

## **Statement of Basis**

**Permit to Construct No. P-2012.0029  
Project ID 61056**

**US Air Force - Mountain Home AFB  
Mountain Home, Idaho**

**Facility ID 039-00001**

**Final**

**August 23, 2012**  
**Kelli Wetzel** *KW*  
**Permit Writer**

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

<b>ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE .....</b>	<b>3</b>
<b>FACILITY INFORMATION .....</b>	<b>5</b>
Description .....	5
Permitting History .....	5
Application Scope .....	6
Application Chronology .....	6
<b>TECHNICAL ANALYSIS .....</b>	<b>7</b>
Emissions Units and Control Equipment .....	7
Emissions Inventories.....	7
Ambient Air Quality Impact Analyses.....	9
<b>REGULATORY ANALYSIS.....</b>	<b>9</b>
Attainment Designation (40 CFR 81.313).....	9
Permit to Construct (IDAPA 58.01.01.201).....	9
Tier II Operating Permit (IDAPA 58.01.01.401) .....	9
Visible Emissions (IDAPA 58.01.01.625) .....	10
Standards for New Sources (IDAPA 58.01.01.676).....	10
Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70).....	10
PSD Classification (40 CFR 52.21).....	10
NSPS Applicability (40 CFR 60) .....	10
NESHAP Applicability (40 CFR 61) .....	13
MACT Applicability (40 CFR 63) .....	14
Permit Conditions Review.....	14
<b>PUBLIC REVIEW.....</b>	<b>20</b>
Public Comment Opportunity.....	20
<b>APPENDIX A – EMISSIONS INVENTORIES.....</b>	<b>21</b>
<b>APPENDIX B – FACILITY DRAFT COMMENTS .....</b>	<b>22</b>
<b>APPENDIX C – PROCESSING FEE .....</b>	<b>24</b>

## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O <sub>2</sub>	oxygen
PC	permit condition
PM	particulate matter
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RICE	reciprocating internal combustion engines
Rules	<i>Rules for the Control of Air Pollution in Idaho</i>

scf	standard cubic feet
SM	synthetic minor
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
µg/m <sup>3</sup>	micrograms per cubic meter

## FACILITY INFORMATION

### *Description*

Mountain Home Air Force Base (MHAFB) is a military base under the command of the U.S. Air Force. The base houses the 366<sup>th</sup> Composite Wing, which is classified as an Air Force Fighter Wing. To support the aircraft mission, and the Air Force personnel and their dependents, the base operates a number of facilities that are air pollution sources, which include the following:

- Aircraft operation and maintenance
- Aircraft engine testing
- Ground vehicle operation and maintenance
- Hospital
- Portable sources
- Base maintenance activities

### *Permitting History*

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

May 24, 2007	P-060068, PTC modification for changing monitoring and operation requirements and including permit conditions in PTC No. P-040025 issued October 1, 2004, Permit status (A, but will become S upon issuance of this permit)
October 1, 2004	P-040026, PTC revision for change of responsible official and facility contact person, Permit status (S)
October 1, 2004	P-040025, PTC revision for change of responsible official and facility contact person, Permit status (S)
May 25, 2004	P-030037, Initial PTC for installing a dual-fuel burner for the Hurst boiler and increasing hours of three CAT generators, Permit status (S)
April 9, 2003	P-030004, PTC revision for change of responsible official, Permit status (S)
May 30, 2002	Revised and consolidated PTC for the hospital boilers, Hush House I and II, Bead-blasting unit, Flight line area spray painting, Vehicle spray painting booth, Aircraft and aircraft parts surface-coating spray booths Building 1330, Permit status (S)
March 30, 2000	Modified PTC for the flight line area spray painting operations, Permit status (S)
November 30, 1999	PTC to allow jet engine testing in the hush houses, Permit status (S)
November 8, 1999	PTC issued for the flight line area spray painting operations, Permit status (S)
September 19, 1999	Modified PTC issued for the vehicle paint booth, Permit status (S)
November 18, 1998	PTC issued for the operation of three boilers at the hospital, Permit status (S)
September 13, 1996	An exemption from permitting requirements was issued for Hush House I.
April 18, 1996	Modified PTC issued for the vehicle paint booth, Permit status (S)
November 22, 1995	PTC issued for the bead-blasting unit in Hanger 1330, Permit status (S)
May 28, 1992	PTC issued for a vehicle spray paint booth, Permit status (S)

## ***Application Scope***

This PTC is for a modification at an existing Tier I facility. See the current Tier I permit statement of basis for the permitting history.

The applicant has proposed to:

- Operate the existing four permitted dual-fired hospital boilers on natural gas exclusively and eliminate the use of diesel fuel as a backup option
- Replace the three existing 750 kW diesel emergency generators with two new 800 kW diesel emergency generators.

## ***Application Chronology***

May 18, 2012	DEQ received an application and an application fee.
May 30, 2012 – June 14, 2012	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
June 13, 2012	DEQ determined that the application was complete.
July 16, 2012	DEQ made available the draft permit and statement of basis for peer and regional office review.
July 23, 2012	DEQ made available the draft permit and statement of basis for applicant review.
August 15, 2012	DEQ received the permit processing fee.
August 23, 2012	DEQ issued the final permit and statement of basis.

# TECHNICAL ANALYSIS

## Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
Boiler 1, 2, 3, and 4	<u>Hospital Boiler (1):</u> Manufacturer: Hurst Model: C1-GO-12 Heat input rating: 1.05 MMBtu/hr Fuel: Natural Gas exclusively	None
	<u>Hospital Boilers (3)</u> Manufacturer: Kewanee Model: LSW-125-GO Heat input rating: 5.231 MMBtu/hr Fuel: Natural Gas exclusively	
Generator 1 and 2	<u>Emergency Generators (2)</u> Manufacturer: Cummins Model: DQFAC Maximum Rating: 1.05 MMBtu/hr Tier Certification: 2 Fuel: ULSD	None
	Hush Houses I and II	None
	Bead-Blasting Unit	Dust Collector
	Flight Line Area Spray Painting	None
	Vehicle Spray Paint Booth	Spray Booth Filters
	Aircraft and Aircraft Parts Spray Booths	Spray Booth Filters

## Emissions Inventories

An emission inventory was developed for the sources of emissions at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, GHG, and HAP PTE were based on emission factors from AP-42, operation of 8,760 hours per year for Boilers 1, 2, 3, and 4, and 500 hours per year for Generator 1 and 2, and process information specific to the facility for this proposed project.

## Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria and GHG pollutants from the units being modified as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	T/yr <sup>(b)</sup>
Boilers 1 - 4	0.12	0.53	8.22	36.00	2.32	10.14	1.31	5.74	0.09	0.38	0.00
Generators 1 - 3	1.21	0.30	12.21	3.05	72.42	18.10	16.60	4.15	2.13	0.53	0.00
<b>Pre-Project Totals</b>	<b>1.33</b>	<b>0.83</b>	<b>20.43</b>	<b>39.05</b>	<b>74.74</b>	<b>28.24</b>	<b>17.91</b>	<b>9.89</b>	<b>2.22</b>	<b>0.91</b>	<b>0.00</b>

- a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.  
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

### Post Project Potential to Emit

The following table presents the post project Potential to Emit for criteria and GHG pollutants from the units being modified as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

**Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	lb/hr <sup>(a)</sup>	T/yr <sup>(b)</sup>	T/yr <sup>(b)</sup>
Boilers 1 - 4	0.12	0.51	0.01	0.04	1.55	6.77	1.30	5.69	0.09	0.37	8581
Generators 1 and 2	0.73	0.18	0.02	0.01	23.22	5.80	12.58	3.14	1.47	0.37	660
<b>Post Project Totals</b>	<b>0.85</b>	<b>0.69</b>	<b>0.03</b>	<b>0.05</b>	<b>24.77</b>	<b>12.57</b>	<b>13.88</b>	<b>8.83</b>	<b>1.56</b>	<b>0.74</b>	<b>9241.0</b>

- a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.  
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

### Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

**Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS**

Source	PM <sub>10</sub> /PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		CO <sub>2</sub> e
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	T/yr
Pre-Project Potential to Emit	1.33	0.83	20.43	39.05	74.74	28.24	17.91	9.89	2.22	0.91	0.00
Post Project Potential to Emit	0.85	0.69	0.03	0.05	24.77	12.57	13.88	8.83	1.56	0.74	9241.0
<b>Changes in Potential to Emit</b>	<b>-0.48</b>	<b>-0.14</b>	<b>-20.40</b>	<b>-39.00</b>	<b>-49.97</b>	<b>-15.67</b>	<b>-4.03</b>	<b>-1.06</b>	<b>-0.66</b>	<b>-0.17</b>	<b>9241.00</b>

### Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

**Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS**

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acrolein	1.66E-04	1.29E-04	-3.74E-05	0.017	No
Naphthalene	2.75E-03	2.13E-03	-6.16E-04	3.33	No
Toluene	5.94E-03	4.60E-03	-1.33E-03	25	No
Xylenes	4.08E-03	3.16E-03	-9.15E-04	29	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

### Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

**Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS**

<b>Carcinogenic Toxic Air Pollutants</b>	<b>Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)</b>	<b>Carcinogenic Screening Emission Level (lb/hr)</b>	<b>Exceeds Screening Level? (Y/N)</b>
Benzene	1.64E-02	1.27E-02	-3.68E-03	8.0E-04	No
Formaldehyde	1.67E-03	1.29E-03	-3.74E-04	5.1E-04	No
PAH <sup>a</sup>	2.13E+00	3.47E-03	-2.12E+00	2.0E-06	No

a) Polynuclear Aromatic Hydrocarbons (PAH) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

None of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any carcinogenic TAP because none of the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

**Ambient Air Quality Impact Analyses**

The estimated emission rates of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline<sup>1</sup>. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

Because there was no emissions increase associated with this PTC modification, no modeling was required.

**REGULATORY ANALYSIS**

**Attainment Designation (40 CFR 81.313)**

The facility is located in Elmore County, which is designated as attainment or unclassifiable for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

**Permit to Construct (IDAPA 58.01.01.201)**

IDAPA 58.01.01.201 ..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

**Tier II Operating Permit (IDAPA 58.01.01.401)**

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400-410 were not applicable to this permitting action.

<sup>1</sup> Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

**Visible Emissions (IDAPA 58.01.01.625)**

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of PM<sub>10</sub> emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4, 3.4, 4.4, 5.4, 6.4, 7.5, and 8.4.

**Standards for New Sources (IDAPA 58.01.01.676)**

IDAPA 58.01.01.677 .....Standards for Minor and Existing Sources

The fuel burning equipment located at this facility, with a maximum rated input of less than ten (10) million BTU per hour, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by Permit Condition 2.3.

**Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)**

IDAPA 58.01.01.301 .....Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility have a potential to emit greater than 100 tons per year for NO<sub>x</sub> and CO as demonstrated in the Emissions Inventories Section of the facility’s Tier I Operating Permit No. T1-2007.0041 issued July 22, 2008. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10. The facility’s Tier I Operating Permit will be modified in accordance with IDAPA 58.01.01.209.05.a to incorporate this modified PTC.

**PSD Classification (40 CFR 52.21)**

40 CFR 52.21 .....Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

**NSPS Applicability (40 CFR 60)**

Because the facility has four natural gas-fired boilers the following NSPS requirements may apply to this facility:

**40 CFR 60, Subpart Dc.....Standards of Performance for Small Industrial–Commercial–Institutional Steam Generating Units**

§ 60.40c      *Applicability and delegation of authority*

*(a) Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).*

*(b) In delegating implementation and enforcement authority to a State under section 111(c) of the Clean Air Act, §60.48c(a)(4) shall be retained by the Administrator and not transferred to a State.*

*(c) Steam generating units that meet the applicability requirements in paragraph (a) of this section are not subject to the sulfur dioxide (SO<sub>2</sub>) or particulate matter (PM) emission limits, performance testing requirements, or monitoring requirements under this subpart (§§60.42c, 60.43c, 60.44c, 60.45c, 60.46c, or 60.47c) during periods of combustion research, as defined in §60.41c.*

Each of the four natural gas-fired boilers have a maximum rated heat input of less than 10 MMBtu/hr. Therefore, the four natural gas-fired boilers are not subject to the requirements of this subpart.

The facility is subject to the requirements of 40 CFR 60, Subpart III – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). The two generators are 818 kW diesel CI engines manufactured in 2011 and installed in 2012 for emergency use.

**40 CFR 60 Subpart III..... Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

**§ 60.4200** *Am I subject to this Subpart?*

*(a) The provisions of this Subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this Subpart, the date that construction commences is the date the engine is ordered by the owner or operator.*

*(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:*

*(i) Manufactured after April 1, 2006 and are not fire pump engines, or*

*(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.*

*(3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.*

*(b) The provisions of this Subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.*

*(c) If you are an owner or operator of an area source subject to this Subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this Subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this Subpart applicable to area sources.*

*(d) Stationary CI ICE may be eligible for exemption from the requirements of this Subpart as described in 40 CFR part 1068, Subpart C (or the exemptions described in 40 CFR part 89, Subpart J and 40 CFR part 94, Subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.*

The IC engines are new engines which will be constructed after July 11, 2005. Therefore the engines are subject to the Subpart.

**§ 60.4201** *What emission standards must I meet for non-emergency engines if I am a stationary CI internal combustion engine manufacturer?*

The permittee is not the manufacturer of the engines and therefore this requirement is not applicable.

**§ 60.4202** *What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?*

The permittee is not the manufacturer of the engines. Therefore, this requirement is not applicable.

**§ 60.4203** *How long must my engines meet the emission standards if I am a stationary CI internal combustion engine manufacturer?*

The permittee is not the manufacturer of the engines and therefore this requirement is not applicable.

**§ 60.4204** *What emission standards must I meet for non-emergency engines if I am an owner or operator of a stationary CI internal combustion engine?*

The IC engines are emergency engines and therefore this requirement is not applicable.

**§ 60.4205** *What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?*

*(a) Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in Table 1 to this subpart. Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards in 40 CFR 94.8(a)(1).*

*(b) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.*

The IC engines must comply with the emission standards for new nonroad CI engines in §60.4202.

The subpart requires that the permittee comply with Table 1 per 40 CFR 89.112.

*§ 60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?*

*Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.*

The permittee must operate the IC engines for the life of the units in accordance with manufacturer-approved methods.

*§ 60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this Subpart?*

*(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this Subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).*

*(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this Subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.*

The permittee has stated that they will operate the IC engines in accordance with 40 CFR 80.510(b). The fuel sulfur content cannot exceed 15 ppm or 0.0015% by weight. All emissions calculations assume that percentage.

*§ 60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?*

*If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.*

*(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.*

A non-resettable hour meter shall be installed on the IC engines.

*§ 60.4210 What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?*

The permittee is not the manufacturer of the IC engines and therefore this requirement is not applicable.

*§ 60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?*

*(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this Subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.*

The permittee is subject to 60.4205(b), therefore the IC engines must be installed and configured according to the manufacturer's specifications.

*(f) Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited.*

Maintenance and testing of the IC engines shall not exceed 100 hours per year.

§ 60.4212 *What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?*

A performance test on the IC engines is not required and therefore this requirement is not applicable.

§ 60.4213 *What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of greater than or equal to 30 liters per cylinder?*

A performance test on the IC engines is not required and the engines are less than 30 liters per cylinder. Therefore this requirement is not applicable.

§ 60.4214 *What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?*

*(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.*

The IC engines do not meet the criteria set forth in the subpart requiring notification unless they are uncertified.

### **NESHAP Applicability (40 CFR 61)**

The facility is not subject to any NESHAP requirements in 40 CFR 61.

## **MACT Applicability (40 CFR 63)**

Because the facility has four natural gas-fired boilers the following NESHAP requirements may apply to this facility:

### **40 CFR 63 Subpart JJJJJJ.....NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources**

§ 63.11195 *Are any boilers not subject to this subpart?*

*The types of boilers listed in paragraphs (a) through (g) of this section are not subject to this subpart and to any requirements in this subpart.*

*(a) Any boiler specifically listed as, or included in the definition of, an affected source in another standard(s) under this part.*

*(b) Any boiler specifically listed as an affected source in another standard(s) established under section 129 of the Clean Air Act.*

*(c) A boiler required to have a permit under section 3005 of the Solid Waste Disposal Act or covered by subpart EEE of this part (e.g., hazardous waste boilers).*

*(d) A boiler that is used specifically for research and development. This exemption does not include boilers that solely or primarily provide steam (or heat) to a process or for heating at a research and development facility. This exemption does not prohibit the use of the steam (or heat) generated from the boiler during research and development, however, the boiler must be concurrently and primarily engaged in research and development for the exemption to apply.*

*(e) A gas-fired boiler as defined in this subpart.*

*(f) A hot water heater as defined in this subpart.*

*(g) Any boiler that is used as a control device to comply with another subpart of this part, provided that at least 50 percent of the heat input to the boiler is provided by the gas stream that is regulated under another subpart.*

The four hospital boilers meet the definition of a gas-fired boiler and therefore are not subject to the requirements of this subpart.

