



Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

P. O. Box 200901

Helena, MT 59620-0901

(406) 444-2544

Website: www.deq.mt.gov

July 17, 2008

Captain Tim Shanks
Support Services Bureau
Great Falls Animal Shelter
1010 25th Avenue NE
Great Falls, MT 59404

Dear Captain Shanks:

Air Quality Permit #3082-01 is deemed final as of July 17, 2008, by the Department of Environmental Quality (Department). This permit is for an animal shelter crematorium. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-3490

Christine A. Weaver
Air Quality Specialist
Air Resources Management Bureau
(406) 444-5287

VW: cw
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Air Quality Permit #3082-01

Great Falls Animal Shelter
1010 25th Avenue NE
Great Falls, MT 59404

July 17, 2008



AIR QUALITY PERMIT

Issued to: Great Falls Animal Shelter
1010 25th Avenue NE
Great Falls, MT 59404

Permit #3082-01
Administrative Amendment (AA)
Request Received: 4/03/08
Department Decision on AA: 07/01/08
Final Permit: 07/17/08
AFS: 013-0031

An air quality permit, with conditions, is hereby granted to the Great Falls Animal Shelter (Animal Shelter) pursuant to Sections 75-2-204, 211, and 215, Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

The City of Great Falls operates the Animal Shelter crematorium located in the Northwest ¼ Section 36, Township 21 North, Range 3 East, in Cascade County, Montana. The physical address is 1010 25th Avenue NE in Great Falls, Montana. The Animal Shelter consists of a 1999 Crawford model C1000H incinerator/crematorium, which is fired on natural gas and is capable of consuming up to 150 pounds per hour (lbs/hr) of animal remains. A complete listing of the permitted equipment can be found in the analysis associated with this permit.

B. Current Permit Action

On April 3, 2008, the Department of Environmental Quality (Department) received a request to change the permittee name from the Humane Society of Cascade County to the Animal Shelter. The current permit action is an administrative amendment pursuant to ARM 17.8.764 that changes the permittee name as requested. In addition, the permit format and regulatory references were updated.

SECTION II: Limitations and Conditions

A. Operational Requirements

1. The Animal Shelter shall not incinerate/cremate any material other than animal remains, and any corresponding container (ARM 17.8.749).
2. The Animal Shelter shall provide written notice to the Department, and obtain approval from the Department, if material other than what would normally be termed animal remains, or its container, is to be incinerated (ARM 17.8.749).
3. The secondary chamber operating temperature of the 1999 Crawford Incinerator shall be maintained above 1400° F. The operating temperature shall be maintained during operation and for one-half hour after the feed has stopped (ARM 17.8.749).

B. Emission Limitations

The Animal Shelter shall not cause or authorize to be discharged into the atmosphere from the 1999 Crawford Incinerator (ARM 17.8.752):

1. Visible emissions that exhibit an opacity of 10% or greater; and
2. Any particulate emissions in excess of 0.10 grains per dry standard cubic foot (gr/dscf) corrected to 12% carbon dioxide (CO₂.)

C. Monitoring Requirements

The Animal Shelter shall install, calibrate, maintain and operate continuous monitoring and recording equipment on the 1999 Crawford Incinerator to measure the secondary chamber exit temperature. The Animal Shelter shall also record the daily quantity of material incinerated/cremated and the daily hours of operation of the 1999 Crawford Incinerator (ARM 17.8.749).

D. Operational Reporting Requirement

1. The Animal Shelter shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions covered by this permit.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. The Animal Shelter shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
3. All records compiled in accordance with this permit must be maintained by the Animal Shelter as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

E. Testing Requirements

1. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

2. The Department may require further testing (ARM 17.8.105).

SECTION III: General Conditions

- A. Inspection – The Animal Shelter shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if the Animal Shelter fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving the Animal Shelter of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by the Animal Shelter may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
The Great Falls Animal Shelter
Permit #3082-01

I. Introduction

The Great Falls Animal Shelter (Animal Shelter) owns and operates an animal incinerator/crematorium. The facility is located in the Northwest ¼ Section 36, Township 21 North, Range 3 East, in Cascade County. The physical address is 1010 25th Avenue NE in Great Falls, Montana.

