STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1077-AOP-R2 AFIN: 70-00012

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

Great Lakes Chemical Corporation (Central Plant)
2226 Haynesville Highway
El Dorado, Arkansas 71730

3. PERMIT WRITER:

Derrick Brown

4. NAICS DESCRIPTION AND CODE:

NAICS Description: All Other Miscellaneous Chemical Product and Preparation Manufacturing
NAICS Code: 325998

5. SUBMITTALS:

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
6/27/2013	Renewal	N/A

6. REVIEWER'S NOTES:

Great Lakes Chemical Corporation (GLCC) Central Plant operates a chemical product preparation and manufacturing facility located at 2226 Haynesville Highway, Union County, El Dorado, Arkansas. This permit action is incorporates the facility's renewal permit application. Included in this permit action is the removal of the Fine Chemicals Unit and transfer of SN-657 to the Alkyl Bromide Unit. Also, the Spray Dryer Unit is being removed from the permit. This permit action decreases criteria pollutant emissions by 29.26 tons of PM per year, 30.26 tons pf PM_{10} per year, 3.08 tons of SO_2 per year, 52.8 tons per year of NO_x, and 4.32 tons of VOC. Overall HAP pollutant emissions decreased as well.

7. COMPLIANCE STATUS:

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

There are no current/pending enforcement actions for this facility.

8. PSD APPLICABILITY:

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

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

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

If yes, explain why this permit modification is not PSD.

This permit action does not involve construction, reconstruction, or modification that would require a PSD application.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-303	N/A	NSPS Part 60, Subpart Dc
Alkyl Bromides Unit TBBPA Unit Packaging and Shipping	VOC	NSPS Part 60, Subpart VV
SN-1907, SN-1908, SN-1909	N/A	NSPS Part 60, Subpart IIII
Facility	Benzene	NESHAP Part 61, Subpart FF
Facility – Compliance option for 40 CFR Part 63 Subpart MMM and FFFF	HAPs	NESHAP Part 63, Subpart F
TCO Unit	HAPs	NESHAP Part 63, Subpart UU
TCO Unit	HAPs	NESHAP Part 63, Subpart YY
TBBPA Unit BRU Unit	HAPs	NESHAP Part 63, Subpart MMM
Alkyl Bromides Unit BOC Unit OCP Unit	HAPs	NESHAP Part 63, Subpart EEEE

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
TBBPA Unit TCO Unit OCP Unit	HAPs	NESHAP Part 63, Subpart FFFF
SN-1903, SN-1904, SN-1905, SN-1906, SN-1907, SN-1908, SN-1909	N/A	NESHAP Part 63, Subpart ZZZZ
SN-301, SN-302, SN-303	HAPs	NESHAP Part 63, Subpart DDDDD

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. AMBIENT AIR EVALUATIONS:

a) Reserved.

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.

1st 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^3), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Methanol	262	28.82	0.27	Y
Toluene	75.4	8.29	0.08	Y
Methanol + Methyl Bromide	262/3.83	28.82/0.421	3.8	N
Triethalamine + Ethyl Chloride	4.14/263.9	0.455/29.0	0.01	Y
Triethylamine	4.14	0.455	2.23	N**
Ethyl chloride	263.9	29.0	3.42	Y

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Methylene Chloride	173.7	19.11	10.95	Y
Cl_2	1.45	0.16	1.50	N**
HCl	2.98	0.33	8.09	N**
Hydrazine	0.013	0.001	0.08	N
Br_2	0.66	0.07	17.68	N
HBr	6.62	0.73	14.96	N
Hbr/Br_2	6.62/0.66	0.728/0.0726	2.5	N
Ammonia	17.4	1.915	0.1	Y
Ammonium Bromide	No value found		0.1	
H_2S	13.94	1.53	1.3	Y

*HAPs emitted at less than 10 tons per year each and with a TLV less than 1 mg/m^3.

