

77NORTH CAROLINA DIVISION OF
AIR QUALITY

Air Permit Review

Permit Issue Date: **PROPOSED**

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600009
Inspector's Name: Heather Hawkins
Date of Last Inspection: 08/05/2009
Compliance Code: 3 / Compliance - inspection

Facility Data			Permit Applicability (this application only)
<p>Applicant (Facility's Name): Hexion Specialty Chemicals, Inc.</p> <p>Facility Address: Hexion Specialty Chemicals, Inc. 1411 Industrial Drive Fayetteville, NC 28301</p> <p>SIC: 2891 / Adhesives And Sealants NAICS: 32552 / Adhesive Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>			<p>SIP: NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: 112(r): Other:</p>
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 2600009.09B Date Received: 08/31/2009 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 03387/T37 Existing Permit Issue Date: 12/16/2009 Existing Permit Expiration Date: 05/31/2010</p>
Kevin Morris Plant Engineer (910) 485-9225 1411 Industrial Drive Fayetteville, NC 28301	Lynn Rives Site Leader (910) 485-9226 1411 Industrial Drive Fayetteville, NC 28301	Michelle West Regional Environmental Engineer (910) 485-9221 1411 Industrial Drive Fayetteville, NC 28301	
<p>Review Engineer: Jenny Kelvington</p> <p>Review Engineer's Signature: _____ Date: _____</p>		<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 03387/T38 Permit Issue Date: Permit Expiration Date:</p>	

I. Purpose of Application

This permitting action is a renewal of an existing Title V permit pursuant to 2Q .0513. The existing Title V permit is set to expire on May 31, 2010. Because the renewal application was received nine months prior to the permit expiration date, all terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied. Following the renewal, the permit shield will include the RTU vessel with filter (ID No. ES-103) controlled by particle separator (ID No. CD-104PS); the resin/washwater storage tank (ID No. ES-103WW) controlled by scrubber (ID No. CD-104S); and the dry material silos with hopper (ID No. ES-RTUDM) controlled by dust collector (ID No. CD-RTUDC1), which all became operational as of January 1, 2009, and temporary boiler (ID No. TB1), which is yet to be placed in service.

As part of the renewal application, Hexion requests the following revisions to their permit:

Formaldehyde Plant Nos. 1, 2, and 3.

Hexion requests the flexibility to route tail gas from Formaldehyde Plant Nos. 1 and 2 to the tail gas boiler at Formaldehyde Plant No. 3. The Plant No. 3 boiler, rated at 20.9 MMBtu/hr, is large enough to accommodate the tail gas from Plants Nos. 1 and 2 whose tail gas boiler is rated at 12.4 MMBtu/hr.

Formaldehyde Plant No. 4 (ID No. ES-16) controlled by Catalytic Oxidizer (ID No. CD-17)

The Plant No. 4 UFC storage tanks MOStore 1A – 1C are used to store re-work resin known as hydrolyzed UFC. Additional formaldehyde is added to reverse the resin reaction and make hydrolyzed UFC. This resin has a composition similar to UFC with some impurities including caustic and triethanolamine. Hexion requests that this information be included in the emission source description.

Resin Storage Tanks (ID Nos. RTF1 through RTF40)

In addition to storing resin, Hexion would like to have the operational flexibility to also store resin washwater created during reactor flushes in these tanks. The resin washwater contains less VOC/HAP than the resin so emissions will not increase.

Catalyst Storage Tanks (ID No. ICSTA/B)

These tanks have never been installed. Hexion no longer wishes to keep them on the permit.

Dry Hexamine Production including Hexamine Dryer (ID No. HDRY), Mother Liquid Tank (ID No. IML), Centrifuge (ID No. IHCENT), and Reverse Osmosis Unit (ID No. RO)

Hexion has removed all of their dry hexamine production capabilities and has requested that these sources be taken out of the permit. Dry hexamine has not been produced since August 2007 with the exception of four days in March 2009. Without these sources, Hexion does **not** generate a wastewater stream from the RO permeate. Therefore, the monitoring, recordkeeping, and reporting for this wastewater stream previously contained in Condition 2.1.G.3 has been revised to eliminate the Group 1 wastewater avoidance condition.

Loading/Unloading Operations

Hexion has proposed ID Nos. for each of these insignificant activities.

Cooling Water Towers and Caustic Storage/Handling

The above sources emit less than 5 tons per year of each criteria pollutant and less than 1000 pounds per year of HAPs. Hexion requests that they be added to the list of insignificant activities.

II. Facility Description

The Hexion Specialty Chemicals, Inc. facility located in Fayetteville, North Carolina (Hexion) is a chemical manufacturing facility that produces formaldehyde, urea-formaldehyde resin, phenol-formaldehyde resin, and hexamethylenetetramine. The facility has four formaldehyde manufacturing plants that use continuous processes, two batch plants that are used to manufacture urea-formaldehyde resins, and a third batch plant to manufacture phenol-formaldehyde resins. In addition, there is a hexamethylenetetramine manufacturing plant that is usually referred to as the “hexamine” plant, a wax emulsion plant, and an on-site wastewater treatment operation (Hexion WWTP).

The formaldehyde plants and the hexamine plant are subject to the Hazardous Organic NESHAP referred to as HON. The urea-formaldehyde and phenol-formaldehyde batch plants are subject to the Subpart OOO Resins MACT. The majority of the resins produced at this site are for use in the wood industries (plywood / particle board) and small amounts are used as coatings in circuit boards and the automotive industry.

III. Permit History

The following list provides a very brief summary of Title V permit revisions for this facility:

<u>Permit No.</u>	<u>Issuance Date</u>	<u>Description of Revision</u>
03387T27	June 2005	Initial Title V permit.
03387T28	July 2005	Name Change: Borden to Hexion
03387T29	January 2006	Modify action dates in permit to be consistent with SOC
03387T30	February 2006	Provide for an extension for testing and reporting of parametric values for continuous compliance for formaldehyde plant No. 4 (ID No. ES16)

03387T31	March 2006	Modify the urea delivery systems to the resin reactors and add a third weigh tank to be used as an alternate to reduce down time in the event an existing weigh tank is disabled
03387T32	January 2007	Significant modification [501(c)(2)] to include a “HON Group 1 wastewater avoidance condition” that specifies a limit of 10 liters per minute (annual average per rolling 12-months) and to modify existing equipment to allow the reuse of a portion of the RO permeate stream as a raw material for resin production at the facility.
03387T33	August 17, 2007	Significant modification to add monitoring parameters for the resin scrubbers CD200A and CD200B as determined during compliance testing conducted on June 28, 2006 (permit application 2600009.06F), incorporate toxic air pollutant modeling rates as determined through air dispersion modeling approved by the Air Quality Analysis Branch on December 7, 2006 (permit application 2600009.06G), add monitoring parameters for the catalytic oxidizer CD17 as determined during compliance testing conducted on September 20, 2006 (permit application 2600009.06H), and incorporate alternative monitoring for the catalytic oxidizer CD17 allowing HON affected facilities to use annual catalyst activity checks in lieu of temperature rise across the catalyst bed (permit application 2600009.07A).
03387T34	September 21, 2007	Minor modification to add a “temporary, back-up boiler TB1.
03387T35	June 4, 2008	Minor modification to allow RTU mixing tank (ES103) to be used for HAP service; to install an inline process filter after the RTU mixing tank; to replace existing wet scrubber (CD-104) with a particulate separator (CD-104PS) followed by a wet scrubber (CD-104S); to use wash water storage tank (ES-103WW) for resin storage, to add three dry material storage silos with weigh hopper and transfer system (ES-RTUDM) and associated fabric filter (CD-RTUDC1); and to increase allowable facility wide emissions of formaldehyde and phenol.
03387T36	August 26, 2008	Minor modification to increase Plant No. 4 production by 26.5 percent to 210,000,000 pounds of formaldehyde by adding the preheating of methanol and increasing fresh air supply via use of a booster blower.
03387T37	December 16, 2009	Administrative amendment to incorporate monitoring parameters for wet scrubber (ID No. CD-104S).

IV. Facility Compliance Status

Current Compliance

Hexion was last inspected by Heather Hawkins of DAQ FRO on August 5, 2009 for the annual compliance assessment. Ms. Hawkins observed each operation and associated control rooms and verified compliance with all operating parameters and inspection requirements at the time of the inspection. Continued compliance is expected.