A. Permitted Equipment

The Animal Shelter operates a 1999 Crawford model C1000H incinerator/crematorium, which is fired on natural gas and is capable of consuming up to 150 pounds per hour (lbs/hr) of animal remains.

B. Source Description

The incinerator incorporates primary and secondary combustion chambers and is fueled by natural gas. The unit will be used to incinerate animal remains.

C. Permit History

On January 3, 2000, the Humane Society of Cascade County (Humane Society) submitted a complete application for an air quality preconstruction permit to install and operate a 1999 Crawford model C1000H incinerator/crematorium at their existing animal shelter located at 1010 - 25th Avenue NE in Great Falls, Montana. The incinerator/crematorium is fired on natural gas and will be capable of consuming up to 150 lbs/hr of animal remains. This application was assigned **Permit #3082-00**.

D. Current Permit Action

On April 3, 2008, the Department of Environmental Quality (Department) received a request to change the permittee name from the Humane Society to the Great Falls Animal Shelter. The current permit action is an administrative amendment pursuant to the Administrative Rules of Montana (ARM) 17.8.764 that changes the permittee name as requested. In addition, regulatory references were updated. **Permit #3082-01** replaces Permit #3082-00.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available upon request from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1, General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

The Animal Shelter shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2, Ambient Air Quality, including, but not limited to:

1. ARM 17.8.210, Ambient Air Quality Standards for Sulfur Dioxide;
2. ARM 17.8.211, Ambient Air Quality Standards for Nitrogen Dioxide;
3. ARM 17.8.212, Ambient Air Quality Standards for Carbon Monoxide;
4. ARM 17.8.214, Ambient Air Quality Standard for Hydrogen Sulfide;
5. ARM 17.8.220, Ambient Air Quality Standards for Settled Particulate Matter; and
6. ARM 17.8.223, Ambient Standards for PM₁₀.

The Animal Shelter must comply with the applicable ambient air quality standards. As part of the risk assessment required for this project, the Department completed a screening level ambient air impact analysis using an Environmental Protection Agency (EPA)-approved dispersion model (SCREEN3). This analysis was also used to demonstrate that the facility can comply with all applicable ambient air quality standards.

- C. ARM 17.8, Subchapter 3, Emission Standards, including, but not limited to:
1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
 2. ARM 17.8.308 Particulate Matter, Airborne. This section requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control particulate emissions from fugitive sources. (2) Under this rule, the Animal Shelter shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
 3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This section states that emissions of particulate matter caused by the combustion of fuel shall not exceed the hourly rate set forth in this section.
 4. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Also, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions which exhibit an opacity of 10% or greater averaged over six consecutive minutes. This section does not apply to the 1999 Crawford Incinerator, because the Animal Shelter has applied for and received an air quality permit in accordance with ARM 17.8.748 and Montana Code Annotated (MCA) 75-2-215.
 5. ARM 17.8.340 New Source Performance Standards. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS-affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR Part 60.
- D. ARM 17.8, Subchapter 5, Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:
1. ARM 17.8.504 Air Quality Permit Application Fees. The Animal Shelter shall submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. No fee was required for this permitting action since the action is an administrative amendment.
 2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

- E. ARM 17.8, Subchapter 7, Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:
1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
 2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant, or any incinerator as defined in MCA 75-2-103(11). The Animal Shelter operates an incinerator as defined; therefore, an air quality permit is required.
 3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
 4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
 5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. The current permit action is an administrative permit amendment that does not require a permit application or public notice.
 6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
 7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
 8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
 9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving the Animal Shelter of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
 10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.
15. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, MCA.

