NORTH CAROLINA DIVISION OF AIR QUALITY

Air Permit Review

Permit Issue Date:

Region: Wilmington Regional Office
County: Onslow
NC Facility ID: 6700011
Inspector's Name: Ashby Armistead
Date of Last Inspection: 09/23/2010
Compliance Code: 3 / Compliance - inspection

Facility Data	Permit Applicability (this application only)
Applicant (Facility's Name): Camp Lejeune Marine Corp Base **Facility Address:** Camp Lejeune Marine Corp Base Camp Lejeune, NC 28542 **SIC:** 9711 / National Security **NAICS:** 92811 / National Security **Facility Classification: Before:** Title V **After:** Title V **Fee Classification: Before:** Title V **After:** Title V	**SIP:** **NSPS:** **NESHAP:** **PSD:** **PSD Avoidance:** **NC Toxics:** **112(r):** **Other:** 2D .1109 Case-by-Case MACT [112(j)]

Contact Data

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Application Data

Application Number: 6700011.10C
Date Received: 07/15/2009
Application Type: 112(j) Part I
Application Schedule: TV-Significant

Existing Permit Data

Existing Permit Number: 06591/T23
Existing Permit Issue Date: 10/05/2010
Existing Permit Expiration Date: 02/28/2014

Review Engineer: Jeff Twisdale

Review Engineer's Signature: **Date:**

Comments / Recommendations:

Issue 06591/T24
Permit Issue Date:
Permit Expiration Date:

I. Purpose of Application

Camp Lejeune is a large Marine Corps base. Most of the permitted items include boilers, engine test stands, storage tanks, paint booths, and emergency generators. There are an incredible amount of insignificant activities that include boilers, internal combustion engines, parts cleaners, welding, fuel dispensing, and storage tanks. The facility has been divided into 3 zones for modeling purposes. Zone A is east of the New River and northwest of Hwy. 172 and includes the Main Steam Plant, Montford Point, Paradise Point, Naval Hospital, and the Field Maintenance Complex. Zone B is southeast of Hwy. 172 and includes Courthouse Bay. Zone C is west of the New River and includes Camp Geiger, the Rifle Range, and Air Station. The facility=s main gate is located in Jacksonville off Hwy. 24. Visitors must be "sponsored" by someone from the base to gain access.

Camp Lejeune is located in Onslow County, North Carolina. Application No. 6700011.10C, received September 11, 2009, is a Part 2 MACT "Hammer" application for four coal-fired boilers, seventeen natural gas/No. 2 fuel oil-fired boilers rated greater than 10 million Btu per hour (MMBtu/hr) maximum heat input, and several (~125) natural gas and/or No. 2 fuel oil-fired boilers rated less than 10 MMBtu/hr. maximum heat input.

II. Permit Modifications/Changes

The following table lists the changes associated with this permit action:

Old Page No. [Air Permit No. 06591T23]	New Page No. [Air Permit No. 06591T24]	Condition No.	Changes
NA	NA	Cover letter	Changed dates, permit and app number, etc.
NA	NA	Table of Changes	updated the Table of Changes
NA	NA	Permit Cover	Changed dates, permit and app number, etc.
Pages 3-4	Page 3-4	SECTION 1 Source Table	Added 2D .1109 Case-by-Case MACT identifier to affected boilers
Page 12	Page 12	Section 2.1 A.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
NA	Pages 16-20	Section 2.1 A.6.	Added new condition for 2D .1109 requiring testing, monitoring, recordkeeping & reporting for 112(j) for the boilers
Page 14	Page 21	Section 2.1 B.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 16	Page 23	Section 2.1 C.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 18	Page 25	Section 2.1 D.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 19	Page 27	Section 2.1 E.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 22	Page 29	Section 2.1 F.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 23	Page 30	Section 2.1 G.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 24	Page 31	Section 2.1 H.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 25	Page 32	Section 2.1 I.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
Page 27	Page 35	Section 2.1 K.	Revised Table for 112(j) for the affected boilers by adding 2D .1109
NA	Page 86-87	Section 2.2 D.	Added new condition for 2D .1109 requiring best combustion practices for 112(j) for the permitted boilers
NA	Page 87-89	Section 2.2 E.	Added new condition for 2D .1109 requiring best combustion practices for 112(j) for the boilers less than 10.0 million Btu per hour
Pages 80-88	Page 91-99	Section 3 General Conditions	Verified Latest General Conditions (v 3.2.2)

