

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

**Air Permit Review**

**Region:** Raleigh Regional Office  
**County:** Halifax  
**NC Facility ID:** 4200007  
**Inspector's Name:** Will Wike  
**Date of Last Inspection:** 03/24/2010  
**Compliance Code:** 3 / Compliance - inspection

**Permit Issue Date:**

<b>Facility Data</b>			<b>Permit Applicability (this application only)</b>
<b>Applicant (Facility's Name):</b> KapStone Kraft Paper Corporation  <b>Facility Address:</b> KapStone Kraft Paper Corporation 100 Gaston Road Roanoke Rapids, NC 27870  <b>SIC:</b> 2621 / Paper Mills Exc Building Paper <b>NAICS:</b> 322121 / Paper (except Newsprint) Mills  <b>Facility Classification: Before:</b> Title V <b>After:</b> Title V <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V			<b>SIP:</b> <b>NSPS:</b> <b>NESHAP:</b> 1109 Case-by-Case MACT <b>PSD:</b> <b>PSD Avoidance:</b> <b>NC Toxics:</b> <b>112(r):</b> <b>Other:</b>
<b>Contact Data</b>			<b>Application Data</b>
<b>Facility Contact</b>	<b>Authorized Contact</b>	<b>Technical Contact</b>	<b>Application Number:</b> 4200007.09D <b>Date Received:</b> 09/11/2009 <b>Application Type:</b> 112(j) Part I <b>Application Schedule:</b> TV-Significant <b>Existing Permit Data</b> <b>Existing Permit Number:</b> 01649/T47 <b>Existing Permit Issue Date:</b> 08/10/2010 <b>Existing Permit Expiration Date:</b> 03/31/2012
Mike Knudson Senior Environmental Engineer (252) 533-6280 100 Gaston Road Roanoke Rapids, NC 27870	Anitra Collins Mill Manager (252) 533-6213 100 Gaston Road Roanoke Rapids, NC 27870	Mike Knudson Senior Environmental Engineer (252) 533-6280 100 Gaston Road Roanoke Rapids, NC 27870	
<b>Review Engineer:</b> Jenny Kelvington  <b>Review Engineer's Signature:</b> _____ <b>Date:</b> _____		<b>Comments / Recommendations:</b>	
		<b>Issue</b> 01649/T48 <b>Permit Issue Date:</b> <b>Permit Expiration Date:</b>	

**I. Purpose of Application No. 4200007.09B**

KapStone Kraft Paper Corporation (KapStone) is an integrated unbleached Kraft pulp and paper mill located in Roanoke Rapids, Halifax County, North Carolina. Application No. 4200007.09D, received September 11, 2009, is a Part 2 MACT "Hammer" application for seven existing boilers, as listed below:

- **No. 1 Power Boiler:** Coal/biomass (bark and sawdust)/ No. 6 fuel oil/No. 4 equivalent fuel oil-fired boiler (ID No. ES-11-CU-001; 550 million Btu per hour nominal heat input rate) equipped with two parallel venturi scrubbers (ID Nos. 11-CD-001-001 and 11-CD-001-002)
- **No. 2 Package Boiler:** No. 2/ No. 6 fuel oil-fired boiler (ID No. ES-11-CU-033; 185 million Btu per hour nominal heat input)
- **No. 3 Package Boiler:** No. 3 Package Boiler - No. 2/ No. 6 fuel oil-fired boiler (ID No. ES-11-CU-034; 185 million Btu per hour nominal heat input)
- **No. 1 Temporary Boiler:** No. 2 fuel oil-fired temporary boiler (ID No. ES-11-CU-044; 96 million Btu per hour maximum heat input)
- **No. 2 Temporary Boiler:** No. 2 fuel oil-fired temporary boiler (ID No. ES-11-CU-045; 96 million Btu per hour maximum heat input)
- **No. 3 Temporary Boiler:** No. 2 fuel oil-fired temporary boiler (ID No. ES-11-CU-046; 96 million Btu per hour maximum heat input)

- **No. 4 Temporary Boiler:** No. 2 fuel oil-fired temporary boiler (ID No. ES-11-CU-047; 96 million Btu per hour maximum heat input)

This permit (No01649T48) has been updated to include the CAA § 112(j) provisions for the affected boilers.

## II. Permit Modifications/Changes

The following table describes the modifications to the current permit.

Pages	Sections	Description of Changes
Cover	-	Amend permit revision numbers and all dates
All	Page Headers	Amend permit revision number
7	List of Affected Sources	Add Case-By-Case MACT designation to affected boilers ( <b>ID Nos. ES-11-CU-001, ES-11-CU-033, and ES-11-CU-034</b> ).
26	2.1.I.1.c to e	Remove specific monitoring/recordkeeping/reporting conditions under 15A NCAC 2D .0503 and replace with reference to Specific Conditions 2.1.I.8.v, z, bb, and ff.ii.
26-27	2.1.I.2.d; 3.c.; and 5.c.	Change the monitoring/recordkeeping/reporting reference to Specific Conditions 2.1.I.8.v, z, bb, and ff.ii.
29-36	2.1.I.8	Add 15A NCAC 2D .1109: Case-by-Case MACT requirements for power boiler ( <b>ID Nos. ES-11-CU-001</b> )
41-43	2.1.K.4	Add 15A NCAC 2D .1109: Case-by-Case MACT requirements for package boilers ( <b>ID Nos. ES-11-CU-033, and ES-11-CU-034</b> ).
46	2.1.L.4	Add 15A NCAC 2Q .0317 avoidance condition for the Case-by-Case MACT for temporary boilers ( <b>ID Nos. ES-11-CU-044, ES-11-CU-045, ES-11-CU-046, and ES-11-CU-047</b> ).

## III. Regulatory Review – 15A NCAC 2D .1109 –Case-by-Case MACT

- A. **Generally:** On July 20, 2007, the D.C. Circuit Court vacated the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, which had been promulgated under 40 CFR 63, Subpart DDDDD. The North Carolina Attorney General’s office has determined that the NESHAP vacatur equates to the failure of the U.S. EPA to promulgate a standard as required under Section 112(d) of the Clean Air Act (CAA). As a result, the site-specific Maximum Achievable Control Technology (MACT) standards required under CAA §112(j), commonly referred to as the MACT “hammer” provisions, have been triggered. North Carolina regulations implementing the MACT hammer are found at 15A NCAC 2D .1109.

On August 10, 2009, the NC DAQ received a Part 2 MACT “Hammer” application from this facility asking that the NC DAQ establish 112(j) emissions limitations.

NC DAQ has developed this guidance to provide standards and compliance procedures that it has determined meet the requirements of § 112(j) (<http://daq.state.nc.us/permits/112j/>). The initial compliance date for the emission standards, operating requirements, and associated monitoring, recordkeeping, and reporting requirements is [THREE YEARS FROM THE PERMIT ISSUANCE DATE].

1. **No. 1 Power Boiler;** Coal/biomass (bark and sawdust)/ No. 6 fuel oil/No. 4 equivalent fuel oil-fired boiler (ID No. ES-11-CU-001; 550 million Btu per hour nominal heat input rate) equipped with two parallel venturi scrubbers (ID Nos. 11-CD-001-001 and 11-CD-001-002)

The No. 1 power boiler produces steam for energy generation and provides heat for the pulping and paper making process. The boiler also serves as a control device for pulp mill non-condensable gases and stripper off-gases (not considered fuels). Coal is the primary fuel type making up more than half of the heat input.

