United States Army Garrison Alaska

Fort Wainwright, Alaska

Title I Modification Application
Permit Number AQ0236MSS02

June 2020

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

AAC ..... Alaska Administrative Code
CFR ..... Code of Federal Regulations
EU ..... emission unit
ADEC ..... Alaska Department of Environmental Conservation
PTE ..... Potential to Emit
COL ..... Colonel
EF ..... Emission Factors
EPA ..... Environmental Protection Agency
SO_2 ..... Sulfur Dioxide
PM ..... Particulate Matter
NO_x ..... Nitrogen Oxides
CO ..... Carbon Monoxide
MMBtu/hr ..... on million British Thermal Units
kW ..... kilowatts
hp ..... horsepower
lbs ..... pounds
gal ..... gallon
hr ..... hour
TPY ..... tons per year
NMTOC ..... Non-Methane Total Organic Compounds
CO_2 ..... carbon dioxide
CH_4 ..... methane
N_2O ..... nitrogen oxide
NSPS ..... New Source Performance Standards
NESHAP ..... National Emission Standards for Hazardous Air Pollutants
HAP ..... Hazardous Air Pollutants
MACT ..... Maximum Achievable Control Technology
GHG ..... Greenhouse Gas

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1.0 INTRODUCTION

U.S. Army Garrison Alaska has prepared this Title I modification application package for Fort Wainwright. As required by the Alaska State Air Quality Control Plan Vol II.III.D.7 adopted November 19, 2019, Fort Wainwright is required to combust only ultra-low sulfur diesel in all the liquid fuel burning equipment. This modification application includes changes to the applicable emission unit (EU) inventory, other installation updates, and changes in the permit conditions to incorporate the Serious SIP requirements

1.1 Report Organization

The Title I permit modification application includes the following sections:

- Section 1.0 presents an overview of the installation.
- Section 2.0 provides project description for the Title I permit modification
- Section 3.0 summarizes methods used to determine the potential to emit (PTE) for EUs associated with this Title I permit.
- Section 4.0 provides additional detail on applicable regulations.
- Appendix A contains ADEC Title I application forms
- Appendix B contains emission calculations before modification to the stationary source
- Appendix C contains emission calculations after modification to the stationary source
- Appendix D contains the current Title I permit AQ0236MSS02 for reference

1.2 Installation Description and Operational Overview

Fort Wainwright is a federally owned facility managed by the U.S. Army Garrison Alaska and is a part of the U.S. Army Installation Management Pacific. Specifically, it is located on the eastern edge of Fairbanks, within the Fairbanks North Star Borough, within interior Alaska. The installation includes the main post or cantonment area, a range complex, and two maneuver areas. Form A2, located in Appendix A, provides maps showing the general location of Fort Wainwright.

Originally, Fort Wainwright was a cold weather testing station established in 1938. Present day, it is now the home of the 1st Stryker Brigade Combat Team and the 6th Squadron (Attack Reconnaissance), 17th Cavalry Regiment. Primary missions currently include training of infantry soldiers in the Arctic environment, testing of equipment in Arctic conditions, preparation of troops for defense of the Pacific Rim, and preparation for rapid deployment of troops worldwide. Fort Wainwright's mission is to deploy combat ready forces to support joint military operations worldwide and serve as the Joint Force Land Component Command for Joint Task Force Alaska.

2.0 DESCRIPTION OF PROJECT

This project is classified under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50. The purpose of this Title I application is to modify conditions in the current Title I Minor Source Specific Permit No. AQ0236MSS02 issued to Fort Wainwright on September 9, 2008 to enforce the SO_2 controls set out by the State Air Quality Control Plan Vol. II: III.D.7 adopted on November 19, 2019. We request ADEC to make the following modifications:

1) To modify Condition 1 of AQ0236MSS02. We request ADEC to add the emission unit no. 23, 24, 26 through 40, 50 through 65, unpaved roads, and paved roads listed in the current Title V AQ0236TVP03 Revision 3. We also, request ADEC to add emergency generators at buildings 2121 and 3007 to the emission unit inventory.

2) The addition of the emission units mentioned above to the Title I permit AQ0236MSS02 will not trigger 18 AAC 50.502(c)(3) as these emission units have been part of the same stationary source, but were operated by Doyon Utilities under a separate Title I permit. Fort Wainwright obtained these units back from Doyon Utilities at the end of CY2018.

3) To modify Condition 2 of AQ0236MSS02 to include the emission units added to Condition 1.

4) To modify Condition 3 of AQ0236MSS02 to include the emission units added to Condition 1.

5) To modify Condition 4.2(a) of AQ0236MSS02 to enforce EU IDs 8 through 13 to combust only ULSD with sulfur content at or less than 15 ppmw.

6) To add Condition 4.3(a) for EU IDs 26 through 40, 50 through 65, and emergency generators at building 2121, 3007 to combust only ULSD with sulfur content at or less than 15 ppmw.

7) To add Condition 4.3(b) to establish compliance requirements for condition 4.3(a)

Emission estimates used in this Title I modification application are based on the Emission Unit inventory provided to ADEC along with the latest Title V renewal application submitted on March 6,2019. Therefore the emission estimates will be different from the emission based on the current Title I as emission units will be added with this modification.

With this modification changes will be required to be made to Title V operating permit as well. A separate permit application for that will be submitted at a later date to incorporate these changes.

3.0 SAMPLE EMISSION CALCULATIONS

In 2018 a facility wide air emissions inventory was conducted to create a catalog of the emission sources at Fort Wainwright and generate an updated emission estimate for each source. The emission rates presented in this application are calculated using the emission factors (EF) listed in the U.S. Environmental Protection Agency (EPA) publication *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1 – Stationary Point and Area Sources,* henceforth referred to as AP-42.

3.1 Assumptions, Conversions, and Constants

The following are parameters used to calculate PTEs for Fort Wainwright emission sources:

- Type of equipment – The emission calculations were based on equipment type (e.g., internal or external combustion unit) and fuel source (e.g., natural gas, diesel, or waste engine oil). Units with similar combustion of these factors were grouped into classes to simplify the calculations.

- EFs – Published EFs from AP-42 were identified for each of the criteria pollutants (e.g., sulfur dioxide [SO2], particulate matter [PM], nitrogen oxides [NOx], carbon monoxide [CO], and lead).

- The maximum rating (i.e. maximum fuel input rate) is obtained from the emission inventory for each EU to facilitate the calculations of PTEs. For external combustion equipment the fuel input rating in millions of British thermal units per hour (MMBtu/hr) is used and for internal combustion equipment the engine horsepower-hour rating (hp-hr) is used for the maximum production rate.

The following assumptions, conversions, and constants were used to calculate PTE:

- Emergency/standby stationary internal combustion engine operations of 500 hours per year (per federal guidance memorandum)

- All fuel oil burned by Fort Wainwright meets the same specification

- Sulfur Content of fuel oil : 0.0015 ppmw

- Conversion factor of 2,000 pounds per ton

3.1.1 Emission Unit Classifications

To simplify emission calculations, EUs were classified according to equipment type, fuel type, and activity rate. Though not defined by guidance, these classifications closely parallel AP-42 and Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines (40 CFR 89). Three classifications were identified for Fort Wainwright as follows:

- Class 3: External Combustion, Distillate Oil, Boiler < 100 MMBtu/hr heating value
- Class 5: Stationary Internal Combustion Engines, Diesel, ≤ 447 kW (600 horsepower)
- Class 6: Stationary Internal Combustion Engines, Diesel, > 447 kW (600 horsepower), Uncontrolled Emissions

The equipment grouped into each class is discussed in detail in Section 3.2 (External Combustion Engines) and 3.3 (Internal Combustion Engines). Table 3-1 summarizes the EFs utilized for each class of EUs.

Table 3-1

Fort Wainwright Emission Factors by Class

Class	NO_x	SO_2	CO	VOC	PM_{10}	CO_2	CH_4	N_2O	NMTOC
3	20 lbs/1000 gal	42.6 lbs/1000 gal	5.0 lbs/1000 gal	--	1.08 lbs/1000 gal	21500 lbs/1000 gal	0.216 lbs/1000 gal	0.26 lbs/1000 gal	0.34 lbs/1000 gal
5	0.031 lb/hp-hr	0.00205 lb/hp-hr	0.00668 lb/hp-hr	0.00251 lb/hp-hr	0.0022 lb/hp-hr	1.15 lb/hp-hr	--	--	--
6	0.018 lb/hp-hr	0.00809 lb/hp-hr	0.0055 lb/hp-hr	0.000705 lb/hp-hr	0.0004 lb/hp-hr	1.16 lb/hp-hr	--	--	--

3.2 External Combustion Engines

PTE for external combustion units was calculated using the following equation:

$$PTE\ \left[\frac{tons}{year}\right] = \left(Fuel\ Use\ \left[\frac{gal}{year}\right]\right)\left(EF\left[\frac{lb}{1000\ gal}\right]\right)\left(\frac{1ton}{2000\ lbs}\right)$$

The following subsections detail the methods and information used for calculation of the PTE for external combustion units.

3.2.1 External Combustion, Distillate Oil, Boiler < 100 MMBtu/hr heating value (Class 3)

Table 3-2 lists the Emission Units included in class 3. Emissions for these units are calculated using the EFs in Table 3-1. Class 3 include boilers fueled by diesel. This class has 33 external combustion units. The total calculated heat input rate for this class is 71.9 MMBtu/hr. The emission calculations for this class are listed in Form D2. The forms for these emission units are provided in Appendix B and Appendix D.

The emission factors are derived from AP-42 Table 1.3-1, 1.3-3, 1.3-6, 1.3-12.

Table 3-2
Fort Wainwright Class 3 Emission Units

EU ID	Description	Rating
1171	Furnace	0.2
1172	Furnace	0.9
1172	Boiler	0.2
1185	Boiler	1.3
1191	Boiler	0.2
1815	2 Furnaces	0.2
2090	2 Boilers	0.6
2092	2 Furnaces	0.4
2096	2 Boilers	0.8
2400	Boiler	0.3
4076	3 Boilers	19.0
4321	Furnace	0.3
4322	Furnace	0.3
5003	Boiler	0.3
5007	Boiler	2.6
5008	Boiler	0.4
5009	Boiler	0.2
5010	Boiler	0.9
5109	Furnace	0.2
5110	Boiler	0.2
5113	Boiler	0.1
5119	Furnace	0.1
5142	Boiler	0.1
5144	Furnace	0.7
5149	2 Heaters	0.3
5163	Furnace	0.1
5186	Heater	0.1

3.3 Internal Combustion Engines

PTE for internal combustion units was calculated using the following equation:

$$PTE\ \left[\frac{tons}{years}\right] = (\ Max\ Rating\ [\ hp\ ])\ \left(\frac{500\ hour}{year}\right)\ \left(\ EF\ \left[\frac{lbs}{hp * hr}\right]\right)\left(\frac{1ton}{2000lb}\right)$$

3.3.1 Stationary Internal Combustion Engines, Diesel <= 600 hp (Class 5)

Table 3-3 lists the emission units for Class 5. Emissions for this class are calculated using the EFs listed in Table 3-1. Class 5 Emission Units include fire pump engines and emergency generators. This class includes 29 internal combustion engines. The total calculated heat input rate for this class is 4722 hp. The emission calculations for the significant EUs in this class are listed in Form D2. Forms for this emission units are included in Appendix B and Appendix D.

EFs are derived from AP-42 Tables 3.3-1, 3.4-1 and 3.4-2.

Table 3-3
Fort Wainwright Class 5 Emission Units

EU ID	Description	Rating
1572	4 Fire Pump Engines	235 hp
2080	2 Fire Pump Engines	240 hp
2089	Fire Pump Engine	275 hp
3498	Fire Pump Engine	94 hp
5009	Fire Pump Engine	120 hp
1054	Emergency Generator	274 hp
1193	Emergency Generator	82 hp
1555	Emergency Generator	536 hp
1580	Emergency Generator	67 hp
1620	Emergency Generator	47 hp
2088	Emergency Generator	168 hp
2117	Emergency Generator	201 hp
2121	Emergency Generator	60 hp
2132	Emergency Generator	324 hp
2296	Emergency Generator	212 hp
3004	Emergency Generator	67 hp
3007	Emergency Generator	235 hp
3028	Emergency Generator	27 hp
3406	Emergency Generator	398 hp
3407	Emergency Generator	80 hp
3567	Emergency Generator	47 hp
3703	Emergency Generator	50 hp
4390	Emergency Generator	274 hp
5108	Emergency Generator	18 hp

3.3.2 Stationary Internal Combustion Engines, Diesel, > 600 hp, Uncontrolled Emissions (Class 6)

Table 3-4 lists the emission units for Class 6. Emissions for this class are calculated using the EFs listed in Table 3-1. Class 6 Emission Units include fire pump engines and emergency generators. This class includes 6 internal combustion engines. The total calculated heat input rate for this class is 5966 hp. The emission calculations for the significant EUs in this class are listed in Form D2. Forms for this emission units are included in Appendix B and Appendix D.

EFs are derived from AP-42 Tables 3.3-1, 3.4-1 and 3.4-2.

Table 3-4
Fort Wainwright Class 6 Emission Units

EU ID	Description	Rating
1060	Emergency Generator	762 hp
1060	Emergency Generator	762 hp
2117	Emergency Generator	1059 hp
4076	Emergency Generator	1206 hp
4076	Emergency Generator	1206 hp
4076	Emergency Generator	1206 hp

3.4 Other Sources

Other emission sources include emissions from volatile liquid storage tanks, aerospace activities, degreasing activities, welding operations, and paint booth operations.

4.0 APPLICABLE REGULATIONS

4.1 New Source Performance Standards

40 CFR 60, the New Source Performance Standards (NSPS) are for new, modified, and reconstructed units in specific stationary source categories. NSPS requires initial performance testing and for some units, continuous emission monitoring and control device operations in order to maintain compliance with the Clean Air Act (Title 42 of the U.S. Cod, Sections 7401 et seq).

4.2 National Emission Standards for Hazardous Air Pollutants

40 CFR 61 and 40 CFR 63, National Emission Standards for Hazardous Air Pollutants (NESHAP) are stationary source standards for Hazardous Air Pollutants (HAP), which are those pollutants suspected or known to cause cancer and other serious health effects. NESHAP regulates the following HAPs: asbestos, beryllium, mercury, vinyl chloride, benzene, arsenic, and radon/radionuclides.

Those NESHAPs established after 1990 (40 CFR 63) require application of technology-based emissions standards known as Maximum Achievable Control Technology (MACT) and may be referred to as MACT standards.

4.3 Greenhouse Gas Emissions

EPA develops an inventory of greenhouse gas (GHG) emissions annually to track U.S. total emissions and removals. In this effort, EPA collects GHG emissions data from individual facilities and suppliers of certain fossil fuels and industrial gases through the GHG Reporting Program. The GHG inventory is also submitted to the United Nations in accordance with the Framework Convention on Climate Change Exit EPA disclaimer.

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Appendix A

Title I Permit Modification Forms

Alaska Department of Environmental Conservation
Air Quality Minor Permit Application

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: USAG Alaska Fort Wainwright			SIC:9711
Project Name (if different):	Contact: N/A		
Physical Address:1060 Gaffney Road #6000	City: Fort Wainwright	State: AK	Zip:99703-6000
	Telephone:N/A		
	E-Mail Address:N/A		
UTM Coordinates (m) or Latitude/Longitude: N/A	Northing: N/A	Easting:N/A	Zone:N/A
	Latitude: 64˚50'4.444"N	Longitude:147˚37'8.875"	

Section 2 Legal Owner

Name:U.S. Army Garrison Alaska		
Mailing Address:ATTN: IMFW-ZA 1060 Gaffney Road #6000		
City: Fort Wainwright	State: AK	Zip:99703-6000
Telephone #:N/A		
E-Mail Address:N/A		

Section 3 Operator *(if different from owner)*

Name:U.S. Army Garrison Alaska		
Mailing Address:ATTN: IMFW-ZA		
City: Fort Wainwright	State: AK	Zip:99703-6000
Telephone #:N/A		
E-Mail Address:N/A		

Section 4 Designated Agent *(for service of process)*

Name: Christopher J. Ruga, Colonel, U.S. Army		
Mailing Address:ATTN: IMFW-ZA 1060 Gaffney Road #6000		
City Fort Wainwright	State: AK	Zip:99703-6000
Telephone #:N/A		
E-Mail Address:N/A		

Section 5 Billing Contact Person *(if different from owner)*

Name: Robert K. Larimore, Environmental Branch Chief		
Mailing Address:ATTN: IMFW-PWE 1060 Gaffney Road #4500		
City: Fort Wainwright	State: AK	Zip:99703-4500
Telephone #:907-361-4213		
E-Mail Address:Robert.k.larimore.civ@mail.mil		

Section 6 Application Contact

Name: Eric Dick, Compliance Chief, Environmental Division			
Mailing Address:ATTN: IMFW-PWE 1060 Gaffney Road #4500	City: Fort Wainwright	State: AK	Zip:99703-4500
	Telephone:907-361-3006		
	E-Mail Address:eric.m.dick2.civ@mail.mil		

Section 7 Desired Process Method *(Check only one – see 18 AAC 50.542(a) for process descriptions and restrictions)*

☐ Fast track for a permit classification under 18 AAC 50.502 [18 AAC 50.542(b)]

☒ Public comment [18 AAC 50.542(d)]

Section 8 Source Classification(s) *(Check all that apply)*

[18 AAC 50.502(b)]

- ☐ Asphalt Plant [≥ 5 ton per hour]
- ☐ Thermal Soil Remediation Unit [≥ 5 ton per hour]
- ☐ Rock Crusher [≥ 5 ton per hour]
- ☐ Incinerator(s) [total rated capacity ≥ 1000 lb/hour]
- ☐ Coal Preparation Plant
- ☐ Port of Anchorage Facility

If you checked any of the above, is (are) the emission unit(s) ☐ new, ☐ relocated*, or ☐ existing?

[18 AAC 50.502(c)(1)]

New or relocated* stationary source with potential emissions greater than:

- ☐ 40 tons per year (tpy) NOx
- ☐ 40 tpy SO_2
- ☐ 15 tpy PM-10
- ☐ 10 tpy PM-2.5
- ☐ 0.6 tpy lead
- ☐ 100 tpy CO in a nonattainment area

[18 AAC 50.502(c)(2)]

Construction or relocation* of a:

- ☐ Portable oil and gas operation
- ☐ ≥ 10 MMBtu/hr fuel burning equipment in a SO_2 special protection area

* *Relocation does NOT include moving equipment from one place to another within your current stationary source boundary.*

Section 9 Modification Classification(s) (*Check all that apply)*

[18 AAC 50.502(c)(3)]

- ☐ NOx Increase > 10 tpy [and existing PTE > 40 tpy]
- ☐ SO_2 Increase > 10 tpy [and existing PTE > 40 tpy]
- ☐ PM-10 Increase > 10 tpy [and existing PTE > 15 tpy]
- ☐ PM-2.5 Increase > 10 tpy [and existing PTE > 10 tpy]
- ☐ CO Increase > 100 tpy [and existing PTE > 100 tpy in a nonattainment area]

[18 AAC 50.502(c)(4)]

- ☐ NOx Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- ☐ SO_2 Increase > 40 tpy [and existing PTE ≤ 40 tpy]
- ☐ PM-10 Increase > 15 tpy [and existing PTE ≤ 15 tpy]
- ☐ PM-2.5 Increase > 10 tpy [and existing PTE ≤ 10 tpy]
- ☐ CO Increase > 100 tpy [and Existing PTE ≤ 100 tpy in a nonattainment area]

Basis for calculating modification:

- ☐ Projected actual emissions minus baseline actual emissions
- ☒ New potential emissions minus existing potential emissions

Section 10 Permit Action Request (*Check all that apply)*

[18 AAC 50.508]

- ☐ Establish Plant-wide Applicability Limitation (PAL)
- ☐ Establish emission reductions to offset nonattainment pollutant
- ☐ Owner Requested Limit* (ORL)
- ☒ Revise or Rescind Title I Permit Conditions *
  Permit Number: AQ0236MSS02 Condition No. 1-4
  Date: 09/09/2008

**Which to use? See* http://www.dec.state.ak.us/air/ap/docs/orlrtc.pdf

Section 11 Existing Permits and Limits

For an existing stationary source, do you have an existing:
(Check all that apply)

- ☒ Air quality permit Number(s)*: AQ0236MSS02 AQ0236TVP03 Rev 3

- ☒ Owner Requested Limit(s) Permit Number(s):A0236MSS02
- ☐ Pre-Approved Emission Limit (PAEL) Number(s)**:

** All active construction, Title V, and minor permit numbers.*
***Optional. Please provide this number if possible.*
http://dec.alaska.gov/Applications/Air/airtoolsweb/

Section 12 Project Description

Provide a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction.

Please use additional copies of this sheet if necessary.

This project is classified under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50. The purpose of this Title I application is to modify conditions in the current Title I Minor Source Specific Permit No. AQ0236MSS02 issued to Fort Wainwright on September 9, 2008 to enforce the SO_2 controls set out by the State Air Quality Control Plan Vol. II: III.D.7 adopted on November 19, 2019. We request ADEC to make the following modifications:

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2) The addition of the emission units mentioned above to the Title I permit AQ0236MSS02 will not trigger 18 AAC 50.502(c)(3) as these emission units have been part of the same stationary source, but were operated by Doyon Utilities under a separate Title I permit. Fort Wainwright obtained these units back from Doyon Utilities at the end of CY2018.

3) To modify Condition 2 of AQ0236MSS02 to include the emission units added to Condition 1.

4) To modify Condition 3 of AQ0236MSS02 to include the emission units added to Condition 1.

5) To modify Condition 4.2(a) of AQ0236MSS02 to enforce EU IDs 8 through 13 to combust only ULSD with sulfur content at or less than 15 ppmw.

6) To add Condition 4.3(a) for EU IDs 26 through 40, 50 through 65, and emergency generators at building 2121, 3007 to combust only ULSD with sulfur content at or less than 15 ppmw.

7) To add Condition 4.3(b) to establish compliance requirements for condition 4.3(a)

Emission estimates used in this Title I modification application are based on the Emission Unit inventory provided to ADEC along with the latest Title V renewal application submitted on March 6,2019. Therefore the emission estimates will be different from the emission based on the current Title I as emission units will be added with this modification.

With this modification changes will be required to be made to Title V operating permit as well. A separate permit application for that will be submitted at a later date to incorporate these changes.

Section 12 Project Description Continued

For **PALs under Section 10** of this application, include the information listed in 40 C.F.R. 52.21(aa)(3), adopted by reference in 18 AAC 50.040 [18 AAC 50.540(h)].

N/A

For a **limit to establish offsetting emissions under Section 10** of this application, specify the physical or operational limitations necessary to provide actual emission reductions of the nonattainment air pollutant; including [18 AAC 50.540(i)]:

- A calculation of the expected reduction in actual emissions; and

  N/A

- The emission limitation representing that quantity of emission reduction.

  N/A

Section 12 Project Description Continued

For **ORLs under Section 10** of this application [18 AAC 50.540(j)], include:

A description of each proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions [18 AAC 50.225(b)(4)];

N/A

A description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements [18 AAC 50.225(b)(5)];

N/A

Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement [18 AAC 50.225(b)(6)];

N/A

A statement that the owner or operator of the stationary source will be able to comply with each limit [18 AAC 50.225(b)(8)];

N/A

Section 12 Project Description Continued

For **revising or rescinding Title I permit conditions under Section 10** of this application [18 AAC 50.540(k)], include:

An explanation of why the permit term or condition should be revised or rescinded [18 AAC 50.540(k)(2)];

1) Condition 1 needs to be revised to incorporate the emission units added back to Fort Wainwright EU inventory.

2) Condition 2 needs to be revised to include emission units from the revised EU inventory

3) Condition 3 needs to be revised to include emission units from the revised EU inventory

4) Condition 4.2(a) needs to be revised to incorporate the conditions set out by the State Air Quality Control Plan Vol II: III.D.7 adopted on November 19, 2019, to limit EU IDs 8 through 13 to combust only ULSD with sulfur content equal to or less than 15 ppmw.

5) Condition 4.3(a) needs to be added to the permit to incorporate the conditions set out by the State Air Quality Control Plan Vol II: III.D.7 adopted on November 19, 2019, to limit EU IDs 26 through 40, 50 through 65, and emergency generators at buildings 2121, 3007 to combust only ULSD with sulfur content equal to or less than 15 ppm ppmw.

The effect of revising or revoking the permit term or condition on [18 AAC 50. 540 (k)(3)]:

- Emissions;

- Other permit terms;
  1) Condition 1 needs to be revised to incorporate the emission units added back to Fort Wainwright EU inventory.

  2) Condition 2 needs to be revised to include emission units from the revised EU inventory

  3) Condition 3 needs to be revised to include emission units from the revised EU inventory

- The underlying ambient demonstration, if any;

  There will be reduction in emissions as demonstrated above and in the subsequent forms. The ambient demonstration, based on higher emissions, should be conservatively representative of stationary source with the proposed modifications. Therefore, the underlying ambient demonstration has not been revised for this application

- Compliance monitoring; and

  The permittee shall monitor compliance with Condition 4.2(a) and Condition 4.3(a) by obtaining a statement of certification from the fuel supplier showing that all fuel oil delivered to the stationary source complies with these conditions. If a certification is not available from the supplier, analysis of a representative sample of the fuel for each shipment delivered to the stationary source will be conducted to determine the sulfur content using an approved ASTM method.

For revising a condition that allows avoidance of a permit classification, the information required for that type of permit, unless the revised condition would also allow the owner or operator to avoid the classification. [18 AAC 50.540(k)(4)]

This Title I application modifies Condition 1, 2, 3, and 4 of permit no. AQ0236MSS02. No changes are requested to Condition 5 which affects the ORLs for PSD classification

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the Department:

☐ Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of
- emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
- nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

☐ Attached is a document (e.g., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

☐ Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the USAGAK Fort Wainwright (Stationary Source Name) submitted to the Department on: 06/09/2020.

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the signature of a **Responsible Official**. Responsible Official is defined in 18 AAC 50.990. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete."

Signature:	Date:
Printed Name: Christopher J. Ruga	Title: Colonel, U.S. Army

Section 15 Attachments

☒ Attachments Included. List attachments:

Appendix A Stationary Source Identification Form and Other Required Application components including the signature of the responsible official

Appendix B Emission Calculations

Appendix C Emission Calculations after Modification

Appendix D Copy of Air Quality Control Minor Permit No. AQ0236MSS02

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the Department:

☐ Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of
- emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
- nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

☐ Attached is a document (e.g., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

☐ Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the submitted to the Department on: _____

USAGAK Fort Wainwright
(Stationary Source Name)

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the signature of a **Responsible Official**. Responsible Official is defined in 18 AAC 50.990. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete."

Signature:	Date: 18 JUN 20
Printed Name: Christopher J. Ruga	Title: Colonel, U.S. Army

Section 15 Attachments

☒ Attachments Included. List attachments:

Appendix A Stationary Source Identification Form and Other Required Application components including the signature of the responsible official

Appendix B Emission Calculations

Appendix C Emission Calculations after Modification

Appendix D Copy of Air Quality Control Minor Permit No. AQ0236MSS02

Section 16 Mailing Address

Submit the minor permit application to the Permit Intake Clerk in the Department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-6881

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

MINOR PERMIT APPLICATION – EMISSION UNIT INFORMATION

FOR A NEW STATIONARY SOURCE: Complete this form for all emissions units.

FOR A MODIFICATION TO AN EXISTING STATIONARY SOURCE:
IF YOU HAVE A TITLE V PERMIT: Complete this form for each emissions unit that is new or that is affected by a physical change or change in the method of operation.
IF YOU DO NOT HAVE A TITLE V PERMIT or APPLICATION CLASSIFIED UNDER 18 AAC 50.508(5): Complete this form for all emissions units.

Section 1 Stationary Source Information

Stationary Source Name: USAG Alaska Fort Wainwright

Section 2 Emissions Unit (EU) Identification (ID) and Description

Note: Do not use this section for emission units associated with asphalt plants, soil remediation, and rock crushers. Use the Supplementary Forms for these units.

EU ID No.	Description	Construction Date	Make / Model		Serial No.	Requested Limit* (specify units)	Max. Rated Capacity (kW, MMBtu), Horsepower (hp) or. Design Throughput
8	Bassett Hospital Backup Diesel Fired Boiler 1	EST. 2003-2004	Cleaver Brooks	D-34	D-4553	EUs 8 through 10 are limited to combined 600 operating hours	19 MMBtu/hr
9	Bassett Hospital Backup Diesel Fired Boiler 2	EST. 2003-2004	Cleaver Brooks	D-34	D-4554		19 MMBtu/hr
10	Bassett Hospital Backup Diesel Fired Boiler 3	EST. 2003-2004	Cleaver Brooks	D-34	D-4555		19 MMBtu/hr
40	Boiler Building 5007	1985	Wein McLain	BL-988-SW	-	N/A	2.6 MMBtu/hr

11	Bassett Hospital Backup Diesel-Electric Generator 1	EST. 2003-2004	Caterpillar	3512	-	EU IDs 11 through 13 are limited to combined 600 operating hours	900 kw
12	Bassett Hospital Backup Diesel-Electric Generator 2	EST. 2003-2004	Caterpillar	3512	-		900 kW
13	Bassett Hospital Backup Diesel-Electric Generator 3	EST. 2003-2004	Caterpillar	3512	-		900 kW
26	Emergency Generator Building 2132	2012	Cummins	QSB7-G5NR3	-	Limited to 100 hours of non-emergency operation per calendar year	324 hp
27	Emergency Generator Building 1580	2009	John Deere	402HF285B	-	Limited to 100 hours of non-emergency operation per calendar year	67 hp
28	Emergency Generator Building 3406	2007	Caterpillar	C9	-	Limited to 100 hours of non-emergency operation per calendar year	398 hp
29	Emergency Generator Building 3567	2005	SDMO	TM30UCM	-	Limited to 100 hours of non-emergency operation per calendar year	47 hp
30	Fire Pump Building 2089	2007	John Deere	6081AF001	-	Limited to 100 hours of non-emergency operation per calendar year	275 hp
31	Fire Pump #1 Building 1572	1994	Clarke	DDFP-04AT	-	Limited to 100 hours of non-emergency operation per calendar year	235 hp
32	Fire Pump #2 Building 1572	1994	Clarke	DDFP-04AT	-	Limited to 100 hours of non-emergency operation per calendar year	235 hp
33	Fire Pump #3 Building 1572	1994	Clarke	DDFP-04AT	-	Limited to 100 hours of non-emergency operation per calendar year	235 hp
34	Fire Pump #4 Building 1572	1994	Clarke	DDFP-04AT	-	Limited to 100 hours of non-emergency operation per calendar year	235 hp
35	Fire Pump #1 Building 2080	1977	Cummins	N-855-F	-	Limited to 100 hours of non-emergency operation per calendar year	240 hp
36	Fire Pump #2 Building 2080	1977	Cummins	N-855-F	-	Limited to 100 hours of non-emergency operation per calendar year	240 hp

37	Fire Pump Building 3498	2005	Clarke	JU4H-UF40	-	Limited to 100 hours of non-emergency operation per calendar year	105 kW
38	Fire Pump #1 Building 5009	1996	Clarke	PDFP-06YT	-	Limited to 100 hours of non-emergency operation per calendar year	120 hp
39	Fire Pump #2 Building 5009	1996	Clarke	PDFP-06YT	-	Limited to 100 hours of non-emergency operation per calendar year	120 hp
50	Emergency Generator#1 Building 1060	2010	Caterpillar	LC6	-	Limited to 100 hours of non-emergency operation per calendar year	762 hp
51	Emergency Generator#2 Building 1060	2010	Caterpillar	LC6	-	Limited to 100 hours of non-emergency operation per calendar year	762 hp
52	Emergency Generator Building 1193	2002	Cummins	DGHE-5570444	-	Limited to 100 hours of non-emergency operation per calendar year	82 hp
53	Emergency Generator Building 1555	2008	Caterpillar	SR4B	-	Limited to 100 hours of non-emergency operation per calendar year	587 hp
54	Emergency Generator#1 Building 2117	2005	Kohler	750RE0ZDNB	-	Limited to 100 hours of non-emergency operation per calendar year	1059 hp
55	Emergency Generator#2 Building 2117	2005	Kohler	150RE0ZDB	-	Limited to 100 hours of non-emergency operation per calendar year	212 hp
56	Emergency Generator Building 2088	2007	Kohler	125RE0ZJB	-	Limited to 100 hours of non-emergency operation per calendar year	176 hp
57	Emergency Generator Building 2296	2005	Kohler	150RE0ZJB	-	Limited to 100 hours of non-emergency operation per calendar year	212 hp
58	Emergency Generator Building 3004	2007	Kohler	50RE0ZJB	-	Limited to 100 hours of non-emergency operation per calendar year	71 hp
59	Emergency Generator Building 3028	1976	Kohler	20R0ZJ81	-	Limited to 100 hours of non-emergency operation per calendar year	35 hp
60	Emergency Generator Building 3407	2001	Olympian	DG0PZ	-	Limited to 100 hours of non-emergency operation per calendar year	95 hp

61	Emergency Generator Building 3703	1993	Cummins	25DL6-L34064E	-	Limited to 100 hours of non-emergency operation per calendar year	50 hp
62	Emergency Generator Building 5108	2011	Caterpillar	D13-4	-	Limited to 100 hours of non-emergency operation per calendar year	18 hp
63	Emergency Generator Building 1620	2003	Cummins	DGBB-5630732	-	Limited to 100 hours of non-emergency operation per calendar year	68 hp
64	Emergency Generator Building 1054	2010	Caterpillar	D175-2	-	Limited to 100 hours of non-emergency operation per calendar year	274 hp
65	Emergency Generator Building 4390	2010	Caterpillar	D125-6	-	Limited to 100 hours of non-emergency operation per calendar year	274 hp
Emergency Generator BLDG #2121	Emergency Generator Building 2121	2016	Onsite Energy	MTU 4R0113 DS50	-	Limited to 100 hours of non-emergency operation per calendar year	71 hp
Emergency Generator BLDG #3007	Emergency Generator Building 3007	2014	Cummins	DSGAD-1405579	-	Limited to 100 hours of non-emergency operation per calendar year	274 hp
Insignificant Emission Units - Boilers	Various Buildings	Varies	Varies	Varies	Varies	N/A	1.0 MMBtu/hr

**If no annual limit is applicable (e.g., hours, fuel), then specify not applicable (N/A).*
Please use additional copies of this sheet if necessary.

Have you identified each emission unit (if you do not have a Title V permit), or each new or affected emission unit (if you have an existing Title V permit) in Section 2 above? ☒ Yes ☐ No

If not, please explain:

Section 3 Emissions Unit Use

EU ID No.	Is unit portable?		Is the unit:					Is this unit a:		If limited operation, is the unit:		
[List same EUs as in Section 2.]	Yes	No	a nonroad engine? Yes	No	an intermittently used oil field support equipment per Policy 04.02.105? Yes	No	an oil field construction unit per Policy 04.02.104? Yes	No	primary (base load) unit?	or limited operation unit?	emergency or black start unit?	subject to a permit limit?	or other (specify)?
8	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
9	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
10	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
40	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
11	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
12	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
13	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
26	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
27	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
28	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
29	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
30	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
31	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
32	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
33	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
34	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
35	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
36	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
37	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
38	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
39	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
50	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
51	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
52	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
53	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
54	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
55	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
56	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
57	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
58	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
59	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
60	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
61	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
62	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐

63	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	64	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
65	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	Emergency Generator BLDG #2121	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐
Emergency Generator BLDG #3007	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	Insignificant Emission Units - Boilers	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐

Please use additional copies of this sheet if necessary.

