

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0762-AOP-R29 AFIN: 14-00028

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Albemarle Corporation—South Plant  
Highway 79, Approximately 6 Miles South of Magnolia  
Magnolia, Arkansas 71753

3. PERMIT WRITER:

Elliott Marshall

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Other Basic Inorganic Chemical Manufacturing  
NAICS Code: 325180

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
3/24/2020	Minor Mod	No emission changes.

6. REVIEWER'S NOTES:

This application was submitted as a minor modification, to allow permit flexibility to install up to two (2) temporary boilers (BH-03 and BH-04) provided the boilers have a heat input capacity of less than 100 MMBtu/hr (each). Permitted emission rates are not increasing; temporary boilers will be included in the current annual combined boiler emissions limit.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

On March 11, 2020 the facility had an upset condition at SN-CB-18, where there was a mechanical failure of blower belts. Preventative measures have been put in place. There are no active or pending enforcement actions.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N

If yes, were GHG emission increases significant? N

b) Is the facility categorized as a major source for PSD? Y

- *Single pollutant  $\geq 100$  tpy and on the list of 28 or single pollutant  $\geq 250$  tpy and not on list*

If yes for 8(b), explain why this permit modification is not PSD.

No changes to permitted emission rates.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u> ]
Facility	PM <sub>10</sub> , SO <sub>2</sub> , VOC, CO, NO <sub>x</sub>	PSD
Facility	VOC	40 CFR Part 82 – Standards for the Protection of Stratospheric Ozone
Facility	PM/PM <sub>10</sub>	40 CFR Part 61, Subpart M – National Emission Standard for Asbestos
AB-15	VOC/HAP	40 CFR Part 63, Subpart A – National Emission Standards for Hazardous Air Pollutants for Source Categories, General Provisions

Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u> ]
AB-15 TB-11 TB-25 TB-29 TB-30 WW-01	VOC/HAP	40 CFR Part 63, Subpart F – National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry  40 CFR Part 63, Subpart G – National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater  40 CFR Part 63, Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks
NC-23 Process MeBr Scenario	Ozone Depleting Substances	40 CFR Part 82, Part A – Protection of Stratospheric Ozone, Production and Consumption Controls
NC-23 Process MeBr Scenario	Ozone Depleting Substances	40 CFR Part 82, Subpart E – Protection of Stratospheric Ozone, The Labeling of Products Using Ozone-Depleting Substances
NC-17 CMPU	VOC/HAP	40 CFR Part 63, Subpart A – National Emission Standards for Hazardous Air Pollutants for Source Categories, General Provisions
NC-17 CMPU	VOC/HAP	40 CFR Part 63, Subpart F – National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry
NC-17 CMPU	VOC/HAP	40 CFR Part 63, Subpart G – National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater
NC-17 CMPU	VOC/HAP	40 CFR Part 63, Subpart H – National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u> ]
21-01 21-02	VOC/HAP	40 CFR Part 61, Subpart A – National Emission Standards for Organic Hazardous Air Pollutants, General Provisions
21-01 21-02	VOC/HAP	40 CFR Part 61, Subpart J – National Emission Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene
21-01 21-02	VOC/HAP	40 CFR Part 61, Subpart V – National Emission Standards for Equipment Leaks (Fugitive Emission Sources)
21-01 21-02	VOC/HAP	40 CFR Part 61, Subpart Y – National Emission Standards for Benzene Emissions from Benzene Storage Vessels
21-01 21-02	VOC/HAP	40 CFR Part 61, Subpart FF – National Emission Standards for Benzene Waste Operations
MS-05	VOC/HAP	40 CFR Part 63, Subpart JJ – National Emission Standards for Wood Furniture Manufacturing Operations
Facility	Ozone Depleting Substances	40 CFR Part 82, Subpart E – Protection of Stratospheric Ozone, The Labeling of Products Using Ozone-Depleting Substances
MCPU's: DMTDA NC-12 NC-15 NC-17 NC-21 NC-23	VOC/HAP	40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing and Miscellaneous Coating Manufacturing
CCF All Ethylene Glycol Storage	VOC/HAP	40 CFR Part 63, Subpart EEEE – National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)

Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u> ]
Facility/Engines	VOC, CO, NO <sub>x</sub> , HAPs	40 CFR Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines 40 CFR Part 60, Subpart JJJJ – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. 40 CFR Part 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Facility/Boilers and Process Heaters	HAPS, CO, Filterable PM	40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters
BH-03 and BH-04	PM and SO <sub>2</sub>	40 CFR Part 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

10. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? N

(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Regulation 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? N/A  
If not, explain why.

For any requested inapplicable regulation in the permit shield, explain the reason why it is not applicable in the table below.

Source	Inapplicable Regulation	Reason
N/A		

11. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

12. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark. Code Ann. § 8-4-318, dated March 2017 and the ADEQ Air Permit Screening Modeling Instructions.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Department procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

1<sup>st</sup> Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Department has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m<sup>3</sup>), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

No modeling was performed for this revision.

Pollutant	TLV (mg/m <sup>3</sup> )	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Bromine (Br <sub>2</sub> )	0.65	0.0718	11.15	N

2<sup>nd</sup> Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Department to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL (µg/m <sup>3</sup> ) = 1/100 of Threshold Limit Value	Modeled Concentration (µg/m <sup>3</sup> )	Pass?
Bromine (Br <sub>2</sub> )	6.5	37.811 <sup>1</sup>	N

<sup>1</sup>24-hr, H2H value, 2012-2016 Shreveport Met Data.

3<sup>rd</sup> Tier Screening (AEGL-1 and AEGL-2)

A Tier III screening level human health risk assessment was performed to demonstrate that permitted bromine emissions do not result in unacceptable impacts to human health. For this analysis, modeled impacts are compared to the Level 1 and Level 2 Acute Exposure Guideline Levels (AEGL-1 and AEGL-2) as an alternative to PAIL screening levels.

AEGL-1 is the airborne concentration of a substance below which it is not expected that the general population, including susceptible individuals, would experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects.

AEGL-2 is the airborne concentration of a substance below which it is not expected that the general population, including susceptible individuals, would experience irreversible or other serious, long lasting adverse health effects or an impaired ability to escape.

