANTS FROM THE SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY	40 CFR 63, SUBPART F	N	B	

Permit Shield				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
RESERVED	40 CFR 63, SUBPART FF	N	J	No regulation assigned to this Subpart
RESERVED	40 CFR 63, SUBPART FFF	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: MISCELLANEOUS ORGANIC CHEMICAL MANUFACTURING	40 CFR 63, SUBPART FFFF	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR INTEGRATED IRON AND STEEL MANUFACTURING FACILITIES	40 CFR 63, SUBPART FFFFF	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SECONDARY COPPER SMELTING AREA SOURCES	40 CFR 63, SUBPART FFFFFF	N	B	
RESERVED	40 CFR 63, SUBPART FFFFFFF	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR ORGANIC HAZARDOUS AIR POLLUTANTS FROM THE SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY FOR PROCESS VENTS, STORAGE VESSELS. TRANSFER OPERATIONS, AND WASTEWATER	40 CFR 63, SUBPART G	N	B	
NATIONAL EMISSION STANDARDS FOR AEROSPACE MANUFACTURING AND REWORK FACILITIES	40 CFR 63, SUBPART GG	N	B	
NATIONAL EMISSION STANDARDS FOR PHARMACEUTICALS PRODUCTION	40 CFR 63, SUBPART GGG	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SOLVENT EXTRACTION FOR VEGETABLE OIL PRODUCTION	40 CFR 63, SUBPART GGGG	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SITE REMEDIATION	40 CFR 63, SUBPART GGGGG	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY NONFERROUS METALS AREA SOURCES – ZINC, CADMIUM, AND BERYLLIUM	40 CFR 63, SUBPART GGGGGG	N	B	
RESERVED	40 CFR 63, SUBPART GGGGGGG	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR ORGANIC HAZARDOUS AIR POLLUTANTS FOR EQUIPMENT LEAKS	40 CFR 63, SUBPART H	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM OIL AND NATURAL GAS PRODUCTION FACILITIES	40 CFR 63, SUBPART HH	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM NATURAL GAS TRANSMISSIOS AND STORAGE FACILITIES	40 CFR 63, SUBPART HHH	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR WET-FORMED FIBERGLASS MAT PRODUCTION	40 CFR 63, SUBPART HHHH	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: MISCELLANEOUS COATING MANUFACTURING	40 CFR 63, SUBPART HHHHH	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS; PAINT STRIPPING AND MISCELLANEOUS SURFACE COATING OPERATIONS AT AREA SOURCES	40 CFR 63, SUBPART HHHHHH	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS EMISSIONS FOR POLYVINYL SHLORIDE AND COPOLYMERS PRODUCTION	40 CFR 63, SUBPART HHHHHHH	N	B	
NATIONAL EMISSION STANDARDS FOR ORGANIC HAZARDOUS AIR POLLUTANTS FOR CERTAIN PROCESSES SUBJECT TO THE NEGOTIATED REGULATION FOR EQUIPMENT LEAKS	40 CFR 63, SUBPART I	N	B	
NATIONAL EMISSION STANDARDS FOR SHIPBUILDING AND SHIP REPAIR (SURFACE COATING)	40 CFR 63, SUBPART II	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR FLEXIBLE POLYURETHANE FOAM PRODUCTION	40 CFR 63, SUBPART III	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF AUTOMOBILES AND LIGHT DUTY TRUCKS	40 CFR 63, SUBPART IIII	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: MERCURY EMISSINS FROM MERCURY CELL CHLOR-ALKALI PLANTS	40 CFR 63, SUBPART IIIII	N	B	
RESERVED	40 CFR 63, SUBPART IIIIII	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR POLYVINYL CHLORIDE AND COPOLYMERS PRODUCTION	40 CFR 63, SUBPART J	N	B	
NATIONAL EMISSION STANDARDS FOR WOOD FURNITURE MANUFACTURING OPERATIONS	40 CFR 63, SUBPART JJ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS	40 CFR 63, SUBPART JJJ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: PAPER AND OTHER WEB COATING	40 CFR 63, SUBPART JJJJ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR BRICK AND STRUCTURAL CLAY PRODUCTS MANUFACTURING	40 CFR 63, SUBPART JJJJJ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL BOILERS AT AREA SOURCES	40 CFR 63, SUBPART JJJJJJ	N	A	
RESERVED	40 CFR 63, SUBPART K	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR THE PRINTING AND PUBLISHING INDUSTRY	40 CFR 63, SUBPART KK	N	B	
RESERVED	40 CFR 63, SUBPART KKK	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF METAL CANS	40 CFR 63, SUBPART KKKK	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CLAY CERAMICS MANUFACTURING	40 CFR 63, SUBPART KKKKK	N	B	
RESERVED	40 CFR 63, SUBPART KKKKKK	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR COKE OVEN BATTERIES	40 CFR 63, SUBPART L	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY ALUMINUM REDUCTION PLANTS	40 CFR 63, SUBPART LL	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM THE PORTLAND CEMENT MANUFACTURING INDUSTRY	40 CFR 63, SUBPART LLL	N	B	
RESERVED	40 CFR 63, SUBPART LLLL	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: ASPHALT PROCESSING AND ASPHALT ROOFING MANUFACTURING	40 CFR 63, SUBPART LLLLL	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR ACRYLIC AND MODACRYLIC FIBER PRODUCTION AREA SOURCES	40 CFR 63, SUBPART LLLLLL	N	A	
NATIONAL PERCHLOROETHYLENE AIR EMISSION STANDARD FOR DRY CLEANING FACILITIES	40 CFR 63, SUBPART M	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CHEMICAL RECOVERY COMBUSTION SOURCES AT KRAFT, SODA, SULFITE AND STAND-ALONE SEMICHEMICAL PULP MILLS	40 CFR 63, SUBPART MM	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PESTICIDE ACTIVE INGREDIENT PRODUCTION	40 CFR 63, SUBPART MMM	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS	40 CFR 63, SUBPART MMMM	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: FLEXIBLE POLYURETHANE FOAM FABRICATION OPERATIONS	40 CFR 63, SUBPART MMMMM	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CARBON BLACK PRODUCTION AREA SOURCES	40 CFR 63, SUBPART MMMMMM	N	A	
NATIONAL EMISSION STANDARDS FOR CHROMIUM EMISSIONS FROM HARD AND DECORATIVE CHROMIUM ELECTROPLATING AND CHROMIUM ANODIZING TANKS	40 CFR 63, SUBPART N	N	B	
RESERVED	40 CFR 63, SUBPART NN	N	J	No regulation assigned tot his Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR WOOD FIBER GLASS MANUFACTURING	40 CFR 63, SUBPART NNN	N	B	

