

ADEQ OPERATING AIR PERMIT

Pursuant to the Regulations of the Arkansas Operating Air Permit Program, Regulation 26:

Permit No. : 0286-AOP-R6

Renewal #1

IS ISSUED TO:

Great Lakes Chemical Corporation - West Plant

5821 Schuler Road

Marysville, AR 71753

Union County

AFIN: 70-00101

THIS PERMIT AUTHORIZES THE ABOVE REFERENCED PERMITTEE TO INSTALL, OPERATE, AND MAINTAIN THE EQUIPMENT AND EMISSION UNITS DESCRIBED IN THE PERMIT APPLICATION AND ON THE FOLLOWING PAGES. THIS PERMIT IS VALID BETWEEN:

June 12, 2003

AND

June 11, 2008

THE PERMITTEE IS SUBJECT TO ALL LIMITS AND CONDITIONS CONTAINED HEREIN.

Signed:

Mike Bates
Chief, Air Division

Date Modified

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List of Acronyms and Abbreviations

A.C.A.	Arkansas Code Annotated
AFIN	ADEQ Facility Identification Number
CFR	Code of Federal Regulations
CO	Carbon Monoxide
HAP	Hazardous Air Pollutant
lb/hr	Pound Per Hour
MVAC	Motor Vehicle Air Conditioner
No.	Number
NO _x	Nitrogen Oxide
PM	Particulate Matter
PM ₁₀	Particulate Matter Smaller Than Ten Microns
SNAP	Significant New Alternatives Program (SNAP)
SO ₂	Sulfur Dioxide
SSM	Startup, Shutdown, and Malfunction Plan
Tpy	Tons Per Year
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound

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SECTION I: FACILITY INFORMATION

PERMITTEE: Great Lakes Chemical Corporation - West Plant

AFIN: 70-00101

PERMIT NUMBER: 0286-AOP-R6

FACILITY ADDRESS: 5821 Schuler Road
Marysville, AR 71753

MAILING ADDRESS: P.O. Box 7020
El Dorado, AR 71731-7020

COUNTY: Union

CONTACT POSITION: Michael Nolan

TELEPHONE NUMBER: (870) 864-1542

REVIEWING ENGINEER: Kimberly O'Guinn

UTM North South (Y): Zone 15: 3671.7

UTM East West (X): Zone 15: 505.73

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SECTION II: INTRODUCTION

Summary of Permit Activity

Great Lakes Chemical Corporation-West Plant operates a bromine recovery facility at 5821 Schuler Road in Marysville, Arkansas. This modification is to install three diesel-fired generator engines that will supply back-up power for the West Plant sour gas compressors. Each engine will be equipped with a diesel fuel storage tank. The diesel fuel storage tanks qualify as Group A-3 Insignificant Activities. With this modification PM/PM₁₀, SO₂, VOC, CO and NO_x emissions will increase by 1.0 tons/year (tpy), 2.1 tpy, 1.0 tpy, 3.2 tpy, and 14.6 tpy respectively.

This permit modification will also incorporate the language and conditions agreed to in the Permit Appeal Resolution (PAR) 06-005-P issued on December 11, 2006.

Process Description

Bromine-rich brine is pumped to the surface from the underlying Smackover foundation at Great Lakes Chemical Corporation (GLCC) brine supply wells. The brine contains dissolved sour gas, which must be separated from the brine before the brine is sent to the bromine tower.

The gas separation begins at the well site. The gas separated at the well is cooled and transported to the West Plant through a buried pipeline. The brine is sent to the plant in a separate pipeline. At the plant, incoming brine is acidified to make gas removal easier and then sent to a vacuum stripper. After the vacuum stripper, most of the brine is sent directly to the bromine tower. The acid used to treat the brine is stored on site. This storage tank is equipped with a scrubber (SN-301) which uses degassed brine, fresh water or caustic as the scrubbing media. Oil separated at the plant site is stored and sold.

The sour gas stripped at the well sites is combined with the gas removed from the vacuum stripper. The combined sour gas stream is then routed to Lion Oil Company (LOC) (via GLCC's Central Plant) for sweetening. LOC returns the sweetened gas to the Central Plant for combustion in the facility's boilers.

Boilers supply steam for bromine production and for other plant uses.

The major processes at the facility are brine supply pre-treatment, scrubber brine cooling system, flare, boilers, bromine production, and fuel storage.

Brine Supply Pre-Treatment

The incoming brine is acidified and sent to a stripper system, which removes additional sour gas. Most of the stripped brine goes directly to the bromine tower. The remaining brine will be routed to the scrubber brine cooling system (SBCS).

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Scrubber Brine Cooling System

The brine is cooled by non-contact heat exchange. The cooled brine from the SBCS flows through a scrubber brine surge tank and is then used in direct contact cooling (DCC) units at the bromine tower and in brine vent scrubbers. The cooled brine surge tank located in the SBCS and the scrubber brine surge tank are open to the atmosphere.

Flare

The facility will flare sour gas, using the flare as a back-up control device, in the event Lion Oil's amine unit and the Central Plant NaHS unit are not operating or due to power failure or start-up, shutdown or malfunction of piping or equipment used to route the West Plant's sour gas to the Central Plant including, without limitation, the West or Central Plant's compressors.

Boilers

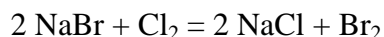
The facility operates two natural gas boilers which supply process steam. Both boilers burn natural gas. In addition, the natural gas consumption is based on maximum capacity for both the pounds per hour and tons per year.

Engines

The facility operates three diesel-fired generator engines that supply back-up power for the West Plant sour gas compressors. Each engine is equipped with a diesel fuel storage tank.

