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

N685961496

FACILITY: Irwin Cremation Service L.L.C.		**SRN / ID:** N6859
LOCATION: 51528 SchoenherrRd, SHELBY TWP		**DISTRICT:** Warren
CITY: SHELBY TWP		**COUNTY:** MACOMB
CONTACT: Craig Irwin ,		**ACTIVITY DATE:** 01/07/2022
STAFF: Adam Bognar	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MINOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

On January 7, 2022, Michigan Department of Environment, Great Lakes, and Energy– Air Quality Division (EGLE-AQD) Staff, I, Adam Bognar conducted a scheduled inspection of Irwin Cremation Service (the "facility"), located at 51528 Schoenherr Road, Shelby Charter Township, MI 48315. The purpose of this inspection was to determine the facility's compliance status with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes, and Energy (EGLE-AQD) rules; and Permit to Install (PTI) No. 263-00A.

I arrived at the facility at around 10 am. I met with Mr. Craig Irwin, Owner (irwincremationsvc@att.net, Cell: 586-243-5754). I identified myself and stated the purpose of the inspection. Mr. Irwin is the owner and the only employee. The furnaces normally operate once in the morning from approximately 8 am to 1 pm and again in the evening from approximately 2 pm to 6 pm. Mr. Irwin provided me with the records I requested and gave me a tour of the facility.

Irwin Cremation Service operates two crematory furnaces. Both are used to cremate human remains (no animals). The first crematory furnace, manufactured by Matthews Cremation Division, was installed in 2000. The second crematory furnace, manufactured by Matthews Cremation, was installed in 2013. Both furnaces operate in a very similar manner. Both furnaces are serviced by Mr. Irwin or by Matthews Cremation if necessary.

Prior to cremation, remains are kept in cardboard boxes near the furnaces. The cardboard boxes are inserted into the furnace along with the remains. After the cremation, the cremated remains (cremains) are transferred to a grinding station where they are cooled, screened for metals using a magnet, ground to a fine dust, then boxed into an urn/box for the family to pick up. Any metals collected such as hip replacements are recycled at a nearby scrap yard.

PTI No. 263-00A

PTI No. 263-00A was issued on August 30, 2013 for a Matthew's Cremation Division Power Pak II Natural gas cremator and a Matthews Cremation Division Power Pak III Plus natural gas cremator. Both furnaces are operated in the same way. Before the remains are charged to the furnace, the secondary combustion chamber is pre-heated until it reaches 1600+°F. Remains are charged into the primary chamber of the furnace through a steel door at the front of the furnace. As the cremation proceeds, the combustion gases travel out of the primary combustion chamber into the secondary combustion chamber where they are further combusted. The goal of the secondary combustion chamber is to ensure complete combustion. Incomplete combustion of remains can lead to fallout, odors, hazardous emissions, and heavy smoke; all of which can be upsetting to neighbors of the facility and/or relatives of the deceased.

Both furnaces are equipped with an opacity alarm. If the opacity gets too high, the primary burner is shut off while the secondary burner keeps running. This allows the secondary combustion chamber to "catch up". These alarms are calibrated approximately every six months. Mr. Irwin performs the calibrations himself by holding tinted glass in front of the opacity sensor and comparing the opacity reading to a known value. Neither furnace is equipped with a probe to monitor excess oxygen in the exhaust gas.

EUCREMATORY1 - Matthews Cremation Division Power Pak II – Installed around 2000

Section I - Special Condition (SC) 1: Limits Particulate Matter (PM) emissions to 0.20 lbs/1000 lbs of exhaust gases, corrected to 50% excess air. Compliance with this condition is determined by monitoring the opacity of the furnace exhaust. This furnace was operating during this inspection. I walked behind the facility with Mr. Irwin to observe the stack. I did not notice any opacity. Mr. Irwin stated that he frequently checks the stacks for opacity. I noticed footprints in the snow indicating that Mr. Irwin has frequently done these checks. An opacity sensor is present on each machine that will adjust the combustion parameters to mitigate excess opacity.

Section II – SC 1: States that the permittee shall only burn pathological wastes in the incinerator. Mr. Irwin stated that only pathological wastes are burned. The records I reviewed indicate that only human remains are burned at this facility. Human remains and the boxes (wood/cardboard) used to transport the remains are the only waste burned at this facility. No animal remains are burned.

Section III – SC 1: States that the permittee shall not combust waste in the incinerator unless a minimum temperature of 1600 °F and a minimum retention time of 1.0 seconds in the secondary combustion chamber are maintained. This furnace was operating during this inspection with a secondary combustion chamber temperature of 1723°F. Mr. Irwin stated that the furnace is always operated above 1600°F during cremation when a body is in the furnace.

