



Montana Department of  
**ENVIRONMENTAL QUALITY**

Brian Schweitzer, Governor

P. O. Box 200901

Helena, MT 59620-0901

(406) 444-2544

Website: [www.deq.mt.gov](http://www.deq.mt.gov)

June 29, 2009

Dr. Carl McQuery  
Animal Medical Clinic  
3302 Monroe Avenue  
Butte, MT 59701

Dear Dr. McQuery:

Montana Air Quality Permit #4428-00 is deemed final as of June 27, 2009, by the Department of Environmental Quality (Department). This permit is for an animal 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) 444-9741

Ed Warner  
Environmental Engineer  
Air Resources Management Bureau  
(406) 444-2468

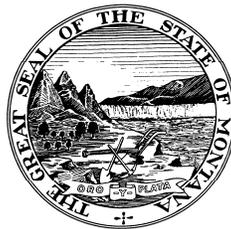
VW:EW  
Enclosure

Montana Department of Environmental Quality  
Permitting and Compliance Division

Montana Air Quality Permit #4428-00

Animal Medical Clinic  
3302 Monroe Avenue  
Butte, MT 59701

June 27, 2009



## MONTANA AIR QUALITY PERMIT

Issued To: Animal Medical Clinic  
3302 Monroe Avenue  
Butte, Montana 59701

Montana Air Quality Permit: #4428-00  
Application Complete: April 3, 2009  
Preliminary Determination Issued: May 11, 2009  
Department's Decision Issued: June 11, 2009  
Permit Final: June 27, 2009  
AFS: #093-0019

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Animal Medical Clinic (AMC), pursuant to Sections 75-2-204, 211, and 215 of the 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. Permitted Equipment

AMC proposes to operate a natural gas-fired 2007 Crawford model CB200 batch load animal crematorium with a maximum incineration design capacity of 70 pounds per hour (lb/hr) of animal remains with a 200 pound initial load.

#### B. Plant Location

AMC is located at 3302 Monroe Avenue in Butte, Montana 59701. The legal description of the facility is the SW $\frac{1}{4}$  of Section 29, Township 3 North, Range 7 West, in Silver Bow County.

### SECTION II: Conditions and Limitations

#### A. Operational Requirements

1. AMC shall not incinerate/cremate any material other than animal remains and/or any corresponding container unless otherwise approved by the Montana Department of Environmental Quality (Department) in writing (ARM 17.8.749).
2. The AMC crematorium shall be equipped with auxiliary fuel burners. An auxiliary fuel burner shall be used to preheat the secondary chamber of the crematorium to the minimum required operating temperature prior to igniting the primary chamber burner. The operating temperatures shall be maintained during operation and for one-half hour after waste feed has stopped, as follows:

The secondary chamber operating temperature of the crematorium shall be maintained above 1800 degrees Fahrenheit (°F) with no single reading less than 1800°F (ARM 17.8.752).

3. AMC shall develop crematorium operation procedures, print those procedures in a crematorium operation procedures manual, and require all personnel who operate the crematorium to familiarize themselves with the operating procedures. A copy of this manual shall be supplied to the Department upon request (ARM 17.8.752).

B. Emission Limitations

AMC shall not cause or authorize to be discharged into the atmosphere from the crematorium:

1. Visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.752); and
2. Any particulate emissions in excess of 0.10 grains per dry standard cubic foot corrected to 12% carbon dioxide (ARM 17.8.752).

C. 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 testing (ARM 17.8.105).

D. Monitoring Requirements

AMC shall install, calibrate, maintain, and operate continuous monitoring and recording equipment on the crematorium to measure the secondary chamber exit gas temperature. AMC shall also record the daily quantity of material incinerated/cremated and the daily hours of operation of the crematorium (ARM 17.8.749).

E. Operational Reporting Requirements

1. AMC 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 identified in the emission inventory contained in the permit analysis.

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. AMC 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 AMC 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).

F. Notification

AMC shall provide the Department with written notification of the actual start-up date of the crematorium within 15 days after the actual start-up date (ARM 17.8.749).

SECTION III: General Conditions

- A. Inspection – AMC 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 continuous monitoring equipment 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 AMC fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving AMC 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 therefor, 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, failure to pay the annual operation fee by AMC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Permit Analysis  
Animal Medical Clinic  
Montana Air Quality Permit #4428-00

I. Introduction/Process Description

Animal Medical Clinic (AMC) owns and operates an animal crematorium. The facility is located at 3302 Monroe Avenue, in Butte, Montana 59701. The legal description of facility is the SW¼ of Section 29, Township 3 North, Range 7 West, in Silver Bow County.

A. Permitted Equipment

AMC proposes to operate a 2007 Crawford model CB200 batch load animal crematorium with associated equipment. This crematorium replaces an existing unit that was exempt from permitting requirements due to its age and date of installation.

B. Source Description

The crematorium has a maximum incineration design capacity of 70 pounds per hour (lb/hr) of animal remains with a 200 pound initial load. The crematorium will utilize natural gas for combustion in the primary and secondary auxiliary burners with the primary burner rated at 0.4 million British thermal units per hour (MMBtu/hr) and the secondary burner rated at 0.75 MMBtu/hr.

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 Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location 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).

AMC 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 the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>
11. ARM 17.8.230 Fluoride in Forage

AMC must maintain compliance with the applicable ambient air quality standards. As part of the risk assessment required for issuance of a Montana Air Quality Permit (MAQP), the Department conducted SCREEN3 modeling, an Environmental Protection Agency (EPA)-approved air dispersion model. The screening analysis demonstrated that the AMC facility, as permitted, would comply with all applicable ambient air quality standards and demonstrated negligible risk to human health as required for permit issuance.

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. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. 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. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

While AMC is required to comply with the Emission Limitations specified in Section II.B of MAQP #4428-00, this particular rule does not apply to the crematorium because AMC has applied for and will operate under an MAQP in accordance with ARM 17.8.770 and MCA 75-2-215 for this unit.