Five-Year Compliance History

- February 2005: NOV/NRE issued for failure to submit a Title V application within 12 months of operation and failure to meet notification and compliance deadlines.
- June 2007: NOV issued for failure to report actions inconsistent with the Startup Shutdown Malfunction Plan

V. Permit Changes

The following table lists all modifications associated with this permit action:

New Page(s)	Section	Description of Change(s)
N/A	Cover letter	Amended permit revision numbers and issuance and expiration dates.
N/A	Attachment II	Removed two catalyst storage tanks (ICSTA/B), one mother liquid tank (IML), and one centrifuge (IHCENT) from the list of insignificant activities Added 16 loading stations, the cooling towers, and caustic storage to the list of insignificant activities. Moved existing tank ES105 to the list of insignificant activities and remained it the wastewater holding basin I105.
Page 1	Cover Sheet	Amended permit revision numbers and issuance and expiration dates.
Page 3	1.0; Table	Updated description of FORM12 to enable tail gases to be fired in the Plant 3 boiler.
Page 5	1.0; Table	Expanded description of storage tanks MOSTORE 1A to 1C to include hydrolyzed re-work resin UFC. Deleted hexamethylenetetramine direct, natural gas-fired rotary dryer (HDRY). Deleted reverse osmosis hexamine filtration for reactor process water (RO)
Page 7	1.0; Table	Expanded description of resin storage tanks (RTF1 to RTF40) to include storing resin washwater.
Page 9	1.0; Table	Removed footnotes concerning recent minor permit modifications. The permit shield now applies to all permitted sources.
Page 11	2.1.A1. b and c	Updated testing language and combined monitoring with recordkeeping/reporting.
Page 15	2.1.C.1.b	Removed monthly testing of cooling water for first six months. The testing is now required quarterly.
Page 32	2.1.F	Removed existing section 2.1.F and renumbered the remaining permit accordingly.
Page 62	2.1.N	Added MACT requirements for the Wax Emulsion Plant (WAX).
Page 70	2.2.D.4	Combined Formaldehyde Plant No. 4 (ES16) and Plant 4 dilute tank (IDTS) under one formaldehyde emission limit.
Page 70	2.2.D.4	Corrected the TAP limits for the wastewater basins to reflect approved modeling. Added toxics recordkeeping and reporting requirements.
Page 71	2.2.E	Added requirement to comply with Section 112(r) of the Clean Air Act for the prevention of accidental releases.
Page 71-79	3.0	Updated General Conditions to Version 3.0

VI. Emissions/Regulatory Review For the Existing Sources

A. Formaldehyde Production

closed vent system (ID No. CVS1)

silver catalyst formaldehyde process (ID No. FORM12) venting as fuel gas to Plant 1 and 2 boiler and/or Plant 3 boiler

silver catalyst formaldehyde process (ID No. FORM3) venting as fuel gas to Plant 3 boiler

Description

The facility has four plants that manufacture formaldehyde using a continuous process. The three “older” formaldehyde manufacturing plants (1956, 1963, and 1965) produce formaldehyde blends by reacting vaporized methanol with air as it is passed over a thin silver catalyst bed and then scrubbing the resulting gas with water. Formaldehyde Plants No. 1 and No. 2 are integrated to operate simultaneously. For each plant, formaldehyde and methanol emissions along with hydrogen gas are captured and vented to a boiler. The tail gas from Plants 1 and 2 is fired in the Plant 1 and 2 boiler (12.4 mmBtu/hr) or the Plant 3 boiler (20.9 mmBtu/hr). The tail gas from Plant 3 is fired only in the Plant 3 boiler. Except for start-up, supplemental fuel is not required for these boilers.

Zero percent opacity was observed from the Plant 1 and 2 boiler firing tail gas on the day of the most recent facility inspection. The Plant 3 boiler was not operating at the time of inspection.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	emissions from the process shall at all times be ducted to the process fuel gas system and combusted in the respective boiler.	15A NCAC 2D.1111 40 CFR 63, Subpart G
HAP	Leak Detection and Repair of Vapor Collection/Closed Vent Systems (40 CFR 63.148) (See Section VII. A.2. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart G
PM	particulate emissions shall not exceed 0.35 pounds per million Btu heat input	15A NCAC 2D.0503
SO ₂	sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	visible emissions shall not exceed 40 percent opacity	15A NCAC 2D .0521
HAP	start up, shut down and malfunction (See Section VII. A.1. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart A
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 15A NCAC 2D .1111: 40 CFR 63 Subpart G, OHAP from SOCFI

40 CFR 63, Subparts F, G, H, and I are referred to as the hazardous organic NESHAP (HON). These standards are applicable to Synthetic Organic Chemical Manufacturing Industry (SOCMI) facilities meeting the criteria specified in 40 CFR 63.100(b). In accordance with 40 CFR 63.113(a)(2), the tail gas boilers at the Hexion silver catalyst formaldehyde processing plants (**ID Nos. FORM12 and FORM3**) are used to control off-gases/waste-gases from the affected Group I process vents (closed vent system, **ID No. CVS1**). The tail gas, which is the primary fuel, is introduced into the flame zone. Pursuant to 40 CFR 63.114(a)(3), boilers/process heaters used to control process vent emissions that use the tail gas as a primary fuel are not required to install temperature monitoring equipment in the firebox. In addition, pursuant to 40 CFR 63.116(b)(2), no performance test is required for a boiler/process heater used as a control device provided the tail gas is introduced to the firebox as the primary fuel or with the primary fuel as is the case for Hexion.

The Permittee is required to reduce emissions of total organic hazardous air pollutants by **98 weight percent** or to a concentration of **20 parts per million by volume**, whichever is less stringent. However, there are no testing, monitoring, recordkeeping or reporting requirements when the gaseous emissions are used as a fuel gas. Leak detection and repair pursuant to Subpart H may apply if the fuel gas system is in HAP service. Compliance with this standard is achieved when the process gas is used as a primary fuel or with a primary fuel in one of the boilers. There are no bypasses to the atmosphere for the fuel gas system.

2. **15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS**
Emissions of particulate matter from the combustion of formaldehyde process gases, natural gas, and/or propane that are discharged from the tail gas boilers into the atmosphere shall not exceed **0.35 pounds per million Btu heat input**. The formaldehyde plant tail gas is a clean light gas that produces little, if any, particulate emissions. Particulate emissions from the combustion of natural gas or propane are less than 0.01 lbs/MMBtu. Therefore, compliance is indicated. No monitoring, recordkeeping, or reporting is required.

3. **15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES**
Emissions of sulfur dioxide from the boilers shall not exceed **2.3 pounds per million Btu heat input**. The formaldehyde plant tail gas is a clean light gas that produces little, if any, sulfur dioxide emissions. Sulfur dioxide emissions from the combustion of natural gas are less than 0.01 lbs/MMBtu. Therefore, compliance is indicated. No monitoring, recordkeeping, or reporting is required.

4. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
Visible emissions from the boilers shall not be more than **40 percent opacity** when averaged over a six-minute period. Natural gas, propane, and the formaldehyde plant tail gas are clean light gases that produces little, if any, visible emissions. No visible emissions have been observed during the annual compliance inspections. Continued compliance is indicated. No monitoring, recordkeeping, or reporting is required.

B. Formaldehyde Production - Group 1 Process Vent

Group 1 Process Vent (ID No. CVS2)

metal oxide catalyst formaldehyde process (ID No. ES16) with catalytic oxidizer (ID No. CD17)

Description

Formaldehyde plant No. 4 (ID No. ES16; startup 1989) produces formaldehyde blends and urea formaldehyde concentrate through the direct oxidation of methanol to formaldehyde using molybdenum and iron oxide catalysts. The reaction occurs when a mixture of air and vaporized methanol pass into catalyst-packed reactor tubes. A catalytic oxidizer controls formaldehyde and methanol emissions, reducing total organic compounds (TOC) emissions by at least 98 weight percent.

The application indicates the formaldehyde plant is subject to CAM because potential uncontrolled VOC emissions are 2000 tpy (uncontrolled emission factor is 459 lb/hr) and provides a compliance assurance monitoring (CAM) plan to ensure the catalytic oxidizer adequately controls VOC emissions. The proposed primary monitoring is continuous monitoring of the inlet bed temperature to ensure the daily average remains above 220 °C for formaldehyde production and 240 °C for UFC production. However, because this source is subject to the HON, the requirements of CAM do not apply. 15A NCAC 2D .0614 (b)(1)(A) exempts emission limitations or standards proposed by the EPA after November 15, 1990 pursuant to Section 111 or 112 of the federal Clean Air Act.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	The Permittee shall reduce HAP emissions by 98 percent by weight or to a concentration of 20 ppm by volume, whichever is less stringent. [40 CFR 63.113(2)]	15A NCAC 2D .1111 40 CFR 63, Subpart G
VOC	98 wt percent or 20 ppmv control - Superceded. A Group 1 process vent that is also subject to 40 CFR Part 60, Subpart III is required to comply only with 40 CFR 63, Subpart G. [40 CFR 63.110(d)]	15A NCAC 2D .0524 40 CFR 60, Subpart III NSPS for VOC from SOCOMI Air Oxidation Units
VOC	Leak Detection and Repair - Superceded. All equipment subject to this NSPS will be monitored in accordance with 40 CFR 63, Subpart H. [40 CFR 63.160(c)]	15A NCAC 2D .0524 40 CFR 60, Subpart VV NSPS for Equipment leaks of VOC from the SOCOMI

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	start up, shut down and malfunction (See Section VII. A.1. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart A
HAP	Leak Detection and Repair of Vapor Collection/Closed Vent Systems [40 CFR 63.148] (See Section VII. A.2. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart G.
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3.. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, SUBPART G, GROUP 1 PROCESS VENT REQUIREMENTS

The Permittee is required to reduce emissions of total organic hazardous air pollutants by **98 weight percent** or to a concentration of **20 parts per million by volume**, whichever is less stringent. This control is achieved with an electrically started catalytic oxidizer. There are no bypasses to the atmosphere for the closed vent system. The Permittee is allowed one excursion per semi-annual reporting period. Each excursion beyond the allowed exception is considered a violation.

There are two operating scenarios for the process; one for production of formaldehyde and the other for urea formaldehyde concentrate. Testing performed in September 2006 and approved by Mr. Gregg O'Neal, Stationary Source Compliance Branch (SSCB) on January 4, 2008, shows 99.7% TOC mass reduction efficiency during formaldehyde production and 99.4% TOC mass reduction efficiency during UFC production. Hexion reported TOC emissions in accordance with 40 CFR 63.113 (c) as an alternative to reporting total organic HAP. According to Mr. O'Neal, "If Hexion had chosen to report using HAP emissions, the reduction efficiency would still have been greater than the required 98% minimum reduction." The results of the test are given in the tables below as extracted from Mr. O'Neal's report.