Have you specified the use of each emission unit in Section 3 above? ☒ Yes ☐ No

If not, please explain:

Section 4 Fuel Information

Complete Section 4a or 4b for each emissions unit, as appropriate.

Section 4a Fuel Burning Equipment not Including Flares

EU ID No.	Fuel type(s)	Maximum fuel sulfur content	Fuel density (lb/gal) (if liquid fuel)	Higher heating value*	Maximum fuel consumption rate (gallons/hour or MMscf/hour)
8	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	140
9	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	140
10	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	140
40	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	18.8
11	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
12	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
13	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
26	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
27	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
28	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
29	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
30	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
31	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
32	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
33	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
34	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
35	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
36	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
37	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
38	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
39	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
50	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
51	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
52	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
53	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
54	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
55	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
56	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
57	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
58	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
59	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
60	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
61	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
62	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
63	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-

64	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
65	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
Emergency Generator	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
Emergency Generator	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	-
Insignificant Emission Units - Boilers	Diesel	0.0015 ☒ wt. % S ☐ ppmv H_2S	6.9	140000 ☒ Btu/gal ☐ Btu/dscf Other	9.4

**Use British thermal unit (Btu) per gallon (gal) for liquid fuels. Use Btu per dry standard cubic foot (dscf) for gaseous fuels.*
Please use additional copies of this sheet if necessary.

Have you provided the fuel details for each fuel-burning emission unit (excluding flares) in Section 4a above? ☒ Yes ☐ No
If not, please explain:

Section 4b Flares

Complete this section if the project/stationary source contains a flare.

Do you own or operate a flare? ☐ Yes ☒ No *(If not skip this section)*

EU ID No:	Heat release rate for pilot / purge operation (MMBtu/hr)	Maximum heat release rate (MMBtu/hr)	Flare gas heat content (Btu/scf)	Flare gas H_2S content (ppmv)

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you provided the fuel use details for all flares in Section 4b above? ☐ Yes ☐ No

If not, please explain:

Section 5 Materials Processed and Methods of Operation

Complete this section if the project/stationary source contains a materials-handling process.

Do you own or operate a flare? ☐ Yes ☒ No *(If not, skip this section)*

EU ID No.	Materials processed	Maximum material processing rate	Describe method of operation

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the material processing details in Section 5 above? ☐ Yes ☐ No

If not, please explain:

Section 6 Emission Control Information (if applicable)

Complete this section if the project/stationary source contains emission control equipment.

Do you own or operate emission control equipment? ☐ Yes ☒ No *(If not, note below and skip this section.)*

EU ID No.	Control equipment	Pollutant(s) controlled:	Description of the control equipment	Description of significant operating parameters and set points for the control equipment	The control equipment is necessary:		
					To comply with an emission standard	To avoid a project classification	Other – give purpose of control equipment
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the details of any emission controls in Section 6 above? ☐ Yes ☐ No

If not, please explain:

Section 7 Emission Factors

Give exact citations of emission factor sources.

EU ID No.	Emission Factors								
	NOx	**CO**	**PM-2.5**	**PM-10**	**PM**	**SO_2**	**VOC**	**HAPs**	**Lead**
SIGNIFICANT UNITS									
8	20 lb/1000gal	5.0lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	142S lb/1000gal [2]	0.252 lb/1000gal	[1]	9 lb/MMBtu
9	20 lb/1000gal	5.0lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	142S lb/1000gal [2]	0.252 lb/1000gal	[1]	9 lb/MMBtu
10	20 lb/1000gal	5.0lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	142S lb/1000gal [2]	0.252 lb/1000gal	[1]	9 lb/MMBtu
40	20 lb/1000gal	5.0lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	1.08lb/1000gal	142S lb/1000gal [2]	0.252 lb/1000gal	[1]	9 lb/MMBtu
11	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
12	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
13	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
26	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
27	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
28	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
29	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
30	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
31	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
32	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
33	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
34	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
35	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
36	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
37	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
38	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
39	3.1E-02 lb/hp-hr	6.68E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.2E-03 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
50	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
51	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
52	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
53	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
54	6.2E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	8.09E-03S lb/hp-hr [2]	7.05E-04 lb/hp-hr	[1]	N/A
55	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
56	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
57	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
58	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A

59	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
60	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
61	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
62	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
63	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
64	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
65	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
Emergency Generator BLDG #2121	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
Emergency Generator BLDG #3007	6.5E-03 lb/hp-hr	5.75E-03 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	3E-04 lb/hp-hr	2.05E-03 lb/hp-hr	2.51E-03 lb/hp-hr	[1]	N/A
Boiler BLDG#1171	20 lb/1000gal	5.0 lb/1000gal	1.08 lb/1000gal	1.08 lb/1000gal	1.08 lb/1000gal	142S lb/1000gal [2]	0.556 lb/1000gal	[1]	9 lb/MMBtu

[1] *See details in Attachment#2*

[2] *S = Sulfur content in fuel*

EU ID No.	Sources and References for Emission Factors								
	NOx	**CO**	**PM-2.5**	**PM-10**	**PM**	**SO_2**	**VOC**	**HAPs**	**Lead**
SIGNIFICANT UNITS									
8	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-8, 1.3-10	AP-42 Tables 1.3-8, 1.3-10
9	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-8, 1.3-10	AP-42 Tables 1.3-8, 1.3-10
10	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-8, 1.3-10	AP-42 Tables 1.3-8, 1.3-10
40	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-8, 1.3-10	AP-42 Tables 1.3-8, 1.3-10
11	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
12	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
13	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	**N/A**
26	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A

27	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
28	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
29	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
30	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
31	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
32	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
33	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
34	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
35	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
36	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
37	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
38	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
39	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-1	AP-42 Table 3.3-2	N/A
50	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
51	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
52	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
53	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
54	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
55	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
56	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A

57	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
58	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
59	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
60	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
61	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
62	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
63	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
64	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
65	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
Emergency Generator BLDG #2121	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
Emergency Generator BLDG #3007	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-1, 3.4-1, 3.4-2	AP-42 Tables 3.3-2, 3.4-3, 3.4-4	N/A
Insignificant Emission Units - Boilers	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12	AP-42 Tables 1.3-8, 1.3-10	AP-42 Tables 1.3-8, 1.3-10

Please use additional copies of this sheet if necessary.
Include additional notes as warranted.

Have you specified all emission factors and reference sources in Section 7 above? ☒ Yes ☐ No
If not, please explain:

Section 8 Applicable State Emission Limits (listed in 18 AAC 50.050 through 18 AAC 50.090)

Complete this section for emissions units that are new or are affected by the physical change or change in operation.

EU ID No.	Emission Limit or Standard	Regulation Citation	Compliance Method
8-13, 26-40, 50-65, Emergency Generator BLDG#2121, Emergency Generator BLDG#3007, IEU Boilers	Visible Emission Standards	18 AAC 50.055(a)(1)	Permittee shall not cause or allow VE, excluding condensed water vapor to reduce visibility through the exhaust effluent by greater than 20 percent averaged over any six consecutive minutes
8-13, 26-40, 50-65, Emergency Generator BLDG#2121, Emergency Generator BLDG#3007, IEU Boilers	Particulate Matter Standards	18 AAC 50.055(b)(1)	Permittee shall not cause or allow particulate matter emitted from EUs to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours
8-13, 26-40, 50-65, Emergency Generator BLDG#2121, Emergency Generator BLDG#3007, IEU Boilers	Sulfur Emission Standards	18 AAC 50.055(c)	All emission units listed shall combust only ULSD
8-13, 26-40, 50-65, Emergency Generator BLDG#2121, Emergency Generator BLDG#3007, IEU Boilers	Additional control measures for a serious PM-2.5 nonattainment area	18 AAC 50.078(b)	All emission units listed shall combust only ULSD

Please use additional copies of this sheet if necessary.

Have you specified all applicable state emission limits in Section 8 above? ☒ Yes ☐ No

Have you specified a demonstration of compliance for each emission limit or standard? ☒ Yes ☐ No

If you answered "no" to either question, please explain:

Section 9 Incinerators

Complete this section if the project/stationary source contains an incinerator.
Do you own or operate an incinerator? ☐ Yes ☒ No *(If not, skip this section.)*

EU ID No.	Fuels Burned (type and consumption rate)	Rated capacity in pounds per hour	Type of waste burned

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the details of all incinerators in Section 9 above? ☐ Yes ☐ No
If not, please explain:

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

EMISSIONS SUMMARY FORM
Modification of an Existing Stationary Source

Section 1 Stationary Source Information

Stationary Source Name: USAG Alaska Fort Wainwright

Section 2 Existing Potential to Emit (PTE) for the Entire Stationary Source BEFORE the Modification

EU ID No.	*Does project affect the emissions unit?*	PTE (tpy)								
		CO	NOx[4]	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC[2]	Fugitive VOC[3]	Fugitive PM[3]
8	☒ Yes ☐ No	2.97	11.89	0.32	0.32	0.64	25.32	0.20	-	-
9	☒ Yes ☐ No	2.97	11.89	0.32	0.32	0.64	25.32	0.20	-	-
10	☒ Yes ☐ No	2.97	11.89	0.32	0.32	0.64	25.32	0.20	-	-
40	☒ Yes ☐ No	0.41	1.63	0.04	0.04	0.09	3.47	0.03	-	-
11	☒ Yes ☐ No	1.73	1.87	0.05	0.05	0.09	0.73	0.21	-	-
12	☒ Yes ☐ No	1.73	1.87	0.05	0.05	0.09	0.73	0.21	-	-
13	☒ Yes ☐ No	1.73	1.87	0.05	0.05	0.09	0.73	0.21	-	-
26	☒ Yes ☐ No	0.47	0.53	0.01	0.01	0.02	0.17	0.20	-	-
27	☒ Yes ☐ No	0.10	0.11	0.00	0.00	0.01	0.03	0.04	-	-
28	☒ Yes ☐ No	0.57	0.65	0.01	0.01	0.03	0.20	0.25	-	-
29	☒ Yes ☐ No	0.07	0.08	0.00	0.00	0.00	0.02	0.03	-	-
30	☒ Yes ☐ No	0.46	2.13	0.08	0.08	0.15	0.14	0.17	-	-
31	☒ Yes ☐ No	0.39	1.82	0.06	0.06	0.13	0.12	0.15	-	-
32	☒ Yes ☐ No	0.39	1.82	0.06	0.06	0.13	0.12	0.15	-	-
33	☒ Yes ☐ No	0.39	1.82	0.06	0.06	0.13	0.12	0.15	-	-
34	☒ Yes ☐ No	0.39	1.82	0.06	0.06	0.13	0.12	0.15	-	-
35	☒ Yes ☐ No	0.40	1.86	0.07	0.07	0.13	0.12	0.15	-	-
36	☒ Yes ☐ No	0.40	1.86	0.07	0.07	0.13	0.12	0.15	-	-

37	☒ Yes	☐ No	0.23	1.09	0.04	0.04	0.08	0.07	0.09	-	-
38	☒ Yes	☐ No	0.20	0.93	0.03	0.03	0.07	0.06	0.08	-	-
39	☒ Yes	☐ No	0.20	0.93	0.03	0.03	0.07	0.06	0.08	-	-
22	☐ Yes	☒ No	N/A	N/A	N/A	N/A	N/A	N/A	1.29	-	-
23	☐ Yes	☒ No	N/A	N/A	N/A	N/A	N/A	N/A	0.57	-	-
24	☐ Yes	☒ No	N/A	N/A	N/A	N/A	N/A	N/A	2.01	-	-
50	☒ Yes	☐ No	1.10	1.18	0.03	0.03	0.06	0.46	0.13	-	-
51	☒ Yes	☐ No	1.10	1.18	0.03	0.03	0.06	0.46	0.13	-	-
52	☒ Yes	☐ No	0.12	0.13	0.00	0.00	0.01	0.04	0.05	-	-
53	☒ Yes	☐ No	0.84	0.95	0.02	0.02	0.04	0.30	0.37	-	-
54	☒ Yes	☐ No	1.52	1.64	0.04	0.04	0.08	0.64	0.19	-	-
55	☒ Yes	☐ No	0.30	0.34	0.01	0.01	0.02	0.11	0.13	-	-
56	☒ Yes	☐ No	0.24	0.27	0.01	0.01	0.01	0.09	0.11	-	-
57	☒ Yes	☐ No	0.29	0.33	0.01	0.01	0.02	0.10	0.13	-	-
58	☒ Yes	☐ No	0.10	0.11	0.00	0.00	0.01	0.03	0.04	-	-
59	☒ Yes	☐ No	0.04	0.04	0.00	0.00	0.00	0.01	0.02	-	-
60	☒ Yes	☐ No	0.12	0.13	0.00	0.00	0.01	0.04	0.05	-	-
61	☒ Yes	☐ No	0.05	0.06	0.00	0.00	0.00	0.02	0.02	-	-
62	☒ Yes	☐ No	0.02	0.03	0.00	0.00	0.00	0.01	0.01	-	-
63	☒ Yes	☐ No	0.07	0.08	0.00	0.00	0.00	0.02	0.03	-	-
64	☒ Yes	☐ No	0.34	0.38	0.01	0.01	0.02	0.12	0.15	-	-
65	☒ Yes	☐ No	0.24	0.27	0.01	0.01	0.01	0.09	0.11	-	-
Paved Roads	☐ Yes	☒ No	N/A	N/A	36.40	36.40	72.80	N/A	N/A	-	-
Unpaved Roads	☐ Yes	☒ No	N/A	N/A	10.30	10.30	20.60	N/A	N/A	-	-
Emergency Generator BLDG #2121	☒ Yes	☐ No	0.09	0.10	0.00	0.00	0.00	0.03	0.04	-	-
Emergency Generator BLDG #3007	☒ Yes	☐ No	0.34	0.38	0.01	0.01	0.02	0.12	0.15	-	-
Insignificant Emission Units - Boilers	☒ Yes	☐ No	1.98	7.93	0.21	0.21	0.43	1.98	0.13	-	-

Insignificant Emission Units - Others	☐ Yes ☒ No	0.27	1.04	0.44	0.44	0.89	16.10	6.88	-	-
Total tons per year (tpy)		**28.35**	**76.92**	**49.28**	**49.28**	**98.56**	**103.90**	**15.83**	-	-

☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached in order for your application to be complete.*
Include multiple copies of this page if more space is required. Continued in Attachment # 2.xlsx

☐ *Check this box if fugitive emissions are included in permit applicability under 18 AAC 50.502(i).*

Brief description of why fugitive emissions are included in permit applicability:

Notes:

1 Include condensable particulate matter for PM-10 and PM-2.5.
2 If total PTE for volatile organic compounds (VOCs) is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.
3 Fugitive VOC and PM emissions are included as assessable emissions regardless of permit applicability.
4 Fugitive NOx emissions from blasting should be included in the PTE column for NOx.
5 Emission Unit Inventory from Title V Operating Permit Renewal for USAG Alaska Fort Wainwright Submitted to ADEC in March 2019

Have you completed Section 2 above? ☒ Yes ☐ No
If not, please explain:

Section 3 Change in Emissions

Show ONLY existing emissions units that are affected by the project. Show EITHER the change in actual emissions (Sections 3a and 3b) OR the change in potential emissions (Sections 2 and 3c).

Section 3a Actual Emissions – NOx, CO, PM-2.5, PM-10, PM, SO_2 (18 AAC 50.502(c)(3)(B) or 18 AAC 50.508(5))

If an existing emissions unit is being removed, enter zero for "projected actual emissions" for that unit.

See 18 AAC 50.502 for directions on calculating "baseline actual emissions" and "projected actual emissions."

EU ID No.	Type of Modification		Baseline Actual Emissions (tpy)					Projected Actual Emissions (tpy)				
	Modified EU	Removed EU	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
Total												

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

☐ Detailed Excel spreadsheets emissions calculations are attached. *These must be attached in order for your application to be complete. You may give an example calculation where the method of calculation is identical for multiple emissions units.*

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Section 3b Change in Actual Emissions (18 AAC 50.502(c) (3) (B) or 18 AAC 50.502(c) (4) (B))

If you choose actual emissions as your basis, complete Sections 3a and 3b for each emissions unit for which you answered "YES" in Section 2. Change in actual emissions = "projected actual emissions" minus "baseline actual emissions" from Section 3a.

EU ID No.	Change in Actual Emissions (tpy)				
	CO	NOx	PM-2.5[1]	PM-10[1]	SO_2
Total					

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Have you completed Section 3a and 3b above? ☐ Yes ☐ No

If not, please explain:

Section 3c Change in Potential to Emit (PTE) (18 AAC 50.502(c)(3)(A) or 18 AAC 50.502(c)(4)(A))

If you choose PTE as your basis for calculation, complete this section for each emissions unit that is new and for each emissions unit for which you answered "YES" in Section 2.

Under "PTE AFTER the Modification", enter zero if you are removing the emissions unit.

Under "Change in PTE":
For each EXISTING emissions unit, subtract the amount of PTE BEFORE Modification in Section 2 from the "PTE AFTER the Modification"
For each NEW emissions unit, enter the amount from "PTE AFTER the Modification."

EU ID No.	PTE - AFTER the Modification (tpy) [only from modified and new emissions units. Do not list emission units for which you answered "NO" in Section 2.]								Change in PTE (tpy)							
	CO	**NO_X**	**PM-2.5[1]**	**PM-10[1]**	**PM**	**SO_2**	**VOC**	**HAPs[2]**	**CO**	**NO_X**	**PM-2.5[1]**	**PM-10[1]**	**PM**	**SO_2**	**VOC**	**HAPs**
8	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
9	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
10	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
40	0.41	1.63	0.04	0.04	0.09	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	-3.45	0.00	0.00
11	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
12	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
13	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
26	0.47	0.53	0.01	0.01	0.02	0.17	0.20	6E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.10	0.11	0.00	0.00	0.01	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.57	0.65	0.01	0.01	0.03	0.20	0.25	7E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.07	0.08	0.00	0.00	0.00	0.02	0.03	8E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.46	2.13	0.08	0.08	0.15	0.14	0.17	3E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.40	1.86	0.07	0.07	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	0.40	1.86	0.07	0.07	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	0.23	1.09	0.04	0.04	0.08	0.07	0.09	9E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.20	0.93	0.03	0.03	0.07	0.06	0.08	1E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	0.20	0.93	0.03	0.03	0.07	0.06	0.08	1E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	1.10	1.18	0.03	0.03	0.06	0.00	0.13	1E-05	0.00	0.00	0.00	0.00	0.00	-0.46	0.00	0.00

51	1.10	1.18	0.03	0.03	0.06	0.00	0.13	1E-05	0.00	0.00	0.00	0.00	0.00	-0.46	0.00	0.00
52	0.12	0.13	0.00	0.00	0.01	0.04	0.05	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	0.84	0.95	0.02	0.02	0.04	0.30	0.37	1E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	1.48	1.59	0.04	0.04	0.08	0.00	0.18	2E-05	-0.04	-0.05	0.00	0.00	0.00	-0.64	-0.01	0.00
55	0.30	0.34	0.01	0.01	0.02	0.11	0.13	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	0.24	0.27	0.01	0.01	0.01	0.09	0.11	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	0.29	0.33	0.01	0.01	0.02	0.10	0.13	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.10	0.11	0.00	0.00	0.01	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	0.04	0.04	0.00	0.00	0.00	0.01	0.02	5E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.12	0.13	0.00	0.00	0.01	0.04	0.05	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	0.05	0.06	0.00	0.00	0.00	0.02	0.02	6E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	0.02	0.03	0.00	0.00	0.00	0.01	0.01	3E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	0.07	0.08	0.00	0.00	0.00	0.02	0.03	8E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	0.34	0.38	0.01	0.01	0.02	0.12	0.15	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.24	0.27	0.01	0.01	0.01	0.09	0.11	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Gen BLDG#2121	0.09	0.10	0.00	0.00	0.00	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Gen BLDG#3007	0.34	0.38	0.01	0.01	0.02	0.12	0.15	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IEU Boilers	1.98	7.93	0.21	0.21	0.43	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00	-1.90	0.00	-0.01
Other unmodified Sources	0.27	1.04	47.14	47.14	94.29	16.10	10.75	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Total	**28.03**	**75.83**	**2.14**	**2.14**	**4.28**	**3.13**	**5.08**	**0.02**	**-0.04**	**-0.05**	**0.00**	**0.00**	**0.00**	**-84.68**	**-0.01**	**0.00**
Source-Wide	**28.31**	**76.87**	**49.28**	**49.28**	**98.56**	**19.23**	**15.83**	**0.02**	**-0.04**	**-0.05**	**0.00**	**0.00**	**0.00**	**-84.68**	**-0.01**	**0.00**

Include multiple copies of this page if more space is required.

☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached for your application to be complete.*

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5

[2] If the total PTE for hazardous air pollutants (HAPs) for the entire stationary source is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.

Have you completed all portions of Section 3c above? ☒ Yes ☐ No

If not, please explain:

Appendix B

Emission Calculations Before Modification

EU ID No.	Does project affect the emissions unit?				PTE (tpy)								
					CO	NOx[4]	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC[2]	Fugitive VOC[3]	Fugitive PM[3]
SIGNIFICANT EMISSION UNITS													
8	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A
9	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A
10	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A
40	Yes	X	No		0.41	1.63	0.04	0.04	0.09	3.47	0.03	N/A	N/A
11	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A
12	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A
13	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A
26	Yes	X	No		0.47	0.53	0.01	0.01	0.02	0.17	0.20	N/A	N/A
27	Yes	X	No		0.10	0.11	0.00	0.00	0.01	0.03	0.04	N/A	N/A
28	Yes	X	No		0.57	0.65	0.01	0.01	0.03	0.20	0.25	N/A	N/A
29	Yes	X	No		0.07	0.08	0.00	0.00	0.00	0.02	0.03	N/A	N/A
30	Yes	X	No		0.46	2.13	0.08	0.08	0.15	0.14	0.17	N/A	N/A
31	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A
32	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A
33	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A
34	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A
35	Yes	X	No		0.40	1.86	0.07	0.07	0.13	0.12	0.15	N/A	N/A
36	Yes	X	No		0.40	1.86	0.07	0.07	0.13	0.12	0.15	N/A	N/A
37	Yes	X	No		0.23	1.09	0.04	0.04	0.08	0.07	0.09	N/A	N/A
38	Yes	X	No		0.20	0.93	0.03	0.03	0.07	0.06	0.08	N/A	N/A
39	Yes	X	No		0.20	0.93	0.03	0.03	0.07	0.06	0.08	N/A	N/A
22	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.29	N/A	N/A
23	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.57	N/A	N/A
24	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	2.01	N/A	N/A
50	Yes	X	No		1.10	1.18	0.03	0.03	0.06	0.46	0.13	N/A	N/A
51	Yes	X	No		1.10	1.18	0.03	0.03	0.06	0.46	0.13	N/A	N/A
52	Yes	X	No		0.12	0.13	0.00	0.00	0.01	0.04	0.05	N/A	N/A
53	Yes	X	No		0.84	0.95	0.02	0.02	0.04	0.30	0.37	N/A	N/A
54	Yes	X	No		1.52	1.64	0.04	0.04	0.08	0.64	0.19	N/A	N/A
55	Yes	X	No		0.30	0.34	0.01	0.01	0.02	0.11	0.13	N/A	N/A
56	Yes	X	No		0.24	0.27	0.01	0.01	0.01	0.09	0.11	N/A	N/A
57	Yes	X	No		0.29	0.33	0.01	0.01	0.02	0.10	0.13	N/A	N/A
58	Yes	X	No		0.10	0.11	0.00	0.00	0.01	0.03	0.04	N/A	N/A
59	Yes	X	No		0.04	0.04	0.00	0.00	0.00	0.01	0.02	N/A	N/A
60	Yes	X	No		0.12	0.13	0.00	0.00	0.01	0.04	0.05	N/A	N/A
61	Yes	X	No		0.05	0.06	0.00	0.00	0.00	0.02	0.02	N/A	N/A
62	Yes	X	No		0.02	0.03	0.00	0.00	0.00	0.01	0.01	N/A	N/A
63	Yes	X	No		0.07	0.08	0.00	0.00	0.00	0.02	0.03	N/A	N/A
64	Yes	X	No		0.34	0.38	0.01	0.01	0.02	0.12	0.15	N/A	N/A
65	Yes	X	No		0.24	0.27	0.01	0.01	0.01	0.09	0.11	N/A	N/A
Paved Roads	Yes		No	X	N/A	N/A	36.40	36.40	72.80	N/A	N/A	N/A	N/A
Unpaved Roads	Yes		No	X	N/A	N/A	10.30	10.30	20.60	N/A	N/A	N/A	N/A
Emergency Gen BLDG#2121	Yes	X	No		0.09	0.10	0.00	0.00	0.00	0.03	0.04	N/A	N/A
Emergency Gen BLDG#3007	Yes	X	No		0.34	0.38	0.01	0.01	0.02	0.12	0.15	N/A	N/A
INSIGNIFICANT EMISSION UNITS													
Boiler BLDG#1171	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#1172_1	Yes	X	No		0.15	0.59	0.02	0.02	0.03	0.15	0.01	N/A	N/A
Boiler BLDG#1172_2	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#1185_1	Yes	X	No		0.20	0.81	0.02	0.02	0.04	0.20	0.01	N/A	N/A
Boiler BLDG#1185_2	Yes	X	No		0.20	0.81	0.02	0.02	0.04	0.20	0.01	N/A	N/A
Boiler BLDG#1191	Yes	X	No		0.02	0.09	0.00	0.00	0.01	0.02	0.00	N/A	N/A
Boiler BLDG#1815_1	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#1815_2	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#2090_1	Yes	X	No		0.09	0.38	0.01	0.01	0.02	0.09	0.01	N/A	N/A
Boiler BLDG#2090_2	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#2092_1	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A
Boiler BLDG#2092_2	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A
Boiler BLDG#2096_1	Yes	X	No		0.13	0.50	0.01	0.01	0.03	0.13	0.01	N/A	N/A
Boiler BLDG#2096_2	Yes	X	No		0.13	0.50	0.01	0.01	0.03	0.13	0.01	N/A	N/A
Boiler BLDG#2400	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#4321	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#4322	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#5003	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#5008	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A
Boiler BLDG#5009	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#5010	Yes	X	No		0.14	0.56	0.02	0.02	0.03	0.14	0.01	N/A	N/A

Boiler BLDG#5109	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#5110	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A
Boiler BLDG#5113	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A
Boiler BLDG#5119	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A
Boiler BLDG#5142	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A
Boiler BLDG#5144	Yes	X	No		0.11	0.44	0.01	0.01	0.02	0.11	0.01	N/A	N/A
Boiler BLDG#5149_1	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#5149_2	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A
Boiler BLDG#5163	Yes	X	No		0.01	0.05	0.00	0.00	0.00	0.01	0.00	N/A	N/A
Boiler BLDG#5186	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A
IEU Boiler Total					1.98	7.93	0.21	0.21	0.43	1.98	0.13	N/A	N/A
Fuel Station BLDG#3484	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	3.40	N/A	N/A
AST BLDG#4076_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_3	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_4	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_5	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG$4076_6	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_7	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4076_8	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#1171	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#1172	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#1185	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1191	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1572_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1572_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1572_3	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1572_4	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
USTBLDG#1580	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#1815	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#2062	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#2078_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.21	N/A	N/A
AST BLDG#2078_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.21	N/A	N/A
UST BLDG#2080	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#2090	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#2092	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#2096_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#2096_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A
AST BLDG#2400	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#3015_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#3015_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A
UST BLDG#3484_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#3484_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#3484_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#3484_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.84	N/A	N/A
AST BLDG#4065_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#4065_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#4065	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#4109	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A
UST BLDG#4321	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#4322	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5003	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5007	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5008	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5009	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5009	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5010	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5011	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5108	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5109	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
UST BLDG#5110	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5113	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5119	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5142	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5149	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5157	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5159	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5163	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5175	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
AST BLDG#5186	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A
Waste Oil Boiler	Yes		No	X	0.27	1.04	0.42	0.42	0.84	16.10	0.00	N/A	N/A

Wood Working	Yes		No	X	N/A	N/A	0.03	0.03	0.05	N/A	N/A	N/A	N/A
IEU Other Total					0.27	1.04	0.44	0.44	0.89	16.10	6.88	N/A	N/A
Total TPY					28.35	76.92	49.28	49.28	98.56	103.90	15.83	N/A	N/A

[1] Include condensable particulate matter for PM-10 and PM-2.5.

[2] If total PTE for volatile organic compounds (VOCs) is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.

[3] Fugitive VOC and PM emissions are included as assessable emissions regardless of permit applicability.

[4] Fugitive NOx emissions from blasting should be included in the PTE column for NOx.

[5] Emission Unit Inventory from Title V Operating Permit Renewal for USAG Alaska Fort Wainwright Submitted to ADEC in March 2019

FORT WAINWRIGHT AIR POLLUTANT EMISSION SUMMARY

ACTUAL CRITERIA POLLUTANT EMISSIONS

Source Category	NOx (TPY)	SO_2 (TPY)	CO (TPY)	VOC (TPY)	PM_{10} [1] (TPY)
Aerospace Operations	N/A	N/A	N/A	0.49	N/A
Boilers (Fuel Oil)	1.22	2.60	0.30	0.02	0.07
Degreasing	N/A	N/A	N/A	0.91	N/A
Emergency Generators	0.84	0.86	0.77	0.16	0.04
Fuel Dispensing Station	N/A	N/A	N/A	0.65	N/A
Fuel Storage	N/A	N/A	N/A	2.32	N/A
Internal Combustion Engines	0.73	0.05	0.16	0.06	0.05
Landfills	N/A	N/A	0.04	0.57	N/A
Surface Coating	N/A	N/A	N/A	0.10	0.05
Waste Oil Boiler	0.05	0.73	0.01	<0.01	0.04
Woodworking	N/A	N/A	N/A	N/A	0.03
TOTAL EMISSIONS:	**2.84**	**4.23**	**1.29**	**5.28**	**0.27**

[1]Particulate Matter (PM) with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}) and total PM emissions are assumed to be equal

N/A = not applicable to source

POTENTIAL CRITERIA POLLUTANT EMISSIONS

Source Category	NOx (TPY)	SO_2 (TPY)	CO (TPY)	VOC (TPY)	PM_{10} [1] (TPY)
Aerospace Operations	N/A	N/A	N/A	2.01	N/A
Boilers (Fuel Oil)	45.16	96.18	11.29	0.75	2.44
Degreasing	N/A	N/A	N/A	3.85	N/A
Emergency Generators	14.58	5.33	13.31	3.01	0.69
Fuel Dispensing Station	N/A	N/A	N/A	0.66	N/A
Fuel Storage	N/A	N/A	N/A	3.48	N/A
Internal Combustion Engines	16.08	1.06	3.47	1.30	1.14
Landfills	N/A	N/A	0.04	0.57	N/A
Surface Coating	N/A	N/A	N/A	0.43	0.22
Waste Oil Boiler	1.04	16.10	0.27	0.05	0.84
Woodworking	N/A	N/A	N/A	N/A	0.05
TOTAL EMISSIONS:	**76.85**	**118.67**	**28.38**	**16.13**	**5.39**

[1]Particulate Matter (PM) with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}) and total PM emissions are assumed to be equal

N/A = not applicable to source

AEROSPACE OPERATIONS - EMISSIONS SUMMARY

Aerospace Operations - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.49**
PM_{10}	**N/A**
HAPs	**0.07**
Formaldehyde	0.00
Phenol	0.00
Toluene	0.00
Xylenes	0.07

Aerospace Operations - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**2.01**
PM_{10}	**N/A**
HAPs	**0.32**
Formaldehyde	0.00
Phenol	0.00
Toluene	0.04
Xylenes	0.28

AEROSPACE OPERATIONS - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes: Aerospace Operations emissions are based on the installation 2010 Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including VOC content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:
Emissions (lb/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	VOC Content (%WT)	VOC Emissions (lb/yr)
Aircraft Maintenance Hangers	Corrosion Prevention Compound	60.00	0.88	7.36	100.0%	441.35
Aircraft Maintenance Hangers	Corrosion Prevention Compound	50.00	0.92	7.70	100.0%	384.89
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	0.25	0.91	7.59	0.0%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.20	1.19	9.92	0.1%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part B	1.00	1.00	8.34	0.1%	0.01
Aircraft Maintenance Hangers	Antiseize Thread Compound	0.43	1.40	11.68	0.0%	0.00
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.03	0.87	7.26	0.0%	0.00
Aircraft Maintenance Hangers	Coating Compound, Nonslip	70.00	1.16	9.67	32.0%	217.00
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.13	0.92	7.70	37.5%	0.37
Aircraft Maintenance Hangers	Epoxy Primer, Part A	0.25	0.86	7.13	79.1%	1.41
Aircraft Maintenance Hangers	Epoxy Primer, Part B	1.00	1.32	10.98	36.5%	4.01
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.11	0.78	6.50	58.0%	0.42
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.13	1.80	15.01	0.0%	0.00
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.01	1.10	9.17	0.0%	0.00
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	0.38	1.51	12.59	1.2%	0.06
Aircraft Maintenance Hangers	Polyurethane Coating	175.00	0.70	5.84	5.6%	56.93
TOTAL EMISSIONS (lb/yr)						**1,106.44**
TOTAL EMISSIONS (TPY)						**0.55**
TOTAL EMISSIONS (lb/yr (VOC - VOC_{HAP}))						**972.98**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**0.49**

AEROSPACE OPERATIONS - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes:
Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including VOC content, was determined from MSDS.
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2080 hr/yr

Potential Emission Calculations:
Emissions (lb/yr) = Potential Product Use (gal/yr) x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	VOC Content (%WT)	VOC Emissions (lb/yr)
Aircraft Maintenance Hangers	Corrosion Prevention Compound	252.69	0.88	7.36	100.0%	1,858.77
Aircraft Maintenance Hangers	Corrosion Prevention Compound	210.58	0.92	7.70	100.0%	1,620.98
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	1.05	0.91	7.59	0.0%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.85	1.19	9.92	0.1%	0.01
Aircraft Maintenance Hangers	Loctite Adhesive Part B	4.21	1.00	8.34	0.1%	0.04
Aircraft Maintenance Hangers	Antiseize Thread Compound	1.80	1.40	11.68	0.0%	0.00
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.13	0.87	7.26	0.0%	0.00
Aircraft Maintenance Hangers	Coating Compound, Nonslip	294.81	1.16	9.67	32.0%	913.90
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.54	0.92	7.70	37.5%	1.57
Aircraft Maintenance Hangers	Epoxy Primer, Part A	1.05	0.86	7.13	79.1%	5.93
Aircraft Maintenance Hangers	Epoxy Primer, Part B	4.21	1.32	10.98	36.5%	16.87
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.47	0.78	6.50	58.0%	1.76
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.53	1.80	15.01	0.0%	0.00
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.06	1.10	9.17	0.0%	0.00
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	1.58	1.51	12.59	1.2%	0.24
Aircraft Maintenance Hangers	Polyurethane Coating	737.02	0.70	5.84	5.6%	240.95
TOTAL EMISSIONS (lb/yr)						**4,661.03**
TOTAL EMISSIONS (TPY)						**2.33**
TOTAL EMISSIONS (lb/yr (VOC - VOC_{HAP}))						**4024.54**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**2.01**

AEROSPACE OPERATIONS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes: Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including HAP content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:
Emissions (lb/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x HAP Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	HAPs							
					Formaldehyde		Phenol		Toluene		Xylene	
					HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.11	0.88	7.36	---	---	---	---	4%	0.03	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.11	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	0.25	0.91	7.59	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.20	1.19	9.92	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part B	1.00	1.00	8.34	---	---	1.0%	0.08	---	---	---	---
Aircraft Maintenance Hangers	Antiseize Thread Compound	0.43	1.40	11.68	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.03	0.87	7.26	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Coating Compound, Nonslip	2.00	1.16	9.67	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.13	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Epoxy Primer, Part A	0.25	0.86	7.13	---	---	---	---	---	---	8%	0.14
Aircraft Maintenance Hangers	Epoxy Primer, Part B	1.00	1.32	10.98	0.13%	0.01	---	---	---	---	3%	0.33
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.11	0.78	6.50	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.13	1.80	15.01	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.01	1.10	9.17	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	0.38	1.51	12.59	---	---	---	---	1%	0.05	---	---
Aircraft Maintenance Hangers	Polyurethane Coating	175.00	0.70	5.84	---	---	---	---	---	---	13.0%	132.81
TOTAL EMISSIONS (lb/yr)						**0.01**		**0.08**		**0.08**		**133.29**
TOTAL EMISSIONS (TPY)						**0.00**		**0.00**		**0.00**		**0.07**

AEROSPACE OPERATIONS - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes:
Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including HAP content, was determined from MSDS.
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2,080 hr/yr

Potential Emission Calculations:
Emissions (lb/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x HAP Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	HAPs							
					Formaldehyde		Phenol		Toluene		Xylene	
					HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr
Aircraft Maintenance Hangers	Corrosion Prevention Compound	252.69	0.88	7.36	---	---	---	---	4%	74.35	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	210.58	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	1.05	0.91	7.59	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.85	1.19	9.92	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part B	4.21	1.00	8.34	---	---	1.0%	0.35	---	---	---	---
Aircraft Maintenance Hangers	Antiseize Thread Compound	1.80	1.40	11.68	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.13	0.87	7.26	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Coating Compound, Nonslip	294.81	1.16	9.67	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.54	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Epoxy Primer, Part A	1.05	0.86	7.13	---	---	---	---	---	---	8%	0.60
Aircraft Maintenance Hangers	Epoxy Primer, Part B	4.21	1.32	10.98	0.13%	0.06	---	---	---	---	3%	1.39
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.47	0.78	6.50	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.53	1.80	15.01	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.06	1.10	9.17	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	1.58	1.51	12.59	---	---	---	---	1%	0.20	---	---
Aircraft Maintenance Hangers	Polyurethane Coating	737.02	0.70	5.84	---	---	---	---	---	---	13%	559.55
TOTAL EMISSIONS (lb/yr)						**0.06**		**0.35**		**74.55**		**561.53**
TOTAL EMISSIONS (TPY)						**0.00**		**0.00**		**0.04**		**0.28**

BOILERS (Fuel Oil) - EMISSIONS SUMMARY

Boilers (#1 Fuel Oil) - Actual Emissions

Pollutant	TPY
NO_x	**1.22**
SO_2	**2.60**
CO	**0.30**
VOC - VOC_{HAP}	**0.02**
PM_{10}	**0.07**
CO_2	**1,309.73**
CH_4	**0.01**
N_2O	**0.02**
HAPs	**6.65**
Arsenic	0.07
Beryllium	0.05
Cadmium	0.05
Chromium	0.05
Formaldehye	5.82
Lead	0.15
Mercury	0.05
Manganese	0.10
Nickel	0.05
Selenium	0.25

Boilers (#1 Fuel Oil) - Potential Emissions

Pollutant	TPY
NO_x	**45.16**
SO_2	**96.18**
CO	**11.29**
VOC - VOC_{HAP}	**0.75**
PM_{10}	**2.44**
CO_2	**48,542.62**
CH_4	**0.49**
N_2O	**0.59**
HAPs	**<0.01**
Arsenic	<0.01
Beryllium	<0.01
Cadmium	<0.01
Chromium	<0.01
Formaldehye	<0.01
Lead	<0.01
Mercury	<0.01
Manganese	<0.01
Nickel	<0.01
Selenium	<0.01

BOILERS (Fuel Oil) - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Fuel Type: No. 2 Fuel Oil
Calculation Method: Emission Factors
Fuel Oil Sulfur Content (%S): 0.3

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP02

Notes: Fuel oil sulfur content from Reference 2, Section 3, Requirement 13.1 (assumes all fuel oil burned by Fort Wainwright meets the same specification).