Bromine Production

Brine, steam, and chlorine are introduced into the bromine tower, where bromine is removed by the following simplified reaction:



The bromine vapor is condensed and purified.

From the purification process, bromine is transferred to storage in tanks. From the tanks it is transferred to tank trucks or ISO's. Spent acid from the acid dryers is routed to the tail brine system.

The debrominated brine is cooled in "heat recovery units". The cooled brine is then reduced, neutralized and transferred to the tail brine system, where it is reinjected into the Smackover formation.

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The vents from the bromine purification system's condensers are scrubbed by direct contact with pre-cooled brine. The vents from these scrubbers will normally vent to the final "environmental" scrubber (SN-005). In the event of a required pressure release, bromine emissions may vent to the atmosphere at the Purification Systems (SN-001, 002, and 007).

Bromine storage and transfer vents are controlled by two caustic scrubbers operating in parallel. Blowdown from the storage and transfer scrubbers is discharged to the feed brine system. Residual bromine is removed from returned ISO's and tank trucks. This removal operation also vents to these scrubbers.

Fuel Storage

Gasoline and diesel fuel for Great Lakes and contractor vehicles is stored in two tanks at the site. The tanks are under a shed.

Emergency Releases

Ammonia is used to control emergency releases of bromine, chlorine, and hydrobromic acid.

Regulations

The following table contains the regulations applicable to this permit.

Regulations
Arkansas Air Pollution Control Code, Regulation 18, effective February 15, 1999
Regulations of the Arkansas Plan of Implementation for Air Pollution Control, Regulation 19, effective May 28, 2006.
Regulations of the Arkansas Operating Air Permit Program, Regulation 26, effective September 26, 2002
40 CFR Part 60, Subpart Dc, <i>Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</i>

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The following table is a summary of emissions from the facility. This table, in itself, is not an enforceable condition of the permit.

Emission Summary

EMISSION SUMMARY					
Source Number	Description	Pollutant	Emission Rates		Cross Reference Page
			lb/hr	tpy	
Total Allowable Emissions		PM	11.2	6.0	
		PM ₁₀	11.2	6.0	
		SO ₂	3393.5	38.3	
		VOC	13.7	6.8	
		CO	64.2	124.3	
		NO _x	72.4	55.9	
Hazardous Air Pollutants		HCl	0.7	3.1	
Air Contaminants**		HBr	0.1	0.5	
		Br ₂	4.0	17.6	
		H ₂ S	36.1	6.6	
201	Flare Pilot Flame Natural Gas (0.125 MMBtu/hr)	PM	0.1	0.5	12
		PM ₁₀	0.1	0.5	
		SO ₂	0.1	0.5	
		VOC	0.1	0.5	
		CO	0.1	0.5	
		NO _x	0.1	0.5	
201	Flare (sour gas combustion)	PM	6.7	1.3	12
		PM ₁₀	6.7	1.3	
		SO ₂	3392.1	35.0	
		VOC	8.9	1.7	
		CO	23.5	4.3	
		NO _x	4.4	0.8	
		H ₂ S	36.1	6.6	
301	HCl/HBr Storage Tank	HCl	0.7	3.1	15
		HBr	0.1	0.5	
005	Final Vent Scrubber	Br ₂	4.0	17.6	17
006	Bromine Storage and Packaging Tank	Source Removed From Service			
009	Bromine Tower #4	Source Removed From Service			

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EMISSION SUMMARY					
Source Number	Description	Pollutant	Emission Rates		Cross Reference Page
			lb/hr	tpy	
101A	Boiler #1 Natural Gas (68 MMBtu/hr)	PM	0.6	1.8	20
		PM ₁₀	0.6	1.8	
		SO ₂	0.1	0.2	
		VOC	0.4	1.3	
		CO	5.7	19.9	
		NO _x	3.4	11.9	
102	Boiler #2 Natural Gas (106 MMBtu/hr)	PM	0.4	1.8	20
		PM ₁₀	0.4	1.8	
		SO ₂	0.6	2.7	
		VOC	0.6	2.7	
		CO	22.1	96.8	
		NO _x	6.5	28.5	
103	Boiler #3	Source Removed From Service			
401	Generator Engine (864 hp)	PM	0.6	0.2	22
		PM ₁₀	0.6	0.2	
		SO ₂	3.5	0.9	
		VOC	0.7	0.2	
		CO	4.8	1.2	
		NO _x	20.8	5.2	
402	Generator Engine (598 hp)	PM	1.4	0.4	22
		PM ₁₀	1.4	0.4	
		SO ₂	2.2	0.6	
		VOC	1.5	0.4	
		CO	4.0	1.0	
		NO _x	18.6	4.7	
403	Generator Engine (598 hp)	PM	1.4	0.4	22
		PM ₁₀	1.4	0.4	
		SO ₂	2.2	0.6	
		VOC	1.5	0.4	
		CO	4.0	1.0	
		NO _x	18.6	4.7	

**Air Contaminants such as ammonia, acetone, and certain halogenated solvents are not VOCs or HAPs.

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SECTION III: PERMIT HISTORY

Permit 286-A to construct and operate was issued on February 3, 1975.

Permit 286-AR-1, which was issued on November 4, 1987, allowed the construction of a sodium hydrosulfide unit and the tail gas from this unit was routed to either or both of the facility's two boilers.

Permit 1647-A was issued on June 27, 1995. This air permit allowed the construction of a third bromine tower and construction of a scrubber brine cooling system (SBCS) to replace the feed brine pond. Other changes included the transport of hydrogen sulfide (sour gas) to Lion Oil Company via GLCC's Central plant. The sour gas is sweetened and returned to the Central plant for combustion.