III. Regulatory Review

A. <u>15A NCAC 2D .1109 – CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters</u> – On July 30, 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 valid 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 September 11, 2009, the NC DAQ received a Part 2 MACT "Hammer" application from this facility asking that the NC DAQ establish 112(j) emissions limitations. In addition to the four solid/liquid fuel institutional boilers at the Main Steam Plant, Camp Lejeune operates 17 large units classified as liquid (distillate) and gaseous (natural gas or propane) fuel fired boilers at other locations (e.g. Camp Geiger) and several (~125) small liquid/gaseous boilers at individual or groups of buildings throughout the facility. All these units have been included in the risk assessment for this facility that will be discussed in another section of this review. In March 2011, some revisions to the Part 2 Boiler MACT application were received that updated the proposed MACT limits and compliance procedures for these institutional boilers.

NC DAQ has developed this guidance (*http://daq.state.nc.us/permits/112j/*) to provide standards and compliance procedures that it has determined meet the requirements of § 112(j). Each affected source shall comply with the applicable emissions limitations listed in the following table or choose to use the Health-Based Compliance Alternative (HBCA) to comply with the applicable limits.

The following table provides NC DAQ's recommended emissions limitations to satisfy the requirements in 15A NCAC 2D .1109 for the existing combustion sources at Camp Lejeune:

Coal	C > 100	Particulate Matter (PM) [filterable]	0.08 lb/MMBtu
		Mercury (Hg)	0.000003 lb/MMBtu
		Hydrogen Chloride (HCl)	0.05 lb/MMBtu
		Carbon Monoxide (CO)	133 ppmvd, 7% O_2
Distillate Fuel Oil (Nos. 1 & 2 also includes JP-5 & JP-8)	All Capacities	All HAP	Work Practice Standards
Gaseous Fuel	All Capacities	All HAP	Work Practice Standards

1. **Boilers located at the Main Steam Plant that are currently listed on the Air Permit that burn solid fuel (e.g. coal) (**These boilers burn other fuels (e.g. distillate) but those emissions will be addressed in another section of this review.**):**
   - **Two coal-fired boilers (114.5 million Btu per hour heat input capacity each, ID Nos. A-HP-1700-01 and A-HP-1700-02) with one associated single-stage, dry type electrostatic precipitator (36,540 square feet of plate area, ID No. CD-01b) in series with two multi-cyclones (ninety-two 4.25 inch diameter tubes each multi-cyclone, ID Nos. CD-01a.1 and CD-01a.2)**

   - **Two coal-fired boilers (114.5 million Btu per hour heat input capacity each, ID Nos. A-HP-1700-03 and A-HP-1700-04) with one associated single-stage, dry type electrostatic precipitator (36,540 square feet of plate area, ID No. CD-02b) in series with two multi-cyclones (ninety-two 4.25 inch diameter tubes each multi-cyclone, ID Nos. CD-02a.1 and CD-02a.2)**

   The facility proposed total filterable particulate matter (PM) and CO emission limitations that are consistent with the NC DAQ application guidance.

However, the facility has chosen to comply with a Health-Based Compliance Alternative (HBCA) for HCl and Hg. The HBCA eligibility demonstration is consistent with the procedures provided by the EPA in the vacated § 112(d) standard for boilers and process heaters.

Camp Lejeune conducted an initial Air Toxics Risk Assessment at maximum emission rates for the boilers to determine if the facility qualifies for an 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 hydrogen chloride (HCl) and mercury (Hg). The results are discussed in more detail below.

Each set of two coal-fired/No. 2 fuel oil-fired boilers are controlled by one electrostatic precipitator each in series with two multi-cyclones each to meet the total PM standard of 0.08 lb/million Btu heat input since four boilers located at the Main Steam Plant are greater than 100 million Btu per hour when firing coal.

a. Filterable Particulate Matter (PM)

In accordance with the 112(j) application guidance provided by NC DAQ, affected facilities may propose either a total selected metal (TSM) limit or a filterable PM limit. The filterable PM is a surrogate for the regulated TSM, including arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium. This facility proposed a filterable PM limit that is consistent with the NC DAQ application guidance.

i. Source Testing:

Camp Lejeune performed a stack test on two of the solid fuel-fired units at the Main Steam Plant to measure the emissions of PM, HCl, Cl_2, Hg, and Mn. In addition to this data, representative testing of a fuel oil-fired unit from the Camp Lejeune was used in estimating the hydrogen chloride and chlorine emission from the small fuel oil-fired boilers. Also, the facility performed testing in 2006 to determine the compliance approach to be used with the original regulation. This testing event quantified emissions of mercury from the solid fuel-fired boilers.