SRNS-J2200-2019-00240

Permit Shield				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF LARGE APPLIANCES	40 CFR 63, SUBPART NNNN	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: HYDROCHLORIC ACID PRODUCTION	40 CFR 63, SUBPART NNNNN	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CHEMICAL MANUFACTURING AREA SOURCES: CHROMIUM COMPOUNDS	40 CFR 63, SUBPART NNNNNN	N	A	
ETHYLENE OXIDE EMISSION STANDARDS FOR STERILIZATION FACILITIES	40 CFR 63, SUBPART O	N	B	
NATIONAL EMISSION STANDARDS FOR TANKS-LEVEL 1	40 CFR 63, SUBPART OO	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: MANUFACTURE OF AMINO/PHENOLIC RESINS	40 CFR 63, SUBPART OOO	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: PRINTING, COATING, AND DYEING OF FABRICS AND OTHER TEXTILES	40 CFR 63, SUBPART OOOO	N	B	
RESERVED	40 CFR 63, SUBPART OOOOO	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR FLEXIBLE POLYURETHANE FOAM PRODUCTION AND FABRICATION AREA SOURCES	40 CFR 63, SUBPART OOOOOO	N	A	
RESERVED	40 CFR 63, SUBPART P	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR CONTAINERS	40 CFR 63, SUBPART PP	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS FOR POLYETHER POLYOLS PRODUCTION	40 CFR 63, SUBPART PPP	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SURFACE COATING OF PLASTIC PARTS AND PRODUCTS	40 CFR 63, SUBPART PPPP	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR ENGINE TEST CELLS/STANDS	40 CFR 63, SUBPART PPPPP	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR LEAD ACID BATTERY MANUFACTURING AREA SOURCES	40 CFR 63, SUBPART PPPPPP	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR INDUSTRIAL PROCESS COOLING TOWERS	40 CFR 63, SUBPART Q	N	B	
NATIONAL EMISSION STANDARDS FOR SURFACE IMPOUNDMENTS	40 CFR 63, SUBPART QQ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY COPPER SMELTING	40 CFR 63, SUBPART QQQ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF WOOD BUILDING PRODUCTS	40 CFR 63, SUBPART QQQQ	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR FRICTION MATERIALS MANUFACTURING FACILITIES	40 CFR 63, SUBPART QQQQQ	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR WOOD PRESERVING AREA SOURCES	40 CFR 63, SUBPART QQQQQQ	N	A	
NATIONAL EMISSION STANDARDS FOR GASOLINE DISTRIBUTION FACILITIES (BULK GASOLINE TERMINALS AND PIPELINE BREAKOUT STATIONS)	40 CFR 63, SUBPART R	N	B	
NATIONAL EMISSION STANDARDS FOR INDIVIDUAL DRAIN SYSTEMS	40 CFR 63, SUBPART RR	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SECONDARY ALUMINUM PRODUCTION	40 CFR 63, SUBPART RRR	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF METAL FURNITURE	40 CFR 63, SUBPART RRRR	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: TACONITE IRON ORE PROCESSING	40 CFR 63, SUBPART RRRRR	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CLAY CERAMICS MANUFACTURING AREA SOURCES	40 CFR 63, SUBPART RRRRRR	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM THE PULP AND PAPER INDUSTRY	40 CFR 63, SUBPART S	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR CLOSED VENT SYSTEMS, CONTROL DEVICES, RECOVERY DEVICES AND ROUTING TO A FUEL GAS SYSTEM OR A PROCESS	40 CFR 63, SUBPART SS	N	B	
RESERVED	40 CFR 63, SUBPART SSS	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: SURFACE COATING OF METAL COIL	40 CFR 63, SUBPART SSSS	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR REFRACTORY PRODUCTS MANUFACTURING	40 CFR 63, SUBPART SSSSS	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR GLASS MANUFACTURING AREA SOURCES	40 CFR 63, SUBPART SSSSSS	N	A	
NATIONAL EMISSION STANDARDS FOR HALOGENATED SOLVENT CLEANING	40 CFR 63, SUBPART T	N	B	
NATIONAL EMISSION STANDARDS FOR EQUIPMENT LEAKS-CONTROL LEVEL 1	40 CFR 63, SUBPART TT	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY LEAD SMELTING	40 CFR 63, SUBPART TTT	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR LEATHER FINISHING OPERATIONS	40 CFR 63, SUBPART TTTT	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PRIMARY MAGNESIUM REFINING	40 CFR 63, SUBPART TTTTT	N	B	