Permit 286-AR-2 was issued on August 13, 1996. This air permit covered consolidating permit 1647-A with 286-AR-2. In addition, this modification allowed for the installation of a fourth bromine tower.

Permit 286-AOP-R0 was this facility's initial Title V permit. It was issued on March 9, 1998 and a third boiler was permitted for the first time in this permit. Several previously permitted sources were designated as insignificant.

An administrative amendment was performed on permit 286-AOP-R0 on June 10, 1999. This amendment corrected several typographical errors and sources SN-302 through 307 were removed.

Permit 286-AOP-R1 was issued on July 12, 2000. It allowed the installation of a smaller third boiler (SN-103) than the one permitted in permit 286-AOP-R0.

Permit 286-AOP-R2 was issued on May 7, 2002. This modification allowed Great Lakes to install a boiler previously located at the Newell facility. This boiler replaced the #1 boiler (SN-101). This boiler is rated at 68 MMBtu/hr and is utilized as a standby boiler. This modification resulted in permitted emissions decreases of 1.4 tpy PM, 1.4 tpy PM₁₀, 17.7 tpy CO, and 274.7 tpy NO_x and a permitted increase of 0.2 tpy VOC. Emissions from the boiler (SN-101A) are less than the PSD significance levels.

Permit 286-AOP-R3 was issued on June 12, 2003. This was the initial renewal of the Title V permit for this facility. This was also a modification which allowed Great Lakes to replace the three Bromine Towers (SN-001, 002 and 007) with three purification systems. SN-009, the fourth bromine tower, SN-103, Boiler #3, and the NaHS unit were removed from service. Finally the natural gas limit was removed from SN-101a and combustion emissions were revised to reflect updated AP-42 factors.

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Permit 286-AOP-R4 was issued on January 21, 2005. This was a minor modification to the existing permit. It allowed Great Lakes to remove the scrubber from SN-006 and route the emissions to SN-005. This modification also incorporated an administrative amendment to add the use of ammonia to control emergency releases to the permit.

Permit 0286-AOP-R5 was issued on July 11, 2006. This modification was to comply with a Consent Administrative Order (CAO LIS 05022) which instructed the facility to submit a permit modification to correct discrepancies between permitted and actual sour gas handling. The permit was modified to allow for an Alternate Operating Scenario in the event of a startup, shutdown, emergency condition, malfunction, or in an unplanned outage of Lion Oil's amine unit or the Central Plant's NaHS unit. The Alternate Operating Scenario allows the West Plant's sour gas to be combusted in the West Plant's sour gas flare (SN-201) or routed to the Great Lakes' Central Plant. Also, this modification allowed for the installation of an electric redundant compressor at the West Plant to minimize sour gas flaring events. This compressor is a back-up compressor for SN-201 and included in the Insignificant Activities List. Including the Alternate Operating Scenario, permitted PM/PM₁₀, NO_x, CO, VOC, SO₂, & H₂S emissions increased by 0.9 tons/year (tpy), 0.4 tpy, 3.9 tpy, 1.3 tpy, 34.6 tpy, & 6.6 tpy, respectively.

SECTION IV: SPECIFIC CONDITIONS

SN- 201 and SN- 301

Brine Supply Wells, Brine Pre-Treatment and Sodium Hydrosulfide

Source Description

The Great Lakes Chemical Company currently operates brine supply wells in conjunction with the West Plant. These wells produce brine that contains dissolved sour gas. Since the gas interferes with the operation of the bromine tower, Great Lakes removes as much of it as possible before the bromine is recovered.

The gas separation begins at the well site. The gas separated at the well is cooled and transported to the West Plant through a buried pipeline. The brine is sent to the plant in a separate pipeline. At the plant, incoming brine is acidified to make gas removal easier and then sent to a vacuum stripper. After the vacuum stripper, most of the brine is sent directly to the bromine tower. The remaining brine is sent to the scrubber brine cooling system (SBCS) and then the bromine tower. The acid used to treat the brine is stored on site. This storage tank is equipped with a scrubber (SN-301) which uses degassed brine, fresh water or caustic as the scrubbing media.

The sour gas stripped at the well sites is combined with the gas removed from the vacuum stripper. The combined sour gas stream is then routed to the Central Plant, where it is combined with the sour gas from other GLCC plants and routed to Lion Oil Company (LOC) for sweetening. LOC returns the sweetened gas to the Central Plant for combustion in the facility's boilers.

In the event of a planned or unplanned outage of Lion Oil's amine unit, the Central Plant's NaHS unit, and/or other equipment related to the off-site transfer or processing of sour gas, the plant is equipped with a flare (SN-201) to burn the sour gas.

The scrubber brine cooling system was installed to replace the feed brine ponds. The SBCS consists of a non-contact heat exchanger, support structures, and feed pumps. The system is also equipped with instrumentation to monitor the surge tank level and the brine temperature. (Previously the brine was pumped into a pond where it cooled by evaporation. The pond had H₂S emissions but they were fugitive and not point source emissions).