Prior to any stack testing, fuel analyses were conducted using the methods outlined in the fuel sampling plan to document that the worse-case fuel mix was fired in each boiler during the HCl, Cl_2, Hg and Mn testing. Based on historical data and the fuel sampling results, coal has the highest chlorine and manganese content of the fuels fired in the Main Steam Plant boilers. Therefore, testing was conducted while firing 100% coal.

b. Mercury (Hg) and Hydrogen Chloride (HCl)

Camp Lejeune proposed the following Hg and HCl (including chlorine) limits for the four coal-fired boilers in accordance with the NC DAQ application guidance and with the site-specific compliance demonstration that showed the health risk from Hg and HCl emissions from the four coal-fired boilers to be low. The facility is eligible for the HBCA for Hg and HCl because their site-specific compliance demonstration indicates that none of the health index (HI) values for mercury are greater than 1.0 at locations where people live or congregate (e.g., schools, daycare centers, etc.).

Mr. Jerry Freeman of NC DAQ's Air Quality Analysis Branch (AQAB) reviewed and approved (*see Mr. Freeman's Memo dated November 4, 2010*) the Air Toxics Risk Assessment analysis that was submitted on September 21, 2010 in support of the 112(j) application. Mr. Freeman stated that Camp Lejeune used AERMOD to model hydrogen chloride, chlorine, manganese and mercury emissions from the facility, and that the analysis demonstrates that the facility long-term non-carcinogen inhalation risk (HI) and the long-term carcinogenic inhalation risk are both less than 1.0, indicating the facility is considered to be "low risk" for the modeled HAPs. Therefore, facility qualifies for both the HCl and the TSM (including Hg) HBCA based on the "low risk" determination. Emission rates and stack parameters for all boilers used in the modeling were attached to his memo. Note that the emission rates were optimized by a factor of 20 for Hg and 1.8 for HCl in a March 29, 2011 submittal by the facility for compliance demonstration.

Mercury (Hg): 7.92 E-2 lb/hr total for boilers (ID Nos. A-HP-1700-01 and A-HP-1700-02)
Mercury (Hg): 9.76 E-2 lb/hr total for boilers (ID Nos. A-HP-1700-03 and A-HP-1700-04)

Hydrogen Chloride-equivalent (HCl): 2.06 E3 lb/hr total for A-HP-1700-01 and A-HP-1700-02
Hydrogen Chloride-equivalent (HCl): 1.54 E3 lb/hr total for A-HP-1700-03 and A-HP-1700-04

HCl-equivalent is defined by the following equation:

$E = E_{HCl} + E_{Cl2} * (R_fC_{HCl}/R_fC_{Cl2})$

Where: E = HCl-equivlent emission rate
E_{HCl} = HCl emission rate;
E_{Cl2} = Cl_2 emission rate;
RfC_{HCl} = Reference concentration for HCl (20 $\mu g/m^3$); and
RfC_{Cl2} = Reference concentration for Cl_2 (0.15 $\mu g/m^3$).

NC DAQ has determined that the proposed Hg and HCl limits are acceptable. Compliance is demonstrated since the Hg and HCl emission limits are 1.8 to 20 times greater than the maximum emissions expected due to optimization factors.

c. Carbon Monoxide (CO)
Camp Lejeune proposed a CO limit of 133 ppmvd, corrected to 7% oxygen, which is consistent with the NC DAQ application guidance and as such are acceptable.

d. Hydrogen Cyanide (HCN) and Hydrogen Fluoride (HF)
Because the current proposed version of the Boiler MACT considers HCN and HF in its regulation, the facility provided modeling on March 16, 2011 for these HAPS. The modeling results provided that the concentration (both 1 hour and 24-hour) of these pollutants are less than 1% of the NC Acceptable Ambient Levels (AAL) reviewed and approved by Mr. Jerry Freeman, Meteorologist with NC DAQ's AQAB (see Mr. Freeman's Memo dated March 25, 2011). Therefore, modeled rates are not included in the permit limits for this 2D .1109 condition since the modeled impacts were all less than 1% of the NC AAL. Also, note that Camp Lejeune is under a Schedule of Compliance for 15A NCAC 2D .1100, "Control of Toxic Air Pollutants" under Section 2.3 of the current permit.