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR GLASS MANUFACTURING AREA SOURCES	40 CFR 63, SUBPART TTTTTT	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP I POLYMERS AND RESINS	40 CFR 63, SUBPART U	N	B	
NATIONAL EMISSION STANDARDS FOR EQUIPMENT LEAKS-CONTROL LEVEL 2 STANDARDS	40 CFR 63, SUBPART UU	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR PETROLEUM REFINERIES: CATALYTIC CRACKING UNITS, CATALTIC REFORMING UNITS, AND SULFUR RECOVERY UNITS	40 CFR 63, SUBPART UUU	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CELLULOSE PRODUCTS MANUFACTURING	40 CFR 63, SUBPART UUUU	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: COAL AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS	40 CFR 63, SUBPART UUUUU	N	B	
RESERVED	40 CFR 63, SUBPART UUUUUU	N	J	No regulation assigned to this Subpart
RESERVED	40 CFR 63, SUBPART V	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR OIL-WATER SEPARATORS AND ORGANIC-WATER SEPARATORS	40 CFR 63, SUBPART VV	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: PUBLICLY OWNED TREATMENT WORKS	40 CFR 63, SUBPART VVV	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR BOAT MANUFACTURING	40 CFR 63, SUBPART VVVV	N	B	
RESERVED	40 CFR 63, SUBPART VVVVV	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR CHEMICAL MANUFACTURING AREA SOURCES	40 CFR 63, SUBPART VVVVVV	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR EPOXY RESINS PRODUCTION AND NON-NYLON POLAMIDES PRODUCTION	40 CFR 63, SUBPART W	N	B	
NATIONAL EMISSION STANDARDS FOR STORAGE VESSELS (TANKS)-CONTROL LEVEL 2	40 CFR 63, SUBPART WW	N	B	
RESERVED	40 CFR 63, SUBPART WWW	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: REINFORCED PLASTIC COMPOSITES PRODUCTION	40 CFR 63, SUBPART WWWW	N	B	
NATIONAL EMISSION STANDARDS FOR HOSPITAL ETHYLENE OXIDE STERILIZERS	40 CFR 63, SUBPART WWWWW	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: AREA SOURCE STANDARDS FOR PLATING AND POLISHING OPERATIONS	40 CFR 63, SUBPART WWWWWW	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM SECONDARY LEAD SMELTING	40 CFR 63, SUBPART X	N	B	
NATIONAL EMISSION STANDARDS FOR ETHYLENE MANUFACTURING PROCESS UNITS: HEAT EXCHANGE SYSTEMS AND WASTE OPERATIONS	40 CFR 63, SUBPART XX	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR FERROALLOYS PRODUCTION: FERROMANGANESE AND SILICOMANGANESE	40 CFR 63, SUBPART XXX	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: RUBBER TIRE MANUFACTURING	40 CFR 63, SUBPART XXXX	N	B	
RESERVED	40 CFR 63, SUBPART XXXXX	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS AREA SOURCE STANDARDS FOR NINE METAL FABRICATION AND FINISHING SOURCE CATEGORIES	40 CFR 63, SUBPART XXXXXX	N	A	
NATIONAL EMISSION STANDARDS FOR MARINE TANK VESSEL LOADING OPERATIONS	40 CFR 63, SUBPART Y	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES: GENERIC MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY STANDARDS	40 CFR 63, SUBPART YY	N	B	
RESERVED	40 CFR 63, SUBPART YYY	N	J	No regulation assigned to this Subpart