ES16 Emissions Controlled by CD17 - TOC Reduction Efficiency

Pollutant	U.S. EPA Method	Formaldehyde Production 09-19-2006			Urea Formaldehyde Production 09-20-2006		
		Inlet Emission Rate (lb/hr)	Outlet Emission Rate (lb/hr)	Mass Reduction Efficiency (%)	Inlet Emission Rate (lb/hr)	Outlet Emission Rate (lb/hr)	Mass Reduction Efficiency (%)
Methanol	18	6.71	0.018	n/a **	48.83	0.05	n/a **
Dimethyl Ether	18	82.13	0.228	n/a **	81.12	0.70	n/a **
Methyl Formate	18	< 0.427 *	< 0.028 *	n/a **	< 0.454 *	0.053	n/a **
TOC Total	TOC by M18	89.27	0.274	99.7%	130.40	0.80	99.4%

* Compounds marked "<" are less than values these compounds were below the minimum detection limit. The emission rate reported is based on the minimum detection limit value.

** The TOC emissions standard applies

Based on this testing, the inlet temperature and the temperature rise across the catalyst bed for the formaldehyde production scenario are 220°C and 273°C, respectively, and the inlet temperature and the temperature rise across the catalyst bed for the urea/formaldehyde concentrate production scenario are 240°C and 265°C, respectively. At the time of the most recent inspection, records showed temperatures within the parameters. At the time of the most recent inspection, records showed temperatures have been consistently monitored and are within the parameters. The Permittee performs monthly unit integrity checks, an annual internal inspection, and annual catalyst activity checks using an on-site gas chromatograph. The annual inspections of catalyst activity are performed in accordance with an approved written plan which is maintained on site and which specifies the catalyst sampling and testing procedures used to determine the catalyst activity. The facility appears to be in compliance with 2D .1111.

In 2008, the DAQ granted with Permit T36 permission for Hexion to expand Plant No. 4 operations and increase production by 26.5%. The permit requires the facility to demonstrate compliance at the increased production rate with a new performance test. During this test, Hexion may establish new minimum temperatures which ensure compliance with the HAP reduction requirement. Hexion may operate the catalytic oxidizer at temperatures lower than the average daily temperatures required by the permit during the test to establish lower minimums. If compliance is demonstrated and approved by the DAQ at lower temperatures, an administrative amendment request is needed to change the temperatures that the daily average temperature of the vent stream immediately before the catalyst bed must remain at or above. Since this testing has not yet been performed, the testing requirement remains in the renewal permit.

C. Formaldehyde Production - Subpart F Heat Exchange Systems

Six Heat Exchanger Systems for formaldehyde process FORM12 (ID Nos. HX9A, HX9B, HXT5, HXE16, HXT1, and HXT2)

Four Heat Exchanger Systems for formaldehyde process FORM3 (ID Nos. HX2, HX6, HX7C, and HX8)

Five Heat Exchanger Systems for formaldehyde process ES16 (ID Nos. HX7, HX8A, HX8B, HX10, and HX11)

Hexamine Production - Subpart F Heat Exchange System (ID No. HX5)

Description

These sources are noncontact heat exchangers whose cooling water may become contaminated with process fluids containing HAPs that would ultimately be released to the atmosphere should there be a leak between the two fluid systems. Systems whose process fluid could become contaminated with the cooling water in the event of a leak are not covered.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	Heat Exchanger leak detection and repair	15A NCAC 2D.1111 49 CFR 63, Subpart F
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F

1. 15A 40 CFR 63.104: HEAT EXCHANGE SYSTEM REQUIREMENTS

There are 15 heat exchange systems that are in HAP service that could potentially leak process fluids into the cooling water and ultimately end up on the atmosphere. Hexion has been required to monitor these exchangers monthly for a six month period and quarterly thereafter to detect leaks. At the time of the most recent inspection, monitoring included analyzing triplicate samples of the cooling water for HAPs, VOCs, and TOCs on a quarterly basis. The results of this monitoring is recorded and reported once every 6 months. A leak is determined by a statistically significant difference in HAP concentration of the inlet and outlet cooling water. If a leak is detected, repairs must be made as soon as possible but no later than 45 days, unless the leak is inaccessible without plant shutdown. For the permit renewal, Hexion will be required to continue leak detection monitoring on a quarterly basis. The facility appears to be operating in compliance with the 2D .1111 requirements based upon the most recent inspection.

Monitoring is not required for the other heat exchange systems located at the site since they have been modified to increase coolant pressures such that the coolant is leaked to the process fluid, or are not in HAP service.

D. Formaldehyde Production - Subpart H (LDAR) Process Equipment Groups

MEOH Tanks, Plant 1, Plant 2, P3 process area

Pumps, agitators, pressure relief devices, open-ended valves or lines, valves, connectors, instrumentation systems, compressors, and sampling connection systems (ID No. FORMEQLK)

Plant 4 (ID No. ES16)

Pumps, agitators, pressure relief devices, open-ended valves or lines, valves, connectors, instrumentation systems in VOC service, compressors, sampling connection systems in VOC service and subject to 40 CFR 60, Subpart VV.

Hexamine Production - Subpart H Process Equipment Group-Hexa

Pumps, agitators, pressure relief devices, open-ended valves or lines, valves, connectors, instrumentation systems, compressors, and sampling connection systems (ID No. FORMEQLK)

Description

These sources are process equipment containing gases, vapors, or fluids with at least five percent by weight organic hazardous air pollutant (HAP) content.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	Equipment Leak Detection and Repair	15A NCAC 2D .1111 (40 CFR 63, Subpart H)
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM THE SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY - Subpart H

These are specific procedures for leak detection and repair of process equipment in HAP service to prevent HAPs from entering the environment via leaking equipment including: pumps, agitators, pressure relief devices, open-ended valves or lines, valves, connectors, instrumentation systems, compressors, and sampling connection systems. These requirements take the place of NSPS VV with the caveat that VOC be treated as HAPs. The equipment is subdivided into process groups for the intent of maintaining separate monitoring and recordkeeping requirements for each group. The Permittee is required to monitor all equipment with instrumentation, by visual inspection, or both. The frequency of monitoring is weekly for pumps, and from monthly to once per year for valves dependant on the number and frequency of leaks detected for each group of equipment, monthly for agitators, and every year or every two years for

connectors. The remaining equipment inspection is “as needed” for pressure release and as discovered by random visual inspection for equipment in heavy liquid service. Records of all visual and instrument monitoring, leaking equipment, and repairs are maintained by the Permittee. Leaks and leak repairs are reported every six months. At the time of the most recent inspection, the facility appeared to be in compliance with 2D .1111. Continued compliance is expected.

There were no compressors, sampling connection systems, surge tanks, bottoms receivers, or closed vent systems which qualify as affected equipment. However, LDAR requirements are included for compressors and sampling connection systems to enable them (if so desired) to be added at a later date without permit revision. Addition of any surge vessels, bottoms receivers, or closed vent systems is expected to require a permit modification.

E. Formaldehyde Production

urea water tank with cyclone separator (ID No. UW1) with cartridge filter (ID No. CD-UWBH)
 urea water tank with cyclone separator (ID No. UW2) with cartridge filter (ID No. CD-UWBH)

Resin Production

urea weighing and conveying for BR2 (ID No. ES24) with fabric filter (ID No. CD24)
 urea weighing and conveying for BR2 and BR3 (ID No. UWC1) with fabric filter (ID No. CDBF1)
 urea weighing and conveying for BR3 (ID No. UWC2) with fabric filter (ID No. CDBF2)
 urea weighing and conveying for BR4 (ID No. ES26) with fabric filter (ID No. CD26)

Description

These are mixing operations involving non-HAP compounds. A cartridge or fabric filter controls particulate emissions from these processes.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	particulate emissions shall not exceed the rate prescribed by the process weight equation for process rates up to 30 tons per hour: $E = 4.10 \times P^{0.67}$ Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour	15A NCAC 2D .0515
visible emissions	visible emissions shall not exceed 20 percent opacity	15A NCAC 2D .0521
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES

This regulation limits particulate matter (PM) emissions based on the weight of the material processed according to the equation: $E = 4.10 \times P^{0.67}$, where E = allowable emission rate in lbs/hr and P = process weight in tons/hr, for P < 30

tons/hr. These sources operate in a batch mode and emit particulates. Compliance with the particulate limits are achieved with cartridge or fabric filter control. In 2008, the particulate emissions from all of these sources combined were 1,460 pounds for the year and well below the hourly allowable emission rates. The facility visually inspects the baghouses and ductwork to ensure proper operation. The last inspection notes “These actions are performed monthly and documented.” Continued compliance is expected.

2. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

This regulation limits visible emissions to no more than 20 percent opacity. Compliance is achieved with the use of control equipment. The facility has consistently maintained VE less than 20% opacity, performed VE observations, conducted monthly visual inspections on the baghouses and ductwork, and submitted timely reports. The “normal” opacity of all the emission sources is defined as zero and visible emissions were 0% opacity during the most recent inspection. Continued compliance is expected.

**F. ^aHexamine Reactor (ID No. HRE) - Group 2 Process Vent, Group 2 wastewater
^bFormaldehyde Plant No. 3 De-acidifier (ID No. Form 3)**

Description

The Hexamine Plant (startup 1981) produces hexamethylenetetramine (also known as hexamine or hexa) via the reaction of anhydrous ammonia and formaldehyde. Until August 2007, the plant produced both a dry and a liquid hexamine product. With the permit renewal application, Hexion has requested that all dry hexamine production processes including hexamine dryer (ID No. HDRY), mother liquid tank (ID No. IML), centrifuge (ID No. IHCENT), and reverse osmosis Unit (ID No. RO) be removed.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP ^a	The Permittee shall maintain a TRE greater than 4.0 for the group 2 process vent	15A NCAC 2D .1111 40 CFR 63, Subpart G
HAP ^{ab}	The Permittee shall retain records for the Group 2 wastewater sources	15A NCAC 2D .1111 40 CFR 63, Subpart G
HAP ^{ab}	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC ^a PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC ^a	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor ^a	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP ^a	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, SUBPART G, GROUP 2 PROCESS VENT REQUIRTEMENTS

The MACT requires the facility to maintain a total resource effectiveness (TRE) index value greater than 4.0. The TRE value for this HAP source is estimated at 401. Since the TRE is greater than 4.0, no control is required. The Permittee is required to maintain records of the TRE calculations and any process changes that might affect the TRE value. Additionally, the Permittee must report any TRE index changes as a result of process changes. Compliance is expected.