To limit the amount of hazardous air pollutants released from boilers, NC DAQ has included emission limits for particulate matter, mercury, hydrogen chloride, and carbon monoxide based upon the type of fuel fired. NC DAQ

allows facilities to choose to comply with the Total Selected Metals (TSM) standard *in lieu* of the particulate matter (PM) standard and to opt to use a Health-Based Compliance Alternative (HBCA) instead of complying with emission limits. The applicable NC DAQ emission limits for the No. 1 power boiler are listed in the table below:

Fuel Fired	Heat Input Capacity in MMBtu/hr [C]	Pollutant	Emission Limitation
Dry Wood ( <i>&lt;20% Moisture Content</i> )	$30 \leq C$	Particulate Matter (filterable), or Total Selected Metals	0.39 lb/MMBtu or 0.0005 lb/MMBtu
		Mercury	0.000005 lb/MMBtu
		Hydrogen Chloride	0.02 lb/MMBtu
		Carbon Monoxide	555 ppmvd, 7% O <sub>2</sub>
Green Wood ( <i>≥20% Moisture Content</i> )	$100 \leq C$	Particulate Matter (filterable), or Total Selected Metals	0.18 lb/MMBtu or 0.0003 lb/MMBtu
		Mercury	0.000005 lb/MMBtu
		Hydrogen Chloride	0.02 lb/MMBtu
		Carbon Monoxide	589 ppmvd, 7% O <sub>2</sub>
Coal	$100 \leq C$	Particulate Matter (filterable), or Total Selected Metals	0.08 lb/MMBtu or 0.0004 lb/MMBtu
		Mercury	0.000003 lb/MMBtu
		Hydrogen Chloride	0.05 lb/MMBtu
		Carbon Monoxide	133 ppmvd, 7% O <sub>2</sub>
Residual Fuel Oil (Nos. 4, 5, and 6)	All Capacities	Particulate Matter (filterable), or Total Selected Metals	0.45 lb/MMBtu or 0.002 lb/MMBtu
		Mercury	0.00002 lb/MMBtu
		Carbon Monoxide	28 ppmvd, 7% O <sub>2</sub>

a. Coal/wood fuel firing

Testing conducted August 31, 2006 on the No. 1 power boiler (east and west stacks) while firing the maximum sawdust fuel feed rate with some coal shows that the boiler emits an average of 0.000467 lbs TSM/MMBtu, 0.000356 lb TSM (minus Mn)/MMBtu, and 0.121 lb filterable PM/MMBtu. Carbon monoxide (CO), hydrogen chloride (HCl), and mercury (Hg) emissions were not analyzed during this test.

KapStone has proposed to comply with the above DAQ emission limits for CO and TSM (arsenic and chromium VI only) and the HBCA for HCl, Hg, and the remaining selected metals including beryllium (Be), cadmium (Cd), lead (Pb), manganese (Mn), nickel (Ni), and selenium (Se) by demonstrating that the modeled annual impacts from emissions of these compounds result in a hazard index of less than 1.0 from all applicable boilers and process heaters including the No. 1 power boiler and the No. 2 and No. 3 package boilers. KapStone conducted an Air Toxics Risk Assessment to determine if the facility qualifies for the HBCA. The assessment consisted of a dispersion modeling analysis (following the guidance contained in Guideline on Air Quality Models (USEPA 2005) and the Guidelines for Evaluation the Air Quality Impacts of Toxic Air Pollutants in North Carolina (NCDAQ 2009), and Hazard Quotient (HQ)/ Hazard Index (HI) calculations for beryllium, cadmium, hydrochloric acid (HCl), lead, manganese, mercury, nickel, and selenium. The HBCA eligibility demonstration is consistent with the procedures provided by the EPA in the proposed § 112(d) standard for boilers and process heaters. The facility conducted fuel analysis for coal and biomass following their site-specific fuel analysis plan, which was approved by NC DAQ SSCB on May 12, 2006, and used NCASI data for No. 6 fuel oil to determine the fuel mixture that would yield the highest average emissions of hazardous air pollutants (HAPs). For the fuel analysis, they assumed that the chloride content of the fuel is emitted as HCl and not chlorine based on stack testing performed on similar boilers firing a mixture of biomass and coal at the Domtar facility located in Plymouth, North Carolina. For No. 1 power boiler, KapStone found burning coal results in the highest emissions of HCl and Hg at 0.01 lb/MMBtu and 8.98E-6 lb/MMBtu, respectively and burning wood results in the highest TSM at 0.0108 lb/MMBtu. For the No. 2 and No. 3 Power Boilers, No. 6 fuel oil is considered the worst-case fuel and according to NCASI data, is expected to emit HCl, Hg, and TSM at 4.75E-3 lb/MMBtu, 7.88E-7 lb/MMBtu, and 1.23E04 lb/MMBtu, respectively. The expected emission rates for each fuel are listed in the table below.

Fuel	Emission Factor (Pounds Per Million Btu)									
	As	Be	Cd	Cr VI	HCl	Pb	Hg	Mn	Ni	Se
Wood/Coal	5.88-05 <sup>1</sup>	1.21-06 <sup>1</sup>	2.66-06 <sup>1</sup>	1.39-04 <sup>1</sup>	0.015 <sup>2</sup>	1.35-05 <sup>1</sup>	1.21-05 <sup>2</sup>	1.11-04 <sup>1</sup>	1.31004 <sup>1</sup>	1.00-05 <sup>1</sup>
No. 6 Oil - NCASI	0	0	0	2.49-05	8.92-04	1.33-05	7.89-08	1.52-05	6.97-05	0
No. 6 Oil - AP-42	8.71-05	1.83-08	2.63-06	5.58-06	NA	9.97-06	7.44-07	1.98-05	5.58-04	4.51-06

1. Based on average of 3 runs on each stack from the 8/31/06 No. 1 Power Boiler Stack Test
2. Based on 90<sup>th</sup> percentile for the fuel analysis data.

The maximum hourly emission rates from the three boilers based on firing wood/coal in No. 1 power boiler and No. 6 fuel oil in the No. 2 and No. 3 package boilers based on the stack testing, fuel analysis, and NCASI and AP-2 emission factors for No. 6 fuel oil are listed in the table below:

Boiler No.	As (lb/hr)	Be (lb/hr)	Cd (lb/hr)	Cr VI (lb/hr)	HCl (lb/hr)	Pb (lb/hr)	Hg (lb/hr)	Mn (lb/hr)	Ni (lb/hr)	Se (lb/hr)
1 Wood/Coal	3.23-02*	<b>6.66-04</b>	<b>1.46-03</b>	<b>7.65-02</b>	<b>8.45</b>	<b>7.43-03</b>	<b>6.66-03</b>	<b>6.11-02</b>	<b>7.21-02</b>	<b>5.50-03</b>
2 & 3 each NCASI	0	0	0	<b>4.60-03</b>	<b>1.65-01</b>	<b>2.43-03</b>	1.46-05	2.82-03	1.29-02	0
2 & 3 each AP-42	<b>1.61-02</b>	<b>3.39-06</b>	<b>4.87-04</b>	1.03-03	NA	1.84-03	<b>1.38-04</b>	<b>3.66-03</b>	<b>1.03-01</b>	<b>8.34-04</b>

\*Based on AP-42 emission factors for No. 6 fuel oil, arsenic emissions from the No. 1 Power Boiler are 0.0479 lb/hr when No. 6 fuel oil is fired.

The initial site-specific risk analysis included a dispersion modeling analysis and Hazard Quotient (HQ)/Hazard Index (HI) calculations for Be, Cd, HCl, Hg, Pb, Mn, Ni, and Se using the above maximum hourly emission rates based on stack testing, fuel analysis, and NCASI data. Mr. Mark Yoder, Meteorologist, NC Air Quality Analysis Branch, reviewed the modeling and calculations and found they demonstrate the facility's long-term carcinogenic and non-carcinogenic inhalation risk are both less than 1.0 at 0.08 and 0.05, respectively. The risk to the public due to the long-term inhalation of air emissions from the power boiler and two package boilers is well below the low risk thresholds established by the rule for long-term exposure. Therefore, the facility qualifies for HCl, Hg, and TSM [beryllium, cadmium, lead, manganese, nickel, and selenium] HBCA based on the "low risk" determination assuming the emission factors used for compliance demonstration are relevant to their specific boilers. The selected metals that pose low risk can be excluded from the TSM calculations.