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/1,000 gal)[1]							
	NO_x	SO_2[2]	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
Distillate Oil-Fired Boilers (<100 MMBTU/hr)	20	42.6	5.0	0.34	1.08	21,500	0.216	0.26

[1] Reference 1, Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12 [No.2 Distillate Oil Fired]

[2] SO_2 emissions factor = 142S, where S = weight % sulfur: 142 x 0.3 = 42.6

Emission Calculation:
Emissions (lbs/yr) = Fuel Use (gal/yr) x Emission Factor (lbs/1,000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Actual Fuel Use[1] (gal/yr)	Emissions (lbs/yr)							
			NO_x	SO_2	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
1171	0.2	2,000	40.0	85.2	10.0	0.7	2.2	43,000.0	0.4	0.5
1172	0.9	10,000	200.0	426.0	50.0	3.4	10.8	215,000.0	2.2	2.6
1172	0.2	2,000	40.0	85.2	10.0	0.7	2.2	43,000.0	0.4	0.5
1185	1.3	11,871	237.4	505.7	59.4	4.0	12.8	255,226.5	2.6	3.1
1185	1.3	11,872	237.4	505.7	59.4	4.0	12.8	255,248.0	2.6	3.1
1191	0.2	559	11.2	23.8	2.8	0.2	0.6	12,018.5	0.1	0.1
1815	0.2	750	15.0	32.0	3.8	0.3	0.8	16,125.0	0.2	0.2
1815	0.2	750	15.0	32.0	3.8	0.3	0.8	16,125.0	0.2	0.2
2090	0.6	3,650	73.0	155.5	18.3	1.2	3.9	78,475.0	0.8	0.9
2090	0.3	3,650	73.0	155.5	18.3	1.2	3.9	78,475.0	0.8	0.9
2092	0.4	4,452	89.0	189.7	22.3	1.5	4.8	95,718.0	1.0	1.2
2092	0.4	4,452	89.0	189.7	22.3	1.5	4.8	95,718.0	1.0	1.2
2096	0.8	1,750	35.0	74.6	8.8	0.6	1.9	37,625.0	0.4	0.5
2096	0.8	1,750	35.0	74.6	8.8	0.6	1.9	37,625.0	0.4	0.5
2400	0.3	3,650	73.0	155.5	18.3	1.2	3.9	78,475.0	0.8	0.9
4076	19.0	2,380	47.6	101.4	11.9	0.8	2.6	51,170.0	0.5	0.6
4076	19.0	2,800	56.0	119.3	14.0	1.0	3.0	60,200.0	0.6	0.7
4076	19.0	1,260	25.2	53.7	6.3	0.4	1.4	27,090.0	0.3	0.3
4321	0.3	2,968	59.4	126.4	14.8	1.0	3.2	63,812.0	0.6	0.8
4322	0.3	2,968	59.4	126.4	14.8	1.0	3.2	63,812.0	0.6	0.8
5003	0.3	2,968	59.4	126.4	14.8	1.0	3.2	63,812.0	0.6	0.8
5007	2.6	14,839	296.8	632.1	74.2	5.0	16.0	319,038.5	3.2	3.9
5008	0.4	5,936	118.7	252.9	29.7	2.0	6.4	127,624.0	1.3	1.5
5009	0.2	5,936	118.7	252.9	29.7	2.0	6.4	127,624.0	1.3	1.5
5010	0.9	4,452	89.0	189.7	22.3	1.5	4.8	95,718.0	1.0	1.2
5109	0.2	2,500	50.0	106.5	12.5	0.9	2.7	53,750.0	0.5	0.7
5110	0.2	2,968	59.4	126.4	14.8	1.0	3.2	63,812.0	0.6	0.8
5113	0.1	571	11.4	24.3	2.9	0.2	0.6	12,276.5	0.1	0.1
5119	0.1	535	10.7	22.8	2.7	0.2	0.6	11,502.5	0.1	0.1
5142	0.1	669	13.4	28.5	3.3	0.2	0.7	14,383.5	0.1	0.2
5144	0.7	2,241	44.8	95.5	11.2	0.8	2.4	48,181.5	0.5	0.6
5149	0.3	820	16.4	34.9	4.1	0.3	0.9	17,630.0	0.2	0.2
5149	0.3	820	16.4	34.9	4.1	0.3	0.9	17,630.0	0.2	0.2
5163	0.1	456	9.1	19.4	2.3	0.2	0.5	9,804.0	0.1	0.1
5186	0.1	592	11.8	25.2	3.0	0.2	0.6	12,728.0	0.1	0.2
TOTAL EMISSIONS (lbs/yr)			**2,436.7**	**5,190.2**	**609.2**	**41.4**	**131.6**	**2,619,452.5**	**26.3**	**31.7**
TOTAL EMISSIONS (TPY)			**1.22**	**2.60**	**0.30**	**0.02**	**0.07**	**1309.73**	**0.01**	**0.02**
TOTAL EMISSIONS (lbs/yr (NMTOC - VOC_{HAP}))						**34.77**				
TOTAL EMISSIONS (TPY (NMTOC - VOC_{HAP}))						**0.02**				

[1] Actual Fuel Use is from Fuel Storage calculations and actual fuel delivery receipts obtained from the supplier. Fuel used in the same building by more than one boiler was distributed proportionately to boiler capacity.

BOILERS (Fuel Oil) - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Fuel Type: No. 2 Fuel Oil
Calculation Method: Emission Factors
Fuel Oil Sulfur Content (%S): 0.3

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP02

Notes: Fuel oil sulfur content from Reference 2, Section 3, Requirement 13.1 (assumes all fuel oil burned by Fort Wainwright meets the same specification).

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/1,000 gal)[1]							
	NO_x	SO_2[2]	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
Distillate Oil-Fired Boilers (<100 MMBTU/hr)	20	42.6	5.0	0.34	1.08	21,500	0.216	0.26

[1] Reference 1, Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12 [No.2 Distillate oil fired]
[2] SO_2 emissions factor = 142S, where S = weight % sulfur: 142 x 0.3 = 42.6

Emission Calculation:
Potential Emissions (lbs/yr) =Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/1,000 gal) x 8760 (hr/year) / Fuel Heat Value (140 MMBtu/1000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Emissions (lbs/yr)							
		NO_x	SO_2	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
1171	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
1172	0.9	1,172.6	2,497.6	293.1	19.9	63.3	1,260,532.7	12.7	15.2
1172	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
1185	1.3	1,626.9	3,465.2	406.7	27.7	87.9	1,748,871.4	17.6	21.1
1185	1.3	1,626.9	3,465.2	406.7	27.7	87.9	1,748,871.4	17.6	21.1
1191	0.2	187.7	399.8	46.9	3.2	10.1	201,792.9	2.0	2.4
1815	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
1815	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
2090	0.6	750.9	1,599.3	187.7	12.8	40.5	807,171.4	8.1	9.8
2090	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
2092	0.4	500.6	1,066.2	125.1	8.5	27.0	538,114.3	5.4	6.5
2092	0.4	500.6	1,066.2	125.1	8.5	27.0	538,114.3	5.4	6.5
2096	0.8	1,001.1	2,132.4	250.3	17.0	54.1	1,076,228.6	10.8	13.0
2096	0.8	1,001.1	2,132.4	250.3	17.0	54.1	1,076,228.6	10.8	13.0
2400	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
4076	19.0	23,777.1	50,645.3	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4076	19.0	23,777.1	50,645.3	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4076	19.0	23,777.1	50,645.3	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4321	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
4322	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
5003	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
5007	2.6	3,253.7	6,930.4	813.4	55.3	175.7	3,497,742.9	35.1	42.3
5008	0.4	500.6	1,066.2	125.1	8.5	27.0	538,114.3	5.4	6.5
5009	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
5010	0.9	1,126.3	2,399.0	281.6	19.1	60.8	1,210,757.1	12.2	14.6
5109	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
5110	0.2	250.3	533.1	62.6	4.3	13.5	269,057.1	2.7	3.3
5113	0.1	125.1	266.6	31.3	2.1	6.8	134,528.6	1.4	1.6
5119	0.1	125.1	266.6	31.3	2.1	6.8	134,528.6	1.4	1.6
5142	0.1	125.1	266.6	31.3	2.1	6.8	134,528.6	1.4	1.6
5144	0.7	876.0	1,865.9	219.0	14.9	47.3	941,700.0	9.5	11.4
5149	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
5149	0.3	375.4	799.7	93.9	6.4	20.3	403,585.7	4.1	4.9
5163	0.1	100.1	213.2	25.0	1.7	5.4	107,622.9	1.1	1.3
5186	0.1	125.1	266.6	31.3	2.1	6.8	134,528.6	1.4	1.6
TOTAL EMISSIONS (lbs/yr)		**90,311.8**	**192,364.2**	**22,578.0**	**1,535.3**	**4,876.8**	**97,085,234.1**	**975.4**	**1,174.1**
TOTAL EMISSIONS (TPY)		**45.16**	**96.18**	**11.29**	**0.77**	**2.44**	**48542.62**	**0.49**	**0.59**
TOTAL EMISSIONS (lbs/yr (NMTOC - VOCHAP))						**1504.3**			
TOTAL EMISSIONS (TPY (NMTOC - VOCHAP))						**0.75**			

BOILERS (Fuel Oil) - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Fuel Type: No. 2 Fuel Oil
Calculation Method: Emission Factors
Fuel Oil Heat Value (Btu/gal) 140,000 [Reference 1, Appendix A (Typical Parameters of Various Fuels - Distillate Oil)]

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP02

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/10^{12} Btu)[1]									
	Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde[2]	Lead	Mercury	Manganese	Nickel	Selenium
Distillate Oil-Fired Boilers	4	3	3	3	0.048	9	3	6	3	15

[1] Reference 1, Tables 1.3-8, 1.3-10
[2] Formaldehyde emission factor has units of (lbs/1,000 gal)

Emission Calculation:
Emissions (lbs/yr) = Fuel Use (gal/yr) x Fuel Heat Value (Btu/gal) x Emission Factor (lbs/10^{12} Btu)
Emissions (lbs/yr) = Fuel Use (gal/yr) x Emission Factor (lbs/1,000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Actual Fuel Use[1] (gal/yr)	Emissions (lbs/yr)									
			Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde	Lead	Mercury	Manganese	Nickel	Selenium
1171	0.2	2,000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
1172	0.9	10,000	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
1172	0.2	2,000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
1185	1.3	11,871	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
1185	1.3	11,872	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
1191	0.2	559	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2090	0.6	3,650	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
2090	0.3	3,650	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
2092	0.4	4,452	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
2092	0.4	4,452	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
2096	0.8	1,750	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2096	0.8	1,750	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2400	0.3	3,650	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
4076	19.0	2,380	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
4076	19.0	2,800	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
4076	19.0	1,260	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
4321	0.3	2,968	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
4322	0.3	2,968	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5003	0.3	2,968	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5007	2.6	14,839	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
5008	0.4	5,936	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
5009	0.2	5,936	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
5010	0.9	4,452	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
5109	0.2	2,500	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5110	0.2	2,968	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5113	0.1	571	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5119	0.1	535	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5142	0.1	669	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5144	0.7	2,241	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
5149	0.3	820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5149	0.3	820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5163	0.1	456	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5186	0.1	592	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL EMISSIONS (lbs/yr)			**0.1**	**0.1**	**0.1**	**0.1**	**5.8**	**0.2**	**0.1**	**0.1**	**0.1**	**0.3**
TOTAL EMISSIONS (TPY)			**0.07**	**0.05**	**0.05**	**0.05**	**5.82**	**0.15**	**0.05**	**0.10**	**0.05**	**0.25**

[1] Actual Fuel Use is from Fuel Storage calculations. Fuel used in the same building by more than one boiler was distributed proportionately to boiler capacity.

BOILERS (Fuel Oil) - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Fuel Type: No. 2 Fuel Oil
Calculation Method: Emission Factors
Fuel Oil Heat Value (Btu/gal) 140,000 [Reference 1, Appendix A (Typical Parameters of Various Fuels - Distillate Oil)]

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP02

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/10^{12} Btu)[1]									
	Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde[2]	Lead	Mercury	Manganese	Nickel	Selenium
Distillate Oil-Fired Boilers	4	3	3	3	0.048	9	3	6	3	15

[1] Reference 1, Tables 1.3-8, 1.3-10
[2] Formaldehyde emission factor has units of (lbs/1,000 gal)

Emission Calculation:
Potential Emissions (lbs/yr) = Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/10^^{12} Btu)
Potential Emissions (lbs/yr) =Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/1,000 gal) x 8760 (hr/year) / Fuel Heat Value (140 MMBtu/1000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Emissions (lbs/yr)									
		Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde	Lead	Mercury	Manganese	Nickel	Selenium
1171	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1172	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
1172	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1185	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2
1185	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2
1191	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2090	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2090	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2092	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2092	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2096	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
2096	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
2400	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4321	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4322	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5003	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5007	2.6	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.3
5008	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5009	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5010	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
5109	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5110	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5113	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5119	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5142	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5144	0.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
5149	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5149	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5163	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5186	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL EMISSIONS (lbs/yr)		**2.5**	**1.9**	**1.9**	**1.9**	**<0.1**	**5.7**	**1.9**	**3.8**	**1.9**	**9.5**
TOTAL EMISSIONS (TPY)		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

DEGREASING - EMISSIONS SUMMARY

Degreasing - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.91
PM_{10}	N/A

Degreasing - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	3.85
PM_{10}	N/A

DEGREASING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

Degreasing: General Degreasing Unit	4-01-002-96

Notes:
Amount of solvent added is based on the installation's Hazardous Material Product Use report.
The amount of solvent removed was not available at the time of the inventory.
VOC content is based on the MSDS for each solvent.
There were no HAP emissions from degreasing.

B. EMISSION CALCULATION METHOD

Actual Emission Calculations:
Emissions (lb/yr) = [Solvent Added (gal/yr) - Solvent Removed (gal/yr)] x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Solvent Name	Density of Solvent (lb/gal)	Solvent Added (gal/yr)	Solvent Removed (gal/yr)	VOC Content (%WT)	VOC Emissions (lb/yr)
3015	Heavy Duty Industrial Degreaser	8.26	165.00	0.00	95.0%	1,294.22
3018	Loctite Natural Blue Biodegradable	8.34	10.00	0.00	4.4%	3.63
3018	Omni Biodegradable Degreaser	8.51	0.50	0.00	0.0%	0.00
3018	Citratech, Citrus Cleaner	6.68	45.00	0.00	94.9%	285.28
3475	Electron Dielectric Solvent	6.54	48.00	0.00	78.4%	246.06
3490	Paradigm	8.76	1.00	0.00	0.0%	0.00
TOTAL EMISSIONS (lb/yr)						**1,829.19**
TOTAL EMISSIONS (TPY)						**0.91**

DEGREASING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

Degreasing: General Degreasing Unit	4-01-002-96

Notes: Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Emission Calculations:

Emissions (lb/yr) = [Solvent Added (gal/yr) - Solvent Removed (gal/yr)] x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Solvent Name	Density of Solvent (lb/gal)	Potential Solvent Added (gal/yr)	Potential Solvent Removed (gal/yr)	VOC Content (%WT)	VOC Emissions (lb/yr)
3015	Heavy Duty Industrial Degreaser	8.26	694.90	0.00	95.0%	5,450.67
3018	Loctite Natural Blue Biodegradable	8.34	42.12	0.00	4.4%	15.28
3018	Omni Biodegradable Degreaser	8.51	2.11	0.00	0.0%	0.00
3018	Citratech, Citrus Cleaner	6.68	189.52	0.00	94.9%	1,201.48
3475	Electron Dielectric Solvent	6.54	202.15	0.00	78.4%	1,036.29
3490	Paradigm	8.76	4.21	0.00	0.0%	0.00
TOTAL EMISSIONS (lb/yr)						**7,703.72**
TOTAL EMISSIONS (TPY)						**3.85**

FUEL DISPENSING STATION - EMISSIONS SUMMARY

Fuel Dispensing Station - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.65**
PM_{10}	**N/A**
CO_2	**N/A**
CH_4	**N/A**
HAPs	**0.15**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
n-Hexane	0.02
Methyl-t-butyl ether	0.09
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
m & p-Xylene	0.01
o-Xylene	<0.01

Fuel Dispensing Station - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.66**
PM_{10}	**N/A**
CO_2	**N/A**
CH_4	**N/A**
HAPs	**0.66**
Benzene	0.03
Cumene	<0.01
Ethyl benzene	0.01
n-Hexane	0.09
Methyl-t-butyl ether	0.39
Naphthalene	<0.01
Toluene	0.06
2,2,4-Trimethylpentane	0.06
m & p-Xylene	0.02
o-Xylene	0.01

FUEL DISPENSING STATION - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References: Gasoline Service Station Industrywide Risk Assessment Guidelines. California Air Pollution Control Officers Association, November 1997

Notes: Calculations assume no Stage II vapor recovery on dispensing nozzles

B. EMISSION CALCULATION METHOD

Gasoline Storage and Dispensing Emission Factors

Emission Process	VOC Emissions (lbs/1,000 gal)		
	AST[1]	UST-1[2]	UST-2[3]
Tank Filling (Loading)	0.42	0.42	0.084
Tank Breathing	2.1	0.84	0.21
Vehicle Refueling	8.4	8.4	8.4
Spillage	0.61	0.61	0.61
Total Emission Factor	**11.53**	**10.27**	**9.30**

[1] Reference, Appendix A, Scenario 2 - AST, Phase I controls (only)

[2] Reference, Appendix A, Scenario 5A - UST, Phase I controls (only)

[3] Reference, Appendix A, Scenario 5B - UST, Phase I controls with vent valves

Emission Calculation:

Emissions (lb/yr) = Fuel Throughput (gal/yr) x Emission Factor (lb/1,000 gal)

C. EMISSION SUMMARY

FUEL DISPENSING STATION - ACTUAL EMISSIONS (Criteria Pollutants)

Location	Bldg	Fuel Grade	Tank Capacity (gal)	Tank Configuration	Actual Fuel Throughput (gal/yr)	VOC Emissions (lbs/yr)
Main Fuelpoint	3484	Regular	12,000	AST	140,417	1,619.0
TOTAL EMISSIONS (lbs/yr)						**1,619.0**
TOTAL EMISSIONS (TPY)						**0.81**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))						**1,303.3**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**0.65**

FUEL DISPENSING STATION - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References: Gasoline Service Station Industrywide Risk Assessment Guidelines. California Air Pollution Control Officers Association, November 1997

Notes: Calculations assume no Stage II vapor recovery on dispensing nozzles
Actual hours of operation (8 hrs/day x 5 days/wk) (hrs/wk) : 40
Potential hours of operation (24 hrs/day x 7 days/wk) (hrs/wk): 168

B. EMISSION CALCULATION METHOD

Gasoline Storage and Dispensing Emission Factors

Emission Process	VOC Emissions (lbs/1,000 gal)		
	AST[1]	UST-1[2]	UST-2[3]
Tank Filling (Loading)	0.42	0.42	0.084
Tank Breathing	2.1	0.84	0.21
Vehicle Refueling	8.4	8.4	8.4
Spillage	0.61	0.61	0.61
Total Emission Factor	**11.53**	**10.27**	**9.30**

[1] Reference, Appendix A, Scenario 2 - AST, Phase I controls (only)
[2] Reference, Appendix A, Scenario 5A - UST, Phase I controls (only)
[3] Reference, Appendix A, Scenario 5B - UST, Phase I controls with vent valves

Emission Calculation:
Emissions (lbs/yr) = Actual Fuel Throughput (gal/yr) x [Potential Operation (hrs/wk) / Actual Operation (hrs/wk)] x Emission Factor (lb/1,000 gal)

C. EMISSION SUMMARY

Location	Bldg	Fuel Grade	Tank Capacity (gal)	Tank Configuration	Actual Fuel Throughput (gal/yr)	Potential Fuel Throughput (gal/yr)	VOC Emissions (lbs/yr)

FUEL DISPENSING STATION - POTENTIAL EMISSIONS (Criteria Pollutants)

Main Fuelpoint	3484	Regular	12,000	AST	140,417	589,751	6,799.8
TOTAL EMISSIONS (lbs/yr)							**6,799.8**
TOTAL EMISSIONS (TPY)							**3.40**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))							**1,326**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))							**0.66**

FUEL DISPENSING STATION - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References:
1. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 87 - not adjusted for oxygenates [Profile 8546]
2. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 89 - not adjusted for oxygenates [Profile 8547]
3. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 93 - not adjusted for oxygenates [Profile 8548]

Notes: Actual VOC emissions from Gasoline Dispensing Station Criteria Pollutant worksheet:
Grade 87 (regular) Gasoline VOCs (lbs/yr): 1,619.0
Grade 89 (mid-grade) Gasoline VOCs (lbs/yr): (n/a)
Grade 93 (premium) Gasoline VOCs (lbs/yr): (n/a)

B. EMISSION CALCULATION METHOD

HAP Emission Factors

Fuel Type	HAP Vapor Phase Concentration (%WT)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline [1]	0.95%	0.01%	0.20%	2.55%	11.50%	0.01%	1.81%	1.65%	0.63%	0.21%
Grade 89 (midgrade) Gasoline [2]	1.35%	0.04%	0.35%	2.86%	16.43%	0.04%	3.26%	3.76%	1.15%	0.44%
Grade 93 (premium) Gasoline [3]	0.73%	0.02%	0.32%	0.86%	15.53%	0.03%	3.43%	4.16%	1.11%	0.40%

[1]Reference 1; [2]Reference 2; [3]Reference 3

Emission Calculation:
HAP Emissions (lb/yr) = VOC Emissions (lb/yr) x HAP Vapor Phase Concentration (%WT)

C. EMISSION SUMMARY

Fuel Type	HAP Emissions (lbs/yr)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline	15.3	0.2	3.2	41.3	186.1	0.2	29.2	26.7	10.1	3.4
TOTAL EMISSIONS (lbs/yr)	**15.3**	**0.2**	**3.2**	**41.3**	**186.1**	**0.2**	**29.2**	**26.7**	**10.1**	**3.4**
TOTAL EMISSIONS (TPY)	**0.01**	**<0.01**	**<0.01**	**0.02**	**0.09**	**<0.01**	**0.01**	**0.01**	**0.01**	**<0.01**

FUEL DISPENSING STATION - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References:
1. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 87 - not adjusted for oxygenates [Profile 8546]
2. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 89 - not adjusted for oxygenates [Profile 8547]
3. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 93 - not adjusted for oxygenates [Profile 8548]

Notes: Potential VOC emissions from Gasoline Dispensing Station Criteria Pollutant worksheet:
Grade 87 (regular) Gasoline VOCs (lbs/yr): 6,799.8
Grade 89 (mid-grade) Gasoline VOCs (lbs/yr): (n/a)
Grade 93 (premium) Gasoline VOCs (lbs/yr): (n/a)

B. EMISSION CALCULATION METHOD

HAP Emission Factors

Fuel Type	HAP Vapor Phase Concentration (%WT)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline [1]	0.95%	0.01%	0.20%	2.55%	11.50%	0.01%	1.81%	1.65%	0.63%	0.21%
Grade 89 (midgrade) Gasoline [2]	1.35%	0.04%	0.35%	2.86%	16.43%	0.04%	3.26%	3.76%	1.15%	0.44%
Grade 93 (premium) Gasoline [3]	0.73%	0.02%	0.32%	0.86%	15.53%	0.03%	3.43%	4.16%	1.11%	0.40%

[1]Reference 1; [2]Reference 2; [3]Reference 3

Emission Calculation:
HAP Emissions (lb/yr) = VOC Emissions (lb/yr) x HAP Vapor Phase Concentration (%WT)

C. EMISSION SUMMARY

Fuel Type	HAP Emissions (lbs/yr)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline	64.3	1.0	13.6	173.3	781.7	0.7	122.8	112.0	42.6	14.2
TOTAL EMISSIONS (lbs/yr)	**64.3**	**1.0**	**13.6**	**173.3**	**781.7**	**0.7**	**122.8**	**112.0**	**42.6**	**14.2**
TOTAL EMISSIONS (TPY)	**0.03**	**<0.01**	**0.01**	**0.09**	**0.39**	**<0.01**	**0.06**	**0.06**	**0.02**	**0.01**

FUEL STORAGE - EMISSIONS SUMMARY

Fuel Storage - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC	**2.32**
PM_{10}	**N/A**
HAPs	**0.05**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
Hexane	<0.01
Methyl tert-butyl ether	0.03
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
Xylenes	<0.01

Fuel Storage - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC	**3.48**
PM_{10}	**N/A**
HAPs	**0.08**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
Hexane	0.01
Methyl tert-butyl ether	0.05
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
Xylenes	<0.01

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Actual Fuel Throughput (gal/yr):

1,543,558	(JP-4)
274,442	(JP-8)
90,520	(FS1)
66,228	(Diesel)
140,417	(MOGAS)

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breating Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breating Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:

1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

B. EMISSION CALCULATION METHOD

Actual Fuel Use Calculation:

Actual Fuel Use (gal/yr) = Tank Volume (gal) x Turnover Factor for Fuel Type (n/yr)

Actual Fuel Use (gal/yr) values obtained from contract responsible for fuel procurement on Fort Wainwright

Actual VOC Emission Calculation:

EPA Tanks 4.09d was utilized to determine VOC emissions

C. EMISSION SUMMARY

Fuel	Throughput (gal/yr)	Tank Volume (gal)	Turnovers per Tank (n/yr)
JP-4	1,543,558	72,000	21.44
JP-8	274,442	60,000	4.57
FS1	90,520	38,600	2.35
Diesel	66,228	121,700	0.54
MOGAS	140,417	18,500	7.59

Bldg #	Tank Type	Fuel Type	Tank Capacity	Actual Fuel Use	VOC Emissions

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	VOC Emissions (lb/yr)
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	100	54	0.02
Bassett Hospital	AST	Diesel	100	54	0.02
Bassett Hospital	AST	Diesel	100	54	0.02
1171	UST	Diesel	1,000	2,000	0.01
1172	UST	FS1	3,000	12,000	0.11
1185	UST	FS1	8,000	18,761	0.30
1191	AST	Diesel	1,000	4,600	0.23
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1580	UST	Diesel	2,500	1,360	0.01
1815	AST	Diesel	1,500	1,500	0.06
2062	UST	FS1	1,000	2,345	0.04
2078	AST	JP-4	36,000	771,779	1,568.25
2078	AST	JP-4	36,000	771,779	1,568.25
2080	UST	Diesel	1,000	544	0.01
2090	UST	Diesel	1,000	7,300	0.01
2092	UST	FS1	3,000	7,035	0.11
2096	UST	Mogas	500	3,795	15.38
2096	UST	Diesel	500	3,500	0.00
2400	AST	Diesel	3,000	3,650	0.09
3015	UST	Diesel	5,000	2,721	0.03
3015	UST	Mogas	5,000	37,951	153.79
3484	UST	JP-8	30,000	137,221	1.74
3484	UST	JP-8	30,000	137,221	1.74
3484	AST	Diesel	12,000	6,530	1.69
3484	AST	Mogas	12,000	91,081	1,288.68
4065	UST	Diesel	12,000	6,530	0.06
4065	AST	Diesel	100	54	0.02
4065	AST	Diesel	100	54	0.02
4109	UST	Mogas	1,000	7,590	30.76

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	VOC Emissions (lb/yr)
4321	UST	FS1	1,000	2,345	0.04
4322	UST	FS1	1,000	2,345	0.04
5003	UST	FS1	1,000	2,345	0.04
5007	UST	FS1	5,000	11,725	0.19
5008	UST	FS1	2,000	8,900	0.08
5009	UST	FS1	2,000	4,690	0.08
5009	AST	Diesel	1,000	544	0.23
5010	UST	FS1	1,500	12,500	0.06
5011	UST	FS1	1,000	2,345	0.04
5108	AST	Diesel	500	272	0.05
5109	AST	Diesel	1,000	2,500	0.23
5110	UST	Diesel	1,000	2,345	0.04
5113	AST	Diesel	500	571	0.05
5119	AST	Diesel	500	535	0.05
5142	AST	Diesel	1,000	669	0.23
5144	AST	Diesel	1,000	2,241	0.23
5149	AST	Diesel	3,000	1,633	0.09
5157	AST	Diesel	300	354	0.03
5159	AST	Diesel	300	359	0.03
5163	AST	Diesel	500	456	0.05
5175	AST	Diesel	250	1,345	0.02
5186	AST	Diesel	1,000	592	0.23
TOTAL EMISSIONS (lb/yr)					**4,646.5**
TOTAL EMISSIONS (TPY)					**2.32**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**4,533.9**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**2.27**

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Actual Fuel Throughput (gal/yr):

274,442	(JP-8)
66,228	(Diesel)
140,417	(MOGAS)

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breathing Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breathing Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12

References:
1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes: Since throughput for each individual tank was not available, distribution is based on size of each tank.
To calculate potential emissions, it was assumed that current deployment preparation could result in an OPTEMPO twice the non-deployment OPTEMPO. Therefore, the rate of fuel consumption would be twice the non-deployment rate.