2nd 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 ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Methanol	2621	363.68	Y
Methyl Bromide	38.83	*	N**
Hydrazine	0.13	0.52	N**
Br_2	6.6	158.98	N**
HBr	66.2	124.6	N**
Phosgene	4.05	8.30	N**

**The facility was required to submit a risk assessment for these pollutants per Plantwide Condition 7 and 8 of 1077-AOP-R1.
***The facility operates a phosgene monitoring system in the vicinity of the phosgene cylinders.

c) H_2S 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_2S Standards Y
If exempt, explain: Facility subject to NSPS Subpart VV, and is therefore exempt under A.C.A. §8-3-103(B)(ii)(c)

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

$Cp = Cm\ (t_m/t_p)^{0.2}$ where

Cp = 5-minute average concentration
Cm = 1-hour average concentration
t_m = 60 minutes
t_p = 5 minutes

12. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
102	Testing, PAI MACT Requirements		Adsorber/Scrubber Train	VOC: 98% + Halogens: 94%+	
199	EPA Document 453/R-95-017, Table 2-4				
201	Mass Balance		Scrubber	95%	
202	AP-42 Table 4.3-1				
299	EPA Document 453/R-95-017, Table 2-4				
301, 302, 303	AP-42 Tables 1.4-1, 1.4-2				301-150 MMBtu/hr 302-113 MMBtu/hr 303-88.6 MMBtu/hr
402	Current Permitted Rate	N/A	Scrubber	95% for BR_2	

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
	of Bromine HCl and Cl_2 to be emitted in trace amounts				
403	Testing HCl and Cl_2 to be emitted in trace amounts	5.4 E-4 lb/hr (Used for Br_2 and HBr)	N/A	N/A	*Maximum of three stack test averages multiplied by 2. (2.7 E-4)
405	Testing HCl and Cl_2 to be emitted in trace amounts	0.36 lb Br_2/hr 0.02 lb HBr/hr	Scrubber	95% for BR_2	*Maximum of three stack test averages multiplied by 2. (2.1 E-4 lb Br_2/hr) (1.2 E-2 lb HBr/hr)
411	Assumed TDS from AP-42 Vendor report maximum drift of 0.005%	Maximum drift of 0.005%	N/A	N/A	12,000 ppm TDS
412, 413	PM/PM_{10}: AP-42 Table 13.4-1 VOC, HCl, HBr to be emitted in trace amounts	1.7 lb total liquid drift per 1000 gal circulating water flow	Drift eliminator	99.9%	0.29 total dissolved solids fraction
499	EPA Document 453/R-95-017, Table 2-4	N/A	N/A	N/A	
605, 612, 653, 654, 657, 658	Tanks 4.0	N/A	N/A	N/A	Used Worst-case tank of 12,500 gallons and vapor pressure of gasoline RVP 6
612	Testing HCl to be emitted in trace amounts	N/A	N/A	N/A	
660	Ideal Gas Law	N/A	Condenser	95%	300 gal/hr exhaust flow
661, 664	Tanks 4.0	N/A	N/A	N/A	Used Worst-case tank of 10,500 gallons and vapor pressure of

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
					ethanol
673	Tanks 4.0 (Assumed emissions from tanks are summed) (Assumed two trucks/railcars are loaded simultaneously)	N/A	N/A	N/A	Used Worst-case tank of 12,500 gallons and vapor pressure of gasoline RVP 6
699	EPA Document 453/R-95-017, Table 2-4	N/A	N/A	N/A	
901	Estimated using saturated filling loss calculation.	0.311 lb HCl/hr 0.005 lb HBr/hr (Release rate from scrubber)	Scrubber	95%	52% HBr Solution 36% HCl Solution
902	AP-42 Table 13.5-1 H_2S/SO_2: Mass Balance				Emissions from 301 and 902 are "bubbled" as only one will be operational at any given time
906	Vendor Data	0.005% drift	Drift eliminator		
907	AP-42 Table 13.4-1 PM_{10}: 0.019 lb/1000 gal				
908	Vendor Data	0.001% drift	Drift eliminator		
999	EPA Document 453/R-95-017, Table 2-4				
1001A/B	Testing				
1002, 1003, 1005, 1006, 1007	PM_{10}: 0.02 gr/dscf VOC: Testing				
1008	Tanks 4.0 (VOC)		Flare	95% (VOC)	