In November, 2010, KapStone revised the HBCA risk assessment to demonstrate low risk at higher HAP emission rates. With the exception of Be, Cd, and Se emission from the No. 3 Package Boiler, all modeled emission rates were all higher than the expected maximum emission rates. The second site-specific risk analysis was performed at the following higher emission rates:

Boiler No.	Be (lb/hr)	Cd (lb/hr)	HCl (lb/hr)	Pb (lb/hr)	Hg (lb/hr)	Mn (lb/hr)	Ni (lb/hr)	Se (lb/hr)
1	9.98-03	1.46-02	4.22+02	5.57-01	6.66-02	3.05-01	1.44	5.5
2	5.55-04	4.91-04	8.26	1.82-01	1.46-05	1.41-02	2.59-01	8.42-04
3	0	0	8.26	1.82-01	1.46-05	1.41-02	2.59-01	0

Mr. Jerry Freeman, Meteorologist, NC Air Quality Analysis Branch, reviewed the modeling and calculations and found they demonstrate the facility's long-term carcinogenic and non-carcinogenic inhalation risk are both less than 1.0 at 0.94 and 0.97 respectively. The risk to the public due to the long-term inhalation of air emissions from the power boiler and two package boilers remained below the low risk thresholds established by the rule for long-term exposure. Therefore, the facility qualifies for HCl, Hg, and TSM [beryllium, cadmium, lead, manganese, nickel, and selenium] HBCA based on the "low risk" determination. The selected metals that pose low risk can be excluded from the TSM calculations. Compliance with the TSM emission limit will be based on the sum of arsenic and

chromium VI emissions for Nos. 1 and 2 boilers and the sum of arsenic, chromium IV, beryllium, cadmium, and selenium (rather than establishing modeled rates for beryllium, cadmium, and selenium from this boiler, which is currently out of service). Should Kapstone decide to re-establish the operation of the No. 3 boiler, they shall demonstrate compliance with the TSM limitation (As, Be, Cd, Cr VI, and Se) within six months of the firing of No. 6 fuel oil in the boiler.

KapStone has opted to comply with the carbon monoxide (CO) emission limitations recommended by the NC DAQ in the application guidance (See <http://daq.state.nc.us/permits/112j/>) for coal-fired boilers and residual fuel oil-fired boilers and the revised NC DAQ recommended 112(j) CO limit for green and dry wood fired boilers. The presumptive NC DAQ 30-day rolling average limit for wood-fired boilers is 555 ppmv CO @ 7% oxygen based on AP-42 Chapter 1.6; Table 1.6-2; Sept. 2003. The NCDAQ requests comment on the CO emission limit. All relevant and comments will be reviewed prior to the issuance of the final 112(g) determination for this facility. The draft permit contains the following limits:

Fuel Fired	Emission Limitation
Green Wood ( $\geq 20\%$ Moisture Content)	555 ppmvd, 7% O <sub>2</sub>
Dry Wood ( $< 20\%$ Moisture Content)	555 ppmvd, 7% O <sub>2</sub>
Coal	133 ppmvd, 7% O <sub>2</sub>

The CO emission limitation applies to each fuel that accounts for at least 10% of the heat input to the boiler for each consecutive 12 month period. The proposed permit establishes the CO emission limitation in proportion to the heat input of the particular fuels combusted. The 30 day rolling average emission limit in ppmvd, corrected to 7% O<sub>2</sub> is calculated as follows:

$$E_{CO} = [(30)(DFO) + 28 (RFO) + 555 (HF) + (133)(C) + 28(RFO)] / (DFO + RFO + HF + C)$$

Where:

$E_{CO}$  = allowable CO emission rate in ppmvd, corrected to 7% O<sub>2</sub>;

DFO = heat input of distillate fuel oil;

RFO = heat input of residual fuel oil;

HF = heat input of hog fuel; and

C = heat input of coal.

The Permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) and monitor the heat inputs for each fuel fired to demonstrate compliance with the carbon monoxide limits.

b. No. 6 fuel oil firing:

KapStone proposes the HBCA for demonstrating compliance for Hg, HCl, and beryllium, cadmium, lead, manganese, nickel, and selenium. As noted above, modeling analysis and HQ/HI calculations show a “low risk” to the public from long-term inhalation of air emissions from the power boiler and two package boilers.

CO emissions from the No. 1 power boiler will be limited of 28 ppmvd, corrected to 7% oxygen when No. 6 fuel oil is fired. This is consistent with the NC DAQ application guidance. The Permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) for carbon monoxide.

2. **No. 2 and No. 3 Package Boilers:** No. 2/ No. 6 fuel oil-fired boilers (ID Nos. ES-11-CU-033 and ES-11-CU-034; 185 million Btu per hour nominal heat input each)

The No. 2 and 3 package boilers (**ID Nos. ES-11-CU-033, and ES-11-CU-034**) are permitted to fire distillate and residual fuel oils (Nos. 2 and 6). Emissions are not controlled. KapStone fires predominantly No. 6 fuel oil in these boilers. They operate about 10 percent of the time and typically less than their rated capacity. The applicable NC DAQ emission limits for the No. 2 and No. 3 package boilers are listed in the table below:

Fuel Fired	Heat Input Capacity in MMBtu/hr [C]	Pollutant	Emission Limitation
Residual Fuel Oil (Nos. 4, 5, and 6)	All Capacities	Particulate Matter (filterable), or Total Selected Metals	0.45 lb/MMBtu or 0.002 lb/MMBtu
		Mercury	0.00002 lb/MMBtu
		Carbon Monoxide	28 ppmvd, 7% O <sub>2</sub>
Distillate Fuel Oil (Nos. 1, and 2)	All Capacities	Particulate Matter (filterable), or Total Selected Metals	0.014 lb/MMBtu or 0.00005 lb/MMBtu
		Mercury	0.000003 lb/MMBtu
		Carbon Monoxide	30 ppmvd, 7% O <sub>2</sub>

a. No. 2 fuel oil firing:

No control technologies for the control of CO, metals, Hg, or HCl were identified for No. 2 fuel oil-fired boilers in the state of North Carolina, nor were any such technologies identified in a North Carolina query using U.S. EPA's AirControlNet software (v4.1). The NC DAQ has determined that MACT is the use of best work practice standards for natural gas-fired combustion sources of this size, consistent with the provisions in CAA § 112(d)(2)(D). Best work practice standards in this case shall include the annual inspection and maintenance of the boiler as follows:

To assure compliance, the Permittee shall perform an annual boiler inspection and maintenance as recommended by the manufacturer, or as a minimum, the inspection and maintenance requirement shall include the following:

- i. Inspect the burner, and clean or replace any components of the burner as necessary;
- ii. Inspect the flame pattern and make any adjustments to the burner necessary to optimize the flame pattern; and,
- iii. Inspect the system controlling the air-to-fuel ratio, and ensure that it is correctly calibrated and functioning properly.

The Permittee shall conduct at least one tune-up per calendar year to demonstrate compliance with this requirement. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if the affected boilers are not inspected and maintained as required above.

In addition, the Permittee will be required to record the results of the annual inspection in a logbook (written or electronic format), which shall be retained on-site and made available to an authorized representative upon request.

No initial or subsequent annual testing is required to demonstrate compliance with the emissions standards associated with burning of No. 2 fuel oil in the affected boilers.

b. No. 6 fuel oil firing:

KapStone proposes the HBCA for demonstrating compliance for Hg, HCl, and beryllium, cadmium, lead, manganese, nickel, and selenium for the No. 2 Package Boiler and the HBCA for demonstrating compliance for Hg, HCl, and lead, manganese, and nickel for the No. 3 Package Boiler. As noted above, modeling analysis and HQ/HI calculations show a "low risk" to the public from long-term inhalation of air emissions from the power boiler and two package boilers.

The facility proposed to comply with the TSM [arsenic plus chromium VI for No. 2 boiler and the sum of arsenic, beryllium, cadmium, chromium VI, and selenium for the No. 3 boiler] emission limitation that is consistent with the NC DAQ application guidance (<http://daq.state.nc.us/permits/112j/>) and demonstrate compliance using stack testing or fuel analysis. A site-specific fuel analysis plan was approved by NC DAQ SSCB on May 12, 2006. The compliance demonstration will ONLY be required if No. 6 fuel oil comprises at least 10% of the fuel fired in a package boiler on an annual basis. The initial demonstration shall be required within 180 days of No. 6 fuel oil comprising at least 10% of the fuel fired in a package boiler. Thereafter, a compliance demonstration will be

required between 11 and 13 months after the previous demonstration for each package boiler firing at least 10% No. 6 fuel oil on an annual basis.

KapStone has proposed a CO limit of 28 ppmvd, corrected to 7% oxygen, for the two package boilers firing No. 6 fuel oil which is consistent with the NC DAQ application guidance. Because these boilers run for a limited time and do not typically run at full capacity, KapStone has requested that stack testing to demonstrate compliance with the CO limit be performed within 30 days of operation of No. 2 and No. 3 package boilers at greater than 50 percent of load rather than within 180 day of the initial compliance date.