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Specific Conditions

1. The permittee shall not exceed the emission rates set forth in the following table. The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #3 & #4. [Regulation 19, §19.501 et seq., effective May 28, 2006 and 40 CFR Part 52, Subpart E]

SN	Description	Pollutant	lb/hr	tpy
201	Flare Pilot (0.125 MMBtu/hr)	PM ₁₀	0.1	0.1
		SO ₂	0.1	0.1
		VOC	0.1	0.1
		CO	0.1	0.1
		NO _x	0.1	0.1

2. The permittee shall not exceed the emission rates set forth in the following table. The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #3 & #4. [Regulation 18, §18.801, effective February 15, 1999, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Description	Pollutant	lb/hr	tpy
201	Flare Pilot (0.125 MMBtu/hr)	PM	0.1	0.1

3. Visible emissions from the flare pilot (SN-201) shall not exceed 5% opacity. The permittee shall show compliance by burning only pipeline quality natural gas as fuel for the flare pilot (SN-201). [Regulation 18, §18.501 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
4. The permittee shall use only pipeline quality natural gas as fuel for the flare pilot (SN-201). [Regulation 19, §19.705, A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311, and 40 CFR Part 70.6]

Alternate Operating Scenario
Sour Gas Flaring Events

5. During planned outages of Loin Oil’s amine unit, the Central Plant’s NaHs unit, and/or other equipment related to the off-site transfer or processing of sour gas (including startup and shutdown associated therewith), the permittee shall be allowed to combust the West Plant’s sour gas in the West Plant’s sour gas flare in accordance with Specific Conditions #6, #7, #8 and #9 or route the sour gas to another facility permitted to accept it. [Regulation 19, §19.601]
6. The permittee shall not exceed the emission rates set forth in the following table when flaring sour gas during planned outages. The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #7. [Regulation 19, §19.501 et seq., effective May 28, 2006 and 40 CFR Part 52, Subpart E]

SN	Description	Pollutant	lb/hr	tpy
201	Flare (sour gas combustion)	PM ₁₀	6.7	1.3
		SO ₂	3392.1	35.0
		VOC	8.9	1.7
		CO	23.5	4.3
		NO _x	4.4	0.8

7. The permittee shall maintain records which document compliance with the emission limits listed in Specific Condition #6. These records shall indicate the reason for flaring, the duration of each flaring event, the total volume of gas flared during each event, and the air emissions resulting from each event in both lb/hr and tons/yr. These records shall be updated for each flaring event, kept on site, and made available to Department personnel upon request and submitted to the Department in accordance with General Provision 7. If emissions exceed the limits of Specific Condition #6, the emissions must be reported in accordance with §19.601 or §19.602, as applicable. [Regulation No. 19 §19.705 and 40 CFR Part 52, Subpart E]
8. The permittee shall not exceed the emission rates set forth in the following table when flaring sour gas during planned outages of Lion Oil’s amine unit, the Central Plant’s NaHS unit, and/or other equipment related to the off-site transfer or processing of sour gas (including startup and shutdown associated therewith). The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #9. [Regulation 18, §18.801, effective February 15, 1999, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

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SN	Description	Pollutant	lb/hr	tpy
201	Flare (sour gas combustion)	PM	6.7	1.3
		H ₂ S	36.1	6.6

9. The permittee shall maintain records which document compliance with the emission limits listed in Specific Condition #8. These records shall indicate the reason for flaring the duration of each flaring event, the total volume of gas flared during each event, and the air emissions resulting from each event in both lb/hr and tons/yr. These records shall be updated for each flaring event, kept on site, made available to Department personnel upon request and submitted to the Department in accordance with General Provision 7. If emissions exceed the limits in Specific Condition #8, the emissions must be reported in accordance with §18.1101, as applicable. [Regulation No. 18 §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
10. Sour gas flaring of any duration during any unplanned outage of Lion Oil's amine unit, the Central Plant's NaHS unit, and/or other equipment related to the off-site transfer or processing of sour gas (including startup and shutdown associated therewith), shall be considered an "upset condition" or "emergency condition" and shall be reported in accordance with Regulations 19, §§19.601, 19.602 and Regulation 18, §§18.1101 and 18.105, as applicable.
11. On or before June 30, 2007, the permittee shall submit a root cause analysis to ADEQ demonstrating the effectiveness of the backup compressor and backup power supply in reducing sour gas flaring incidents at the West Plant. The Department may use this information to re-evaluate the flaring limits and conditions.

SN- 301

HCl/HBr Storage Tank

12. The permittee shall not exceed the emission rates set forth in the following table. The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #13. [Regulation 18, §18.801, effective February 15, 1999, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Description	Pollutant	lb/hr	tpy
301	HCl/HBr Storage Tank	HCl	0.7	3.1
		HBr	0.1	0.5

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13. Visible emissions may not exceed the limits specified in the following table of this permit as measured by EPA Reference Method 9. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Limit	Regulatory Citation
301	5%	§18.501

14. The permittee shall conduct weekly observations of the opacity from source SN-301 and keep a record of these observations. If the permittee detects visible emissions, the permittee must immediately take action to identify and correct the cause of the visible emissions. After implementing the corrective action, the permittee must document that the source complies with the visible emissions requirements. The permittee shall maintain records of the cause of any visible emissions and the corrective action taken. The permittee must keep these records onsite and make them available to Department personnel upon request. [Regulation 18, §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
15. The permittee shall maintain a minimum flow rate of 5 gallons per minute to the acid tank scrubber (SN-301) during acid transfer operations from tanker trucks to acid storage tanks. Flow rate shall be monitored and recorded a minimum of once during acid transfer operations from tanker trucks to the acid storage tanks. Records of flow rate shall be maintained on site and provided to Department personnel upon request. [Regulation 18, §18.1003 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
16. The permittee shall use only degassed brine, fresh water, and/or caustic as the scrubbing media in the acid tank scrubber (SN-301). Compliance shall be demonstrated through compliance with Specific Condition #17. [Regulation 18, §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
17. The permittee shall maintain monthly records of the scrubbing media used at SN-301. The permittee shall update these records any time the scrubbing media being used is changed. The permittee shall keep these records onsite and make them available to Department personnel upon request. [Regulation 18, §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN- 001, SN- 002, SN- 005, and SN- 007

Bromine Production

Source Description

Bromine containing brine occurs naturally in specific south Arkansas geologic formations. When the brine first comes out of the ground it contains sour gas and sodium bromide. This gas is separated and sent to Lion Oil via the Central pipeline. Most of the degassed brine goes directly to the bromine tower where it is mixed with chlorine. The rest is sent to a scrubber brine cooling system (SBCS). Liquid chlorine is unloaded from trucks and stored. Chlorine gas is then injected into the bromine purification systems under flow control.