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
	AP-42 Table 13.5-1 (CO/NO_x) Table 1.4-2 (PM_{10}/SO_2)				
1014, 1015, 1016	Engineering Estimate				Recycle Water Tank assumed to emit trace amounts of VOC
1019	Mass Balance				
1025	Testing for Br_2, Cl_2		Scrubber	Testing for compliance	2.5% caustic; min: 10 gal/min
1030, 1031	AP-42 Table 13.4-1 PM_{10}: 0.019 lb/1000 gal				Assumed a worst-case tank of 25,000 gal storing No. 2 fuel oil with 1 turnover per day
1099	EPA Document 453/R-95-017, Table 2-4				
1102, 1112	AP-42 Table 1.4-1 and 1.4-2 (natural gas combustion emissions) Testing for PM_{10}, HBr, BR_2, Cl_2, HCl	NO_x = 100 lb/MMscf CO = 84 lb/MMscf PM = 7.6 lb/MMscf VOC = 5.5 lb/MMscf SO_2 = 0.6 lb/MMscf	Scrubber	Not disclosed. Testing for compliance	0.0005 MMscf/hr each Both water scrubbers@10gal/min
1107	HBr/Br_2: Testing HCl/Cl_2: assumed trace emissions when HBr/Br_2 are emitted		Scrubber	Not disclosed. Testing for compliance	2.5% caustic @10.0gal/min
1109	HBr/Br_2: Testing VOC/HCl/Cl_2: assumed trace emissions when		Scrubber	Not disclosed. Testing for compliance	2.5% caustic @10.0gal/min

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
	HBr/Br_2 are emitted				
1103, 1103, 1105, 1106, 1113, 1114, 1115, 1116, 1123	PM10: 0.02 gr/scf HBr/Br_2: Mass Balance HCl/Cl_2: assumed trace emissions when HBr/Br_2 are emitted		Fabric Filter		1103@6400cfm 1104@3250cfm 1105@3250cfm 1106@3250cfm 1113@6400cfm 1114@3100cfm 1115@3250cfm 1116@3500cfm 1123@1900cfm
1120, 1121	Tanks 4.0	Assumed a worst-case tank of 10,000 gal storing No. 2 fuel oil with 1 turnover per day, tanks actually store DPO which has a RVP of 0.0005 psi			
1140, 1141, 1142	AP-42 Table 13.4-1	PM10: 0.003 lb/1000			Recirculating Water Flow = 1,000 gpm each Based on a max recirculating water TDS of 2000 ppm
1199	EPA Document 453/R-95-017, Table 2-4	Factors in lb/hr/component **For VOC:** **Gas Service** Valves -0.00289 Connectors-0.0001786 **LLS** Valves -0.0003638 Connectors-0.0001786 PumpSeals/Agitators-0.0041226 Press Relief valves – 0.0985466 **HLS** Valves -0.005072 Connectors-0.000179 PumpSeals/Agitators-			**For VOC:** **Gas Service** Valves -40 Connectors-264 **LLS** Valves -185 Connectors-1221 PumpSeals/Agitators-5 Press Relief valves –2 **HLS** Valves -193 Connectors-1273 PumpSeals/Agitators-6 Press Relief valves –2 **For Hydrazine**: Valves -4 Connectors-24