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY COMBUSTION TURBINES	40 CFR 63, SUBPART YYYY	N	B	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: ELECTRIC ARC FURNACE STEELMAKING FACILITIES	40 CFR 63, SUBPART YYYYY	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR AREA SOURCES: FERROALLOYS PRODUCTION FACILITIES	40 CFR 63, SUBPART YYYYYY	N	A	
RESERVED	40 CFR 63, SUBPART Z	N	J	No regulation assigned to this Subpart
RESERVED	40 CFR 63, SUBPART ZZ	N	J	No regulation assigned to this Subpart
RESERVED	40 CFR 63, SUBPART ZZZ	N	J	No regulation assigned to this Subpart
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES	40 CFR 63, SUBPART ZZZZ	Y	D	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR IRON AND STEEL FOUNDRIES AREA SOURCES	40 CFR 63, SUBPART ZZZZZ	N	A	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS: AREA SOURCE STANDARDS FOR ALUMINUM, COPPERM AND OTHER NONFERROUS FOUNDRIES	40 CFR 63, SUBPART ZZZZZZ	N	A	
COMPLIANCE ASSURANCE MONITORING PROGRAM	40 CFR 64	Y	I	
CONSOLIDATED FEDERAL AIR RULE	40 CFR 65	N	B	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
CHEMICAL ACCIDENT PREVENTION PROVISION	40 CFR 68	N	G	SRS maintains threshold quantities below those established by the rule
STATE OPERATING PERMIT PROGRAMS	40 CFR 70	N	J	Applicable to States
PERMITS REGULATION - ACID RAIN PROGRAM	40 CFR 72	N	A	
SULFUR DIOXIDE ALLOWANCE SYSTEM - ACID RAIN	40 CFR 73	N	A	
SULFUR DIOXIDE OPT-INS	40 CFR 74	N	A	
CONTINUOUS EMISSION MONITORING (CEM)	40 CFR 75	N	A	
ACID RAIN NITROGEN OXIDES EMISSION REDUCTION PROGRAM	40 CFR 76	N	A	
EXCESS EMISSIONS	40 CFR 77	N	A	
APPEAL PROCEDURES	40 CFR 78	N	A	
REGISTRATION OF FUELS AND FUEL ADDITIVES	40 CFR 79	N	A	
REGULATION OF FUELS AND FUEL ADDITIVES	40 CFR 80	N	A	
DESIGNATION OF AREAS FOR AIR QUALITY PLANNING PURPOSES	40 CFR 81	N	J	Applicable to the EPA
PROTECTION OF STRATOSPHERIC OZONE	40 CFR 82	Y	I	
PRODUCTION AND COMSUMPTION CONTROLS	40 CFR 82, SUBPART A	Y	I	
SERVICING OF MOTOR VEHICLE AIR CONDITIONERS	40 CFR 82, SUBPART B	Y	I	.
BAN ON NONESSENTIAL PRODUCTS CONTAINING CLASS I SUBSTANCES AND BAN ON NONESSENTIAL PRODUCTS CONTAINING OR MANUFACTURED WITH CLASS II SUBSTANCES	40 CFR 82, SUBPART C	N	J	SRS does not sell or distribute in interstate commerce any of the products identified
FEDERAL PROCUREMENT	40 CFR 82, SUBPART D	Y	I	
THE LABELING OF PRODUCTS USING OZONE-DEPLETING SUBSTANCES	40 CFR 82, SUBPART E	Y	I	
RECYCLING AND EMISSION REDUCTION	40 CFR 82, SUBPART F	Y	I	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