**3. Nos. 1, 2, 3, and 4 Temporary Boilers;** No. 2 fuel oil-fired temporary boilers (ID Nos. ES-11-CU-044 to ES-11-CU-047; 96 million Btu per hour maximum heat input each)

KapStone has requested that the duration that their four back-up boilers (**ID Nos. ES-11-CU-044 to ES-11-CU-047**) may remain on-site be limited to no greater than 180 days in order to avoid applicability of the Case-by-Case MACT requirements pursuant to 15A NCAC 2D .1109. This is consistent with the EPA's approach in both the vacated Boiler MACT and in the revised Boiler MACT that was proposed in June 2010. EPA has proposed that "temporary boilers"<sup>1</sup> are not affected by the federal Boiler MACT requirements. These four boilers, which have not been in use in the past, are allowed to operate during planned maintenance outages of the permanent boilers.

NC DAQ has determined that the Permittee can avoid applicability of the case-by-case MACT pursuant to 15A NCAC 2D .1109 by accepting an enforceable limitation on the duration that any temporary boiler can remain on-site to no greater than 180 consecutive days. Any temporary boiler that replaces a temporary boiler at a location and is intended to perform the same or similar function will be included in calculating the consecutive time period. The proposed permit includes both a recordkeeping and notification requirements to demonstrate compliance with the standard.

The 15A NCAC 2D .1109 permit requirements for each of the boilers are included in Attachment I of this review.

**IV. Draft Permit Review Summary**

Ms. Katy Forney and Ms. Gracy DeNois (U.S. EPA, Region IV) were provided a draft permit for review on December 2, 2010. *No comments were received at the time of permit issuance.* ??

A 30-day public notice period was initiated on December 2, 2010. *No comments were received at the time or permit issuance.*??

**V. Recommendations**

This permit modification application for the KapStone Kraft Paper Corporation located in Roanoke Rapids, Halifax County, North Carolina has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

**Issue Permit No. 01649T48**

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<sup>1</sup> "Temporary Boilers" means "any gaseous or liquid fuel boiler that is designed to, and is capable of, being carried or moved from one location to another. A temporary boiler that remains at a location for more than 180 consecutive days is no longer considered to be a temporary boiler. Any temporary boiler that replaces a temporary boiler at a location and is intended to perform the same or similar function will be included in calculating the consecutive time period.

**ATTACHMENT I: 15A NCAC 2D .1109 “MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY” REQUIREMENTS ADDED TO PERMIT NO. 01649T48**

**2.1.I No. 1 Power Boiler**

**8. 15A NCAC 2D .1109: CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters**

**Emission Limitations**

- a. Emissions from the No. 1 Power Boiler (**ID No. ES-11-CU-001**) shall not exceed the emissions limits listed below:

<b>Pollutant</b>	<b>Emission Limitations for the No. 1 Power Boiler (30 day rolling average)</b>	<b>Fuel Combusted</b>
Hydrogen chloride equivalent <sup>1</sup>	422 lb/hr	No. 4/6 fuel oil/wood/coal
Mercury (Hg)	0.0666 lb/hr	No. 4/6 fuel oil/wood/coal
Total Selected Metals (TSM) <sup>2</sup> arsenic (As) + chromium VI (Cr <sup>6+</sup> )	0.002 lb/MMBtu	No. 4 and No. 6 fuel oil
	0.0005 lb/MMBtu	Green wood
	0.0003 lb/MMBtu	Dry wood
	0.0004 lb/MMBtu	Coal
Beryllium (Be)	0.00998 lb/hr	No. 4/6 fuel oil/wood/coal
Cadmium (Cd)	0.0146 lb/hr	No. 4/6 fuel oil/wood/coal
Lead (Pb)	0.557 lb/hr	No. 4/6 fuel oil/wood/coal
Manganese (Mn)	0.305 lb/hr	No. 4/6 fuel oil/wood/coal
Nickel (Ni)	1.44 lb/hr	No. 4/6 fuel oil/wood/coal
Selenium (Se)	5.5 lb/hr	No. 4/6 fuel oil/wood/coal
Carbon Monoxide (CO) <sup>2</sup>	28 ppmvd @ 7% O <sub>2</sub>	No. 4 and No. 6 fuel oil
	555 ppmvd @ 7% O <sub>2</sub>	All wood biomass
	133 ppmvd @ 7% O <sub>2</sub>	Coal

1. HCl-equivalent is defined by the following equation:

$$E = E_{HCl} + E_{Cl_2} * (RfC_{HCl} / RfC_{Cl_2})$$

Where:

- E = HCl-equivalent emission rate (in lbs/hr);  
 E<sub>HCl</sub> = Hydrogen chloride emission rate (in lbs/hr);  
 E<sub>Cl<sub>2</sub></sub> = Chlorine emission rate (in lbs/hr);  
 RfC<sub>HCl</sub> = Reference concentration for HCl (20 µg/m<sup>3</sup>); and  
 RfC<sub>Cl<sub>2</sub></sub> = Reference concentration for Cl<sub>2</sub> (0.20 µg/m<sup>3</sup>)

2. The emissions limitation is proportional to the heat input of the particular fuels combusted.

**TSM (arsenic and chromium VI combined)**

$$E_{TSM} = [(0.0005)(GW) + (0.0003)(DW) + 0.0004(C) + 0.002(RFO)] / (GW + DW + C + RFO)$$

Where:

- E<sub>TSM</sub> = TSM emission limitation in pounds per million Btu  
 GW = heat input of green wood in million Btu per hour;  
 DW = heat input of dry wood in million Btu per hour;

C = heat input of coal in million Btu per hour, and  
RFO = heat input of residual No. 4/6 fuel oil in million Btu per hour

Carbon monoxide

$$E_{CO} = [(555)(GW + DW) + (133)(C) + 28(RFO)] / (GW + DW + C + RFO)$$

Where:

$E_{TSM}$  = CO emission limitation in ppmvd, corrected to 7% oxygen

GW = heat input of green wood in million Btus per hour;

DW = heat input of dry wood in million Btu per hour;

C = heat input of coal in million Btu per hour, and

RFO = heat input of residual No. 4/6 fuel oil in million Btu per hour

- c. The emissions limitations for a specific fuel type in Section 2.1. I. 8. a above shall only apply when the Permittee fires at least 10% of that fuel in the No. 1 power boiler on a 12-month rolling average heat input basis. If the Permittee fires less than 10% of a specific fuel in the No. 1 power boiler, the respective emissions limitations and the associated testing, monitoring, and recordkeeping shall not apply. However, the Permittee must retain records of the fuels fired in the boiler in accordance with Section 2.1.I.8.u below.
- d. **The initial compliance date for these emission limitations and the associated testing, monitoring, recordkeeping, and reporting requirements is [3 years from date of permit issuance].** These conditions need not be included on the annual compliance certification until after the initial compliance date.

**Control Device and Continuous Monitoring System Requirements**

- e. The Permittee shall install, operate and maintain control devices and continuous monitoring systems (CMS) for the No. 1 power boiler (**ID No. ES-11-CU-001**) as follows:
  - i. Mercury, selected metals, and hydrogen chloride emissions shall be controlled by the two scrubbers (**ID Nos. 11-CD-001-001 and 11-CD-001-002**).
  - ii. The Permittee shall perform monthly inspections of the scrubbers and perform maintenance as recommended by the manufacturer.
  - iii. The Permittee shall install, operate, and maintain an effluent pH monitor (CMS), a liquid flow meter (CMS) and a gas pressure drop indicator (CMS) on each scrubber.
  - iv. The Permittee shall maintain the 12-hour average pressure drop and liquid flow-rate for each scrubber at or above the operating levels, adjusted for variability, established during the performance test that demonstrated compliance with the applicable emission limits.

**Compliance Demonstration** [15A NCAC 2Q .0508(f)]

- f. The Permittee shall demonstrate compliance with the TSM emission limitations in Section 2.1 I. 8. a above by either of the following methods:
  - i. Stack Testing. Stack testing shall be performed in accordance with 15A NCAC 2D .2601 and General Condition JJ in Section 3 of this permit to determine the emissions. Within 180 days of initial compliance date, the Permittee shall conduct the initial boiler stack test. Thereafter, each stack test shall be conducted between 11 and 13 months after the previous stack test. However, if a stack test shows that the emission rates of hazardous air pollutants are less than or equal to 80 percent of the allowable limits in (**30 day rolling average**), the stack test frequency may be reduced to once every five years for that pollutant.
  - ii. Fuel Analysis. Fuel analysis shall be conducted in accordance with the site specific fuel analysis plan approved May 2006. If all fuel samples show a compound is below the detection limit, emissions of that compound can be considered zero. If some samples show the compound is detected, any non-detect values shall be considered at half the detection limit. Within 180 days of the initial compliance date, the Permittee shall perform the initial fuel analyses. Thereafter, each fuel analysis shall be conducted between 11 and 13 months after the previous analysis. If a fuel analysis shows a potential exceedance of an emission limitation in Sections 2.1.I.8. a above, the Permittee shall conduct a follow-up stack test of the affected source within 90 days.