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
		0.004631 Press Relief valves – 0.098564 **For Hydrazine:** **LLS** Valves -0.0003638 Connectors-0.0001786 PumpSeals/Agitators-0.0041226 Press Relief valves – 0.0985466			PumpSeals/Agitators-1 Press Relief valves –0
1202	Testing Cl_2 to be emitted in trace amounts	N/A	Scrubber	95% for Br_2	
1203	Grain Loading	0.02 gr/cf	Fabric Filter	99% for PM/PM_{10}	600 cfm
1204	Testing HCl and Cl_2 to be emitted in trace amounts	N/A	Scrubber	90% for HBr	
1220	AP-42 Table 13.4-1	0.019 lb PM_{10} per 1000 gal circulating water flow	N/A	N/A	1300 gpm recirculating water flow
1221	HBr: GLCC Process Engineer Estimate HCl to be emitted in trace amounts	3 ppmv HBr	Scrubber	90%	These units are not required to be operated and sources are permitted separately
1299	EPA Document 453/R-95-017, Table 2-4	N/A	N/A	N/A	
1301	AP-42 Table 13.5-1 AP-42 Table 1.4-1 (for small boilers)	NO_x = 100 lb/MMscf CO = 0.37 lb/MMBTU PM = 7.6 lb/MMscf VOC = 1.1 lb/hr SO_2 = 0.6 lb/MMscf			Assumed destruction efficiency of 90% for VOC 4.728 MMBTU/hr
1314, 1315, 1337	PM_{10}: 0.02 gr/scf		Fabric Filter		1314@925cfm 1315@1600cfm

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
	Br_2/Cl_2: testing				1337@1000cfm
1399	EPA Document 453/R-95-017, Table 2-4	Factors in lb/hr/component **Gas Service** Valves -0.00028881 Connectors-0.0001786 **LLS** Valves -0.0003638 Connectors-0.0001786 PumpSeals/Agitators-0.0041226 Press Relief valves – 0.0985466 **HLS** Valves -0.005072 Connectors-0.000179 PumpSeals/Agitators-0.004631 Press Relief valves – 0.098564			**Gas Service** Valves -21 Connectors-139 **LLS** Valves -313 Connectors-1878 PumpSeals/Agitators-9 Press Relief valves –4 **HLS** Valves -89 Connectors-588 PumpSeals/Agitators-2 Press Relief valves –2
1403, 1413, 1423	PM10: 0.2 gr/dscf VOC: testing				
1404	Testing				
1406A/B	Testing				
1409	Mass balance				
1420	EPA Water9 Software				
1421, 1422	Tanks 4.0				Assumed 2 turnovers per day
1430, 1431	Engineering estimate				Assumed trace emissions of ethylene chloride
1433, 1434	AP-42 Table 13.4-1	PM_{10}: 0.019 lb/1000 gal			Flow rates: 2,880 gal/min (SN-1433), 1,500 gal/min (SN-1434)
1499					
1501	HBr + Br: Testing		Scrubber	Not disclosed.	2.5% caustic @1.5 gal/min

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equip.	Control Equip. Eff.	Comments
	Cl/HCl: Assumed to be emitted in trace amounts when Br is present			Testing for compliance.	
1504, 1552	Tanks 4.0	Assumed RVP 13 gasoline (VOC) and o-xylene (HAP) as a conservative estimate, and assumed continuous filling at 312 gal/hr (SN-1504) and 442 gal/hr (SN-1552)			Actual vp of stored components are 7.74 psia@70^{o}F for ethyl bromide or 0.087 psi @68^{o}F
1509A/B	Mass Balance	8.0 lb VOC/gal			10gal/hr, 249gal/yr
1511	AP-42 Table 13.2.6-1	PM_{10}: 0.69 lb/1000 lb abrasive 1200 lb/hr usage	Fabric Filter		
1551	Testing		Scrubber	Not disclosed. Testing for compliance.	2.5% caustic @2.0 gal/min
1599	EPA Document 453/R-95-017, Table 2-4	Factors in lb/hr/component **Gas Service** Valves -0.00028881 Connectors-0.0001786 **LLS** Valves -0.0003638 Connectors-0.0001786 PumpSeals/Agitators-0.0041226 Press Relief valves –0.0985466			**Gas Service** Valves -13 Connectors-78 **LLS** Valves -354 Connectors-2124 PumpSeals/Agitators-7 Press Relief valves –8
1903, 1904, 1905, 1907, 1908, 1909	AP-42 Section 3.3				Emissions from diesel-fired generator engines