F. ARM 17.8, Subchapter 8, Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801, Definitions. This rule is a list of applicable definitions used in this subchapter.
2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications-- Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12, Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

- a. PTE > 100 tons per year (TPY) of any pollutant;
 - b. PTE > 10 TPY of any one Hazardous Air Pollutant (HAP), PTE > 25 TPY of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - c. PTE > 70 TPY of PM₁₀ in a serious PM₁₀ nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. (1) Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. In reviewing and issuing Montana Air Quality Permit #3082-01, the following conclusions were made:
- a. The facility's PTE is less than 100 tons/year for any criteria pollutant.
 - b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year of all HAPs.
 - c. This source is not located in a serious PM₁₀ nonattainment area.
 - d. This facility is not subject to any current NSPS.
 - e. This facility is not subject to any current NESHAP standards.
 - f. This source is not a Title IV affected source, nor a solid waste combustion unit.
 - g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that the Animal Shelter is a minor source of emissions as defined under the Title V operating permit program.

H. MCA 75-2-103, Definitions provides, in part, as follows:

- 1. "Incinerator" means any single or multiple-chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.
- 2. "Solid waste" means all putrescible and nonputrescible solid, semisolid, liquid, or gaseous wastes, including, but not limited to ... air pollution control facilities...

I. MCA 75-2-215, Solid or hazardous waste incineration - additional permit requirements:

- 1. MCA 75-2-215 requires air quality permits for all new commercial solid waste incinerators. The Animal Shelter will, therefore, have to obtain an air quality permit.
- 2. MCA 75-2-215 requires the applicant to provide, to the Department's satisfaction, a characterization and estimate of emissions and ambient concentrations of air pollutants, including hazardous air pollutants from the incineration of solid waste. The Department has determined that the information submitted in this application is sufficient to fulfill this requirement.
- 3. MCA 75-2-215 requires that the Department reach a determination that the projected emissions and ambient concentrations constitute a negligible risk to public health, safety and welfare. The Department has completed a health risk

assessment based on an emissions inventory and ambient air quality modeling for this proposal. Based on the results of the emission inventory, modeling, and the health risk assessment, the Department has determined that the Animal Shelter's proposal complies with this requirement.

4. MCA 75-2-215 requires the application of pollution control equipment or procedures that meet or exceed BACT. The Department has determined that the proposed incinerator constitutes BACT.

III. Best Available Control Technology Analysis

A BACT determination is required for each new or altered source. The Animal Shelter shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that best available control technology shall be utilized. In addition, MCA 75-2-215 requires a BACT determination for all pollutants, not just criteria pollutants. A BACT analysis was not required for the current permit action because the current permit action is considered an administrative permit action.

IV. Emission Inventory

An emission inventory was completed for the Animal Shelter's original proposal. This emission inventory for criteria pollutants was based on emission factors from the AIRS FACILITY SUBSYSTEM SOURCE CLASSIFICATION CODES (AFSSCC) manual dated March 1990. The application indicated that the fuel used would be natural gas; therefore, the Department also used emission factors from AFSSCC 1-02-006-03 for the combustion of natural gas.

The Department developed a hazardous air pollutant emission inventory using those emissions contained in FIRE (the EPA emission factor repository) for SCC code 50200505 (Incineration-Pathological). Since the only currently regulated hazardous air pollutants are those pollutants considered in the required health risk assessment, only those hazardous air pollutants with an associated risk factor were considered in the emission inventory.