B. EMISSION CALCULATION METHOD

Potential Fuel Use Calculation:
Potential Fuel Use (gal/yr) = Actual Fuel Use (gal/yr) x 2 (Increased OPTEMPO)

Potential VOC Emission Calculation:
EPA Tanks 4.09d was utilized to determine VOC emissions

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	Potential Fuel Use (gal/yr)	VOC Emissions (lb/yr)
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	100	54	109	0.02
Bassett Hospital	AST	Diesel	100	54	109	0.02
Bassett Hospital	AST	Diesel	100	54	109	0.02
1171	UST	Diesel	1,000	2,000	4,000	0.01
1172	UST	FS1	3,000	12,000	24,000	0.23
1185	UST	FS1	8,000	18,761	37,521	0.60

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	Potential Fuel Use (gal/yr)	VOC Emissions (lb/yr)
1191	AST	Diesel	1,000	4,600	9,200	0.23
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1580	UST	Diesel	2,500	1,360	2,721	0.03
1815	AST	Diesel	1,500	1,500	3,000	0.23
2062	UST	FS1	1,000	2,345	4,690	0.08
2078	AST	JP-4	36,000	771,779	1,543,558	2,429.93
2078	AST	JP-4	36,000	771,779	1,543,558	2,429.93
2080	UST	Diesel	1,000	544	1,088	0.01
2090	UST	Diesel	1,000	7,300	14,600	0.01
2092	UST	FS1	3,000	7,035	14,070	0.17
2096	UST	Diesel	500	3,795	7,590	0.01
2096	UST	Mogas	500	3,500	7,000	30.76
2400	AST	Diesel	3,000	3,650	7,300	0.50
3015	UST	Diesel	5,000	2,721	5,442	0.05
3015	UST	Mogas	5,000	37,951	75,901	307.57
3484	UST	JP-8	30,000	137,221	274,442	3.48
3484	UST	JP-8	30,000	137,221	274,442	3.48
3484	AST	Diesel	12,000	6,530	13,061	1.75
3484	AST	Mogas	12,000	91,081	182,163	1,671.51
4065	AST	Diesel	100	54	109	0.02
4065	AST	Diesel	100	54	109	0.02
4065	UST	Diesel	12,000	6,530	13,061	0.13
4109	UST	Mogas	1,000	7,590	15,180	61.51
4321	UST	FS1	1,000	2,345	4,690	0.08
4322	UST	FS1	1,000	2,345	4,690	0.08
5003	UST	FS1	1,000	2,345	4,690	0.08
5007	UST	FS1	5,000	11,725	23,451	0.38
5008	UST	FS1	2,000	8,900	17,800	0.15
5009	UST	FS1	2,000	4,690	9,380	0.15
5009	AST	Diesel	1,000	544	1,088	0.23
5010	UST	FS1	1,500	12,500	25,000	0.11
5011	UST	FS1	1,000	2,345	4,690	0.08
5108	AST	Diesel	500	272	544	0.06
5110	UST	Diesel	1,000	2,345	4,690	0.08
5113	AST	Diesel	500	571	1,142	0.06

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	Potential Fuel Use (gal/yr)	VOC Emissions (lb/yr)
5119	AST	Diesel	500	535	1,070	0.06
5142	AST	Diesel	1,000	669	1,337	0.23
5144	AST	Diesel	1,000	2,241	4,482	0.23
5149	AST	Diesel	3,000	1,000	2,000	0.50
5157	AST	Diesel	300	354	707	0.03
5159	AST	Diesel	300	359	718	0.03
5163	AST	Diesel	500	456	912	0.06
5175	AST	Diesel	250	1,345	2,690	0.02
5186	AST	Diesel	1,000	592	1,184	0.23
TOTAL EMISSIONS (lb/yr)						**6,958.6**
TOTAL EMISSIONS (TPY)						**3.48**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))						**6,799.6**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**3.40**

FUEL STORAGE - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breating Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breating Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:
1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes: Since throughput for each individual tank was not available, fuel distribution is based on size of each tank.

B. EMISSION CALCULATION METHOD

Fuel Type	HAP Vapor Phase Concentration in Fuel (%WT)								
	Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylene
Diesel Fuel [1]	7.20%	0.40%	0.70%	2.30%	---	---	4.10%	---	2.50%
JP-8 [2]	0.613%	0.330%	0.271%	---	---	0.003%	1.143%	0.010%	1.877%
MOGAS[3]	0.600%	0.020%	0.040%	0.500%	4.600%	---	0.700%	0.700%	0.200%

[1] Reference 1, Table 13-3, Weight Percent in Vapor-Phase
[2] Reference 1, Table 13-2, Weight Percent in Vapor-Phase
[3] Reference 1, Table 15-2, Weight Percent in Vapor-Phase

Emission Calculation
HAP Emissions (lb/yr) = VOC Emissions for fuel type (lb/yr) x HAP vapor phase concentration for fuel type (%WT)

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1171	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1172	UST	FS1	3,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
1185	UST	FS1	8,000	0.3	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.01
1191	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1580	UST	Diesel	2,500	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00

FUEL STORAGE - ACTUAL EMISSIONS (HAPs)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
1815	AST	Diesel	1,500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2062	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
2078	AST	JP-4	36,000	1,568.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2078	AST	JP-4	36,000	1,568.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2080	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2090	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2092	UST	FS1	3,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
2096	UST	Diesel	500	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2096	UST	Mogas	500	15.4	0.09	0.00	0.01	0.08	0.71	--	0.11	0.11	0.03
2400	AST	Diesel	3,000	0.1	0.01	0.00	0.00	0.00	--	--	0.00	--	0.00
3015	UST	Diesel	5,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
3015	UST	Mogas	5,000	153.8	0.92	0.03	0.06	0.77	7.07	--	1.08	1.08	0.31
3484	UST	JP-8	30,000	1.7	0.01	0.01	0.00	--	--	0.00	0.02	0.00	0.03
3484	UST	JP-8	30,000	1.7	0.01	0.01	0.00	--	--	0.00	0.02	0.00	0.03
3484	AST	Diesel	12,000	1.7	0.12	0.01	0.01	0.04	--	--	0.07	--	0.04
3484	AST	Mogas	12,000	1,288.7	7.73	0.26	0.52	6.44	59.28	--	9.02	9.02	2.58
4065	UST	Diesel	12,000	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4065	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4065	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4109	UST	Mogas	1,000	30.8	0.18	0.01	0.01	0.15	1.41	--	0.22	0.22	0.06
4321	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
4322	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5003	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5007	UST	FS1	5,000	0.2	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5008	UST	FS1	2,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5009	UST	FS1	2,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5009	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5010	UST	FS1	1,500	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5011	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5108	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5110	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5113	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5119	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5142	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5144	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5149	AST	Diesel	3,000	0.1	0.01	0.00	0.00	0.00	--	--	0.00	--	0.00
5157	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5159	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5163	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5175	AST	Diesel	250	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5186	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
TOTAL EMISSIONS (lb/yr)					**10.1**	**0.4**	**0.7**	**7.8**	**68.5**	**<0.1**	**11.1**	**10.4**	**3.5**
TOTAL EMISSIONS (TPY)					**0.01**	**<0.01**	**<0.01**	**<0.01**	**0.03**	**<0.01**	**0.01**	**0.01**	**<0.01**

FUEL STORAGE - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breathing Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breathing Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:
1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes:
Since throughput for each individual tank was not available, distribution is based on size of each tank.
To calculate potential emissions, it was assumed that current deployment preparation could result in an OPTEMPO twice the non-deployment OPTEMPO.
Therefore, the rate of fuel consumption would be twice the non-deployment rate.

B. EMISSION CALCULATION METHOD

Fuel Type	HAP Vapor Phase Concentration in Fuel (%WT)								
	Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylene
Diesel Fuel [1]	7.20%	0.40%	0.70%	2.30%	---	---	4.10%	---	2.50%
JP-8 [2]	0.613%	0.330%	0.271%	---	---	0.003%	1.143%	0.010%	1.877%
MOGAS[3]	0.600%	0.020%	0.040%	0.500%	4.600%	---	0.700%	0.700%	0.200%

[1] Reference 1, Table 13-3, Weight Percent in Vapor-Phase
[2] Reference 1, Table 13-2, Weight Percent in Vapor-Phase
[3] Reference 1, Table 15-2, Weight Percent in Vapor-Phase

Emission Calculation

HAP Emissions (lb/yr) = VOC Emissions for fuel type (lb/yr) x HAP vapor phase concentration for fuel type (%WT)

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Potential VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1171	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1172	UST	FS1	3,000	0.23	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
1185	UST	FS1	8,000	0.60	0.00	0.00	0.00	---	---	0.00	0.01	0.00	0.01
1191	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1580	UST	Diesel	2,500	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1815	AST	Diesel	1,500	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01

FUEL STORAGE - POTENTIAL EMISSIONS (HAPs)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Potential VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
2062	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
2078	AST	JP-4	36,000	2,429.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2078	AST	JP-4	36,000	2,429.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2080	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
2090	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
2092	UST	FS1	3,000	0.17	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
2096	UST	Mogas	500	0.01	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00
2096	UST	Diesel	500	30.76	2.21	0.12	0.22	0.71	---	---	1.26	---	0.77
2400	AST	Diesel	3,000	0.50	0.04	0.00	0.00	0.01	---	---	0.02	---	0.01
3015	UST	Diesel	5,000	0.05	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
3015	UST	Mogas	5,000	307.57	1.85	0.06	0.12	1.54	14.15	---	2.15	2.15	0.62
3484	UST	JP-8	30,000	3.48	0.02	0.01	0.01	---	---	0.00	0.04	0.00	0.07
3484	UST	JP-8	30,000	3.48	0.02	0.01	0.01	---	---	0.00	0.04	0.00	0.07
3484	AST	Diesel	12,000	1.75	0.13	0.01	0.01	0.04	---	---	0.07	---	0.04
3484	AST	Mogas	12,000	1,671.51	10.03	0.33	0.67	8.36	76.89	---	11.70	11.70	3.34
4065	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
4065	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
4065	UST	Diesel	12,000	0.13	0.01	0.00	0.00	0.00	---	---	0.01	---	0.00
4109	UST	Mogas	1,000	61.51	0.37	0.01	0.02	0.31	2.83	---	0.43	0.43	0.12
4321	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
4322	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5003	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5007	UST	FS1	5,000	0.38	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.01
5008	UST	FS1	2,000	0.15	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5009	UST	FS1	2,000	0.15	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5009	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5010	UST	FS1	1,500	0.11	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5011	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5108	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5110	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5113	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5119	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5142	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5144	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5149	AST	Diesel	3,000	0.50	0.04	0.00	0.00	0.01	---	---	0.02	---	0.01
5157	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5159	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5163	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5175	AST	Diesel	250	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5186	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
TOTAL EMISSIONS (lb/yr)					**15.8**	**0.6**	**1.2**	**11.3**	**93.9**	**<0.1**	**16.4**	**14.3**	**5.5**
TOTAL EMISSIONS (TPY)					**0.01**	**<0.01**	**<0.01**	**0.01**	**0.05**	**<0.01**	**0.01**	**0.01**	**<0.01**

INTERNAL COMBUSTION ENGINES - EMISSIONS SUMMARY

Internal Combustion Engines - Actual Emissions

Pollutant	TPY
NO_x	**0.73**
SO_2	**0.05**
CO	**0.16**
VOC - VOC_{HAPS}	**0.06**
PM_{10}	**0.05**
CO_2	**27.09**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

Internal Combustion Engines - Potential Emissions

Pollutant	TPY
NO_x	**16.08**
SO_2	**1.06**
CO	**3.47**
VOC - VOC_{HAPS}	**1.30**
PM_{10}	**1.14**
CO_2	**596.56**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

INTERNAL COMBUSTION ENGINES - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Fuel Used: #2 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: All Reciprocating Internal Combustion Engines (RICE) are fire pumps.

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines < or = 447 kW (600 hp)	3.10E-02	2.05E-03	6.68E-03	2.51E-03	2.20E-03	1.15E+00

[1]Reference 1, Table 3.3-1

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1572	Clarke	1994	DDFP-04AT	235	25	182.1	12.0	39.2	14.8	12.9	6756.25
1572	Clarke	1994	DDFP-04AT	235	22	160.3	10.6	34.5	13.0	11.4	5945.50
1572	Clarke	1994	DDFP-04AT	235	24	174.8	11.6	37.7	14.2	12.4	6486.00
1572	Clarke	1994	DDFP-04AT	235	26	189.4	12.5	40.8	15.4	13.4	7026.50
2080	Cummins	1977	N-855-F	240	25	186.0	12.3	40.1	15.1	13.2	6900.00
2080	Cummins	1977	N-855-F	240	24	178.6	11.8	38.5	14.5	12.7	6624.00
2089	Clarke	2007	JW64-UF30	275	10	85.3	5.6	18.4	6.9	6.1	3162.50
3498	Clarke	2005	JU4H-UF40	94	38	110.7	7.3	23.9	9.0	7.9	4107.80
5009	Clarke	1996	PDFP-06YT	120	25	93.0	6.2	20.0	7.5	6.6	3450.00
5009	Clarke	1996	PDFP-06YT	120	27	100.4	6.6	21.6	8.1	7.1	3726.00
TOTAL EMISSIONS (lbs/yr)						**1,460.6**	**96.6**	**314.7**	**118.5**	**103.7**	**54184.55**
TOTAL EMISSIONS (TPY)						**0.73**	**0.05**	**0.16**	**0.06**	**0.05**	**27.09**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: #2 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

Reference: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) The fire pumps of Fort Wainwright are emergency engines

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines < or = 447 kW (600 hp)	3.10E-02	2.05E-03	6.68E-03	2.51E-03	2.20E-03	1.15E+00

[1]Reference, Table 3.3-1

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
2080	Cummins	1977	N-855-F	240	500	3,720.0	246.0	801.6	301.7	264.0	138,000.0
2080	Cummins	1977	N-855-F	240	500	3,720.0	246.0	801.6	301.7	264.0	138,000.0
2089	John Deere	2007	JW64-UF30	275	500	4,262.5	281.9	918.5	345.7	302.5	158,125.0
3498	Clarke	2005	JU4H-UF40	140	500	2,170.0	143.5	467.6	176.0	154.0	80,500.0
5009	Clarke	1996	PDFP-06YT	120	500	1,860.0	123.0	400.8	150.8	132.0	69,000.0
5009	Clarke	1996	PDFP-06YT	120	500	1,860.0	123.0	400.8	150.8	132.0	69,000.0
TOTAL EMISSIONS (lbs/yr)						**32,162.5**	**2,126.9**	**6,930.5**	**2,608.4**	**2,282.5**	**1,193,125.0**
TOTAL EMISSIONS (TPY)						**16.08**	**1.06**	**3.47**	**1.30**	**1.14**	**596.56**

INTERNAL COMBUSTION ENGINES - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #2 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: All Reciprocating Internal Combustion Engines (RICE) are fire pumps.

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	1.68E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2.
[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1572	Clarke	235	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2089	Clarke	275	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3498	Clarke	94	38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**2E-09**	**2E-08**	**9E-10**	**3E-08**	**4E-09**	**1E-08**	**7E-09**	**0E+00**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #2 Fuel Oil

Source Classification Codes (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, January 1995

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) The fire pumps of Fort Wainwright are emergency engines

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	2.12E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2.

[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Capacity (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2089	Clarke	275	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3498	Clarke	140	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**5E-08**	**5E-07**	**2E-08**	**6E-07**	**1E-07**	**2E-07**	**1E-07**	**0E+00**

EMERGENCY GENERATORS - EMISSIONS SUMMARY

Emergency Generators - Actual Emissions

Pollutant	TPY
NO_x	**0.84**
SO_2	**0.86**
CO	**0.77**
VOC	**0.16**
PM_{10}	**0.04**
CO_2	**155.52**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
Naphthalene	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

Internal Combustion Engines - Potential Emissions

Pollutant	TPY
NO_x	**14.58**
SO_2	**5.33**
CO	**13.31**
VOC	**3.01**
PM_{10}	**0.69**
CO_2	**2,676.89**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
Naphthalene	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

EMERGENCY GENERATORS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #2 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines > 447 kW (600 hp)	6.20E-03	8.09E-03	5.75E-03	7.05E-04	3.00E-04	1.16E+00
Internal Combustion Engines < or = 447 kW (600 hp)	6.50E-03	2.05E-03	5.75E-03	2.51E-03	3.00E-04	1.15E+00

[1]Reference 1, Tables 3.3-1, 3.4-1 and 3.4-2.

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1054	Caterpillar	2011	D175-2	235	12.5	19.1	6.0	16.9	7.4	0.9	3378.13
1060	Caterpillar	2011	LC6	762	24	113.4	147.9	105.2	12.9	5.5	21214.08
1060	Caterpillar	2011	LC6	762	18.4	86.9	113.4	80.6	9.9	4.2	16264.13
1193	Cummins	2011	DGHE-5570444	82	15.2	8.1	2.6	7.2	3.1	0.4	1433.36
1555	Caterpillar	2011	SR4B	587	21	80.1	25.3	70.9	31.0	3.7	14176.05
1580	Kohler	2010	50REOZJC	67	17.6	7.7	2.4	6.8	3.0	0.4	1356.08
1620	Cummins	2011	DGBB-5630732	47	236.6	72.3	22.8	63.9	28.0	3.3	12788.23
2088	Kohler	2011	125RE0ZJB	168	10.5	11.5	3.6	10.1	4.4	0.5	2028.60
2117	Kohler	2011	750RE0ZDB	1059	8.4	55.2	72.0	51.1	6.3	2.7	10318.90
2117	Kohler	2011	150RE0ZJB	212	9.7	13.4	4.2	11.8	5.2	0.6	2364.86
2121	Onsite Energy	2011	MTU 4R0113 D850	60	10	3.9	1.2	3.5	1.5	0.2	690.00
2132	Cummins	2012	QSB7-G3 NR3	324	33	69.5	21.9	61.5	26.9	3.2	12295.80
2296	Kohler	2011	150RE0ZJB	201	11	14.4	4.5	12.7	5.6	0.7	2542.65
3004	Kohler	2011	50RE0ZJB	67	20.6	9.0	2.8	7.9	3.5	0.4	1587.23
3007	Cummins	2014	DSGAD-14055	235	10	15.3	4.8	13.5	5.9	0.7	2702.50

EMERGENCY GENERATORS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

3028	Kohler	2011	20R0ZJ81	27	21	3.7	1.2	3.3	1.4	0.2	652.05
3406	Caterpillar	2007	CAT C9 GENSET	398	49.4	127.8	40.3	113.1	49.4	5.9	22610.38
3407	Olympian	2011	DG0PZ	80	21.6	11.2	3.5	9.9	4.3	0.5	1987.20
3567	SDMO	ND	TM30UCM	47	3.6	1.1	0.3	1.0	0.4	0.1	194.58
3703	Cummins	2011	25DL6-L34064	34	9.5	2.1	0.7	1.9	0.8	0.1	371.45
4076	Caterpillar	2003	3512	1206	39	291.6	380.5	270.4	33.2	14.1	54559.44
4076	Caterpillar	2003	3512	1206	44	329.0	429.3	305.1	37.4	15.9	61554.24
4076	Caterpillar	2003	3512	1206	43	321.5	419.5	298.2	36.6	15.6	60155.28
4390	Caterpillar	2011	D125-6	168	18.3	20.0	6.3	17.7	7.7	0.9	3535.56
5108	Caterpillar	2011	D13-4	17	14.7	1.6	0.5	1.4	0.6	0.1	287.39
TOTAL EMISSIONS (lbs/yr)						**1,689.2**	**1,717.7**	**1,545.6**	**326.3**	**80.6**	**311048.154**
TOTAL EMISSIONS (TPY)						**0.84**	**0.86**	**0.77**	**0.16**	**0.04**	**155.52**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #1 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

Reference: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) 600 hour limit in current operating permit AQ0236TVP02.

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines > 447 kW (600 hp)	6.20E-03	2.43E-03	5.75E-03	7.05E-04	3.00E-04	1.16E+00
Internal Combustion Engines < or = 447 kW (600 hp)	6.50E-03	2.05E-03	5.75E-03	2.51E-03	3.00E-04	1.15E+00

[1]Reference 1, Tables 3.3-1, 3.4-1 and 3.4-2.

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)
ˆ SO_2 emissions factor(ICE > 447 kW) = 8.09E-03 S, where S = weight % sulfur: 8.09E-03 x 0.3 = 0.002427

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1054	Caterpillar	2011	D175-2	235	500	763.8	240.9	675.6	295.4	35.3	135,125.0
1060	Caterpillar	2011	LC6	762	500	2,362.2	924.7	2,190.8	268.6	114.3	441,960.0
1060	Caterpillar	2011	LC6	762	500	2,362.2	924.7	2,190.8	268.6	114.3	441,960.0
1193	Cummins	2011	DGHE-5570444	82	500	266.5	84.1	235.8	103.1	12.3	47,150.0
1555	Caterpillar	2011	SR4B	587	500	1,907.8	601.7	1,687.6	737.9	88.1	337,525.0
1580	Kohler	2010	4024HF285B	67	500	217.8	68.7	192.6	84.2	10.1	38,525.0
1620	Cummins	2011	DGBB-5630732	47	500	152.8	48.2	135.1	59.1	7.1	27,025.0
2088	Kohler	2011	125RE0ZJB	168	500	546.0	172.2	483.0	211.2	25.2	96,600.0
2117	Kohler	2011	750RE0ZDB	1059	500	3,282.9	1,285.1	3,044.6	373.3	158.9	614,220.0
2117	Kohler	2011	150RE0ZJB	212	500	689.0	217.3	609.5	266.5	31.8	121,900.0
2121	Onsite Energy	2011	MTU 4R0113 D850	60	500	195.0	61.5	172.5	75.4	9.0	34,500.0
2132	Cummins	2012	QSB7-G3 NR3	324	500	1,053.0	332.1	931.5	407.3	48.6	186,300.0
2296	Kohler	2011	150RE0ZJB	201	500	653.3	206.0	577.9	252.7	30.2	115,575.0

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

3004	Kohler	2011	50RE0ZJB	67	500	217.8	68.7	192.6	84.2	10.1	38,525.0
3007	Cummins	2014	DSGAD-14055	235	500	763.8	240.9	675.6	295.4	35.3	135,125.0
3028	Kohler	2011	20R0ZJ81	27	500	87.8	27.7	77.6	33.9	4.1	15,525.0
3406	Caterpillar	2007	CAT C9 GENSET	398	500	1,293.5	408.0	1,144.3	500.3	59.7	228,850.0
3407	Olympian	2011	DG0PZ	80	500	260.0	82.0	230.0	100.6	12.0	46,000.0
3567	SDMO	ND	TM30UCM	47	500	152.8	48.2	135.1	59.1	7.1	27,025.0
3703	Cummins	2011	25DL6-L34064	34	500	110.5	34.9	97.8	42.7	5.1	19,550.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	1,463.5	3,467.3	425.1	180.9	699,480.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	1,463.5	3,467.3	425.1	180.9	699,480.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	1,463.5	3,467.3	425.1	180.9	699,480.0
4390	Caterpillar	2011	D125-6	168	500	546.0	172.2	483.0	211.2	25.2	96,600.0
5108	Caterpillar	2011	D13-4	17	500	55.3	17.4	48.9	21.4	2.6	9,775.0
TOTAL EMISSIONS (lbs/yr)						**29,155.1**	**10,657.3**	**26,613.9**	**6,027.4**	**1,388.6**	**5,353,780.0**
TOTAL EMISSIONS (TPY)						**14.58**	**5.33**	**13.31**	**3.01**	**0.69**	**2676.89**

EMERGENCY GENERATORS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #1 Fuel Oil

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes:

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines > 447 kW (600 hp)	2.52E-05	7.88E-06	7.76E-04	---	7.89E-05	2.12E-04	2.81E-04	1.93E-04
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	1.68E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2, 3.4-3 and 3.4-4 .
[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

	Naphthalene
Diesel Internal Combustion Engines > 447 kW (600 hp)	1.30E-04

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu) x 0.007 Btu/hp-hr

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1054	Caterpillar	235	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	18.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1193	Cummins	82	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1555	Caterpillar	587	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1580	Kohler	67	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1620	Cummins	47	236.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2088	Kohler	168	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	1059	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	212	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2121	Onsite Energy	60	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2132	Cummins	324	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EMERGENCY GENERATORS - ACTUAL EMISSIONS (HAPs)

2296	Kohler	201	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3004	Kohler	67	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3007	Cummins	235	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3028	Kohler	27	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3406	Caterpillar	398	49.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3407	Olympian	80	21.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3703	Cummins	34	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3567	SDMO	47	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4390	Caterpillar	168	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5108	Caterpillar	17	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**1E-08**	**1E-07**	**5E-09**	**2E-07**	**2E-08**	**5E-08**	**4E-08**	**0E+00**

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs
				Naphthalene
1054	Caterpillar	235	12	---
1060	Caterpillar	671	10	0.0
1060	Caterpillar	671	20	0.0
1193	Cummins	34	10	---
1555	Caterpillar	536	13	---
1580	Kohler	67	10	---
1620	Cummins	47	10	---
2088	Kohler	168	13	---
2117	Kohler	1006	15	0.0
2117	Kohler	201	15	---
2121	Onsite Energy	60	10	---
2132	Cummins	134	10	---
2296	Kohler	201	12	---
3004	Kohler	67	10	---
3007	Cummins	235	11	---
3028	Kohler	27	9	---
3406	Caterpillar	335	10	---
3407	Olympian	80	9	---
3567	SDMO	47	10	---
3703	Cummins	34	15	---
4076	Caterpillar	1206	34	0.0
4076	Caterpillar	1206	32	0.0
4076	Caterpillar	1206	20	0.0
4390	Caterpillar	168	12	---
5108	Caterpillar	17	17	---
TOTALS (lbs/yr)				**0.0**
TOTALS (TPY)				**0**

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: #1 Fuel Oil

Source Classification Codes (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, January 1995

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) 600 hour limit in current operating permit AQ0236TVP02.

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines > 447 kW (600 hp)	2.52E-05	7.88E-06	7.76E-04	---	7.89E-05	2.12E-04	2.81E-04	1.93E-04
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	2.12E-04	4.09E-04	2.85E-04

	Naphthalene
Diesel Internal Combustion Engines > 447 kW (600 hp)	1.30E-04

[1]Reference, Table 3.3-2, 3.4-3 and 3.4-4 .
[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Capacity (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1054	Caterpillar	235	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1193	Cummins	82	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1555	Caterpillar	587	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1580	Kohler	67	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

1620	Cummins	47	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2088	Kohler	168	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	1059	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	212	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2121	Onsite Energy	60	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2132	Cummins	324	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2296	Kohler	201	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3004	Kohler	67	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3007	Cummins	235	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3028	Kohler	27	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3406	Caterpillar	398	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3407	Olympian	80	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3567	SDMO	47	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3703	Cummins	34	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4390	Caterpillar	168	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5108	Caterpillar	17	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.06**	**0.01**	**0.08**	**0.00**	**0.10**	**0.02**	**0.03**	**0.02**
TOTALS (TPY)				**4E-06**	**4E-05**	**2E-06**	**5E-05**	**9E-06**	**2E-05**	**1E-05**	**0E+00**

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs
				Naphthalene
1054	Caterpillar	235	500	---
1060	Caterpillar	671	500	0.0
1060	Caterpillar	671	500	0.0
1193	Cummins	34	500	---
1555	Caterpillar	536	500	---
1580	Kohler	67	500	---
1620	Cummins	47	500	---
2088	Kohler	168	500	---
2117	Kohler	1006	500	0.0
2117	Kohler	201	500	---
2121	Onsite Energy	60	500	---
2132	Cummins	134	500	---
2296	Kohler	201	500	---
3004	Kohler	67	500	---
3007	Cummins	235	500	---
3028	Kohler	27	500	---
3406	Caterpillar	335	500	---
3407	Olympian	80	500	---
3567	SDMO	47	500	---
3703	Cummins	34	500	---
4076	Caterpillar	1206	500	0.0
4076	Caterpillar	1206	500	0.0
4076	Caterpillar	1206	500	0.0
4390	Caterpillar	168	500	---

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

5108	Caterpillar	17	500	---
TOTALS (lbs/yr)				**0.0**
TOTALS (TPY)				**0**

LANDFILLS - EMISSIONS SUMMARY

Landfills - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	0.04
NMOC (VOC)	0.57
PM_{10}	N/A
CO_2	240.70
CH_4	87.72
HAPs	0.11
Acrylonitrile	0.00
Benzene	0.00
Carbon disulfide	0.00
Carbon tetrachloride	0.00
Carbonyl sulfide	0.00
Chlorobenzene	0.00
Chloroform	0.00
Ethyl benzene	0.01
Ethyl chloride	0.00
Ethylene dibromide	0.00
Ethylene dichloride	0.00
Ethylidene dichloride	0.00
Hexane	0.01
Mercury	0.00
Methyl chloroform	0.00
Methyl isobutyl ketone	0.00
Methylene chloride	0.01
Propylene dichloride	0.00
1,1,2,2-Tetrachloroethane	0.00
Tetrachloroethylene	0.01
Toluene	0.04
Trichloroethylene	0.00
Vinyl chloride	0.00
Vinylidene chloride	0.00
Xylene	0.01

Landfills- Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	0.04
NMOC (VOC)	0.57
PM_{10}	N/A
CO_2	240.70
CH_4	87.72
HAPs	0.11
Acrylonitrile	0.00
Benzene	0.00
Carbon disulfide	0.00
Carbon tetrachloride	0.00
Carbonyl sulfide	0.00
Chlorobenzene	0.00
Chloroform	0.00
Ethyl benzene	0.01
Ethyl chloride	0.00
Ethylene dibromide	0.00
Ethylene dichloride	0.00
Ethylidene dichloride	0.00
Hexane	0.01
Mercury	0.00
Methyl chloroform	0.00
Methyl isobutyl ketone	0.00
Methylene chloride	0.01
Propylene dichloride	0.00
1,1,2,2-Tetrachloroethane	0.00
Tetrachloroethylene	0.01
Toluene	0.04
Trichloroethylene	0.00
Vinyl chloride	0.00
Vinylidene chloride	0.00
Xylene	0.01

LANDFILLS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: LandGEM v. 3.02

Source Classification Code:

	SCC
Solid Waste Landfills	5-03-006-01

References: EPA-600/R-05/047, Landfill Gas Emissions Model (LandGEM) Version 3.02 User Guide, May 2005

Notes:
Assumed all municipal solid waste was degradable.
Assumed that L_o=100 m^3/Mg and k=0.02. These were the default values for areas w/ less than 25 inches rainfall/yr (reference 1).
Fairbanks, AK has an average precipitation of 10 inches/yr (http://www.usclimatedata.com/climate.php?location=USAK0083).
Methane concentration is the default value in LandGEM for Clean Air Act compliance calculations
NMOC concentration is for conventional landfills with no or unknown co-disposal of hazardous waste for emission inventories
Since landfills are no longer accepting waste, potential emissions are deemed equal to actual emissions

Landfill Data:

Landfill Data	FWA Landfill
Year landfill opened	1960
Year landfill closed	2000
Mass of Waste (tons)	2,811
Waste Acceptance Rate (short tons/yr)	115,251
Lo (m^3/Mg)	100
k (yr^{-1})	0.02
NMOC Concentration (as ppmv hexane)	500
Methane Concentration (%vol)	50%
Emission Year	2010

B. EMISSION CALCULATION METHOD

Mass of Waste Calculation:
Mass of Waste (Tons) = Waste Acceptance Rate (ton/yr) x Lifespan of Landfill (yr)

Actual Emissions Calculation:
Landfill Emissions were calculated using the LandGEM v 3.02 software

C. EMISSION SUMMARY

Landfill ID No.	Criteria Pollutants (TPY)		GHGs (TPY)	
	CO	NMOC	CO_2	CH_4
FWA Landfill	0.04	0.57	240.70	87.72
TOTAL EMISSIONS (TPY)	**0.04**	**0.57**	**240.70**	**87.72**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))		**0.46**		

LANDFILLS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: LandGEM v. 3.02

Source Classification Code:

	SCC
Solid Waste Landfills	5-03-006-01

References: EPA-600/R-05/047, Landfill Gas Emissions Model (LandGEM) Version 3.02 User Guide, May 2005

Notes:
Assumed all municipal solid waste was degradable.
Assumed that L_o=100 m^3/Mg and k=0.02. These were the default values for areas w/ less than 25 inches rainfall/yr (reference 1).
Fairbanks, AK has an average precipitation of 10 inches/yr (http://www.usclimatedata.com/climate.php?location=USAK0083).
Methane concentration is the default value in LandGEM for Clean Air Act compliance calculations
NMOC concentration is for conventional landfills with no or unknown co-disposal of hazardous waste for emission inventories
Since landfills are no longer accepting waste, potential emissions are deemed equal to actual emissions

Landfill Data:

Landfill Data	FWA Landfill
Year landfill opened	1960
Year landfill closed	2000
Waste Acceptance Rate (short tons/yr)	2,811
Mass of Waste (tons)	115,251
Lo (m^3/Mg)	100
k (yr^{-1})	0.02
NMOC Concentration (as ppmv hexane)	500
Methane Concentration (%vol)	50%
Emission Year	2010

B. EMISSION CALCULATION METHOD

Mass of Waste Calculation:
Mass of Waste (Tons) = Waste Acceptance Rate (ton/yr) x Lifespan of Landfill (yr)

Actual Emissions Calculation:
Landfill Emissions were calculated using the LandGEM v 3.02 software

C. EMISSION SUMMARY

LANDFILLS - ACTUAL EMISSIONS (HAPs)

HAP	Landfill Emissions (TPY)
Acrylonitrile	3.66E-03
Benzene	1.62E-03
Carbon disulfide	4.83E-04
Carbon tetrachloride	6.73E-06
Carbonyl sulfide	3.22E-04
Chlorobenzene	3.08E-04
Chloroform	3.92E-05
Ethyl benzene	5.34E-03
Ethyl chloride	9.18E-04
Ethylene dibromide	2.06E-06
Ethylene dichloride	4.44E-04
Ethylidene dichloride	2.60E-03
Hexane	6.22E-03
Mercury	6.36E-07
Methyl chloroform	7.00E-04
Methyl isobutyl ketone	2.08E-03
Methylene chloride	1.30E-02
Propylene dichloride	2.23E-04
1,1,2,2-Tetrachloroethane	2.02E-03
Tetrachloroethylene	6.71E-03
Toluene	3.93E-02
Trichloroethylene	4.02E-03
Vinyl chloride	4.99E-03
Vinylidene chloride	2.12E-04
Xylene	1.39E-02

SURFACE COATING - EMISSIONS SUMMARY

Surface Coating - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.10
PM_{10}	0.05

Surface Coating - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.43
PM_{10}	0.22

SURFACE COATING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal) 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Application - General	4-02-007-10

Reference: 1. Air Emissions Guide to Air Force Stationary Sources, Air Force Center for Engineering and the Environment, San Antonio, TX, December 2009.

Notes: Surface coatings emissions are based on the installation Hazardous Material Use reports.
According to reports, all surface coating operations took place at Buildings 3015 and 3490.
All painting was conducted with High Volume/Low Pressure spray guns. Transfer efficiency is equal to 65% (Reference 1, Table 33-4)
Product information, including VOC content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:
VOC Emissions (lbs/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x VOC Content (%WT)
PM10 Emissions (lbs/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x Solids Content (%WT) x (1 - Transfer Efficiency%)

C. EMISSION SUMMARY

Product Name	Product Use (gal/yr)	Specific Gravity	Density (lbs/gal)	VOC Content (%WT)	VOC Emissions (lbs/yr)	Solids Content (%WT)	Transfer Efficiency (%)	PM_{10} Emissions (lbs/yr)
Building 3015								
Olympic Premium I/E Gloss Base	5.00	1.16	9.65	63.65%	30.7	36.4%	65%	6.1
Plasti Dip Spray	0.96	0.68	5.63	87.30%	4.7	12.7%	65%	0.2
Krylon, Camouflage Paint, Olive	1.03	0.76	6.34	47.23%	3.1	52.8%	65%	1.2
Krylon, Industiral Quik-Mark, Orange	0.75	0.89	7.42	56.25%	3.1	43.8%	65%	0.9
Krylon, Contractor Marking Paint, White	0.92	0.83	6.92	40.91%	2.6	59.1%	65%	1.3
Building 3490								
Brown CARC	1.00	1.28	10.68	33.00%	3.5	67.0%	65%	2.5
CROSSFIRE Acrylic Enamel System	3.00	1.32	10.99	45.00%	14.8	55.0%	65%	6.3
DTM Acrylic Semi-Gloss Acrylic Coating	4.00	1.06	8.84	18.00%	6.4	82.0%	65%	10.1
Green CARC	10.00	1.33	11.09	29.70%	32.9	70.3%	65%	27.3
Polyurethane Aerosol	24.88	0.70	5.84	48.00%	69.7	52.0%	65%	26.4
Black Zenthane	10.00	1.21	10.07	32.70%	32.9	67.3%	65%	23.7
TOTAL EMISSIONS (lbs/yr)					**204.5**			**106.2**
TOTAL EMISSIONS (TPY)					**0.10**			**0.05**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**188.7**			
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**0.09**			

SURFACE COATING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lbs/gal) 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Application - General	4-02-007-10

Reference: 1. Air Emissions Guide to Air Force Stationary Sources, Air Force Center for Engineering and the Environment, San Antonio, TX, December 2009.

