

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **072010-005** Project Number: 2010-04-003

Parent Company: Heckart Funeral Home

Parent Company Address: 903 South Ohio Ave., Sedalia, MO 65301

Installation Name: Heckart Funeral Home

Installation Number: 159-0069

Installation Address: 903 South Ohio Ave., Sedalia, MO 65301

Location Information: Pettis County, S4, T45N, R21W

Application for Authority to Construct was made for:
Installation of one Therm-Tec Model SQC-300 human crematorium and one Therm-Tec Model S-27-T animal incinerator. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JUL 14 2010

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James L. Kawanchuk".

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Project No.	2010-04-003

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Heckart Funeral Home
Pettis County, S4, T45N, R21W

1. Process Requirements for the Human Crematory (EP-01)
 - A. Heckart Funeral Home shall burn exclusively non-infectious human bodies or body parts (as defined in the Installation Description) and containers not containing chlorine.
 - B. Charging of remains between burn cycles is prohibited.
 - C. Heckart Funeral Home shall maintain an accurate record of the weight and incineration time of each batch combusted at this installation. Attachment A or a form approved by the Air Pollution Control Program shall be used for this purpose.
 - D. The crematory shall be equipped with a continuous chart recorder that monitors, displays and records the temperature in the final combustion chamber with an accuracy of two percent ($\pm 2\%$).
 - E. Heckart Funeral Home shall maintain the temperature in the final combustion chamber at or above 1,500 degrees Fahrenheit.
2. Process Requirements for the Pet Crematory (EP-02)
 - A. Heckart Funeral Home shall burn exclusively non-infectious animal carcasses or body parts (as defined in the Installation Description) and containers not containing chlorine.
 - B. Charging of remains between burn cycles is prohibited.
 - C. Batch weight shall not exceed 450.0 pounds of remains.
 - D. Remains shall be incinerated at a rate not exceeding 75.0 pounds per hour.
 - E. Attachment B or a form approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.C and 2.D.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- F. The crematory shall be equipped with a continuous chart recorder that monitors, displays and records the temperature in the final combustion chamber with an accuracy of two percent ($\pm 2\%$).
 - G. Heckart Funeral Home shall maintain the temperature in the final combustion chamber at or above 1,400 degrees Fahrenheit.
3. **Opacity**
The crematories (EP-01 and EP-02) shall individually have opacity of less than ten percent (10%) at all times.
4. **Requirements for Operators of the Human and Pet Crematories (EP-01 and EP-02)**
- A. All crematory operators shall attend a training program equivalent to that developed by the American Society of Mechanical Engineers (ASME), by the crematory manufacturer or by an individual with more than one (1) year experience in the operation of the crematory. The training shall include basic combustion theory, operating procedures, monitoring of combustion control parameters and all emergency procedures to be followed if the crematory should malfunction or exceed operating parameters.
 - B. The crematory operator shall have the essential steps necessary for satisfactory operation of the crematory readily available in a manual.
5. **Restriction of Emission of Odors**
If a continued situation of verified nuisance odors exists in violation of 10 CSR 10-3.090, the Director may require through written notice that Heckart Funeral Home submit within ten days a corrective action plan adequate to timely and significantly mitigate the odors. Heckart Funeral Home shall implement any such plan immediately upon its approval by the Director. Failure to either submit or implement such a plan shall be in violation of this permit.
6. **Record Keeping and Reporting Requirements**
- A. Heckart Funeral Home shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used.
 - B. Heckart Funeral Home shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2010-04-003
Installation ID Number: 159-0069
Permit Number:

Heckart Funeral Home
903 South Ohio Ave.
Sedalia, MO 65301

Complete: April 1, 2010

Parent Company:
Heckart Funeral Home
903 South Ohio Ave.
Sedalia, MO 65301

Pettis County, S4, T45N, R21W

REVIEW SUMMARY

- Heckart Funeral Home has applied for authority to install one Therm-Tec Model SQC-300 human crematorium and one Therm-Tec Model S-27-T animal incinerator.
- A small amount of Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are from the combustion of remains and natural gas. Potential mercury emissions from the human cremator are above the Screening Model Action Level (SMAL).
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Afterburners installed by the manufacturer are being used in association with the new equipment, as control devices.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of criteria pollutants are below de minimis levels. Section (1)(B) requires all incinerators to obtain construction permits.
- This installation is located in Pettis County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.

