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

P074654555

FACILITY: LENOX CREMATION SERVICES OF MICHIGAN, INC		**SRN / ID:** P0746
LOCATION: 10918 Gratiot Avenue, CASCO		**DISTRICT:** Warren
CITY: CASCO		**COUNTY:** SAINT CLAIR
CONTACT: Craig Harms , Owner		**ACTIVITY DATE:** 08/04/2020
STAFF: Robert Elmouchi	**COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Scheduled inspection.		
RESOLVED COMPLAINTS:		

On August 4, 2020, I conducted a scheduled inspection of Lenox Cremation Services of Michigan **(SRN: P0746)**, located at 10918 Gratiot Avenue, Casco, Michigan 48064. The purpose of this inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act; Article II, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451); the administrative rules; the conditions of Permit to Install (PTI) No. 155-16.

Lenox Cremation Services of Michigan (Lenox) is permitted to conduct human cremations. This facility contains one human crematory, a refrigerator, and an AP Lazer SN3024 laser engraving machine, which is used to engrave wood (oak, maple, and walnut) and marble urns. This facility operates the cremation unit per PTI 155-16. PTI No. 155-16A, for a second cremation unit, is pending final review and approval.

I entered the facility, presented identification, and explained the purpose of the inspection to Mr. Craig Harms, owner. Mr. Harms answered questions, provided copies of documents, and escorted me throughout the inspection.

EUCREMATORY01
During this inspection, I observed the ATI Environmental UK Limited cremation unit model number CR2000XL. The ATI CR2000XL is one of the largest cremation units in Michigan. With a maximum charge capacity of 1,100 pounds, this cremation unit can cremate a 200-pound person in 90 minutes, whereas a typical cremation unit may take 120 minutes or more. This emission unit appears to be well constructed and maintained. Mr. Harms stated that the largest charge placed in this cremation unit was about 820 pounds and that Lenox typically cremates about one person over 600-pounds per month. Mr. Harms stated that the first cremation occurred in April of 2017.

The manufacturer has instructed Lenox cremation to keep the primary combustion chamber door closed throughout the cremation cycle. This procedure prevents a short-term temperature drop in the secondary combustion chamber. Mr. Harms showed me the viewing port at the rear of the primary combustion chamber, which the operator uses to determine if the cremation is complete. If the cremation is not complete, the operator can extend the cremation in 15-minutes intervals.

The ATI Environmental UK Limited cremation unit model number CR2000XL has some notable features as compared to other cremation units I've observed. There is a water spray nozzle at the rear of the primary combustion chamber, which is activated when the primary combustion chamber is opened to insert a charge. Mr. Harms stated that the water spray is used to temporarily suppress the heat from the primary combustion chamber to reduce heat exposure to the operator. Mr. Harms also stated that the water spray is automatically activated for fire suppression when the temperature in the primary combustion chamber exceeds 2500 degrees F. All other crematoriums I've inspected use a grinding container to process the cremains and emissions are controlled by a filter preceding an exhaust fan. Lenox uses a ball mill to process cremains and remove materials such as implants. The ball mill station has a small baghouse, that vent to the general in-plant environment, to control particulate emissions from this process.

This cremation unit has three thermocouples to monitor operating temperatures. One thermocouple is located in the primary combustion chamber; the second thermocouple (PC1) is located at the rear of the secondary combustion chamber; and the third thermocouple (PC2) is located where the exhaust stack is connected to the body of the cremation unit. Per a visual inspection of this cremation unit, PC1 (Post Combustion 1) appears to be

the temperature sensor located in the secondary combustion chamber. This cremation unit appeared to be properly maintained. Mr. Harms showed me thermocouples and an oxygen sensor that had been replaced as part of routine maintenance.

We discussed how a charge is inserted and the operator maintains control when inserting the charge. Most crematory operators use thick cardboard tubes underneath the charge, which act as rollers, but this method can create a safety issue if the container veers off course and becomes lodged partway into the primary combustion chamber. If the container is lodged partway, the heat remaining from the previous cremation can ignite the charge before it is completely inserted, which can result in an uncontrolled fire. Lenox uses a scissor lift table with a ram to push the charge into the primary combustion chamber. The lift table latches to the front of the cremation unit to ensure the lift table does not move during insertion. The floor of the primary combustion chamber is covered with refractory tiles, which permits a relatively easy repair when portions of the floor wear out due to abrasion or thermal cycling. The scissor lift has a built-in scale to comply with recordkeeping requirements.

Per my review of Lenox Cremations recordkeeping, the permittee appears to satisfy the recordkeeping requirements of maintaining daily records of the time (duration of burn), description and weight of the charge combusted in EUCREMATORY01 per special condition VI.3.

During this inspection Mr. Harms and I determined that the secondary combustion chamber temperature records are recorded in degrees Fahrenheit (F) but the crematory manufacturer failed to change the Cremation Data row headings from Centigrade (C) to Fahrenheit. Therefore, even though the records indicate that the temperature records are recorded in C the recorded values are actually in degrees F. This recordkeeping error appears to be in violation of VI.1 and shall be cited in a violation notice.

On August 4, 2020, I collected the following records:
Date: June 10, 2020, cremation no. 3672, record includes temperature chart.
Date: June 17, 2020, cremation no. 3688, record includes temperature chart.
Date: August 3, 2020, cremation no. 3852, record does not include temperature chart.
Date: August 4, 2020, cremation no. 3857, record does not include temperature chart.
Date: August 4, 2020, cremation no. 3860, record does not include temperature chart.