## **Permit Conditions Review**

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

### **Existing Permit Condition 2.1**

*One Hurst boiler and three Kewanee boilers provide space heat and other heat needs at the base hospital. The hospital boilers are dual-fuel capable and operate on natural gas or distillate fuel.*

### **Revised Permit Condition 2.1**

*One Hurst boiler and three Kewanee boilers provide space heat and other heat needs at the base hospital. The hospital boilers operate on natural gas exclusively.*

This permit condition has been revised to remove the option for the boilers to operate on distillate fuel. The permittee has requested this change and emissions are based on natural gas.

### **Deleted Existing Permit Condition 2.3**

*Emissions of SO<sub>2</sub> from the Kewanee boilers common hospital boiler stack shall not exceed 2.1 tons per any consecutive 12-month period.*

This permit condition has been deleted because current potential emissions from the boilers are only 0.4 tpy, well below the 2.1 tpy emission limit.

#### Existing Permit Condition 2.4

*As required by IDAPA 58.01.01.677, particulate matter emissions from the boiler stacks shall not exceed the following stack gas concentrations:*

- *Distillate fuel oil - 0.05 gr/dscf corrected to 3% oxygen by volume*
- *Natural gas – 0.015 gr/dscf corrected to 3% oxygen by volume*

#### Revised Permit Condition 2.3

*The permittee shall not discharge to the atmosphere from any fuel burning equipment with a maximum rated input of ten million BTU per hour, PM in excess of 0.015 gr/dscf corrected to 3% oxygen, in accordance with IDAPA 58.01.01.677.*

This permit condition has been revised to remove the reference to distillate fuel.

#### Existing Permit Condition 2.6

*The only fuels allowed to be combusted in the hospital boilers are the following:*

- *Natural gas*
- *Distillate fuel oil (ASTM Grade 1 fuel oil; ASTM Grade 2 fuel oil)*

#### Revised Permit Condition 2.5

*The hospital boilers shall be fired on natural gas exclusively.*

This permit condition has been revised to remove the ability to operate on distillate fuel oil.

#### Deleted Existing Permit Condition 2.7

*The permittee shall not operate any hospital boiler for more than 500 hours per any consecutive 12-month period when fueled by distillate fuel oil.*

This permit condition has been deleted because the boilers can no longer operate on distillate fuel oil.

#### Deleted Existing Permit Condition 2.8

*The sulfur content of the distillate fuel oil combusted in the hospital boilers shall not exceed the following:*

- *ASTM Grade 1 fuel oil – 0.3 % by weight*
- *ASTM Grade 2 fuel oil – 0.5 % by weight*

This permit condition has been deleted because the boilers can no longer operate on distillate fuel oil.

#### Existing Permit Condition 2.9

*The permittee shall conduct a quarterly see/no see visible emissions observation of each of the hospital boiler stacks during normal operations. If any visible emissions are present at the time of the observation, the permittee shall conduct an opacity visible emissions observation in accordance with IDAPA 58.01.01.625.04 while the boiler is operating. If it is determined in accordance with IDAPA 58.01.01.625 that opacity is greater than 20%, the permittee shall take all necessary corrective action and report excess emissions in accordance with IDAPA 58.01.01.130-136. The permittee shall record the results of each visible emission observation, and corrective action taken, if any, and maintain the records in accordance with General Provision 7.*

#### Revised Permit Condition 2.6

*The permittee shall conduct a quarterly inspection of each of the hospital boiler stacks, during daylight hours and under normal operating conditions. The inspection shall consist of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission, the permittee shall either*

- a) *take appropriate corrective action as expeditiously as practicable to eliminate the visible emissions. Within 24 hours of the initial see/no see evaluation and after the corrective action, the permittee shall conduct a see/no see evaluation of the emissions point in question. If the visible emissions are not eliminated, the permittee shall comply with b).*

or

- b) *perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is greater than 20%, as measured using Method 9, for a period or periods aggregating more than three minutes in any 60-minute period, the permittee shall take all necessary corrective action and report the exceedance in accordance with IDAPA 58.01.01.130-136.*

*The permittee shall maintain records of the results of each visible emission inspection and each opacity test when conducted. The records shall include, at a minimum, the date and results of each inspection and test and a description of the following: the permittee's assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.*

This permit condition was revised to reflect the most current standard PTC language.

**Deleted Existing Permit Condition 2.10**

*The permittee shall monitor and record the following information and retain records of this information onsite for the most recent five-year period and shall be made available to DEQ representatives upon request.*

- *The annual hours of operation of the Hurst boiler when combusting either ASTM Grade 1 or ASTM Grade 2 fuel oils. Annual hours of operation shall be determined by summing daily hours of operation monthly, and then summing monthly hours of operation over the previous consecutive 12-month period.*
- *The permittee shall obtain documentation of the fuel oil sulfur content for each shipment of distillate fuel received from the fuel supplier. The documentation shall clearly indicate the fuel oil sulfur content in weight percent of sulfur present in each fuel oil shipment.*

This permit condition was deleted because the boilers can no longer operate on distillate fuel oil.

**Existing Permit Condition 3.1**

*The three emergency generators provide emergency power to the base hospital in the event of a power failure.*

**Revised Permit Condition 3.1**

*Two diesel-fired emergency standby IC (internal combustion) engines powering two emergency generators provide emergency power to the base hospital in the event of a power failure.*

This permit condition has been revised from three emergency generators to two new diesel-fired emergency generators.

**Existing Permit Condition 3.3**

*The aggregate sulfur dioxide emissions and the aggregate nitrogen oxides emissions from the three emergency generator stacks shall not exceed any corresponding emissions rate limits listed in Table 3.1.*

**Table 3.7 EMERGENCY GENERATORS EMISSIONS LIMITS**

<b>Source Description</b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>
	<b>Tons/year</b>	<b>Tons/year</b>
Total generator emissions <sup>a</sup>	3.1	18.1

<sup>a</sup> Total generator emissions are the aggregated emissions from the three emergency generators.

### Revised Permit Condition 3.3

*The emissions from the two emergency generator stacks combined shall not exceed any corresponding emissions rate limits listed in Error! Reference source not found.*

**Table 3.2 EMERGENCY GENERATORS EMISSION LIMITS<sup>(a)</sup>**

<i>Source Description</i>	<i>SO<sub>2</sub> T/yr<sup>(b)</sup></i>	<i>NO<sub>x</sub> T/yr<sup>(b)</sup></i>
<i>Emergency Generator IC Engines</i>	<i>0.01</i>	<i>5.80</i>

*a) In absence of any other credible evidence, compliance is assured by complying with permit operating, monitoring, and record keeping requirements.*

*b) Tons per any consecutive 12-calendar month period.*

This permit condition has been revised to establish the hourly and annual emissions limits for PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and VOC emissions from the new IC engines.

### Existing Permit Condition 3.5

*The only fuels allowed to be combusted in the emergency generators are the following:*

- *Distillate fuel oil (ASTM Grade 1 fuel oil; ASTM Grade 2 fuel oil)*

### Revised Permit Condition 3.5

*No diesel fuel oil containing sulfur in excess of 15 ppm (0.0015% by weight) shall be burned in the Emergency Generators IC Engines.*

This permit condition has been revised to establish the use of only ULSD in the IC engines as proposed by the permittee.

### Existing Permit Condition 3.6

*The maximum annual hours of operation of each emergency generator shall not exceed 500 hours per consecutive 12-month period.*

### Revised Permit Condition 3.6

*To demonstrate compliance with the Emissions Limits permit condition and in accordance with 40 CFR 60.4211 the Emergency Generators IC engines shall be operated only for testing and maintenance of the engines, required regulatory purposes, and during emergency situations. Operation of the engines for maintenance, testing, and required regulatory purposes shall not exceed 100 hours per consecutive 12 months.*

This permit condition has been revised in accordance with 40 CFR 60.4211.

### Deleted Existing Permit Condition 3.7

*The sulfur content of the distillate fuel oil combusted in any of the three emergency generators shall not exceed the following:*

- *ASTM Grade 1 fuel oil – 0.3 % by weight*
- *ASTM Grade 2 fuel oil – 0.5 % by weight*

This permit condition was deleted in lieu of revised permit condition 3.5.