In my previous inspection, Mr. Irwin stated that he inserts the remains when the temperature is at 1200°F and lets the temperature climb to 1700°F once combustion begins. This was the case with both furnaces. I informed Mr. Irwin that this was a violation of his permit to install. At AQD discretion, no violation notice was issued. Mr. Irwin stated that he was operating the furnace according to manufacturer's guidelines and wasn't sure if he could get it up to temperature before inserting the waste. AQD confirmed with Matthews Cremation that starting a cremation at 1200°F has been a recommended practice in the past. According to Matthews Cremation, many older furnaces (generally older than 2001) are not necessarily equipped to start primary combustion with a secondary combustion chamber temperature as high as 1600°F.

Mr. Irwin applied for a permit modification to allow for a lower secondary combustion temperature during startup. This application was withdrawn after Mr. Irwin discovered he was able to make modifications to the furnace settings to achieve the 1600°F secondary combustion chamber temperature required by PTI No. 263-00A. The circular chart records I reviewed show that the secondary combustion chamber temperatures are operated above 1600°F at all times during combustion.

Section III – SC 2: States that the incinerator shall be installed, maintained, and operated in a satisfactory manner to control emissions. Irwin cremation appears to comply with this condition through compliance with the following permit conditions under EUCREMATORY1 of PTI No. 263-00A: Section I - SC 1; Section II – SC 1; Section III – SC 1; Section VI – SC 1,2, & 3; and SC VIII - SC 1.

Section IV – SC 1: Requires that the permittee install, calibrate, maintain, and operate a device to monitor and record the secondary combustion chamber temperature. This machine has a thermocouple that continuously monitors the secondary combustion chamber temperature and reports this data to a circular chart recorder.

This chart recorder was recently installed in early 2021 after my previous inspection indicated that no chart recorder was present. No violation notice was issued at the time because Mr. Irwin purchased a chart recorder and installed it quickly after my inspection. Mr. Irwin provided pictures of the chart recorder to verify the installation on April 27, 2021.

Thermocouples are changed as needed by Mr. Irwin. Mr. Irwin stated that thermocouples have a highly variable lifespan. It appears that the only reasonable way to tell when a thermocouple is ready to be replaced is by waiting for it to malfunction. Mr. Irwin keeps two extra thermocouples on-site for quick replacement.

I reached out to Mr. Michael Tricoche (mtricoche@matthewsintl.com) of Matthew's Cremation about best practices for thermocouple maintenance and replacement. Mr. Tricoche confirmed that the best way to maintain thermocouples is to replace them. He explained that there are no warning signs to predict when a thermocouple

will fail. When a thermocouple fails it usually will show an unusually high temperature and stay at that temperature without variation. Thermocouples can be replaced while the furnace is on.

I also reached out to another Michigan based crematory operating a similar Matthew's Cremation furnace. They stated that their thermocouples generally fail after a cremation such that they only notice the malfunction when they re-start the furnace for the following cremation case. They also confirmed that their thermocouples fail after an undeterminable amount of time.

Section VI – SC 1,2,3: Specifies recordkeeping requirements for the incinerator. The facility must keep records of the time, description, and weight of waste combusted in the incinerator. Additionally, the facility must keep continuous temperature data for the secondary combustion chamber during each of these combustions.

Mr. Irwin was able to provide me with these records during the inspection. These records are not kept digitally. The facility maintains hand-written logs of each cremation case. I randomly reviewed cremation case records from January 2021 to present. The facility notes the name of the deceased, the weight of the body, and the start time of each cremation.

Circular chart records indicate that the secondary combustion temperature is always kept above 1600°F during waste combustion. The secondary combustion chamber temperature is usually kept around 1700°F. The temperature charts look consistent with no large variances during combustion. Occasionally, a heavier cremation case will cause the secondary combustion chamber temperature to spike higher during the first 30 minutes or so of cremation. Mr. Irwin stated that he has seen a trend toward heavier cremation cases since the Covid-19 pandemic started.

Section VIII – SC 1: Specifies stack dimension requirements. I did not verify stack dimensions during this inspection. Both furnace stacks appear to be exhausted unobstructed vertically upwards to the ambient air.

EUCREMATORY2 - Matthew's Cremation Division Power Pak III Plus – Installed 2013

Section I - Special Condition (SC) 1: Limits Particulate Matter (PM) emissions to 0.20 lbs/1000 lbs of exhaust gases, corrected to 50% excess air. Compliance with this condition is determined by monitoring the opacity of the furnace exhaust. An opacity sensor is present on each machine that will adjust the combustion parameters to mitigate excess opacity. This furnace was operating during this inspection. I walked outside to observe the stack during operation. I did not notice any opacity coming from the stack.

Section II – SC 1: States that the permittee shall only burn pathological wastes in the incinerator. Mr. Irwin stated that only pathological wastes are burned. The records I reviewed indicate that only human remains are burned at this facility. Human remains and the boxes (wood/cardboard) used to transport the remains are the only waste burned at this facility. No animal remains are burned.

