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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3366
Plant ID No.:	077-00108
Applicant:	Luke Massey Pet Cremation Service, LLC
Facility Name:	Arthurdale Facility
Location:	Arthurdale, Preston County, WV
NAICS Code:	812210
Application Type:	Construction
Received Date:	April 28, 2017
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1000.00
Date Received:	April 28, 2017
Completeness Date:	May 18, 2017
Newspaper:	*The Dominion Post*
Applicant Ad Date:	May 01, 2017
UTMs:	Easting: 601.242 km Northing: 4,373.644 km Zone: 17
Description:	Construction and operation of a pet crematory.

DESCRIPTION OF PROCESS

The proposed unit is a Cremation Systems Model CFS2300-Pet cremation chamber. It is a dual chamber design with a primary chamber and a secondary chamber. The rated capacity of the incinerator is 100 lb/hr with a maximum of 300 lb Batch Load Capacity. The animal remains are placed in the primary chamber, where the remains are incinerated. Products of combustion from the main chamber flow into a U-shaped afterburner chamber located beneath the main chamber. Any combustible gases produced in the main chamber are combusted in the afterburner chamber. Additional air is added through the burner in the afterburner chamber as required when smoke is detected by the opacity monitor located at the entry to the flue. The batch process has a total time of 2.5 hours.

SITE INSPECTION

A site inspection of the location for the proposed facility was conducted by the writer on June 1, 2017. The proposed facility will be located in the backyard of the owner/operator. The area is rural/residential with the closest occupied dwelling (other than the applicants own house) being approximately 100 yards away from the proposed site. To get to the facility take I-79 north to exit 119. Take US Route 50 east approximately 28 miles and turn left on Route 92. Take Route 92 north for approximately 13.3 miles and turn left on A Road. Next, go approximately 0.7 miles and turn right on D road. Take D road approximately 0.2 miles and the driveway is on the left. Take the driveway around the house to the proposed site. Below is a picture taken during the site inspection. The orange flags mark the location where the 24 foot by 24 foot building will be.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The applicant presented emission estimates based on actual stack test results from an identical crematory conducted by TRC Environmental Corporation. The testing was performed in Lake Villa, Illinois on January 27, 2015. The estimates are presented in the following table:

Pollutant	Hourly Rate	Annual Emissions
	lb/hr	TPY
Particulate Matter (PM/PM_{10})	0.03	0.14
Sulfur Dioxide (SO_2)	0.09	0.40
Oxides of Nitrogen (NO_x)	0.24	1.06
Carbon Monoxide (CO)	0.01	0.05
Volatile Organic Compounds (VOCs)	0.01	0.05

REGULATORY APPLICABILITY

The following state regulations apply.

45CSR6 - To Prevent and Control Air Pollution From Combustion of Refuse

The purpose of this rule is to prevent and control air pollution from combustion of refuse. The permittee has proposed to install and operate one animal remains crematory. This rule defines incineration as the destruction of combustible refuse by burning in a furnace designed for that purpose. The proposed crematory is designed to destroy animal remains and associated containers through incineration. Thus, it meets this definition.

Per section 4.1, these crematories must meet the particulate matter limit by weight. The animal crematory will have an allowable particulate matter emission rate of 0.27 pounds per hour (based on maximum design-incineration rate of 100 lb/hr). This allowable rate is higher than the actual test result of 0.03 lb/hr. Thus, the unit should be more than capable of meeting this PM standard.

The crematory is subject to the 20% opacity (visible emission) limitation in section 4.3 of this rule. The opacity and the allowable limits should be met since the crematory is equipped with a secondary chamber with the afterburner, which is designed to reduce the particulate matter and other pollutants entrained in the exhaust stream into products of complete combustion.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The potential-to-emit from the proposed crematory is below 6 pounds per hour and 10 tons per year for all of the criteria pollutants, which is less than the permit trigger level as defined in 45CSR§13-2.24.b. However, Rule 6 requires all incinerators to obtain a construction or modification permit regardless of size. Luke Massey Pet Cremation Service, LLC has proposed to install a crematory, which is subject to Rule 6. Therefore, the facility is required to obtain a permit as required in 45CSR§6-6.1. and 45CSR§13-2.24.a. The facility has met the applicable requirements of this rule by publishing a Class I Legal Advertisement in *The Dominion Post* on May 01, 2017, paid the $1,000.00 application fee, and submitted a complete permit application.

45CSR22 - Air Quality Management Fee Program

The Luke Massey Pet Cremation Service will not be classified as a major source of hazardous air pollutants or have the potential to emit 100 tons per year or greater of any criteria pollutants, which is the Title V major source trigger level. In addition, the emission unit is not subject to a New Source Performance Standard. Thus, the facility is not subject to Title V and will not be required to obtain an operating permit under 45CSR30. Therefore, the Arthurdale facility will be classified as a "9B - Crematory Incinerator" source as defined in 45CSR22.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Only trace amounts of non-criteria regulated pollutants will be emitted from this facility. These are acetaldehyde, arsenic, antimony, beryllium, cadmium, chromium, copper, formaldehyde, hydrogen chloride, lead, and mercury. Only the metals, (i.e. cadmium, chromium, mercury, etc.) and hydrogen chloride would not be controlled by the afterburner (secondary chamber).

Under EPA's IRIS program, hydrogen chloride (hydrochloric acid) has undergone a complete evaluation and determination for evidence of human carcinogenic potential. Reference concentration for chronic inhalation exposure to HCl was determined to be 0.02 mg/cu.m. In general, the reference concentration is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure of the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. The file contains summaries of the IRIS database information on hydrogen chloride and mercury. For a complete discussion of the known health effects, refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed construction does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

For the purposes of ensuring compliance with the proposed emissions limits and applicable rules, the facility will be required to monitor and record the following:

* Weight of each charge/batch per cremation.

* Temperature of the afterburner chamber on a continuous basis for each cremation.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application and the conditions set forth in the permit indicates this pet crematory should meet all applicable state rules and federal regulations when operated. Therefore, this writer recommends that a Rule 13 Construction Permit be granted to Luke Massey Pet Cremation Service, LLC for their proposed crematory in Arthurdale, Preston County.

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Steven R. Pursley, PE
Engineer

June 6, 2017
Date