SIGNIFICANT NEW ALTERNATIVES POLICY PROGRAM	40 CFR 82, SUBPART G	Y	I	
HALON EMISSIONS REDUCTION	40 CFR 82, SUBPART H	Y	I	
BAN ON REFRIGERATION AND AIR-CONDITIONING APPLIANCES CONTAINING HCFCS	40 CFR 82, SUBPART I	N	B	
CONTROL OF AIR POLLUTION FROM MOBILE SOURCES	40 CFR 85	N	A	
CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES	40 CFR 86	N	A	
CONTROL OF AIR POLLUTION FROM AIRCRAFT ENGINES	40 CFR 87	N	A	
CLEAN FUEL VEHICLES	40 CFR 88	N	A	
CONTROL OF EMISSIONS FROM NEW AND IN-USE NON-ROAD COMPRESSION-IGNITION ENGINES	40 CFR 89	N	A	
CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES AT OR BELOW 19 KILOWATTS	40 CFR 90	N	A	
CONTROL OF EMISSIONS FROM MARINE SPARK-IGNITION ENGINES	40 CFR 91	N	A	
CONTROL OF AIR POLLUTION FROM LOCOMOTIVES AND LOCOMOTIVE ENGINES	40 CFR 92	N	A	
DETERMINING CONFORMITY OF FEDERAL ACTIONS TO STATE OR FEDERAL IMPLEMENTATION PLANS	40 CFR 93	N	A	
CONTROL OF EMISSIONS FROM MARINE COMPRESSION-IGNITION ENGINES	40 CFR 94	N	A	
MANDATORY PATENT LICENSES	40 CFR 95	N	A	
NOx BUDGET TRADING PROGRAM AND CAIR NOx AND SO2 TRADING PROGRAMS FOR STATE IMPLEMENTATION PLANS	40 CFR 96	N	A	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
FEDERAL NOx BUDGET TRADING PROGRAM CAIR NOx AND SO2 TRADING PROGRAMS	40 CFR 97	N	A	
MANDATORY GREENHOUSE GAS REPORTING	40 CFR 98	Y	D	
STANDARDS OF PERFORMANCE FOR ASBESTOS PROJECTS	SC 61 - 86.1	Y	I	
ENVIRONMENTAL PROTECTION FEES	SC 61-30	Y	D	
DEFINITIONS AND GENERAL REQUIREMENTS	SC 61-62.1	Y	I	
PROHIBITION OF OPEN BURNING	SC 61-62.2	Y	D	
AIR POLLUTION EPISODES	SC 61-62.3	Y	D	
HAZARDOUS AIR POLLUTION CONDITIONS	SC 61-62.4	Y	D	
EMISSIONS FROM FUEL BURNING OPERATIONS	SC 61-62.5, Std. 1	Y	I	
AMBIENT AIR QUALITY STANDARDS	SC 61-62.5, Std. 2	Y	D	
WASTE COMBUSTION AND REDUCTION	SC 61-62.5, Std. 3	N	B	
HOSPITAL / MEDICAL / INFECTIOUS WASTE INCINERATIONS (HMIWI)	SC 61-62.5, Std. 3.1	N	B	
EMISSIONS FROM PROCESS INDUSTRIES	SC 61-62.5, Std. 4	Y	I	
EMISSIONS FROM PROCESS INDUSTRIES - GENERAL	SC 61-62.5, Std. 4, Sect. I	Y	D	
EMISSIONS FROM PROCESS INDUSTRIES - SULFURIC ACID MANUFACTURING	SC 61-62.5, Std. 4, Sect. II	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - KRAFT PULP AND PAPER MANUFACTURING	SC 61-62.5, Std. 4, Sect. III	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - RESERVED	SC 61-62.5, Std. 4, Sect. IV	N	J	No applicable requirements listed for this section
EMISSIONS FROM PROCESS INDUSTRIES - VISIBLE EMISSIONS (WHERE NOT SPECIFIED ELSEWHERE)	SC 61-62.5, Std. 4, Sect. IX	Y	I	

PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
EMISSIONS FROM PROCESS INDUSTRIES - COTTON GINS	SC 61-62.5, Std. 4, Sect. V	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - HOT MIX ASPHALT MANUFACTURING	SC 61-62.5, Std. 4, Sect. VI	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - METAL REFINING	SC 61-62.5, Std. 4, Sect. VII	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - OTHER MANUFACTURING	SC 61-62.5, Std. 4, Sect. VIII	Y	I	
EMISSIONS FROM PROCESS INDUSTRIES - NON-ENCLOSED OPERATIONS	SC 61-62.5, Std. 4, Sect. X	Y	D	
EMISSIONS FROM PROCESS INDUSTRIES - TOTAL REDUCED SULFUR EMISSIONS FROM KRAFT PULP MILLS	SC 61-62.5, Std. 4, Sect. XI	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - PERIODIC TESTING	SC 61-62.5, Std. 4, Sect. XII	N	B	
EMISSIONS FROM PROCESS INDUSTRIES - RESERVED	SC 61-62.5, Std. 4, Sect. XIII	N	J	No applicable requirements listed for this section
VOLATILE ORGANIC COMPOUNDS (VOC)	SC 61-62.5, Std. 5	N	B	
LOWEST ACHIEVABLE EMISSION RATE (LAER) APPLICABLE TO VOLATILE ORGANIC COMPOUNDS	SC 61-62.5, Std. 5.1	Y	D	
CONTROL OF OXIDES OF NITROGEN (NOX)	SC 61-62.5, Std. 5.2	Y	I	
ALTERNATIVE EMISSION LIMITATION OPTIONS ("BUBBLE")	SC 61-62.5, Std. 6	N	J	SRS does not have sources under a site wide bubble
PREVENTION OF SIGNIFICANT DETERIORATION (PSD)	SC 61-62.5, Std. 7	Y	D	
NONATTAINMENT NEW SOURCE REVIEW (NSR)	SC 61-62.5, Std. 7.1	N	H	
TOXIC AIR POLLUTANTS	SC 61-62.5, Std. 8	Y	D	
CONTROL OF FUGITIVE PARTICULATE MATTER	SC 61-62.6	N	D	
CONTROL OF FUGITIVE PARTICULATE MATTER - IN NON-ATTAINMENT AREAS	SC 61-62.6, Sect. I	N	H	