Ambient air concentrations of bromine used to assess risk were predicted using air dispersion modeling. The latest version of the AERMOD modeling system (dated 18081) was used to estimate maximum ground-level concentrations of bromine for 1-hour, 4-hour, and 8-hour averaging periods. Meteorological data for 2012 through 2016 measured at the Shreveport, LA was used in the model. To determine both the 10-minute and 30-minute average concentration, the equation below was used:

$$C_p = C_m (t_m/t_p)^{0.2} \text{ where}$$

$C_p$  = 10-minute or 30-minute average concentration as appropriate

$C_m$  = 1-hour average concentration

$t_m$  = 60 minutes

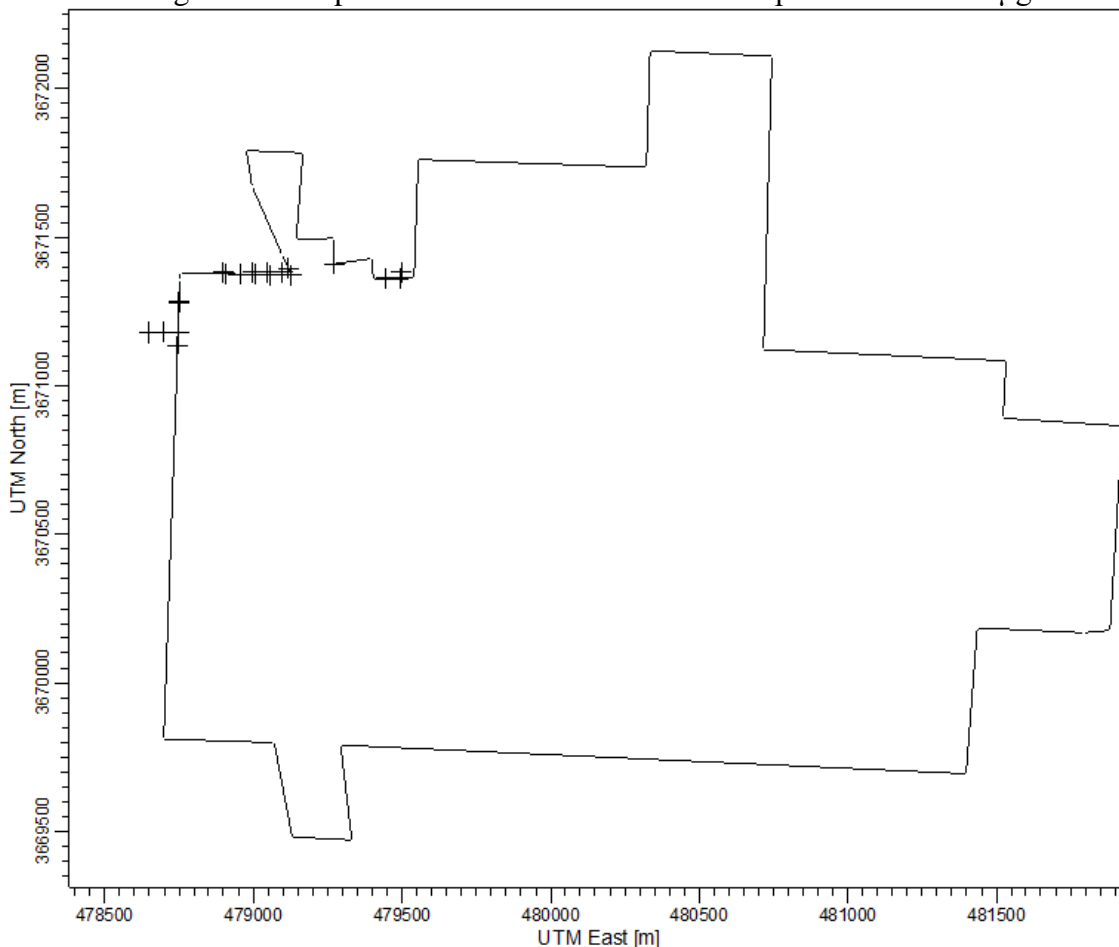
$t_p$  = 10 minutes or 30 minutes as appropriate

The highest predicted acute concentrations occur very near the facility property line. The table below compares the predicted concentrations with the AEGL-1 and AEGL-2 thresholds.

Averaging Period	Highest Modeled Impact ( $\mu\text{g}/\text{m}^3$ )	AEGL-1 Value ( $\mu\text{g}/\text{m}^3$ )	Percent of AEGL-1	AEGL-2 Value ( $\mu\text{g}/\text{m}^3$ )	Percent of AEGL-2
10-minute	251.41	220	114.3%	3600	7.0%
30-minute	201.83	220	91.7%	2200	9.2%
1-hour	175.69	220	79.9%	1600	11.0%
4-hour	134.25	220	61.0%	850	15.8%
8-hour	100.37	220	45.6%	620	16.2%

Predicted concentrations at (and beyond) the facility property line are well below AEGL-2 thresholds for all averaging periods. The areas with predicted 10-minute impacts above the AEGL-1 threshold (Figure 1) are along, or very near, the Albemarle property line. The area surrounding Albemarle's property is densely forested, rural, and uninhabited. Model results at all potentially occupied public "receptors" are less than AEGL-1. Given that the predicted concentrations above the AEGL-1 10-minute threshold are limited to only the rural, unoccupied area immediately adjacent to Albemarle's property line, it is unlikely that the public would be present in that area. A condition of pollution is not expected from short-term exposure to bromine emissions.

Figure 1. Receptors with Predicted 10-minute Impacts Above  $220 \mu\text{g}/\text{m}^3$



a) H<sub>2</sub>S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H<sub>2</sub>S Standards

N



If exempt, explain: \_\_\_\_\_

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H <sub>2</sub> S	20 parts per million (5-minute average*)	110.0	Y
	80 parts per billion (8-hour average) residential area	26.2	Y
	100 parts per billion (8-hour average) nonresidential area		

