K7643
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DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
**ACTIVITY REPORT: On-site Inspection**

K764360280

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| **FACILITY:** MICHIGAN MEMORIAL PARK | | **SRN / ID:** K7643 |
| **LOCATION:** 32163 W HURON RIVER DR, FLAT ROCK | | **DISTRICT:** Detroit |
| **CITY:** FLAT ROCK | | **COUNTY:** WAYNE |
| **CONTACT:** John Fenech , Superintendent | | **ACTIVITY DATE:** 09/28/2021 |
| **STAFF:** C. Nazaret Sandoval | **COMPLIANCE STATUS:** Compliance | **SOURCE CLASS:** MINOR |
| **SUBJECT:** FY 2021 - Scheduled Inspection | | |
| **RESOLVED COMPLAINTS:** | | |

**SRN**: K7643
**SOURCE NAME**: Michigan Memorial Park
**FACILITY ADDRESS**: 32163 W Huron River Dr., Flat Rock
**INSPECTOR**: Nazaret Sandoval, AQD – Detroit District Office
**MAIN CONTACT**: John Fenech, Superintendent Michigan Memorial Park

## 1. BACKGROUND INFORMATION

The Michigan Memorial Funeral Home and the Michigan Memorial Park (Cemetery) in Flat Rock, MI, is set on the banks of the Huron River. The company provides funeral services, cremation, and burial options; all in one area. The property is an extensive area that occupies about 290 acres. The crematory unit is located inside the Funeral Home in an annex built on the west side corner of the original building. The source is located more than 600 feet from the property line. The last inspection of the facility on 1/29/2013, was a few months after the installation of the human crematory permitted under Permit to Install (PTI) No. 127-12, issued on 8/21/2012. During the inspection of 2013 the crematory unit was still under construction.

## 2. EQUIPMENT DESCRIPTION AND OPERATION

The crematory unit located inside the Funeral Home has the following specs:
Make: Matthews
Model: Super-Power-Pak III (IE43-SPP)
Cremation Burner: 600,000 BTU / HR
Afterburner: 1,200,000 BTU / HR
Fuel Type: Natural Gas
Maximum Charge: 750 Pounds
Burn Rate: 200 Pounds/Hour
Charge Type: Human Remains

The Matthews Super-Power-Pack IE43-SPP human crematory, herein "crematory unit", is a dual chamber design (71-cubic feet primary chamber and 104-cubic feet secondary chamber) which is fired with natural gas as an auxiliary fuel. The crematory unit has a maximum burn rate of 200 pounds per hour of remains and the associated container, based on the entire cremation period. It is designed to be manually loaded in batches with maximum load capacity up to 750 pounds. Matthews International Cremation Division, Industrial Equipment & Engineering, Co., the crematory manufacturer, has prescribed specific operating procedures for cremating remains over 350 pounds up to 750 pounds. When the load is over 350 pounds, the operation must be monitored and supervised by Mathew's staff who in turn leads the cremation cycle from start to end.

The remains are typically loaded into the primary chamber and then the secondary chamber is preheated to 1600 °F in 30 minutes using the secondary chamber burner (afterburner). Then, the primary or cremation burner is ignited to begin the cremation cycle. The equipment is designed to complete one human cremation in one hundred and twenty (120) minutes or less. The cremation time does not include preheating the secondary chamber or the cool-down period before the removal of the remains. A cool-down period of 30 minutes or more is recommended at the end of the cremation cycle before removing the cremated remains and loading the next set of remains. Actual cycle time varies with the loading charge, the cremation time and the preheat/cooldown times.

The primary chamber has one Eclipse TJ-75 burner rated at a maximum of 0.6 MM BTU /hour. The secondary chamber has one Eclipse ThermJet Burner model TJ0150 rated at a maximum of 1.2 MM BTU/hour. Combustion safeguard with UV flame sensor is equipped on each burner. The secondary chamber temperature is monitored by a digital controller with the signal coming from a type K thermocouple, which adjusts the after-burner gas input to maintain the desired temperature set point.

**3. INSPECTION NARRATIVE**

On 9/28/2021, at about 11:15 AM, I arrived at the Michigan Memorial Funeral Home located at 32163 W Huron River Dr., Flat Rock MI 48134 and met with John Fenech, Michigan Memorial Park Superintendent.
The purpose of the inspection was to evaluate compliance with the administrative rules promulgated pursuant to Part 55, Air Pollution Control, of Act 451 and the conditions stipulated in the Permit to Install (PTI) 127-12.