### New Permit Condition 3.7

*In accordance with 40 CFR 60.4206, the permittee shall operate and maintain the Emergency Generator IC engines according to the manufacturer's written instructions, or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engines.*

This permit condition establishes operation and maintenance requirements for the IC Engines as required by 40 CFR 60, III for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

New Permit Condition 3.8

*If the facility decides to change out/replace the IC engines at the facility they shall meet the engine replacement requirements of 40 CFR 60.4208 at that time.*

This permit condition establishes engine replacement requirements for the IC Engines as required by 40 CFR 60, III for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

New Permit Condition 3.9

*In accordance with 40 CFR 60.4209, the Emergency Generator IC engines shall be equipped with a non-resettable hour meter.*

This permit condition establishes that the IC Engines be equipped with a non-resettable hour meter as required by 40 CFR 60, III for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

New Permit Condition 3.10

*Unless expressly provided otherwise, any reference in this permit to any document identified in IDAPA 58.01.01.107.03 shall constitute the full incorporation into this permit of that document for the purposes of the reference, including any notes and appendices therein. Documents include, but are not limited to:*

- *Standards of Performance for New Stationary Sources (NSPS), 40 CFR Part 60, Subpart III*

*For permit conditions referencing or cited in accordance with any document incorporated by reference (including permit conditions identified as NSPS), should there be any conflict between the requirements of the permit condition and the requirements of the document, the requirements of the document shall govern, including any amendments to that regulation.*

This permit condition establishes that the federal requirements of 40 CFR Part 60 are incorporated by reference into the requirements of this permit per current DEQ guidance.

New Permit Condition 3.11

*The permittee shall comply with the requirements of 40 CFR 60 – General Provisions according to the requirements of 40 CFR 60, Subpart III for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.*

This permit condition incorporates 40 CFR 60, Subpart A – General Provisions.

Existing Permit Condition 3.9

*The permittee shall monitor and record the following information to demonstrate compliance with Permit Conditions 3.6 and 3.7. Records of this information shall be kept onsite for the most recent five-year period and shall be made available to DEQ representatives upon request.*

- *The annual hours of operation of each emergency generator. Annual hours of operation shall be determined by summing daily hours of operation monthly, and then summing monthly hours of operation over the previous consecutive 12-month period.*
- *The permittee shall obtain documentation of the fuel oil sulfur content for each shipment of distillate fuel received from the fuel supplier. The documentation shall clearly indicate the fuel oil sulfur content in weight percent of sulfur present in each fuel oil shipment.*

Revised Permit Condition 3.12

*In accordance with 40 CFR 60.4214, the permittee shall monitor and record operation of the IC engine in hours per month to demonstrate compliance with the IC Engine Operating Limit permit condition.*

*Consecutive 12-months operation of the IC engine shall be determined by summing the monthly operation over the previous consecutive 12 month period to demonstrate compliance with the consecutive 12-months IC Engine Operating Limit permit condition.*

This permit condition establishes that the permittee monitor and record monthly operation of the IC Engines to demonstrate compliance with the IC Engine operating limit permit condition.

#### Revised Permit Condition 3.13

*The permittee shall maintain purchase records or equivalent from the manufacturer that show the sulfur content of the fuel oil delivered to the facility. Records of this information shall be kept on site for the most recent five year period and shall be made available to DEQ representatives upon request.*

This permit condition establishes that the permittee shall maintain delivery receipts showing the percent sulfur content by weight for each shipment of fuel oil to demonstrate compliance with the fuel oil sulfur content permit condition.

#### New Permit Condition 3.14

*The permittee shall maintain records of the operation and maintenance of the IC engine to demonstrate compliance with the Operation and Maintenance Requirement permit condition.*

This permit condition establishes that the permittee shall maintain records of the operation and maintenance of the IC engines to demonstrate compliance with the operation and maintenance permit condition.

#### Existing Permit Condition 3.8

*The permittee shall conduct a quarterly see/no see visible emissions observation on each emergency generator stack during normal operating conditions if/when they are operating. If the generators are not operating during the time of the scheduled quarterly observation, the permittee shall indicate such and record all other relevant information in accordance with General Provision 7. If the generators are operating during the quarterly observation and any visible emissions are present at the time of the observation, the permittee shall conduct an opacity visible emissions observation in accordance with IDAPA 58.01.01.625.04 while the generator is operating. If it is determined in accordance with IDAPA 58.01.01.625 that opacity is greater than 20%, the permittee shall take all necessary corrective action and report excess emissions in accordance with IDAPA 58.01.01.130-136. The permittee shall record the results of each visible emission observation, and corrective action taken, if any, and maintain the records in accordance with General Provision 7.*

#### Revised Permit Condition 3.15

*The permittee shall conduct a quarterly inspection of each of the emergency generator stacks, during daylight hours and under normal operating conditions. The inspection shall consist of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission, the permittee shall either*

- a) *take appropriate corrective action as expeditiously as practicable to eliminate the visible emissions. Within 24 hours of the initial see/no see evaluation and after the corrective action, the permittee shall conduct a see/no see evaluation of the emissions point in question. If the visible emissions are not eliminated, the permittee shall comply with b).*

*or*

- b) *perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of 30 observations shall be recorded when conducting the opacity test. If opacity is greater than 20%, as measured using Method 9, for a period or periods aggregating more than three minutes in any 60-minute period, the permittee shall take all necessary corrective action and report the exceedance in accordance with IDAPA 58.01.01.130-136.*

*The permittee shall maintain records of the results of each visible emission inspection and each opacity test when conducted. The records shall include, at a minimum, the date and results of each inspection and test and a description of the following: the permittee's assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.*

This permit condition was revised to reflect the most current standard PTC language.

## **PUBLIC REVIEW**

### ***Public Comment Opportunity***

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

## **APPENDIX A – EMISSIONS INVENTORIES**

**Building 6000 Emissions**  
Mountain Home AFB

**Existing Emissions for Building 6000**

Pollutant	Boiler Emission Rate (Worst)		Generator Emission Rate		Total Emission Rate	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	0.121	0.528	1.47	0.37	1.59	0.886
Total Particulate Matter (PM2.5)	0.118	0.516	1.21	0.30	1.33	0.819
Particulate Matter (PM10)	0.121	0.528	1.21	0.30	1.33	0.831
Sulfur Oxides (SO2)	8.220	36.004	12.21	3.05	20.43	39.055
Nitrogen Oxides (NOx)	2.316	10.142	72.42	18.10	74.73	28.246
Carbon Monoxide (CO)	1.311	5.741	16.60	4.15	17.91	9.890
VOC	0.086	0.375	2.13	0.53	2.21	0.907

**Change in Emissions for Building 6000**

Pollutant	Boiler Emission Rate		Generator Emission Rate		Total Emission Rate	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	-0.003	-0.014	-0.75	-0.19	-0.75	-0.200
Total Particulate Matter (PM2.5)	0.000	-0.002	-0.48	-0.12	-0.48	-0.123
Particulate Matter (PM10)	-0.003	-0.014	-0.48	-0.12	-0.48	-0.135
Sulfur Oxides (SO2)	-8.211	-35.963	-12.18	-3.05	-20.39	-39.008
Nitrogen Oxides (NOx)	-0.770	-3.373	-49.20	-12.30	-49.97	-15.673
Carbon Monoxide (CO)	-0.013	-0.055	-4.02	-1.00	-4.03	-1.060
VOC	-0.001	-0.002	-0.65	-0.16	-0.65	-0.166

**New Emissions for Building 6000**

Pollutant	Boiler Emission Rate (NG Only)		Generator Emission Rate (Replace Generators)		Total Emission Rate	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	0.12	0.51	0.73	0.18	0.84	0.696
Total Particulate Matter (PM2.5)	0.12	0.51	0.73	0.18	0.84	0.696
Particulate Matter (PM10)	0.12	0.51	0.73	0.18	0.84	0.696
Sulfur Oxides (SO2)	0.01	0.04	0.02	0.01	0.034	0.047
Nitrogen Oxides (NOx)	1.55	6.77	23.22	5.80	24.76	12.574
Carbon Monoxide (CO)	1.30	5.69	12.58	3.14	13.87	8.830
VOC	0.09	0.37	1.47	0.37	1.56	0.741
Total HAPs						0.14