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
102	PM_{10} VOC NO_x HBr Br_2	EPA Method 5 or 201A Method 18 Method 7E Dept to approve prior to test Dept to approve prior to test	Initial and every 3 years	Verify emissions
403, 405	HBr Br_2	EPA Reference Method 26 EPA Reference Method 26	5 yr	Department Guidance
409	Cl_2	Method specified in 40 CFR Part 60 Appendix A	At least once every five years	Verify emissions
410	HCl	Method specified in 40 CFR Part 60 Appendix A	At least once every five years	Verify emissions and operating parameters
1202, 1204	HBr Br_2	EPA Reference Method 26 EPA Reference Method 26	5 yr	Department Guidance
657	HCl HBr NH_3	EPA Reference Method 26 EPA Reference Method 26 CTM 027	5 yr	Department Guidance
1001A, 1001B	Br_2 Cl_2	EPA Reference Method 26 CTM 027	5 yr	Department Guidance
1102, 1112	PM/PM_{10}	5 or 201A	Initial + 5 yrs	Verify emission rates
1107	HBr, Br_2	EPA Reference Method 26 or other pre-approved Method	Initial + 5 yrs	Verify emission rates
1109	HBr, Br_2	EPA Reference	Initial + 5 yrs	Verify emission

SN	Pollutants	Test Method	Test Interval	Justification
		Method 26 or other pre-approved Method		rates
1025	Br_2	EPA Reference Method 26 or other pre-approved Method	Initial + 5 yrs	Verify emission rates
1403, 1413, 1406A, 1406B	Organic HAPs Non-VOC organic HAPs	EPA Reference Method 18 Approved Method	At least once every five years	Verify emissions
1404	Organic HAPs Non-VOC organic HAPs CO	EPA Reference Method 18 Approved Method EPA Reference Method 10	At least once every five years	Verify emissions
1409	Hydrogen Chloride	EPA Reference Method 26	At least once every five years	Verify emissions
1423	PM/PM_{10}	EPA Reference Method 5 or 201A.	At least once every five years	Verify emissions
1501	Br_2 HBr	26 or other pre-approved Method	Initial + 5 yrs	Verify emission rates
1551	Br_2	26 or other pre-approved Method	Initial + 5 yrs	Verify emission rates

14. 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 (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
102	Temperature	Thermocouple	Every 15 minutes when controlling HAP	Y
BRU Scrubber	Scrubbing Liquid Flowrate	CMS	Every 15 minutes	Y

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
BRU Absorber	Scrubbing Liquid Flowrate	CMS	Every 15 minutes	Y
201	Scrubbing Liquid Flowrate	CMS	Once per day	Y
201	Specific Gravity	Pressure gauge	Once per day	Y
202	Wastewater organic concentration	Sampling	Monthly	Y
301	H_2S concentration	ASTM E-260	Every 2 hours at constant flow. Every 15 minutes when not constant	Y
405	Scrubber Liquid Flowrate	CMS	Every 12 hours of operation	N
	Scrubber Liquid caustic concentration	CMS	Every 12 hours of operation	N
406	Flowrate Caustic percentage	CMS Not specified	Every 12 hours of operation	N
409	Flowrate Caustic percentage	CMS Not specified	Every 12 hours of operation	N
410	Flowrate Specific Gravity	CMS Not Specified	Every 12 hours of operation	N
657	Scrubber Liquid Flowrate	CMS	Continuously	Y
657	Scrubber Liquid Caustic Concentration	CMS	Continuously	Y
660	Temperature of Heat Exchange Fluid downstream of SN-660	Temperature	Once per operating day	N
901	Flowrate	CMS	Every 12 hours of operation	Y
1001A and B	Scrubber Liquid Flowrate	CMS	Continuously	Y
1001A and B	Scrubber Liquid Caustic Concentration	CMS	Continuously	Y
1008	Pilot Flame Present	Thermocouple	Continuously	N
1019	Scrubber Liquid Flowrate	CMS	Continuously	Y
1107	Flowrate Caustic percentage	CMS Not Specified	Every 12 hours of operation	N
1025	Flowrate Caustic percentage	CMS	Every 12 hrs of operation	N
SN-1140, 1141 and 1142	Flowrate	1,000	Daily	Y
SN-1140, SN-	TDS	2,000 ppm	Weekly	Y