In the bromine tower, the brine is chlorinated to remove the bromine that is steam stripped and condensed. The bromine vapors are condensed, purified, and packaged in tank trucks, ISO's or bulk containers. Each bromine purification system has its own scrubber (SN-001, SN-002, and SN-007) but vapors are normally routed to a final vent scrubber (SN-005) which vents to the atmosphere. Vapors from the bromine tower (formerly SN-009) are now also routed to the final vent scrubber, SN-005. Vapors leaving SN-001, SN-002, SN-005 and SN-007 are visually monitored from the bromine control room. Bromine is highly visible even when present in low concentrations. This allows early detection of possible process upsets.

Bromine vapors displaced during the storage and packaging operations were formerly controlled by two scrubbers operating in parallel (SN-006). This modification allows this scrubber to be removed and these vapors will now be routed to the final vent scrubber, SN-005.

The debrominated brine flows from the bromine tower, through a heat recovery system and then to the tail brine system where it is reinjected into the Smackover formation. Great Lakes uses lime, caustic, or ammonia to neutralize the tail brine.

Specific Conditions

18. The permittee shall not exceed the emission rates set forth in the following table. The permittee shall demonstrate compliance with this condition through compliance with Specific Condition #24. [Regulation 18, §18.801, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Pollutant	lb/hr	tpy
SN-005	Br ₂	4.0	17.6

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19. Visible emissions may not exceed the limits specified in the following table of this permit as measured by EPA Reference Method 9 except when changing scrubbing media in SN-005. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Limit	Regulatory Citation
005	5%	Regulation 18, §18.501

20. The permittee shall conduct weekly observations of the opacity from source SN-005 and keep a record of these observations. If the permittee detects visible emissions, the permittee must immediately take action to identify and correct the cause of the visible emissions. After implementing the corrective action, the permittee must document that the source complies with the visible emissions requirements. The permittee shall maintain records of the cause of any visible emissions and the corrective action taken. The permittee must keep these records onsite and make them available to Department personnel upon request. [Regulation 18, §18.501 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
21. Venting from the Bromine Purification Systems #1, #2, and #3 (SN-001, SN-002, and SN-007) shall be considered an upset condition and subject to the requirements of Regulation 18, §18.11. [Regulation 18, §18.11]
22. The permittee shall maintain a minimum scrubbing media flow rate of 25 gallons per minute to the Bromine Purification System scrubbers (SN-001, SN-002, and SN-007). The flow rate shall be monitored and recorded a minimum of once per week. Records of flow rate shall be maintained on site and made available to Department personnel upon request. [Regulation 18, §18.1003 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
23. The permittee shall maintain a minimum scrubbing media flow rate of 2 gallons per minute to the Final Vent Scrubber (SN-005). The flow rate shall be minimum and recorded a minimum of once per week. Records of flow rate shall be kept on site and made available to Department personnel upon request. [Regulation 18, §18.1003 and §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
24. The permittee shall measure the bromine emissions from the Final Vent Scrubber (SN-005) once during the term of each Title V permit in accordance with an EPA approved test method. [Regulation 18, §18.1002 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

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25. The bromine loading rate shall not exceed 30 gallons per minute and 300,000 B-lots per any consecutive twelve month period. Compliance with this condition shall be verified by maintaining monthly records of the amount of bromine shipped. These records shall be kept on site and shall be provided to Department personnel upon request. [Regulation 18, §18.1003 and §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

26. The permittee shall use only degassed brine, fresh water, and/or caustic as the scrubbing media in the Bromine Purification Systems (SN-001, SN-002, and SN-007) and the Bromine Purification System Common Vent (SN-005). The concentration of this scrubbing media shall be measured once per shift. The permittee may use degassed brine, fresh water, and/or caustic as the scrubbing media for any of the above mentioned sources if the permittee has conducted emission testing while simultaneously sampling the scrubbing media concentration in order to establish alternative operating parameters for each of the proposed scrubbing media which will not exceed the permitted emission limits. [Regulation 18, §18.1003 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN- 101A and SN- 102

Boilers

Source Description

Great Lakes has permitted two boilers (#1 and #2) at the West Plant.

Boiler #1 (SN-101A) and boiler #2 (SN-102) have a rated capacity of 68 and 106 million Btu per hour, respectively. These boilers are equipped with low NO_x burners and use only natural gas as fuel.

SN-101A is subject to 40 CFR Part 60, Subpart Dc-*Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*. SN-102 was installed before June 19, 1984 and is not subject to 40 CFR Part 60.