- Ambient air quality modeling was performed for the human crematorium to determine the ambient impact of mercury.
- Emissions testing are not required for the equipment proposed in this project.
- A Basic Operating Permit application is required for this installation within 30 days of equipment startup according to 10 CSR 10-6.065 Operating Permits (1)(B).
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Heckart Funeral Home is located at 903 South Ohio Avenue in Sedalia, Missouri. No permits have been issued to Heckart Funeral Home from the Air Pollution Control Program. All incinerators are required to obtain both a construction permit and an operating permit from the Air Pollution Control Program as mandated in 10 CSR 10-6.060(1)(B) and 10 CSR 10-6.065 (1)(B). A basic operating permit is required for this installation.

PROJECT DESCRIPTION

Heckart Funeral Home is installing one Therm-Tec Model SQC-300 human crematorium (EP-01) and one Therm-Tec Model S-27-T animal incinerator (EP-02). Both units have a primary and secondary/afterburner chamber, and are fueled by natural gas.

The human crematory is a multiple chamber design and has a rated capacity of 100 pounds per hour. The crematory will be fired solely by natural gas. The burner for the crematory's main chamber is rated at 1.36 MMBtu per hour and the burner for the secondary chamber is rated at 2.4 MMBtu per hour.

The pet crematory is also a multiple chamber design and has a rated capacity of 75 pounds per hour. Natural gas is used to power the unit and has a maximum heat input rate of 0.89 MMBtu/hr.

Stack test requirements include that a crematory achieve a combustion efficiency of 99.9%, that the maximum particulate concentration in the crematory's stack gas is less than 0.09 grains per dry standard cubic feet and that the crematory's opacity does not exceed 10%. These requirements were developed to ensure proper combustion. The proposed crematories have met these requirements as shown in prior testing at other facilities using the same incinerator models.

The human crematory is permitted to cremate non-infectious human bodies and body parts. The animal crematory is permitted to cremate non-infectious animal carcasses and body parts. The Air Pollution Control Program's definition of the term "non-infectious human bodies and body parts" is human bodies and body parts that do not fit the definition of medical/infectious waste as defined in the Code of Federal Regulations, 40 CFR 60.51, *Standards of Performance for New Stationary Sources*, Subpart Ec— "Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which

Construction is Commenced After June 20, 1996". The Air Pollution Control Program's definition of the term "non-infectious animal carcasses and body parts" is animal carcasses and body parts that do not fit the definition of medical/infectious waste as defined in the aforementioned rule. The rule defines medical/infectious waste as:

Medical/infectious waste means any waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals that are listed in paragraphs (1) through (7) of this definition. The definition of medical/infectious waste does not include hazardous waste identified or listed under the regulations in part 261 of this chapter; household waste, as defined in §261.4(b)(1) of this chapter; ash from incineration of medical/infectious waste, once the incineration process has been completed; human corpses, remains, and anatomical parts that are intended for interment or cremation; and domestic sewage materials identified in §261.4(a)(1) of this chapter.

- (1) Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.
- (2) Human pathological waste, including tissues, organs, and body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.
- (3) Human blood and blood products including:
 - (i) Liquid waste human blood;
 - (ii) Products of blood;
 - (iii) Items saturated and/or dripping with human blood; or
 - (iv) Items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, and other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis or the development of pharmaceuticals. Intravenous bags are also included in this category.
- (4) Sharps that have been used in animal or human patient care or treatment or in medical, research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips.
- (5) Animal waste including contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals or testing of pharmaceuticals.