6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.
  7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
  8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. 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. This rule requires that an applicant 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. AMC submitted the appropriate permit application fee for the current permit action.
  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 modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year (TPY) of any pollutant. AMC does not have the PTE greater than 25 TPY of any pollutant; however, in accordance with the MCA 75-2-215, an air quality permit must be obtained prior to the construction and operation of any incinerator, regardless of potential incinerator emissions. Because AMC must obtain an air quality permit, all normally applicable requirements apply in this case.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the MAQP 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 MAQP 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, modification, or use of a source. AMC submitted the required permit application for the current permit action. (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. AMC submitted an affidavit of publication of public notice in the March 29, 2009, issue of the *Montana Standard*, a newspaper of general circulation in the City of Butte in Silver Bow County, as proof of compliance with the public notice requirements.
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 Best Available Control Technology (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 AMC 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 modified 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 source having:
    - a. PTE > 100 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 particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) in a serious PM<sub>10</sub> nonattainment area.
  2. ARM 17.8.1204 Air Quality Operating Permit Program. (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 MAQP #4428-00 for AMC, the following conclusions were made:

- a. The facility's PTE is less than 100 TPY for any pollutant.
- b. The facility's PTE is less than 10 TPY for any one HAP and less than 25 TPY of all HAPs.
- c. This source is not located in a serious PM<sub>10</sub> nonattainment area. The community of Butte and the surrounding area is classified as a PM<sub>10</sub> nonattainment area; however, this designation does not meet the criteria of a serious PM<sub>10</sub> nonattainment area.
- d. This facility is not subject to any current NSPS.
- e. This facility is not subject to any current National Emission Standards for Hazardous Air Pollutants (NESHAP) standards.
- f. This source is not a Title IV affected source.
- g. This source is not a solid waste combustion unit under 129(e) of the FCAA.
- h. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that AMC will be a minor source of emissions as defined under the Title V operating permit program.

H. MCA 75-2-103, Definitions provided, 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; therefore, AMC must 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 determined that the information submitted in the initial MAQP application was 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 completed a health risk assessment based on an emissions inventory and ambient air quality modeling for this MAQP application. Based on the results of the emission inventory, modeling, and the health risk assessment, the Department determined that AMC 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 determined that operating AMC's incinerator according to the manufacturer-recommended operation procedures constitutes BACT.

### III. BACT Determination

A BACT determination is required for each new or modified source. AMC shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. In addition, MCA 75-2-215 requires a BACT determination for all pollutants resulting from crematorium operations, not only criteria pollutants.

The MAQP application #4428-00 submitted by AMC contained schematics and technical information about the model of incinerator that will be used at the facility. This information described the pollution control technology installed on the incinerator. The application also stated that there would be a continuous monitoring system installed on the source for monitoring and recording the temperature of the secondary combustion chamber. The information provided indicates an operating temperature for the primary combustion chamber of 1400 to 1600 degrees Fahrenheit (°F) and a minimum operating temperature of 1800 °F for the secondary combustion chamber. The Department has reviewed the information submitted by the applicant, as well as previous Department BACT determinations. The following control options have been reviewed by the Department in order to make the final BACT determination.

AMC proposes to control the emissions from the incinerator/crematorium with a secondary chamber designed specifically to reduce the amount of emitted pollutants, including HAPs, by maintaining the exit gas temperature of the secondary chamber at or above 1800 °F. Previous research conducted by the Department indicates very few crematoriums have been required to install additional air pollution control equipment beyond that provided by the design of the incinerator. With the estimated particulate matter emissions being 0.75 TPY, the incremental cost per ton of additional control would be very high and not in line with control costs of other similar sources. In addition, the incinerator is limited by its MAQP to 0.10 grains per dry standard cubic foot for particulate matter and to 10% opacity. Therefore, the Department determined that compliance with the particulate matter and opacity emission limits with no additional controls constitutes BACT in this case.

BACT for products of combustion/incineration (carbon monoxide [CO], oxides of nitrogen [NO<sub>x</sub>], volatile organic compounds [VOC], and oxides of sulfur [SO<sub>x</sub>]) and HAPs resulting from crematorium operations is good combustion including the requirement that the secondary chamber must be maintained at an operating temperature of 1800 °F or higher. The operating procedures and minimum operating temperature requirement contained in MAQP #4428-00 will ensure good combustion and constitutes BACT for this source.

Further, pipeline quality natural gas combustion inherently results in low emissions of air pollutants due to characteristics of the natural gas fuel fired. Potential PM<sub>10</sub>, NO<sub>x</sub>, CO, VOC, and SO<sub>x</sub> emissions from the combustion of natural gas to operate the crematorium are 0.04 TPY, 0.49 TPY, 0.41 TPY, 0.03 TPY, and 0.00 TPY, respectively. Because potential emissions of all regulated pollutants resulting from pipeline quality natural gas combustion are low, incorporation of available pollutant-specific control technologies would result in high cost-effective (cost per ton removed) values thereby making pollutant-specific add-on controls for PM<sub>10</sub>, NO<sub>x</sub>, CO, VOC, and SO<sub>x</sub> economically infeasible in this case. Therefore, the Department determined that combustion of pipeline quality natural gas only and proper operation and maintenance of the crematorium with no additional control constitutes BACT for all regulated pollutants resulting from natural gas combustion, in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

#### IV. Emission Inventory

The Department completed an emission inventory for the AMC facility. This emission inventory for criteria pollutants from the incineration of animal remains was based on emission factors from the EPA AP-42 Compilation of Air Pollutant Emission Factors, Section 2.3, Medical Waste Incineration. The application indicated that the fuel used in the crematorium burners would be natural gas; therefore, the Department also used emission factors from AP-42, Section 1.4, Natural Gas Combustion, to estimate project-specific emissions.

The Department developed a HAP emission inventory using those emission factors contained in the AIRS FACILITY SUBSYSTEM SOURCE CLASSIFICATION CODES (AFSSCC) manual dated March 1990, as well as the emission factors from AP-42, Section 1.4, Natural Gas Combustion. The Department considered only those HAPs for which an emission factor was available and that have been analyzed for other permitted similar sources.