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
1141, and SN-1142				
1202, 1204	Scrubber Liquid Flowrate	CMS	Every 12 hours of operation	N
	Scrubber Liquid caustic concentration	CMS	Every 12 hours of operation	N
1301	Pilot Flame Present	Thermocouple	Continuously	N
SN-1302	Flowrate Caustic %	CMS Not Specified	Once every 12 hours	N
1403, 1413, 1423	Pressure Drop	Pressure differential	Once each day	N
1404	Flowrate	CMS	Every 12 hours of operation	N
1409	Flowrate	CMS	Every 12 hours of operation	N
1420	Wastewater organic concentration	Sampling	Monthly	Y
1501	Flowrate Caustic percentage	CMS 2.5%	Every 12 hours of operation	N
1551	Flowrate Caustic percentage	CMS 2.5%	Every 12 hours of operation	N

15. RECORDKEEPING REQUIREMENTS:

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

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
102	All streams processed	Only streams listed to be processed	Monthly	N
201	Scrubbing Liquid Flowrate	9 gal/min	Monthly	Y
201	Specific Gravity	1.1 or lower	Monthly	Y
202	Wastewater organic concentration	4000 ppm	Monthly	Y
303	Fuel Usage	None	monthly	N
405	Scrubber Liquid Flowrate	Minimum of 5.0 gal/min of caustic solution	Daily	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
	Caustic Concentration	Minimum of 5% caustic concentration		
406	Flowrate Caustic %	10.0 gal/min 2.5%	Daily	N
409	Flowrate Caustic percentage	8.0 gal/min 2.5%	Daily	N
410	Flowrate Specific Gravity	Establish in test 1.0	daily	N
411	Maximum Water Flowrate	2,500 gpm	Daily	Y
411	Total Dissolved Solids Concentration	12,000 ppm	Weekly	Y
412		0.29 lb TDS per lb water		
413		0.29 lb TDS per lb water		
Alkyl Bromides Unit	Ethyl Bromide	23.53	Monthly	Y
	Isopropyl Bromide	23.53		
	N-Proply Bromide	23.53		
	Isobutyl Bromide	23.53		
	CN-3370	20		
657	Scrubber Liquid Flowrate	8.0 gal/min of caustic solution	Once every 12 hours	N
657	Scrubber Liquid pH	2.5% caustic solution	Once every 12 hours	N
660	Temperature of Heat Exchange Fluid downstream of SN-660	10ºF	Once per operating day	N
699	Audit results and fugitive emission calculations	N/A	Every 5 years	N
901	Scrubbing Liquid Flowrate	6 gal/min	Every 12 hours	N
902	Flaring Records of more than 30 minutes in any 24 hours	None	Daily as needed	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
TBBPA Unit	TBBPA Methyl Bromide	25.58 lots/day 30.46 lots/day	Monthly	Y
1001A	Scrubber Liquid Flowrate	8.0 gal/min of caustic solution	Once every 12 hours	N
1001B	Scrubber Liquid pH	2.5% caustic solution	Once every 12 hours	N
