

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

M364124800

FACILITY: UNIVERSITY OF MICHIGAN FLINT		SRN / ID: M3641
LOCATION: 502 MILL STREET, FLINT		DISTRICT: Lansing
CITY: FLINT		COUNTY: GENESEE
CONTACT: Michael Lane , EHS Director		ACTIVITY DATE: 03/26/2014
STAFF: Brian Culham	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: This was an announced scheduled inspection and an initial contact for me. A new permit to install was issued in 2013 to replace existing boilers with new units. The new boilers are operational.		
RESOLVED COMPLAINTS:		

Michael Lane - EHS Director – milane@umflint.edu

Tim Barden – Asst. Dir. Facilities and Operations – tbarden@umflint.edu

This was an announced scheduled inspection and an initial contact for me. A new permit to install was issued in 2013 to replace existing boilers with new units. The new boilers are operational.

The U of M Flint campus is next to the Flint River and straddles I-475 in the center of the city of Flint. The physical plant is adjacent to the west side of I-475. The area is generally a mixture of commercial and industrial use; however; to the east and southeast is a large residential development.

U of M Flint is an educational "institution". Boilers are used to generate steam primarily for comfort heat in buildings on campus. Several small generator sets are scattered across campus for emergency electrical use. Two large boilers and a generator set are housed at the physical plant.

Permit 497-96 is identified as an opt-out permit. The permit restricts Hazardous Air Pollutants (HAPs) to 9 and 22.5 tons per year of any single and all combined HAPs respectively. The permit is identified as active in the Permit Card Database. The five boilers identified in this permit have all since been removed and the permit will be voided. With the installation of the new natural gas boilers, the HAP formaldehyde is likely the most significant single HAP emitted from the source. Actual emissions of formaldehyde have been reported to the MAERS database as 8 pounds for 2013. The potential to emit (PTE) formaldehyde is expected to be below 10 tons per year and the source will be characterized as a "True Minor Source of HAPs" and an "Area Source of HAPs". Sue Thelen of AQD was contacted to void Permit to Install 497-96.

Existing "institutional" emergency stationary RICE located at an "area source" of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii) are not subject to the National Emissions Standards for Hazardous Air Pollutants (MACT NESAP) for Stationary Reciprocating Internal Combustion Engines (RICE) 40 CFR 63 subpart ZZZZ. However; the stationary RICE must meet the definition of an emergency stationary RICE in §63.6675, which includes operating according to the provisions specified in §63.6640(f). The existing generators that are scattered around campus are being operated as emergency use only and therefore are not expected to be subject to 40 CFR 63 subpart ZZZZ.

The new boilers installed in December are subject to the New Source Performance Standards (NSPS) subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. EUBoiler2 burns oil and for that reason is also subject to 40 CFR 63 subpart JJJJJ, National Emission Standards for Hazardous Air Pollutants (MACT NESAP) for Industrial, Commercial, and Institutional Boilers Area Sources

Because the boilers are subject to an NSPS standard U of M Flint is considered a category II fee subject source. U of M Flint has submitted a MAERS report for 2013 emissions. They will be required to pay fees.

No.	Emission Unit or Flexible Group	Description	Permit Number or Exemption	Comp. Status
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1	FGBOILERS1&2	EU Boiler 1 and EUBoiler2 both are 27,600 lb. Steam/Hr. (33.6 mmbtu/hr.) natural gas boilers. Boiler 2 burns some oil.	PTI 140-13 40 CFR 60 subpart Dc 40 CFR 63 subpart JJJJJ (boiler 2 only)	C C C
2	EUGENERATOR	Existing stationery 310 kW (approx. 300 HP or 0.75 MMBTU/hr) CI natural gas inline 6 RICE generator set.	Rule 285(g) 40 CFR 63.6675 subpart ZZZZ (RICE)	C C
3	FGBOILERS	A collection of smaller boilers (7) scattered across campus.	Rule 282(b)	C
4	FGEMERGENCYGEN	A collection of smaller generators (7) scattered across campus.	Rule 285(g)	C

I contacted Michael Lane two days prior to the inspection so that I could plan where to meet him. I met Michael Lane at the Hubbard Building, which also houses the Department of Public Safety, at 8:00 am. Tim Barden and the two operators responsible for the boilers and generators were at the Hubbard building when we arrived.

I spent the first hour in a meeting with the four people discussing regulations and what other installations on campus may be subject to air quality regulations. The discussion included considering things like lab solvent collection, paint coating booths, ETO sterilizers, and pottery kilns. From the interview, it did not seem that there were any additional emission units installed on campus that required permitting or were of a significant size for further investigation.

The remaining investigation focused on boilers and ICEs.

FGBOILERS1&2

Two new boilers were installed at the end of 2013 replacing all the existing boilers in the physical plant. The new boilers are intended to combust pipeline quality gas; however the east boiler is permitted to burn ultra-low sulfur diesel fuel oil during gas curtailment and therefore is subject to Boiler MACT subpart JJJJJ. The boiler plates on the two boilers indicated that each are rated at a maximum steam load of 27,600 #/hour, which is equivalent to the 33.6 MMBtu/hr. maximum restrictions in the permit.