Criteria Pollutant Emissions (TPY)							
Source of Combustion	PM	PM <sub>10</sub>	NO <sub>x</sub>	VOC	CO	SO <sub>x</sub>	Lead
Crematorium Animal Remains and Container	0.72	0.72	0.55	0.46	0.45	0.33	0.01
Natural Gas Fuel	0.04	0.04	0.49	0.03	0.41	0.00	0.00
<b>Total Criteria Pollutant Potential Emissions</b>	<b>0.75</b>	<b>0.75</b>	<b>1.04</b>	<b>0.49</b>	<b>0.87</b>	<b>0.34</b>	<b>0.01</b>

HAP Emissions from Animal Remains and Container Combustion		HAP Emissions from Natural Gas Combustion	
HAP	TPY	HAP	TPY
Bromoform	4.45E-06	2-Methylnaphthalene	1.19E-07
Carbon Tetrachloride	8.80E-06	3-Methylchloranthrene	8.89E-09
Chloroform	8.35E-06	7,12-Dimethylbenz(a)anthracene	7.90E-08
1,2-Dichloropropane	2.02E-04	Acenaphthene	8.89E-09
Ethyl Benzene	2.47E-04	Acenaphthylene	8.89E-09
Naphthalene	1.78E-03	Anthracene	1.19E-08
Tetrachloroethylene	6.18E-06	Benzene	1.04E-05
1,1,2,2-Tetrachloroethane	1.69E-05	Benzo(a)anthracene	8.89E-09
Toluene	7.08E-04	Benzo(a)pyrene	5.93E-09
Vinylidene Chloride	1.09E-05	Benzo(b)fluoranthene	8.89E-09
Xylene	3.37E-04	Benzo(k)fluoranthene	8.89E-09
<b>Total HAP PTE from Animal Remains and Container Combustion</b>	<b>3.33E-03</b>	Benzo(g,h,i)perylene	5.93E-09
		Chrysene	8.89E-09
		Dibenz(a,h)anthracene	5.93E-09
		Dichlorobenzene	5.93E-06
		Fluoranthene	1.48E-08
		Fluorene	1.38E-08
		Formaldehyde	3.70E-04
		Hexane	8.89E-03
		Indeno(1,2,3,c,d)pyrene	8.89E-09
		Naphthalene	3.01E-06
		Phenanthrene	8.40E-08
		Pyrene	2.47E-08
		Toluene	1.68E-05
		Arsenic	9.88E-07
		Beryllium	5.93E-08
		Cadmium	5.43E-06
		Chromium, total	6.91E-06
		Cobalt	4.15E-07
		Manganese	1.88E-06
		Mercury	1.28E-06
		Nickel	1.04E-05
		Selenium	1.19E-07
		<b>Total HAP PTE from Natural Gas Combustion</b>	<b>9.32E-03</b>

## CRITERIA POLLUTANT EMISSION RATE CALCULATIONS

### *Crematorium Animal Remains Combustion*

Maximum Capacity: 70 lb/hr  
 Operating Hours: 8760 hours per year (hrs/yr)  
 Conversion: 70 lb/hr \* 8760 hrs/yr \* 0.0005 tons per pound (tons/lb) = 306.6 TPY

### PM Emissions

Emission Factor: 4.67 pounds per ton (lbs/ton) (AP-42 Table 2.3-2, 07/93)  
 Calculations: 4.67 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.72 TPY

### PM<sub>10</sub> Emissions

Emission Factor: 4.67 lbs/ton (AP-42 Table 2.3-2, assume PM=PM<sub>10</sub>, 07/93)  
Calculations: 4.67 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.72 TPY

### NO<sub>x</sub> Emissions

Emission Factor: 3.56 lbs/ton (AP-42 Table 2.3-1, 07/93)  
Calculations: 3.56 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.55 TPY

### VOC Emissions

Emission Factor: 3.00 lbs/ton (AFSSCC 5-02-005-05, 03/90)  
Calculations: 3 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.46 TPY

### CO Emissions

Emission Factor: 2.95 lbs/ton (AP-42 Table 2.3-1, 07/93)  
Calculations: 2.95 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.45 TPY

### SO<sub>x</sub> Emissions

Emission Factor: 2.17 lbs/ton (AP-42 Table 2.3-1, 07/93)  
Calculations: 2.17 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.33 TPY

### Lead Emissions

Emission Factor: 0.0728 lbs/ton (AP-42 Table 2.3-2, 07/93)  
Calculations: 0.0728 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.01 TPY

### *Natural Gas Combustion*

Hours of Operation: 8760 hrs/yr  
Max Fuel Combustion Rate: 1.15 MMBtu/hr  
Conversion: 1.15 MMBtu/hr \* 1 MMscf/1020MMBtu = 0.0011 MMscf/hr  
Notes: MMscf = million standard cubic feet  
MMBtu = million British thermal units

### PM<sub>10</sub> Emissions (Assume all natural gas PM emissions are PM<sub>10</sub>)

Emissions Factor: 7.6 pounds per million standard cubic feet (lbs/MMscf)  
(AP-42 Table 1.4-2, 07/98)  
Calculations: 7.6 lbs/MMscf \* 0.0011 MMscf/hr = 0.009 lb/hr  
0.009 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.04 TPY

### NO<sub>x</sub> Emissions

Emissions Factor: 100.0 lbs/MMscf (AP-42 Table 1.4-1, 07/98)  
Calculations: 100 lbs/MMscf \* 0.0011 MMscf/hr = 0.113 lb/hr  
0.113 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.49 TPY

## VOC Emissions

Emissions Factor: 5.5 lbs/MMscf (AP-42 Table 1.4-2, 07/98)  
Calculations: 5.5 lbs/MMscf \* 0.0011 MMscf/hr = 0.006 lb/hr  
0.006 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.03 TPY

## CO Emissions

Emissions Factor: 84.0 lbs/MMscf (AP-42 Table 1.4-1, 07/98)  
Calculations: 84 lbs/MMscf \* 0.0011 MMscf/hr = 0.095 lb/hr  
0.095 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.41 TPY

## SO<sub>x</sub> Emissions

Emissions Factor: 0.6 lbs/MMscf (AP-42 Table 1.4-2, 07/98)  
Calculations: 0.6 lbs/MMscf \* 0.0011 MMscf/hr = 0.001 lb/hr  
0.001 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.00 TPY

## Lead Emissions

Emission Factor: 0.0005 lbs/MMscf (AP42, Table 1.4-2, 7/98)  
Calculations: 0.0005 lbs/MMscf \* 0.0011 MMscf/hr = 5.64E-07 lb/hr  
5.64E-07 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 0.00 TPY

## HAP EMISSION RATE CALCULATIONS

### *Crematorium Animal Remains Combustion*

Maximum Design Capacity: 306.6 TPY

### Bromoform

Emission Factor: 0.000029 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.000029 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000004 TPY

### Carbon Tetrachloride

Emission Factor: 0.0000574 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.0000574 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000009 TPY

### Chloroform

Emission Factor: 0.0000545 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.0000545 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000008 TPY

### 1,2-Dichloropropane

Emission Factor: 0.00132 lbs/ton (AFSSCC 1-02-009-01)  
Calculations: 0.00132 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000202 TPY

### Ethyl Benzene

Emission Factor: 0.00161 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.00161 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000247 TPY

## Naphthalene

Emission Factor: 0.0116 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.0116 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.001778 TPY