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PERMIT SHIELD				
1.Citation	2. Regulation	3. Applicable (Y/N)	4. Standard Reason Indicator	5. Comments (Use when choosing Indicator "J")
CONTROL OF FUGITIVE PARTICULATE MATTER - IN PROBLEM ARES	SC 61-62.6, Sect. II	N	H	
CONTROL OF FUGITIVE PARTICULATE MATTER - STATEWIDE	SC 61-62.6, Sect. III	Y	D	
CONTROL OF FUGITIVE PARTICULATE MATTER – EFFECTIVE DATE	SC 62-62.6, Sect. IV	Y	D	
SOUTH CAROLINA DESIGNATED FACILITY PLAN AND NEW SOURCE PERFORMANCE STANDARDS	SC 61-62.60	Y	D	
NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)	SC 61-62.63	Y	D	
CHEMICAL ACCIDENT PREVENTION PROVISIONS	SC 61-62.68	N	G	SRS maintains threshold quantities below those established by the rule
GOOD ENGINEERING PRACTICE (GEP) STACK HEIGHT	SC 61-62.7	Y	D	
TITLE V OPERATION PERMIT PROGRAM	SC 61-62.70	Y	I	
ACID RAIN - PROGRAM GENERAL PROVISIONS - DEFINITIONS	SC 61-62.72	N	A	
ACID RAIN	SC 61-62.72	N	A	
NITROGEN OXIDES (NOx) BUDGET TRADING PROGRAM (SEPTEMBER 24, 2004)	SC 61-62.96	N	A	
NITROGEN OXIDES (NOx) BUDGET PROGRAM REQUIREMENTS FOR STATIONARY SOURCES NOT IN THE TRADING PROGRAM (MAY 24, 2002)	SC 61-62.99	N	A	

STANDARD REASONS	
Indicator	Standard Reason
A	The facility is not in the applicable source category
B	The specified source/process is not present at the facility
C	The facility/unit was constructed or last modified prior to the effective date of the rule
D	Applies to all facilities
E	Rule/Standard proposed, but not final/effective
F	The facility/unit emits pollutants at a level less than established by the rule

PERMIT SHIELD				
1.Citation	**2. Regulation**	**3. Applicable (Y/N)**	**4. Standard Reason Indicator**	**5. Comments (Use when choosing Indicator "J")**

G	The facility/unit design capacity or production capacity is less than established by the rule.
H	The facility is not in a special control/non-attainment area.
I	Applicable to facility; requirements are listed in permit application and facility has certified compliance.
J	Other (explain)

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itle V Permit Application
Operational Flexibility– Form OF
Part II
Bureau of Air Quality

Please Refer to Instruction / Definitions Pages Before Completing This Form

The South Carolina Department of Health and Environmental Control may modify the permit as described on this form through the procedures described in SC Regulation 61-62.70.7(e). If the facility is requesting an operational flexibility (502(b)(10)), complete Part I. If this request is in response to the operational flexibility condition in your existing permit, submit Part II of this Form. You must apply for an operational flexibility modification in writing by submitting this form along with Form A to the Department, Environmental Protection Agency, and the local Environmental Quality Control District Office. If new or modified unit(s) are placed into operation, the form must be submitted at least fifteen days prior to operation to satisfy the requirements of SC Regulation 61-62.1, Section II(B)(1). If a new construction permit was not required, the form must be submitted at least seven days in advance.

OPERATIONAL FLEXIBILITY NOTIFICATION

1. Modification Request Type:
☐ 502(b)(10) (Submit Part I of this Operational Flexibility Form) X Permit Operational Flexibility Condition Request (Submit Part II portion of this Permit Operational Flexibility Form.)

2. Anticipated Date of Change (MM/DD/YYYY):	Upon issuance of new Title V permit	3. Notification Date (MM/DD/YYYY):	9/2007	4. Existing State Construction Air Permit Number:	TV-0080-0041
5. Existing Actual Emissions:	N/A	6. Change in Actual Emissions:	Zero	7. Projected Actual Emissions:	Zero

POLLUTANT INFORMATION

8. Permit ID	9. Equipment ID	10. List Pollutant(s) Affected by the Change	11. Allowable Emission Rate	12. Monitoring/Compliance Requirements:	13.Permit Term(s) or Condition(s) Affected by the Change

DESCRIPTION OF CHANGE

14. Describe why this operational flexibility change does not exceed any allowable emission rate. Describe why this change does not violate any applicable requirements or contravene any federally enforceable permit terms or conditions that are monitoring (including test methods), recordkeeping, reporting or compliance certification requirements.
This operational flexibility request does not exceed any allowable emission rate and does not violate any applicable requirements as the change is already a condition in the current SRS Part 70 Air Quality permit.