If stack testing or fuel analysis shows an exceedance of a limit in Section 2.1.I.8.a above, the Permittee shall be deemed in non-compliance with 15A NCAC 2D .1109.

- g. The Permittee shall demonstrate compliance with the carbon monoxide (CO) emission limitations in Section 2.1. I. 8. a above with a continuous emissions monitoring system (CEMS) for measuring the concentrations of CO and O<sub>2</sub> at the same location in the No. 1 power boiler exhaust stack. The Permittee shall begin continuous monitoring of CO on or before **3 years from date of permit issuance**. If the initial 30-day rolling average CO concentration after the initial compliance date or any subsequent 30-day rolling average CO concentration exceeds the applicable emission limitation in Section 2.1. I. 8. a above, the Permittee shall be deemed in non-compliance with 15A NCAC 2D .1109.
- h. The Permittee has demonstrated compliance with the HCl and mercury limitations in Section 2.1. I. 8. a above using fuel analysis and with the beryllium, cadmium, lead, manganese, nickel, and selenium limitations in Section 2.1. I. 8. a above with stack tests performed August 31, 2006. If additional emission testing is required to demonstrate compliance with HCl, mercury, beryllium, cadmium, lead, manganese, nickel, or selenium, the testing shall be performed in accordance General Condition JJ. If the results of this test are above the limit given in Section 2.1 I.8. a. above, the Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109.

**Stack Testing** [15A NCAC 2Q .0508(f)]

- i. Performance tests shall be conducted at the maximum normal operating load while burning the fuel with the highest selected HAP content. The No 1 power boiler shall fire biomass at the maximum normal operating load when total selected metal emissions are determined. Each required performance test shall include three separate test runs as specified in 40 CFR 63.7(e)(3). Each test run must last at least 1 hour. Performance tests may not be conducted during periods of startup, shutdown, or malfunction.
- j. Performance testing shall be in accordance with 15A NCAC 2D .2600 and follow the procedures outlined below:
  - i. The Permittee shall submit a completed Protocol Submittal Form to the DAQ Regional Supervisor at least 45 days prior to the scheduled test date. A copy of the Protocol Submittal Form may be obtained from the Regional Supervisor.
  - ii. The Permittee shall notify the Regional Supervisor of the specific test dates at least 15 days prior to testing in order to afford the DAQ the opportunity to have an observer on-site during the sampling program.
  - iii. During all sampling periods, the Permittee shall operate the emission source(s) under maximum normal operating conditions or alternative operating conditions as deemed appropriate by the Regional Supervisor or his delegate.
  - iv. The Permittee shall submit **two** copies of the test report to the DAQ. The test report shall contain at a minimum the following information:
    - A. a description of the training and air testing experience of the person directing the test;
    - B. a certification of the test results by sampling team leader and facility representative;
    - C. a summary of emissions results and text detailing the objectives of the testing program, the applicable state and federal regulations, and conclusions about the testing and compliance status of the emission source(s);
    - D. a detailed description of the tested emission source(s) and sampling location(s) process flow diagrams, engineering drawings, and sampling location schematics should be included as necessary;
    - E. all field, analytical, and calibration data necessary to verify that the testing was performed as specified in the applicable test methods;
    - F. example calculations for at least one test run using equations in the applicable test methods and all test results including intermediate parameter calculations; and
    - G. documentation of facility operating conditions during all testing periods and an explanation relating these operating conditions to maximum normal operation. If necessary, provide historical process data to verify maximum normal operation.
- k. The performance tests shall be conducted in accordance with the following methods, as applicable:
  - i. Select sampling port locations and traverse points using Method 1 in 40 CFR 60, Appendix A;
  - ii. Determine the velocity and volumetric flow rate of the stack gas using Method 2, 2F, or 2G in 40 CFR 60, Appendix A;
  - iii. Determine oxygen and carbon dioxide concentrations of the stack gas using Method 3A or 3B in 40 CFR 60, Appendix A, or ASME PTC 19, Part 10 (1981) (IBR, see 40 CFR 63.14(i));

- iv. Measure the moisture content of the stack gas using Method 4 in 40 CFR 60, Appendix A;
- v. Measure pollutant emission concentrations, as follows:
  - A. Metals: Use Method 29 in 40 CFR 60, Appendix A or for mercury only, use Method 101A in 40 CFR 61, Appendix B or ASTM Method D6784-02 (IBR, see 40 CFR 63.14(b)); and
  - B. Hydrogen Chloride: Use Method 26 or 26A in 40 CFR 60, Appendix A.
- vi. Convert emission concentration to pound per million British thermal units (lb/MMBtu) emission rates using Method 19 F-factor methodology in 40 CFR 60, Appendix A.
- l. The Permittee shall use the F-Factor methodology and equations in Sections 12.2 and 12.3 of EPA Method 19 of 40 CFR Part 60, Appendix A to convert the measured arsenic and chromium VI concentrations that result from the initial performance test to pounds per million Btu heat input (lb/MMBtu) emission rates using F-factors.
- m. The Permittee shall establish operating parameters for the two scrubbers controlling emissions from the No. 1 power boiler as follows:

Pollutant(s)	Requirements for Performance Test
Selected metals	<ol style="list-style-type: none"> <li>1. Collect pressure drop or liquid flow rate data every 15 minutes during the entire period of the performance test; and,</li> <li>2. Determine the average pressure drop or liquid flow rate for each individual test run in the 3-run performance test by computing the average of all the 15-minute readings taken during each test run.</li> </ol>

The minimum liquid flow rate and pressure drop operating limits shall be the highest 3-run average minimum values established during any of the performance tests.

**Fuel Analyses Procedures**

- n. The fuel analysis shall be conducted in accordance the most recent NC DAQ approved Site Specific Boiler MACT Fuel Sampling Plan, referenced henceforth as the “KapStone Fuel Sampling Plan.” The current KapStone Fuel Sampling Plan was approved by the NC DAQ in May 2006.
- o. The Permittee shall obtain, at a minimum, three composite fuel samples for each solid fuel type according to the following procedures:
  - i. If sampling from a belt (or screw) feeder, stop the belt and withdraw a 6-inch wide sample from the full cross-section of the stopped belt to obtain a minimum two pounds of sample. Collect all the material (fines and coarse) in the full cross-section. Transfer the sample to a clean plastic bag.
  - ii. If sampling from a fuel pile or truck, select a minimum of five sampling locations uniformly spaced over the surface of the pile. At each sampling site, dig into the pile to a depth of 18 inches. Insert a clean flat square shovel into the hole and withdraw a sample, making sure that large pieces do not fall off during sampling. Transfer all samples to a clean plastic bag for further processing.
  - iii. Collect a minimum of three samples at approximately equal intervals during the testing period for each composite sample. Thoroughly mix and pour the entire composite sample over a clean plastic sheet. Break sample pieces larger than 3 inches into smaller sizes. Make a pie shape with the entire composite sample and subdivide it into four equal parts. Separate one of the quarter samples and grind the sample in a mill.
- p. The Permittee shall determine the concentration of pollutants in the fuel (Hg, chloride, and/or selected metals) in units of lbs/MMBtu of each composite sample for each fuel type according to the procedures in following table.