## Tetrachloroethylene

Emission Factor: 0.000040 lbs/ton (AFSSCC 1-02-009-01)  
Calculations: 0.0000403 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000006 TPY

## Tetrachloroethane

Emission Factor: 0.00011 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.00011 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000017 TPY

## Toluene

Emission Factor: 0.00462 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.00462 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000708 TPY

## Vinylidene Chloride

Emission Factor: 0.000071 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.000071 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000011 TPY

## Xylene

Emission Factor: 0.0022 lbs/ton (AFSSCC 5-02-005-05)  
Calculations: 0.0022 lbs/ton \* 306.6 TPY \* 0.0005 tons/lb = 0.000337 TPY

## Natural Gas Combustion

Hours of Operation: 8760 hrs/yr

Max Fuel Combustion Rate: 1.15 MMBtu/hr

Conversion: 1.15 MMBtu/hr \* 1 MMscf/1020MMBtu = 0.0011 MMscf/hr

## 2-Methylnaphthalene

Emission Factor 2.40E-05 lbs/MMscf (AP42, Table 1.4-3, 7/98)  
Calculations 0.000024 lbs/MMscf \* 0.0011 MMscf/hr = 2.71E-08 lb/hr  
2.71E-08 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 1.19E-07 TPY

## 3-Methylchloranthrene

Emission Factor 1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)  
Calculations 0.0000018 lbs/MMscf \* 0.0011 MMscf/hr = 2.03E-09 lb/hr  
2.03E-09 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 8.89E-09 TPY

## 7,12-Dimethylbenz(a)anthracene

Emission Factor 1.60E-05 lbs/MMscf (AP42, Table 1.4-3, 7/98)  
Calculations 0.000016 lbs/MMscf \* 0.0011 MMscf/hr = 1.80E-08 lb/hr  
1.80E-08 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 7.90E-08 TPY

## Acenaphthene

Emission Factor 1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)  
Calculations 0.0000018 lbs/MMscf \* 0.0011 MMscf/hr = 2.03E-09 lb/hr  
2.03E-09 lb/hr \* 8760 hrs/yr \* 0.0005 tons/lb = 8.89E-09 TPY

Acenaphthylene		
Emission Factor	1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =	2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	8.89E-09 TPY
Anthracene		
Emission Factor	2.40E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000024 lbs/MMscf * 0.0011 MMscf/hr =	2.71E-09 lb/hr
	2.71E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	1.19E-08 TPY
Benzene		
Emission Factor	2.10E-03 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0021 lbs/MMscf * 0.0011 MMscf/hr =	2.37E-06 lb/hr
	2.37E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	1.04E-05 TPY
Benz(a)anthracene		
Emission Factor	1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =	2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	8.89E-09 TPY
Benzo(a)pyrene		
Emission Factor	1.20E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000012 lbs/MMscf * 0.0011 MMscf/hr =	1.35E-09 lb/hr
	1.35E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	5.93E-09 TPY
Benzo(b)fluoranthene		
Emission Factor	1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =	2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	8.89E-09 TPY
Benzo(k)fluoranthene		
Emission Factor	1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =	2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	8.89E-09 TPY
Benzo(g,h,i)perylene		
Emission Factor	1.20E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000012 lbs/MMscf * 0.0011 MMscf/hr =	1.35E-09 lb/hr
	1.35E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	5.93E-09 TPY
Chrysene		
Emission Factor	1.80E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =	2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	8.89E-09 TPY
Dibenzo(a,h)anthracene		
Emission Factor	1.20E-06 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0000012 lbs/MMscf * 0.0011 MMscf/hr =	1.35E-09 lb/hr
	1.35E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	5.93E-09 TPY
Dichlorobenzene		
Emission Factor	1.20E-03 lbs/MMscf (AP42, Table 1.4-3, 7/98)	
Calculations	0.0012 lbs/MMscf * 0.0011 MMscf/hr =	1.35E-06 lb/hr
	1.35E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =	5.93E-06 TPY

Fluoranthene			
Emission Factor	3.00E-06 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.000003 lbs/MMscf * 0.0011 MMscf/hr =		3.38E-09 lb/hr
	3.38E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.48E-08 TPY
Fluorene			
Emission Factor	2.80E-06 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.0000028 lbs/MMscf * 0.0011 MMscf/hr =		3.16E-09 lb/hr
	3.16E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.38E-08 TPY
Formaldehyde			
Emission Factor	7.50E-02 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.075 lbs/MMscf * 0.0011 MMscf/hr =		8.46E-05 lb/hr
	8.46E-05 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		3.70E-04 TPY
Hexane			
Emission Factor	1.80E+00lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	1.8 lbs/MMscf * 0.0011 MMscf/hr =		2.03E-03 lb/hr
	2.03E-03 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		8.89E-03 TPY
Indeno(1,2,3,c,d)pyrene			
Emission Factor	1.80E-06 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.0000018 lbs/MMscf * 0.0011 MMscf/hr =		2.03E-09 lb/hr
	2.03E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		8.89E-09 TPY
Naphthalene			
Emission Factor	6.10E-04 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.00061 lbs/MMscf * 0.0011 MMscf/hr =		6.88E-07 lb/hr
	6.88E-07 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		3.01E-06 TPY
Phenanthrene			
Emission Factor	1.70E-05 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.000017 lbs/MMscf * 0.0011 MMscf/hr =		1.92E-08 lb/hr
	1.92E-08 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		8.40E-08 TPY
Pyrene			
Emission Factor	5.00E-06 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.000005 lbs/MMscf * 0.0011 MMscf/hr =		5.64E-09 lb/hr
	5.64E-09 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		2.47E-08 TPY
Toluene			
Emission Factor	3.40E-03 lbs/MMscf	(AP42, Table 1.4-3, 7/98)	
Calculations	0.0034 lbs/MMscf * 0.0011 MMscf/hr =		3.83E-06 lb/hr
	3.83E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.68E-05 TPY
Arsenic			
Emission Factor	2.00E-04 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.0002 lbs/MMscf * 0.0011 MMscf/hr =		2.25E-07 lb/hr
	2.25E-07 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		9.88E-07 TPY
Beryllium			
Emission Factor	1.20E-05 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.000012 lbs/MMscf * 0.0011 MMscf/hr =		1.35E-08 lb/hr
	1.35E-08 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		5.93E-08 TPY