**GHG Emissions Summary for Hospital**

Emissions Unit Name	Stack ID	CO <sub>2</sub>		N <sub>2</sub> O		CH <sub>4</sub>		Total on Mass Basis		CO <sub>2</sub> e	
		Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr
New Generator 1 - 1097 HP	GEN1	299	329	0.0024	0.0027	0.012	0.013	299	329	300	330
New Generator 2 - 1097 HP	GEN2	299	329	0.0024	0.0027	0.012	0.013	299	329	300	330
Boiler 1 - 5.23 MMBTU (NG)	GEN4	2430	2678	0.0046	0.0051	0.046	0.051	2430	2678	2,432	2,681
Boiler 2 - 5.23 MMBTU (NG)	GEN5	2430	2678	0.0046	0.0051	0.046	0.051	2430	2678	2,432	2,681
Boiler 3 - 5.23 MMBTU (NG)	GEN6	2430	2678	0.0046	0.0051	0.046	0.051	2430	2678	2,432	2,681
Boiler 4 - 1.05 MMBTU (NG)	GEN7	488	538	0.00092	0.00101	0.0092	0.010	488	538	488	538
<b>Total</b>		<b>8,373</b>	<b>9,230</b>	<b>0.020</b>	<b>0.022</b>	<b>0.17</b>	<b>0.19</b>	<b>8,374</b>	<b>9,230</b>	<b>8,383</b>	<b>9,241</b>
<b>GHG Title V Thresholds</b>								<b>100</b>			<b>100,000</b>

**Potential Emission Calculations**

**Existing Hospital Generator Diesel Emissions (Three Identical Generators To be Removed)**

Emission Point No.	Hos Gen
Fuel Type	Distillate #2
Generator Size (kW)	750
Generator Size (HP)	1005.8
BTU/gal distillate fuel	140,000
Maximum annual operating hours	500

Criteria Pollutant	Emission Factor		Individual Generator			All Three Generators		
	(lb/MMBtu)	(lb/HP-hr)	Uncontrolled Potential to Emit			Uncontrolled Potential to Emit		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) <sup>1</sup>	6.97E-02	4.88E-04	0.49	245	0.12	1.47	736	0.37
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>	5.73E-02	4.01E-04	0.40	202	0.10	1.21	605	0.30
Particulate Matter (PM <sub>10</sub> ) <sup>1,2</sup>	5.73E-02	4.01E-04	0.40	202	0.10	1.21	605	0.30
Sulfur Oxides (SO <sub>2</sub> ) <sup>3,4</sup>		4.05E-03	4.07	2,034	1.017	12,205	6,103	3.0513
Nitrogen Oxides (NOx) <sup>4</sup>		0.024	24.14	12,070	6.03	72.4	36,209	18.10
Carbon Monoxide (CO) <sup>4</sup>		0.0055	5.53	2,766	1.38	16.6	8,298	4.15
VOC <sup>4</sup>		7.05E-04	0.71	355	0.18	2.13	1,064	0.53

Idaho TAPs <sup>5</sup>	Emission Factor		Individual Generator			All Three Generators		
	(lb/MMBtu)	(lb/HP-hr)	Uncontrolled Potential to Emit			Uncontrolled Potential to Emit		
			Rate (lb/hr)	Rate (lb/yr)	Rate (ton/yr)	Rate (lb/hr)	Rate (lb/yr)	Rate (ton/yr)
Benzene	7.76E-04	5.43E-06	5.46E-03	2.73E+00	1.37E-03	1.84E-02	8.20E+00	4.10E-03
Toluene	2.81E-04	1.97E-06	1.98E-03	9.89E-01	4.95E-04	5.94E-03	2.97E+00	1.48E-03
Xylenes	1.93E-04	1.35E-06	1.36E-03	6.79E-01	3.40E-04	4.08E-03	2.04E+00	1.02E-03
Propylene	2.79E-03	1.95E-05	1.96E-02	9.82E+00	4.91E-03	5.89E-02	2.95E+01	1.47E-02
Formaldehyde	7.89E-05	5.52E-07	5.56E-04	2.78E-01	1.39E-04	1.67E-03	8.33E-01	4.17E-04
Acetaldehyde	2.52E-05	1.76E-07	1.77E-04	8.87E-02	4.44E-05	5.32E-04	2.66E-01	1.33E-04
Acrolein	7.88E-06	5.52E-08	5.55E-05	2.77E-02	1.39E-05	1.68E-04	8.32E-02	4.16E-05
Naphthalene	1.30E-04	9.10E-07	9.15E-04	4.58E-01	2.29E-04	2.75E-03	1.37E+00	6.86E-04
Acenaphthylene	9.23E-06	6.46E-08	6.50E-05	3.25E-02	1.62E-05	1.95E-04	9.75E-02	4.87E-05
Acenaphthene	4.68E-06	3.28E-08	3.30E-05	1.65E-02	8.24E-06	9.89E-05	4.94E-02	2.47E-05
Fluorene	1.28E-05	8.96E-08	9.01E-05	4.51E-02	2.25E-05	2.70E-04	1.35E-01	6.76E-05
Phenanthrene	4.08E-05	2.86E-07	2.87E-04	1.44E-01	7.18E-05	8.62E-04	4.31E-01	2.15E-04
Anthracene	1.23E-06	8.61E-09	8.66E-06	4.33E-03	2.16E-06	2.60E-05	1.30E-02	6.49E-06
Fluoranthene	4.03E-06	2.82E-08	2.84E-05	1.42E-02	7.09E-06	8.51E-05	4.26E-02	2.13E-05
Pyrene	3.71E-06	2.60E-08	2.81E-05	1.31E-02	6.53E-06	7.84E-05	3.92E-02	1.96E-05
Benz(a)anthracene	6.22E-07	4.35E-09	4.38E-06	2.19E-03	1.09E-06	1.31E-05	6.57E-03	3.28E-06
Chrysene	1.53E-06	1.07E-08	1.08E-05	5.39E-03	2.69E-06	3.23E-05	1.62E-02	8.08E-06
Benzo(b)fluoranthene	1.11E-06	7.77E-09	7.82E-06	3.91E-03	1.95E-06	2.34E-05	1.17E-02	5.86E-06
Benzo(k)fluoranthene	2.18E-07	1.53E-09	1.53E-06	7.67E-04	3.84E-07	4.60E-06	2.30E-03	1.15E-06
Benzo(a)pyrene	2.57E-07	1.80E-09	1.81E-06	9.05E-04	4.52E-07	5.43E-06	2.71E-03	1.36E-06
Indeno(1,2,3-cd)pyrene	4.14E-07	2.90E-09	2.91E-06	1.46E-03	7.29E-07	8.74E-06	4.37E-03	2.19E-06
Dibenz(a,h)anthracene	3.46E-07	2.42E-09	2.44E-06	1.22E-03	6.09E-07	7.31E-06	3.65E-03	1.83E-06
Benzo(g,h,i)perylene	5.56E-07	3.89E-09	3.91E-06	1.96E-03	9.79E-07	1.17E-05	5.87E-03	2.94E-06
Total PAH	2.12E-04	7.05E-04	7.09E-01	3.55E+02	1.77E-01	2.13E+00	1.08E+03	5.32E-01
<b>Total HAPs</b>				<b>0.003</b>				<b>0.008</b>

<sup>1</sup> Emission factors from AP-42 5th Edition Section 3.4 Table 3.4-2 (October 1996)

<sup>2</sup> Assumed PM<sub>2.5</sub> = PM<sub>10</sub>

<sup>3</sup> SOX emission factor = 8.09E-003 x S where S is the percent sulfur content in the diesel fuel. At 0.5%, S = 0.5

<sup>4</sup> Emission factors from AP-42 5th Edition Section 3.4 Table 3.4-1 (October 1996)

<sup>5</sup> Emission factors from AP-42 5th Edition Section 3.4 Tables 3.4-3 and 3.4-4 (October 1996)

Assumed brake-specific fuel consumption of 7,000 BTU/HP-hr to convert lb/MMBTU to lb/HP-hr

<b>GHG Emissions - Individual Generator</b>			
Compound <sup>7</sup>	Emissions (metric tons)	GWP	CO2e
CO <sub>2</sub>	298.54	1	298.540
CH <sub>4</sub>	0.0121	21	0.254
N <sub>2</sub> O	0.00242	310	0.751
<b>Total</b>	<b>298.55</b>		<b>299.54</b>

For CO<sub>2</sub>, Use Equation C-1 from 40 CFR 98 Subpart C:

$$\text{CO}_2 = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$$

CO <sub>2</sub> = Annual CO <sub>2</sub> mass emissions in Metric Tons	=	298.54
Fuel = Volume of fuel used (gallons)	=	29,250
HHV = High Heat Value from Table C-1 (mmBTU/gal)	=	0.138
EFCO <sub>2</sub> = Emission factor (kg/mmBTU)	=	73.96