Emission Inventory - Permit #3082-01

	Tons/Year					
	TSP	PM-10	SOx	NOx	VOC	CO
Crawford Incinerator	2.63	1.94	2.63	0.99	0.99	0.00
Natural Gas Fuel	0.23	0.23	0.05	7.67	0.41	1.53
Total	2.86	2.17	2.67	8.66	1.39	1.53

Crawford Incinerator

TSP Emissions

Emission Factor: 8.00 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*8 lbs/ton*0.0005 ton/lb = 2.63 ton/yr

PM-10 Emissions:

Emission Factor: 5.92 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*6 lbs/ton*0.0005 ton/lb = 1.94 ton/yr

NOx Emissions:

Emission Factor: 3.00 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*3.00 lbs/ton*0.0005 ton/lb = 0.99 tons/yr

VOC Emissions:

Emission Factor: 3.00 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*3.00 lbs/ton*0.0005 ton/lb = 0.99 ton/yr

CO Emissions:

Emission Factor: 0.00 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*0 lbs/ton*0.0005 ton/lb = 0.00 tons/yr

SOx Emissions:

Emission Factor: 8.00 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 tons/year (Maximum Rated Design)
 Calculations: 657.00 tons/year*8.00 lbs/ton*0.0005 ton/lb = 2.63 ton/yr

Natural Gas Fuel

TSP Emissions

Emission Factor: 3.00 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*3 lbs/MMscf*8760 hr/yr*0.0005 ton/lb = 0.23 ton/yr

PM-10 Emissions:

Emission Factor: 3.00 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*3 lbs/MMscf*8760 hr/yr*0.0005 ton/ = 0.23 ton/yr

NOx Emissions:

Emission Factor: 100.00 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*100.00 lbs/MMscf*8760 hr/yr*0.0005 ton/lb = 7.67 ton/yr

VOC Emissions:

Emission Factor: 5.30 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*5.30 lbs/MMscf*8760 hrs/yr*0.0005 ton/lb = 0.41 ton/yr

CO Emissions:

Emission Factor: 20.00 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*20 lbs/MMscf*8760 hrs/yr*0.0005 ton/lb = 1.53 ton/yr

SOx Emissions:

Emission Factor: 0.60 lbs/MMscf {AFSSCC 1-02-006-03, pg 23}
 Fuel Consumption: 17.52 MMscf/yr (Maximum Rated Design)
 Calculations: 17.52 MMscf/yr*0.60 lbs/MMscf*8760 hrs/yr*0.0005 ton/lb = 0.05 ton/yr

HAZARDOUS AIR POLLUTANTS

Bromoform

Emission Factor: 2.90e-05 lbs/ton {AFSSCC 5-02-005-05, pg 227}
 Fuel Consumption: 657.00 ton/yr (Maximum Rated Design)
 Calculations: 657.00 ton/yr*0.00003 lb/ton*0.0005 tons/lb = 9.53e-06 ton/yr

Carbon Tetrachloride

Emission Factor: 5.74e-05 lbs/ton {AFSSCC 1-02-009-01}
 Fuel Consumption: 657.00 ton/yr (Maximum Rated Design)
 Calculations: 657.00 ton/yr*0.00006 lbs/ton*0.0005 ton/lb = 1.89e-05 ton/yr

Chloroform

Emission Factor:	5.45e-05 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.0000545 lbs/ton*0.0005 ton/lb = 1.79e-05 ton/yr	
1,2-Dichloropropane		
Emission Factor:	1.32e-03 lbs/ton	{AFSSCC 1-02-009-01} (Salt laden wood)
Control Efficiency:	0.0%	
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.001320000 lbs/ton*0.0005 ton/lb = 4.34e-04 ton/yr	
Ethyl Benzene		
Emission Factor:	1.61e-03 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.001610000000 lbs/ton*0.0005 ton/lb =5.29e-04 ton/yr	
Naphthalene		
Emission Factor:	1.16e-02 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.011600 lbs/ton*0.0005 ton/lb = 3.81e-03 ton/yr	
Tetrachloroethylene		
Emission Factor:	4.03e-05 lbs/ton	{AFSSCC 1-02-009-01}
Control Efficiency:	0.0%	
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.0000 lbs/ton*0.0005 tons/lb = 1.32e-05 ton/yr	
1,1,2,2-Tetrachloroethane		
Emission Factor:	1.10e-04 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.0001 lbs/ton*0.0005 ton/lb = 3.61e-05 ton/yr	
Toluene		
Emission Factor:	4.62e-03 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.00462 lbs/ton*0.0005 ton/lb = 1.52e-03 ton/yr	
Vinylidene Chloride		
Emission Factor:	7.10e-05 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.0000710 lbs/ton*0.0005 ton/lb = 2.33e-05 ton/yr	
Xylene		
Emission Factor:	2.20e-03 lbs/ton	{AFSSCC 1-02-009-01}
Fuel Consumption:	657.00 ton/yr	(Maximum Rated Design)
Calculations:	657.00 ton/yr*0.002200000 lbs/ton*0.0005 ton/lb = 7.23e-04 ton/yr	