Cadmium			
Emission Factor	1.10E-03 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.0011 lbs/MMscf * 0.0011 MMscf/hr =		1.24E-06 lb/hr
	1.24E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		5.43E-06 TPY
Chromium, total			
Emission Factor	1.40E-03 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.0014 lbs/MMscf * 0.0011 MMscf/hr =		1.58E-06 lb/hr
	1.58E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		6.91E-06 TPY
Cobalt			
Emission Factor	8.40E-05 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.000084 lbs/MMscf * 0.0011 MMscf/hr =		9.47E-08 lb/hr
	9.47E-08 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		4.15E-07 TPY
Lead			
Emission Factor	5.00E-04 lbs/MMscf	(AP42, Table 1.4-2, 7/98)	
Calculations	0.0005 lbs/MMscf * 0.0011 MMscf/hr =		5.64E-07 lb/hr
	5.64E-07 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		2.47E-06 TPY
Manganese			
Emission Factor	3.80E-04 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.00038 lbs/MMscf * 0.0011 MMscf/hr =		4.28E-07 lb/hr
	4.28E-07 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.88E-06 TPY
Mercury			
Emission Factor	2.60E-04 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.00026 lbs/MMscf * 0.0011 MMscf/hr =		2.93E-07 lb/hr
	2.93E-07 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.28E-06 TPY
Nickel			
Emission Factor	2.10E-03 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.0021 lbs/MMscf * 0.0011 MMscf/hr =		2.37E-06 lb/hr
	2.37E-06 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.04E-05 TPY
Selenium			
Emission Factor	2.40E-05 lbs/MMscf	(AP42, Table 1.4-4, 7/98)	
Calculations	0.000024 lbs/MMscf * 0.0011 MMscf/hr =		2.71E-08 lb/hr
	2.71E-08 lb/hr * 8760 hrs/yr * 0.0005 tons/lb =		1.19E-07 TPY

## V. Existing Air Quality

AMC is located at 3302 Monroe Avenue in Butte, Silver Bow County, Montana. The city of Butte and some of the immediate surrounding area is classified as nonattainment for the EPA-established National Ambient Air Quality Standards (NAAQS) for PM<sub>10</sub>. A nonattainment classification means that an area does not meet one or more of the primary or secondary NAAQS for the criteria pollutants designated in the FCAA. AMC is a source of PM<sub>10</sub> emissions; however, the Department concludes that the PTE quantity of this pollutant is low enough that it does not negatively impact the ambient air quality in Butte. The screening analysis performed during the MAQP process demonstrated that the facility complies with all applicable ambient air quality standards and poses a negligible risk to human health as required for permit issuance. Additionally, MAQP #4428-00 contains operating and monitoring requirements to ensure that proper operation of the facility would not result in air emissions that violate any ambient air quality standards.

## VI. Ambient Air Impact Analysis

The Department conducted SCREEN3, an EPA-approved screening model, using the indicated inputs obtained from the permit application and an emission rate of 9.58E-05 grams per second (g/s), which is the sum of all HAP emissions from the combustion of animal remains and container from the proposed crematorium. The individual one-hour results for each pollutant were calculated by multiplying the modeled impact of 1.42E-02 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) by the percentage of each individual HAP making up the total of the HAP emissions. The maximum 1-hour concentrations were then converted to an annual average and used in the risk assessment. This process was repeated for the risk assessment of the HAPs emitted from the combustion of natural gas. The combined HAP emission rate from natural gas combustion is 2.68E-04 g/s and the SCREEN3 modeled impact was 3.96E-02  $\mu\text{g}/\text{m}^3$ . The results are contained in Section VII, Health Risk Assessment, of the permit analysis.

### SCREENVIEW Model Run

#### Simple Terrain Inputs:

Source Type	=	POINT
Emission Rate (g/s)	=	9.58E-05 for animal remains and container 2.68E-04 for natural gas
Stack Height in meters (m)	=	5.33
Stack Inside Diameter (m)	=	0.457
Stack Exit Velocity (m/s)	=	8.91
Stack Gas Exit Temp (K)	=	922
Ambient Air Temp (K)	=	293
Receptor Height (m)	=	0.0000
Urban/Rural Option	=	RURAL

Stack exit velocity was calculated using a volumetric flow rate of 3100 actual cubic feet per minute.

Summary of SCREEN3 Model Results				
Component Modeled	Calculation Procedure	Maximum 1 Hour Concentration ( $\mu\text{g}/\text{m}^3$ )	Distance of Maximum (m)	Terrain Height (m)
Animal Remains and Container	Simple Terrain	1.42E-02	90	0
Natural Gas	Simple Terrain	3.96E-02	90	0

## VII. Health Risk Assessment

A health risk assessment was conducted to determine if the proposed AMC incinerator/crematorium complies 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 determined that inhalation risk was the only necessary pathway to consider. Only those HAPs for which there were established emission factors were considered in the emission inventory.