- (6) Isolation wastes including biological waste and discarded materials contaminated with blood, excretions, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.
- (7) Unused sharps including the following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

EMISSIONS/CONTROLS EVALUATION

For the human crematory, the emission rates for particulate matter less than ten microns in aerodynamic diameter (PM₁₀), carbon monoxide (CO) and nitrogen oxides (NO_x) were obtained from stack tests performed on a Therm-Tec SQC-300 crematory at installations in Vancouver, WA and San Leandro, CA. Emissions of sulfur dioxide (SO_x) were calculated using the emission factor from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition Table 1.4-2. Volatile organic compound (VOC) emissions were calculated using an emission factor from Factor Information Retrieval (FIRE) source classification code (SCC) 5-02-001-01. The emission factors used in the analysis of HAP emissions were obtained from FIRE for SCC 3-15-021-01.

For the pet/animal crematory, the emission rates for PM₁₀ and CO were obtained from the pet model stack test performed in Sherwood, OR. Emissions of SO_x, VOC, and HAP were calculated using the same emission factors as the human crematory, except mercury was not considered emitted. Significant mercury emissions would be present only from combusting human remains containing mercury dental amalgam fillings. Emissions of NO_x were calculated using FIRE SCC 5-02-001-01.

As this installation has not previously been reviewed by the Air Pollution Control Program, there are no existing potential or actual emissions. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year). The following table provides an emissions summary for this project.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Potential Emissions of EU-01	Potential Emissions of EU-02	Potential Emissions of the Installation	New Installation Conditioned Potential
PM ₁₀	15.0	0.57	0.31	0.88	N/A
SO _x	40.0	0.04	0.01	0.05	N/A
NO _x	40.0	2.85	0.49	3.34	N/A
VOC	40.0	0.66	0.49	1.15	N/A
CO	100.0	0.18	0.03	0.21	N/A
Combined HAPs	25.0	0.22	0.16	0.38	N/A
Mercury	¹ 0.01	0.01	N/A	0.01	N/A

N/A = Not Applicable

¹ Screening Model Action Level (SMAL)

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of criteria pollutants are below de minimis levels. Section (1)(B) requires all incinerators to obtain construction permits.

APPLICABLE REQUIREMENTS

Heckart Funeral Home shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

AMBIENT AIR QUALITY ANALYSIS

In accordance with Missouri State Rules 10 CSR-6.060 paragraph (5)(D)2, a Screen 3 modeling analysis was performed to determine if the Risk Assessment Level (RAL) for mercury emissions from the human crematory (EP-01) would be exceeded at or beyond the property line of the Heckart Funeral Home facility. The analysis was performed using the Lakes Environment software package *Screen View*, version 3.0.0, which uses Screen3 dispersion modeling. The emission rate for mercury is 0.00219 pounds per hour. The distance from the stack to the property line is approximately 23 feet. The results of the analysis, listed in Table 1, show that the maximum concentration of mercury for both the annual and twenty-four (24) hour averaging times are expected to be less than the Risk Assessment Levels (RAL). The stack parameters as provided by the applicant are listed in Table 2.

Table 2: Ambient Impact Analysis of Mercury

Averaging Time	Risk Assessment Levels ($\mu\text{g}/\text{m}^3$)	Modeled Impact ($\mu\text{g}/\text{m}^3$)
24-hour	0.14	0.0113
Annual	0.07	0.0023

Table 3: Stack Parameters

Stack No.	Height (ft)	Diameter (ft)	Temperature (F)	Velocity (feet/min)
EP-01	22.75	2.33	1,195	16.25

As indicated in the above table, mercury emissions from the equipment added under this permit are expected to be in compliance with the RALs.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

 Susan Heckenkamp
 Environmental Engineer

 Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 26, 2010, received April 1, 2010, designating Heckart Funeral Home as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- FIRE
- Stack test report on Therm-Tec Model SQC-300 in San Leandro, CA on May 5, 1995
- Stack test report on Therm-Tec Model SQC-300 in Vancouver, WA on June 13, 2006
- Stack test report on Therm-Tec Model S-27 in Sherwood, OR on January 22 & 23, 2002
- Kansas City Regional Office Site Survey, June 2, 2010.