2. 40 CFR 63, SUBPART G, GROUP 2 WASTEWATER REQUIREMENTS

The Permittee has determined that the wastewater from these sources does not contain sufficient HAP content to classify it as Group 1 wastewater. Therefore, it is considered Group 2 wastewater and requires no treatment or control. The Permittee is required to maintain records of the flow and HAP concentrations determination and any process changes that might affected this determination. The Permittee must report any change in the “Group” designation as a result of process changes. Compliance is expected.

G. Resin Production

^a**Aggregate Batch Vent Stream (ID No. CVS3) consisting of wet scrubbers (ID No. CD200A and CD200B) on: three reactors (ID Nos. BR2, BR3, and BR4) three distillate receiving tanks (ID Nos. BR2DRT, BR3DRT, and BR4DRT), and a weigh tank (ID No. FWTBR2)**

^b**Non-Reactor Batch Process Vent Stream (NRBPV1) consisting of particulate separator (ID No. CD-104PS) and wet scrubber (ID No. CD-104S) on: RTU mix tank with filter (ID No. ES103)**

^c**Three dry materials storage silos/weigh hopper (ID No. ES-RTUDM) with fabric filter (ID No. CD-RTUDC1)**

Description

Reactors No. 1 and No. 2 produce urea formaldehyde resins. Reactor No. 3 produces phenol formaldehyde resins. The Permittee has chosen to control both reactor batch process vent and non reactor batch process vents under the aggregate batch vent compliance option. Two wet scrubbers are used to control HAP emissions from these reactors and the associated distillate receiving tanks and weigh tank.

The RTU mix tank and associated control devices became operational on January 1, 2009. Two resins containing phenol, methanol, and formaldehyde and produced at the facility are mixed with water and dry raw materials (nut shell flour, wheat flour, and soda ash) in this non-reactor batch mixing tank. An inline process filter located after the tank removes solids from the generated product. Potential throughput is 109,500 tpy and 8,760 batches/year. Potential uncontrolled emissions are 0.134 pounds of VOCs per batch (0.587 tpy) and 0.082 lb PM per ton (4.49 tpy) processed. Emissions are controlled by a particulate separator (ID No. CD-104PS) followed by a wet scrubber (ID No. CD-104S).

Three dry material storage silos ES-RTUDM (10’ height, 200 ft³ each), which send material via screw conveyor to their associated hopper (28’ height, 200 ft³), also became operational on January 1, 2009. The hopper weighs the material and sends to the RTU vessel via screw conveyor. The maximum design filling rates are 15 tph per silo and 6 tph for the hopper. The maximum unloading rate is 6 tpy per silo and 17 tph for the hopper. Particulates are ducted to dust collector CD-RTUDC1 for emissions control. The inlet air flow rate into the collector is 50 acfm. To ensure proper operation, the facility inspects the dust collector for leaks and structural integrity and observes opacity each month. Uncontrolled PM emissions are 0.359 tons per year. (Factor 0.082 lbs/ton).

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM ^{bc}	particulate emissions shall not exceed the rate prescribed by the process weight equation for process rates up to 30 tons per hour: $E = 4.10 \times P^{0.67}$ Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour	15A NCAC 2D .0515

Regulated Pollutant	Limits/Standards	Applicable Regulation
visible emissions ^{bc}	visible emissions shall not exceed 20 percent opacity	15A NCAC 2D .0521
HAP	Reduce HAP emissions by 83 percent or to less than or equal to 50 ppmv, whichever is less stringent.	15 A NCAC 2D .1111 40 CFR 63, Subpart OOO
HAP ^a	Reduce HAP emissions by 83 percent or to less than or equal to 50 ppmv, whichever is less stringent.	15 A NCAC 2D .1111 40 CFR 63, Subpart A
HAP ^b	Reduce HAP emissions by 62 percent or to less than or equal to 50 ppmv.	
HAP	Closed Vent System Equipment and Operating Requirements [40 CFR 63.983] (See Section VII. A.2. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart OOO/SS
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES

This regulation applies to the RTU mix tank and silos/weigh hopper and limits particulate matter (PM) emissions based on the weight of the material processed according to the equation: $E = 4.10 \times P^{0.67}$, where E = allowable emission rate in lbs/hr and P = process weight in tons/hr, for P < 30 tons/hr. Compliance with the particulate limits is achieved with a wet scrubber and fabric filter control. The facility conducts monthly visible inspections and keeps detailed records in compliance with the permit. Continued compliance is expected.

2. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

This regulation limits visible emissions to no more than 20 percent opacity. "Normal" for these sources is zero percent opacity. Compliance is achieved with the use of control equipment. Continued compliance is expected.

3. 40 CFR 63, Subpart OOO, NESHAP for MANUFACTURE OF AMINO/PHENOLIC RESINS

The MACT requires the Permittee to reduce organic HAP emissions from the batch reactors by **83 weight percent** or to a concentration of less than or equal to **50 ppmv**, whichever is less stringent, on a continuous basis and from the non-reactor batch RTU mix tank by **62 weight percent** or to a concentration of less than or equal to **20 ppmv**, whichever is less stringent.

For the reactors, the Permittee achieves compliance with the use of two scrubbers. The first scrubber CD200A, a once through packed bed scrubber using city water, is designed to remove formaldehyde, methanol, and phenol emissions. The once through design maintains a constant fresh supply of scrubbing medium. A minimum liquid flow rate is required to ensure scrubber control. The second scrubber CD200B, an acidic scrubber that uses sulfuric acid added to the circulating medium, is designed to remove the triethylamine emissions. 40 CFR 63 Subpart OOO requires the establishment of a minimum pH; however a low pH is required to control triethylamine emissions. Thus the alternative monitoring parameter for continuous compliance operating limits are based on the average maximum pH measured during a stack test. The Permittee performed testing on June 27, 2006. The approved test results, in the table below, show the total HAP emissions reduction efficiency was 93.5% which is above the required 83% minimum, and establish the monitoring parameters for scrubbers CD200A and CD200B at a minimum liquid to gas ratio of 0.0049 gallons per dry cubic foot and a maximum pH of 4.9, respectively. The Permittee maintains daily

average values for the monitored parameters, any equipment or monitor down time, start ups, shut downs, and malfunctions, and periods in which insufficient monitoring data is acquired. The Permittee also reports all daily average values for the monitored parameters that are outside of the establish limits and all periods in which insufficient monitoring data is acquired. Continued compliance is expected.

CVS3 System Emissions Controlled by CD200A & CD200B - HAP Reduction Efficiency

Pollutant	U.S. EPA Method	Unspiked Max Production 06-27-2006 (FG-472X)			Spiked Max Production 06-28-2006 (Spiking with Formaldehyde and Methanol)		
		Average Inlet Emission	Average Outlet Emission	Mass Reduction Efficiency (%)	Average Inlet Emission	Average Outlet Emission	Mass Reduction Efficiency (%)
Formaldehyde	316	1588 ppmv 11.8 lb/hr	70.6 ppmv 0.601 lb/hr	n/a **	9905 ppmv 71.4 lb/hr	319 ppmv 2.60 lb/hr	n/a **
Methanol	308	171 ppmv 6.71 lb/hr	6.21 ppmv 0.056 lb/hr	n/a **	676 ppmv 5.21 lb/hr	32.5 ppmv 0.282 lb/hr	n/a **
Methanol	18	257 ppmv 2.25 lb/hr	8.97 ppmv 0.090 lb/hr	n/a **	1004 ppmv 7.72 lb/hr	23.63 ppmv 0.20 lb/hr	n/a **
Triethylamine	18	28.6 ppmv 0.824 lb/hr	8.05 ppmv 0.258 lb/hr	n/a **	Not Measured During Test	Not Measured During Test	n/a **
Phenol	NCASI CI/WP-98.01	0.294 ppmv 0.007 * lb/hr	< 0.056 * ppmv < 0.002 * lb/hr	n/a **	Not Measured During Test	Not Measured During Test	n/a **
Total HAP		14.8 lb/hr ***	0.950 lb/hr ***	93.5%	79.1 lb/hr ***	2.80 lb/hr ***	96.4%

* Compounds marked "<" were below the minimum detection limit. The emission rate reported is based on the minimum detection limit value.

** The HAP emissions standard applies to the total HAP emissions and not to individual pollutants, therefore these reductions were not calculated.

*** Only Method 18 Methanol results were used in the total. The 06-28-2006 test results did not include the contribution of phenol and triethylamine emissions to the total HAP emissions. These compounds were not measured.

Testing was performed during production of the highest HAP recipe. During normal operations at the Fayetteville Hexion facility most batch recipes contain lesser amounts of HAP in the raw materials. Spiked testing was conducted to allow for future resin operations flexibility.