Pollutant(s)	Task	Method
mercury, selected metals and/or HCl	Collect Fuel Samples	<ul style="list-style-type: none"> <li>• Procedures in the KapStone Fuel Sampling Plan and Section 2.1.I.8. m and n above.</li> <li>• ASTM D2234-00, D2234M-03 (for coal)*. or</li> <li>• ASTM D6323-98 (2003) (for biomass)*</li> </ul>

Pollutant(s)	Task	Method
	Prepare Composited Fuel Samples	<ul style="list-style-type: none"> <li>• Procedures in the KapStone Fuel Sampling Plan and Section 2.1.I.8. m and n above.</li> <li>• SW-846-3050B (for solid samples); or</li> <li>• SW-846-3020A (for liquid samples); or</li> <li>• ASTM D2013-01 (for coal); or</li> <li>• ASTM E829-94 (for biomass)</li> </ul>
	Determine Heat Content	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• ASTM D5865-03a (for coal); or</li> <li>• ASTM D5865-03a (for biomass)</li> </ul>
	Determine Moisture Content	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• ASTM D3137-03* or</li> <li>• ASTM E871-82 (1998)*</li> </ul>
Mercury	Measure Hg Concentration in Sample	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• ASTM D6722-01 (for coal)* or</li> <li>• SW-846-7471A (for solid samples); or</li> <li>• SW-846-7470A (for liquid samples).</li> </ul>
	Convert Concentration into lbs/hour	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• Method 19 F-factor methodology in 40 CFR 60, Appendix A</li> </ul>
Selected Metals	Measure Metal Concentrations in Sample	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• SW-846-6010B or ASTM D6357-04 (for arsenic, beryllium, cadmium, chromium, lead, manganese, and nickel for all solid fuels); and,</li> <li>• ASTM D4606-03 (for selenium in coal)* or</li> <li>• ASTM E885-88 (1996) (for biomass)*</li> </ul>
	Convert Concentration into lbs/hour	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• Method 19 F-factor methodology in 40 CFR 60, Appendix A</li> </ul>
HCl	Measure HCl Concentration in Sample	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• SW-846-9250 or ASTM D6721-01 (for coal); or,</li> <li>• SW-846-9076 (for biomass)</li> </ul>
	Convert Concentration into lbs/hour	<ul style="list-style-type: none"> <li>• Procedure in the KapStone Fuel Sampling Plan</li> <li>• Method 19 F-factor methodology in 40 CFR 60, Appendix A</li> </ul>

\*IBR, see 40 CFR 63.14(b)

- q. If the Permittee elects to demonstrate compliance with an applicable emission limit through fuel analysis, the Permittee must meet the following requirements:
- i. The HCl emission rate shall be calculated using the following equation:

$$\text{HCl} = Q_t \times \text{Summation of } [(C_{i90}) (Q_i) (1.028)]$$

Where:

HCl = HCl emission rate from the boiler in lbs/hour.

C<sub>i90</sub> = 90th percentile confidence level concentration of chlorine in fuel type, i, in lbs/MMBtu.

Q<sub>i</sub> = Fraction of total heat input from fuel type, i, based on the fuel mixture that has the highest content of chlorine. If the affected source does not burn multiple fuel types, insert a value of "1" for Q<sub>i</sub>.

i = 1 to the number of different fuel types burned in the affected source for the

mixture that has the highest content of chlorine.

1.028 = Molecular weight ratio of HCl to chlorine.

$Q_T$  = Total Maximum Heat Input of Worst Case Fuels in MMBtu/hr.

- ii. The mercury and other selected metals emission rates shall be calculated using the equation below:

$$M = Q_i \times \text{Summation of } [(M_{i90}) (Q_i)]$$

Where:

M = metal emission rate from the boiler in lbs/hour.

$M_{i90}$  = 90th percentile confidence level concentration of the metal in fuel, i, in lbs/MMBtu.

$Q_i$  = Fraction of total heat input from fuel type, i, based on the fuel mixture that has the highest content of selected metals. If the affected source does not burn multiple fuel types, insert a value of "1" for  $Q_i$ .

i = 1 to the number of different fuel types burned in the affected source for the mixture that has the highest content of the metal.

$Q_T$  = Total Maximum Heat Input of Worst Case Fuels in MMBtu/hr.

- r. If the Permittee uses fuel analysis to demonstrate compliance with the standard, the Permittee must conduct an annual fuel analysis for each type of fuel burned.
- s. The Permittee must report the results of fuel analyses within 60 days after the completion of the analyses. This report should also verify that the operating limits for your affected source have not changed or provide documentation of revised operating parameters.

**Fuel Use and Monitoring Requirements** [15A NCAC 2Q .0508(f)]

- t. Whenever fuel analysis is used to comply with any HAP limit in Section 2.1. I. 8.a above, the Permittee shall:
- i. maintain the fuel type or fuel mixture such that the HAP emission rates are less than the applicable emission limit; and
- ii. maintain records of the type and amount of all fuels burned in each affected source during the reporting period to demonstrate that:
- A. All fuel types and mixtures of fuels burned result in selected metals, HCl, and mercury emission that are lower than the applicable emission limit for each pollutant (if the facility demonstrates compliance using fuel analysis); or,
- B. All fuel types and mixtures of fuels burned result in lower fuel input of selected metals, chlorine, and mercury than the maximum values calculated during the last performance tests (if the facility demonstrates compliance through performance testing).
- u. The Permittee shall create and retain a record of the amounts of each fuel fired in the No. 1 power boiler during the previous calendar month. The monthly fuel combustion records shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if these records are not maintained or if the boiler fires a fuel other than No. 6 fuel oil, No. 4 equivalent fuel oil, coal, or wood.<sup>2</sup>

**Continuous Emissions Monitoring System (CEMS) for Carbon Monoxide**

- v. The Permittee must install, operate, and maintain a continuous emission monitoring system (CEMS) for carbon monoxide (CO) and oxygen (O<sub>2</sub>) according to the procedures listed in i. through viii. below. CO and O<sub>2</sub> shall be monitored at the same location at the outlet of the No. 1 power boiler following the control devices and these measurements shall each be on a consistent basis (wet or dry).
- i. The Permittee must install, operate, and maintain each CEMS according to the applicable procedures under Performance Specification (PS) 3 or 4A of 40 CFR 60, Appendix B.
- ii. The Permittee must conduct a performance evaluation of each CEMS according to the requirements in 40 CFR 63.8 and according to PS 4A of 40 CFR 60, Appendix B.
- iii. Each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

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<sup>2</sup> Non combustible gases (NCG) may also be fired in the No. 1 power boiler.

- iv. The CEMS data must be reduced as specified in 40 CFR 63.8(g)(2).
- v. The Permittee must calculate and record a 30-day rolling average emission rate on a daily basis. A new 30-day rolling average emission rate is calculated as the average of all of the hourly CO emission data for the preceding 30 operating days.
- vi. Except for monitor malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the Permittee must monitor continuously (or collect data at all required intervals) at all times that the affected source is operating.
- vii. For purposes of calculating data averages, the Permittee may not use data recorded during periods of monitoring malfunctions, associated repairs, out-of-control periods, required quality assurance or control activities, or when the boiler or process heater is operating at less than 50 percent of its rated capacity. The Permittee must use all the data collected during all other periods in assessing compliance. Any period for which the monitoring system is out-of-control and data are not available for required calculations constitutes a deviation from the monitoring requirements.
- viii. A 30-day rolling average emission rate above the applicable emission limitation shall constitute a violation of the standard.

**Operating Standards & Continuous Monitoring Systems (CMS) Requirements** [15A NCAC 2Q .0508(f)]

- w. The liquid flow rate for each scrubber (**ID Nos. 11-CD-001-001 and 11-CD-001-002**) shall be maintained at or above the respective minimum rate established during the performance test on a 12-hour block average.
- x. The pressure drop across each scrubber (**ID Nos. 11-CD-001-001 and 11-CD-001-002**) shall be maintained within the respective operating limits established during the performance test on a 12-hour block average.
- y. **The Permittee shall submit a permit application within 60 days of initial compliance test to incorporate the operating parameter limitations for the scrubbers into the Title V air quality permit. Such modification may be made by Administrative Amendment to the Title V air quality permit.**
- z. The Permittee shall install, calibrate, and maintain a CMS flow measurement device for each scrubber (**ID Nos. 11-CD-001-001 and 11-CD-001-002**) in accordance with manufacturer's specifications or other written procedures that provide adequate assurance that the equipment would reasonably be expected to monitor accurately. Each monitor shall be equipped with a continuous recorder. The Permittee shall perform the following for each CMS flow measurement device:
  - i. Locate the flow sensor and other necessary equipment in a position that provides a representative flow.
  - ii. Use a flow sensor with a measurement sensitivity of 2 percent of the flow rate.
  - iii. Reduce swirling flow or abnormal velocity distributions due to upstream and downstream disturbances.
  - iv. Conduct a flow sensor calibration check at least semiannually.