The MAERS report for 2013 indicated a source wide total emission of 5.5 TPY of NO_x; with about 4.3 TPY from boiler operations. The new boilers have generated about 1.1 TPY in the 3 week period of operation (peak heating) in December. This extrapolates to about 18.7 TPY, not adjusting for warm weather. The limit is 23.16 TPY NO_x for the new boilers.

The boilers were both operating at about 10,000 # of steam, or between about 35% and 40% maximum load during the inspection. They were both combusting natural gas.

The diesel fuel is limited to a maximum of 0.5% sulfur content. M. Lane showed me analytical results for the fuel they presently have in storage. The results indicate 150 mg/kg total sulfur, or about 0.015%.

Diesel fuel combustion was less than 600 gallons for the total operational period and was only used during the required opacity readings completed in December 2013. Opacity results were received in February and indicated the highest 6-minute average value of 0.4% opacity during the 1-hour read. The limit is 20%. The unit operated at 45% of maximum load during the VE observations as was determined prior to the evaluation. The evaluation was completed by a certified observer named Kent McCroskey.

According to U of M staff, analytic data that was obtained from the boiler tune-up period indicated that the boilers were operating at efficiencies and at emission rates considerably better than those values anticipated prior to construction. They are pleased with the boilers initial performance.

Sometime shortly after bringing the boilers on line, however; UM Flint boiler operators discovered that at low loads the devices installed to monitor fuel flow were not accurate. New monitoring devices have been ordered and will be installed within the month. I was also shown the data acquisition software (DAS). The software had been the intended source of recordkeeping, including the method of completing NO_x calculations and subpart JJJJJ records. Without accurate flow monitors the DAS is not being used. M. Lane stated that values from the gas meters coming into the plant can be used to estimate and replace the last three months of corrupted and missing data. In the last 3 weeks of December, 24.8 mmcf of

gas were combusted. He showed me a record format that they intend to use to complete the manual recordkeeping for the compromised data. Oil consumption values (600 gal. on December 12) necessary to satisfy The Boiler MACT requirements also exist. M. Lane agreed to e-mail me when the monitoring glitch has been resolved.

I will not cite a violation of 140-13 condition IV.2 at this time because the monitoring equipment was installed as required by permit. In my opinion it was proper procedure upon learning of the inaccurate components to immediately contact the manufacture for the construction of appropriately calibrated replacements. Furthermore there is no indication with the backup data that the NOx emission limit has been exceeded.

I went outside to view the stacks. Both boilers were generating condensing water vapor plumes. The plumes were detached, looping, and indicated no identifiable tail-off. Opacity was 0%. The stack heights and diameters appeared to match the permit requirements.

The NSPS Subpart Dc and A "Notification of Commencement of Construction" was received on July 12, 2013. A "Notification of Startup" indicated December 9, 2013 as the startup date.

EUGENERATOR

I identified a 6 cylinder compression ignition reciprocating internal combustion engine associated with a generator in the physical plant. The Serial plate indicated 310kW in size, or approximately 415 HP and about 1.1 mmbtu heat input. The engine is exempt from Air Pollution Control (APC) Rule 201, the need to obtain a Permit to Install, by Rule 285(g).

According to U of M staff, the estimated installation date was sometime in the 1970's. An hour meter was identified that report 144 hours of use.

Existing institutional emergency stationary RICE located at an area source of HAP emissions are not subject to 40 CFR 63 subpart ZZZZ if they are operated in an emergency capacity. Emergency stationary RICE may be operated for maintenance checks and readiness testing for up to 100 hours per calendar year. Recordkeeping is required.

A clipboard was identified that contained data associated with the generator. The gen-set operator stated that he remembered operating the unit once for a total of 9 hours during an emergency. He stated most of the hours on the meter were for readiness checks.

FGBOILERS

A collection of smaller boilers and heating units are scattered across campus and are exempted from APC Rule 201 by Rule 282(b). This includes 4 additional boilers, 3 @ 4.4 mmbtu and 1 @ 1.3 mmbtu, listed in the MAERS report. They are all identified as natural gas fired. I did not ask to see these boilers during the inspection.

FGEMERGENCYGEN

MAERS identifies 8 emergency generators including the one identified above. They operate on natural gas or diesel fuel and all are less than 450 horsepower in size. Because the engines are all less than 10 mmbtu heat input they are exempted from APC Rule 201 by Rule 285(g).

Existing institutional emergency stationary RICE located at an area source of HAP emissions are not subject to 40 CFR 63 subpart ZZZZ if they are operated in an emergency capacity. Emergency stationary RICE may be operated for maintenance checks and readiness testing for up to 100 hours per calendar year. Recordkeeping is required. Operational and maintenance records are being maintained as part of the maintenance database.

M. Lane stated that he would be completing a more comprehensive survey of campus wide installations of stationary reciprocating internal combustion engines to assure compliance with EPA subparts.

I left the facility at 10:30 am.

NAME

Brian Walker

DATE

4-7-2014

SUPERVISOR

Mildred Miller