Specific Conditions

27. The permittee shall not exceed the emission rates set forth in the following table. Both lb/hr and tpy limits are based on maximum capacity of the equipment. [Regulation 19, §19.501 et seq. and 40 CFR Part 52, Subpart E]

SN	Pollutant	lb/hr	tpy
101A	PM ₁₀	0.5	2.1
	SO ₂	0.1	0.2
	VOC	0.4	1.5
	CO	5.2	22.8
	NO _x	3.1	13.6
102	PM ₁₀	0.4	1.8
	SO ₂	0.6	2.7
	VOC	0.6	2.7
	CO	22.1	96.8
	NO _x	6.5	28.5

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28. The permittee shall not exceed the emission rates set forth in the following table. Both lb/hr and tpy limits are based on maximum capacity of the equipment. [Regulation 18, §18.801, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Pollutant	lb/hr	tpy
101A	PM	0.5	2.1
102	PM	0.4	1.8

29. Visible emissions shall not exceed 5% opacity from SN-101A or SN-102. The permittee shall demonstrate compliance by burning only natural gas as fuel at these sources. [Regulation 18, §18.501 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
30. SN-101A is considered an affected source due to a heat input capacity less than 100 MMBtu/hr and installation after June 19, 1984. A copy of Subpart Dc is provided as Appendix A. The permittee shall maintain records of the amount of fuel combusted at SN-101A. These records shall be maintained on a monthly basis and updated monthly. These records shall be maintained on site and made available to Department personnel upon request. [Regulation 19, §19.304 and 40 CFR Part 60, Subpart Dc]

SN- 401, SN- 402 and SN- 403

Generator Engines

Source Description

Three diesel-fired generator engines supply back-up power for the West Plant sour gas compressors. Each engine is equipped with a diesel fuel storage tank. The diesel storage tanks are listed as Insignificant Activities due to the capacity of less than 10,000 gallons and vapor pressure less than 0.5 psia.

31. The permittee shall not exceed the emission rates set forth in the following table. Emission limits are based on testing and are assumed to be worst case. [Regulation No. 19 §19.901 *et seq.* effective May 28, 2006, and 40 CFR Part 52, Subpart E]

Maximum Criteria Emission Rates

Source	Pollutant	lb/hr	tpy
SN-401 (864 hp)	PM ₁₀	0.6	0.2
	SO ₂	3.5	0.9
	VOC	0.7	0.2
	CO	4.8	1.2
	NO _x	20.8	5.2
SN-402 (598 hp)	PM ₁₀	1.4	0.4
	SO ₂	2.2	0.6
	VOC	1.5	0.4
	CO	4.0	1.0
SN-403 (598 hp)	NO _x	18.6	4.7
	PM ₁₀	1.4	0.4
	SO ₂	2.2	0.6
	VOC	1.5	0.4
	CO	4.0	1.0

32. The permittee shall not exceed the emission rates set forth in the following table. Emission limits are based on testing and are assumed to be worst case. [Regulation No. §18.801, effective February 15, 1999, and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

Maximum Non-Criteria Emission Rates

Source	Pollutant	lb/hr	tpy
SN-401 (864 hp)	PM	0.6	0.2
SN-402 (598 hp)	PM	1.4	0.4
SN-403 (598 hp)	PM	1.4	0.4

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33. Visible emissions from these sources shall not exceed 20% opacity as measured by EPA Reference Method 9. [Regulation No. 19 §19.503 *et seq.* effective February 15, 1999, and 40 CFR Part 52, Subpart E]
34. The permittee shall not operate SN-401, SN-402 and SN-403 in exceedance of 500 hours per 12-month period for each engine. [Regulation No. 19 §19.705, A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311, and 40 CFR 70.6]
35. The permittee shall maintain records which demonstrate compliance with the limits set forth in Specific Condition #34. These records shall be updated monthly, shall be kept on site, and shall be made available to Department personnel upon request. [Regulation No. 19 §19.705 *et seq.* effective May 28, 2006, and 40 CFR Part 52, Subpart E]
36. No. 2 fuel oil (diesel fuel) shall be the only fuel utilized for SN-401, SN-402, and SN-403. Any fuel utilized at these sources shall have a sulfur content of 0.5% by weight or less. The permittee shall maintain documentation of the sulfur content of the fuel used at these sources for the purpose of compliance demonstration. These records shall be updated as necessary, maintained on-site, and made available to Department personnel upon request. [§19.705 of Regulation 19 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

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SECTION V: COMPLIANCE PLAN AND SCHEDULE

Great Lakes Chemical Corporation - West Plant will continue to operate in compliance with those identified regulatory provisions. The facility will examine and analyze future regulations that may apply and determine their applicability with any necessary action taken on a timely basis.

SECTION VI: PLANTWIDE CONDITIONS

1. The permittee shall notify the Director in writing within thirty (30) days after commencing construction, completing construction, first placing the equipment and/or facility in operation, and reaching the equipment and/or facility target production rate. [Regulation 19, §19.704, 40 CFR Part 52, Subpart E, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
2. If the permittee fails to start construction within eighteen months or suspends construction for eighteen months or more, the Director may cancel all or part of this permit. [Regulation 19, §19.410(B) and 40 CFR Part 52, Subpart E]
3. The permittee must test any equipment scheduled for testing, unless stated in the Specific Conditions of this permit or by any federally regulated requirements, within the following time frames: (1) new equipment or newly modified equipment within sixty (60) days of achieving the maximum production rate, but no later than 180 days after initial start up of the permitted source or (2) operating equipment according to the time frames set forth by the Department or within 180 days of permit issuance if no date is specified. The permittee must notify the Department of the scheduled date of compliance testing at least fifteen (15) days in advance of such test. The permittee shall submit the compliance test results to the Department within thirty (30) days after completing the testing. [Regulation 19, §19.702 and/or Regulation 18 §18.1002 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
4. The permittee must provide: [Regulation 19, §19.702 and/or Regulation 18, §18.1002 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
 - a. Sampling ports adequate for applicable test methods;
 - b. Safe sampling platforms;
 - c. Safe access to sampling platforms; and
 - d. Utilities for sampling and testing equipment.
5. The permittee must operate the equipment, control apparatus and emission monitoring equipment within the design limitations. The permittee shall maintain the equipment in good condition at all times. [Regulation 19, §19.303 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
6. This permit subsumes and incorporates all previously issued air permits for this facility. [Regulation 26 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
7. The permittee is authorized to use ammonia, as an emergency response, to neutralize releases of bromine, chlorine, and hydrobromic acid. Any use of ammonia shall be reportable under the Emergency and Upset release provisions contained in Regulations 18 and 19. [Regulation 18, §18.1101 & §18.1105 and Regulation 19, §19.601 & §19.602]

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8. Compliance with the conditions of this permit shall be deemed compliance with all applicable requirements, as of the date of permit issuance, included in and specifically identified in the following table of this condition. The permit specifically identifies the following as applicable requirements based upon the information submitted by the permittee in an application dated September 6, 2002.