Notes: Surface coatings emissions are based on the installation Hazardous Material Use reports.
According to reports, all surface coating operations took place at Buildings 3015 and 3490.
All painting was conducted with High Volume/Low Pressure spray guns. Transfer efficiency is equal to 65% (Reference 1, Table 33-4)
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2,080 hr/yr

Emission Calculations:
VOC Emissions (lbs/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lbs/gal) x VOC Content (%WT)
PM10 Emissions (lbs/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lbs/gal) x Solids Content (%WT) x (1 - Transfer Efficiency%)

C. EMISSION SUMMARY

Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lbs/gal)	VOC Content (wt%)	VOC Emissions (lbs/yr)	Solids Content (wt%)	Transfer Efficiency (%)	PM_{10} Emissions (lbs/yr)
Building 3015								
Olympic Premium I/E Gloss Base	21.06	1.16	9.65	63.65%	129.3	36.4%	65%	25.9
Plasti Dip Spray	4.04	0.68	5.63	87.30%	19.9	12.7%	65%	1.0
Krylon, Camouflage Paint, Olive	4.34	0.76	6.34	47.23%	13.0	52.8%	65%	5.1
Krylon, Industiral Quik-Mark, Orange	3.16	0.89	7.42	56.25%	13.2	43.8%	65%	3.6
Krylon, Contractor Marking Paint, White	3.87	0.83	6.92	40.91%	11.0	59.1%	65%	5.5
Building 3490								
Brown CARC	4.21	1.28	10.68	33.00%	14.8	67.0%	65%	10.5
CROSSFIRE Acrylic Enamel System	12.63	1.32	10.99	45.00%	62.5	55.0%	65%	26.7
DTM Acrylic Semi-Gloss Acrylic Coating	16.85	1.06	8.84	18.00%	26.8	82.0%	65%	42.7
Green CARC	42.12	1.33	11.09	29.70%	138.7	70.3%	65%	114.9
Polyurethane Aerosol	104.76	0.70	5.84	48.00%	293.6	52.0%	65%	111.3
Black Zenthane	42.12	1.21	10.07	32.70%	138.6	67.3%	65%	99.9
TOTAL EMISSIONS (lbs/yr)					**861.4**			**447.2**
TOTAL EMISSIONS (TPY)					**0.43**			**0.22**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**769.5**			
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**0.38**			

WASTE OIL BOILER - EMISSIONS SUMMARY

Waste Oil Boiler - Actual Emissions

Pollutant	TPY
NO_x	**0.05**
SO_x	**0.73**
CO	**0.01**
TOC	**<0.01**
PM_{10}	**0.04**
CO_2	**54.45**
HAPs	**0.14**
Arsenic	<0.01
Cadmium	<0.01
Chromium	<0.01
Cobalt	<0.01
Lead	0.14
Manganese	<0.01
Nickel	<0.01

Waste Oil Boiler - Potential Emissions

Pollutant	TPY
NO_x	**1.04**
SO_x	**16.10**
CO	**0.27**
TOC	**0.05**
PM_{10}	**0.84**
CO_2	**1,204.50**
HAPs	**3.02**
Arsenic	0.01
Cadmium	<0.01
Chromium	<0.01
Cobalt	<0.01
Lead	3.01
Manganese	<0.01
Nickel	<0.01

WASTE OIL BOILER - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Usage rate log provided by the operator. Each drum contained 50 gallons according to installation.
Waste oil burner is not operated between April and September when weather is warm.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	NO_x	SO_X[2,4]	CO	TOC	PM_{10}[3,4]	CO_2
Waste oil combustors, Small boilers	19.00	294.00	5.00	1.00	15.30	22,000

[1] Reference 1, Tables 1.11-1, 1.11-2, 1.11-3

[2] SO_x emissions factor = 147S, where S = weight % sulfur: 147 X 2.0 = 294

[3] PM_{10} emissions factor = 51A, where A = weight % ash: 51 X 0.3 = 15.3

[4] Reference 2, Part C. Default value for S = 2.0 and for A = 0.3

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	NO_x	SO_x	CO	TOC	PM_{10}	CO_2
Waste Oil Combustor, Small Boilers	4,950	94.1	1,455.3	24.8	5.0	75.7	108,900.0
TOTAL EMISSIONS (lbs/yr)		**94.1**	**1,455.3**	**24.8**	**5.0**	**75.7**	**108,900.0**
TOTAL EMISSIONS (TPY)		**0.05**	**0.73**	**0.01**	**<0.01**	**0.04**	**54.45**

WASTE OIL BOILER - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Assume burner operated 365 days, 6 drums per day (maximum number of drums burned in one day according to log).
Each drum contained 50 gallons according to installation.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	NO_x	SO_X[2,4]	CO	TOC	PM_{10}[3,4]	CO_2
Waste oil combustors, Small boilers	19.00	294.00	5.00	1.00	15.30	22,000

[1] Reference 1, Tables 1.11-1, 1.11-2, 1.11-3

[2] SO_x emissions factor = 147S, where S = weight % sulfur: 147 X 2.0 = 294

[3] PM_{10} emissions factor = 51A, where A = weight % ash: 51 X 0.3 = 15.3

[4] Reference 2, Part C. Default value for S = 2.0 and for A = 0.3

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	NO_x	SO_x	CO	TOC	PM_{10}	CO_2
Waste Oil Combustor, Small Boilers	109,500	2,080.5	32,193.0	547.5	109.5	1,675.4	2,409,000.0
TOTAL EMISSIONS (lbs/yr)		**2,080.5**	**32,193.0**	**547.5**	**109.5**	**1,675.4**	**2,409,000.0**
TOTAL EMISSIONS (TPY)		**1.04**	**16.10**	**0.27**	**0.05**	**0.84**	**1,204.50**

WASTE OIL BOILER - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Usage rate log provided by the operator. Each drum contained 50 gallons according to installation.
Waste oil burner is not operated between April and September when weather is warm.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste oil combustors, Small boilers	1.10E-01	9.30E-03	2.00E-02	2.10E-04	5.50E+01	6.80E-02	1.10E-02

[1] Reference 1, Table 1.11-4

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste Oil Combustor, Small Boilers	4,950	0.5	0.0	0.1	0.0	272.3	0.3	0.1
TOTAL EMISSIONS (lbs/yr)		**0.5**	**0.0**	**0.1**	**0.0**	**272.3**	**0.3**	**0.1**
TOTAL EMISSIONS (TPY)		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.14**	**<0.01**	**<0.01**

WASTE OIL BOILER - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Assume burner operated 365 days, 6 drums per day (maximum number of drums burned in one day according to log).
Each drum contained 50 gallons according to installation.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste oil combustors, Small boilers	1.10E-01	9.30E-03	2.00E-02	2.10E-04	5.50E+01	6.80E-02	1.10E-02

[1] Reference 1, Table 1.11-4

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste Oil Combustor, Small Boilers	109,500	12.0	1.0	2.2	0.0	6,022.5	7.4	1.2
TOTAL EMISSIONS (lbs/yr)		**12.0**	**1.0**	**2.2**	**0.0**	**6,022.5**	**7.4**	**1.2**
TOTAL EMISSIONS (TPY)		**0.01**	**<0.01**	**<0.01**	**<0.01**	**3.01**	**<0.01**	**<0.01**

WOODWORKING - EMISSIONS SUMMARY

Woodworking - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	N/A
PM_{10}	0.03

Woodworking - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	N/A
PM_{10}	0.05

WOODWORKING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Control Efficiency: 90%
Sawdust Density (lb/ft^3): 12
PM_{10} fraction(%) (Reference 2): 52.9%

Source Classification Code (SCC):

	SCC
Fugitive Emissions Tons Processed	3-07-008-07

References:
1. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, OAQPS, EPA, RTP, North Carolina, January 1995
2. North American Combustion Handbook, Volume I: Combustion, Fuels, Stoichiometry, Heat Transfer, Fluid Flow, Third Edition, North American Manufacturing Company, 1986

Notes:
PM_{10} fraction of particulate matter was selected from Reference 1, Appendix B.1, Table 10.5, Page B.1-48
Density of sawdust emissions was selected from Reference 2, Page 20
Emissions from woodworking operations were based on amounts of sawdust waste collected annually from the Bldg 5110 Wood Shop
Sawdust is conveyed from the shop collection system to a shed with a waste bin about 3 feet deep, 4 feet wide, and 6 feet long.
The bin is a settling chamber with an assumed control efficiency of 90%.
The bin is emptied about twice a year when it becomes half full. Total volume of the bin is 4' x 6' x 3' = 72 cubic feet. Half full would be 36 cubic feet. At 2 collections per year, that would be 72 cubic feet of sawdust waste.

B. EMISSION CALCULATION METHOD

Actual Emission Calculation:
Sawdust Collected (lb/yr) = Sawdust Collected (ft^3/yr) x Density of Sawdust (lb/ft^3)
Sawdust Generated (lb/yr) = Sawdust Collected (lb/yr) /control efficiency(%)
Sawdust Emitted (lb/yr) = Sawdust Generated (lb/yr) - Sawdust Collected (lb/yr)
PM_{10} Emissions (lb/yr) = Sawdust Emitted (lb/yr) x PM_{10} fraction(%)

C. EMISSION CALCULATIONS

Building Number	Location	Sawdust Collected (ft^3/yr)	Control Equipment	Sawdust (lb/yr)			PM_{10} Emissions (lb/yr)
				Collected	Generated	Emitted	
5110	Small Arms Range	72	Shed	864.0	960.0	96.0	50.8
TOTAL EMISSIONS (lb/yr)				**864.0**	**960.0**	**96.0**	**50.8**
TOTAL EMISSIONS (TPY)							**0.03**

WOODWORKING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Control Efficiency: 95%
Sawdust Density (lb/ft^3): 12
PM_{10} fraction(%) (Reference 2): 52.9%

Source Classification Code (SCC):

	SCC
Fugitive Emissions Tons Processed	3-07-008-07

References:

1. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, OAQPS, EPA, RTP, North Carolina, January 1995
2. North American Combustion Handbook, Volume I: Combustion, Fuels, Stoichiometry, Heat Transfer, Fluid Flow, Third Edition, North American Manufacturing Company, 1986

Notes: Actual Hours based on 40 hour work week x 52 wk/yr = 2,080 hr/yr
Potential Hours based on 24 hr/day x 365 day/yr = 8,760 hr/yr
Potential amount of sawdust collected was based on the ratio of potential hours (8,760 hr/yr) to actual hours of operation, assuming an 8-hr workday (2,080 hr/yr)

B. EMISSION CALCULATION METHOD

Potential Emission Calculation:
Potential Sawdust Collected (lb/yr) = Actual Sawdust Collected (lb/yr) x Potential Hours/Actual Hours
Potential Sawdust Collected (lb/yr) = Potential Sawdust Collected (ft^3/yr) x Density of Sawdust (lb/ft^3)
Potential Sawdust Generated (lb/yr) = Potential Sawdust Collected (lb/yr) / control efficiency(%)
Potential Sawdust Emitted (lb/yr) = Potential Sawdust Generated (lb/yr) - Potential Sawdust Collected (lb/yr)
PM_{10} Emissions (lb/yr) = Potential Sawdust Emitted (lb/yr) x PM_{10} fraction(%)

C. EMISSION CALCULATIONS

Building Number	Location	Potential Sawdust Collected (ft^3/yr)	Control Equipment	Potential Sawdust (lb/yr)			PM_{10} Emissions
				Collected	Generated	Emitted	(lb/yr)
5110	Small Arms Range	303.2	Shed	3638.8	3,830.3	191.5	101.3
TOTAL EMISSIONS (lb/yr)				**3,638.8**	**3,830.3**	**191.5**	**101.3**
TOTAL EMISSIONS (TPY)							**0.05**

Appendix C

Emission Calculations After Modification

EU ID No.	PTE - AFTER the Modification (tpy) [only from modified and new emissions units. Do not list emission units for which you answered "NO" in Section 2.]								Change in PTE (tpy)							
	CO	NO_X	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC	HAPs[2]	CO	NO_X	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC	HAPs
SIGNIFICANT SOURCES																
8	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
9	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
10	2.97	11.89	0.32	0.32	0.64	0.13	0.20	0.00	0.00	0.00	0.00	0.00	0.00	-25.20	0.00	0.00
40	0.41	1.63	0.04	0.04	0.09	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	-3.45	0.00	0.00
11	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
12	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
13	1.73	1.87	0.05	0.05	0.09	0.00	0.21	2E-05	0.00	0.00	0.00	0.00	0.00	-0.73	0.00	0.00
26	0.47	0.53	0.01	0.01	0.02	0.17	0.20	6E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.10	0.11	0.00	0.00	0.01	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.57	0.65	0.01	0.01	0.03	0.20	0.25	7E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.07	0.08	0.00	0.00	0.00	0.02	0.03	8E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.46	2.13	0.08	0.08	0.15	0.14	0.17	3E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.39	1.82	0.06	0.06	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.40	1.86	0.07	0.07	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	0.40	1.86	0.07	0.07	0.13	0.12	0.15	2E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	0.23	1.09	0.04	0.04	0.08	0.07	0.09	9E-08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.20	0.93	0.03	0.03	0.07	0.06	0.08	1E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	0.20	0.93	0.03	0.03	0.07	0.06	0.08	1E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	1.10	1.18	0.03	0.03	0.06	0.00	0.13	1E-05	0.00	0.00	0.00	0.00	0.00	-0.46	0.00	0.00
51	1.10	1.18	0.03	0.03	0.06	0.00	0.13	1E-05	0.00	0.00	0.00	0.00	0.00	-0.46	0.00	0.00
52	0.12	0.13	0.00	0.00	0.01	0.04	0.05	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	0.84	0.95	0.02	0.02	0.04	0.30	0.37	1E-05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54	1.48	1.59	0.04	0.04	0.08	0.00	0.18	2E-05	-0.04	-0.05	0.00	0.00	0.00	-0.64	-0.01	0.00
55	0.30	0.34	0.01	0.01	0.02	0.11	0.13	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	0.24	0.27	0.01	0.01	0.01	0.09	0.11	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57	0.29	0.33	0.01	0.01	0.02	0.10	0.13	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.10	0.11	0.00	0.00	0.01	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	0.04	0.04	0.00	0.00	0.00	0.01	0.02	5E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0.12	0.13	0.00	0.00	0.01	0.04	0.05	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	0.05	0.06	0.00	0.00	0.00	0.02	0.02	6E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	0.02	0.03	0.00	0.00	0.00	0.01	0.01	3E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	0.07	0.08	0.00	0.00	0.00	0.02	0.03	8E-07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	0.34	0.38	0.01	0.01	0.02	0.12	0.15	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.24	0.27	0.01	0.01	0.01	0.09	0.11	3E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Gen BLDG#2121	0.09	0.10	0.00	0.00	0.00	0.03	0.04	1E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Gen BLDG#3007	0.34	0.38	0.01	0.01	0.02	0.12	0.15	4E-06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

INSIGNIFICANT SOURCES																
Boiler BLDG#1171	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#1172_1	0.15	0.59	0.02	0.02	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.14	0.00	0.00
Boiler BLDG#1172_2	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#1185_1	0.20	0.81	0.02	0.02	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.19	0.00	0.00
Boiler BLDG#1185_2	0.20	0.81	0.02	0.02	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.19	0.00	0.00
Boiler BLDG#1191	0.02	0.09	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	0.00
Boiler BLDG#1815_1	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#1815_2	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#2090_1	0.09	0.38	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.09	0.00	0.00
Boiler BLDG#2090_2	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#2092_1	0.06	0.25	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	0.00	0.00
Boiler BLDG#2092_2	0.06	0.25	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	0.00	0.00
Boiler BLDG#2096_1	0.13	0.50	0.01	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	0.00	0.00
Boiler BLDG#2096_2	0.13	0.50	0.01	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	0.00	0.00
Boiler BLDG#2400	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#4321	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#4322	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#5003	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#5008	0.06	0.25	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	0.00	0.00
Boiler BLDG#5009	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#5010	0.14	0.56	0.02	0.02	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.13	0.00	0.00
Boiler BLDG#5109	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#5110	0.03	0.13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00
Boiler BLDG#5113	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Boiler BLDG#5119	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Boiler BLDG#5142	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Boiler BLDG#5144	0.11	0.44	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.10	0.00	0.00
Boiler BLDG#5149_1	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00
Boiler BLDG#5149_2	0.05	0.19	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	-0.01
Boiler BLDG#5163	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
Boiler BLDG#5186	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00
IEU Boilers	1.98	7.93	0.21	0.21	0.43	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00	-1.90	0.00	-0.01
Other unmodified units	0.27	1.04	47.14	47.14	94.29	16.10	10.75	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Total	**28.03**	**75.83**	**2.14**	**2.14**	**4.28**	**3.13**	**5.08**	**0.02**	**-0.04**	**-0.05**	**0.00**	**0.00**	**0.00**	**-84.68**	**-0.01**	**0.00**
Source-Wide	**28.31**	**76.87**	**49.28**	**49.28**	**98.56**	**19.23**	**15.83**	**0.02**	**-0.04**	**-0.05**	**0.00**	**0.00**	**0.00**	**-84.68**	**-0.01**	**0.00**

[1] Include condensable particulate matter for PM-10 and PM-2.5

[2] If the total PTE for hazardous air pollutants (HAPs) for the entire stationary source is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.

EU ID No.	Does project affect the emissions unit?				PTE (tpy)									
					CO	NOx[4]	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC[2]	Fugitive VOC[3]	Fugitive PM[3]	HAPs
SIGNIFICANT EMISSION UNITS														
8	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A	0.00
9	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A	0.00
10	Yes	X	No		2.97	11.89	0.32	0.32	0.64	25.32	0.20	N/A	N/A	0.00
40	Yes	X	No		0.41	1.63	0.04	0.04	0.09	3.47	0.03	N/A	N/A	0.00
11	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A	6E-08
12	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A	4E-08
13	Yes	X	No		1.73	1.87	0.05	0.05	0.09	0.73	0.21	N/A	N/A	2E-06
26	Yes	X	No		0.47	0.53	0.01	0.01	0.02	0.17	0.20	N/A	N/A	6E-07
27	Yes	X	No		0.10	0.11	0.00	0.00	0.01	0.03	0.04	N/A	N/A	2E-07
28	Yes	X	No		0.57	0.65	0.01	0.01	0.03	0.20	0.25	N/A	N/A	7E-07
29	Yes	X	No		0.07	0.08	0.00	0.00	0.00	0.02	0.03	N/A	N/A	1E-06
30	Yes	X	No		0.46	2.13	0.08	0.08	0.15	0.14	0.17	N/A	N/A	4E-08
31	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A	0E+00
32	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A	0E+00
33	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A	4E-08
34	Yes	X	No		0.39	1.82	0.06	0.06	0.13	0.12	0.15	N/A	N/A	4E-08
35	Yes	X	No		0.40	1.86	0.07	0.07	0.13	0.12	0.15	N/A	N/A	4E-08
36	Yes	X	No		0.40	1.86	0.07	0.07	0.13	0.12	0.15	N/A	N/A	4E-08
37	Yes	X	No		0.23	1.09	0.04	0.04	0.08	0.07	0.09	N/A	N/A	4E-08
38	Yes	X	No		0.20	0.93	0.03	0.03	0.07	0.06	0.08	N/A	N/A	5E-08
39	Yes	X	No		0.20	0.93	0.03	0.03	0.07	0.06	0.08	N/A	N/A	2E-08
22	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.29	N/A	N/A	N/A
23	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.57	N/A	N/A	N/A
24	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	2.01	N/A	N/A	0.32
50	Yes	X	No		1.10	1.18	0.03	0.03	0.06	0.46	0.13	N/A	N/A	0E+00
51	Yes	X	No		1.10	1.18	0.03	0.03	0.06	0.46	0.13	N/A	N/A	7E-07
52	Yes	X	No		0.12	0.13	0.00	0.00	0.01	0.04	0.05	N/A	N/A	2E-06
53	Yes	X	No		0.84	0.95	0.02	0.02	0.04	0.30	0.37	N/A	N/A	2E-06
54	Yes	X	No		1.52	1.64	0.04	0.04	0.08	0.64	0.19	N/A	N/A	1E-07
55	Yes	X	No		0.30	0.34	0.01	0.01	0.02	0.11	0.13	N/A	N/A	5E-07
56	Yes	X	No		0.24	0.27	0.01	0.01	0.01	0.09	0.11	N/A	N/A	2E-07
57	Yes	X	No		0.29	0.33	0.01	0.01	0.02	0.10	0.13	N/A	N/A	2E-07
58	Yes	X	No		0.10	0.11	0.00	0.00	0.01	0.03	0.04	N/A	N/A	1E-06
59	Yes	X	No		0.04	0.04	0.00	0.00	0.00	0.01	0.02	N/A	N/A	2E-07
60	Yes	X	No		0.12	0.13	0.00	0.00	0.01	0.04	0.05	N/A	N/A	8E-08
61	Yes	X	No		0.05	0.06	0.00	0.00	0.00	0.02	0.02	N/A	N/A	2E-07
62	Yes	X	No		0.02	0.03	0.00	0.00	0.00	0.01	0.01	N/A	N/A	4E-06
63	Yes	X	No		0.07	0.08	0.00	0.00	0.00	0.02	0.03	N/A	N/A	2E-06
64	Yes	X	No		0.34	0.38	0.01	0.01	0.02	0.12	0.15	N/A	N/A	0E+00
65	Yes	X	No		0.24	0.27	0.01	0.01	0.01	0.09	0.11	N/A	N/A	4E-06
Paved Roads	Yes		No	X	N/A	N/A	36.40	36.40	72.80	N/A	N/A	N/A	N/A	N/A
Unpaved Roads	Yes		No	X	N/A	N/A	10.30	10.30	20.60	N/A	N/A	N/A	N/A	N/A
Emergency Gen BLDG#2121	Yes	X	No		0.09	0.10	0.00	0.00	0.00	0.03	0.04	N/A	N/A	3E-06
Emergency Gen BLDG#3007	Yes	X	No		0.34	0.38	0.01	0.01	0.02	0.12	0.15	N/A	N/A	6E-07
INSIGNIFICANT EMISSION UNITS														
Boiler BLDG#1171	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#1172_1	Yes	X	No		0.15	0.59	0.02	0.02	0.03	0.15	0.01	N/A	N/A	0.00
Boiler BLDG#1172_2	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#1185_1	Yes	X	No		0.20	0.81	0.02	0.02	0.04	0.20	0.01	N/A	N/A	0.00
Boiler BLDG#1185_2	Yes	X	No		0.20	0.81	0.02	0.02	0.04	0.20	0.01	N/A	N/A	0.00
Boiler BLDG#1191	Yes	X	No		0.02	0.09	0.00	0.00	0.01	0.02	0.00	N/A	N/A	0.00
Boiler BLDG#1815_1	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#1815_2	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#2090_1	Yes	X	No		0.09	0.38	0.01	0.01	0.02	0.09	0.01	N/A	N/A	0.00
Boiler BLDG#2090_2	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#2092_1	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A	0.00
Boiler BLDG#2092_2	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A	0.00
Boiler BLDG#2096_1	Yes	X	No		0.13	0.50	0.01	0.01	0.03	0.13	0.01	N/A	N/A	0.00
Boiler BLDG#2096_2	Yes	X	No		0.13	0.50	0.01	0.01	0.03	0.13	0.01	N/A	N/A	0.00
Boiler BLDG#2400	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#4321	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#4322	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#5003	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#5008	Yes	X	No		0.06	0.25	0.01	0.01	0.01	0.06	0.00	N/A	N/A	0.00
Boiler BLDG#5009	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#5010	Yes	X	No		0.14	0.56	0.02	0.02	0.03	0.14	0.01	N/A	N/A	0.00
Boiler BLDG#5109	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#5110	Yes	X	No		0.03	0.13	0.00	0.00	0.01	0.03	0.00	N/A	N/A	0.00
Boiler BLDG#5113	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A	0.00
Boiler BLDG#5119	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A	0.00
Boiler BLDG#5142	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A	0.00
Boiler BLDG#5144	Yes	X	No		0.11	0.44	0.01	0.01	0.02	0.11	0.01	N/A	N/A	0.00
Boiler BLDG#5149_1	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.00
Boiler BLDG#5149_2	Yes	X	No		0.05	0.19	0.01	0.01	0.01	0.05	0.00	N/A	N/A	0.01
Boiler BLDG#5163	Yes	X	No		0.01	0.05	0.00	0.00	0.00	0.01	0.00	N/A	N/A	0.00
Boiler BLDG#5186	Yes	X	No		0.02	0.06	0.00	0.00	0.00	0.02	0.00	N/A	N/A	0.00
IEU Boiler Total					1.98	7.93	0.21	0.21	0.43	1.98	0.13	N/A	N/A	

Fuel Station BLDG#3484	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	3.40	N/A	N/A	
AST BLDG#4076_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_3	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_4	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_5	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG$4076_6	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_7	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4076_8	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#1171	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#1172	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#1185	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1191	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1572_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1572_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1572_3	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1572_4	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
USTBLDG#1580	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#1815	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#2062	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#2078_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.21	N/A	N/A	
AST BLDG#2078_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	1.21	N/A	N/A	
UST BLDG#2080	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#2090	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#2092	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#2096_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#2096_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.02	N/A	N/A	
AST BLDG#2400	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#3015_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#3015_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.15	N/A	N/A	
UST BLDG#3484_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#3484_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#3484_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#3484_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.84	N/A	N/A	
AST BLDG#4065_1	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#4065_2	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#4065	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#4109	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.03	N/A	N/A	
UST BLDG#4321	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#4322	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5003	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5007	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5008	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5009	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5009	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5010	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5011	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5108	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5109	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
UST BLDG#5110	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5113	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5119	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5142	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5149	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5157	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5159	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5163	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5175	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
AST BLDG#5186	Yes		No	X	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	
Waste Oil Boiler	Yes		No	X	0.27	1.04	0.42	0.42	0.84	16.10	0.00	N/A	N/A	
Wood Working	Yes		No	X	N/A	N/A	0.03	0.03	0.05	N/A	N/A	N/A	N/A	
IEU Other Total					0.27	1.04	0.44	0.44	0.89	16.10	6.88	N/A	N/A	
Unmodified Units Total					0.27	1.04	47.14	47.14	94.29	16.10	10.75	N/A	N/A	
Total TPY					28.35	76.92	49.28	49.28	98.56	103.90	15.83	N/A	N/A	

[1] Include condensable particulate matter for PM-10 and PM-2.5.

[2] If total PTE for volatile organic compounds (VOCs) is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.

[3] Fugitive VOC and PM emissions are included as assessable emissions regardless of permit applicability.

[4] Fugitive NOx emissions from blasting should be included in the PTE column for NOx.

[5] Emission Unit Inventory from Title V Operating Permit Renewal for USAG Alaska Fort Wainwright Submitted to ADEC in March 2019

FORT WAINWRIGHT AIR POLLUTANT EMISSION SUMMARY

ACTUAL CRITERIA POLLUTANT EMISSIONS

Source Category	NOx (TPY)	SO_2 (TPY)	CO (TPY)	VOC (TPY)	PM_{10}[1] (TPY)
Aerospace Operations	N/A	N/A	N/A	0.49	N/A
Boilers (Fuel Oil)	1.22	0.01	0.30	0.02	0.07
Degreasing	N/A	N/A	N/A	0.91	N/A
Emergency Generators	0.84	0.86	0.77	0.16	0.04
Fuel Dispensing Station	N/A	N/A	N/A	0.65	N/A
Fuel Storage	N/A	N/A	N/A	2.32	N/A
Internal Combustion Engines	0.76	0.05	0.16	0.06	0.05
Landfills	N/A	N/A	0.04	0.57	N/A
Surface Coating	N/A	N/A	N/A	0.10	0.05
Waste Oil Boiler	0.05	0.73	0.01	<0.01	0.04
Woodworking	N/A	N/A	N/A	N/A	0.03
TOTAL EMISSIONS:	**2.87**	**1.65**	**1.30**	**5.29**	**0.28**

[1]Particulate Matter (PM) with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}) and total PM emissions are assumed to be equal

N/A = not applicable to source

FORT WAINWRIGHT AIR POLLUTANT EMISSION SUMMARY

POTENTIAL CRITERIA POLLUTANT EMISSIONS

Source Category	NOx (TPY)	SO_2 (TPY)	CO (TPY)	VOC (TPY)	PM_{10}[1] (TPY)
Aerospace Operations	N/A	N/A	N/A	2.01	N/A
Boilers (Fuel Oil)	45.16	0.48	11.29	0.75	2.44
Degreasing	N/A	N/A	N/A	3.85	N/A
Emergency Generators	14.53	1.58	13.26	3.01	0.69
Fuel Dispensing Station	N/A	N/A	N/A	0.66	N/A
Fuel Storage	N/A	N/A	N/A	3.48	N/A
Internal Combustion Engines	16.08	1.06	3.47	1.30	1.14
Landfills	N/A	N/A	0.04	0.57	N/A
Surface Coating	N/A	N/A	N/A	0.43	0.22
Waste Oil Boiler	1.04	16.10	0.27	0.05	0.84
Woodworking	N/A	N/A	N/A	N/A	0.05
TOTAL EMISSIONS:	76.81	19.23	28.33	16.12	5.38

[1]Particulate Matter (PM) with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}) and total PM emissions are assumed to be equal

N/A = not applicable to source

AEROSPACE OPERATIONS - EMISSIONS SUMMARY

Aerospace Operations - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.49**
PM_{10}	**N/A**
HAPs	**0.07**
Formaldehyde	0.00
Phenol	0.00
Toluene	0.00
Xylenes	0.07

Aerospace Operations - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**2.01**
PM_{10}	**N/A**
HAPs	**0.32**
Formaldehyde	0.00
Phenol	0.00
Toluene	0.04
Xylenes	0.28

AEROSPACE OPERATIONS - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes: Aerospace Operations emissions are based on the installation 2010 Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including VOC content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:
Emissions (lb/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	VOC Content (%WT)	VOC Emissions (lb/yr)
Aircraft Maintenance Hangers	Corrosion Prevention Compound	60.00	0.88	7.36	100.0%	441.35
Aircraft Maintenance Hangers	Corrosion Prevention Compound	50.00	0.92	7.70	100.0%	384.89
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	0.25	0.91	7.59	0.0%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.20	1.19	9.92	0.1%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part B	1.00	1.00	8.34	0.1%	0.01
Aircraft Maintenance Hangers	Antiseize Thread Compound	0.43	1.40	11.68	0.0%	0.00
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.03	0.87	7.26	0.0%	0.00
Aircraft Maintenance Hangers	Coating Compound, Nonslip	70.00	1.16	9.67	32.0%	217.00
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.13	0.92	7.70	37.5%	0.37
Aircraft Maintenance Hangers	Epoxy Primer, Part A	0.25	0.86	7.13	79.1%	1.41
Aircraft Maintenance Hangers	Epoxy Primer, Part B	1.00	1.32	10.98	36.5%	4.01
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.11	0.78	6.50	58.0%	0.42
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.13	1.80	15.01	0.0%	0.00
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.01	1.10	9.17	0.0%	0.00
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	0.38	1.51	12.59	1.2%	0.06
Aircraft Maintenance Hangers	Polyurethane Coating	175.00	0.70	5.84	5.6%	56.93
TOTAL EMISSIONS (lb/yr)						**1,106.44**
TOTAL EMISSIONS (TPY)						**0.55**
TOTAL EMISSIONS (lb/yr (VOC - VOC_{HAP}))						**972.98**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**0.49**

AEROSPACE OPERATIONS - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes:
Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including VOC content, was determined from MSDS.
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2080 hr/yr

Potential Emission Calculations:
Emissions (lb/yr) = Potential Product Use (gal/yr) x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	VOC Content (%WT)	VOC Emissions (lb/yr)
Aircraft Maintenance Hangers	Corrosion Prevention Compound	252.69	0.88	7.36	100.0%	1,858.77
Aircraft Maintenance Hangers	Corrosion Prevention Compound	210.58	0.92	7.70	100.0%	1,620.98
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	1.05	0.91	7.59	0.0%	0.00
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.85	1.19	9.92	0.1%	0.01
Aircraft Maintenance Hangers	Loctite Adhesive Part B	4.21	1.00	8.34	0.1%	0.04
Aircraft Maintenance Hangers	Antiseize Thread Compound	1.80	1.40	11.68	0.0%	0.00
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.13	0.87	7.26	0.0%	0.00
Aircraft Maintenance Hangers	Coating Compound, Nonslip	294.81	1.16	9.67	32.0%	913.90
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.54	0.92	7.70	37.5%	1.57
Aircraft Maintenance Hangers	Epoxy Primer, Part A	1.05	0.86	7.13	79.1%	5.93
Aircraft Maintenance Hangers	Epoxy Primer, Part B	4.21	1.32	10.98	36.5%	16.87
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.47	0.78	6.50	58.0%	1.76
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.53	1.80	15.01	0.0%	0.00
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.06	1.10	9.17	0.0%	0.00
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	1.58	1.51	12.59	1.2%	0.24
Aircraft Maintenance Hangers	Polyurethane Coating	737.02	0.70	5.84	5.6%	240.95
TOTAL EMISSIONS (lb/yr)						**4,661.03**
TOTAL EMISSIONS (TPY)						**2.33**
TOTAL EMISSIONS (lb/yr (VOC - VOC_{HAP}))						**4024.54**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**2.01**

AEROSPACE OPERATIONS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes: Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including HAP content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:
Emissions (lb/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x HAP Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	HAPs							
					Formaldehyde		Phenol		Toluene		Xylene	
					HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.11	0.88	7.36	---	---	---	---	4%	0.03	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.11	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	0.25	0.91	7.59	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.20	1.19	9.92	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part B	1.00	1.00	8.34	---	---	1.0%	0.08	---	---	---	---
Aircraft Maintenance Hangers	Antiseize Thread Compound	0.43	1.40	11.68	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.03	0.87	7.26	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Coating Compound, Nonslip	2.00	1.16	9.67	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.13	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Epoxy Primer, Part A	0.25	0.86	7.13	---	---	---	---	---	---	8%	0.14
Aircraft Maintenance Hangers	Epoxy Primer, Part B	1.00	1.32	10.98	0.13%	0.01	---	---	---	---	3%	0.33
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.11	0.78	6.50	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.13	1.80	15.01	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.01	1.10	9.17	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	0.38	1.51	12.59	---	---	---	---	1%	0.05	---	---
Aircraft Maintenance Hangers	Polyurethane Coating	175.00	0.70	5.84	---	---	---	---	---	---	13.0%	132.81
TOTAL EMISSIONS (lb/yr)						**0.01**		**0.08**		**0.08**		**133.29**
TOTAL EMISSIONS (TPY)						**0.00**		**0.00**		**0.00**		**0.07**