Section II – SC 2: Limits the charge size to this furnace to 750 lbs. Mr. Irwin stated that he does not accept cases larger than 500 lbs. I did not see any cases larger than 500 lbs in the cremation case records I reviewed.

Section II – SC 3: States that the permittee shall not burn any fuel in the furnaces other than natural gas. According to Mr. Irwin both furnaces at this facility are designed to burn only natural gas. I observed that the natural gas meter outside the facility showed that natural gas is being utilized while the furnaces are on.

Section III – SC 1: States that the permittee shall not combust waste in the incinerator unless a minimum temperature of 1600 °F and a minimum retention time of 1.0 seconds in the secondary combustion chamber are maintained. This furnace was operating during my inspection. The secondary combustion temperature during this inspection was at 1650°F.

Section III – SC 2: States that the incinerator shall be installed, maintained, and operated in a satisfactory manner to control emissions. Irwin cremation appears to comply with this condition through compliance with

EUCREMATORY2 of PTI No. 263-00A: Section I - SC 1; Section II – SC 1,2 &3; Section III – SC 1; Section IV - SC 1; Section VI – SC 1,2,3,4,5 & 6.

Section IV – SC 1: Requires that the permittee install, calibrate, maintain, and operate a device to monitor and record the secondary combustion chamber temperature. This machine is equipped with a circular chart recorder that continuously records secondary combustion temperature. Thermocouples are changed as needed by Mr. Irwin. Mr. Irwin keeps two extra thermocouples on-site for quick replacement.

The circular chart recorder readings were also made available to me during my inspection. I reviewed chart recorder records randomly from January 2021 to present. Based on these charts it appears that the secondary combustion chamber temperature readings are regularly kept above 1600°F. I did not notice any instance where the combustion chamber temperature fell below 1600°F during combustion in the records I reviewed. The secondary combustion chamber gets up to temperature quickly in a straight line upwards on the chart. The temperature appeared to be consistent during combustion with no large fluctuations. The secondary combustion temperature in this furnace is normally maintained at 1650°F.

Section VI – SC 1,2,3,4,5,6: Specifies recordkeeping requirements for EUCREMATORY2. The facility must keep records of the time and weight of waste combusted in the incinerator. Additionally, the facility must keep continuous temperature data for the secondary combustion chamber during each of these combustions.

Mr. Irwin was able to provide me with these records during the inspection. These records are not kept digitally. The facility maintains hand-written logs of each cremation. I reviewed records from January 2021 to present. The facility notes the name of the deceased, the weight of the body, and the start time of each cremation. Maintenance records are maintained. These records show that a new thermocouple was purchased in December 2021. Mr. Irwin installed this thermocouple on EU-CREMATORY2 himself. Quarterly records of the periods of time when pathological waste is combusted are maintained. Only pathological waste is burned at this facility, and it is burned every quarter.

Incinerator Operation and Maintenance Guidelines

PTI No. 263-00A contains a list of operation and maintenance guidelines. I went through this list with Mr. Irwin to see how he operates this facility.

- A trained operator, Mr. Irwin, is responsible for doing basic maintenance checks on the incinerator such as cleaning spark plugs, replacing thermocouples, and greasing bearings.
- Grates are cleaned before each cremation
- Waste is currently combusted once the furnace secondary combustion chamber temperature reaches at least 1600°F.
- Mr. Irwin stated that bodies larger than 500 lbs are not accepted in either furnace.
- The charge doors are only opened about 4 inches towards the end of the cremation to check and make sure the remains are fully burned. Mr. Irwin stated that he has had occasional (approximately once per year) pacemaker explosions in his furnaces, but that the furnaces have not been damaged by these events.
- Only human remains are combusted in these furnaces.
- Combustion air ratios are adjusted as needed by Matthews Cremation during annual/biannual maintenance. A new Belimo air flow valve was installed in October 2021. In the newer furnace, Matthews Cremation can remote into the furnace software and adjust the air flow ratio if needed. Mr. Irwin said he can tell when the air flow ratio is off based on the sound of the combustion burners.
- Mr. Irwin stated that he periodically observes the stacks to watch for signs of opacity. The stack is visible during normal business hours for the purpose of doing Method 9 readings.
- A copy of the manufacturer's manual is kept in Mr. Irwin's office.
- Basic maintenance is performed by Mr. Irwin on an as needed basis such as cleaning spark plugs and greasing bearings. Full maintenance checks by a crematory expert are generally conducted annually by Matthews Cremation. Mr. Irwin stated that he conducts quarterly inspections of critical

furnace components. I asked Mr. Irwin to begin keeping records of the date, any issues noted, and any maintenance performed when he conducts these inspections.

Compliance Determination

Irwin Cremation Services is operating in compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes, and Energy (EGLE-AQD) rules; and Permit to Install (PTI) No. 263-00A.

NAME Adam Bogros DATE 1/24/2022 SUPERVISOR K. Kelly