CVS3 System Emissions Controlled by CD200A & CD200B - Monitoring Parameters

Test Date	Once Through Wet Scrubber CD200A			Sulfuric Acid Scrubber CD200B	
	Test Condition	Average Minimum Water Scrubber Water Flow Rate, gl/min	Average Maximum Total Air Flow Through both Scrubbers (measured at CD200A outlet), scfm	Monitoring Parameter for Water Scrubber CD200A Liquid/gas Ratio, gl/dscf	Monitoring Parameter for Sulfuric Scrubber CD200B, pH
06-27-2006	Unspiked Max Production	10	2050.0	0.0049	4.9
06-28-2006	Spiked Max Production	9.7	2051.7	0.0047	3.2

For the non-reactor RTU mix tank, the Permittee achieves compliance with scrubber control. Wet scrubber CD104S is a once through packed bed scrubber using once-through city water and is designed to remove formaldehyde, methanol, and phenol emissions. The once through design maintains a constant fresh supply of scrubbing medium. Hexion completed source testing of the scrubber on May 13-14, 2009 which demonstrated that maximum pre-controlled organic HAP emissions entering the scrubber are less than 1 ton per year. For devices controlling sources with potential HAP emissions below 1 tpy, §63.1413(a)(2) allows monitoring to consist of *only* a daily or per batch verification that the control device is

operating properly. This verification must include, but not be limited to, a daily or per batch demonstration that the control device is working as designed. Hexion monitors continuously with the option to perform batch verification that the liquid to gas (L/G) ratio in the scrubber is greater than or equal to 0.042 gpm/scfm. Compliance is expected.

RUN #	DATE	pH	L/G Ratio (gpm/scfm)	MeOH ¹ Inlet (lb/hr)	MeOH ¹ Outlet (lb/hr)	% Reduction
1	5/13/09	7.5	0.044	0.12	0.000048	99.96
2	5/14/09	5.9	0.042	0.10	0.000048	99.95
3	5/14/09	5.5	0.042	0.11	0.00010	99.91
Average		6.3	0.043	0.11	0.000066	99.94

H. Resin Production - Leaks from Equipment Groups

Reactor 2, Reactor 3, Reactor 4 area

pumps, agitators, sampling connection systems, pressure relief devices, open-ended valves or lines, valves, connectors, instrumentation systems, compressors, and sampling connection systems in organic HAP service

Description

These are equipment that are in organic hazardous air pollutant service, which means that the gases, vapors, or fluids contained in these equipment contain at least five percent by weight organic HAP.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	Equipment Leak Detection and Repair	15A NCAC 2D .1111 (40 CFR 63, Subpart OOO) (40 CFR 63, Subpart UU)
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, Subpart OOO/UU NESHAP for the Amino/Phenol Resins Manufacturing Industry

The equipment is subdivided into process groups for the intent of maintaining separate monitoring and recordkeeping requirements for each group. The Permittee is required to monitor all equipment with instrumentation, by visual inspection, or both. The frequency of monitoring is weekly for pumps, and from monthly to once per year for valves dependant on the number and frequency of leaks detected for each group of equipment, monthly for agitators, and every year or every two years for connectors. The remaining equipment inspection is "as needed" for pressure release and "as discovered by random visual inspection" for equipment in heavy liquid service. Records of all visual and instrument monitoring, leaking equipment, and repairs are maintained by the Permittee. Leaks and leak repairs are reported every six months.

¹ Preliminary Emissions Characterization Test performed 2/18/09 showed > 99% of VOCs/HAPs entering the scrubber consists of methanol (MeOH).

There were no compressors, sampling connection systems, surge tanks, bottoms receivers, or closed vent systems which qualify as affected equipment. However, LDAR requirements are included for compressors and sampling connection systems to enable them (if so desired) to be added at a later date without permit revision. Addition of any surge vessels, bottoms receivers, or closed vent systems is expected to require a permit modification.

I. TRANSFER OPERATIONS - 40 CFR 63, Subpart G-Group 1
rail car methaform product load out (two loading arms; ID No. RLOAD1)
rail car formaldehyde product load out (two loading arms; ID No. RLOAD2)
tank truck formaldehyde mixed product load out (one loading arm; ID No. TLOAD1A)

Description

This is equipment used to transfer material with sufficient HAP concentration and vapor pressure to require control as a Group 1 transfer operation. These loading arms exist at transfer stations and include multiple loading arms for various products, not all of which require controls as a group 1 transfer operation. The Permittee meets the control requirement by routing HAP emissions via a vapor collection system to the formaldehyde process.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	Vapors shall be collected and vented to the formaldehyde processes at all times	15A NCAC 2D .1111 40 CFR 63, Subpart G
HAP	start up, shut down and malfunction (See Section VII. A.1. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart A
HAP	Leak Detection and Repair of Vapor Collection and Closed Vent Systems - 40 CFR 63.148 (See Section VII. A.2. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart G.
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, Subpart G, Group 1 Transfer Operation Requirements

Emissions from the transfer operations are routed to one of four formaldehyde production units to fulfill the control requirements for these sources. The transfers are limited to trucks meeting the DOT certifications for vapor tightness. There are no bypasses to the atmosphere for closed vent system except for emergency purposes. The Permittee is required to monitor the tank truck vapor tightness certifications and the fact that the stream is being routed to a formaldehyde process. The facility completes load out tickets with the DOT certification date for each tank or railcar that is loaded Reporting is not required. At the time of the most recent inspection, the facility appeared to be operating in compliance.

J. STORAGE TANKS - 40 CFR 63, Subpart G-Group 1

internal floating roof methanol storage tank (ID No. METH1)

internal floating roof methanol storage tank (ID No. METH2)

Description

These storage tanks are used to store methanol for the production of formaldehyde and for addition to various products as a stabilizer. Each tank is equipped with a fixed roof and an internal floating roof. Each internal floating roof has dual seals.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC	[40 CFR 63.110(b)] A group 1 storage vessel that is also subject to the provision of 40 CFR 60, Subpart Kb is required to comply only with the provisions of 40 CFR , Subpart G.	15A NCAC 2D .0524 40 CFR 60, Subpart Kb
HAP	Each tank shall maintain a fixed roof with an internal floating roof.	15A NCAC 2D .1111 40 CFR 63.119, Subpart G
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.4. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, Subpart G, Group 1 Storage Tank Requirements

As required by the MACT, each tank has a fixed roof and an internal floating roof. The internal floating roof consists of two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The Permittee performs internal inspections to ensure the integrity of the tank and floating roof every time the tank is emptied and degasses and at least one every five years. Hexion performs an internal inspection at ten year intervals unless the tank is emptied and degassed. Hexion maintains records of each inspection including any failure detected during the inspection and repairs performed and reports the inspection findings to the DAQ semi annually.

K. Formaldehyde Production^athree methaform storage tanks (ID Nos. STORE1MAF1 through STORE1MAF3)^a14 formaldehyde storage tanks (ID Nos. STOREFORM1 through STORE1FORM14)^a50% formaldehyde storage tank (ID No. MOSTORE2)^athree urea formaldehyde concentrate and hydrolyzed re-work resin UFC storage tanks (ID Nos. MOSTORE1A through MORETSTORE1C)^atwo 50% formaldehyde storage tanks (ID No. MOSTORE1D through MOSTORE1E)**Hexamine Production**^athree hexamine process water recycle tanks (ID Nos. ESOT1, ESOT2, and ESOT3)^atwo hexamine concentrate water recycle tanks (ID Nos. ESCT1 and ESCT2)^atwo liquid hexamine tanks (ID Nos. ESLH1 and ESLH2)

^ahexamine distillate tank (ID No. ESDS)

Resin Production

^btwo phenol tanks (ID Nos. PT1 and PT2)

^b39 resin/resin washwater storage tanks (ID Nos. RTF1 through RTF8 and RTF10 through RTF40)

^bresin/resin wash water/diethylene glycol storage tank (ID No. RTF9)

^btwo liquid ring vacuum seal water tanks (ID Nos. VST2/3 and VST4)

^bRTU wash water/resin storage tank (ID No. ES-103WW)

Transfer Operations

^btruck load out station for urea formaldehyde resin (ID No. TLOAD6)

^btwo tank truck urea formaldehyde resin and phenol formaldehyde resin load out stations (ID Nos. TLOAD1B and TLOAD2B)

^btank truck urea formaldehyde resin and wax load out (ID No. TLOAD3B)

^btank truck phenol formaldehyde resin load out, and receiving for caustic, temulose, beet molasses, and phenol (ID No. TLOAD4)

^btank truck urea formaldehyde resin and phenol formaldehyde resin load out, and receiving of aqueous ammonia (ID No. TLOAD5)

^crailcar urea formaldehyde concentrate product load out (ID No. RLOAD3) vented to scrubber (ID No. CD200)

^ctank truck urea formaldehyde concentrate product load out (ID No. TLOAD2A) vented to scrubber (ID No. CD200)

^ctank truck hexamine load out (ID No. TLOAD3A)

^crail car hexamine load out (ID No. RLOAD4)

Other

^bwastewater treatment plant (ID No. WWTP)

Description

These sources include tanks used to store raw material, intermediates, recycle material, and/or final products; loading racks used for shipping product and receiving raw materials; and wastewater holding areas. The HAP content of each source does not meet the vapor pressure required to be classified as a Group 1. The 20,000 gallon capacity RTU washwater and resin storage tank (ID No. ES-103WW) was placed into HAP service on January 1, 2009. The maximum liquid surface temperature and true vapor pressure for the material stored in this tank are 145 °F and 0.04 psia, respectively.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP ^a	recordkeeping for group 2 storage tanks	15A NCAC 2D.1111 40 CFR 63, Subpart G
HAP ^c	recordkeeping for group 2 transfer racks	15A NCAC 2D.1111 40 CFR 63, Subpart G
HAP ^{ac}	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
VOC ^{ab} PSD AVOIDANCE	VOC emissions shall not 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317
VOC ^{abc}	Work Practice Standards for Sources of VOC (See Section VII. B.2. Multiple Emission Sources)	15A NCAC 2D.0958

Regulated Pollutant	Limits/Standards	Applicable Regulation
odor ^{abc}	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP ^{abc}	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

1. 40 CFR 63, Subpart G, Group 2 Storage Vessel Requirements

For Group 2 storage vessels, the Permittee is only required to keep the storage vessel dimensions and capacity readily available. No other monitoring or recordkeeping is required.