For CH<sub>4</sub> and N<sub>2</sub>O, Use Equation C-8 from 40 CFR 98 Subpart C:

$$\text{CH}_4, \text{N}_2\text{O} = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$$

CH <sub>4</sub> = Annual CH <sub>4</sub> mass emissions in Metric Tons	=	0.0121
N <sub>2</sub> O = Annual N <sub>2</sub> O mass emissions in Metric Tons	=	0.00242
Fuel = Volume of fuel used (gallons)	=	29,250
HHV = High Heat Value from Table C-1 (mmBTU/gal)	=	0.138
EFCH <sub>4</sub> = Emission factor (kg/mmBTU)	=	3.00E-03
EFN <sub>2</sub> O = Emission factor (kg/mmBTU)	=	6.00E-04

**Notes**

<sup>7</sup> 40 CFR 98.32 - For stationary fuel combustion sources only, report CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

**Comparison - Exchange Three Old Hospital Generators with Two New Hospital Generators**  
Mountain Home AFB

**Table 1 - Three Existing Generators (to be removed)**

Pollutant	Emission Rate	
	(lb/hr)	(ton/yr)
Total Particulate Matter (PM) <sup>1</sup>	1.47	0.37
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>	1.21	0.30
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	1.21	0.30
Sulfur Oxides (SO <sub>2</sub> ) <sup>3</sup>	12.21	3.05
Nitrogen Oxides (NOx) <sup>4</sup>	72.42	18.10
Carbon Monoxide (CO) <sup>4</sup>	16.60	4.15
VOC	2.13	0.53

**Table 2 - Two New Generators (New Emissions)**

Pollutant	Diesel Emission Rate	
	(lb/hr)	(ton/yr)
Total Particulate Matter (PM) <sup>1</sup>	0.73	0.18
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>	0.73	0.18
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	0.73	0.18
Sulfur Oxides (SO <sub>2</sub> ) <sup>3</sup>	0.02	0.01
Nitrogen Oxides (NOx) <sup>4</sup>	23.22	5.80
Carbon Monoxide (CO) <sup>4</sup>	12.58	3.14
VOC	1.47	0.37

**Table 3 - Net Difference**

Pollutant	Change in Emission Rate		Idaho Modeling Level I Thresholds <sup>1</sup>		Exceed Level I Threshold	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM) <sup>1</sup>	-0.747	-0.187				
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>	-0.485	-0.121	0.22		NO	
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	-0.485	-0.121	0.054	0.35	NO	NO
Sulfur Oxides (SO <sub>2</sub> ) <sup>3</sup>	-12.1806	-3.0451	0.21	1.2	NO	NO
Nitrogen Oxides (NOx) <sup>4</sup>	-49.200	-12.300	0.2	1.2	NO	NO
Carbon Monoxide (CO) <sup>4</sup>	-4.020	-1.005	15		NO	
VOC	-0.653	-0.163				

<sup>1</sup> State of Idaho Guideline for Performing Air Quality Impact Analyses, Table 2, July 2011

**Table 4 - Toxic Difference**

Idaho TAPs	Removed Generators (Three Generators)		New Generators (Two Generators)		Net Difference	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Benzene	1.64E-02	4.10E-03	1.27E-02	3.18E-03	-3.68E-03	-9.20E-04
Toluene	5.94E-03	1.49E-03	4.60E-03	1.15E-03	-1.33E-03	-3.33E-04
Xylenes	4.08E-03	1.02E-03	3.16E-03	7.90E-04	-9.15E-04	-2.29E-04
Propylene	5.89E-02	1.47E-02	4.57E-02	1.14E-02	-1.32E-02	-3.31E-03
Formaldehyde	1.67E-03	4.17E-04	1.29E-03	3.23E-04	-3.74E-04	-9.35E-05
Acetaldehyde	5.32E-04	1.33E-04	4.13E-04	1.03E-04	-1.19E-04	-2.99E-05
Acrolein	1.86E-04	4.18E-05	1.29E-04	3.23E-05	-3.74E-05	-9.34E-06
Naphthalene	2.75E-03	6.86E-04	2.13E-03	5.32E-04	-6.18E-04	-1.54E-04
Acenaphthylene	1.95E-04	4.87E-05	1.51E-04	3.78E-05	-4.38E-05	-1.09E-05
Acenaphthene	9.89E-05	2.47E-05	7.67E-05	1.92E-05	-2.22E-05	-5.55E-06
Fluorene	2.70E-04	6.76E-05	2.10E-04	5.24E-05	-6.07E-05	-1.52E-05
Phenanthrene	8.62E-04	2.15E-04	6.68E-04	1.67E-04	-1.93E-04	-4.84E-05
Anthracene	2.60E-05	6.49E-06	2.01E-05	5.04E-06	-5.83E-06	-1.46E-06
Fluoranthene	8.51E-05	2.13E-05	6.60E-05	1.65E-05	-1.91E-05	-4.78E-06
Pyrene	7.84E-05	1.98E-05	6.08E-05	1.52E-05	-1.76E-05	-4.40E-06
Benz(a)anthracene	1.31E-05	3.28E-06	1.02E-05	2.55E-06	-2.95E-06	-7.37E-07
Chrysene	3.23E-05	8.08E-06	2.51E-05	6.27E-06	-7.25E-06	-1.81E-06
Benzo(b)fluoranthene	2.34E-05	5.86E-06	1.82E-05	4.55E-06	-5.28E-06	-1.32E-06
Benzo(k)fluoranthene	4.60E-06	1.15E-06	3.57E-06	8.93E-07	-1.03E-06	-2.58E-07
Benzo(a)pyrene	5.43E-06	1.36E-06	4.21E-06	1.05E-06	-1.22E-06	-3.05E-07
Indeno(1,2,3-cd)pyrene	8.74E-06	2.19E-06	6.78E-06	1.70E-06	-1.96E-06	-4.91E-07
Dibenzo(a,h)anthracene	7.31E-06	1.83E-06	5.67E-06	1.42E-06	-1.64E-06	-4.10E-07
Benzo(g,h,i)perylene	1.17E-05	2.94E-06	9.11E-06	2.28E-06	-2.64E-06	-6.59E-07
Total PAH	2.13E+00	5.32E-01	3.47E-03	8.68E-04	-2.12E+00	-5.31E-01
Total HAPs		0.008		0.006		-0.002

**Potential Emission Calculations  
Hospital Boiler Diesel Emissions**

Emission Point No.	Fos Boiler
Fuel Type	Distillate #2
Fuel usage Boiler 1-3 (MMBTU/hr)	5.23
Fuel usage Boiler 4 (MMBTU/hr)	1.05
BTU/gal distillate fuel	140,000
Max Gallons/hr (5.23 MMBTU boiler)	37.36
Max Gallons/hr (0.83 MMBTU boiler)	7.50
Maximum annual operating hours	8,760

Total for all three boilers

Pollutant	CAS No.	Emission Factor (lb/10 <sup>3</sup> gal)	Boilers 1-3 (5.23 MMBTU/hr)		Boiler 4 (1.05 MMBTU/hr)		Combined (all 4 boilers)			
			Uncontrolled Potential to Emit Rate (lb/hr)	Emission Rate (ton/yr)	Uncontrolled Potential to Emit Rate (lb/hr)	Emission Rate (ton/yr)	Uncontrolled Potential to Emit Rate (lb/hr)	Emission Rate (ton/yr)		
Total Particulate Matter (PM) <sup>1,2</sup>		1	0.11	0.49	0.0037	32	0.016	0.116	1,014	0.51
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>1</sup>		0.3	0.03	0.12	0.0009	8	0.004	0.029	254	0.13
Particulate Matter (PM <sub>10</sub> ) <sup>1,2</sup>		1	0.11	0.49	0.0037	32	0.016	0.116	1,014	0.51
Sulfur Oxides (SO <sub>2</sub> ) <sup>3,4</sup>		71,000	7.96	34.86	0.2614	2,290	1.145	8.220	72,007	36.00
Nitrogen Oxides (NOx) <sup>4</sup>		20	2.24	9.82	0.0736	645	0.323	2.316	20,284	10.14
Carbon Monoxide (CO) <sup>4</sup>		5	0.56	2.45	0.0184	161	0.081	0.579	5,071	2.54
VOC <sup>5</sup>		0.252	0.03	0.12	0.0009	8	0.004	0.029	256	0.13