Temperature Records
Cremation no. 3672, minimum temp. 1476°F, average temp. 1622°F: maximum temp.1672°F:
Cremation no. 3688, minimum temp. 1458°F, average temp. 1634°F: maximum temp.1713°F:
Cremation no. 3852, minimum temp. 1126°F, average temp. 1331°F: maximum temp.1713°F:
Cremation no. 3857, minimum temp. 1542°F, average temp. 1645°F: maximum temp.1742°F:
Cremation no. 3860, minimum temp. 1601°F, average temp. 1673°F: maximum temp.1740°F:

Special condition III.1 states in part, “The permittee shall not combust waste in EUCREMATORY01 unless a minimum temperature of 1600°F is maintained.” Therefore, it appears the permittee was in violation of EUCREMATORY01 special condition III.1 on June 10, 2020, June 17, 2020, August 3, 2020, and August 4, 2020. These noncompliances shall be cited in a violation notice.

The temperature records for cremation no. 3652 on August 3, 2020, and cremation numbers 3857 and 3860 on August 4, 2020, do not include continuous temperature records (e.g. charts). The failure to provide continuous temperature records appears to be a violation of VI.5, which states in part, “The permittee shall keep, in a manner satisfactory to the AQD District Supervisor, secondary combustion chamber temperature records for EUCREMATORY01, as required by SC VI.2. The permittee shall keep all records on file and make them available to the Department upon request.” This noncompliance shall be cited in a violation notice.

AP Lazer SN3024
Lenox uses an AP Lazer model SN3024 to engrave wood and marble urns. Even though this device is used about once per week and not for routine production, it does not appear to be exempt from R 336.1201(1) per R 336.1285(2)(l)(vi) because per the Technical Discussion of Michigan’s Air Permitting Exemptions document, the R 336.1285(2)(l)(vi) exemption applies to mechanical processes that generate larger particulates as compared to thermal processes that generate small particulates.

I contacted the AP Lazer equipment manufacturer via their website (https://aplazer.com/) to obtain information on emission rates to determine if this emission unit might be exempt from R 336.1201(1) per R 336.1290 or R

336.1291. Mr. Wytka informed me that the SN3024 has not been manufactured for about a year. Currently, three similar models are available SN2816 (90w laser), SN4024 (100w laser) and SN4836 (100w laser). Mr. Wytka provided the following information for engraving or cutting materials with densities similar to hardwood (~0.41 oz/in3), which I used to estimate uncontrolled particulate emissions:

- Laser cutting head transverse rate: 1 inch per second.
- Depth of laser ablation: 0.5 inch
- Width of laser ablation: 0.05 inch
- The emission unit can operate continuously 24-hours per day.
- Wood (Oak) density per internet search: 0.41 ounces per cubic inch.

Per my calculations using the above parameters, it appears the PTE of PM from this emission unit is approximately 10.1 tons per year. It's important to note that per this inspection, Lenox Cremation operates this emission unit approximately 1-hour per week. Therefore, the permittee might be able to demonstrate compliance per R 336.1290 or may apply for a permit to install. On August 11, 2020, I discussed compliance options with Mr. Harms. Mr. Harms stated that he will submit a permit to install application for the laser engraving process. Per this inspection, the permittee appears to be in violation of R 336.1201(1), for installing the emission unit without an approved permit to install or demonstrating an exemption from R 336.1201(1) applies. This noncompliance shall be cited in a violation notice.

On August 11, 2020, I spoke with Mr. Craig Harms, owner of Lenox Cremation Services of Michigan (P0746). We had a friendly conversation about potentially applicable exemptions and applying for an permit to install for the laser engraving machine. Mr. Harms indicated that he planned on applying for a permit to install

ADDENDUM
On August 12, 2020, I emailed the following response to questions from Lenox:

Regarding our discussion of cremating human remains that contain radioactive materials, this activity may qualify for the R 336.1285(2)(s) exemption which states in part, *"(2) The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following: (s) emissions or airborne radioactive materials specifically authorized pursuant to a United States nuclear regulatory commission license."* Therefore, failure to obtain the aforementioned license before cremating human or animal remains that contain radioactive material may be cited as a violation of the requirement to obtain an air use permit to install per R 336.1201(1).

Regarding excess oxygen, I spoke with Marina Ostaszewski and she confirmed my understanding that the AQD does not currently specify or require a minimum percentage of excess O2 in the cremation combustion chambers or exhaust stack.

I spoke with my supervisor, Joyce Zhu, regarding your question about the secondary combustion chamber minimum operating temperature. We have determined that if the secondary combustion chamber is operating at a minimum of 1600°F and the primary combustion chamber door is opened for the minimum time necessary to insert the charge, the AQD will apply enforcement discretion and not cite a violation of the permit specified 1600° F minimum temperature if the secondary combustion chamber temperature drops below 1600°F for a total duration of two minutes or less per cremation. Please be advised that this determination does not affect the applicability of emission limitations of particulate matter per R 336.1301 and General Condition number 11 of Permit to Install No. 155-16.

CONCLUSION
This is the first AQD inspection of Lenox Cremation Services of Michigan since the permit was approved on November 10, 2016. The cremation unit and associated equipment appear to be properly maintained with the exception of the cited deviations from the minimum operating temperature and recordkeeping deficiencies. Mr. Harms is aware that a violation notice will be issued and has had multiple conversations with me to actively correct the noncompliances in a timely manner.

NAME Robert Dimacchi DATE August 25, 2020 SUPERVISOR Joyce Zhu