2. 40 CFR 63, Subpart G, Group 2 Transfer Operation Requirements

For Group 2 transfer operations, the Permittee is required to keep the analysis demonstrating the design and actual annual throughput of the transfer rack, documentation of the weight-percent organic HAP's in the liquid loaded (e.g., analyses of the material and engineering calculations), and an analysis documenting the annual rack weighted average HAP partial pressure of the transfer rack.

L. Boiler No. 3 (ID No. ES3) and boiler No. 4 (ID No. ES4)

Description

These are natural gas and residual oil-fired boilers used for process heat.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	Particulate emissions shall not exceed 0.39 pounds per million Btu heat input.	15A NCAC 2D .0503
SO ₂	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	Visible emissions shall not exceed 40 percent opacity.	15A NCAC 2D .0521
SO ₂ PSD AVOIDANCE	Sulfur dioxide emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total. [This is a facility wide emission limit. Compliance is based on boiler emissions from fuel oil as the sole source of SO ₂ emissions.]	15A NCAC 2Q .0317
VOC PSD AVOIDANCE	VOC emissions shall not 100 tons per consecutive 12-month period, rolling monthly total. (See Section VII. B.1. Multiple Emission Sources)	15A NCAC 2Q .0317

1. 15A NCAC 2D .0503: Particulates from Fuel Burning Indirect Heat Exchangers

Emissions of particulate matter from the combustion of natural gas, No. 4, No. 5, and No. 6 fuel oils that are discharged from these sources into the atmosphere shall not exceed **0.39 pounds per million Btu heat input**. Hexion limits particulate emissions with proper operation during the combustion of gas and liquid fossil fuels. No monitoring, recordkeeping, or reporting is required for the combustion of natural gas, No. 4, No. 5, and No. 6 fuel oils.

2. 15A NCAC 2D .0516: Sulfur dioxide Combustion Sources

Emissions of sulfur dioxide from these sources shall not exceed **2.3 pounds per million Btu heat input**. To ensure this standard is not exceeded, the sulfur content of residual oil fired in these sources is limited to 2.1 percent by

weight, The Permit requires Hexion to monitor the sulfur content of all fuel oils received by way of supplier certification; maintain fuel certification records, and report semi annually the sulfur content of all fuel oils received.

3. 15A NCAC 2D .0521: Control of Visible Emissions

Visible emissions from the boilers shall not be more than 40 percent opacity when averaged over a six-minute period. Compliance is anticipated with proper operation of the boiler. The Permittee monitors visible emissions daily when burning residual fuels to detect any emissions above normal, maintains inspection records, and reports semi annually the results of these inspections. When abnormal emissions are observed, the Permittee is required to perform a Method 9 test to demonstrate compliance. Records show readings are made as required.

4. 15A NCAC 2Q .0317: PSD Avoidance Condition for Major Source Classification

In order to avoid applicability of 15A NCAC 2D .0530(g), Hexion has requested that sulfur dioxide emissions from the facility be limited to less than 100 tons of sulfur dioxide per consecutive 12-month period, rolling monthly total. Although this is a facility wide limit, only boilers No. 3 and No. 4 are significant contributors with potential unrestricted SO₂ emissions at 400 tpy. Potential SO₂ emissions from all other sources are 0.16 tons per year. To ensure the 100 tpy limit is not exceeded, Hexion monitors the amount of residual fuel fired in these two boilers and the respective sulfur content, maintains records, and semiannually reports the total calculated sulfur dioxide emissions from the boilers for each of the most recent 17 months and the six 12 month rolling totals of emissions for that reporting period.

M. Temporary², back-up boiler (ID No. TB1) with a maximum heat input capacity of less than 30 million Btu per hour; formaldehyde process tailgas and natural gas-fired

Description

This boiler has not yet been required for service. It is a temporary back-up boiler with a maximum heat input less than 30 MMBtu/hr. If used, it will combust formaldehyde process tail gas and/or natural gas and be subject to the HON.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate matter	0.32 pounds per million Btu heat input	15A NCAC 2D .0503
Sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
Visible emissions	20 percent opacity	15A NCAC 2D .0521(d)
<u>40 CFR 60, Subpart Dc</u>		
The following standards are only applicable to temporary, back-up boilers that commenced construction, reconstruction, or modification after June 9 th , 1989; <u>AND</u> that have a maximum heat input capacity equal to or greater than 10 million Btu per hour		
N/A	Monthly recordkeeping requirement, only.	15A NCAC 2D .0524 40 CFR 60, Subpart Dc
<u>40 CFR 63, Subpart G</u>		
The following standards are only applicable to temporary, back-up boilers that are used to back up tail gas boilers at the silver catalyst formaldehyde processes (ID No. FORM12 and FORM3).		
HAPs	Tail gas shall be used as the primary fuel for any boiler used to back up the tail gas boilers at the silver catalyst formaldehyde processes (ID No. FORM12 and FORM3).	15A NCAC 2D .1111 40 CFR 63, Subpart G

² “Temporary”, in this case, is descriptive only. There is no limit to the amount of time a back-up boiler authorized pursuant to this section of the permit may operate.

1. 15A NCAC 2D .0503 – Particulates from Fuel Burning Indirect Heat Exchangers

Emissions of particulate matter from the combustion of formaldehyde process gases and natural gas that are discharged from the temporary boiler into the atmosphere shall not exceed **0.32 pounds per million Btu heat input**. The formaldehyde plant tail gas is a clean light gas that produces little, if any, particulate emissions. Particulate emissions from the combustion of natural gas are less than 0.01 lbs/MMBtu. Therefore, compliance is indicated. No monitoring, recordkeeping, or reporting is required.

2. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

Emissions of sulfur dioxide from this boiler shall not exceed **2.3 pounds per million Btu heat input**. The formaldehyde plant tail gas is a clean light gas that produces little, if any, sulfur dioxide emissions. Sulfur dioxide emissions from the combustion of natural gas are less than 0.01 lbs/MMBtu. Therefore, compliance is indicated. No monitoring, recordkeeping, or reporting is required.

3. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

Visible emissions from this boiler shall not be more than **20 percent opacity** when averaged over a six-minute period. Natural gas, propane, and the formaldehyde plant tail gas are clean light gases that produces little, if any, visible emissions. No visible emissions have been observed during the annual compliance inspections. Continued compliance is indicated. No monitoring, recordkeeping, or reporting is required.

4. 15A NCAC 2D .0524 – 40 CFR 60, Subpart Dc, NSPS for Small Industrial-Commercial-Institutional Steam Generating Units

This regulation is applicable to boilers that commenced construction, reconstruction, or modification after June 9, 1989 AND that have a maximum heat input capacity equal to or greater than 10 million Btu per hour and less than or equal to 100 million Btu per hour (i.e., $10 \text{ MMBtu/hr} \leq Q \leq 100 \text{ MMBtu/hr}$). The permit allows the facility to rent boilers with various construction/reconstruction/modification dates, and the rented boiler may or may not be affected by the NSPS.

As provided below, no NSPS-affected temporary boiler meeting the requirements of the permit shall be subject to the emissions standards in 40 CFR 60, Subpart Dc:

- Sulfur Dioxide. The NSPS provides SO₂ standards for affected units firing coal and/or oil. The proposed temporary boiler is not permitted to fire either coal or oil. **Therefore, the NSPS standards for SO₂ shall not be applicable to any temporary boiler meeting the requirements of the permit.**
- Visible Emissions. For any Subpart Dc-affected boiler with a maximum heat input capacity of greater than or equal to 30 MMBtu/hr, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period, except for one six-minute period per hour of not more than 27 percent opacity. The proposed temporary boiler is limited to a maximum heat input capacity of less than 30 MMBtu/hr. **Therefore, the NSPS standards for visible emissions are not applicable to any temporary boiler meeting the requirements of the permit.**

However, when the boiler is in operation, the facility is required to keep a monthly record of the quantity of each fuel fired pursuant to 40 CFR 60.48c(g)(2), as follows:

“As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c (f) to demonstrate compliance with the SO₂ standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.”

In addition, pursuant to 40 CFR 60.7(a)(3) the Permittee is required to submit a written notification of the actual date of initial startup of any NSPS-affected temporary, backup boiler (**ID No. TB1**) within 15 days of such date. This notification shall be submitted to the Regional Supervisor.

5. **15A NCAC 2D .1111 – 40 CFR 63, Subpart G, NESHAP for SOCM I Process Vents, Storage Vessels, Transfer Operations, and Wastewater**

In accordance with 40 CFR 63.113(a)(2), this temporary tail gas boiler is used to control off-/waste-gases from an affected Group I process vents (closed vent system, **ID No. CVS1**) by at least 98 percent by weight or to a concentration of 20 parts per million by volume (ppmv), whichever is less stringent. The tail gas, which is the primary fuel, is introduced into the flame zone. Pursuant to 40 CFR 63.114(a)(3), boilers/process heaters used to control process vent emissions that use the tail gas as a primary fuel are not required to install temperature monitoring equipment in the firebox. In addition, pursuant to 40 CFR 63.116(b)(2) no performance test is required for a boiler/process heater used as a control device provided the tail gas is introduced to the firebox as the primary fuel or with the primary fuel.

The Permittee is required to reduce emissions of total organic hazardous air pollutants by **98 weight percent** or to a concentration of **20 parts per million by volume**, whichever is less stringent. However, there are no testing, monitoring, recordkeeping or reporting requirements when the gaseous emissions are used as a fuel gas. Compliance with this standard is achieved when the process gas is used as a primary fuel or with a primary fuel in one of the boilers. There are no bypasses to the atmosphere for the fuel gas system.