AEROSPACE OPERATIONS - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Mass Balance
Density of Water (lb/gal): 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Operations: Large Aircraft	4-02-024-99

Notes:
Aerospace Operations emissions are based on the installation Hazardous Materials Use reports.
According to the reports, all aerospace operations took place at Building 2077, also known as Hanger 7&8.
Product information, including HAP content, was determined from MSDS.
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2,080 hr/yr

Potential Emission Calculations:
Emissions (lb/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x HAP Content (%WT)

C. EMISSION SUMMARY

Building	Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lb/gal)	HAPs							
					Formaldehyde		Phenol		Toluene		Xylene	
					HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr	HAP%	lb/yr
Aircraft Maintenance Hangers	Corrosion Prevention Compound	252.69	0.88	7.36	---	---	---	---	4%	74.35	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	210.58	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	3M Scotch-Weld Adhesive	1.05	0.91	7.59	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part A	0.85	1.19	9.92	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Loctite Adhesive Part B	4.21	1.00	8.34	---	---	1.0%	0.35	---	---	---	---
Aircraft Maintenance Hangers	Antiseize Thread Compound	1.80	1.40	11.68	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Royco 634 Lubricant	0.13	0.87	7.26	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Coating Compound, Nonslip	294.81	1.16	9.67	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Corrosion Prevention Compound	0.54	0.92	7.70	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	Epoxy Primer, Part A	1.05	0.86	7.13	---	---	---	---	---	---	8%	0.60
Aircraft Maintenance Hangers	Epoxy Primer, Part B	4.21	1.32	10.98	0.13%	0.06	---	---	---	---	3%	1.39
Aircraft Maintenance Hangers	So-Sure Zinc Chromate Primer, Aerosol	0.47	0.78	6.50	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Curing Agent	0.53	1.80	15.01	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	INSTAbond 146 Anaerobic Sealing	0.06	1.10	9.17	---	---	---	---	---	---	---	---
Aircraft Maintenance Hangers	WS-8020 Class B-1/2 Base	1.58	1.51	12.59	---	---	---	---	1%	0.20	---	---
Aircraft Maintenance Hangers	Polyurethane Coating	737.02	0.70	5.84	---	---	---	---	---	---	13%	559.55
TOTAL EMISSIONS (lb/yr)						**0.06**		**0.35**		**74.55**		**561.53**
TOTAL EMISSIONS (TPY)						**0.00**		**0.00**		**0.04**		**0.28**

BOILERS (Fuel Oil) - EMISSIONS SUMMARY

Boilers (#1 Fuel Oil) - Actual Emissions

Pollutant	TPY
NO_x	**1.22**
SO_2	**0.01**
CO	**0.30**
VOC - VOC_{HAP}	**0.02**
PM_{10}	**0.07**
CO_2	**1,309.73**
CH_4	**0.01**
N_2O	**0.02**
HAPs	**<0.01**
Arsenic	0.00
Beryllium	0.00
Cadmium	0.00
Chromium	0.00
Formaldehye	0.00
Lead	0.00
Mercury	0.00
Manganese	0.00
Nickel	0.00
Selenium	0.00

Boilers (#1 Fuel Oil) - Potential Emissions

Pollutant	TPY
NO_x	**45.16**
SO_2	**0.48**
CO	**11.29**
VOC - VOC_{HAP}	**0.75**
PM_{10}	**2.44**
CO_2	**48,542.62**
CH_4	**0.49**
N_2O	**0.59**
HAPs	**0.02**
Arsenic	0.00
Beryllium	0.00
Cadmium	0.00
Chromium	0.00
Formaldehye	0.00
Lead	0.00
Mercury	0.00
Manganese	0.00
Nickel	0.00
Selenium	0.00

BOILERS (Fuel Oil) - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Fuel Type: ULSD
Calculation Method: Emission Factors
Fuel Oil Sulfur Content (%S): 0.0015

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. State Air Quality Control Plan; Vol. II: III.D.7.1-7.15; adopted November 19, 2019

Notes: Fuel oil sulfur content from Reference 2, Section 7.7.8.3.3, SOx Controls for Fort Wainwright

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/1,000 gal)[1]							
	NO_x	SO_2[2]	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
Distillate Oil-Fired Boilers (<100 MMBTU/hr)	20	0.2	5.0	0.34	1.08	21,500	0.216	0.26

[1] Reference 1, Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12 [No. 1 (kerosene)]

[2] SO_2 emissions factor = 142S, where S = weight % sulfur: 142 x 0.0015 = 0.213

Emission Calculation:
Emissions (lbs/yr) = Fuel Use (gal/yr) x Emission Factor (lbs/1,000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Actual Fuel Use[1] (gal/yr)	Emissions (lbs/yr)							
			NO_x	SO_2	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
1171	0.2	2,000	40.0	0.4	10.0	0.7	2.2	43,000.0	0.4	0.5
1172	0.9	10,000	200.0	2.1	50.0	3.4	10.8	215,000.0	2.2	2.6
1172	0.2	2,000	40.0	0.4	10.0	0.7	2.2	43,000.0	0.4	0.5
1185	1.3	11,871	237.4	2.5	59.4	4.0	12.8	255,226.5	2.6	3.1
1185	1.3	11,872	237.4	2.5	59.4	4.0	12.8	255,248.0	2.6	3.1
1191	0.2	559	11.2	0.1	2.8	0.2	0.6	12,018.5	0.1	0.1
1815	0.2	750	15.0	0.2	3.8	0.3	0.8	16,125.0	0.2	0.2
1815	0.2	750	15.0	0.2	3.8	0.3	0.8	16,125.0	0.2	0.2
2090	0.6	3,650	73.0	0.8	18.3	1.2	3.9	78,475.0	0.8	0.9
2090	0.3	3,650	73.0	0.8	18.3	1.2	3.9	78,475.0	0.8	0.9
2092	0.4	4,452	89.0	0.9	22.3	1.5	4.8	95,718.0	1.0	1.2
2092	0.4	4,452	89.0	0.9	22.3	1.5	4.8	95,718.0	1.0	1.2
2096	0.8	1,750	35.0	0.4	8.8	0.6	1.9	37,625.0	0.4	0.5
2096	0.8	1,750	35.0	0.4	8.8	0.6	1.9	37,625.0	0.4	0.5
2400	0.3	3,650	73.0	0.8	18.3	1.2	3.9	78,475.0	0.8	0.9
4076	19.0	2,380	47.6	0.5	11.9	0.8	2.6	51,170.0	0.5	0.6
4076	19.0	2,800	56.0	0.6	14.0	1.0	3.0	60,200.0	0.6	0.7
4076	19.0	1,260	25.2	0.3	6.3	0.4	1.4	27,090.0	0.3	0.3
4321	0.3	2,968	59.4	0.6	14.8	1.0	3.2	63,812.0	0.6	0.8
4322	0.3	2,968	59.4	0.6	14.8	1.0	3.2	63,812.0	0.6	0.8
5003	0.3	2,968	59.4	0.6	14.8	1.0	3.2	63,812.0	0.6	0.8
5007	2.6	14,839	296.8	3.2	74.2	5.0	16.0	319,038.5	3.2	3.9
5008	0.4	5,936	118.7	1.3	29.7	2.0	6.4	127,624.0	1.3	1.5
5009	0.2	5,936	118.7	1.3	29.7	2.0	6.4	127,624.0	1.3	1.5
5010	0.9	4,452	89.0	0.9	22.3	1.5	4.8	95,718.0	1.0	1.2
5109	0.2	2,500	50.0	0.5	12.5	0.9	2.7	53,750.0	0.5	0.7
5110	0.2	2,968	59.4	0.6	14.8	1.0	3.2	63,812.0	0.6	0.8
5113	0.1	571	11.4	0.1	2.9	0.2	0.6	12,276.5	0.1	0.1
5119	0.1	535	10.7	0.1	2.7	0.2	0.6	11,502.5	0.1	0.1
5142	0.1	669	13.4	0.1	3.3	0.2	0.7	14,383.5	0.1	0.2
5144	0.7	2,241	44.8	0.5	11.2	0.8	2.4	48,181.5	0.5	0.6
5149	0.3	820	16.4	0.2	4.1	0.3	0.9	17,630.0	0.2	0.2
5149	0.3	820	16.4	0.2	4.1	0.3	0.9	17,630.0	0.2	0.2
5163	0.1	456	9.1	0.1	2.3	0.2	0.5	9,804.0	0.1	0.1
5186	0.1	592	11.8	0.1	3.0	0.2	0.6	12,728.0	0.1	0.2
TOTAL EMISSIONS (lbs/yr)			**2,436.7**	**26.0**	**609.2**	**41.4**	**131.6**	**2,619,452.5**	**26.3**	**31.7**
TOTAL EMISSIONS (TPY)			**1.22**	**0.01**	**0.30**	**0.02**	**0.07**	**1309.73**	**0.01**	**0.02**

TOTAL EMISSIONS (lbs/yr (NMTOC - VOC_{HAP}))	**40.59**
TOTAL EMISSIONS (TPY (NMTOC - VOC_{HAP}))	**0.02**

[1] Actual Fuel Use is from Fuel Storage calculations and actual fuel delivery receipts obtained from the supplier. Fuel used in the same building by more than one boiler was distributed proportionately to boiler capacity.

BOILERS (Fuel Oil) - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Fuel Type: ULSD
Calculation Method: Emission Factors
Fuel Oil Sulfur Content (%S): 0.0015

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. State Air Quality Control Plan; Vol. II: III.D.7.1-7.15; adopted November 19, 2019

Notes: Fuel oil sulfur content from Reference 2, Section 7.7.8.3.3, SOx Controls for Fort Wainwright

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/1,000 gal)[1]							
	NO_x	SO_2[2]	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
Distillate Oil-Fired Boilers (<100 MMBTU/hr)	20	0.2	5.0	0.34	1.08	21,500	0.216	0.26

[1] Reference 1, Tables 1.3-1, 1.3-3, 1.3-6, 1.3-12 [No. 1 (kerosene)]
[2] SO_2 emissions factor = 142S, where S = weight % sulfur: 142 x 0.0015 = 0.213

Emission Calculation:
Potential Emissions (lbs/yr) =Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/1,000 gal) x 8760 (hr/year) / Fuel Heat Value (140 MMBtu/1000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Emissions (lbs/yr)							
		NO_x	SO_2	CO	NMTOC	PM_{10}	CO_2	CH_4	N_2O
1171	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
1172	0.9	1,172.6	12.5	293.1	19.9	63.3	1,260,532.7	12.7	15.2
1172	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
1185	1.3	1,626.9	17.3	406.7	27.7	87.9	1,748,871.4	17.6	21.1
1185	1.3	1,626.9	17.3	406.7	27.7	87.9	1,748,871.4	17.6	21.1
1191	0.2	187.7	2.0	46.9	3.2	10.1	201,792.9	2.0	2.4
1815	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
1815	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
2090	0.6	750.9	8.0	187.7	12.8	40.5	807,171.4	8.1	9.8
2090	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
2092	0.4	500.6	5.3	125.1	8.5	27.0	538,114.3	5.4	6.5
2092	0.4	500.6	5.3	125.1	8.5	27.0	538,114.3	5.4	6.5
2096	0.8	1,001.1	10.7	250.3	17.0	54.1	1,076,228.6	10.8	13.0
2096	0.8	1,001.1	10.7	250.3	17.0	54.1	1,076,228.6	10.8	13.0
2400	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
4076	19.0	23,777.1	253.2	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4076	19.0	23,777.1	253.2	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4076	19.0	23,777.1	253.2	5,944.3	404.2	1,284.0	25,560,428.6	256.8	309.1
4321	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
4322	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
5003	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
5007	2.6	3,253.7	34.7	813.4	55.3	175.7	3,497,742.9	35.1	42.3
5008	0.4	500.6	5.3	125.1	8.5	27.0	538,114.3	5.4	6.5
5009	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
5010	0.9	1,126.3	12.0	281.6	19.1	60.8	1,210,757.1	12.2	14.6
5109	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
5110	0.2	250.3	2.7	62.6	4.3	13.5	269,057.1	2.7	3.3
5113	0.1	125.1	1.3	31.3	2.1	6.8	134,528.6	1.4	1.6
5119	0.1	125.1	1.3	31.3	2.1	6.8	134,528.6	1.4	1.6
5142	0.1	125.1	1.3	31.3	2.1	6.8	134,528.6	1.4	1.6
5144	0.7	876.0	9.3	219.0	14.9	47.3	941,700.0	9.5	11.4
5149	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
5149	0.3	375.4	4.0	93.9	6.4	20.3	403,585.7	4.1	4.9
5163	0.1	100.1	1.1	25.0	1.7	5.4	107,622.9	1.1	1.3
5186	0.1	125.1	1.3	31.3	2.1	6.8	134,528.6	1.4	1.6
TOTAL EMISSIONS (lbs/yr)		**90,311.8**	**961.8**	**22,578.0**	**1,535.3**	**4,876.8**	**97,085,234.1**	**975.4**	**1,174.1**
TOTAL EMISSIONS (TPY)		**45.16**	**0.48**	**11.29**	**0.77**	**2.44**	**48542.62**	**0.49**	**0.59**
TOTAL EMISSIONS (lbs/yr (NMTOC - VOCHAP))						**1504.3**			
TOTAL EMISSIONS (TPY (NMTOC - VOCHAP))						**0.75**			

BOILERS (Fuel Oil) - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Fuel Type: ULSD
Calculation Method: Emission Factors
Fuel Oil Heat Value (Btu/gal) 140,000 [Reference 1, Appendix A (Typical Parameters of Various Fuels - Distillate Oil)]

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP03

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/10^{12} Btu)[1]									
	Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde[2]	Lead	Mercury	Manganese	Nickel	Selenium
Distillate Oil-Fired Boilers	4	3	3	3	0.048	9	3	6	3	15

[1] Reference 1, Tables 1.3-8, 1.3-10
[2] Formaldehyde emission factor has units of (lbs/1,000 gal)

Emission Calculation:
Emissions (lbs/yr) = Fuel Use (gal/yr) x Fuel Heat Value (Btu/gal) x Emission Factor (lbs/10^{12} Btu)
Emissions (lbs/yr) = Fuel Use (gal/yr) x Emission Factor (lbs/1,000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Actual Fuel Use[1] (gal/yr)	Emissions (lbs/yr)									
			Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde	Lead	Mercury	Manganese	Nickel	Selenium
1171	0.2	2,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1172	0.9	10,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1172	0.2	2,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1185	1.3	11,871	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1185	1.3	11,872	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1191	0.2	559	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2090	0.6	3,650	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2090	0.3	3,650	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2092	0.4	4,452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2092	0.4	4,452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2096	0.8	1,750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2096	0.8	1,750	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2400	0.3	3,650	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	19.0	2,380	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	19.0	2,800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	19.0	1,260	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4321	0.3	2,968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4322	0.3	2,968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5003	0.3	2,968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5007	2.6	14,839	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5008	0.4	5,936	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	0.2	5,936	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5010	0.9	4,452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5109	0.2	2,500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5110	0.2	2,968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5113	0.1	571	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5119	0.1	535	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5142	0.1	669	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5144	0.7	2,241	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5149	0.3	820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5149	0.3	820	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5163	0.1	456	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5186	0.1	592	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL EMISSIONS (lbs/yr)			**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.2**	**0.1**	**0.1**	**0.1**	**0.3**
TOTAL EMISSIONS (TPY)			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[1] Actual Fuel Use is from Fuel Storage calculations. Fuel used in the same building by more than one boiler was distributed proportionately to boiler capacity.

BOILERS (Fuel Oil) - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Fuel Type: ULSD
Calculation Method: Emission Factors
Fuel Oil Heat Value (Btu/gal) 140,000 [Reference 1, Appendix A (Typical Parameters of Various Fuels - Distillate Oil)]

Source Classification Code (SCC):

	SCC
Commercial/Institutional Boilers (<10 MMBtu/hr) (Distillate Fuel Oil)	1-03-005-03

References:
1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, May 2010
2. Alaska Department of Environmental Conservation Air Quality Permit AQ0236TVP03

B. EMISSION CALCULATION METHOD

Boiler Size	Emission Factor (lbs/10^{12} Btu)[1]									
	Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde[2]	Lead	Mercury	Manganese	Nickel	Selenium
Distillate Oil-Fired Boilers	4	3	3	3	0.048	9	3	6	3	15

[1] Reference 1, Tables 1.3-8, 1.3-10
[2] Formaldehyde emission factor has units of (lbs/1,000 gal)

Emission Calculation:
Potential Emissions (lbs/yr) = Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/10^12 Btu)
Potential Emissions (lbs/yr) =Boiler Capacity (MMBTU/hr) x Emission Factor (lbs/1,000 gal) x 8760 (hr/year) / Fuel Heat Value (140 Btu/1000 gal)

C. EMISSION SUMMARY

Building Number	Boiler Capacity (MMBtu/hr)	Emissions (lbs/yr)									
		Arsenic	Beryllium	Cadmium	Chromium	Formaldehyde	Lead	Mercury	Manganese	Nickel	Selenium
1171	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1172	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
1172	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1185	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2
1185	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.2
1191	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1815	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2090	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2090	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2092	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2092	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2096	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
2096	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
2400	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4076	19.0	0.7	0.5	0.5	0.5	0.0	1.5	0.5	1.0	0.5	2.5
4321	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4322	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5003	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5007	2.6	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.3
5008	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5009	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5010	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
5109	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5110	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5113	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5119	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5142	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5144	0.7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
5149	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5149	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5163	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5186	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL EMISSIONS (lbs/yr)		**2.5**	**1.9**	**1.9**	**1.9**	**0.0**	**5.7**	**1.9**	**3.8**	**1.9**	**9.5**
TOTAL EMISSIONS (TPY)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

DEGREASING - EMISSIONS SUMMARY

Degreasing - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.91
PM_{10}	N/A

Degreasing - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	3.85
PM_{10}	N/A

DEGREASING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

Degreasing: General Degreasing Unit	4-01-002-96

Notes:
Amount of solvent added is based on the installation's Hazardous Material Product Use report.
The amount of solvent removed was not available at the time of the inventory.
VOC content is based on the MSDS for each solvent.
There were no HAP emissions from degreasing.

B. EMISSION CALCULATION METHOD

Actual Emission Calculations:
Emissions (lb/yr) = [Solvent Added (gal/yr) - Solvent Removed (gal/yr)] x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Solvent Name	Density of Solvent (lb/gal)	Solvent Added (gal/yr)	Solvent Removed (gal/yr)	VOC Content (%WT)	VOC Emissions (lb/yr)
3015	Heavy Duty Industrial Degreaser	8.26	165.00	0.00	95.0%	1,294.22
3018	Loctite Natural Blue Biodegradable	8.34	10.00	0.00	4.4%	3.63
3018	Omni Biodegradable Degreaser	8.51	0.50	0.00	0.0%	0.00
3018	Citratech, Citrus Cleaner	6.68	45.00	0.00	94.9%	285.28
3475	Electron Dielectric Solvent	6.54	48.00	0.00	78.4%	246.06
3490	Paradigm	8.76	1.00	0.00	0.0%	0.00
TOTAL EMISSIONS (lb/yr)						**1,829.19**
TOTAL EMISSIONS (TPY)						**0.91**

DEGREASING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

Degreasing: General Degreasing Unit	4-01-002-96

Notes: Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Emission Calculations:

Emissions (lb/yr) = [Solvent Added (gal/yr) - Solvent Removed (gal/yr)] x Density (lb/gal) x VOC Content (%WT)

C. EMISSION SUMMARY

Building	Solvent Name	Density of Solvent (lb/gal)	Potential Solvent Added (gal/yr)	Potential Solvent Removed (gal/yr)	VOC Content (%WT)	VOC Emissions (lb/yr)
3015	Heavy Duty Industrial Degreaser	8.26	694.90	0.00	95.0%	5,450.67
3018	Loctite Natural Blue Biodegradable	8.34	42.12	0.00	4.4%	15.28
3018	Omni Biodegradable Degreaser	8.51	2.11	0.00	0.0%	0.00
3018	Citratech, Citrus Cleaner	6.68	189.52	0.00	94.9%	1,201.48
3475	Electron Dielectric Solvent	6.54	202.15	0.00	78.4%	1,036.29
3490	Paradigm	8.76	4.21	0.00	0.0%	0.00
TOTAL EMISSIONS (lb/yr)						**7,703.72**
TOTAL EMISSIONS (TPY)						**3.85**

FUEL DISPENSING STATION - EMISSIONS SUMMARY

Fuel Dispensing Station - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.65**
PM_{10}	**N/A**
CO_2	**N/A**
CH_4	**N/A**
HAPs	**0.15**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
n-Hexane	0.02
Methyl-t-butyl ether	0.09
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
m & p-Xylene	0.01
o-Xylene	<0.01

Fuel Dispensing Station - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC - VOC_{HAP}	**0.66**
PM_{10}	**N/A**
CO_2	**N/A**
CH_4	**N/A**
HAPs	**0.66**
Benzene	0.03
Cumene	<0.01
Ethyl benzene	0.01
n-Hexane	0.09
Methyl-t-butyl ether	0.39
Naphthalene	<0.01
Toluene	0.06
2,2,4-Trimethylpentane	0.06
m & p-Xylene	0.02
o-Xylene	0.01

FUEL DISPENSING STATION - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References: Gasoline Service Station Industrywide Risk Assessment Guidelines. California Air Pollution Control Officers Association, November 1997

Notes: Calculations assume no Stage II vapor recovery on dispensing nozzles

B. EMISSION CALCULATION METHOD

Gasoline Storage and Dispensing Emission Factors

Emission Process	VOC Emissions (lbs/1,000 gal)		
	AST[1]	UST-1[2]	UST-2[3]
Tank Filling (Loading)	0.42	0.42	0.084
Tank Breathing	2.1	0.84	0.21
Vehicle Refueling	8.4	8.4	8.4
Spillage	0.61	0.61	0.61
Total Emission Factor	**11.53**	**10.27**	**9.30**

[1] Reference, Appendix A, Scenario 2 - AST, Phase I controls (only)

[2] Reference, Appendix A, Scenario 5A - UST, Phase I controls (only)

[3] Reference, Appendix A, Scenario 5B - UST, Phase I controls with vent valves

Emission Calculation:

Emissions (lb/yr) = Fuel Throughput (gal/yr) x Emission Factor (lb/1,000 gal)

C. EMISSION SUMMARY

Location	Bldg	Fuel Grade	Tank Capacity (gal)	Tank Configuration	Actual Fuel Throughput (gal/yr)	VOC Emissions (lbs/yr)
Main Fuelpoint	3484	Regular	12,000	AST	140,417	1,619.0
TOTAL EMISSIONS (lbs/yr)						**1,619.0**
TOTAL EMISSIONS (TPY)						**0.81**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))						**1,303.3**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**0.65**

FUEL DISPENSING STATION - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References: Gasoline Service Station Industrywide Risk Assessment Guidelines. California Air Pollution Control Officers Association, November 1997

Notes: Calculations assume no Stage II vapor recovery on dispensing nozzles
Actual hours of operation (8 hrs/day x 5 days/wk) (hrs/wk) : 40
Potential hours of operation (24 hrs/day x 7 days/wk) (hrs/wk): 168

B. EMISSION CALCULATION METHOD

Gasoline Storage and Dispensing Emission Factors

Emission Process	VOC Emissions (lbs/1,000 gal)		
	AST[1]	UST-1[2]	UST-2[3]
Tank Filling (Loading)	0.42	0.42	0.084
Tank Breathing	2.1	0.84	0.21
Vehicle Refueling	8.4	8.4	8.4
Spillage	0.61	0.61	0.61
Total Emission Factor	**11.53**	**10.27**	**9.30**

[1] Reference, Appendix A, Scenario 2 - AST, Phase I controls (only)
[2] Reference, Appendix A, Scenario 5A - UST, Phase I controls (only)
[3] Reference, Appendix A, Scenario 5B - UST, Phase I controls with vent valves

Emission Calculation:
Emissions (lbs/yr) = Actual Fuel Throughput (gal/yr) x [Potential Operation (hrs/wk) / Actual Operation (hrs/wk)] x Emission Factor (lb/1,000 gal)

C. EMISSION SUMMARY

Location	Bldg	Fuel Grade	Tank Capacity (gal)	Tank Configuration	Actual Fuel Throughput (gal/yr)	Potential Fuel Throughput (gal/yr)	VOC Emissions (lbs/yr)
Main Fuelpoint	3484	Regular	12,000	AST	140,417	589,751	6,799.8
TOTAL EMISSIONS (lbs/yr)							**6,799.8**
TOTAL EMISSIONS (TPY)							**3.40**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))							**1,326**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))							**0.66**

FUEL DISPENSING STATION - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References:
1. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 87 - not adjusted for oxygenates [Profile 8546]
2. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 89 - not adjusted for oxygenates [Profile 8547]
3. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 93 - not adjusted for oxygenates [Profile 8548]

Notes: Actual VOC emissions from Gasoline Dispensing Station Criteria Pollutant worksheet:
Grade 87 (regular) Gasoline VOCs (lbs/yr): 1,619.0
Grade 89 (mid-grade) Gasoline VOCs (lbs/yr): (n/a)
Grade 93 (premium) Gasoline VOCs (lbs/yr): (n/a)

B. EMISSION CALCULATION METHOD

HAP Emission Factors

Fuel Type	HAP Vapor Phase Concentration (%WT)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline [1]	0.95%	0.01%	0.20%	2.55%	11.50%	0.01%	1.81%	1.65%	0.63%	0.21%
Grade 89 (midgrade) Gasoline [2]	1.35%	0.04%	0.35%	2.86%	16.43%	0.04%	3.26%	3.76%	1.15%	0.44%
Grade 93 (premium) Gasoline [3]	0.73%	0.02%	0.32%	0.86%	15.53%	0.03%	3.43%	4.16%	1.11%	0.40%

[1]Reference 1; [2]Reference 2; [3]Reference 3

Emission Calculation:
HAP Emissions (lb/yr) = VOC Emissions (lb/yr) x HAP Vapor Phase Concentration (%WT)

C. EMISSION SUMMARY

Fuel Type	HAP Emissions (lbs/yr)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline	15.3	0.2	3.2	41.3	186.1	0.2	29.2	26.7	10.1	3.4
TOTAL EMISSIONS (lbs/yr)	**15.3**	**0.2**	**3.2**	**41.3**	**186.1**	**0.2**	**29.2**	**26.7**	**10.1**	**3.4**
TOTAL EMISSIONS (TPY)	**0.01**	**<0.01**	**<0.01**	**0.02**	**0.09**	**<0.01**	**0.01**	**0.01**	**0.01**	**<0.01**

FUEL DISPENSING STATION - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance

Source Classification Code (SCC):

	SCC
Gasoline Retail Operations - Stage I, Balanced submerged filling	4-06-003-06
Gasoline Retail Operations - Stage I, UST breathing and emptying	4-06-003-07
Filling Vehicle Gas Tanks - Stage II, Vapor loss	4-06-004-01
Filling Vehicle Gas Tanks - Stage II, Liquid spillage	4-06-004-02

References:
1. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 87 - not adjusted for oxygenates [Profile 8546]
2. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 89 - not adjusted for oxygenates [Profile 8547]
3. SPECIATE 4.2, November 2008, Gasoline Headspace Vapor - Chevron Grade 93 - not adjusted for oxygenates [Profile 8548]

Notes: Potential VOC emissions from Gasoline Dispensing Station Criteria Pollutant worksheet:
Grade 87 (regular) Gasoline VOCs (lbs/yr): 6,799.8
Grade 89 (mid-grade) Gasoline VOCs (lbs/yr): (n/a)
Grade 93 (premium) Gasoline VOCs (lbs/yr): (n/a)

B. EMISSION CALCULATION METHOD

HAP Emission Factors

Fuel Type	HAP Vapor Phase Concentration (%WT)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline [1]	0.95%	0.01%	0.20%	2.55%	11.50%	0.01%	1.81%	1.65%	0.63%	0.21%
Grade 89 (midgrade) Gasoline [2]	1.35%	0.04%	0.35%	2.86%	16.43%	0.04%	3.26%	3.76%	1.15%	0.44%
Grade 93 (premium) Gasoline [3]	0.73%	0.02%	0.32%	0.86%	15.53%	0.03%	3.43%	4.16%	1.11%	0.40%

[1]Reference 1; [2]Reference 2; [3]Reference 3

Emission Calculation:
HAP Emissions (lb/yr) = VOC Emissions (lb/yr) x HAP Vapor Phase Concentration (%WT)

C. EMISSION SUMMARY

Fuel Type	HAP Emissions (lbs/yr)									
	Benzene	Cumene	Ethyl Benzene	n-Hexane	Methyl-t-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	m & p-Xylene	o-Xylene
Grade 87 (regular) Gasoline	64.3	1.0	13.6	173.3	781.7	0.7	122.8	112.0	42.6	14.2
TOTAL EMISSIONS (lbs/yr)	**64.3**	**1.0**	**13.6**	**173.3**	**781.7**	**0.7**	**122.8**	**112.0**	**42.6**	**14.2**
TOTAL EMISSIONS (TPY)	**0.03**	**<0.01**	**0.01**	**0.09**	**0.39**	**<0.01**	**0.06**	**0.06**	**0.02**	**0.01**

FUEL STORAGE - EMISSIONS SUMMARY

Fuel Storage - Actual Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC	**2.32**
PM_{10}	**N/A**
HAPs	**0.05**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
Hexane	<0.01
Methyl tert-butyl ether	0.03
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
Xylenes	<0.01

Fuel Storage - Potential Emissions

Pollutant	TPY
NO_x	**N/A**
SO_2	**N/A**
CO	**N/A**
VOC	**3.48**
PM_{10}	**N/A**
HAPs	**0.08**
Benzene	0.01
Cumene	<0.01
Ethyl benzene	<0.01
Hexane	0.01
Methyl tert-butyl ether	0.05
Naphthalene	<0.01
Toluene	0.01
2,2,4-Trimethylpentane	0.01
Xylenes	<0.01

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Actual Fuel Throughput (gal/yr):

1,543,558	(JP-4)
274,442	(JP-8)
90,520	(FS1)
66,228	(Diesel)
140,417	(MOGAS)

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breating Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breating Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:

1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

B. EMISSION CALCULATION METHOD

Actual Fuel Use Calculation:

Actual Fuel Use (gal/yr) = Tank Volume (gal) x Turnover Factor for Fuel Type (n/yr)

Actual Fuel Use (gal/yr) values obtained from contract responsible for fuel procurement on Fort Wainwright

Actual VOC Emission Calculation:

EPA Tanks 4.09d was utilized to determine VOC emissions

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

C. EMISSION SUMMARY

Fuel	Throughput (gal/yr)	Tank Volume (gal)	Turnovers per Tank (n/yr)
JP-4	1,543,558	72,000	21.44
JP-8	274,442	60,000	4.57
FS1	90,520	38,600	2.35
Diesel	66,228	121,700	0.54
MOGAS	140,417	18,500	7.59

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	VOC Emissions (lb/yr)
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	15,850	8,625	2.56
Bassett Hospital	AST	Diesel	100	54	0.02
Bassett Hospital	AST	Diesel	100	54	0.02
Bassett Hospital	AST	Diesel	100	54	0.02
1171	UST	Diesel	1,000	2,000	0.01
1172	UST	FS1	3,000	12,000	0.11
1185	UST	FS1	8,000	18,761	0.30
1191	AST	Diesel	1,000	4,600	0.23
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1572	AST	Diesel	300	163	0.03
1580	UST	Diesel	2,500	1,360	0.01
1815	AST	Diesel	1,500	1,500	0.06
2062	UST	FS1	1,000	2,345	0.04
2078	AST	JP-4	36,000	771,779	1,568.25
2078	AST	JP-4	36,000	771,779	1,568.25
2080	UST	Diesel	1,000	544	0.01
2090	UST	Diesel	1,000	7,300	0.01
2092	UST	FS1	3,000	7,035	0.11
2096	UST	Mogas	500	3,795	15.38
2096	UST	Diesel	500	3,500	0.00
2400	AST	Diesel	3,000	3,650	0.09
3015	UST	Diesel	5,000	2,721	0.03

FUEL STORAGE - ACTUAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	VOC Emissions (lb/yr)
3015	UST	Mogas	5,000	37,951	153.79
3484	UST	JP-8	30,000	137,221	1.74
3484	UST	JP-8	30,000	137,221	1.74
3484	AST	Diesel	12,000	6,530	1.69
3484	AST	Mogas	12,000	91,081	1,288.68
4065	UST	Diesel	12,000	6,530	0.06
4065	AST	Diesel	100	54	0.02
4065	AST	Diesel	100	54	0.02
4109	UST	Mogas	1,000	7,590	30.76
4321	UST	FS1	1,000	2,345	0.04
4322	UST	FS1	1,000	2,345	0.04
5003	UST	FS1	1,000	2,345	0.04
5007	UST	FS1	5,000	11,725	0.19
5008	UST	FS1	2,000	8,900	0.08
5009	UST	FS1	2,000	4,690	0.08
5009	AST	Diesel	1,000	544	0.23
5010	UST	FS1	1,500	12,500	0.06
5011	UST	FS1	1,000	2,345	0.04
5108	AST	Diesel	500	272	0.05
5109	AST	Diesel	1,000	2,500	0.23
5110	UST	Diesel	1,000	2,345	0.04
5113	AST	Diesel	500	571	0.05
5119	AST	Diesel	500	535	0.05
5142	AST	Diesel	1,000	669	0.23
5144	AST	Diesel	1,000	2,241	0.23
5149	AST	Diesel	3,000	1,633	0.09
5157	AST	Diesel	300	354	0.03
5159	AST	Diesel	300	359	0.03
5163	AST	Diesel	500	456	0.05
5175	AST	Diesel	250	1,345	0.02
5186	AST	Diesel	1,000	592	0.23
TOTAL EMISSIONS (lb/yr)					**4,646.5**
TOTAL EMISSIONS (TPY)					**2.32**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**4,533.9**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**2.27**

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Actual Fuel Throughput (gal/yr):

274,442	(JP-8)
66,228	(Diesel)
140,417	(MOGAS)

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breathing Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breathing Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12

References:
1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes: Since throughput for each individual tank was not available, distribution is based on size of each tank.
To calculate potential emissions, it was assumed that current deployment preparation could result in an OPTEMPO twice the non-deployment OPTEMPO.
Therefore, the rate of fuel consumption would be twice the non-deployment rate.