At the crematory room Mr. Fenech showed me the unit and explained the sequence of steps that are followed for a body cremation.

Once a casket is brought to the crematory unit the operator enters the following information into the computer console.

- Operator's Name
- Case ID
- Size: That's the weight; generally, from 100 to 200 pounds
- Type of Container: Cardboard, Particle Board, or Hardwood.
- Gender
- Case number of the day: from 1 to 10 (the average is five cases per day)

Once all the data is entered, the operator hits the "Cycle Start" button to activate the automatic controls and start the process. Initially, the burners reach the set point temperatures and thereafter, when the afterburner temperature reaches 1,600 °F, the load-light turns on indicating that it is safe to load the casket. The operator pushes the load button and enters the casket into the retort.

There was a clipboard near the computer console where the operator enters the case number, the exhaust stack temperature (labeled as ceiling temperature). The temperature values for the cases recorded at the time of the visit were from 71 to 81 °F.
Computerized controls regulate the operations of the primary and secondary chambers burners such that the secondary chamber temperature of at least 1600 °F is maintained.
The unit is equipped with cremation heat charts and the system automatically records the

temperature during the cremation cycle from start to end. The operators write on the charts the case ID, the date, the start time, and the loading charge. The logs are kept on file. The crematory unit is equipped with emission control features such as an opacity monitor and controller with visual and audible alarms.

I asked about the collection of the ashes and Mr. Fenech explained that the cremated remains are swept out into a hopper that fills a collection pan. Thereafter, the cremated remains are properly processed in separate equipment, the Therm-Tec processor before its destination, the cemetery, or the families of the deceased.

Refractory materials will wear out over time and need to be repaired or replaced.
I asked about the maintenance and routine inspection of the crematory unit. Mr. Fenech provided records of the most recent inspections and repairs. Details about the records collected will be discussed later in the Compliance Evaluation Section of this report.

There are five certified operators that can operate the crematory unit. They received certification from Mathews' Operations Certification Program.

At the time of the inspection the crematory was not operating. I left the facility at about 2:00 PM.

**4. COMPLIANCE EVALUATION (PTI 127-12)**
The permit includes design, operating and monitoring requirements that are paraphrased and evaluated herein.

The following conditions apply to EU-CREMATORY1

I. EMISSION LIMITS – IN COMPLIANCE
1. The permit limits particulate matters (PM) to 0.20 lb/1,000 lb of gas, corrected to 50 % excess air.

> PM is associated with opacity. Keeping opacity values below the limits of Rule 301(a) as cited under general condition GC.11 of PTI 127-12 requires properly maintained and operated controls (i.e., the afterburner). To access compliance AQD verified that the facility is operating the crematory unit in accordance with manufacturer's recommendations and following the best practice for incinerator operations that are highlighted in Appendix A of the permit. In addition, there is an opacity monitor on the base of the stack and a smoke alarm.

II. MATERIAL LIMITS - IN COMPLIANCE
1. EU-CREMATORY1 is only used to burn human pathological waste and its associated materials, such as the bags/containers used to collect and transport the waste material.

2. The maximum permitted charge to EU-CREMATORY1 is 750 pounds per charge.
In general, the unit operates within the range of 100 to 200 pounds, and rarely, there are cases handling weights above 500 pounds.

3. The facility does not burn any fuel in EU-CREMATORY1 other than natural gas.

III. PROCESS/OPERATIONAL RESTRICTIONS – IN COMPLIANCE

1. The permittee shall not combust waste in EU-CREMATORY1 unless a minimum temperature of 1600°F and a minimum retention time of 1.0 seconds in the secondary combustion chamber are maintained.

Partlow cremation logs are used to continuously record the temperature. Some records were collected during the inspection for four different dates. The cremation heat charts showed that the temperature in the secondary combustion chamber appear to be at or above 1600°F.
The retention time is calculated based on the volume of the secondary chamber and the volumetric rate of the exhaust at the actual exit temperature (1600 F). There have not been changes in those two parameters; therefore, the estimated retention time in the secondary combustion chamber is around 3 seconds (as originally estimated), which is above 1 second.

2. The incinerator shall be installed, maintained, and operated in a satisfactory manner to control emissions from EU-CREMATORY1. A list of recommended operating and maintenance procedures is specified in Appendix A.