<sup>1</sup> Emission factors from AP-42 5th Edition Section 1.3 Table 1.3-6 (May 2010)

<sup>2</sup> Assumed PM = PM10

<sup>3</sup> SOX emission factor = 142S where S is the percent sulfur content in the diesel fuel. At 0.5%, S = 0.5

<sup>4</sup> Emission factors from AP-42 5th Edition Section 1.3 Table 1.3-1 (May 2010)

<sup>5</sup> Emission factors from AP-42 5th Edition Section 1.3 Table 1.3-3 (May 2010)

**Potential Emission Calculations  
Hospital Boiler NG Emissions**

Emission Point No.	Has Boiler
Fuel Type	Natural Gas
Fuel usage Boiler 1-3 (MMBTU/hr)	5,23
Fuel usage Boiler 4 (MMBTU/hr)	1,05
BTU/gal natural gas	1,020
Max R <sup>2</sup> /hr (5.23 MMBTU boiler)	5,128
Max R <sup>2</sup> /hr (1.05 MMBTU boiler)	1,029
Max R <sup>2</sup> /yr (5.23 MMBTU boiler)	44,925,059
Max R <sup>2</sup> /yr (1.05 MMBTU boiler)	9,017,647
Maximum annual operating hours	8,760

Total for all three boilers

Pollutant	CAS No.	Emission Factor (lb/10 <sup>6</sup> scf)	Boilers 1-3 (5.23 MMBTU/hr)		Boiler 4 (1.05 MMBTU/hr)		Combined (all 4 boilers)	
			Emission Rate (lb/hr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) <sup>1,2</sup>		7.6	0.12	0.51	0.0005	5	0.117	1,029
Total Particulate Matter (PM <sub>2.5</sub> ) <sup>1,2</sup>		7.6	0.12	0.51	0.0005	5	0.117	1,029
Particulate Matter (PM <sub>10</sub> ) <sup>1,2</sup>		7.6	0.12	0.51	0.0005	5	0.117	1,029
Sulfur Oxides (SO <sub>2</sub> ) <sup>1</sup>		0.6	0.01	0.040	0.00004	0.4	0.009	81
Nitrogen Oxides (NOx) <sup>3</sup>		100	1.54	6.74	0.0069	61	1.545	13,538
Carbon Monoxide (CO) <sup>3</sup>		84	1.29	5.66	0.0058	51	1.298	11,372
VOC <sup>1</sup>		5.5	0.08	0.37	0.0004	3	0.085	745

<sup>1</sup> Emission factors from AP-42 5th Edition Section 1.4 Table 1.4-2 (July 1998)

<sup>2</sup> Assumed Total PM = PM10 = PM2.5

<sup>3</sup> Emission factors from AP-42 5th Edition Section 1.4 Table 1.4-1 (July 1998), Small Boiler (<100 MMBTU/hr)

GHG Emissions Compound <sup>4</sup>	5.23 MMBTU Boiler (Individual Boiler)			1.05 MMBTU Boiler		
	Emissions (metric tons)	GWP	CO2e	Emissions (metric tons)	GWP	CO2e
CO <sub>2</sub>	2429.57	1	2429.565	487.68	1	487.678
CH <sub>4</sub>	0.0458	21	0.962	0.0092	21	0.193
N <sub>2</sub> O	0.00458	310	1.421	0.00092	310	0.285
Total	2429.62		2431.95	487.69		488.16

For CO<sub>2</sub>, Use Equation C-1 from 40 CFR 98 Subpart C:

$$\text{CO}_2 = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$$

CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions in Metric Tons =

5.23 MMBTU

1.05 MMBTU

Fuel = Volume of fuel used (standard cubic feet) =

44,925,059

9,017,647

HHV = High Heat Value from Table C-1 (mmBTU/scf) =

0.00102

0.00102

EFCO<sub>2</sub> = Emission factor (kg/mmBTU) =

53.02

53.02

For CH<sub>4</sub> and N<sub>2</sub>O, Use Equation C-8 from 40 CFR 98 Subpart C:

$$\text{CH}_4, \text{N}_2\text{O} = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$$

CH<sub>4</sub> = Annual CH<sub>4</sub> mass emissions in Metric Tons =

0.0458

0.0092

N<sub>2</sub>O = Annual N<sub>2</sub>O mass emissions in Metric Tons =

0.00458

0.00092

Fuel = Volume of fuel used (standard cubic feet) =

44,925,059

9,017,647

HHV = High Heat Value from Table C-1 (mmBTU/scf) =

0.00102

0.00102

EFCH<sub>4</sub> = Emission factor (kg/mmBTU) =

1.00E-03

1.00E-03

EFN<sub>2</sub>O = Emission factor (kg/mmBTU) =

1.00E-04

1.00E-04

Notes

<sup>4</sup> 40 CFR 98.32 - For stationary fuel combustion sources only, report CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

**Comparison - Removal of Diesel Fuel for Boilers at Hospital (Only use Natural Gas)**  
**Mountain Home AFB**

**Table 1 - Currently Permitted Emissions (all 4 boilers)**

Pollutant	Diesel Emission Rate (Individual Boilers)				Natural Gas Emission Rate (Individual Boilers)				Worst Case	
	5.23 MMBtu		1.05 MMBtu		5.23 MMBtu		1.05 MMBtu			
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	0.037	0.164	0.004	0.016	0.039	0.171	0.0005	0.0023	0.121	0.528
Total Particulate Matter (PM <sub>2.5</sub> )	0.009	0.041	0.001	0.004	0.039	0.171	0.0005	0.0023	0.118	0.516
Particulate Matter (PM <sub>10</sub> )	0.037	0.164	0.004	0.016	0.039	0.171	0.0005	0.0023	0.121	0.528
Sulfur Oxides (SO <sub>2</sub> )	2.653	11.620	0.261	1.145	0.003	0.013	0.00004	0.0002	8.220	36.004
Nitrogen Oxides (NOx)	0.747	3.273	0.074	0.323	0.513	2.246	0.0069	0.0304	2.316	10.142
Carbon Monoxide (CO)	0.187	0.818	0.018	0.081	0.431	1.887	0.0058	0.0255	1.311	5.741
VOC	0.009	0.041	0.001	0.004	0.028	0.124	0.0004	0.0017	0.086	0.375

**Table 2 - Removal of Diesel Emissions**

Pollutant	Diesel Emission Rate				Total Emissions	
	5.23 MMBtu		1.05 MMBtu			
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	0.037	0.164	0.004	0.016	0.116	0.507
Total Particulate Matter (PM <sub>2.5</sub> )	0.009	0.041	0.001	0.004	0.029	0.127
Particulate Matter (PM <sub>10</sub> )	0.037	0.164	0.004	0.016	0.116	0.507
Sulfur Oxides (SO <sub>2</sub> )	2.653	11.620	0.261	1.145	8.220	36.004
Nitrogen Oxides (NOx)	0.747	3.273	0.074	0.323	2.316	10.142
Carbon Monoxide (CO)	0.187	0.818	0.018	0.081	0.579	2.535
VOC	0.009	0.041	0.001	0.004	0.029	0.128

**Table 3 - New Emissions (Natural Gas Only)**

Pollutant	Natural Gas Emission Rate (Individual Boilers)				Total Emissions		Net Change in Emissions	
	5.23 MMBtu		1.05 MMBtu					
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Total Particulate Matter (PM)	0.039	0.171	0.0005	0.002	0.117	0.514	(0.003)	(0.014)
Total Particulate Matter (PM <sub>2.5</sub> )	0.039	0.171	0.0005	0.002	0.117	0.514	(0.000)	(0.002)
Particulate Matter (PM <sub>10</sub> )	0.039	0.171	0.0005	0.002	0.117	0.514	(0.003)	(0.014)
Sulfur Oxides (SO <sub>2</sub> )	0.003	0.013	0.00004	0.000	0.009	0.041	(8.211)	(35.983)
Nitrogen Oxides (NOx)	0.513	2.246	0.0069	0.030	1.545	6.789	(0.770)	(3.373)
Carbon Monoxide (CO)	0.431	1.887	0.0058	0.026	1.298	5.686	(0.013)	(0.055)
VOC	0.028	0.124	0.0004	0.002	0.085	0.372	(0.0005)	(0.002)