\*To determine the 5-minute average use the following equation

$$C_p = C_m (t_m/t_p)^{0.2} \text{ where}$$

C<sub>p</sub> = 5-minute average concentration

C<sub>m</sub> = 1-hour average concentration

t<sub>m</sub> = 60 minutes

t<sub>p</sub> = 5 minutes

13. CALCULATIONS:

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
BR-01	Testing	1.5 lb/hr VOC	Scrubber		99% Control for Bromine and Chlorine
BR-04	Testing	3.81 lb/hr VOC			
BR-08	TANKS	0.04 lb/hr HCl			
BR-09	Mass Balance	0.02 lb/hr HBr 0.02 lb/hr Br <sub>2</sub>			
BR-12	Testing	0.10 lb/hr Cl <sub>2</sub> 0.30 lb/hr Br <sub>2</sub>	Scrubber	99.9	
BR-14	SOCMI	0.50 lb/hr VOC			
BR-15	Testing	1.63 lb/hr Halogens			
SL-01	AP-42	See Section 14.1			
SL-02	Mass Balance	0.12 lb/hr VOC			
SR-01	AP-42	See Section 14.1			
SR-02	SOCMI	0.50 lb/hr VOC			
SR-03	Mass Balance	0.42 lb/hr SO <sub>2</sub> 0.22 lb/hr H <sub>2</sub> S			8,760 hr/yr
CB-01	Mass Balance	0.1 lb/hr PM <sub>10</sub>			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
CB-04	Mass Balance	26.00 lb/hr VOC			
CB-16	Mass Balance	0.27 lb/hr VOC			
CB-17	SOCMI	1.80 lb/hr VOC			
CB-18	Mass Balance	0.1 lb/hr PM <sub>10</sub> 0.06 lb/hr HAP			Baghouse, control is included in emission rate
CB-21	Mass Balance	9.35E-05 lb/hr HAP			
CB-22a	Mass Balance	6.92E-06 lb/hr HAP			
CB-22b	Mass Balance	6.92E-06 lb/hr HAP			
CB-23	Mass Balance	1.97E-03 lb/hr HAP			
CB-23	Mass Balance	5.9 lb MeOH/Batch			Alternate scenario limited to 185 batches/yr
DE-01	Mass Balance	0.5 lb/hr VOC			ADMA Brine Storage Tank (Additional ADMA Storage Scenario)
AD-01	TANKS	0.16 lb/hr VOC			
AD-02	TANKS	0.16 lb/hr VOC			
AD-03	TANKS	0.26 lb/hr VOC			
AD-05	VOC TANKS HCl Mass Balance	0.30 lb/hr VOC 0.10 lb/hr HCl			
AD-07	TANKS	0.05 lb/hr VOC			
AD-08	TANKS	0.05 lb/hr VOC			
AD-09	TANKS	0.05 lb/hr VOC			
AD-10	TANKS	0.26 lb/hr VOC			
AD-11	TANKS	0.26 lb/hr VOC			
AD-12	TANKS	0.26 lb/hr VOC			
AD-13	TANKS	0.26 lb/hr VOC			
AD-14	TANKS	0.26 lb/hr VOC			
AD-15	TANKS	0.26 lb/hr VOC			
AD-16	AP-42 Sec. 1.4	See Tables 1.4-1 and 1.4-2	None	None	3.55 MMBtu/hr
AD-17	TANKS	0.26 lb/hr VOC			
AD-18	TANKS	0.26 lb/hr VOC			
AD-20	TANKS	0.16 lb/hr VOC			
AD-21	TANKS	3.45 lb/hr VOC			
AD-23	TANKS	0.03 lb/hr VOC			
AD-24	TANKS	0.26 lb/hr VOC			
AD-25	TANKS	0.26 lb/hr VOC			
AD-26	AP-42	See Section 14.1			
AD-27	TANKS	0.26 lb/hr VOC			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
AD-28	TANKS	0.08 lb/hr VOC			
AD-29	TANKS	0.08 lb/hr VOC			
AD-32	AP-42 Section 1.4	0.04 lb/hr PM <sub>10</sub> 0.01 lb/hr SO <sub>2</sub> 0.03 lb/hr VOC 0.38 lb/hr CO 0.45 lb/hr NO <sub>x</sub>			4.62 MMBtu/hr
AD-35	See Application	0.22 lb/hr PM <sub>10</sub> 0.15 lb/hr SO <sub>2</sub> 1.22 lb/hr VOC 0.06 lb/hr CO 0.70 lb/hr NO <sub>x</sub>			
AD-36	SOCMI	4.13 lb/hr VOC			
AD-37	TANKS	0.05 lb/hr VOC			
AD-39	Mass Balance	0.1 lb/hr VOC			ADMA Additional Storage Alternate Operating Scenario Loadout Emissions
AD-40	Mass Balance	0.26 lb/hr VOC			
AB-15	Testing	1.20 lb/hr VOC			
AB-16	SOCMI	7.50 lb/hr VOC			
AB-18	EPA Water9	1.44 lb/hr VOC 0.34 lb/hr MeCl			
DB-01	Mass Balance	0.44 lb/hr Halogens 0.10 lb/hr HCl	Scrubber		Includes assumed scrubber efficiency of 99.9% Can also treat HCl emissions from DB-07
DB-02	TANKS	0.10 lb/hr VOC			
DB-04	Manufacturer Specification (combustion) Mass Balance (PM)	1.8 lb/hr PM <sub>10</sub> 0.14 lb/hr SO <sub>2</sub> 0.96 lb/hr VOC 3.6 lb/hr CO 1.6 lb/hr NO <sub>x</sub>			
DB-05	Mass Balance	0.3 lb/hr PM <sub>10</sub>			
DB-06	Mass Balance	0.3 lb/hr PM <sub>10</sub>			
DB-07	Mass Balance	0.10 lb/hr VOC			
DB-08	Mass Balance	1.1 lb/hr PM <sub>10</sub>			
DB-16	SOCMI	1.40 lb/hr VOC			
DB-17	Mass Balance	0.10 lb/hr Halogens			
DB-18	Mass Balance	0.06 g/ft <sup>3</sup> @ 460 ft <sup>3</sup> /min		99.9%	
DB-19	Mass Balance	1.00 lb/hr Br <sub>2</sub> +HBr		40%	
DB-20	Mass Balance	0.9 lb/hr VOC			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
DB-22	Mass Balance	160 ft <sup>3</sup> /min 2 g solids/ft <sup>3</sup>	Fabric filter	99.93%	
TB-01	TANKS	0.26 lb/hr VOC			
TB-04 (NC-22)	Mass Balance	0.90 lb/hr PM <sub>10</sub> 0.21 lb/hr VOC			
TB-05	Mass Balance	0.45 lb/hr PM <sub>10</sub>			
TB-08 (NC-22)	Mass Balance	0.30 lb/hr PM <sub>10</sub>			
TB-11	Mass Balance	0.1 lb/hr VOC			ADMA Brine Storage Tank (Additional ADMA Storage Scenario)
TB-14 (Stabrom)	Mass Balance	0.30 lb/hr Halogens			
TB-14 (NC-22)	Mass Balance	0.10 lb/hr Halogens			
TB-29 (Stabrom)	SOCMI	0.30 lb/hr Halogens			
TB-29 (NC-22)	SOCMI	1.45 lb/hr VOC			
TB-41 (NC-22)	Mass Balance	18.40 lb/hr VOC			
TB-42 (NC-22 C)	TANKS	0.03 lb/hr HBr			
TB-43 (NC-22)	Mass Balance	0.63 lb/hr VOC			
TB-45 (NC-22)	TANKS	1.174E-04 lb/hr Hydrazine			
TB-47	Mass Balance	50.5 lb/hr VOC 0.40 lb/hr MeCl <sub>2</sub>			
TB-48	Mass Balance	0.20 lb/hr PM/PM <sub>10</sub>	Fabric Filter	99.9%	
TB-49	Mass Balance	0.30 lb/hr PM/PM <sub>10</sub>			
15-02	Mass Balance	0.20 lb/hr Halogens	Scrubber	99.99%	