B. EMISSION CALCULATION METHOD

Potential Fuel Use Calculation:
Potential Fuel Use (gal/yr) = Actual Fuel Use (gal/yr) x 2 (Increased OPTEMPO)

Potential VOC Emission Calculation:
EPA Tanks 4.09d was utilized to determine VOC emissions

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	Potential Fuel Use (gal/yr)	VOC Emissions (lb/yr)
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	15,850	8,625	17,251	2.65
Bassett Hospital	AST	Diesel	100	54	109	0.02
Bassett Hospital	AST	Diesel	100	54	109	0.02
Bassett Hospital	AST	Diesel	100	54	109	0.02
1171	UST	Diesel	1,000	2,000	4,000	0.01
1172	UST	FS1	3,000	12,000	24,000	0.23
1185	UST	FS1	8,000	18,761	37,521	0.60
1191	AST	Diesel	1,000	4,600	9,200	0.23
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1572	AST	Diesel	300	163	327	0.03
1580	UST	Diesel	2,500	1,360	2,721	0.03
1815	AST	Diesel	1,500	1,500	3,000	0.23
2062	UST	FS1	1,000	2,345	4,690	0.08
2078	AST	JP-4	36,000	771,779	1,543,558	2,429.93
2078	AST	JP-4	36,000	771,779	1,543,558	2,429.93
2080	UST	Diesel	1,000	544	1,088	0.01
2090	UST	Diesel	1,000	7,300	14,600	0.01
2092	UST	FS1	3,000	7,035	14,070	0.17
2096	UST	Diesel	500	3,795	7,590	0.01
2096	UST	Mogas	500	3,500	7,000	30.76
2400	AST	Diesel	3,000	3,650	7,300	0.50
3015	UST	Diesel	5,000	2,721	5,442	0.05
3015	UST	Mogas	5,000	37,951	75,901	307.57
3484	UST	JP-8	30,000	137,221	274,442	3.48
3484	UST	JP-8	30,000	137,221	274,442	3.48
3484	AST	Diesel	12,000	6,530	13,061	1.75
3484	AST	Mogas	12,000	91,081	182,163	1,671.51
4065	AST	Diesel	100	54	109	0.02
4065	AST	Diesel	100	54	109	0.02
4065	UST	Diesel	12,000	6,530	13,061	0.13
4109	UST	Mogas	1,000	7,590	15,180	61.51
4321	UST	FS1	1,000	2,345	4,690	0.08
4322	UST	FS1	1,000	2,345	4,690	0.08
5003	UST	FS1	1,000	2,345	4,690	0.08
5007	UST	FS1	5,000	11,725	23,451	0.38

FUEL STORAGE - POTENTIAL EMISSIONS (Criteria Pollutants)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual Fuel Use (gal/yr)	Potential Fuel Use (gal/yr)	VOC Emissions (lb/yr)
5008	UST	FS1	2,000	8,900	17,800	0.15
5009	UST	FS1	2,000	4,690	9,380	0.15
5009	AST	Diesel	1,000	544	1,088	0.23
5010	UST	FS1	1,500	12,500	25,000	0.11
5011	UST	FS1	1,000	2,345	4,690	0.08
5108	AST	Diesel	500	272	544	0.06
5110	UST	Diesel	1,000	2,345	4,690	0.08
5113	AST	Diesel	500	571	1,142	0.06
5119	AST	Diesel	500	535	1,070	0.06
5142	AST	Diesel	1,000	669	1,337	0.23
5144	AST	Diesel	1,000	2,241	4,482	0.23
5149	AST	Diesel	3,000	1,000	2,000	0.50
5157	AST	Diesel	300	354	707	0.03
5159	AST	Diesel	300	359	718	0.03
5163	AST	Diesel	500	456	912	0.06
5175	AST	Diesel	250	1,345	2,690	0.02
5186	AST	Diesel	1,000	592	1,184	0.23
TOTAL EMISSIONS (lb/yr)						**6,958.6**
TOTAL EMISSIONS (TPY)						**3.48**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))						**6,799.6**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))						**3.40**

FUEL STORAGE - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breating Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breating Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:

1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes: Since throughput for each individual tank was not available, fuel distribution is based on size of each tank.

B. EMISSION CALCULATION METHOD

Fuel Type	HAP Vapor Phase Concentration in Fuel (%WT)								
	Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylene
Diesel Fuel [1]	7.20%	0.40%	0.70%	2.30%	---	---	4.10%	---	2.50%
JP-8 [2]	0.613%	0.330%	0.271%	---	---	0.003%	1.143%	0.010%	1.877%
MOGAS[3]	0.600%	0.020%	0.040%	0.500%	4.600%	---	0.700%	0.700%	0.200%

[1] Reference 1, Table 13-3, Weight Percent in Vapor-Phase
[2] Reference 1, Table 13-2, Weight Percent in Vapor-Phase
[3] Reference 1, Table 15-2, Weight Percent in Vapor-Phase

Emission Calculation

HAP Emissions (lb/yr) = VOC Emissions for fuel type (lb/yr) x HAP vapor phase concentration for fuel type (%WT)

FUEL STORAGE - ACTUAL EMISSIONS (HAPs)

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	15,850	2.6	0.18	0.01	0.02	0.06	--	--	0.10	--	0.06
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
Bassett Hospital	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1171	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1172	UST	FS1	3,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
1185	UST	FS1	8,000	0.3	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.01
1191	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1572	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1580	UST	Diesel	2,500	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
1815	AST	Diesel	1,500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2062	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
2078	AST	JP-4	36,000	1,568.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2078	AST	JP-4	36,000	1,568.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2080	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2090	UST	Diesel	1,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2092	UST	FS1	3,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
2096	UST	Diesel	500	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
2096	UST	Mogas	500	15.4	0.09	0.00	0.01	0.08	0.71	--	0.11	0.11	0.03
2400	AST	Diesel	3,000	0.1	0.01	0.00	0.00	0.00	--	--	0.00	--	0.00
3015	UST	Diesel	5,000	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
3015	UST	Mogas	5,000	153.8	0.92	0.03	0.06	0.77	7.07	--	1.08	1.08	0.31
3484	UST	JP-8	30,000	1.7	0.01	0.01	0.00	--	--	0.00	0.02	0.00	0.03
3484	UST	JP-8	30,000	1.7	0.01	0.01	0.00	--	--	0.00	0.02	0.00	0.03
3484	AST	Diesel	12,000	1.7	0.12	0.01	0.01	0.04	--	--	0.07	--	0.04
3484	AST	Mogas	12,000	1,288.7	7.73	0.26	0.52	6.44	59.28	--	9.02	9.02	2.58
4065	UST	Diesel	12,000	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4065	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4065	AST	Diesel	100	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
4109	UST	Mogas	1,000	30.8	0.18	0.01	0.01	0.15	1.41	--	0.22	0.22	0.06
4321	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
4322	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5003	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5007	UST	FS1	5,000	0.2	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5008	UST	FS1	2,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00

FUEL STORAGE - ACTUAL EMISSIONS (HAPs)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Actual VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
5009	UST	FS1	2,000	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5009	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5010	UST	FS1	1,500	0.1	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5011	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5108	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5110	UST	FS1	1,000	0.0	0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00
5113	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5119	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5142	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5144	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
5149	AST	Diesel	3,000	0.1	0.01	0.00	0.00	0.00	--	--	0.00	--	0.00
5157	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5159	AST	Diesel	300	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5163	AST	Diesel	500	0.1	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5175	AST	Diesel	250	0.0	0.00	0.00	0.00	0.00	--	--	0.00	--	0.00
5186	AST	Diesel	1,000	0.2	0.02	0.00	0.00	0.01	--	--	0.01	--	0.01
TOTAL EMISSIONS (lb/yr)					**10.1**	**0.4**	**0.7**	**7.8**	**68.5**	**<0.1**	**11.1**	**10.4**	**3.5**
TOTAL EMISSIONS (TPY)					**0.01**	**<0.01**	**<0.01**	**<0.01**	**0.03**	**<0.01**	**0.01**	**0.01**	**<0.01**

FUEL STORAGE - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors and Emissions Software

Source Classification Code (SCC):

	SCC
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Breathing Loss	4-04-004-03
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Gasoline RVP 10: Working Loss	4-04-004-04
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Breathing Loss	4-04-004-11
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Jet Kerosene, Working Loss	4-04-004-12
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Breathing Loss	4-04-004-13
Petroleum Liquid Storage (non-refinery) Petroleum Products, USTs, Distillate Fuel #2, Working Loss	4-04-004-14

References:

1. IERA-RS-BR-SR-1999-0001, Air Emission Inventory Guidance Document for Stationary Sources at Air Force Installations, May 1999 (Revised December 2003)
2. TANKS Version 4.09d, Storage Tank Emissions Calculation Software, updated October 2005

Notes:

Since throughput for each individual tank was not available, distribution is based on size of each tank.
To calculate potential emissions, it was assumed that current deployment preparation could result in an OPTEMPO twice the non-deployment OPTEMPO.
Therefore, the rate of fuel consumption would be twice the non-deployment rate.

B. EMISSION CALCULATION METHOD

Fuel Type	HAP Vapor Phase Concentration in Fuel (%WT)								
	Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylene
Diesel Fuel [1]	7.20%	0.40%	0.70%	2.30%	---	---	4.10%	---	2.50%
JP-8 [2]	0.613%	0.330%	0.271%	---	---	0.003%	1.143%	0.010%	1.877%
MOGAS[3]	0.600%	0.020%	0.040%	0.500%	4.600%	---	0.700%	0.700%	0.200%

[1] Reference 1, Table 13-3, Weight Percent in Vapor-Phase
[2] Reference 1, Table 13-2, Weight Percent in Vapor-Phase
[3] Reference 1, Table 15-2, Weight Percent in Vapor-Phase

Emission Calculation

HAP Emissions (lb/yr) = VOC Emissions for fuel type (lb/yr) x HAP vapor phase concentration for fuel type (%WT)

FUEL STORAGE - POTENTIAL EMISSIONS (HAPs)

C. EMISSION SUMMARY

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Potential VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	15,850	2.65	0.19	0.01	0.02	0.06	---	---	0.11	---	0.07
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
Bassett Hospital	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1171	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1172	UST	FS1	3,000	0.23	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
1185	UST	FS1	8,000	0.60	0.00	0.00	0.00	---	---	0.00	0.01	0.00	0.01
1191	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1572	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1580	UST	Diesel	2,500	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
1815	AST	Diesel	1,500	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
2062	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
2078	AST	JP-4	36,000	2,429.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2078	AST	JP-4	36,000	2,429.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2080	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
2090	UST	Diesel	1,000	0.01	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
2092	UST	FS1	3,000	0.17	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
2096	UST	Mogas	500	0.01	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00
2096	UST	Diesel	500	30.76	2.21	0.12	0.22	0.71	---	---	1.26	---	0.77
2400	AST	Diesel	3,000	0.50	0.04	0.00	0.00	0.01	---	---	0.02	---	0.01
3015	UST	Diesel	5,000	0.05	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
3015	UST	Mogas	5,000	307.57	1.85	0.06	0.12	1.54	14.15	---	2.15	2.15	0.62
3484	UST	JP-8	30,000	3.48	0.02	0.01	0.01	---	---	0.00	0.04	0.00	0.07
3484	UST	JP-8	30,000	3.48	0.02	0.01	0.01	---	---	0.00	0.04	0.00	0.07
3484	AST	Diesel	12,000	1.75	0.13	0.01	0.01	0.04	---	---	0.07	---	0.04
3484	AST	Mogas	12,000	1,671.51	10.03	0.33	0.67	8.36	76.89	---	11.70	11.70	3.34
4065	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
4065	AST	Diesel	100	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
4065	UST	Diesel	12,000	0.13	0.01	0.00	0.00	0.00	---	---	0.01	---	0.00
4109	UST	Mogas	1,000	61.51	0.37	0.01	0.02	0.31	2.83	---	0.43	0.43	0.12
4321	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
4322	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5003	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5007	UST	FS1	5,000	0.38	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.01

FUEL STORAGE - POTENTIAL EMISSIONS (HAPs)

Bldg #	Tank Type	Fuel Type	Tank Capacity (gal)	Potential VOC Emissions (lb/yr)	HAP Emissions (lb/yr)								
					Benzene	Cumene	Ethyl Benzene	Hexane	Methyl tert-butyl ether	Naphthalene	Toluene	2,2,4-Trimethylpentane	Xylenes
5008	UST	FS1	2,000	0.15	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5009	UST	FS1	2,000	0.15	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5009	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5010	UST	FS1	1,500	0.11	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5011	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5108	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5110	UST	FS1	1,000	0.08	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00
5113	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5119	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5142	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5144	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
5149	AST	Diesel	3,000	0.50	0.04	0.00	0.00	0.01	---	---	0.02	---	0.01
5157	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5159	AST	Diesel	300	0.03	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5163	AST	Diesel	500	0.06	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5175	AST	Diesel	250	0.02	0.00	0.00	0.00	0.00	---	---	0.00	---	0.00
5186	AST	Diesel	1,000	0.23	0.02	0.00	0.00	0.01	---	---	0.01	---	0.01
TOTAL EMISSIONS (lb/yr)					**15.8**	**0.6**	**1.2**	**11.3**	**93.9**	**<0.1**	**16.4**	**14.3**	**5.5**
TOTAL EMISSIONS (TPY)					**0.01**	**<0.01**	**<0.01**	**0.01**	**0.05**	**<0.01**	**0.01**	**0.01**	**<0.01**

INTERNAL COMBUSTION ENGINES - EMISSIONS SUMMARY

Internal Combustion Engines - Actual Emissions

Pollutant	TPY
NO_x	**0.76**
SO_2	**0.05**
CO	**0.16**
VOC - VOC_{HAPS}	**0.06**
PM_{10}	**0.05**
CO_2	**28.10**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

Internal Combustion Engines - Potential Emissions

Pollutant	TPY
NO_x	**16.08**
SO_2	**1.06**
CO	**3.47**
VOC - VOC_{HAPS}	**1.30**
PM_{10}	**1.14**
CO_2	**596.56**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

INTERNAL COMBUSTION ENGINES - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors

Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: All Reciprocating Internal Combustion Engines (RICE) are fire pumps.

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines < or = 447 kW (600 hp)	3.10E-02	2.05E-03	6.68E-03	2.51E-03	2.20E-03	1.15E+00

[1]Reference 1, Table 3.3-1

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1572	Clarke	1994	DDFP-04AT	235	25	182.1	12.0	39.2	14.8	12.9	6756.25
1572	Clarke	1994	DDFP-04AT	235	22	160.3	10.6	34.5	13.0	11.4	5945.50
1572	Clarke	1994	DDFP-04AT	235	24	174.8	11.6	37.7	14.2	12.4	6486.00
1572	Clarke	1994	DDFP-04AT	235	26	189.4	12.5	40.8	15.4	13.4	7026.50
2080	Cummins	1977	N-855-F	240	25	186.0	12.3	40.1	15.1	13.2	6900.00
2080	Cummins	1977	N-855-F	240	24	178.6	11.8	38.5	14.5	12.7	6624.00
2089	John Deere	2007	JW64-UF30	275	10	85.3	5.6	18.4	6.9	6.1	3162.50
3498	Clarke	2005	JU4H-UF40	140	38	164.9	10.9	35.5	13.4	11.7	6118.00
5009	Clarke	1996	PDFP-06YT	120	25	93.0	6.2	20.0	7.5	6.6	3450.00
5009	Clarke	1996	PDFP-06YT	120	27	100.4	6.6	21.6	8.1	7.1	3726.00
TOTAL EMISSIONS (lbs/yr)						**1,514.8**	**100.2**	**326.4**	**122.9**	**107.5**	**56194.75**
TOTAL EMISSIONS (TPY)						**0.76**	**0.05**	**0.16**	**0.06**	**0.05**	**28.10**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

Reference: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) The fire pumps of Fort Wainwright are emergency engines

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines < or = 447 kW (600 hp)	3.10E-02	2.05E-03	6.68E-03	2.51E-03	2.20E-03	1.15E+00

[1]Reference, Table 3.3-1

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
1572	Clarke	1994	DDFP-04AT	235	500	3,642.5	240.9	784.9	295.4	258.5	135,125.0
2080	Cummins	1977	N-855-F	240	500	3,720.0	246.0	801.6	301.7	264.0	138,000.0
2080	Cummins	1977	N-855-F	240	500	3,720.0	246.0	801.6	301.7	264.0	138,000.0
2089	Clarke	2007	JW64-UF30	275	500	4,262.5	281.9	918.5	345.7	302.5	158,125.0
3498	Clarke	2005	JU4H-UF40	140	500	2,170.0	143.5	467.6	176.0	154.0	80,500.0
5009	Clarke	1996	PDFP-06YT	120	500	1,860.0	123.0	400.8	150.8	132.0	69,000.0
5009	Clarke	1996	PDFP-06YT	120	500	1,860.0	123.0	400.8	150.8	132.0	69,000.0
TOTAL EMISSIONS (lbs/yr)						**32,162.5**	**2,126.9**	**6,930.5**	**2,608.4**	**2,282.5**	**1,193,125.0**
TOTAL EMISSIONS (TPY)						**16.08**	**1.06**	**3.47**	**1.30**	**1.14**	**596.56**

INTERNAL COMBUSTION ENGINES - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: All Reciprocating Internal Combustion Engines (RICE) are fire pumps.

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	1.68E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2.
[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1572	Clarke	235	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2089	Clarke	275	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3498	Clarke	94	38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**2.2E-09**	**2.2E-08**	**9.2E-10**	**2.8E-08**	**4.0E-09**	**9.6E-09**	**6.7E-09**	**0.0E+00**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Codes (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, January 1995

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) The fire pumps of Fort Wainwright are emergency engines

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	2.12E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2.

[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Capacity (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1572	Clarke	235	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2080	Cummins	240	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2089	Clarke	275	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3498	Clarke	94	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5009	Clarke	120	500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**4.7E-08**	**4.7E-07**	**2.0E-08**	**6.0E-07**	**1.1E-07**	**2.1E-07**	**1.4E-07**	**0.0E+00**

EMERGENCY GENERATORS - EMISSIONS SUMMARY

Emergency Generators - Actual Emissions

Pollutant	TPY
NO_x	**0.84**
SO_2	**0.86**
CO	**0.77**
VOC	**0.16**
PM_{10}	**0.04**
CO_2	**155.38**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
Naphthalene	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

Internal Combustion Engines - Potential Emissions

Pollutant	TPY
NO_x	**14.53**
SO_2	**1.58**
CO	**13.26**
VOC	**3.01**
PM_{10}	**0.69**
CO_2	**2,668.19**
HAPs	
Acetaldehyde	<0.01
Acrolein	<0.01
Benzene	<0.01
1,3-Butadiene	<0.01
Formaldehyde	<0.01
Naphthalene	<0.01
POM	<0.01
Toluene	<0.01
Xylene	<0.01

EMERGENCY GENERATORS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines > 447 kW (600 hp)	6.20E-03	8.09E-03	5.75E-03	7.05E-04	3.00E-04	1.16E+00
Internal Combustion Engines < or = 447 kW (600 hp)	6.50E-03	2.05E-03	5.75E-03	2.51E-03	3.00E-04	1.15E+00

[1]Reference 1, Tables 3.3-1, 3.4-1 and 3.4-2.

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

EMERGENCY GENERATORS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1054	Caterpillar	2011	D175-2	235	12.5	19.1	6.0	16.9	7.4	0.9	3378.13
1060	Caterpillar	2011	LC6	762	24	113.4	147.9	105.2	12.9	5.5	21214.08
1060	Caterpillar	2011	LC6	762	18.4	86.9	113.4	80.6	9.9	4.2	16264.13
1193	Cummins	2011	DGHE-5570444	82	15.2	8.1	2.6	7.2	3.1	0.4	1433.36
1555	Caterpillar	2011	SR4B	587	21	80.1	25.3	70.9	31.0	3.7	14176.05
1580	Kohler	2010	50REOZJC	67	17.6	7.7	2.4	6.8	3.0	0.4	1356.08
1620	Cummins	2011	DGBB-5630732	47	236.6	72.3	22.8	63.9	28.0	3.3	12788.23
2088	Kohler	2011	125RE0ZJB	168	10.5	11.5	3.6	10.1	4.4	0.5	2028.60
2117	Kohler	2011	750RE0ZDB	1029	8.4	53.6	69.9	49.7	6.1	2.6	10026.58
2117	Kohler	2011	150RE0ZJB	212	9.7	13.4	4.2	11.8	5.2	0.6	2364.86
2121	Onsite Energy	2011	MTU 4R0113 D850	60	10	3.9	1.2	3.5	1.5	0.2	690.00
2132	Cummins	2012	QSB7-G3 NR3	324	33	69.5	21.9	61.5	26.9	3.2	12295.80
2296	Kohler	2011	150RE0ZJB	201	11	14.4	4.5	12.7	5.6	0.7	2542.65
3004	Kohler	2011	50RE0ZJB	67	20.6	9.0	2.8	7.9	3.5	0.4	1587.23
3007	Cummins	2014	DSGAD-14055	235	10	15.3	4.8	13.5	5.9	0.7	2702.50
3028	Kohler	2011	20R0ZJ81	27	21	3.7	1.2	3.3	1.4	0.2	652.05
3406	Caterpillar	2007	CAT C9 GENSET	398	49.4	127.8	40.3	113.1	49.4	5.9	22610.38
3407	Olympian	2011	DG0PZ	80	21.6	11.2	3.5	9.9	4.3	0.5	1987.20
3567	SDMO	ND	TM30UCM	47	3.6	1.1	0.3	1.0	0.4	0.1	194.58
3703	Cummins	2011	25DL6-L34064	34	9.5	2.1	0.7	1.9	0.8	0.1	371.45
4076	Caterpillar	2003	3512	1206	39	291.6	380.5	270.4	33.2	14.1	54559.44
4076	Caterpillar	2003	3512	1206	44	329.0	429.3	305.1	37.4	15.9	61554.24
4076	Caterpillar	2003	3512	1206	43	321.5	419.5	298.2	36.6	15.6	60155.28
4390	Caterpillar	2011	D125-6	168	18.3	20.0	6.3	17.7	7.7	0.9	3535.56
5108	Caterpillar	2011	D13-4	17	14.7	1.6	0.5	1.4	0.6	0.1	287.39
TOTAL EMISSIONS (lbs/yr)						**1,687.7**	**1,715.7**	**1,544.1**	**326.2**	**80.6**	**310755.83**
TOTAL EMISSIONS (TPY)						**0.84**	**0.86**	**0.77**	**0.16**	**0.04**	**155.38**

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

Reference: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) 600 hour limit in current operating permit AQ0236TVP02.

B. EMISSION CALCULATION METHOD

Emission Factors for Uncontrolled Diesel Industrial Engines [Power Output (lb/hp-hr)][1]

	NO_x	SO_2	CO	VOC	PM_{10}	CO_2
Internal Combustion Engines > 447 kW (600 hp)	6.20E-03	1.21E-05	5.75E-03	7.05E-04	3.00E-04	1.16E+00
Internal Combustion Engines < or = 447 kW (600 hp)	6.50E-03	2.05E-03	5.75E-03	2.51E-03	3.00E-04	1.15E+00

[1]Reference 1, Tables 3.3-1, 3.4-1 and 3.4-2.
ˆ SO_2 emissions factor for ICE >447 kW = 0.00809S, where S = weight % sulfur: 0.00809 x 0.0015 = 0.000012135

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hr/yr) x Emission Factor (lb/hp-hr)

INTERNAL COMBUSTION ENGINES - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

C. EMISSION SUMMARY

Building Number	Manufacturer	Manufacturer Year	Model Number	Engine Rating (hp)	Operating Hours (hr/yr)	Emissions (lbs/yr)					
						NO_x	SO_2	CO	VOC	PM_{10}	CO_2
1054	Caterpillar	2011	D175-2	235	500	763.8	240.9	675.6	295.4	35.3	135,125.0
1060	Caterpillar	2011	LC6	762	500	2,362.2	4.6	2,190.8	268.6	114.3	441,960.0
1060	Caterpillar	2011	LC6	762	500	2,362.2	4.6	2,190.8	268.6	114.3	441,960.0
1193	Cummins	2011	DGHE-5570444	82	500	266.5	84.1	235.8	103.1	12.3	47,150.0
1555	Caterpillar	2011	SR4B	587	500	1,907.8	601.7	1,687.6	737.9	88.1	337,525.0
1580	Kohler	2010	4024HF285B	67	500	217.8	68.7	192.6	84.2	10.1	38,525.0
1620	Cummins	2011	DGBB-5630732	47	500	152.8	48.2	135.1	59.1	7.1	27,025.0
2088	Kohler	2011	125RE0ZJB	168	500	546.0	172.2	483.0	211.2	25.2	96,600.0
2117	Kohler	2011	750RE0ZDB	1029	500	3,189.9	6.2	2,958.4	362.7	154.4	596,820.0
2117	Kohler	2011	150RE0ZJB	212	500	689.0	217.3	609.5	266.5	31.8	121,900.0
2121	Onsite Energy	2011	MTU 4R0113 D850	60	500	195.0	61.5	172.5	75.4	9.0	34,500.0
2132	Cummins	2012	QSB7-G3 NR3	324	500	1,053.0	332.1	931.5	407.3	48.6	186,300.0
2296	Kohler	2011	150RE0ZJB	201	500	653.3	206.0	577.9	252.7	30.2	115,575.0
3004	Kohler	2011	50RE0ZJB	67	500	217.8	68.7	192.6	84.2	10.1	38,525.0
3007	Cummins	2014	DSGAD-14055	235	500	763.8	240.9	675.6	295.4	35.3	135,125.0
3028	Kohler	2011	20R0ZJ81	27	500	87.8	27.7	77.6	33.9	4.1	15,525.0
3406	Caterpillar	2007	CAT C9 GENSET	398	500	1,293.5	408.0	1,144.3	500.3	59.7	228,850.0
3407	Olympian	2011	DG0PZ	80	500	260.0	82.0	230.0	100.6	12.0	46,000.0
3567	SDMO	ND	TM30UCM	47	500	152.8	48.2	135.1	59.1	7.1	27,025.0
3703	Cummins	2011	25DL6-L34064	34	500	110.5	34.9	97.8	42.7	5.1	19,550.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	7.3	3,467.3	425.1	180.9	699,480.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	7.3	3,467.3	425.1	180.9	699,480.0
4076	Caterpillar	2003	3512	1206	500	3,738.6	7.3	3,467.3	425.1	180.9	699,480.0
4390	Caterpillar	2011	D125-6	168	500	546.0	172.2	483.0	211.2	25.2	96,600.0
5108	Caterpillar	2011	D13-4	17	500	55.3	17.4	48.9	21.4	2.6	9,775.0
TOTAL EMISSIONS (lbs/yr)						**29,062.1**	**3,169.8**	**26,527.6**	**6,016.8**	**1,384.1**	**5,336,380.0**
TOTAL EMISSIONS (TPY)						**14.53**	**1.58**	**13.26**	**3.01**	**0.69**	**2668.19**

EMERGENCY GENERATORS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Code (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996

Notes:

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines > 447 kW (600 hp)	2.52E-05	7.88E-06	7.76E-04	---	7.89E-05	2.12E-04	2.81E-04	1.93E-04
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	1.68E-04	4.09E-04	2.85E-04

[1]Reference, Table 3.3-2, 3.4-3 and 3.4-4 .
[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

	Naphthalene
Diesel Internal Combustion Engines > 447 kW (600 hp)	1.30E-04

Emission Calculation:
Emissions (lbs/yr) = Engine Rating (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu) x 0.007 Btu/hp-hr

EMERGENCY GENERATORS - ACTUAL EMISSIONS (HAPs)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1054	Caterpillar	235	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	18.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1193	Cummins	82	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1555	Caterpillar	587	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1580	Kohler	67	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1620	Cummins	47	236.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2088	Kohler	168	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	1029	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	212	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2121	Onsite Energy	60	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2132	Cummins	324	33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2296	Kohler	201	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3004	Kohler	67	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3007	Cummins	235	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3028	Kohler	27	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3406	Caterpillar	398	49.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3407	Olympian	80	21.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3703	Cummins	47	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3567	SDMO	34	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	43	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4390	Caterpillar	168	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5108	Caterpillar	17	14.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**1.2E-08**	**1.2E-07**	**5.2E-09**	**1.6E-07**	**2.2E-08**	**5.4E-08**	**3.8E-08**	**0.0E+00**

EMERGENCY GENERATORS - ACTUAL EMISSIONS (HAPs)

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs
				Naphthalene
1054	Caterpillar	235	12	---
1060	Caterpillar	671	10	0.0
1060	Caterpillar	671	20	0.0
1193	Cummins	34	10	---
1555	Caterpillar	536	13	---
1580	Kohler	67	10	---
1620	Cummins	47	10	---
2088	Kohler	168	13	---
2117	Kohler	1006	15	0.0
2117	Kohler	201	15	---
2121	Onsite Energy	60	10	---
2132	Cummins	134	10	---
2296	Kohler	201	12	---
3004	Kohler	67	10	---
3007	Cummins	235	11	---
3028	Kohler	27	9	---
3406	Caterpillar	335	10	---
3407	Olympian	80	9	---
3567	SDMO	47	10	---
3703	Cummins	34	15	---
4076	Caterpillar	1206	34	0.0
4076	Caterpillar	1206	32	0.0
4076	Caterpillar	1206	20	0.0
4390	Caterpillar	168	12	---
5108	Caterpillar	17	17	---
TOTALS (lbs/yr)				**0.0**
TOTALS (TPY)				**0**

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: Emission Factors
Fuel Used: ULSD

Source Classification Codes (SCC):

Internal Combustion Engines	SCC
Diesel Internal Combustion Engines > 447 kW (600 hp)	2-03-001-01
Diesel Internal Combustion Engines < 447 kW (600 hp)	2-03-001-01

References: AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, January 1995

Notes: Potential to emit hours were derived from the following:(a) 500 hour limit in USEPA Memorandum, September 6, 1995, "Calculating Potential to Emit (PTE) for Emergency Generators", and (b) 600 hour limit in current operating permit AQ0236TVP02.

B. EMISSION CALCULATION METHOD

Diesel Engine HAP Emission Factors (lbs/MMBtu)[1]

	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM[2]	Toluene	Xylene
Diesel Internal Combustion Engines > 447 kW (600 hp)	2.52E-05	7.88E-06	7.76E-04	---	7.89E-05	2.12E-04	2.81E-04	1.93E-04
Diesel Internal Combustion Engines < 447 kW (600 hp)	7.67E-04	9.25E-05	9.33E-04	3.91E-05	1.18E-03	2.12E-04	4.09E-04	2.85E-04

	Naphthalene
Diesel Internal Combustion Engines > 447 kW (600 hp)	1.30E-04

[1]Reference, Table 3.3-2, 3.4-3 and 3.4-4 .

[2]Polycyclic Organic Matter (POM) emission factor was deemed equal to the emission factor for Total Polyaromatic Hydrocarbons (PAH)

Emission Calculation:
Emissions (lbs/yr) = Capacity (hp) x Operating Hours (hrs/yr) x Emission Factor (lbs/MMBtu) x (1 MMBtu/ 1,000,000 Btu)

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

C. EMISSION SUMMARY

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs							
				Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	POM	Toluene	Xylene
1054	Caterpillar	235	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1060	Caterpillar	762	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1193	Cummins	82	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1555	Caterpillar	587	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1580	Kohler	67	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1620	Cummins	47	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2088	Kohler	168	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	1029	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2117	Kohler	212	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2121	Onsite Energy	60	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2132	Cummins	324	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2296	Kohler	201	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3004	Kohler	67	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3007	Cummins	235	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3028	Kohler	27	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3406	Caterpillar	398	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3407	Olympian	80	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3567	SDMO	47	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3703	Cummins	34	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4076	Caterpillar	1206	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4390	Caterpillar	168	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5108	Caterpillar	17	8760	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTALS (lbs/yr)				**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**
TOTALS (TPY)				**3.7E-06**	**3.7E-05**	**1.5E-06**	**4.7E-05**	**8.4E-06**	**1.6E-05**	**1.1E-05**	**0.0E+00**

EMERGENCY GENERATORS - POTENTIAL EMISSIONS (HAPs)

Bldg	Manufacturer	Engine Rating (hp)	Operating Hours (hr/yr)	HAPs
				Naphthalene
1054	Caterpillar	235	500	---
1060	Caterpillar	671	500	0.0
1060	Caterpillar	671	500	0.0
1193	Cummins	34	500	---
1555	Caterpillar	536	500	---
1580	Kohler	67	500	---
1620	Cummins	47	500	---
2088	Kohler	168	500	---
2117	Kohler	1006	500	0.0
2117	Kohler	201	500	---
2121	Onsite Energy	60	500	---
2132	Cummins	134	500	---
2296	Kohler	201	500	---
3004	Kohler	67	500	---
3007	Cummins	235	500	---
3028	Kohler	27	500	---
3406	Caterpillar	335	500	---
3407	Olympian	80	500	---
3567	SDMO	47	500	---
3703	Cummins	34	500	---
4076	Caterpillar	1206	500	0.0
4076	Caterpillar	1206	500	0.0
4076	Caterpillar	1206	500	0.0
4390	Caterpillar	168	500	---
5108	Caterpillar	17	500	---
TOTALS (lbs/yr)				**0.0**
TOTALS (TPY)				**0**

LANDFILLS - EMISSIONS SUMMARY

Landfills - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	0.04
NMOC (VOC)	0.57
PM_{10}	N/A
CO_2	240.70
CH_4	87.72
HAPs	0.11
Acrylonitrile	0.00
Benzene	0.00
Carbon disulfide	0.00
Carbon tetrachloride	0.00
Carbonyl sulfide	0.00
Chlorobenzene	0.00
Chloroform	0.00
Ethyl benzene	0.01
Ethyl chloride	0.00
Ethylene dibromide	0.00
Ethylene dichloride	0.00
Ethylidene dichloride	0.00
Hexane	0.01
Mercury	0.00
Methyl chloroform	0.00
Methyl isobutyl ketone	0.00
Methylene chloride	0.01
Propylene dichloride	0.00
1,1,2,2-Tetrachloroethane	0.00
Tetrachloroethylene	0.01
Toluene	0.04
Trichloroethylene	0.00
Vinyl chloride	0.00
Vinylidene chloride	0.00
Xylene	0.01

Landfills- Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	0.04
NMOC (VOC)	0.57
PM_{10}	N/A
CO_2	240.70
CH_4	87.72
HAPs	0.11
Acrylonitrile	0.00
Benzene	0.00
Carbon disulfide	0.00
Carbon tetrachloride	0.00
Carbonyl sulfide	0.00
Chlorobenzene	0.00
Chloroform	0.00
Ethyl benzene	0.01
Ethyl chloride	0.00
Ethylene dibromide	0.00
Ethylene dichloride	0.00
Ethylidene dichloride	0.00
Hexane	0.01
Mercury	0.00
Methyl chloroform	0.00
Methyl isobutyl ketone	0.00
Methylene chloride	0.01
Propylene dichloride	0.00
1,1,2,2-Tetrachloroethane	0.00
Tetrachloroethylene	0.01
Toluene	0.04
Trichloroethylene	0.00
Vinyl chloride	0.00
Vinylidene chloride	0.00
Xylene	0.01

LANDFILLS - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: LandGEM v. 3.02

Source Classification Code:

	SCC
Solid Waste Landfills	5-03-006-01

References: EPA-600/R-05/047, Landfill Gas Emissions Model (LandGEM) Version 3.02 User Guide, May 2005

Notes:
Assumed all municipal solid waste was degradable.
Assumed that L_o=100 m^3/Mg and k=0.02. These were the default values for areas w/ less than 25 inches rainfall/yr (reference 1).
Fairbanks, AK has an average precipitation of 10 inches/yr (http://www.usclimatedata.com/climate.php?location=USAK0083).
Methane concentration is the default value in LandGEM for Clean Air Act compliance calculations
NMOC concentration is for conventional landfills with no or unknown co-disposal of hazardous waste for emission inventories
Since landfills are no longer accepting waste, potential emissions are deemed equal to actual emissions

Landfill Data:

Landfill Data	FWA Landfill
Year landfill opened	1960
Year landfill closed	2000
Mass of Waste (tons)	2,811
Waste Acceptance Rate (short tons/yr)	115,251
Lo (m^3/Mg)	100
k (yr^{-1})	0.02
NMOC Concentration (as ppmv hexane)	500
Methane Concentration (%vol)	50%
Emission Year	2010

B. EMISSION CALCULATION METHOD

Mass of Waste Calculation:
Mass of Waste (Tons) = Waste Acceptance Rate (ton/yr) x Lifespan of Landfill (yr)

Actual Emissions Calculation:
Landfill Emissions were calculated using the LandGEM v 3.02 software

C. EMISSION SUMMARY

Landfill ID No.	Criteria Pollutants (TPY)		GHGs (TPY)	
	CO	NMOC	CO_2	CH_4
FWA Landfill	0.04	0.57	240.70	87.72
TOTAL EMISSIONS (TPY)	**0.04**	**0.57**	**240.70**	**87.72**
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))		**0.46**		

LANDFILLS - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Emission Year: 2020
Calculation Method: LandGEM v. 3.02

Source Classification Code:

	SCC
Solid Waste Landfills	5-03-006-01

References: EPA-600/R-05/047, Landfill Gas Emissions Model (LandGEM) Version 3.02 User Guide, May 2005

Notes:
Assumed all municipal solid waste was degradable.
Assumed that L_o=100 m^3/Mg and k=0.02. These were the default values for areas w/ less than 25 inches rainfall/yr (reference 1).
Fairbanks, AK has an average precipitation of 10 inches/yr (http://www.usclimatedata.com/climate.php?location=USAK0083).
Methane concentration is the default value in LandGEM for Clean Air Act compliance calculations
NMOC concentration is for conventional landfills with no or unknown co-disposal of hazardous waste for emission inventories
Since landfills are no longer accepting waste, potential emissions are deemed equal to actual emissions

Landfill Data:

Landfill Data	FWA Landfill
Year landfill opened	1960
Year landfill closed	2000
Waste Acceptance Rate (short tons/yr)	2,811
Mass of Waste (tons)	115,251
Lo (m^3/Mg)	100
k (yr^{-1})	0.02
NMOC Concentration (as ppmv hexane)	500
Methane Concentration (%vol)	50%
Emission Year	2010

B. EMISSION CALCULATION METHOD

Mass of Waste Calculation:
Mass of Waste (Tons) = Waste Acceptance Rate (ton/yr) x Lifespan of Landfill (yr)

Actual Emissions Calculation:
Landfill Emissions were calculated using the LandGEM v 3.02 software

LANDFILLS - ACTUAL EMISSIONS (HAPs)

C. EMISSION SUMMARY

HAP	Landfill Emissions (TPY)
Acrylonitrile	3.66E-03
Benzene	1.62E-03
Carbon disulfide	4.83E-04
Carbon tetrachloride	6.73E-06
Carbonyl sulfide	3.22E-04
Chlorobenzene	3.08E-04
Chloroform	3.92E-05
Ethyl benzene	5.34E-03
Ethyl chloride	9.18E-04
Ethylene dibromide	2.06E-06
Ethylene dichloride	4.44E-04
Ethylidene dichloride	2.60E-03
Hexane	6.22E-03
Mercury	6.36E-07
Methyl chloroform	7.00E-04
Methyl isobutyl ketone	2.08E-03
Methylene chloride	1.30E-02
Propylene dichloride	2.23E-04
1,1,2,2-Tetrachloroethane	2.02E-03
Tetrachloroethylene	6.71E-03
Toluene	3.93E-02
Trichloroethylene	4.02E-03
Vinyl chloride	4.99E-03
Vinylidene chloride	2.12E-04
Xylene	1.39E-02

SURFACE COATING - EMISSIONS SUMMARY

Surface Coating - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.10
PM_{10}	0.05

Surface Coating - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	0.43
PM_{10}	0.22

SURFACE COATING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lb/gal) 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Application - General	4-02-007-10

Reference:

1. Air Emissions Guide to Air Force Stationary Sources, Air Force Center for Engineering and the Environment, San Antonio, TX, December 2009.