V. Air Quality Impacts

The Department ran SCREEN3, an EPA-approved screening model, using the indicated inputs obtained from the permit application and an emission rate of 0.00020561 gram per second, which is the sum of all the hazardous air pollutant emissions. The individual one-hour results for each pollutant were then calculated prorating the actual emission rate in grams per second against the 0.00020561 gram-per-second ambient impact of 0.04651 $\mu\text{g}/\text{m}^3$. The maximum one-hour concentrations were then converted to an annual average and used in the risk assessment.

SCREEN3 Model Run

Simple Terrain Inputs:

Source Type	=	POINT
Emission Rate (G/S)	=	.20561E-03
Stack Height (M)	=	4.5200

Stack Inside Diam (M)	=	.5100
Stack Exit Velocity (M/S)	=	6.8600
Stack Gas Exit Temp (K)	=	755
Ambient Air Temp (K)	=	293
Receptor Height (M)	=	1.0000
Urban/Rural Option	=	RURAL
Building Height (M)	=	0.0000
Minimum Horizontal Building Dimension (M)	=	0.0000
Maximum Horizontal Building Dimension (M)	=	0.0000

Stack exit velocity was calculated using a volumetric flow rate of 2965 ACFM.

Summary of Screen Model Results

Calculation Procedure	Maximum 1 Hour Concentration ($\mu\text{g}/\text{m}^3$)	Distance of Maximum (M)	Terrain Height (M)
Simple Terrain	.04651	75	0

VI. Health Risk Assessment

A health risk assessment was conducted to determine if the proposed Animal Shelter incinerator/crematorium complied with the negligible risk requirement of MCA 75-2-215. The emission inventory did not contain sufficient quantities of any pollutant on the Department's list of pollutants for which non-inhalation impacts must be considered; therefore, the Department has determined that inhalation risk was the only necessary pathway to consider. Only those hazardous air pollutants for which there were established emission factors were considered in the emission inventory.

Chemical Compound	Annual Conc $\mu\text{g}/\text{m}^3$	Cancer ELCR Chronic	Non-Cancer Hazard Quotient	
			Chronic	Acute
Bromoform	.610E-05	.67E-11	.0000	.0000
Carbon Tetrachloride	.120E-04	.18E-09	.0000	.0000
Chloroform	.120E-04	.27E-09	.0000	.0000
1,2-Dichloropropane	.280E-03	.00	.0000	.0000
Ethyl Benzene	.350E-03	.00	.0000	.0000
Naphthalene	.250E-02	.00	.0002	.0000
Tetrachloroethylene	.860E-05	.51E-10	.0000	.0000
1,1,2,2-Tetrachloroethane	.240E-04	.14E-08	.0000	.0000
Toluene	.990E-03	.00	.0000	.0000
Vinylidene Chloride	.150E-04	.75E-09	.0000	.0000
Xylene	.470E-03	.00	.0000	.0000
Total Risks =		.26E-08	.0002	.0000

ELCR = Excess lifetime cancer risks

The Department considers the risks estimated in the risk assessment to be in compliance with the requirement to demonstrate negligible risk to human health and the environment.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
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	X	1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an Environmental Assessment is not required.

Analysis Prepared By: Christine A. Weaver
Date: May 28, 2008