All the conditions listed in Appendix A were verified with Mr. Fenech and it appears as if most off the listed recommendations are followed. Visual inspection the unit is conducted by the operators at the end of each month to check and verify if service is required. Annual detailed inspections are conducted by specialized technicians (refer to most recent inspection records under condition VI.4 below)

IV. DESIGN/EQUIPMENT PARAMETERS – IN COMPLIANCE

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature in the secondary combustion chamber of EU-CREMATORY1 on a continuous basis.

The temperature in the secondary combustion chamber is monitored using a thermocouple. There are two thermocouple replacements in storage, readily available at the site if there is a thermocouple malfunction. Mr. Fenech brought me to the storage area where the parts inventory are kept, for maintenance and repairs.

2. The permittee shall maintain a properly calibrated scale at the facility, for the purpose of verifying the charge weight as required by SC II.2.

The scale is calibrated once a year

V. TESTING/SAMPLING – NA

VI. MONITORING/RECORDKEEPING – IN COMPLIANCE
Records shall be maintained on file for a period of five years.

1. The permittee shall monitor and record the temperature in the secondary combustion chamber of EU-CREMATORY1 on a continuous basis.
2. The permittee shall keep, in a satisfactory manner, daily records of the time (duration of burn), description and weight of waste combusted in EU-CREMATORY1, as required by SC II.1 and SC II.2. The permittee shall keep all records on file and make them available to the Department upon request.

3. The permittee shall keep, in a satisfactory manner, secondary combustion chamber temperature records for EU-CREMATORY1, as required by SC VI.1. The permittee shall keep all records on file and make them available to the Department upon request.

SC VI.1, VI.2 and SC VI.3
Computerized controls regulate the operations of the primary and secondary chambers burners such that the secondary chamber temperature of at least 1600 ºF is maintained. The unit is equipped with cremation heat charts and the system continuously and automatically records the temperature during the cremation cycle from start to end. The operators write on the charts the case ID, the date, the start time, and the loading charge. The logs are kept on file and were available for review. Sample records were provided when requested.

4. The permittee shall keep, in a satisfactory manner, a record of all service, maintenance and equipment inspections for EU-CREMATORY1. The record shall include the description, reason, date and time of the service, maintenance or inspection. The permittee shall keep all records on file and make them available to the Department upon request.

The facility keeps records of the routine maintenance performed to the equipment. They do in-house routine inspections of the main components of the crematory unit in accordance with the manufacturer 's specs, but a more detailed inspection is conducted by specialized services. During the inspection I collected excerpts of records for the most recent inspections and repairs.

One of the records showed the outcomes of an inspection performed by an incinerator service company on 3/19/2020. The following components were inspected on that date: the primary and secondary chambers, the exhaust stack, and the refractories. The inspector described in detail his observations and the recommended repairs. A CD with pictures and a complete report was provided to the facility. According to the summary, the overall condition of the chambers and refractory were rated acceptable to good. All walls, hearth (crematory floor), piers, tiles and roof were intact and exhibit some waving, cracking, spalling, and loosening, as happens in any large temperature changing structure. Patching and replacements were undertaken, and the unit is in good operating condition.

A separate record dated 4/28/2021, showed work done at the cremation furnace; specifically, the repair of a crack between the heart (the floor) and the side wall of the refractory furnace.

Another record reported the repairs completed on 6/20/2021 after an inspection completed by Matthews on 2/18/2021. The worked completed in June 2021 consisted of the upgrade of the previous ACE computer mod to a Siemens PC-mod.

VII. REPORTING - NA

VIII. STACK/VENT RESTRICTIONS – IN COMPLIANCE

There have been no changes to the original dimensions of the stack that was permitted by PTI 127-12. The exhaust gases from the 20-inch diameter x 28-feet high stack (SV-CREMATORY), discharges unobstructed vertically upwards to the ambient air.

## 5. CONCLUSION

As a result of the inspection of the crematory unit located at the Michigan Memorial Funeral Home, AQD concludes that the operation of the unit is in substantial compliance with the administrative rules promulgated pursuant to Part 55, Air Pollution Control, of Act 451 and the conditions stipulated in the Permit to Install (PTI) 127-12.

NAME C Handoval DATE 1/31/2022 SUPERVISOR JK