The Permittee shall be deemed in non-compliance with 15A NCAC 2D .1111 if the required monitoring devices are not installed and operated as required above.
- aa. The Permittee shall install, calibrate, and maintain a CMS pressure measurement device for each scrubber (**ID Nos. 11-CD-001-001 and 11-CD-001-002**) in accordance with manufacturer's specifications or other written procedures that provide adequate assurance that the equipment would reasonably be expected to monitor accurately. Each monitor shall be equipped with a continuous recorder. The Permittee shall perform the following for each CMS pressure measurement device:
  - i. Locate the pressure sensor(s) in a position that provides a representative measurement of the pressure.
  - ii. Minimize or eliminate pulsating pressure, vibration, and internal and external corrosion.
  - iii. Use a gauge with a minimum tolerance of 1.27 centimeters of water or a transducer with a minimum tolerance of 1 percent of the pressure range.
  - iv. Check pressure tap pluggage daily.
  - v. Using a manometer, check gauge calibration quarterly and transducer calibration monthly.
  - vi. Conduct calibration checks any time the sensor exceeds the manufacturer's specified maximum operating pressure range or install a new pressure sensor.

The Permittee shall be deemed in non-compliance with 15A NCAC 2D .1111 if the required monitoring devices are not installed and operated as required above.

- bb. For each CMS device, the Permittee shall:
  - i. Complete a minimum of one cycle of operation for each successive 15-minute period. A valid hour of data must have a minimum of four successive cycles of operation.
  - ii. Except for monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), conduct all monitoring in continuous operation at all times that the affected unit is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.
  - iii. Determine the 12-hour block average of all recorded readings, except data recorded during monitoring malfunctions, associated repairs, out-of-control periods, or required quality assurance or control activities. The Permittee must use all the data collected during all other periods in assessing compliance. Any period for which the monitoring system is out-of-control and data are not available for required calculations constitutes a deviation from the monitoring requirements.
  - vi. Record the results of each inspection, calibration, and validation check.
- cc. The Permittee shall maintain the following records of the continuous and 12-hour block average liquid flow rates and pressure drops for each scrubber (**ID Nos. 11-CD-001-001 and 11-CD-001-002**). The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if the above records are not created and maintained, or if any 12-hour block average is not within the allowable limit, as provided in Section 2.1 I.8.v and w of this permit.

**Site Specific Monitoring Plan**

- dd. The Permittee must develop a site-specific monitoring plan for each required CEMS and CMS. The plan shall be submitted to the NC DAQ Stationary Source Compliance Branch (SSCB) at least 60 days before the initial performance evaluation of the CMS. The plan must include the elements listed below:
  - i. For each required performance test, the plan must include describe the following:
    - A. Installation of the CMS sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (*e.g.*, on or downstream of the last control device);
    - B. Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems; and
    - C. Performance evaluation procedures and acceptance criteria (*e.g.*, calibrations).
  - ii. For on-going maintenance and operation of each CEMS and CMS, the plan must include the following:
    - A. Ongoing operation and maintenance procedures in accordance with the general requirements of 40 CFR 63.8(c)(1), (c)(3), and (c)(4)(ii);
    - B. Ongoing data quality assurance procedures in accordance with the general requirements of 40 CFR 63.8(d); and
    - C. Ongoing recordkeeping and reporting procedures in accordance with the general requirements of 40 CFR 63.10(c), (e)(1), and (e)(2)(i).
  - iii. The Permittee must conduct a performance evaluation of each CEMS and CMS in accordance with the site-specific monitoring plan.
  - iv. The Permittee must operate and maintain each CEMS and CMS in continuous operation in accordance with the site-specific monitoring plan.

**Additional Recordkeeping Requirements**

- ee. In addition to the recordkeeping requirements above, the Permittee shall maintain the following in a logbook (written or electronic format) on-site and made available to an authorized representative upon request:
  - i. A copy of each notification and report required by this standard, including all documentation supporting any Notification of Compliance Status;
  - ii. Records of performance tests, fuel analyses, or other compliance demonstrations, and CEMS and CMS performance evaluations;
  - iii. Records of the CEMS and CMS measurements needed to demonstrate compliance with a relevant standard (including, but not limited to raw performance testing and evaluation measurements;

- iv. A record of each period during which a CEMS or CMS is malfunctioning or inoperative (including out-of-control periods);
- v. Records of all CEMS and CMS calibration checks and all adjustments and maintenance performed on the CEMS and CMS;
- vi. Records of all monitoring data and calculated averages for applicable operating limits, such as pressure drop and flow rate, used to demonstrate compliance with the standard;
- vii. Records of monthly fuel use by each affected source, including the type(s) of fuel and amount(s) used;

**Reporting** [15A NCAC 2Q .0508(f)]

- ff. **Notification of Compliance Status.** The Permittee shall submit a Notification of Compliance Status in accordance with 40 CFR 63.9(h)(2)(ii) within 60 days of completion of the final performance test or fuel analyses required for the initial compliance demonstration. The Notification of Compliance Status report must contain the following information, as applicable:
  - i. A description of the No. 1 power boiler including the fuels combusted, heat input capacity, and add-on controls used;
  - ii. A justification for the fuel(s) burned during the performance test.
  - iii. Summary of the results of all performance tests and calculations conducted to demonstrate initial compliance.
  - iv. A certification signed by the Responsible Official that the facility has met all applicable emission limits and work practice standards.
- gg. **Semiannual Summary Report.** The Permittee shall submit a summary report by January 30 of each calendar year for the preceding six-month period between July and December, and July 30 of each calendar year for the preceding six-month period between January and June. The first summary report shall be required following the initial compliance date, but no earlier than January 30, 2014. The report shall include the following:
  - i. The highest 30-day rolling average CO concentration measured during the preceding six-month period and identification of all periods during which the 30-day rolling average CO concentration exceeded the applicable emission limitation in Section 2.1.I.8.a above;
  - ii. Identification of all periods during which the average scrubber liquid flow rate or pressure drop was measured outside of the allowable operating range over a 12-hour period.
  - iii. A summary of the results of any annual stack tests or fuel analyses performed during the preceding six-month period; and
  - iv. A certification signed by the Responsible Official that the facility has met all applicable emission limits and work practice standards.

**2.1.K No. 2 and No. 3 Package Boilers**

**4. 15A NCAC 2D .1109: CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters**

**Emission Limitations for Operating Scenario 1 –No. 6 Fuel Oil Firing**

- a. Emissions from the firing of No. 6 residual fuel oil in the No. 2 and No. 3 Package Boilers (ID No. ES-11-CU-033 and ES-11-CU-034) shall not exceed the limitations listed below:

Pollutant	Emission Limitations for the No. 2 Package Boiler (30 day rolling average)
Hydrogen chloride equivalent <sup>1</sup>	8.26 lb/hr
Mercury (Hg)	0.000146 lb/hr
Total Selected Metals (TSM) <sup>2</sup> arsenic (As) + chromium VI (Cr <sup>6+</sup> )	0.002 lb/MMBtu
Beryllium (Be)	0.000555 lb/hr
Cadmium (Cd)	0.000491 lb/hr

Pollutant	Emission Limitations for the No. 2 Package Boiler (30 day rolling average)
Lead (Pb)	0.182 lb/hr
Manganese (Mn)	0.0141 lb/hr
Nickel (Ni)	0.259 lb/hr
Selenium (Se)	0.000842 lb/hr
Carbon Monoxide (CO)	28 ppmvd @ 7% O <sub>2</sub>

Pollutant	Emission Limitations for the No. 3 Package Boiler (30 day rolling average)
Hydrogen chloride equivalent <sup>1</sup>	8.26 lb/hr
Mercury (Hg)	0.000146 lb/hr
Total Selected Metals (TSM) <sup>2</sup> arsenic (As) + Beryllium (Be) + Cadmium (Cd) + Selenium (Se) + chromium VI (Cr <sup>6+</sup> )	0.002 lb/MMBtu
Lead (Pb)	0.182 lb/hr
Manganese (Mn)	0.0141 lb/hr
Nickel (Ni)	0.259 lb/hr
Carbon Monoxide (CO)	28 ppmvd @ 7% O <sub>2</sub>

1. HCl-equivalent is defined by the following equation:

$$E = E_{\text{HCl}} + E_{\text{Cl}_2} * (\text{RfC}_{\text{HCl}} / \text{RfC}_{\text{Cl}_2})$$

Where:

- E = HCl-equivalent emission rate (in lbs/hr);
- E<sub>HCl</sub> = Hydrogen chloride emission rate (in lbs/hr);
- E<sub>Cl<sub>2</sub></sub> = Chlorine emission rate (in lbs/hr);
- RfC<sub>HCl</sub> = Reference concentration for HCl (20 µg/m<sup>3</sup>); and
- RfC<sub>Cl<sub>2</sub></sub> = Reference concentration for Cl<sub>2</sub> (0.20 µg/m<sup>3</sup>)