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
15-12	Facility Knowledge AP-42	0.101 lb/hr Br <sub>2</sub> +HBr/batches per day See Section 1.4	Scrubber	90%	
15-13	Mass Balance	0.079 lb/hr VOC			
15-14A 15-14B	AP-42 Section 1.4	0.01 lb/hr PM <sub>10</sub> 0.01 lb/hr SO <sub>2</sub> 0.01 lb/hr VOC 0.08 lb/hr CO 0.10 lb/hr NO <sub>x</sub>			1.0 MMBtu/hr, each
15-15	SOCMI	4.23 lb/hr VOC			
15-16	Mass Balance	1.20 lb/hr VOC			
15-17	Mass Balance	0.69 lb/hr VOC			
15-18	Mass Balance	1.10 lb/hr VOC			
15-19	Mass Balance	160 ft <sup>3</sup> /min 2 g solids/ft <sup>3</sup>	Fabric filter	99.93%	
15-20	Mass Balance	6.90 lb/hr VOC			
16-01	Mass Balance	0.50 lb/hr SO <sub>2</sub> 0.10 lb/hr PM <sub>10</sub>			
16-02	Mass Balance	0.40 lb/hr SO <sub>2</sub> 0.10 lb/hr VOC			
16-05	Mass Balance	0.10 lb/hr VOC			
16-06	Mass Balance	0.10 lb/hr VOC 0.40 lb/hr VOC			
16-07	Testing	0.30 lb/hr PM <sub>10</sub>			
16-08	Testing	0.30 lb/hr PM <sub>10</sub>			
16-10	Testing	0.50 lb/hr PM <sub>10</sub>			
16-12	Testing	0.10 lb/hr PM <sub>10</sub>			
16-13	Mass Balance	0.10 lb/hr SO <sub>2</sub>			
16-14	Mass Balance	0.10 lb/hr VOC			
16-15	Mass Balance	0.01 lb/hr VOC			
16-16	Mass Balance	0.10 lb/hr SO <sub>2</sub>			
16-17	Mass Balance	0.02 lb/hr VOC			
16-18	AP-42	See Section 1.4			
16-19	Testing (PM <sub>10</sub> ) Mass Balance (SO <sub>2</sub> )	0.30 lb/hr PM <sub>10</sub> 0.10 lb/hr SO <sub>2</sub>			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
16-20	AP-42	7.6 lb/MMscf PM <sub>10</sub> 0.60 lb/MMscf SO <sub>2</sub> 100 lb/MMscf NO <sub>x</sub> 84 lb/MMscf CO 5.5 lb/MMscf VOC			
16-21	Testing (PM <sub>10</sub> ) Mass Balance (VOC)	0.20 lb/hr PM <sub>10</sub> 0.40 lb/hr VOC			
16-22	Mass Balance	0.01 lb/hr PM <sub>10</sub> 0.01 lb/hr VOC			
16-23	SOCMI	6.60 lb/hr VOC			
16-24	Mass Balance	1.80 lb/hr SO <sub>3</sub>			
16-28	Mass Balance	0.10 lb/hr SO <sub>2</sub>			
16-30	AP-42 Sec. 1.4	See Tables 1.4-1 and 1.4-2			1.2 MMBtu/hr 8,760 hr/yr
16-31	Mass Balance	3.83 lb/hr VOC			
16-33	Mass Balance	0.19 lb/hr SO <sub>2</sub> 0.10 lb/hr H <sub>2</sub> S			8,760 hr/yr
BH-01 BH-02	Testing (SO <sub>2</sub> , VOC, NO <sub>x</sub> , CO) AP-42 (PM <sub>10</sub> )	2.59 lb/hr PM <sub>10</sub> 5.60 lb/hr SO <sub>2</sub> 1.87 lb/hr VOC 13.60 lb/hr CO 47.60 lb/hr NO <sub>x</sub>			Emission rates are for each boiler except SO <sub>2</sub> . The emission rate for SO <sub>2</sub> is bubbled for both sources.
BH-03 BH-04	AP-42, Testing, Vendor Data	lb/MMscf PM/PM <sub>10</sub> : 7.6 VOC: 5.5 CO/NO <sub>x</sub> : 37 Lead: 5.0E-04  SO <sub>2</sub> : 5.6 lb/hr			
21-01	Testing (PM <sub>10</sub> ) Mass Balance (VOC, SO <sub>2</sub> , CO, NO <sub>x</sub> )	0.10 lb/hr PM <sub>10</sub> 0.01 lb/hr SO <sub>2</sub> 1.71 lb/hr VOC 3.80 lb/hr VOC 0.50 lb/hr NO <sub>x</sub>			Emissions are calculated every six months.
21-02	SOCMI	3.79 lb/hr VOC			
21-03	Mass Balance	0.01 lb/hr VOC			Emissions are calculated annually.

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
21-04	Testing	2.16 lb/hr VOC			
23-01	SOCMI	<i>NC-23 Scenario</i> 1.12 lb/hr VOC <i>MeBr Scenario</i> 2.33 lb/hr VOC 0.97 lb/hr MeOH 0.97 lb/hr MeBr			
23-02	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-03	<i>NC-23 Scenario</i> Testing <i>MeBr Scenario</i> Mass Balance	<i>NC-23 Scenario</i> 0.35 lb/hr VOC <i>MeBr Scenario</i> 27.37 lb/hr VOC 27.37 lb/hr MeOH			
23-04	Mass Balance	0.44 lb/hr VOC			
23-05	<i>NC-23 Scenario</i> Testing <i>MeBr Scenario</i> Mass Balance	<i>NC-23 Scenario</i> 2.90 lb/hr VOC <i>MeBr Scenario</i> 1.60 lb/hr VOC 0.40 lb/hr MeOH 0.90 lb/hr MeBr			
23-06 23-07 23-08	Mass Balance (PM <sub>10</sub> ) Testing (VOC)	0.30 lb/hr PM <sub>10</sub> 3.80 lb/hr VOC			
23-09	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-10	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-11A 23-11B	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-12A 23-12B	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-13	Mass Balance	0.10 lb/hr PM <sub>10</sub>			
23-16	Mass Balance	0.10 lb/hr MeOH 0.01 lb/hr H <sub>2</sub> SO <sub>4</sub>			
23-17	Mass Balance	0.01 lb/hr Ethylene Glycol			
23-18	Mass Balance	0.01 lb/hr Ethylene Glycol			
BT-01	Mass Balance	0.01 lb/hr VOC 0.14 lb/hr H <sub>2</sub> S			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
BT-11 BT-13	Mass Balance	0.01 lb/hr VOC 0.01 lb/hr H <sub>2</sub> S 0.20 lb/hr NH <sub>3</sub> 0.03 lb/hr Halogens			Emission rates for each source.
BT-12, BT-23, BT-24, BT-25, BT-26, BT-27, BT-28	Mass Balance	0.01 lb/hr VOC 0.20 lb/hr NH <sub>3</sub> 0.03 lb/hr Halogens			Emission rates for each source.
BT-16	Mass Balance	30.00 lb/hr VOC 0.01 lb/hr H <sub>2</sub> S			Emission rates for each source.
BT-17	TANKS	16.40 lb/hr VOC 0.01 lb/hr H <sub>2</sub> S			
BT-21	Mass Balance	4.12 lb/hr PM <sub>10</sub> 3.37 lb/hr VOC			
BT-22	Engineering Estimate	0.02 lb/hr VOC			
DM-01	TANKS	0.03 lb/hr VOC			
DM-02	AP-42 Section 1.4	0.50 lb/hr PM <sub>10</sub> 6.00 lb/hr SO <sub>2</sub> 0.10 lb/hr VOC 0.10 lb/hr CO 0.31 lb/hr NO <sub>x</sub>			1.12 MMBtu/hr SO <sub>2</sub> Determined by mass balance PM <sub>10</sub> EF is from stack testing
DM-03 DM-06	TANKS	0.81 lb/hr H <sub>2</sub> O <sub>2</sub>			Emission rates for each source.
DM-07	SOCMI	4.10 lb/hr VOC			
MS-01	Water9	6.00 lb/hr VOC			Calculate emission rate once every six months
MS-02	Mass Balance	0.10 lb/hr VOC			Calculate emission rate once every six months
MS-03	Test Sample Data	0.1 lb/hr VOC			
MS-05	Mass Balance	0.67 lb/hr VOC			
MS-06	Mass Balance	0.50 lb/hr SO <sub>2</sub> 7.00 lb/hr VOC			
MS-07	TANKS	47.70 lb/hr VOC			



SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
MS-08 -01 -02 -03 -04 -05 -06 -07 -08 -09	AP-42	See AP-42 Sections 3.2 3.3			Emission rates are based on worst case fuel combustion. VOC emission rate includes an estimate for non-combustion emissions (evaporation, crankcase, and refueling losses).
MS-12	SOCMI	1.06 lb/hr Refrigerant			Combined all Non-VOC/Non-HAP Refrigerant emissions for the entire facility
24-01	Mass Balance	48.5 lb/hr VOC 0.10 lb/hr HBr 0.10 lb/hr Acetone 0.10 lb/hr HCl 0.1 lb/hr 1,2-Epoxybutane			Primary Operating VOC emissions from the reactor before flaring are 48.5 lb/hr
24-01	Mass Balance	48.5 lb/hr VOC 0.10 lb/hr HBr 0.10 lb/hr Acetone 0.10 lb/hr HCl 0.1 lb/hr			VOC emissions are not sent to a flare but emitted directly to the atmosphere HBr and HCl are scrubbed out by the wash column.
24-02	SOCMI	1.2 lb/hr VOC 0.1 lb/hr HBr 0.1 lb/hr Acetone 0.1 lb/hr HCl 0.1 lb/hr 1,2-Epoxybutane 0.2 lb/hr Ethylene Glycol			

SN	Emission Factor Source (AP-42, Testing, etc.)	Emission Factor and units (lbs/ton, lbs/hr, etc.)	Control Equipment Type ( if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc.)
33-01	Mass Balance ChemCAD Manufacturer HCl Stack Test	1.90 PM <sub>10</sub> lb/hr 0.10lb/hr SO <sub>2</sub> 5.15 lb/hr VOC 1.68 lb/hr CO 8.71 lb/hr NO <sub>x</sub> 1.60 lb/hr H <sub>2</sub> S 1.00 lb/hr Br <sub>2</sub> 0.10 lb/hr HBr 0.20 lb/hr HCl 1.04 lb/hr Benzene 0.01 lb/hr Bromoform 1.28 lb/hr Xylene 0.01 lb/hr Phenol 1.29 lb/hr Toluene		99.9% VOC	Emission factors are based on maximum feed rate 1,380 lb/hr brominated VOC compounds
33-02	SOCMI	5.15E-05 lb/hr Benzene 9.14E-03 lb/hr Bromoform 4.08E-05 lb/hr Hexane 1.29E-05 lb/hr Isooctane 2.75E-04 lb/hr Phenol 1.01E-04 lb/hr Toluene 4.59E-04 lb/hr Xylene			
33-03	Mass Balance	0.10 lb/hr PM <sub>10</sub>	Fabric Filter	99.93%	<3 micron
33-04	Mass Balance	1.17E-04 lb/hr N <sub>2</sub> H <sub>4</sub>			

14. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
BR-01 BR-04	VOC	18/25A	5 year	Compliance Verification
BR-01 BR-04 BR-12	Br <sub>2</sub> Cl <sub>2</sub>	26A	5 year	Compliance Verification

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SR-01	SO <sub>2</sub>	6C	5 year	Compliance Verification
CB-16	Br <sub>2</sub>	26A	5 year	Compliance Verification
CB-16 (Alternate)	VOC	18 or 25A	Every 365 days operation	Compliance Verification
AD-05	VOC HBr	18 or 25A 26A	5 year	Compliance Verification
AD-35	PM <sub>10</sub> SO <sub>2</sub> VOC CO NO <sub>x</sub>	5 6C 18/25A 10B 7E	2 years	Compliance Verification
AD-35	Br <sub>2</sub>	26A	5 year	Compliance Verification
DB-01	Br <sub>2</sub>	26A	5 year	Compliance Verification
DB-04	Br <sub>2</sub>	26A	5 year	Compliance Verification
TB-14 (Stabrom)	Br <sub>2</sub> BrCl Cl <sub>2</sub>	26A 26A 26A	5 year	Compliance Verification
15-12	VOC	18 or 25A	2 year	Compliance Verification
15-12	PM <sub>10</sub>	5	2 year	Compliance Verification
15-12	Br <sub>2</sub>	26A	5 year	Compliance Verification
15-16	PM <sub>10</sub>	5	2 year	Compliance Verification
16-02	Br <sub>2</sub>	26A	5 year	Compliance Verification
16-24	SO <sub>2</sub>	Approved Method	5 year	Compliance Verification
BH-01 BH-02	SO <sub>2</sub> VOC CO NO <sub>x</sub>	6C 18/25A 10B 7E	5 year	Compliance Verification
21-04	VOC	Approved Method	5 year after initial compliance	Compliance Verification
23-03	VOC	18	5 year	Compliance Verification
23-05	VOC	18	5 year	Compliance Verification
23-06 23-07 23-08	VOC	18	5 year, one silo, must be in receiving mode	Compliance Verification
23-06 23-07 23-08	HBr	26A	5 year, one silo, must be in receiving mode	Compliance Verification
DM-02	PM <sub>10</sub> VOC CO NO <sub>x</sub>	5 18 10B 7E	5 year	Compliance Verification
DM-02	SO <sub>2</sub>	6C	2 year	Compliance Verification

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
33-01	Br <sub>2</sub>	26A	5 year	Compliance Verification

## 15. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method of Monitoring (CEM, Pressure Gauge, etc)	Frequency	Report (Y/N)
BR-01 BR-04	Flow Rate	Flow Rate Monitor Alarm	Continuously	Y
SR-01	Temperature	Thermocouple	Continuously	N
AD-05	Scrubber Media Flow Rate	Flow Rate Monitor	Continuously	N
AD-35	Temperature	Thermocouple	Continuously	N
23-05	Liquid to Gas Mass Flow Rate	Flow Rate Monitor	Continuously	N
23-05	Stripper Temperature	Thermocouple	Continuously	N
TB-25 (NC-24)	Coolant Temperature	Thermocouple	Continuously (Compliance is demonstrated using daily averages)	N
15-02	Br <sub>2</sub>	CEM	Continuously	N
15-12	Br <sub>2</sub>	CEM	Continuously	N
16-01	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N
16-01	Scrubber Media pH	pH Monitor	Every 3 hours	N
16-02	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N
16-02	Scrubber Media pH	pH Monitor	Every 3 hours	N
16-05	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N
16-05	Scrubber Media pH	pH Monitor	Every 3 hours	N
16-06	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N
16-06	Scrubber Media pH	pH Monitor	Every 3 hours	N
16-13	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N
16-24	Scrubber Media Flow Rate	Flow Rate Monitor	Every 3 hours	N