2. **Boilers that are currently listed on the Air Permit that burn liquid (e.g. distillate) or gaseous (e.g. natural gas) fuels (**Four boilers at the Main Steam Plant burn solid fuels (e.g. coal), but those emissions will be addressed in another section of this review.**):**
Four No. 2 fuel oil-fired boilers (114.5 million Btu per hour heat input capacity each, ID Nos. A-HP-1700-01 thru A-HP-1700-04), located at Building HP-1700, Main Steam Plant; One No. 2 fuel oil/natural gas-fired boiler (95.0 million Btu per hour maximum heat input capacity, ID No. A-HP-1700-05, NSPS) with associated flue gas re-circulation system located at the Main Steam Plant; Two No. 2 fuel oil/natural gas-fired boilers (50.0 million Btu per hour heat input capacity each, ID Nos. C-CG-650-83B and C-CG-650-84B, NSPS) located at Camp Geiger; One No. 2 fuel oil/natural gas-fired boiler (31.6 million Btu per hour maximum Btu per hour heat input capacity, ID No. C-CG-650-85, NSPS) located at Camp Geiger; One No. 2 fuel oil-fired, "water tube design", replacement boiler, (26.0 million Btu per hour heat input capacity, ID No. B-BB-9-53B, NSPS) and one No. 2 fuel oil-fired boiler (18.4 million Btu per hour heat input capacity, ID No. B-BB-9-55, NSPS) located in the Court House Bay Area; One No. 2 fuel oil-fired boiler (25.1 million Btu heat input capacity, ID No. B-BB-9-54) located in the Court House Bay Area; Two No. 2 fuel oil-fired replacement boilers (10.5 million Btu heat input capacity each, ID Nos. C-RR-15-46B and C-RR-15-47B, NSPS) located at the Rifle Range; Three No. 2 fuel oil/natural gas-fired boilers (29.94 million Btu heat input capacity each, ID Nos. A-MP-625-72, A-MP-625-73, and A-MP-625-74) located at Montford Point; Three No. 2 fuel oil/JP-5/JP-8/natural gas-fired boilers (48.0 million Btu per hour Btu per hour heat input capacity, ID No. C-AS-4151-16, C-AS-4151-17A, and C-AS-4151-18, NSPS) located at the Air Station; and Two No. 2 fuel oil/natural gas-fired boilers (14.645 million Btu per hour maximum heat input capacity each, ID Nos. A-NH-100-01 and A-NH-100-02) located at the Naval Hospital.

   All the boilers listed above are fired by distillate (No. 2 fuel oil, JP-5 or JP-8) or natural gas. No control technologies for the control of carbon monoxide (CO), total selected metals (TSM or filterable particulate matter (PM) as a surrogate), mercury (Hg), or hydrogen chloride (HCl) were identified for the natural gas-fired/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 (and No. 2 fuel oil for the boilers) combustion sources of this size (e.g., 25.1 MMBtu/hr for boilers), consistent with the provisions in CAA § 112(d)(2)(D). The facility proposed work practice standards that are consistent with the NC DAQ application guidance. Best work practice standards in this case shall include the annual inspection and maintenance of the boilers 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.

   Compliance with the work practice standards is expected.

3. Boilers that have an a heat input capacity of less than 10.0 million Btu/hr and are currently listed on the Insignificant Activities List of the Air Permit that burn liquid (e.g. distillate) or gaseous (e.g. natural gas) fuels

All the boilers listed above are fired by distillate (No. 2 fuel oil) or gaseous (natural gas or propane). No control technologies for the control of carbon monoxide (CO), total selected metals (TSM or filterable particulate matter (PM) as a surrogate), mercury (Hg), or hydrogen chloride (HCl) were identified for the natural gas-fired/No. 2 fuel oil-fired boilers and the natural gas-fired process heaters 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 (and No. 2 fuel oil for the boilers) combustion sources of this size (e.g. <10.0 MMBtu/hr for boilers), consistent with the provisions in CAA § 112(d)(2)(D). The facility proposed work practice standards that are consistent with the NC DAQ application guidance. Best work practice standards in this case shall include the annual inspection and maintenance of the boilers and the process heaters as follows:

To assure compliance, the Permittee shall perform an annual inspection and maintenance on the boilers and process heaters 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 and process heaters 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.

Compliance with work practice standards is expected.

IV. Draft Permit Review Summary

Mr. Dean Carroll and Mr. Ashby Armistead of the Wilmington Regional Office were provided a draft permit and draft permit review document on April 4, 2011.

Ms. Lisa Gideon, Camp Lejeune, was provided a draft permit for review on April 4, 2011.

Ms. Katy Forney and Ms. Gracy DeNois (U.S. EPA, Region IV) were provided a draft permit for review on April 4, 2011.

V. Recommendations

This permit modification application for the Camp Lejeune military base located in Onslow 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.

Recommend issuance of Permit No. 06591T24 once the public notice and EPA review periods have been completed.