1008	Pilot Flame Present	N/A	As Necessary	N
1019	Scrubber Liquid Flowrate	2.0 gal/min of water	Once every 12 hours	N
1025	Caustic % conc and flow rate	2.5% Caustic Min. / 10 gpm min flow	Once every 12 hours	N
1099	# of valves, pumps, relief valves, flanges, & compressors	N/A	5 year	N
BOC Plant	DE-83 Wet DE-83 Dry	57.34 lots/day 67.2 lots/day	Monthly	Y
1102, 1112	Natural gas usage at tray dryers (controlled by 1102,1112)	4.38 MMscf, each	Monthly	Y
1102,1112	Water Flowrate	10 gal/min	Once per day	Y
1107	Flowrate Caustic %	10.0 gal/min 2.5%	Daily	N
1199	# of valves, pumps, relief valves, flanges, & compressors	N/A	5 year	N
CaBr/HBr	CaBr 48% HBr Anhydrous HBr	23.53 lots/day 23.53 lots/day 23.53 lots/day	Monthly	Y
1202, 1204	Scrubber Liquid Flowrate	Minimum of 10.0 gal/min	Every 12 hours of operation	N
1202, 1204	pH	Established during testing	Daily, 3 hour block average	N
1203	Pressure Drop	N/A	Once each day	N
1220	Total Dissolved Solids	12,000 ppm	Weekly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
1299	Audit results and fugitive emission calculations	N/A	5 year	N
OCP Plant	BZ-45 FM-2100 DP-45	3 lots/day 3.49 lots/day 2.4 lots/day	Monthly	Y
1399	# of valves, pumps, relief valves, flanges, & compressors	N/A	5 year	N
1404	absorber media and flowrate	When TCO is operating, only fresh water at minimum of 9.0 gpm When TCO is not operating, recycle water at minimum of 5.0 gpm	Every twelve hour of operation of the source	N
1409	Scrubber media flowrate Each scrubber media change	9.0 gpm Only fresh water shall be used for each scrubber media change	Every twelve hour of operation of the source	N
TCO	MACT subpart UU limit	See Specific Condition 143.		
1501	Flowrate Caustic percentage	1.5 gal/min of caustic solution 2.5% caustic concentration	Daily	N
1551	Flowrate Caustic percentage	2.0 gal/min of caustic solution 2.5% caustic concentration	Daily	N
1501, 1551	Production Rate	Established at time of test	Monthly	N
1504	Maximum Vapor Pressure @ 70 ^{o}F, VOC and Organic	7.74 psi	Monthly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
	HAP			
1552	Maximum Vapor Pressure @ 70 ^{o}F, VOC			
1504	Production Fill Volume	2,733,100 gallons	Monthly	Y
1552	Production Fill Volume	3,871,900 gallons	Monthly	Y
1599	# of valves, pumps, relief valves, flanges, & compressors	N/A	5 year	N
1903, 1904, 1907, 1908, 1909	Fuel sulfur content	0.5% by weight		N
1903, 1904, 1907, 1908, 1909	Hour limit	500 hours / 12 months	Monthly	N