SN	Parameter or Pollutant to be Monitored	Method of Monitoring (CEM, Pressure Gauge, etc)	Frequency	Report (Y/N)
BH-01 BH-02 BH-03 BH-04	H <sub>2</sub> S Concentration / Gas Flow Rate	H <sub>2</sub> S Concentration Monitor / Flow Rate Monitor	Continuously for concentration Once every six hours for flow rate	N
21-01	Process Gas Flow Rate into Oxidizer	Flow Rate Monitor	Continuously	N
21-01	Combustion Zone Temperature	Thermocouple	Continuously	N
23-03	Scrubber media Flow Rate	Flow Rate Monitor Alarm	Continuously	N
23-05	Scrubber media Flow Rate	Flow Rate Monitor Alarm	Continuously	N
DM-02	Combustion Zone Temperature	Thermocouple	Continuously	N
24-01	Water Flow Rate	Flow Rate Monitor	Continuously	N
	Chilled Water Temperature	Thermocouple		
33-01	Combustion Zone Temperature	Thermocouple	Continuously	N
	Scrubber Media Flow Rate	Flow Rate Meter	Continuously	N
	Evaporative Cooling Water Flow Rate	Flow Rate Meter	Continuously	N
	Solids Concentration in Evaporative Cooling Water	Sampling	Weekly	N
	Brue Feed Tank Feed Rate	Flow Meter	Continuously	Y

16. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
BR-01 BR-04	Brine Solution Flow Rate	Established according to most recent satisfactory test	Per Alarm Incident	Y
BR-12	Pump Discharge Valve Position and Run Light	Established according to most recent satisfactory test	3 hours	Y

SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
BR-12	Caustic Concentration of Scrubber Media	Strength of caustic solution as established according to most recent satisfactory test	Each RailCar/Truck Unloading	Y
SR-01	Incinerator Temperature	1200 °F or above	Continuous	N
CB-04	Methanol Throughput	10 <sup>6</sup> gallon per consecutive 12 months	Monthly	Y
CB-16	Batch Production (Alternate Scenario)	185 batches per consecutive 12 months	Monthly	Y
CB-18	Raw Material Baghouse Products	Identity of each compound, TLV, amount of each compound	Per Batch	N
AD-05	Scrubber Media Flow Rate	Established according to most recent satisfactory test	4 hour	N
AD-05	Caustic Concentration of Scrubber Media	Strength of caustic solution and change out as established according to most recent satisfactory test	12 hour	N
AD-21	Period of Storage of C8 Olefin	Not to exceed 4380 hours per consecutive 12 months	Monthly	N
AD-35	Incinerator Temperature	1500 °F or above	Continuous	N
AD-39	Duration of each Alternate Scenario Event and Vapor Pressure	2.9 tpy VOC as calculated from mass balance and records	Per Event	N
AB-15	Carbon Bed Regeneration/Carbon Replacement	Regenerate every 12 hours Replace Every 10,220 hours of operation	N/A	N
DB-01	Caustic Concentration of Scrubber Media	Must measure greater than 5%	12 hour	N
		Replace caustic when concentration falls below 5%	As Needed	N
	Scrubber Media Pumps	Visual Inspections	Once Per Day	N
DB-07	Dried Tanks of Diphenyl Oxide	150 tanks per year	Monthly	N
23-05	Liquid to Gas Mass Flow Rate Ratio	$L/G \geq 5.7$	Continuous	N
23-05	Stripper Temperature	170 °F or above	Continuous	Y
TB-25 (NC-24)	Glycol Coolant Temperature	Maximum Daily Ave 40 °F	Daily	N
TB-47 (NC-22)	Tons of off-spec product processed	660 tons/12 month	Monthly	Y
15-18 15-20	DPE Production By-Product Generation	140,000 lbs/week By-Product Throughput	Weekly	N

SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
16-01	Scrubber Media Flow Rate	6 gpm	3 hours	N
16-01	Scrubber Media pH	Established according to most recent satisfactory test	3 hours	N
16-02	Scrubber Media Flow Rate	60 gpm	3 hours	N
16-02	Scrubber Media pH	Established according to most recent satisfactory test	3 hours	N
16-05	Scrubber Media Flow Rate	4 gpm	3 hours	N
16-05	Scrubber Media pH	Established according to most recent satisfactory test	3 hours	N
16-06	Scrubber Media Flow Rate	6 gpm	3 hours	N
16-06	Scrubber Media pH	Established according to most recent satisfactory test	3 hours	N
16-13	Scrubber Media Flow Rate	4 gpm	3 hours	N
16-14	Carbon Canister Replacement	Once every year	Annually	N
16-15	Carbon Canister Replacement	Once every year	Annually	N
16-22	Carbon Canister Replacement	Once every year	Annually	N
16-24	Hours of Operation	1,752 hours per year	Per Event	N
16-24	Scrubber Media Flow Rate	6 gpm	3 hours	N
16-31	Phthalic Anhydride Throughput	18.25 MM lb per consecutive 12 months	Monthly	Y
BH-01 BH-02 BH-03 BH-04	H <sub>2</sub> S Concentration in fuel	Established according to most recent satisfactory test for SO <sub>2</sub> at BH-01 and BH-02.	6 hours	N
BH-01 BH-02 BH-03 BH-04	Fuel Flow Rate	Established according to most recent satisfactory test at BH-01 and BH-02.	6 hours	N
BH-03 BH-04	Fuel Combusted	N/A	Daily	N
BH-03 BH-04	Temporary Status of Boiler	See Specific Condition #170c.	As Necessary to verify boiler is temporary	N
21-01	Combustion Zone Temperature	1400 °F Min.	Continuous	N
NC-22 Unit	Number of Batches Produced	3,137 batches per consecutive 12 months	Monthly	Y
23-03	Scrubber Media Flow Rate	Minimum flow rate set point established according to most recent satisfactory test.	Per Alarm Incident	N
23-04	By-Product Drum Turnovers	96 turnovers per day	Daily	N

SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
23-05	Scrubber Media Flow Rate	Minimum flow rate set point established according to most recent satisfactory test.	Per Alarm Incident	N
23-14	Cleaning Cycles	If less than 75 cycles per year then monthly recordkeeping of number of cycles.	Monthly	Y
		If more than 75 cycles per year then compliance demonstrated through emission calculations.	Monthly	
NC-23 CMPU	Primary Reactor Throughput for ABRM1	1.725 Million Pounds of ABRM1 per year	Monthly	Y
DM-02	Combustion Zone Temperature	1200 °F or above	24 hours	N
MS-02	Amount of Solids Transferred to Landfill (MS-06)	Based on Semi-Annual Emission Calculations	Monthly	N
MS-03	Amount of Water Recovered	82.0 million gallons per year (total)	Monthly	N
MS-05	Coating and Adhesives Usage	100 gallons per year	Monthly	N
MS-06	All Matter Disposed	24 million pounds per consecutive 12 months	Monthly	N
MS-07	Gasoline Throughput	200,000 gallons per consecutive 12 months	Monthly	N
MS-08 -01 -02 -03 -04 -05 -06 -07 -08 -09	Hours of Operation Reason of Operation ( <i>i.e.</i> testing, readiness checks, emergency, <i>etc.</i> )	Non-Emergency: 100 hr per calendar year per engine  Emergency: No Limit	Monthly	Y
24-01	Water Flow Rate	Minimum Daily Ave. 1,700 lb/hr	Daily	N
	Chilled Water Temperature	Maximum Daily Ave. 60 °F		
24-01	Duration of each event while operating in alternate Scenario	0.60 tpy VOC calculated based on mass balance and recordkeeping		
NC-24 Unit	Gallons of Product	2,800,000 gallons per year	Monthly	Y
	1,2-Epoxybutane Usage	50,000 gallons per year		



SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
	Venting to SN-AD-26	24-hours per consecutive 12 months. If venting exceeds 24 hours calculate emissions for each event.		
33-01	Feed Tank Feed Rate to Thermal Oxidizer	1,380 lb/hr	Monthly	Y
	Thermal Oxidizer Temperature	Minimum 1,750 °F	Continuously	Y
	Scrubber Media (Brine) Flow Rate	350 gpm	Continuously	N
	Evaporative Cooling Water Flow Rate	20 gpm	Continuously	N
	Evaporative Cooling Water Solids (including TDS)	183 mg/l	Weekly	N

## 17. OPACITY:

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
BR-01	5	Department Guidance	Inspector's Observation
BR-04	5	Department Guidance	Inspector's Observation
BR-09	5	Department Guidance	Inspector's Observation
BR-12	5	Department Guidance	Inspector's Observation
SL-01	5	Department Guidance	Inspector's Observation
SR-01	5	Department Guidance	Inspector's Observation
CB-01	5	Department Guidance	Inspector's Observation
CB-16	5	Department Guidance	Inspector's Observation
CB-18	5	Department Guidance	Inspector's Observation
AD-05	5	Department Guidance	Inspector's Observation
AD-16	5	Department Guidance	Inspector's Observation
AD-26	5	Department Guidance	Inspector's Observation
AD-35	5	Department Guidance	Inspector's Observation
DB-01	5	Department Guidance	Inspector's Observation
DB-04	5	Department Guidance	Inspector's Observation
DB-05	5	Department Guidance	Inspector's Observation
DB-06	5	Department Guidance	Inspector's Observation
DB-08	5	Department Guidance	Inspector's Observation
DB-17	5	Department Guidance	Inspector's Observation
DB-19	5	Department Guidance	Inspector's Observation
DB-22	5	Department Guidance	Inspector's Observation

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
TB-04	5	Department Guidance	Inspector's Observation
TB-05	5	Department Guidance	Inspector's Observation
TB-08	5	Department Guidance	Inspector's Observation
TB-14	5	Department Guidance	Inspector's Observation
15-02	5	Department Guidance	Inspector's Observation
15-12	5	Department Guidance	Inspector's Observation
15-16	5	Department Guidance	Inspector's Observation
15-19	5	Department Guidance	Inspector's Observation
16-01	5	Department Guidance	Inspector's Observation
16-02	5	Department Guidance	Inspector's Observation
16-06	5	Department Guidance	Inspector's Observation
16-07	5	Department Guidance	Inspector's Observation
16-08	5	Department Guidance	Inspector's Observation
16-10	5	Department Guidance	Inspector's Observation
16-12	5	Department Guidance	Inspector's Observation
16-18	5	Department Guidance	Inspector's Observation
16-19	5	Department Guidance	Inspector's Observation
16-20	5	Department Guidance	Inspector's Observation
16-21	5	Department Guidance	Inspector's Observation
16-22	5	Department Guidance	Inspector's Observation
16-29	5	Department Guidance	Inspector's Observation
16-30	5	Department Guidance	Inspector's Observation
BH-01	5	Department Guidance	Inspector's Observation
BH-02	5	Department Guidance	Inspector's Observation
BH-03	5	Department Guidance	Inspector's Observation
BH-04	5	Department Guidance	Inspector's Observation
21-01	5	Department Guidance	Inspector's Observation
23-02	5	Department Guidance	Inspector's Observation
23-06	5	Department Guidance	Inspector's Observation
23-11A	5	Department Guidance	Inspector's Observation
23-11B	5	Department Guidance	Inspector's Observation
23-12A	5	Department Guidance	Inspector's Observation
23-12B	5	Department Guidance	Inspector's Observation
23-13	5	Department Guidance	Inspector's Observation
BT-11	5	Department Guidance	Inspector's Observation
BT-12	5	Department Guidance	Inspector's Observation
BT-13	5	Department Guidance	Inspector's Observation
BT-21	5	Department Guidance	Inspector's Observation
DM-02	5	Department Guidance	Inspector's Observation

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
MS-08-X	20/5	§19.503 and Part 52, Subpart E	Inspector's Observation
33-01	5	Department Guidance	Inspector's Observation

18. DELETED CONDITIONS:

Former SC	Justification for removal
	None

19. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

INSIGNIFICANT ACTIVITIES				
SN	Description	Category	Pollutant	ton/yr
BR-05	Recovered Groundwater Storage Tank, T-3045	A13	VOC	<0.01
			Bromoform	<0.01
			Ethylene Dibromide	<0.01
			Ethylene Dichloride	<0.01
			Toluene	<0.01
			Br <sub>2</sub>	<0.01
BR-16	C-12 Olefin Storage (up to 10,000 gal total capacity)	A3	VOC	0.07
SL-03	Sulfolane Storage Sump (S-1901)	A3	Sulfolane	<0.01
			DIPA	<0.01
SL-04	MDEA Storage Tank (T-5001)	A3	MDEA	<0.01
CB-10	Wash Water Tank	A13	VOC	<0.10
			HCl	<0.10
			HBr	<0.10
			Acetone	<0.10
CB-20	Formic Acid Storage Bins	A13	Formic Acid	<0.01
DE-05	Pressure Vessel	A13	No Emissions	N/A
DB-23	DPE Heavies	A3	VCO	<0.01
AD-38	Alcohol Addition System	A13	VOC	0.02
AB-17	T-703 Ethylene Glycol Storage Tank	A3	Ethylene Glycol	0.001
TB-08	Polymer Transfer	A13	PM	0.14
			PM <sub>10</sub>	0.07
TB-13	Refrigerant Storage Tank	A3	VOC	<0.01
			Ethylene Glycol	<0.01
TB-26	Sulfuric Acid Storage Tank Alternate Use: Ethylene Glycol Storage	A3	VOC	0.04
			H <sub>2</sub> SO <sub>4</sub>	0.05
			Ethylene Glycol	0.04
TB-27	Refrigerant Storage Tank	A3	Ethylene Glycol	<0.01