- b. The emissions limitations in Section 2.1.K.4.a above shall only apply for a particular package boiler when residual fuel oil comprises at least 10% of the fuel fired in that boiler on a 12-month rolling average heat input basis. If the Permittee fires less than 10% residual fuel oil in a package boiler, these emissions limitations and the associated testing, monitoring, and recordkeeping in Sections 2.1.K.4.g through o, with the exception of 2.1.K.4.k, shall not apply for that combustion source. The Permittee shall retain records of the fuels fired in each package boiler in accordance with Section 2.1.K.4.k.
- c. **The initial compliance date for these emission limitations and associated testing, monitoring, record-keeping, and reporting requirements is <ENTER DATE: 3 YEARS AFTER PERMIT ISSUANCE>.**

**Work Practice Standards for Operating Scenario 2 –No. 2 Fuel Oil Firing**

- d. The Permittee shall perform an annual boiler inspection and maintenance as recommended by the manufacturer, or as a minimum, the inspection and maintenance requirement shall include the following:
  - i. Inspect the burner, and clean or replace any components of the burner as necessary;
  - ii. Inspect the flame pattern and make any adjustments to the burner necessary to optimize the flame pattern; and,
  - iii. Inspect the system controlling the air-to-fuel ratio and ensure that it is correctly calibrated and functioning properly.

The Permittee shall conduct at least one tune-up per calendar year to demonstrate compliance with this requirement. The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if the affected boilers are not inspected and maintained as required above.

- e. The results of any required annual burner inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:
  - i. The date of each recorded action;
  - ii. The results of each inspection; and,
  - iii. The results of any maintenance performed on the boilers.The Permittee shall be deemed in noncompliance with 15A NCAC 2D .1109 if these records are not maintained.
- f. **The initial compliance date for the work practice standards in Section 2.1.K.4.d and e above is <ENTER DATE: 3 YEARS AFTER PERMIT ISSUANCE>.**

**Compliance Demonstration for Operating Scenario 1 –No. 6 Fuel Oil Firing** [15A NCAC 2Q .0508(f)]

- g. For each affected Package Boiler **ID No. ES-11-CU-033 and ES-11-CU-034**), the Permittee shall demonstrate compliance for with the TSM (arsenic plus chromium VI for the No. 2 Package Boiler; arsenic plus beryllium plus cadmium plus chromium VI plus selenium for the No. 3 Package Boiler) limitations in Section 2.1 K. 4.a. above by either of the following methods within 180 days of the residual fuel oil comprising 10% or more of the annual heat input to the boiler following the initial compliance date:
  - i. **Stack Testing.** Stack testing shall be performed for the No. 2 and No. 3 Package boilers while firing No. 6 fuel oil at the maximum normal operating load in accordance with 15A NCAC 2D .2601 and General Condition JJ in Section 3 of this permit. Tests may not be conducted during periods of startup, shutdown, or malfunction. Within 180 days of initial compliance date, the Permittee shall conduct the initial stack test. Thereafter, each stack test shall be conducted between 11 and 13 months after the previous stack test. However, if a stack test shows that the emission rates of hazardous air pollutants are less than or equal to 80 percent of the allowable limits in **(30 day rolling average)**, the stack test frequency may be reduced to once every five years for that pollutant.
  - ii. **Fuel Analysis.** Fuel analysis shall be conducted in accordance with the site specific fuel analysis plan approved May 2006. Within 180 days of the initial compliance date, the Permittee shall perform the initial fuel analyses. Thereafter, each fuel analysis shall be conducted between 11 and 13 months after the previous analysis. If a fuel analysis shows a potential exceedance of an emission limitation in Sections 2.1 K.4. a above, the Permittee shall conduct a follow-up stack test of the affected source within 90 days.

If stack testing or fuel analysis shows an exceedance of the TSM limit in Section 2.1.K. 4.a above, the Permittee shall be deemed in non-compliance with 15A NCAC 2D .1109.

**Monitoring Requirements for Operating Scenario 1 – No. 6 Residual Fuel Oil Firing**

- h. The Permittee shall install, operate, and maintain carbon monoxide continuous emissions monitoring system (CO CEMS) at the package boilers (**ID No. ES-11-CU-033 and ES-11-CU-034**). The monitor must complete a minimum of one cycle of operation for each successive 15-minute period. The monitor must record a minimum of four successive cycles of operation to have a valid hour of data. For the purposes of calculating data averages, do not use data recorded during monitoring malfunctions, associated repairs, out-of-control periods, or required QA/QC activities.
  - i. The 30-day rolling average CO emission rate shall be calculated and recorded on a daily basis.
  - ii. Each CEMS must be installed, operated, and maintained according to the applicable procedures under Performance Specification (PS) 3 or 4A of 40 CFR 60, Appendix B, and according to the site-specific monitoring plan.
- i. The Permittee shall develop a site-specific monitoring plan for the CO CEMS. The plan shall be submitted to the NC DAQ Stationary Source Compliance Branch (SSCB) at least 60 days before the initial performance evaluation of the CEMS. The plan must describe the elements listed below:
  - i. The measurement location such that the measurement is representative.
  - ii. Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems.
  - iii. Performance evaluation procedures and acceptance criteria (e.g., calibrations).

- iv. Ongoing operation and maintenance procedures.
- v. Ongoing data quality assurance procedures.
- vi. Ongoing recordkeeping and reporting procedures.

**Recordkeeping Requirements**

- j. The Permittee shall create and retain the following records at least once per calendar month:
  - i. The Permittee shall record the fuel use by each affected source, including the type of fuel and amount of fuel used, during the previous calendar month; and,
  - ii. The Permittee shall calculate the annual average heat input from distillate fuel oil and from residual fuel oil for each affected source during the previous 12-month period.
- k. The Permittee shall maintain a copy of each notification and report required by this standard, including all documentation supporting any Notification of Compliance Status.
- l. The Permittee shall maintain records of performance tests, fuel analyses, and CEMS performance evaluations.
- m. For each CEMS, the Permittee shall maintain the following records:
  - i. All required measurements needed to demonstrate compliance with a relevant standard (including, but not limited to, 15-minute averages of CEMS data, raw performance testing measurements, and raw performance evaluation measurements, that support data that the source is required to report);
  - ii. A record of each period during which a CEMS is malfunctioning or inoperative (including out-of-control periods);
  - iii. All CEMS calibration checks; and,
  - iv. All adjustments and maintenance performed on CEMS.

**Reporting Requirements**

- n. **Notification of Compliance Status.** The Permittee must submit a Notification of Compliance Status that meets the requirements of 40 CFR 63.9(h)(2)(ii) before the close of business on the 60th day following the completion of the final required performance test and/or other initial compliance demonstration. The Notification of Compliance Status report must contain the following information, as applicable:
  - i. A description of the affected source(s) including identification of which subcategory the source is in, the capacity of the source, a description of the add-on controls used on the source description of the fuel(s) burned, and justification for the fuel(s) burned during the performance test.
  - ii. Summary of the results of all performance tests and calculations conducted to demonstrate initial compliance.
  - iii. A certification signed by the Responsible Official that the facility has met all applicable emission limits and work practice standards.
- o. **Semiannual Summary Report.** The Permittee shall submit a summary report by January 30 of each calendar year for the preceding six-month period between July and December, and by July 30 of each calendar year for the preceding six-month period between January and June. The first summary report shall be required following the initial compliance date, but no earlier than January 30, 2014. The report shall include the following:
  - i. Company name and address;
  - ii. Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report;
  - iii. Date of report and beginning and ending dates of the reporting period;
  - iv. A summary of the results of the annual performance tests;
  - v. Signed statement indicating that no new types of fuel were fired in the affected sources.

**2.1.L Four Temporary Boilers**

**4. 15A NCAC 2Q. 0317: AVOIDANCE CONDITIONS for 15A NCAC 2D .1109: CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters**

- a. In order to avoid the applicability of 15A NCAC 2D .1109, the Four Temporary Boilers (**ID Nos. ES-11-CU-044 through ES-11-CU-047**) shall not remain on site for more than 180 consecutive days. If any of these boilers remains on site for longer than 180 consecutive days, the Permittee shall notify the Regional Office in writing within 10 days of exceeding the 180 day period