**Potential Emission Calculations**  
**Hospital Generator NG Emissions**

Emission Point No.	Hos Boiler
Fuel Type	Natural Gas
Fuel usage Boiler 1-3 (MMBTU/hr)	5.23
Fuel usage Boiler 4 (MMBTU/hr)	1.05
BTU/gal natural gas	1,020
Max ft <sup>3</sup> /hr (5.23 MMBTU boiler)	5,128
Max ft <sup>3</sup> /hr (1.05 MMBTU boiler)	1,029
Max ft <sup>3</sup> /yr (5.23 MMBTU boiler)	44,925,059
Max ft <sup>3</sup> /yr (1.05 MMBTU boiler)	9,017,647
Maximum annual operating hours	8,760

TAP/HAP <sup>1</sup>	Emission Factor (lb/10 <sup>6</sup> scf)	5.23 MMBTU Boiler			1.05 MMBTU Boiler			Total (4 Boilers)		
		Uncontrolled Potential to Emit			Uncontrolled Potential to Emit			Uncontrolled Potential to Emit		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
2-Methylnaphthalene	2.40E-05	1.23E-07	1.08E-03	5.39E-07	2.47E-08	2.16E-04	1.08E-07	3.94E-07	3.45E-03	1.73E-06
3-Methylchloranthrene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
7,12-Dimethylbenzo[ <i>a</i> ]anthracene	1.60E-05	8.21E-08	7.19E-04	3.59E-07	1.65E-08	1.44E-04	7.21E-08	2.63E-07	2.30E-03	1.15E-06
Acenaphthene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Acenaphthylene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Anthracene	2.40E-06	1.23E-08	1.08E-04	5.39E-08	2.47E-09	2.16E-05	1.08E-08	3.94E-08	3.45E-04	1.73E-07
Benzo[ <i>a</i> ]anthracene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Benzo (HAP)	2.10E-03	1.08E-05	9.43E-02	4.72E-05	2.16E-06	1.89E-02	9.47E-06	3.45E-05	3.02E-01	1.51E-04
Benzo[ <i>a</i> ]pyrene	1.20E-06	6.15E-09	5.39E-05	2.70E-08	1.24E-09	1.08E-05	5.41E-09	1.97E-08	1.73E-04	8.63E-08
Benzo[ <i>b</i> ]fluoranthene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Benzo[ <i>g,h,i</i> ]perylene	1.20E-06	6.15E-09	5.39E-05	2.70E-08	1.24E-09	1.08E-05	5.41E-09	1.97E-08	1.73E-04	8.63E-08
Benzo[ <i>k</i> ]fluoranthene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Butane	2.10E+00	1.08E-02	9.43E+01	4.72E-02	2.16E-03	1.89E+01	9.47E-03	3.45E-02	3.02E+02	1.51E-01
Chrysene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Dibenz[ <i>a,h</i> ]anthracene	1.20E-06	6.15E-09	5.39E-05	2.70E-08	1.24E-09	1.08E-05	5.41E-09	1.97E-08	1.73E-04	8.63E-08
Dichlorobenzene	1.20E-03	6.15E-06	5.39E-02	2.70E-05	1.24E-06	1.08E-02	5.41E-06	1.97E-05	1.73E-01	8.63E-05
Ethane	3.10E+00	1.59E-02	1.39E+02	6.96E-02	3.19E-03	2.80E+01	1.40E-02	5.09E-02	4.46E+02	2.23E-01
Fluoranthene	3.00E-06	1.54E-08	1.35E-04	6.74E-08	3.09E-09	2.71E-05	1.35E-08	4.92E-08	4.31E-04	2.16E-07
Fluorane	2.80E-06	1.44E-08	1.26E-04	6.29E-08	2.88E-09	2.52E-05	1.26E-08	4.60E-08	4.03E-04	2.01E-07
Formaldehyde	7.50E-02	3.85E-04	3.37E+00	1.68E-03	7.72E-05	6.76E-01	3.38E-04	1.23E-03	1.08E+01	5.39E-03
Hexane	1.80E+00	9.23E-03	8.09E+01	4.04E-02	1.85E-03	1.62E+01	8.12E-03	2.95E-02	2.59E+02	1.29E-01
Indeno[1,2,3- <i>cd</i> ]pyrene	1.80E-06	9.23E-09	8.09E-05	4.04E-08	1.85E-09	1.62E-05	8.12E-09	2.95E-08	2.59E-04	1.29E-07
Naphthalene	6.10E-04	3.13E-06	2.74E-02	1.37E-05	6.28E-07	5.50E-03	2.75E-06	1.00E-05	8.77E-02	4.39E-05
Pentane	2.60E+00	1.33E-02	1.17E+02	5.84E-02	2.68E-03	2.34E+01	1.17E-02	4.27E-02	3.74E+02	1.87E-01
Phenanthrene	1.70E-05	8.72E-08	7.64E-04	3.82E-07	1.75E-08	1.53E-04	7.67E-08	2.79E-07	2.44E-03	1.22E-06
Propane	1.60E+00	8.21E-03	7.19E+01	3.59E-02	1.65E-03	1.44E+01	7.21E-03	2.63E-02	2.30E+02	1.15E-01
Pyrene	3.00E-06	1.54E-08	1.35E-04	6.74E-08	3.09E-09	2.71E-05	1.35E-08	4.92E-08	4.31E-04	2.16E-07
Toluene	3.40E-03	1.74E-05	1.53E-01	7.64E-05	3.50E-06	3.07E-02	1.53E-05	5.58E-05	4.89E-01	2.44E-04
<b>Metals</b>										
Arsenic	2.00E-04	1.03E-06	8.99E-03	4.49E-06	2.06E-07	1.80E-03	9.02E-07	3.28E-06	2.88E-02	1.44E-05
Barium	4.40E-03	2.26E-05	1.98E-01	9.88E-05	4.53E-06	3.97E-02	1.98E-05	7.22E-05	6.33E-01	3.16E-04
Beryllium	1.20E-05	6.15E-08	5.39E-04	2.70E-07	1.24E-08	1.08E-04	5.41E-08	1.97E-07	1.73E-03	8.63E-07
Cadmium	1.10E-03	5.64E-06	4.94E-02	2.47E-05	1.13E-06	9.92E-03	4.96E-06	1.81E-05	1.58E-01	7.91E-05
Chromium	1.40E-03	7.18E-06	6.29E-02	3.14E-05	1.44E-06	1.26E-02	6.31E-06	2.30E-05	2.01E-01	1.01E-04
Cobalt	8.40E-05	4.31E-07	3.77E-03	1.89E-06	8.65E-08	7.57E-04	3.79E-07	1.38E-06	1.21E-02	6.04E-06
Copper	8.50E-04	4.36E-06	3.82E-02	1.91E-05	8.75E-07	7.67E-03	3.83E-06	1.40E-05	1.22E-01	6.11E-05
Manganese	3.80E-04	1.95E-06	1.71E-02	8.54E-06	3.91E-07	3.43E-03	1.71E-06	6.24E-06	5.46E-02	2.73E-05
Mercury	2.60E-04	1.33E-06	1.17E-02	5.84E-06	2.68E-07	2.34E-03	1.17E-06	4.27E-06	3.74E-02	1.87E-05
Molybdenum	1.10E-03	5.64E-06	4.94E-02	2.47E-05	1.13E-06	9.92E-03	4.96E-06	1.81E-05	1.58E-01	7.91E-05
Nickel	2.10E-03	1.08E-05	9.43E-02	4.72E-05	2.16E-06	1.89E-02	9.47E-06	3.45E-05	3.02E-01	1.51E-04
Selenium	2.40E-05	1.23E-07	1.08E-03	5.39E-07	2.47E-08	2.16E-04	1.08E-07	3.94E-07	3.45E-03	1.73E-06
Vanadium	2.30E-03	1.18E-05	1.03E-01	5.17E-05	2.37E-06	2.07E-02	1.04E-05	3.78E-05	3.31E-01	1.65E-04
Zinc	2.90E-02	1.49E-04	1.30E+00	6.51E-04	2.99E-05	2.62E-01	1.31E-04	4.76E-04	4.17E+00	2.08E-03
<b>TOTAL HAPs</b>										<b>0.14</b>

<sup>1</sup> AP 42 section 1.4 Table 1.4-3, July 1998

## APPENDIX B – FACILITY DRAFT COMMENTS

**The following comments were received from the facility on July 25, 2012:**

**Facility Comment:** In the SOB description it states we are an Air Force "Fighter" wing. It should say "Fighter".

**DEQ Response:** The Facility Information description has been updated as requested.

**Facility Comment:** Under permit condition 3.11 delete the first two bullet points under Notification and Record Keeping since they are not applicable to emergency generators.

**DEQ Response:** Table 3.3 has been updated as requested.

## **APPENDIX C – PROCESSING FEE**