INSIGNIFICANT ACTIVITIES				
SN	Description	Category	Pollutant	ton/yr
TB-36	Water Scrubber Tank	A3	VOC	0.03
TB-40	Raw Material Weigh Vessel	A13	PM/PM <sub>10</sub>	0.44
TB-43	During NC-22 Scenario B	A13	VOC	0.10
--	Heating System Expansion Tank	A13	VOC	<0.01
--	Hot Water Tank 67-65-1	A13	Methanol	0.02
--	Area Safety Relief Knockout Pot D-9505	A13	Non-VOC Caustic	N/A
--	Antifoam Storage Tank, T-95107	A13	Org. Liqs., 3.5 psia	N/A
--	Hot Water Tank, T-602	A13	VOC	0.02
--	Pressurized Ethylene Glycol Storage Tank, (D-9972)	A13	None	N/A
16-09	EBTBP Ambient Dust Collector SF9398	A13	PM/PM <sub>10</sub>	0.3
--	Ethylene Glycol Tanks, T-93952, T-9393, T-9351, T-9359, T-9392	A3	Ethylene Glycol	<0.01
--	Hot Oil Expansion Tank / Heat Transfer fluid Tank, T-9354	A2	VOC	0.95
--	Hot Oil Surge Tank, D-3490	A13	VOC	<0.01
BT-02	Purchased Brine Surge Tank, T-3017	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-03	Brine/Oil Separator OS-3002	A13	VOC H <sub>2</sub> S	0.05 0.09
BT-04	Feed Brine Pump Suction Header Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-05	Overflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-06	Overflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-07	Feed Brine Pump Suction Header Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-08	Brine/Oil Separator Outlet Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-09	Overflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-10	Brine/Oil Separator Outlet Line Vent (OS-3002)	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-14	Vacuum Pump Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-15	Overflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-18	Brine Underflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-19	Brine Underflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05
BT-20	Brine Underflow Line Vent	A13	VOC H <sub>2</sub> S	0.05 0.05

INSIGNIFICANT ACTIVITIES				
SN	Description	Category	Pollutant	ton/yr
BT-30	Brine Management Line Vent	A13	VOC	0.05
			H <sub>2</sub> S	0.05
DM-04	Catalyst Loading	A13	PM/PM <sub>10</sub>	0.23
DM-05	Stabilizer Hopper	A13	PM/PM <sub>10</sub>	0.13
--	Solid Waste Vault No. 2	A13	PM/PM <sub>10</sub>	Trace
			VOC	Trace
--	Outfall 002 Bioreactor	A13	Chlorine	Trace
--	PSV-1 Sumps	A13	VOC	1.51
MS-09	Diesel fuel Storage Tanks (up to 10,000 gallons total capacity)	A3	VOC	0.12
MS-10	Gasoline Storage Tanks (up to 2,000 gallons total capacity)	A13	VOC HAPs	1.30 0.07
MS-11	Cooling Towers (Maintenance/Support Facilities)	A13	PM/PM <sub>10</sub> Chlorine	3.29 Trace
--	Drinking Water Treatment and Distribution	A13	N/A	N/A
--	Quality Control Laboratory	A5	N/A	N/A
--	A-12 Emergency Systems Generators – Phone System and Admin Bldg Backup, Emergency Fire Pumps (2), Potable Water Supply Backup, Material Analyzer Backup, Outfall Flow Monitor Battery Backup	A12	N/A	N/A
--	200 gallon Hot Oil Tank (CP-6000-68)	A3	VOC	<1.00E-7
--	pH Adjustment Bag Dumping	A13	PM/PM <sub>10</sub>	0.009
Totals for Category A2			VOC	0.95
Totals for Category A3			VOC	0.80
			H <sub>2</sub> SO <sub>4</sub>	0.05
			Sulfolane	0.01
			DIPA	0.01
			MDEA	0.01
			Any Single HAP	0.07
			Total HAP	0.07
Totals for Category A13			VOC	4.92
			PM	4.55
			PM <sub>10</sub>	4.47
			SO <sub>2</sub>	2.61
			H <sub>2</sub> S	2.13
			Br <sub>2</sub>	0.01
			HCl	<0.10
			HBr	<0.10
			Acetone	<0.10
			Formic Acid	0.01
			Any Single HAP	0.06
Total HAP	0.12			

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20. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
0762-AOP-R28

## APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

## Fee Calculation for Major Source

Revised 03-11-16

Facility Name: Albemarle Corporation - South Plant  
 Permit Number: 0762-AOP-R29  
 AFIN: 14-00028

\$/ton factor	23.93	Annual Chargeable Emissions (tpy)	4589.55
Permit Type	Minor Mod	Permit Fee \$	500

Minor Modification Fee \$	500
Minimum Modification Fee \$	1000
Renewal with Minor Modification \$	500
Check if Facility Holds an Active Minor Source or Minor Source General Permit	<input type="checkbox"/>
If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$	0
Total Permit Fee Chargeable Emissions (tpy)	0
Initial Title V Permit Fee Chargeable Emissions (tpy)	

*HAPs not included in VOC or PM:*

*Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride*

*Air Contaminants:*

*All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensible PM, H2S in TRS, etc.)*

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
PM		127.5	127.5	0	0	127.5
PM <sub>10</sub>		116.5	116.5	0		
PM <sub>2.5</sub>		0	0	0		
SO <sub>2</sub>		3295.4	3295.4	0	0	3295.4
VOC		494.1	494.1	0	0	494.1
CO		182.9	182.9	0		
NO <sub>x</sub>		495.6	495.6	0	0	495.6
Acetone	<input checked="" type="checkbox"/>	0.4	0.4	0	0	0.4



Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Ammonia	<input checked="" type="checkbox"/>	47.23	47.23	0	0	47.23
Br2	<input checked="" type="checkbox"/>	34.97	34.97	0	0	34.97
Br2+HBr	<input checked="" type="checkbox"/>	17.33	17.33	0	0	17.33
BrCl	<input checked="" type="checkbox"/>	0.88	0.88	0	0	0.88
H2O2	<input checked="" type="checkbox"/>	7.54	7.54	0	0	7.54
H2S	<input checked="" type="checkbox"/>	13.7	13.7	0	0	13.7
H2SO4	<input checked="" type="checkbox"/>	0.32	0.32	0	0	0.32
HBr	<input checked="" type="checkbox"/>	25.05	25.05	0	0	25.05
Non-VOC/Non-HAP Refrigerant	<input checked="" type="checkbox"/>	9.62	9.62	0	0	9.62
	<input type="checkbox"/>			0		
Benzene	<input type="checkbox"/>	18.09	18.09	0		
Br2+Cl2	<input checked="" type="checkbox"/>	0.1	0.1	0	0	0.1
Cl2	<input checked="" type="checkbox"/>	4.03	4.03	0	0	4.03
Cl2 or Halogens	<input checked="" type="checkbox"/>	0.62	0.62	0	0	0.62
HCl	<input checked="" type="checkbox"/>	8.87	8.87	0	0	8.87
Hydrazine	<input checked="" type="checkbox"/>	0.46	0.46	0	0	0.46
Methanol	<input type="checkbox"/>	21.31	21.31	0		
Methyl Bromide	<input type="checkbox"/>	9.54	9.54	0		
Methylene Chloride	<input checked="" type="checkbox"/>	5.83	5.83	0	0	5.83