Applicable Regulations

Source No.	Regulation	Description
Facility	Arkansas Regulation 19	Compilation of Regulations of the Arkansas State Implementation Plan for Air Pollution Control
Facility	Arkansas Regulation 26	Regulations of the Arkansas Operation Air Permit Program
SN-101A	40 CFR 60, Subpart Dc	Boiler installed after June 19, 1984, and has a heat input capacity greater than or equal to 2.9 MW (10 MMBtu/hr), but less than 29 MW (100 MMBTU/hr)

The permit specifically identifies the following as inapplicable based upon information submitted by the permittee in an application dated September 6, 2002.

Inapplicable Regulations

Source No.	Regulation	Description
SN-102	40 CFR 60, Subpart Db	New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units

SECTION VII: INSIGNIFICANT ACTIVITIES

The following sources are insignificant activities. Any activity that has a state or federal applicable requirement shall be considered a significant activity even if this activity meets the criteria of §26.304 of Regulation 26 or listed in the table below. Insignificant activity determinations rely upon the information submitted by the permittee in an application dated May 27, 2005.

Description	Category
Gasoline Storage Tank	A, 3
Diesel Storage Tank	A, 3
Caustic Storage Vent	A, 4
Vacuum Breaker Vents on Tail Brine Piping System	A, 13
Cooled Brine Storage	
Scrubber Brine Surge Tank	
Brine Overflow Tanks	
Feed Brine Surge Tanks	
Bromine Tower Heat Recovery Vents	
Tail Brine Cooling Tower	
Non-Process Cooling Water	
Back up Electric Compressor (SN-201)	
936 gal Diesel Fuel Storage Tank	
693 gal Diesel Fuel Storage Tank (2)	A,3

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SECTION VIII: GENERAL PROVISIONS

1. Any terms or conditions included in this permit which specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.) as the sole origin of and authority for the terms or conditions are not required under the Clean Air Act or any of its applicable requirements, and are not federally enforceable under the Clean Air Act. Arkansas Pollution Control & Ecology Commission Regulation 18 was adopted pursuant to the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.). Any terms or conditions included in this permit which specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.) as the origin of and authority for the terms or conditions are enforceable under this Arkansas statute. [40 CFR 70.6(b)(2)]
2. This permit shall be valid for a period of five (5) years beginning on the date this permit becomes effective and ending five (5) years later. [40 CFR 70.6(a)(2) and §26.701(B) of the Regulations of the Arkansas Operating Air Permit Program (Regulation 26), effective September 26, 2002]
3. The permittee must submit a complete application for permit renewal at least six (6) months before permit expiration. Permit expiration terminates the permittee's right to operate unless the permittee submitted a complete renewal application at least six (6) months before permit expiration. If the permittee submits a complete application, the existing permit will remain in effect until the Department takes final action on the renewal application. The Department will not necessarily notify the permittee when the permit renewal application is due. [Regulation 26, §26.406]
4. Where an applicable requirement of the Clean Air Act, as amended, 42 U.S.C. 7401, et seq. (Act) is more stringent than an applicable requirement of regulations promulgated under Title IV of the Act, the permit incorporates both provisions into the permit, and the Director or the Administrator can enforce both provisions. [40 CFR 70.6(a)(1)(ii) and Regulation 26, §26.701(A)(2)]
5. The permittee must maintain the following records of monitoring information as required by this permit. [40 CFR 70.6(a)(3)(ii)(A) and Regulation 26, §26.701(C)(2)]
 - a. The date, place as defined in this permit, and time of sampling or measurements;
 - b. The date(s) analyses performed;
 - c. The company or entity performing the analyses;
 - d. The analytical techniques or methods used;
 - e. The results of such analyses; and
 - f. The operating conditions existing at the time of sampling or measurement.

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6. The permittee must retain the records of all required monitoring data and support information for at least five (5) years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. [40 CFR 70.6(a)(3)(ii)(B) and Regulation 26, §26.701(C)(2)(b)]
7. The permittee must submit reports of all required monitoring every six (6) months. If permit establishes no other reporting period, the reporting period shall end on the last day of the anniversary month of the initial Title V permit. The report is due within thirty (30) days of the end of the reporting period. Although the reports are due every six months, each report shall contain a full year of data. The report must clearly identify all instances of deviations from permit requirements. A responsible official as defined in Regulation No. 26, §26.2 must certify all required reports. The permittee will send the reports to the address below: [40 C.F.R. 70.6(a)(3)(iii)(A) and Regulation 26, §26.701(C)(3)(a)]

Arkansas Department of Environmental Quality
Air Division
ATTN: Compliance Inspector Supervisor
Post Office Box 8913
Little Rock, AR 72219

8. The permittee shall report to the Department all deviations from permit requirements, including those attributable to upset conditions as defined in the permit.
 - a. For all upset conditions (as defined in Regulation 19, § 19.601), the permittee will make an initial report to the Department by the next business day after the discovery of the occurrence. The initial report may be made by telephone and shall include:
 - i. The facility name and location
 - ii. The process unit or emission source deviating from the permit limit,
 - iii. The permit limit, including the identification of pollutants, from which deviation occurs,
 - iv. The date and time the deviation started,
 - v. The duration of the deviation,
 - vi. The average emissions during the deviation,
 - vii. The probable cause of such deviations,
 - viii. Any corrective actions or preventive measures taken or being taken to prevent such deviations in the future, and
 - ix. The name of the person submitting the report.