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
102, 403, 405	5%	Department Guidance	Weekly Observations
406	10%	Department Guidance	Inspector Observation
409, 410	5%	Department Guidance	Inspector Observation
1202, 1203, 1204	5%	Department Guidance	Weekly Observations
1002, 1003, 1005, 1006, 1007	5%	Department Guidance	Weekly Observation
1008	20%	Department Guidance	Weekly Observation
1102, 1107, 1112	5%	Department Guidance	Inspector Observation
1103, 1104, 1105, 1106, 1108, 1113, 1114, 1115, 1116, 1123	5%	Department Guidance	Weekly
1302,1303, 1312, 1313, 1314, 1315 1317, 1318, 1319	5%	Department Guidance	Weekly

SN	Opacity	Justification for limit	Compliance Mechanism
1320, 1337, 1338			
1403, 1413, 1423	5%	Department Guidance	Weekly Observation
301, 302, 303, 902	5%	Department Guidance	Fuel Specification
801, 406	10%	Department Guidance	Inspector Observation
1903, 1904, 1907, 1908, 1909	20%	Department Guidance	Inspector Observation

17. DELETED CONDITIONS:

Former SC	Justification for removal
Multiple Sources	This permit action removes the Fine Chemicals Unit and related sources.

18. GROUP A INSIGNIFICANT ACTIVITIES:

Source Name	Group A Cat.	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
HBr Storage Tanks (TT-12-807, TT-12-827, TT-12-805, TT-12-665, TT-12-666, TT-12-812, TT-12-804)	A-13							1.35E-4
HBr Loading	A-13							
Hydrazine Tone (Tote 1)	A-13							2.2E-4
Toluene Circulation Tank (TT-08-589)	A-13						0.06	
DP-45 Loadout Operations	A-13			0.1				
BZ-54 Loadout Operations	A-13			0.16				
FM-550 Loadout Operations	A-13			0.02				
2-Ethylhexanol Loadout Operations	A-13			0.02				
Hydrazine Storage Tank (TT-13-1605)	A-13			0.02				
Product Storage Tanks (TT-13-1605, TT-13-315,	A-13			0.25				

Source Name	Group A Cat.	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
TT-13-415, TT-13-318, TT-13-316, TT-13-326, TT-13-330)								
Additive Storage Tank (TT-13-330)	A-13			0.05				
Spent Scrubber Neutralization Tank (TT-07-583)	A-13							5.0E-2
Tail Water Surge Tank (TT-21-110, TT-21-109)	A-13							6.1E-2
Treated Leachate Surge Tank (TT-27-110)	A-13			0.35				0.35
North Oil Separator Station Oil Tanks #1 and #2	A-13			0.12				
Product Mix Tank (TK-22-653)	A-13			0.32				0.067
Hydrazine Tote (Tote 1)	A-13							2.2E-4
Hydrazine Tote (Tote 2)	A-13							2.2E-4
Raw Material Storage Tank	A-13			1.9E-2				
Wastewater Storage Tank	A-13			0.026				
Brominated DPO Storage Tanks (TT-10-218, TT-10-388)	A-13			0.02				0.2
DPO Storage Tanks (TT-10-202, TT-10-203)	A-13			0.08				
Gasoline Storage Tanks (2,000 gallon and 1,000 Gallon	A-13			0.59				
Polymer Storage Tank (TT-12-822)	A-3			0.02				
DP-45 Storage Tanks (TT-13-306, TT-13-307. TT-13-308, TT-13-309, TT-13-310, TT-13-311, TT-13-314, TT-13-329)	A-3			0.02 (each)				
Product Storage Tank (TT-13-332, RX-13-413)	A-3			0.02 (each)				

Source Name	Group A Cat.	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
BZ-45 Storage Tank (TT-13-456)	A-3			0.02				
Product Storage (RX-13-413)	A-3			0.02				
Product Day Tank (RX-13-349)	A-3			0.02				
Pre-Coat Tank (TT-13-602)	A-3			0.02				
Filter Feed Tank (TT-13-601)	A-3			0.02				
Waste Removal Vacuum Tanks (SP-13-602, SP-13-601)	A-3			0.02				
Phenol Storage Tank (TT-14-039)	A-3			0.02				
HBr Tank (TT-07-655)	A-3							0.05
Stationary Engine Diesel Storage Tank	A-3			0.02				
Diesel Storage Tanks (2)	A-3			0.015				

19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

List all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1077-AOP-R1

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 08-25-14

Facility Name: Great Lakes-Central
Permit Number: 1077-AOP-R2
AFIN: 70-00012

$/ton factor	23.89	Annual Chargeable Emissions (tpy)	100
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	☐
If Hold Active Permit, Amt of Last Annual Air Permit Invoice $	0
Total Permit Fee Chargeable Emissions (tpy)	-1583.7
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		236.6	0	-236.6		
PM_{10}		236.6	0	-236.6	-236.6	0
SO_2		546.7	0	-546.7	-546.7	0
VOC		367	0	-367	-367	0
CO		340.6	0	-340.6		
NO_X		433.4	0	-433.4	-433.4	0
Chlorine	☐	0	0	0		
Ethyl Chloride	☐	0	0	0		

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Ethylene Dibromide	☐	0	0	0		
HCl	☐	0	0	0		
Hydrazine	☐	0	0	0		
Methanol	☐	0	0	0		
Methanol & Methyl Bromide	☐	0	0	0		
Methyl Bromide	☐	0	0	0		
Methelene Chloride	☐	0	0	0		
Organic HAP	☐	0	0	0		
Phosgene	☐	0	0	0		
Toluene	☐	0	0	0		
Triethylamine	☐	0	0	0		
TEA & Ethyl Chloride	☐	0	0	0		
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