Negligible Risk Assessment for HAPs <sup>(1)</sup>						
HAP		Modeled Concentration (µg/m <sup>3</sup> )	Cancer CIRF <sup>(2)</sup> (µg/m <sup>3</sup> ) <sup>-1</sup>	Cancer Risk <sup>(3)</sup>	CNCREL <sup>(6)</sup> (µg/m <sup>3</sup> )	CNCREL Hazard Quotient <sup>(7)</sup>
Animal Remains and Container Component	Bromoform	1.90E-06	1.10E-06	2.09E-12	ND	ND
	Carbon Tetrachloride	3.75E-06	1.50E-05	5.63E-11	1.90E+02	1.98E-08
	Chloroform	3.56E-06	ND	ND	9.80E+01	3.64E-08
	1,2-Dichloropropane <sup>(4)</sup>	8.63E-05	1.90E-05	1.64E-09	4.00E+00	2.16E-05
	Ethyl Benzene	1.05E-04	ND	ND	1.00E+03	1.05E-07
	Naphthalene	7.60E-04	3.40E-05	2.58E-08	3.00E+00	2.53E-04
	Tetrachloroethylene <sup>(5)</sup>	2.64E-06	5.90E-06	1.56E-11	2.70E+02	9.76E-09
	1,1,2,2-Tetrachloroethane	7.19E-06	5.80E-05	4.17E-10	ND	ND
	Toluene	3.09E-04	ND	ND	5.00E+03	6.19E-08
	Vinylidene Chloride	4.64E-06	ND	ND	2.00E+02	2.32E-08
Xylene	1.44E-04	ND	ND	1.00E+02	1.44E-06	
Natural Gas Component	2-Methylnaphthalene	5.03E-08	ND	ND	ND	ND
	3-Methylchloranthrene	3.77E-09	6.30E-03	2.38E-11	ND	ND
	7,12-Dimethylbenz(a)anthracene	3.36E-08	7.10E-02	2.38E-09	ND	ND
	Acenaphthene	3.77E-09	ND	ND	ND	ND
	Acenaphthylene	3.77E-09	ND	ND	ND	ND
	Anthracene	5.03E-09	ND	ND	ND	ND
	Benzene	4.40E-06	7.80E-06	3.43E-11	3.00E+01	1.468E-07
	Benz(a)anthracene	3.77E-09	1.10E-04	4.15E-13	ND	ND
	Benzo(a)pyrene	2.52E-09	1.10E-03	2.77E-12	ND	ND
	Benzo(b)fluoranthene	3.77E-09	1.10E-04	4.15E-13	ND	ND
	Benzo(k)fluoranthene	3.77E-09	1.10E-04	4.15E-13	ND	ND
	Benzo(g,h,i)perylene	2.52E-09	ND	ND	ND	ND
	Chrysene	3.77E-09	1.10E-05	4.15E-14	ND	ND
	Dibenzo(a,h)anthracene	2.52E-09	1.20E-03	3.02E-12	ND	ND
	Dichlorobenzene	2.52E-06	1.10E-05	2.77E-11	8.00E+02	3.145E-09
	Fluoranthene	6.29E-09	ND	ND	ND	ND
	Fluorene	5.87E-09	ND	ND	ND	ND
	Formaldehyde	1.57E-04	5.50E-09	8.65E-13	9.80E+00	1.605E-05
	Hexane	3.77E-03	ND	ND	7.00E+02	5.392E-06
	Indeno(1,2,3,c,d)pyrene	3.77E-09	1.10E-04	4.15E-13	ND	ND
	Naphthalene <sup>(8)</sup>	1.28E-06				
	Phenanthrene	3.56E-08	ND	ND	ND	ND
	Pyrene	1.05E-08	ND	ND	ND	ND
	Toluene <sup>(8)</sup>	7.13E-06				
	Arsenic	4.19E-07	4.30E-03	1.80E-09	3.00E-02	1.398E-05
	Beryllium	2.52E-08	2.40E-03	6.04E-11	2.00E-02	1.258E-06
	Cadmium	2.31E-06	1.80E-03	4.15E-09	2.00E-02	0.0001153
	Chromium, total	2.94E-06	1.20E-02	3.52E-08	1.08E-01	2.718E-05
	Cobalt	1.76E-07	ND	ND	1.00E-04	0.0017614
	Lead	1.05E-06	ND	ND	1.50E+00	6.99E-07
Manganese	7.97E-07	ND	ND	5.00E-02	1.594E-05	
Mercury	5.45E-07	ND	ND	3.00E-01	1.817E-06	
Nickel	4.40E-06	ND	ND	9.00E-02	4.893E-05	
Selenium	5.03E-08	ND	ND	2.00E+01	2.516E-09	

Negligible Risk Assessment for HAPs <sup>(1)</sup>					
HAP	Modeled Concentration (µg/m <sup>3</sup> )	Cancer CIRF <sup>(2)</sup> (µg/m <sup>3</sup> ) <sup>-1</sup>	Cancer Risk <sup>(3)</sup>	CNCREL <sup>(6)</sup> (µg/m <sup>3</sup> )	CNCREL Hazard Quotient <sup>(7)</sup>
Total Risks	-----	-----	7.17E-08	-----	2.28E-03
A copy of the Screen View modeling conducted for this project is on file with the Department.					
(1) Source of chronic dose-response values is from Table 1: Prioritized Chronic Dose Response Values for Screening Risk Assessments ( <a href="http://www.epa.gov/ttn/atw/toxsource/table1.pdf">www.epa.gov/ttn/atw/toxsource/table1.pdf</a> , 6/12/07). (2) Cancer Chronic Inhalation Risk Factor (1/µg/m <sup>3</sup> ). (3) Cancer Risk is unitless and is calculated by multiplying the predicted concentration by the CIRF. (4) AKA Propylene dichloride. (5) AKA Tetrachloroethene, Perchloroethylene. (6) Chronic Noncancer Reference Exposure Level. (7) The CNCREL hazard quotient is determined by calculating the modeled HAP concentration by the CNCREL. (8) The natural gas combustion component is accounted for in the crematorium emissions ND Not Determined because no value is provided in Table 1: Prioritized Chronic Dose Response Values for Screening Risk Assessments ( <a href="http://www.epa.gov/ttn/atw/toxsource/table1.pdf">www.epa.gov/ttn/atw/toxsource/table1.pdf</a> , 6/12/07).					

The Department determined that the calculated Cancer Risks demonstrate a negligible risk to human health and the environment. As documented in the above table and in accordance with the Department's negligible risk requirement, no single HAP concentration results in a Cancer Risk greater than 1.00E-06 and the sum of all Cancer Risks is less than 1.00E-05. Further, the sum of the Chronic Non-cancer Reference Exposure Level (CNCREL) hazard quotients is 2.28E-03, which is less than 1.0 as required to demonstrate compliance with the negligible risk requirement.

#### VIII. 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	
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.

#### IX. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**Permitting and Compliance Division**  
**Air Resources Management Bureau**  
**P.O. Box 200901, Helena, Montana 59620**  
**(406) 444-3490**

**FINAL ENVIRONMENTAL ASSESSMENT (EA)**

*Issued To:* Animal Medical Clinic

*Montana Air Quality Permit Number:* 4428-00

*Preliminary Determination Issued:* May 11, 2009

*Department Decision Issued:* June 11, 2009

*Permit Final:* June 27, 2009

1. *Legal Description of Site:* SW¼ of Section 29, Township 3 North, Range 7 West, in Silver Bow County.
2. *Description of Project:* AMC operates a Crawford model CB200 animal crematorium/incinerator with a maximum design capacity of 70 lb/hr that requires an MAQP in accordance with ARM 17.8.770 and MCA 75-2-215.
3. *Objectives of Project:* AMC installed and commenced operation of the Crawford CB200 animal crematorium prior to obtaining an MAQP. This project objective is to assign an MAQP to AMC for the crematorium which would bring the facility into compliance with the state of Montana's permitting requirements. The project would allow AMC to safely dispose of animal remains while maintaining compliance with negligible risk requirements as discussed in Section VII of the permit analysis. Further, the project would result in business and revenue for the company.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the MAQP to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because AMC demonstrated compliance with all applicable rules and regulations as required for permit issuance after the submission of their MAQP application. Therefore, the "no-action" alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in MAQP #4428-00.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Emissions from the project may affect terrestrial and aquatic life and habitats in the project area. However, as detailed in Section V, Section VI, and Section VII of the permit analysis, any emissions and resulting impacts from the project would be minor due to the low concentration of those pollutants emitted.