N. Wax Emulsion Plant

Description

Raw materials including slack wax, water, and acid/bases are combined in a premix tank in a batch fashion. The premix tank feeds a hold tank that meters the wax mixture into a continuously operated homogenizer, which completes the product mixing. After the product is mixed and cooled, it is transferred to storage tanks prior to loading. Potential emissions of all criteria pollutants are less than 5 tpy and HAP emissions are less than 1,000 pounds per year. With these low emission rates, the wax emulsion plant meets the definition of an insignificant activity and is listed as such in the existing permit. However, since wax production (1) falls under SIC code 2891, (2) processes materials that contain the HAP methanol, and (3) is not subject to any other MACT, the wax plant is subject to 40 CFR Part 63, Subpart FFFF “NESHAP for Miscellaneous Organic Chemical Manufacturing,” referred to as MON MACT. In October 2008, Hexion submitted the required notification of the methods that are used to comply with the MON requirements. As shown in the table below, the only source subject to the MON MACT is maintenance wastewater. Maintenance wastewater is addressed in Hexion’s start-up, shutdown, and malfunction plan.

Emission Source	HAP Content	MON Status
Hexamine & wax water storage tank (15,000 gallons)	Hexamine water contains 1500 ppmw HAPs (methanol)	Not subject per 63.2550(i)
Stearic acid storage tank (15,000 gallons)	None	Not a source of HAPs
Slack Wax A storage tank (40,000 gallons)	None	Not a source of HAPs
Slack Wax S storage tank (30,000 gallons)	None	Not a source of HAPs
Slack Wax LV storage tank (20,000 gallons)	None	Not a source of HAPs
TEA storage tank (200 gallons)	None	Not a source of HAPs
Premix batch tank with process vent (15,000 gallons)	Impurity Only	Not subject; uncontrolled HAPs < 200 pounds per year.
Hold tank with process vent (1,000 gallons)	Impurity Only	Not subject; less than 10,000 gallons
Continuous homogenizer	Impurity Only	Not subject; there are no process vents
Two plate coolers	Impurity Only	Not subject per 63.104(a); HAP content is < 5% by wt.

Storage tank 1 (10,000 gallons)	Possible impurity	Not subject per 63.2550(i); only contain HAP as an impurity
Storage tank 2 (10,000 gallons)		
Storage tank 3 (10,000 gallons)		
Storage tank 4 (12,000 gallons)		
Storage tank 5 (12,000 gallons)		
Loading railcars and trucks TLOAD3B; RLOADWAX	Possible impurity	Not subject; VP < 1.5 psia
Equipment leaks	Possible impurity; < 1% HAP	Not subject; HAP content is < 5% by wt.
Process wastewater	NA	None generated.
Maintenance wastewater	Impurity Only; Maximum of 1,500 ppmw	Subject to the MACT as Group 2 wastewater.

Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	start up, shut down and malfunction (See Section VII. A.1. Multiple Emission Sources)	15 A NCAC 2D .1111 40 CFR 63, Subpart A
HAP	Maintenance Wastewater Requirements-40 CFR 63.105 (See Section VII. A.3. Multiple Emission Sources)	15A NCAC 2D.1111 40 CFR 63, Subpart F
odor	Odor Control (See Section VII. B.3. Multiple Emission Sources)	15A NCAC 2D.1806
TAP	Toxic Air Pollutants (See Section VII. B.4. Multiple Emission Sources)	15A NCAC 2 D.1100

The MON MACT requires maintenance wastewater to satisfy the requirements of 40 CFR § 63.105 (Subpart F) which calls for Hexion to prepare a description of maintenance procedures for management of wastewater generated from the emptying and purging of equipment during temporary shutdowns for inspections, maintenance and repair and during routine maintenance which does not require shutdown. Hexion has incorporated these procedures into their startup, shutdown, and malfunction plan required under §63.6(e)(3) (Subpart A). Compliance is expected.

VII. Multiple Emission Source Limits

A. Affected Facilities Pursuant to 40 CFR 63, Subparts F, G, H, OOO/UU/SS, and FFFF

The above emission sources are subject to these limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	Startup, Shutdown, Malfunction	15A NCAC 2D .1111 (40 CFR 63, Subpart A)
HAPs	Leak Inspection for vapor collection and closed vent systems-40 CFR 63.148 and 40 CFR 63.983/Subpart SS	15A NCAC 2D .1111 40 CFR 63, Subpart G, OOO/SS
HAP	Maintenance Wastewater Requirements-40 CFR 63.105	15A NCAC 2D.1111 40 CFR 63, Subpart F

1. 40 CFR 63.6(e)(3): Start up, Shut Down and Malfunction Plan

All MACT affected facilities are required to maintain a Start up, Shut down, and Malfunction Plan to ensure they are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation). This plan addresses monitoring equipment as well as process and control equipment and may be revised by the facility or at the request of the DAQ should it be determined that it does not adequately address all SSM issues relating to the affected equipment. Hexion submits semi-annual periodic reports that procedures of the plan are consistently followed. In the event that the plan is not followed, Hexion must submit immediate reports.

2. 15A NCAC 2D .1111 [40 CFR 63.148 and 40 CFR 63.983]: Leak Inspection for Vapor Collection and Closed Vent Systems

As may be required by the specific permit provision, this provision requires the Permittee to ensure that the emissions collection system and associated ducting/piping are not allowing emissions to unintentionally bypass the control device. Ducting requires an initial and annual leak inspections using instrumentation. Hard piping requires only initial inspection. Recordkeeping and semiannual reporting is required for all inspections, any leaks detected, and any leak repair (or why a leak was not repaired).

3. 15A NCAC 2D .1111 [40 CFR 63.105]: Maintenance Wastewater Requirements

This is a general requirement for all MACT affected facilities that the Permittee develop a plan to handle waste water generated from the emptying and purging of equipment in the process during temporary shutdowns for inspections, maintenance, and repair (i.e., a maintenance-turnaround) and during periods which are not shutdowns (i.e., routine maintenance). The plan is an additional part of the SSM plan and follows the recordkeeping and reporting requirements of the SSM plan.

B. Facility Wide

The above emission sources are subject to these limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC PSD AVOIDANCE	VOC emissions shall not exceed 100 tons per consecutive 12-month period, rolling monthly total.	15A NCAC 2Q .0317
VOC	Work Practice Standards for Sources of VOC	15A NCAC 2D .0958
odor	State Enforceable Only The Permittee shall prevent odorous emissions	15A NCAC 2D .1806
TAPS	State Enforceable Only Facility wide TAP limits for AAL compliance [Completion of last MACT modeling requirements pursuant to 15A NCAC 2Q .0705]	15A NCAC 2D .1100

1. 15A NCAC 2Q .0317: PSD AVOIDANCE CONDITION for MAJOR SOURCE CLASSIFICATION

To remain a PSD minor source, Hexion has requested and received a PSD avoidance limit for facility wide VOC emissions. This avoidance condition restricts facility wide VOC emissions to no more than 100 tons per consecutive 12 month period, rolling total calculated monthly. The avoidance condition allows the Permittee to either limit actual VOC emissions from the resin reactors and formaldehyde plants to 49 tons per year and assume potential emissions from all other sources are 51 tons per year or calculate actual emissions from some or all of the other sources. Calculations of VOC emissions from the facility are performed on a monthly basis. Recordkeeping includes the raw data used to develop the monthly emissions as well as documentation of the procedure used for that month. Hexion semi annually reports the monthly VOC emissions for each of the previous 17 months as well as the six rolling VOC emissions totals calculated for each of the months during the 6 month period.

2. 15A NCAC 2D .0958: WORK PRACTICES FOR SOURCES OF VOLATILE ORGANIC COMPOUNDS

This permit requirement applies facility wide and provides housekeeping and work practice standards to prevent fugitive emissions of VOC to the atmosphere. Hexion performs monthly inspections to ensure the work practice and housekeeping standards are being implemented. Records of inspections are maintained and deviations are reported semiannually.

3. 15A NCAC 2D .1806: CONTROL AND PROHIBITION OF ODOROUS EMISSIONS

This "state enforceable only" permit requirement applies facility wide and prohibits the Permittee from operating the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary. This provision has no recordkeeping or reporting requirement and is complaint based. It is not likely that any complaints will be received from this facility as a rendering plant is located next door.

4. TOXIC AIR POLLUTANT EMISSIONS LIMITATION AND REPORTING REQUIREMENT

Pursuant to 15A NCAC 2D .1100, the approved (December 7, 2006) application for an air toxic compliance demonstration in accordance with 15A NCAC 2Q .0705, and the approved Application No.2600009.08A for resin process modifications, modeled emission limits have been established for Hexion as shown in the following table.