The permittee shall make a full report in writing to the Department within five (5) business days of discovery of the occurrence. The report must include, in addition to the information required by the initial report, a schedule of actions taken or planned

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to eliminate future occurrences and/or to minimize the amount the permit's limits were exceeded and to reduce the length of time the limits were exceeded. The permittee may submit a full report in writing (by facsimile, overnight courier, or other means) by the next business day after discovery of the occurrence, and the report will serve as both the initial report and full report.

- b. For all deviations, the permittee shall report such events in semi-annual reporting and annual certifications required in this permit. This includes all upset conditions reported in 8a above. The semi-annual report must include all the information as required by the initial and full reports required in 8a.

[Regulation 19, §19.601 and §19.602, Regulation 26, §26.701(C)(3)(b), and 40 CFR 70.6(a)(3)(iii)(B)]

9. If any provision of the permit or the application thereof to any person or circumstance is held invalid, such invalidity will not affect other provisions or applications hereof which can be given effect without the invalid provision or application, and to this end, provisions of this Regulation are declared to be separable and severable. [40 CFR 70.6(a)(5), Regulation 26, §26.701(E), and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]
10. The permittee must comply with all conditions of this Part 70 permit. Any permit noncompliance with applicable requirements as defined in Regulation 26 constitutes a violation of the Clean Air Act, as amended, 42 U.S.C. §7401, et seq. and is grounds for enforcement action; for permit termination, revocation and reissuance, for permit modification; or for denial of a permit renewal application. [40 CFR 70.6(a)(6)(i) and Regulation 26, §26.701(F)(1)]
11. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit. [40 CFR 70.6(a)(6)(ii) and Regulation 26, §26.701(F)(2)]
12. The Department may modify, revoke, reopen and reissue the permit or terminate the permit for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. [40 CFR 70.6(a)(6)(iii) and Regulation 26, §26.701(F)(3)]
13. This permit does not convey any property rights of any sort, or any exclusive privilege. [40 CFR 70.6(a)(6)(iv) and Regulation 26, §26.701(F)(4)]
14. The permittee must furnish to the Director, within the time specified by the Director, any information that the Director may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee must also furnish to the Director copies of

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- records required by the permit. For information the permittee claims confidentiality, the Department may require the permittee to furnish such records directly to the Director along with a claim of confidentiality. [40 CFR 70.6(a)(6)(v) and Regulation 26, §26.701(F)(5)]
15. The permittee must pay all permit fees in accordance with the procedures established in Regulation 9. [40 CFR 70.6(a)(7) and Regulation 26, §26.701(G)]
 16. No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading and other similar programs or processes for changes provided for elsewhere in this permit. [40 CFR 70.6(a)(8) and Regulation 26, §26.701(H)]
 17. If the permit allows different operating scenarios, the permittee shall, contemporaneously with making a change from one operating scenario to another, record in a log at the permitted facility a record of the operational scenario. [40 CFR 70.6(a)(9)(i) and Regulation 26, §26.701(I)(1)]
 18. The Administrator and citizens may enforce under the Act all terms and conditions in this permit, including any provisions designed to limit a source's potential to emit, unless the Department specifically designates terms and conditions of the permit as being federally unenforceable under the Act or under any of its applicable requirements. [40 CFR 70.6(b) and Regulation 26, §26.702(A) and (B)]
 19. Any document (including reports) required by this permit must contain a certification by a responsible official as defined in Regulation 26, §26.2. [40 CFR 70.6(c)(1) and Regulation 26, §26.703(A)]
 20. The permittee must allow an authorized representative of the Department, upon presentation of credentials, to perform the following: [40 CFR 70.6(c)(2) and Regulation 26, §26.703(B)]
 - a. Enter upon the permittee's premises where the permitted source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;
 - b. Have access to and copy, at reasonable times, any records required under the conditions of this permit;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
 - d. As authorized by the Act, sample or monitor at reasonable times substances or parameters for assuring compliance with this permit or applicable requirements.

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21. The permittee shall submit a compliance certification with the terms and conditions contained in the permit, including emission limitations, standards, or work practices. The permittee must submit the compliance certification annually within 30 days following the last day of the anniversary month of the initial Title V permit. The permittee must also submit the compliance certification to the Administrator as well as to the Department. All compliance certifications required by this permit must include the following: [40 CFR 70.6(c)(5) and Regulation 26, §26.703(E)(3)]
 - a. The identification of each term or condition of the permit that is the basis of the certification;
 - b. The compliance status;
 - c. Whether compliance was continuous or intermittent;
 - d. The method(s) used for determining the compliance status of the source, currently and over the reporting period established by the monitoring requirements of this permit;
 - e. and Such other facts as the Department may require elsewhere in this permit or by §114(a)(3) and §504(b) of the Act.

22. Nothing in this permit will alter or affect the following: [Regulation 26, §26.704(C)]
 - a. The provisions of Section 303 of the Act (emergency orders), including the authority of the Administrator under that section;
 - b. The liability of the permittee for any violation of applicable requirements prior to or at the time of permit issuance;
 - c. The applicable requirements of the acid rain program, consistent with §408(a) of the Act or,
 - d. The ability of EPA to obtain information from a source pursuant to §114 of the Act.

23. This permit authorizes only those pollutant emitting activities addressed in this permit. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

APPENDIX A