Further, the crematorium would operate within an existing building located in an area zoned as commercial and no additional construction or ground disturbance to the area would be required. Overall, any impact to the terrestrial and aquatic life and habitats of the project area would be minor.

B. Water Quality, Quantity and Distribution

The project would not be expected to affect water quantity or distribution in the project area. The crematorium operates within a building and does not discharge or use water during operation.

Emissions from the project may affect water quality in the project area due to air pollutant deposition. However, as detailed in Section V, Section VI, and Section VII of the permit analysis, any emissions and resulting deposition impacts from the project would be minor due to the low concentration of those pollutants emitted.

C. Geology and Soil Quality, Stability and Moisture

The project may affect the geology, soil quality, stability, and moisture of the project area due to pollutant deposition. The crematorium operates within a building located in an area zoned as commercial and no new construction or ground disturbance to the area is required.

Further, as described in Section V, Section VI, and Section VII of the permit analysis, proper crematorium operation results in minor air pollution emissions to the ambient environment. These pollutants would deposit on the soils in the surrounding area. Any impact from deposition of these pollutants would be minor due to dispersion characteristics and the low concentration of those pollutants emitted.

D. Vegetation Cover, Quantity, and Quality

Emissions from the project may affect vegetation cover, quantity, and quality in the project area. However, as detailed in Section V, Section VI, and Section VII of the permit analysis, any emissions and resulting impacts from the project would be minor.

Further, the crematorium operates within an existing building located in an area zoned as commercial and no new construction or ground disturbance is required. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

E. Aesthetics

The project would result in a minor impact to the aesthetic nature of the project area because the crematorium operates within a building located in an area zoned as commercial and a no new construction or site disturbance is required. Because the facility location area is currently designated for commercial use, the project would not change the aesthetic nature of the area. The new incinerator replaces an older unit that was previously operated at this facility. Therefore, the new equipment would not change the aesthetics from its previous state. Further, visible emissions from the source would be limited to 10% opacity and the permit includes emission control requirements. The project would result in only a minor amount of noise from normal operations.

F. Air Quality

The project would result in the emissions of various criteria pollutants and HAPs to the ambient air in the project area. However, as detailed in Section V, Section VI, and Section VII of the permit analysis, it has been demonstrated via air dispersion modeling that any air quality impacts from the project would be minor and would constitute negligible risk to human health and the environment.

The Department conducted air dispersion modeling to determine the ambient air quality impacts from HAPs that would be generated by operating the crematorium. The SCREEN3 model was selected for the air dispersion modeling. The full meteorology option was selected to provide a conservative result. Receptors were placed from 50 to 5000 meters in a simple terrain array.

Stack parameters and emission rates used in the SCREEN3 model are contained in Section VI of the permit analysis and are on file with the Department. Stack velocity and gas temperature were taken from data provided in the MAQP application and by the manufacturer of the crematorium. Due to the dispersion characteristics and low levels of pollutants that would be emitted from the incinerator, the Department determined that any impacts to air quality would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The Department, in an effort to assess any potential impacts to any unique endangered, fragile, or limited environmental resources in the area of operation (SW<sup>1</sup>/<sub>4</sub> of Section 29, Township 3 North, Range 7 West, in Silver Bow County, Montana), contacted the Montana Natural

Heritage Program (MNHP). Search results concluded there are four known vertebrate animal species of concern located within three miles of the facility. The search area, in this case, is defined by the township and range of the proposed site, with an additional one-mile buffer. The MNHP concluded that the endangered species of gray wolf and threatened species of Canada lynx could be potentially located near the facility location. The westslope cutthroat trout and wolverine were listed as sensitive species potentially occupying the same area as the site location.

The gray wolf has a listed state conservation status of S3, signifying a state-level rank of “vulnerable.” “Vulnerable” is defined by NatureServe.org as at moderate risk of extinction or elimination in the jurisdiction due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation. The global conservation status is G4, signifying a global-level rank of “apparently secure.” “Apparently secure” is defined by NatureServe.org as uncommon but not rare; some cause for long-term concern due to declines or other factors. In the mid-to-late 1980s, in an effort to restore wolf populations, the gray wolf was reintroduced into three recovery areas – Northwestern Montana, Central Idaho, and the Greater Yellowstone. Although the project is located within the wolf recovery area, the wolf exhibits no particular habitat preference except wolves usually occupy areas with few roads or human disturbance, so it is unlikely that wolves would be impacted by this project. The Department would not expect the facility to have an impact on the local gray wolf population.

The Canada lynx has a listed state conservation status of S3, signifying a state-level rank of “vulnerable.” The global conservation status is G5, signifying a global-level rank of “secure.” “Secure” is defined by NatureServe.org as common; widespread and abundant. Canada lynx generally prefer a subalpine forest habitat. Throughout their range, shrub-steppe habitats may provide important corridor habitats for traveling between primary habitats. Typical snow conditions are important factors for lynx, with lynx occurring primarily in habitats that also receive relatively uniform and moderately deep snowfall. Due to the location of the facility within the city limits of Butte and the lack of subalpine forest environment, the Department would not expect the facility to have an impact on the local Canada lynx population.

The wolverine has a listed state conservation status of S3, signifying a state-level rank of “vulnerable.” The global conservation status is G4, signifying a global-level rank of “apparently secure.” Wolverines prefer a habitat of alpine tundra and boreal and mountain forests in the western mountains, especially large wilderness areas. However, dispersing individuals have been found far outside of usual habitats. They are usually in areas with snow on the ground in winter. When inactive, wolverines occupy dens in caves, rock crevices, under fallen trees, in thickets, or similar sites. Wolverines are primarily terrestrial but may climb trees. They feed on a wide variety of roots, berries, small mammals, birds' eggs and young, fledglings, and fish. Due to the location of the facility within the city limits of Butte and the lack of large wilderness area, the Department would not expect the facility to have an impact on the local wolverine population.

The westslope cutthroat trout has a listed state conservation status of S2, signifying a state-level rank of “imperiled.” “Imperiled” is defined by NatureServe.org as rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction. The global conservation status is G4, signifying a global-level rank of “apparently secure.” Westslope cutthroat are common in both headwaters lake and stream environments. Due to the location of the facility within the city limits of Butte and the minor amounts of emissions that could potentially settle onto any surrounding drainages or surface waters, the Department would not expect the facility to have an impact on the local westslope cutthroat trout population.