Emission Point: Associated Emission Sources	Toxic Air Pollutants	Emission Limits
Resin Scrubber Stack (CD200A/B): three urea formaldehyde concentrate and hydrolyzed re-work resin UFC storage tanks (MOSTORE 1A, MOSTORE 1B, MOSTORE 1C); three formaldehyde storage tanks (MOSTORE 1D, MOSTORE 1E, MOSTORE 2); urea/formaldehyde No. 2 batch reactor (BR2); distillate receiving tank for batch reactor No. 2 (BR2DRT); weigh tank (12,000 gallons) for batch reactor No. 2 (FWTBR2); urea/formaldehyde No. 3 batch reactor (BR3); distillate receiving tank for No. 3 batch reactor (BR3DRT); liquid ring vacuum seal water tank for batch reactors No. 2 and No. 3 vacuum systems (VST2/3); phenol/formaldehyde No. 4 batch reactor (BR4); liquid ring vacuum seal water tank for No. 4 batch reactor vacuum system (VST4); distillate receiving tank for No. 4 batch reactor (BR4DRT); railcar urea formaldehyde concentrate product load out (two arms, RLOAD3); and tank truck urea formaldehyde concentrate product load out (one arm, TLOAD2A)	formaldehyde phenol	0.85 lb/hr 0.01 lb/hr
Hexamine Scrubber Stack (CDSC2): hexamethylenetetramine reactor (HRE)	ammonia formaldehyde	0.27 lb/hr 0.215 lb/hr
Formaldehyde Production Fugitive Emissions (FORMEQLK)	formaldehyde	0.22 lb/hr
Resin Production Fugitive Emissions (BREQLK)	phenol	0.1 lb/hr
Methanol Distillate Tank (ES105)	formaldehyde	0.00494 lb/hr
Formaldehyde Plants No. 1 and No. 2 (FORM12)	formaldehyde	0.0911 lb/hr
Formaldehyde Plant No. 3 (FORM3)	formaldehyde	0.049 lb/hr
Formaldehyde Plant No. 4 (ES16) and Plant 4 dilute tank (IDTS)	formaldehyde	0.500 lb/hr
hexamine distillate tank (ESDS)	ammonia formaldehyde	0.0018 lb/hr 0.00183 lb/hr
tank truck phenol/formaldehyde resin load out (TLOAD1B or TLOAD2B) and tank truck urea formaldehyde resin load out (TLOAD2B or TLOAD1B)	formaldehyde phenol formaldehyde	0.29 lb/hr 1.42 lb/hr 0.063 lb/hr

Emission Point: Associated Emission Sources	Toxic Air Pollutants	Emission Limits
tank truck urea formaldehyde resin and wax product load out (TLOAD3B)	formaldehyde	0.158 lb/hr
tank truck phenol formaldehyde resin load out, and receiving for caustic, temulose, beet molasses, and phenol (TLOAD4)	formaldehyde phenol	0.165 lb/hr 0.809 lb/hr
tank truck urea formaldehyde resin and phenol formaldehyde resin load out, and receiving for aqueous ammonia (TLOAD5)	formaldehyde phenol	0.165 lb/hr 0.809lb/hr
tank truck urea formaldehyde resin load out (TLOAD6)	formaldehyde	0.048 lb/hr
phenol tank (PT1)	phenol	0.242 lb/hr
phenol tank (PT2)	phenol	0.242 lb/hr
hexamine concentrate tank (ESCT1)	ammonia	0.0041 lb/hr
hexamine concentrate tank (ESCT2)	ammonia	0.0041 lb/hr
hexamine recycle water tank (ESOT1)	ammonia	0.0041 lb/hr
hexamine recycle water tank (ESOT2)	ammonia	0.0041 lb/hr
hexamine recycle water tank (ESOT3)	ammonia	0.0041 lb/hr
wax plant (IWAX)	ammonia	0.0204 lb/hr
Resin/resin washwater tank farm (RTF1 through RFT40)	formaldehyde phenol	0.109 lb/hr 0.21 lb/hr
resin RTU mix tank with filter (ES103)	formaldehyde phenol	0.010 lb/hr 0.100 lb/hr
waste water treatment plant (WWTP)	ammonia formaldehyde phenol	4.70 lb/hr 0.0274 lb/hr 0.00282 lb/hr
anhydrous ammonia leaks	ammonia	1.13 lb/hr
aqueous ammonia leaks	ammonia	0.527 lb/hr

The wastewater treatment plant emission limits in the current permit for ammonia, formaldehyde, and phenol have incorrect units. The limits were modeled with units of lb/hr/ft² but shown in the permit as units of lbs/hr. For the renewal, the emission limits have been converted to lbs/hr by multiplying the limit by the surface area of the wastewater basins 1 and 2.

The Plant No. 4 dilute tank (IDTS) emission limit has also been revised. This tank exhausts to the front end of the formaldehyde processes and not the atmosphere during normal operation. The tank only vents to the atmosphere during Plant No. 4 shutdown, at which time it may be filled with formaldehyde from the process. When this occurs, formaldehyde emissions from the tank exceed the 0.0015 lbs/hr limit in the current permit. However, at the same time this tank is emitting formaldehyde, formaldehyde emissions from Plant No. 4 are near zero and thus the formaldehyde concentration in the air remains at an acceptable ambient level. For the renewal, this tank is placed under the Plant No. 4 formaldehyde limit to ensure compliance with all toxics limits. Because the tank is located near the Plant No. 4 exhaust, no additional modeling is required to implement this change.

VIII. NSPS, NESHAPS/MACT, PSD, 112(r), Facility Wide Toxics, and CAM

NSPS – The facility is currently subject to New Source Performance Standards (NSPS). Plant No. 4 is currently subject to Subpart III for VOC emissions from the synthetic organic chemical manufacturing industry (SOCMI) air oxidation unit processes and Subpart VV for VOC leaks from SOCMI. Process vents subject to Subpart III are required to comply ONLY with the provisions in the HON according to 40 CFR 63.110(d)(1). Likewise, equipment

subject to Subpart VV are required to comply ONLY with the HON provisions in 40 CFR 63.160(c)(1). The facility is currently complying with the HON provisions and is expected to continue to fulfill these requirements following the Plant No. 4 upgrade. Subpart Dc may apply depending upon the construction date of the leased temporary boiler (ID No. TB1). Compliance is anticipated.

NESHAPS/MACT - Plant Nos. 1, 2, 3, and 4 are subject to the HON MACT (Subparts F, G, and H) as an existing source. Process vents (ID Nos. CVS1 and CVS2) are classified as Group 1 process vents and are subject to 98% control by weight or an emission limit of 20 ppm by volume, whichever is least stringent. Associated storage tanks and loading racks are regulated under the Group 2 requirements. Resin and wax production are also existing sources subject to MACT requirements. The Amino/Phenolic Resin MACT (Subpart OOO) requires Hexion to reduce HAP emissions from closed resin process vent (ID No. CVS3) by 83% and from non-reactor resin process vent stream (ID No. NRBPV1) by 62% or an emission limit of 50 ppm by volume, whichever is least stringent. Resin production must also comply with the applicable requirements of 40 CFR 63, Subpart SS for closed vent systems and of 40 CFR 63, Subpart UU for leak detection and repair. The wax emulsion plant is subject to the MON MACT (Subpart FFFF) but for maintenance wastewater only. Hexion has several transfer operations within the facility that are subject to initial notification only under the Organic Liquids Distribution MACT (Subpart EEEE). Lastly, two fire pumps and one emergency generator are subject to the Stationary Reciprocating Internal Combustion Engines (RICE) MACT (Subpart ZZZZ). However, as existing sources, they are not required to meet the requirements of Subpart ZZZZ or A.

PSD – Hexion is located in Cumberland County, which is a designated attainment area for all criteria pollutants except for ozone. While Cumberland County is a designated non-attainment area for ozone, the county is in an ozone Early Action Compact (EAC) area; therefore Non-Attainment Area New Source Review (NAA NSR) review does not apply. Hexion has chosen to limit facility wide emissions of VOCs and SO₂ to no more than 100 tons per year to remain a PSD minor facility.

112(r) – The facility is subject to Section 112(r) of the Clean Air Act requirements because it stores formaldehyde and ammonia in quantities above the thresholds in the Rule. The facility is also subject to OSHA's Process Safety Management Standard for both of these chemicals. Hexion has four 112(r) processes including:

1. Formaldehyde Plants (formaldehyde, EPA Program 3)
2. Urea-Formaldehyde Resin Manufacturing (formaldehyde, EPA Program 3)
3. Phenol-Formaldehyde Resin Manufacturing (formaldehyde, EPA Program 3)
4. Hexamine Plant³ (ammonia, EPA Program 3)

All four processes have off-site receptors for the worst-case accident scenario and are classified as "Program 3" processes. The permit renewal does not affect this status. Hexion's risk management plan was initially submitted to the EPA on June 18, 1999. Hexion is a member of the Cumberland County local emergency planning committee.

Facility Wide Air Toxics – The facility is subject to facility-wide air toxics limitations under 2D .1100. See Section VII.

CAM – Compliance Assurance Monitoring (CAM) (40 CFR Part 64) applies to all controlled emissions sources that are subject to an emission limit or standard, other than those exempted under 2D .0614(b)(1), with pre-controlled emissions of at least one regulated pollutant equal to or greater than 100 tons per year. Each emission source/area has been evaluated to assess CAM applicability. Hexion is exempt from CAM because the only source with potential emissions greater than 100 tons per year [Formaldehyde Plant No. 4; ES-16] is subject to a MACT proposed after November 15, 1990.

³ No formaldehyde is stored at the Hexamine Plant and therefore, 112(r) is only applicable for ammonia at this source.

IX. Facility Emissions Review

The following is an emission summary for the facility.

AIR POLLUTANT	POTENTIAL EMISSIONS (tons per year)	2008 ACTUAL EMISSION (tons per year)
PM	27.8	2.4
PM ₁₀	25.0	1.7
PM _{2.5}	24.2	1.5
SO ₂	<100	1.1
NO _x	81.4	9.3
CO	57.8	37.2
VOC	<100	20.2
HAPs	> 25 > 10	13.4 (6.6 largest individual HAP)

X. Review of Permit Changes Recommended by Facility and Region

The FRO was provided the initial draft permit to review on November 17, 2009 and revised drafts on December 2, 2009 and January 13, 2010. Mr. Tien Nguyen, FRO, recommends permit issuance.

Ms. Michelle West, Hexion, Safety & Environmental Manager, was provided the initial draft permit to review on November 17, 2009 and revised drafts on December 2, 2009 and January 13, 2009. In response to Ms. West comments, the description of insignificant activity IRCHT4 has been changed from loading to unloading, the description of tank RTF9 have been revised to include resin wash water, and the recordkeeping and reporting requirements for the maximum hourly toxic air pollutant rates have been removed.

XI. Public Notice/EPA and Affected State(s) Review

Public notice will be provided consistent with the requirements of 15A NCAC 2Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also pursuant to 2Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 2Q .0521 above.

XII. Conclusions, Comments, and Recommendations

Recommend Permit Issuance.