15. Describe in detail why this change does not constitute a Title I modification and provide calculations (if applicable). N/A

Mail Completed Operational Flexibility Request Form and Supporting Documents to:

Engineering Services Division, Bureau of Air Quality
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

The Environmental Protection Agency
Air Permits Section/ APTMD
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Local District Environmental
Quality Control Office

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Permit Operational Flexibility

PURPOSE OF APPLICATION	
Permit Flexibility Basis: Per section 61-62.70.7(e) of permit flexibility condition.	Date proposed change will occur: Upon issuance of new Title V permit
Description of proposed change: See attachment	
Are emissions calculations attached? ☐ Yes X No	Is process flow diagram(s) attached? ☐ Yes X No
Is modeling required for this change? ☐ Yes X No	
If "Yes", is the proper modeling form attached? ☐ Yes ☐ No	Identify form(s):
State why this change will not be subject to regulation under 40 CFR Parts 60, 61, 63, SC Regulation 61-62.5, Standard 5.1, Standard 7, or constitute a Title I modification: N/A	
What is the net increase in actual VOC emissions prior to this change? (TPY) Zero, No Change	What is the net increase in actual VOC emissions after this change? (TPY) Zero, No Change
Is the source/unit currently regulated by a MACT? X Yes ☐ No	
If "Yes", identify the MACT and specify the current MACT requirement(s): Section 112j	
Is the source/unit currently subject to any existing permit limits or requirements that may be affected/triggered by this change? ☐ Yes X No	
If "Yes", identify all that apply in detail:	
Is this a Title V Facility? X Yes ☐ No	If "Yes", is the operational flexibility request attached? X Yes ☐ No
Is confidential business information, as defined by the CBI rule, submitted with this application under a separate cover? ☐ Yes X No	
If "Yes", is each "confidential" page marked "CONFIDENTIAL" in large red letters? ☐ Yes ☐ No	
Have you attached a copy of this request to the On-Site Implementation Log? ☐ Yes X No	

EMISSION ESTIMATES
(Values must be entered, please do not state "see attachment")

Emission Unit (Equip ID)	Pollutants	Uncontrolled Emissions Prior to Modification		Uncontrolled Emissions After the Modification		Controlled Emissions Prior to Modification		Controlled Emissions After the Modification	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY

Note: Emissions calculations must be attached with this form. These should include, but not be limited to, the basis used to arrive at the estimated rates, and the actual calculations. When literature values are used, please indicate where they were cited and submit a copy of the appropriate page(s) from the literature.

FACILITY WIDE EMISSION ESTIMATES
(Values must be entered, please do not state "see attachment")

Pollutants	Uncontrolled Emissions Prior to Modification		Uncontrolled Emissions After the Modification		Controlled Emissions Prior to Modification		Controlled Emissions After the Modification	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY

SRS PART 70 AIR QUALITY PERMIT
TV-0080-0041 APPLICATION RENEWAL

OPERATIONAL FLEXIBILITY REQUEST

In accordance with SC R61-62.70.7(e), the Savannah River Ste(SRS) request that following Operational Flexibility condition be incorporated in the revised SRS Part 70 Air Quality Permit. The condition currently exists in TV-0080-0041 as 7.B.3 and provides the SRS with immense flexibility to implement small operational changes and, thereby eliminates the necessity to submit information to the Department for sources which are clearly insignificant or exempt. The SRS proposes the following operational flexibility language:

"Pursuant to Savannah River Site's January 24, 1996 letter to the BAQ (ESH-ESS-96-0042), the proposed plan for permitting/exempting of new sources shall remain in effect with the issuance of this permit. In an effort to eliminate the necessity of submitting information for sources which are clearly insignificant or exempt, the BAQ hereby implements the proposed plan to integrate the thresholds and exemptions identified in the following SC Regulations: *61-62.1*, *61-62.5, Standard 8* and *61-62.70*. For any source which has potential emissions of less than 0.5 lb/hr of any criteria pollutant OR less than 0.05 lb/hr of a Toxic Air Pollutant (as defined by the above-referenced Standard 8) where the Level II air dispersion modeling analysis indicates that emissions are below the Standard 8 MAAC, and the source has no other Federal requirement such that it would otherwise require a permit form the BAQ, then SRS shall consider them to be exempt from permitting requirements. No source information needs to be submitted for such sources, nor is a written determination from the BAQ required prior to placing such source into operation. Records of the calculations, basic source descriptions (e.g. size, capacities, flow rates, etc.) and records of operation of all sources that meet the above criteria shall be maintained on-site and shall be made available to Department personnel upon request".