Emissions from the project could impact the previously mentioned unique, endangered, fragile, or limited environmental resources located in the project area. However, as detailed in Section V, Section VI, and Section VII of the permit analysis, any emissions and resulting impacts from the project would be minor due to the low concentration of those pollutants emitted. Overall, any impact to these unique endangered, fragile, or limited environmental resources in the project area would be minor.

#### H. Demands on Environmental Resource of Water, Air and Energy

The project would result in minor demands on environmental resources of water and air as discussed in Section 7.B and 7.F, respectively, of this EA. Further, as detailed in Section V, Section VI, and Section VII of the permit analysis, project impacts on air resources in the project area would be minor due to dispersion characteristics and the low concentration of those pollutants emitted. Because the project would be considered small by industrial standards, little energy would be required for operation and the resulting impact on energy resources would be minor. The crematorium replaces an older unit that performed the same function; therefore, the demands on environmental resources have not changed.

#### I. Historical and Archaeological Sites

The Department contacted the Montana Historical Society, State Historical Preservation Office (SHPO) in an effort to identify any historical and archaeological sites that may be present in the area of operation. Search results concluded that there are no previously recorded historical or archaeological resources of concern within the project area. According to the SHPO, there would be a low likelihood of adverse disturbance to any known archaeological or historic site. Therefore, no impacts upon historical or archaeological sites would be expected as a result of operating the incinerator. The project would operate within an area zoned as commercial, would not disturb any surrounding structures, and would not require any new construction or ground disturbance.

#### J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would be minor due to the relatively small size and potential environmental impact of the operation. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4428-00.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores			X			Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores

The project would result in minor, if any, disruption to the local social structures and mores because it would be a minor source of emissions and would replace old equipment that performed the same function. The equipment is located within an existing commercial building that has already been providing the same services utilizing similar equipment.

B. Cultural Uniqueness and Diversity

The facility is located on private property owned by the operator of AMC. The location of the facility is within a commercial district in the city of Butte. The crematorium replaced similar equipment that performed the same function and no new construction or ground disturbance is required. Therefore, the Department believes that the project would not have an effect on the cultural uniqueness and diversity of the surrounding area.

C. Local and State Tax Base and Tax Revenue

The project would result in minor, if any, impacts to the local and state tax base and tax revenue because the project would not require additional employees. In addition, no new construction is required to complete the project and the facility would be a minor industrial source of emissions. The new equipment would not be expected to change the nature of the services provided by AMC.

#### D. Agricultural or Industrial Production

Because the project would operate within an area zoned as commercial, the project would not affect or displace any land used for agricultural production and would not require any new construction. Further, the nature of the project would dictate that no industrial production would be affected from the proposed project.

#### E. Human Health

The peak annual ambient impact of HAPs from the operation of the crematorium would be  $5.38E-03 \mu\text{g}/\text{m}^3$ , which is the sum of the modeled ambient impact from the combustion of animal remains with corresponding container and natural gas. The predicted annual ambient impact of each individual HAP was determined by multiplying the peak annual ambient concentration by the emission rate of the HAP. The impacts calculated for each HAP are compared to the cancer and non-cancer levels specified in Tables 1 and 2 of ARM 17.8.770. If the predicted ambient impact of a particular HAP is less than the level specified in the table and the inhalation pathway is the only appropriate pathway, that HAP can be excluded from the human health risk assessment. The calculated HAP emissions were all less than the levels established in Tables 1 and 2 of ARM 17.8.770; however, the Department chose not to exclude all of the predicted HAPs so that a human health risk assessment could be presented in the permit analysis to demonstrate negligible risk.

As detailed in Section VII of the permit analysis, a health risk assessment was conducted to determine if the proposed crematorium would comply with the negligible risk requirement of MCA 75-2-215 and ARM 17.8.770. 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 determined that inhalation risk would be the only necessary pathway to consider. The calculated HAP emissions were all less than the levels established in Tables 1 and 2 of ARM 17.8.770. The Department applied the negligible risk assessment criteria as defined in ARM 17.8.740(16), which defines negligible risk as "an increase in excess lifetime cancer risk of less than  $1.0 \times 10^{-6}$  (1.00E-06) for any individual pollutant, and  $1.0 \times 10^{-5}$  (1.00E-05) for the aggregate of all pollutants, and an increase in the sum of the non-cancer hazard quotients for all pollutants with similar toxic effects of less than 1.0 in order to determine negligible risk." Cancer Risk values are found in Table 1: Prioritized Chronic Dose-Response Values for Screening Risk Assessments from [www.epa.gov/ttn/atw/toxsource/table1.pdf](http://www.epa.gov/ttn/atw/toxsource/table1.pdf). For the purposes of determining the negligible risk, all pollutants from the combustion of animal remains with corresponding container and natural gas were included in the human health risk assessment.

All of the individual pollutant concentrations for the ELCR meet the acceptable risk criteria because each pollutant concentration is less than 1.00E-06 and the sum of all pollutant concentrations is less than 1.00E-05. Further, the sums of the chronic non-cancer reference exposure level quotients are less than 1.0. Therefore, the crematorium at the AMC facility meets the criteria of ARM 17.8.770 and operation of the incinerator would be considered a negligible risk to public health, safety, welfare, and to the environment. Overall, any impacts to human health in the project area would be minor.

#### F. Access to and Quality of Recreational and Wilderness Activities

The project would operate within a commercial area and would not affect any access to or quality of recreation or wilderness activity.

G. Quantity and Distribution of Employment

According to the applicant, no new employees would be required for this project. Therefore, this permitting action would not affect the quantity and distribution of employment.

H. Distribution of Population

The project would not require any new employees nor require personnel to relocate to facilitate the action. The nature of the business at AMC would not change as a result of this permitting action. Therefore, there would be no expected effect on the distribution of population.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity

The project would result in only a minor impact on local industrial and commercial activity because the project would operate within an area zoned as commercial, would not require additional construction, and would not result in additional industrial production.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals in the immediate area affected by the project. There is a Montana SIP in effect for the Butte PM<sub>10</sub> nonattainment area; however, this facility is not affected by the provisions of the SIP.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social environment in the immediate area due to the relatively small size of the operation. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4428-00.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the issuance of an MAQP for the operation of animal remains crematorium/incinerator. MAQP #4428-00 includes conditions and limitations to ensure that the facility would operate in compliance with all applicable rules and regulations. In addition, there are no known significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

EA prepared by: Ed Warner  
Date: May 1, 2009