Notes:

Surface coatings emissions are based on the installation Hazardous Material Use reports.
According to reports, all surface coating operations took place at Buildings 3015 and 3490.
All painting was conducted with High Volume/Low Pressure spray guns. Transfer efficiency is equal to 65% (Reference 1, Table 33-4)
Product information, including VOC content, was determined from MSDS.

B. EMISSION CALCULATION METHOD

Emission Calculations:

VOC Emissions (lbs/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x VOC Content (%WT)
PM10 Emissions (lbs/yr) = Product Use (gal/yr) x Specific Gravity x Density of Water (lb/gal) x Solids Content (%WT) x (1 - Transfer Efficiency%)

C. EMISSION SUMMARY

Product Name	Product Use (gal/yr)	Specific Gravity	Density (lbs/gal)	VOC Content (%WT)	VOC Emissions (lbs/yr)	Solids Content (%WT)	Transfer Efficiency (%)	PM_{10} Emissions (lbs/yr)
Building 3015								
Olympic Premium I/E Gloss Base	5.00	1.16	9.65	63.65%	30.7	36.4%	65%	6.1
Plasti Dip Spray	0.96	0.68	5.63	87.30%	4.7	12.7%	65%	0.2
Krylon, Camouflage Paint, Olive	1.03	0.76	6.34	47.23%	3.1	52.8%	65%	1.2
Krylon, Industiral Quik-Mark, Orange	0.75	0.89	7.42	56.25%	3.1	43.8%	65%	0.9
Krylon, Contractor Marking Paint, White	0.92	0.83	6.92	40.91%	2.6	59.1%	65%	1.3
Building 3490								
Brown CARC	1.00	1.28	10.68	33.00%	3.5	67.0%	65%	2.5
CROSSFIRE Acrylic Enamel System	3.00	1.32	10.99	45.00%	14.8	55.0%	65%	6.3
DTM Acrylic Semi-Gloss Acrylic Coating	4.00	1.06	8.84	18.00%	6.4	82.0%	65%	10.1
Green CARC	10.00	1.33	11.09	29.70%	32.9	70.3%	65%	27.3
Polyurethane Aerosol	24.88	0.70	5.84	48.00%	69.7	52.0%	65%	26.4
Black Zenthane	10.00	1.21	10.07	32.70%	32.9	67.3%	65%	23.7
TOTAL EMISSIONS (lbs/yr)					**204.5**			**106.2**
TOTAL EMISSIONS (TPY)					**0.10**			**0.05**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**188.7**			
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**0.09**			

SURFACE COATING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Density of Water (lbs/gal) 8.34

Source Classification Code (SCC):

	SCC
Surface Coating Application - General	4-02-007-10

Reference: 1. Air Emissions Guide to Air Force Stationary Sources, Air Force Center for Engineering and the Environment, San Antonio, TX, December 2009.

Notes:
Surface coatings emissions are based on the installation Hazardous Material Use reports.
According to reports, all surface coating operations took place at Buildings 3015 and 3490.
All painting was conducted with High Volume/Low Pressure spray guns. Transfer efficiency is equal to 65% (Reference 1, Table 33-4)
Potential emissions are based on the ratio of potential working hours (8,760 hr/yr) to actual working hours (2,080 hr/yr).

B. EMISSION CALCULATION METHOD

Potential Product Use Calculation:
Potential Product Use (gal/yr) = Product Use (gal/yr) x 8,760 hr/yr / 2,080 hr/yr

Emission Calculations:
VOC Emissions (lbs/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lbs/gal) x VOC Content (%WT)
PM10 Emissions (lbs/yr) = Potential Product Use (gal/yr) x Specific Gravity x Density of Water (lbs/gal) x Solids Content (%WT) x (1 - Transfer Efficiency%)

SURFACE COATING - POTENTIAL EMISSIONS (Criteria Pollutants)

C. EMISSION SUMMARY

Product Name	Potential Product Use (gal/yr)	Specific Gravity	Density (lbs/gal)	VOC Content (wt%)	VOC Emissions (lbs/yr)	Solids Content (wt%)	Transfer Efficiency (%)	PM_{10} Emissions (lbs/yr)
Building 3015								
Olympic Premium I/E Gloss Base	21.06	1.16	9.65	63.65%	129.3	36.4%	65%	25.9
Plasti Dip Spray	4.04	0.68	5.63	87.30%	19.9	12.7%	65%	1.0
Krylon, Camouflage Paint, Olive	4.34	0.76	6.34	47.23%	13.0	52.8%	65%	5.1
Krylon, Industiral Quik-Mark, Orange	3.16	0.89	7.42	56.25%	13.2	43.8%	65%	3.6
Krylon, Contractor Marking Paint, White	3.87	0.83	6.92	40.91%	11.0	59.1%	65%	5.5
Building 3490								
Brown CARC	4.21	1.28	10.68	33.00%	14.8	67.0%	65%	10.5
CROSSFIRE Acrylic Enamel System	12.63	1.32	10.99	45.00%	62.5	55.0%	65%	26.7
DTM Acrylic Semi-Gloss Acrylic Coating	16.85	1.06	8.84	18.00%	26.8	82.0%	65%	42.7
Green CARC	42.12	1.33	11.09	29.70%	138.7	70.3%	65%	114.9
Polyurethane Aerosol	104.76	0.70	5.84	48.00%	293.6	52.0%	65%	111.3
Black Zenthane	42.12	1.21	10.07	32.70%	138.6	67.3%	65%	99.9
TOTAL EMISSIONS (lbs/yr)					**861.4**			**447.2**
TOTAL EMISSIONS (TPY)					**0.43**			**0.22**
TOTAL EMISSIONS (lbs/yr (VOC - VOC_{HAP}))					**769.5**			
TOTAL EMISSIONS (TPY (VOC - VOC_{HAP}))					**0.38**			

WASTE OIL BOILER - EMISSIONS SUMMARY

Waste Oil Boiler - Actual Emissions

Pollutant	TPY
NO_x	**0.05**
SO_x	**0.73**
CO	**0.01**
TOC	**<0.01**
PM_{10}	**0.04**
CO_2	**54.45**
HAPs	**0.14**
Arsenic	<0.01
Cadmium	<0.01
Chromium	<0.01
Cobalt	<0.01
Lead	0.14
Manganese	<0.01
Nickel	<0.01

Waste Oil Boiler - Potential Emissions

Pollutant	TPY
NO_x	**1.04**
SO_x	**16.10**
CO	**0.27**
TOC	**0.05**
PM_{10}	**0.84**
CO_2	**1,204.50**
HAPs	**3.02**
Arsenic	0.01
Cadmium	<0.01
Chromium	<0.01
Cobalt	<0.01
Lead	3.01
Manganese	<0.01
Nickel	<0.01

WASTE OIL BOILER - ACTUAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Usage rate log provided by the operator. Each drum contained 50 gallons according to installation.
Waste oil burner is not operated between April and September when weather is warm.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	NO_x	SO_X[2,4]	CO	TOC	PM_{10}[3,4]	CO_2
Waste oil combustors, Small boilers	19.00	294.00	5.00	1.00	15.30	22,000

[1] Reference 1, Tables 1.11-1, 1.11-2, 1.11-3

[2] SO_x emissions factor = 147S, where S = weight % sulfur: 147 X 2.0 = 294

[3] PM_{10} emissions factor = 51A, where A = weight % ash: 51 X 0.3 = 15.3

[4] Reference 2, Part C. Default value for S = 2.0 and for A = 0.3

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	NO_x	SO_x	CO	TOC	PM_{10}	CO_2
Waste Oil Combustor, Small Boilers	4,950	94.1	1,455.3	24.8	5.0	75.7	108,900.0
TOTAL EMISSIONS (lbs/yr)		**94.1**	**1,455.3**	**24.8**	**5.0**	**75.7**	**108,900.0**
TOTAL EMISSIONS (TPY)		**0.05**	**0.73**	**0.01**	**<0.01**	**0.04**	**54.45**

WASTE OIL BOILER - POTENTIAL EMISSIONS (Criteria Pollutants and GHGs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Assume burner operated 365 days, 6 drums per day (maximum number of drums burned in one day according to log).
Each drum contained 50 gallons according to installation.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	NO_x	SO_X[2,4]	CO	TOC	PM_{10}[3,4]	CO_2
Waste oil combustors, Small boilers	19.00	294.00	5.00	1.00	15.30	22,000

[1] Reference 1, Tables 1.11-1, 1.11-2, 1.11-3

[2] SO_x emissions factor = 147S, where S = weight % sulfur: 147 X 2.0 = 294

[3] PM_{10} emissions factor = 51A, where A = weight % ash: 51 X 0.3 = 15.3

[4] Reference 2, Part C. Default value for S = 2.0 and for A = 0.3

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	NO_x	SO_x	CO	TOC	PM_{10}	CO_2
Waste Oil Combustor, Small Boilers	109,500	2,080.5	32,193.0	547.5	109.5	1,675.4	2,409,000.0
TOTAL EMISSIONS (lbs/yr)		**2,080.5**	**32,193.0**	**547.5**	**109.5**	**1,675.4**	**2,409,000.0**
TOTAL EMISSIONS (TPY)		**1.04**	**16.10**	**0.27**	**0.05**	**0.84**	**1,204.50**

WASTE OIL BOILER - ACTUAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Usage rate log provided by the operator. Each drum contained 50 gallons according to installation.
Waste oil burner is not operated between April and September when weather is warm.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste oil combustors, Small boilers	1.10E-01	9.30E-03	2.00E-02	2.10E-04	5.50E+01	6.80E-02	1.10E-02

[1] Reference 1, Table 1.11-4

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste Oil Combustor, Small Boilers	4,950	0.5	0.0	0.1	0.0	272.3	0.3	0.1
TOTAL EMISSIONS (lbs/yr)		**0.5**	**0.0**	**0.1**	**0.0**	**272.3**	**0.3**	**0.1**
TOTAL EMISSIONS (TPY)		**<0.01**	**<0.01**	**<0.01**	**<0.01**	**0.14**	**<0.01**	**<0.01**

WASTE OIL BOILER - POTENTIAL EMISSIONS (HAPs)

A. BACKGROUND INFORMATION

Calculation Method: Emission Factors
Fuel Used: Waste oils

Source Classification Code (SCC)

	SCC
External Combustion, Waste Oil, Small Boiler	1-03-013-02

Reference: 1. AP-42, 5th Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, October 1996
2. PI-02F Instructions, "Process Information: Combustion - Instructions", Indiana Department of Environmental Management, Office of Air Quality, October 2006.

Notes: Assume burner operated 365 days, 6 drums per day (maximum number of drums burned in one day according to log).
Each drum contained 50 gallons according to installation.

B. EMISSION CALCULATION METHOD

Emission factors for waste oil combustors (lbs/1000 gal)[1]

	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste oil combustors, Small boilers	1.10E-01	9.30E-03	2.00E-02	2.10E-04	5.50E+01	6.80E-02	1.10E-02

[1] Reference 1, Table 1.11-4

Emission Calculation:
Emissions (lbs/yr) = Emission Factor (lbs/1,000 gal) x Fuel Used (gal/yr)

C. EMISSION SUMMARY

Unit	Fuel Used (gals/yr)	Arsenic	Cadmium	Chromium	Cobalt	Lead	Manganese	Nickel
Waste Oil Combustor, Small Boilers	109,500	12.0	1.0	2.2	0.0	6,022.5	7.4	1.2
TOTAL EMISSIONS (lbs/yr)		**12.0**	**1.0**	**2.2**	**0.0**	**6,022.5**	**7.4**	**1.2**
TOTAL EMISSIONS (TPY)		**0.01**	**<0.01**	**<0.01**	**<0.01**	**3.01**	**<0.01**	**<0.01**

WOODWORKING - EMISSIONS SUMMARY

Woodworking - Actual Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	N/A
PM_{10}	0.03

Woodworking - Potential Emissions

Pollutant	TPY
NO_x	N/A
SO_2	N/A
CO	N/A
VOC	N/A
PM_{10}	0.05

WOODWORKING - ACTUAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Control Efficiency: 90%
Sawdust Density (lb/ft^3): 12
PM_{10} fraction(%) (Reference 2): 52.9%

Source Classification Code (SCC):

	SCC
Fugitive Emissions Tons Processed	3-07-008-07

References:
1. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, OAQPS, EPA, RTP, North Carolina, January 1995
2. North American Combustion Handbook, Volume I: Combustion, Fuels, Stoichiometry, Heat Transfer, Fluid Flow, Third Edition, North American Manufacturing Company, 1986

Notes:
PM_{10} fraction of particulate matter was selected from Reference 1, Appendix B.1, Table 10.5, Page B.1-48
Density of sawdust emissions was selected from Reference 2, Page 20
Emissions from woodworking operations were based on amounts of sawdust waste collected annually from the Bldg 5110 Wood Shop
Sawdust is conveyed from the shop collection system to a shed with a waste bin about 3 feet deep, 4 feet wide, and 6 feet long.
The bin is a settling chamber with an assumed control efficiency of 90%.
The bin is emptied about twice a year when it becomes half full. Total volume of the bin is 4' x 6' x 3' = 72 cubic feet. Half full would be 36 cubic feet. At 2 collections per year, that would be 72 cubic feet of sawdust waste.

B. EMISSION CALCULATION METHOD

Actual Emission Calculation:
Sawdust Collected (lb/yr) = Sawdust Collected (ft^3/yr) x Density of Sawdust (lb/ft^3)
Sawdust Generated (lb/yr) = Sawdust Collected (lb/yr) /control efficiency(%)
Sawdust Emitted (lb/yr) = Sawdust Generated (lb/yr) - Sawdust Collected (lb/yr)
PM_{10} Emissions (lb/yr) = Sawdust Emitted (lb/yr) x PM_{10} fraction(%)

C. EMISSION CALCULATIONS

Building Number	Location	Sawdust Collected (ft^3/yr)	Control Equipment	Sawdust (lb/yr)			PM_{10} Emissions (lb/yr)
				Collected	Generated	Emitted	
5110	Small Arms Range	72	Shed	864.0	960.0	96.0	50.8
TOTAL EMISSIONS (lb/yr)				**864.0**	**960.0**	**96.0**	**50.8**
TOTAL EMISSIONS (TPY)							**0.03**

WOODWORKING - POTENTIAL EMISSIONS (Criteria Pollutants)

A. BACKGROUND INFORMATION

Calculation Method: Mass Balance
Control Efficiency: 95%
Sawdust Density (lb/ft^3): 12
PM_{10} fraction(%) (Reference 2): 52.9%

Source Classification Code (SCC):

	SCC
Fugitive Emissions Tons Processed	3-07-008-07

References:

1. Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, AP-42, OAQPS, EPA, RTP, North Carolina, January 1995
2. North American Combustion Handbook, Volume I: Combustion, Fuels, Stoichiometry, Heat Transfer, Fluid Flow, Third Edition, North American Manufacturing Company, 1986

Notes: Actual Hours based on 40 hour work week x 52 wk/yr = 2,080 hr/yr
Potential Hours based on 24 hr/day x 365 day/yr = 8,760 hr/yr
Potential amount of sawdust collected was based on the ratio of potential hours (8,760 hr/yr) to actual hours of operation, assuming an 8-hr workday (2,080 hr/yr)

B. EMISSION CALCULATION METHOD

Potential Emission Calculation:
Potential Sawdust Collected (lb/yr) = Actual Sawdust Collected (lb/yr) x Potential Hours/Actual Hours
Potential Sawdust Collected (lb/yr) = Potential Sawdust Collected (ft^3/yr) x Density of Sawdust (lb/ft^3)
Potential Sawdust Generated (lb/yr) = Potential Sawdust Collected (lb/yr) / control efficiency(%)
Potential Sawdust Emitted (lb/yr) = Potential Sawdust Generated (lb/yr) - Potential Sawdust Collected (lb/yr)
PM_{10} Emissions (lb/yr) = Potential Sawdust Emitted (lb/yr) x PM_{10} fraction(%)

C. EMISSION CALCULATIONS

Building Number	Location	Potential Sawdust Collected (ft^3/yr)	Control Equipment	Potential Sawdust (lb/yr)			PM_{10} Emissions
				Collected	Generated	Emitted	(lb/yr)
5110	Small Arms Range	303.2	Shed	3638.8	3,830.3	191.5	101.3
TOTAL EMISSIONS (lb/yr)				**3,638.8**	**3,830.3**	**191.5**	**101.3**
TOTAL EMISSIONS (TPY)							**0.05**

Appendix D

Title I Permit No. AQ0236MSS02

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONTROL MINOR PERMIT

Permit No.: AQ0236MSS02 Final – September 9, 2008
Rescinds Permit No. 0031-AC059 Revision 1

The Alaska Department of Environmental Conservation (Department), under the authority of AS 46.14 and 18 AAC 50, issues Air Quality Control Minor Permit No. AQ0236MSS02 to the Permittee listed below.

Permittee: United States Army Garrison (USAG) Fort Wainwright
ATTN: IMPC-FWA-ZA
1060 Gaffney Road #6000
Fort Wainwright, AK 99703-6000

Owner and Operator: Same as Permittee

Stationary Source: Fort Wainwright

Physical Address: 1060 Gaffney Road #6000
Fort Wainwright, AK 99703-6000
3 miles southeast of Fairbanks, AK

Permit Contact: Cliff Seibel
ATTN: IMPC-FWA-PWE
1060 Gaffney Road #4500
Fort Wainwright, AK 99703-4500

Project: Permit split

This project is classified under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50. This permit satisfies the obligation of the Permittee to obtain a minor permit under this provision. The Permittee shall operate the Fort Wainwright stationary source in accordance with the terms and conditions of this permit, and as described in the permit application listed in Section 4 except as specified in this permit. As required by AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this minor permit.

The Permittee may operate under the provisions of this minor permit upon issuance.

Sally A. Rezen

John F. Kuterbach
Manager, Air Permits Program

Table of Contents

Section 1 Permit Terms and Conditions

1. **Emission Unit (EU) Authorization.** This permit authorizes the Permittee to operate the emission units listed in Table 1.

Table 1 –Emission Unit Inventory

Emission Unit ID Number	Source Description	Rating/size[a]	Fuel Type	Install Date
Bassett Army Community Hospital				
8	Backup Diesel-Fired Boiler 1	19 MMBtu/hr	Diesel	2004
9	Backup Diesel-Fired Boiler 1	19 MMBtu/hr	Diesel	2004
10	Backup Diesel-Fired Boiler 1	19 MMBtu/hr	Diesel	2004
11	Backup Diesel-Electric Generator 1	900 kW	Diesel	2004
12	Backup Diesel-Electric Generator 2	900 kW	Diesel	2004
13	Backup Diesel-Electric Generator 3	900 kW	Diesel	2004
Installation Restoration Plans				
22	VOC Extraction and Combustion	N/A	N/A	1993

Table Notes:
a - MMBtu/hr is heat input, kW is electrical output.

1.1 Except as noted elsewhere in this permit, the information in Table 1 is for identification purposes only. The specific unit descriptions do not restrict the permittee from replacing an emission unit identified in Table 1. The Permittee shall comply with all applicable provisions of AS 46.14 and 18 AAC 50 when installing a replacement emission unit, including any applicable minor or construction permit requirements.

Industrial Processes and Fuel-Burning Equipment, Emission Units 8 through 13 and 22

2. **Visible Emissions.** The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from EU IDs 8 through 13 and 22 to reduce visibility through the exhaust effluent by greater than 20 percent averaged over any six consecutive minutes.

3. **Particulate Matter (PM).** The Permittee shall not cause or allow PM emitted from EU IDs 8 through 13 and 22 to exceed 0.05 grains per cubic foot (gr./dscf) of exhaust gas corrected to standard conditions and averaged over three hours.

4. **Sulfur Compound Emissions.** The Permittee shall not cause or allow sulfur compound concentrations, expressed as SO_2, from any EU ID 8 through 13 and 22 to exceed 500 ppm averaged over three hours.

4.1 For EU ID 22:

a. Burn a grade of propane with a fuel sulfur content not to exceed 250 PPM by weight.

b. Obtain a statement of certification from the fuel supplier showing that all propane delivered to the stationary source complies with Condition 4.1a. If a certificate is not available from the supplier, analyze a representative sample of fuel to determine the sulfur content using an approved ASTM method such as ASTM D1265-92 or D2784-92.

4.2 For EU IDs 8 through 13:

a. Burn fuel oil that limits sulfur content to less than 0.30 percent by weight.

b. Obtain a statement of certification from the fuel supplier showing that all fuel oil delivered to the stationary source complies with Condition 4.2a. If a certificate is not available from the supplier, analyze a representative sample of the fuel for each shipment delivered to the stationary source to determine the sulfur content using an approved ASTM method such as ASTM D975-94, D3120-92, D4152-90, D2622-91 or ASTM D396-92.

Owner Requested Limits to Avoid Classification as a PSD Major Modification for Previous Air Quality Construction Permit 0031-AC059

5. **Nitrogen Oxides.** The Permittee shall avoid classification as a Prevention of Significant Deterioration major modification for NO_X as follows:

5.1 Limit the cumulative total NO_X emissions for EU ID 22 to 2 tons per 12 consecutive month period.

a. Calculate and record the cumulative 12 consecutive month rolling total NO_X emissions for each EU ID 22 activity by monitoring and recording the total amount of propane used by the unit each month (gallons) and multiplying the total monthly fuel consumption by the AP-42 NO_X emission factor of 19 lb/1000 gal.

b. Report in the Operating Report required by Condition 12, the cumulative monthly and 12 consecutive month total NO_X emissions for EU ID 22.

5.2 Limit operation of EU IDs 8 through 10 to less than a cumulative total of 600 hours per 12 consecutive month period.

a. Monitor and record the time, date, and duration for which each of EU IDs 8 through 10 operate, calculate and record the cumulative total hours of operation per 12 consecutive months.

b. Report in the Operating Report required by Condition 12, the cumulative total hours of operation per 12 consecutive months for EU IDs 8 through 10.

5.3 Limit operation of EU IDs 11 through 13 to less than a cumulative total of 600 hours per any 12 consecutive months.

a. Monitor and record the time, date, and duration for which each of EU IDs 11 through 13 operate, and calculate and record the cumulative total hours of operation per 12 consecutive months.

b. Report in the Operating Report required by Condition 12, the cumulative total hours of operation per each 12 consecutive month period for EU IDs 11 through 13.

5.4 The Permittee shall not perform fire-fighting training on wooden structures.

6. **Volatile Organic Compound Requirements.** The Permittee shall limit VOC emissions from EU ID 22 to no more than 30 tons in any 12 consecutive months to avoid classification as a Prevention of Significant Deterioration major modification for VOC as follows:

6.1 Obtain exhaust stream grab samples from each restoration activity at the following intervals: 1) monthly sampling for new sites less than 6-months old, 2) semi-annual sampling for sites with oxidizers in place, and 3) semi-annual sampling for all other active sites. Analyze for total VOCs using EPA Method TO-12. Record all analytical results in mass per unit volume.

6.2 Calculate and record VOC emissions for each restoration activity using the hours of operation for each month, and the highest measured flow-rate and highest measured concentration of VOCs determined during the test interval conducted in 6.1.

6.3 Maintain a log of all restoration activities documenting site activity descriptions, dates, and total duration of activities.

6.4 Except as set out in Conditions 6.1, 6.2, and 6.3, follow the procedures set out in the VOC Tracking Plan submitted in October 2, 2000, by the Permittee (or future ADEC approved updates to the VOC Tracking Plan).

6.5 Report to the Department in the Operating Report required by Condition 12, the monthly and 12 consecutive month total VOC emissions from EU ID 22.

6.6 Provide written notice to the Department's Air Permits Program within 10 days after startup of a new restoration activity. List the location, the contaminant preliminary test results showing extent and magnitude of contamination, proposed emission control strategy and proposed air or exhaust monitoring strategy for the restoration activity.

Section 2 General Record Keeping, Reporting, and Compliance Requirements

7. **Certification.** The Permittee shall certify all reports, compliance certifications, or other documents submitted to the Department and required under the permit by including the signature of a responsible official for the permitted stationary source following the statement: "Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete." Excess emission reports must be certified either upon submittal or with an Operating Report required for the same reporting period. All other reports and other documents must be certified upon submittal.

8. **Submittals.** Unless otherwise directed by the Department or this permit, the Permittee shall send reports, compliance certifications, and other documents required by this permit to ADEC, Air Permits Program, 610 University Ave., Fairbanks, AK 99709-3643, ATTN: Compliance Technician. The Permittee may, upon consultation with the Compliance Technician regarding software compatibility, provide electronic copies of data reports, emission source test reports, or other records under a cover letter certified in accordance with Condition 7.

9. **Information Requests.** The Permittee shall furnish to the Department, within a reasonable time, any information the Department requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit or to determine compliance with the permit. Upon request, the Permittee shall furnish to the Department copies of records required to be kept by the permit. The Department may require the Permittee to furnish copies of those records directly to the federal administrator.

10. **Record Keeping Requirements.** The Permittee shall keep all records required by this permit for at least five years after the date of collection, including

    10.1 Copies of all reports and certifications submitted pursuant to this section of the permit.

    10.2 Records of all monitoring required by this permit, and information about the monitoring including:

        a. calibration and maintenance records, original strip chart or computer-based recordings for continuous monitoring instrumentation;

        b. sampling dates and times of sampling or measurements;

        c. the operating conditions that existed at the time of sampling or measurement;

        d. the date analyses were performed;

        e. the location where samples were taken;

f. the company or entity that performed the sampling and analyses;

g. the analytical techniques or methods used in the analyses; and

h. the results of the analyses.

11. **Excess Emissions and Permit Deviation Reports.**

11.1 Except as provided in Condition 14, the Permittee shall report all emissions or operations that exceed or deviate from the requirements of this permit as follows:

a. in accordance with 18 AAC 50.240(c), as soon as possible after the event commenced or is discovered, report

(i) emissions that present a potential threat to human health or safety; and

(ii) excess emissions that the Permittee believes to be unavoidable;

b. in accordance with 18 AAC 50.235(a), within two working days after the event commenced or was discovered, report an unavoidable emergency, malfunction, or nonroutine repair that causes emissions in excess of a technology based emission standard;

c. report all other excess emissions and permit deviations

(i) within 30 days of the end of the month in which the emissions or deviation occurs or is discovered, except as provided in Conditions 11.1c(ii) and 11.1c(iii);

(ii) if continuous or recurring excess emissions are not corrected within 48 hours of discovery, within 72 hours of discovery unless the Department provides written permission to report under Condition 11.1c(i); and

(iii) for failure to monitor, as required in other applicable conditions of this permit.

11.2 The Permittee must report using either the Department's on-line form, or if the Permittee prefers, the form contained in Section 3 of this permit. The Permittee must provide all information called for by the form that is used.

11.3 If requested by the Department, the Permittee shall provide a more detailed written report as requested to follow up an excess emissions report.

12. **Operating Reports.** During the life of this permit, the Permittee shall submit to the Department an original and one copy of an operating report by August 1 for the period January 1 to June 30 of the current year, and by February 1 for the period July 1 to December 31 of the previous year.

12.1 The Operating Report must include all information required to be in operating reports by other conditions of this permit.

12.2 If excess emissions or permit deviations that occurred during the reporting period are not reported under Condition 12.1, either

a. The Permittee shall identify

(i) the date of the deviation;

(ii) the equipment involved;

(iii) the permit condition affected;

(iv) a description of the excess emissions or permit deviation; and

(v) any corrective action or preventive measures taken and the date of such actions; or

b. When excess emissions or permit deviations have already been reported under Condition 11, the Permittee may cite the date or dates of those reports.

13. The Permittee shall allow the Department or an inspector authorized by the Department, upon presentation of credentials and at reasonable times with the consent of the owner or operator to

13.1 enter upon the premises where an emission unit subject to the permit is located or where records required by the permit are kept;

13.2 have access to and copy any records required by the permit;

13.3 inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and

13.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

14. **Air Pollution Prohibited.** No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

14.1 If emissions present a potential threat to human health or safety, the Permittee shall report any such emissions according to Condition 11.

14.2 As soon as practicable after becoming aware of a complaint that is attributable to emissions from the stationary source, the Permittee shall investigate the complaint to

identify emissions that the Permittee believes have caused or are causing a violation of Condition 14.

14.3 The Permittee shall initiate and complete corrective action necessary to eliminate any violation identified by a complaint or investigation as soon as practicable if

a. after an investigation because of a complaint or other reason, the Permittee believes that emissions from the stationary source have caused or are causing a violation of Condition 14; or

b. the Department notifies the Permittee that it has found a violation of Condition 14.

14.4 The Permittee shall keep records of

a. the date, time, and nature of all emissions complaints received;

b. the name of the person or persons that complained, if known;

c. a summary of any investigation, including reasons the Permittee does or does not believe the emissions have caused a violation of Condition 14; and

d. any corrective actions taken or planned for complaints attributable to emissions from the stationary source.

14.5 With each Operating Report under Condition 12, the Permittee shall include a brief summary report which must include

a. the number of complaints received;

b. the number of times the Permittee or the Department found corrective action necessary;

c. the number of times action was taken on a complaint within 24 hours; and

d. the status of corrective actions the Permittee or Department found necessary that were not taken within 24 hours.

14.6 The Permittee shall notify the Department of a complaint that is attributable to emissions from the stationary source within 24 hours after receiving the complaint, unless the Permittee has initiated corrective action within 24 hours of receiving the complaint.

15. **Requested Source Tests.** In addition to any source testing explicitly required by this permit, the Permittee shall conduct source testing as requested by the Department to determine compliance with applicable permit requirements.

16. **Test Deadline Extension.** The Permittee may request an extension to a source test deadline established by the Department. The Permittee may delay a source test beyond the original deadline only if the extension is approved in writing by the Department's appropriate division director or designee.

17. **Test Plans.** Except as provided in Condition 20, before conducting any source tests, the Permittee shall submit a plan to the Department. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance, and must specify how the emission unit will operate during the test and how the Permittee will document that operation. The Permittee shall submit a complete plan within 60 days after receiving a request under Condition 15 and at least 30 days before the scheduled date of any test unless the Department agrees in writing to some other time period. Retesting may be done without resubmitting the plan.

18. **Test Notification.** Except as provided in Condition 20, at least 10 days before conducting a source test, the Permittee shall give the Department written notice of the date and the time the source test will begin.

19. **Test Reports.** Except as provided in Condition 20, within 60 days after completing a source test, the Permittee shall submit two copies of the results in the format set out in the *Source Test Report Outline*, adopted by reference in 18 AAC 50.030. The Permittee shall certify the results in the manner set out in Condition 7. If requested in writing by the Department, the Permittee must provide preliminary results in a shorter period of time specified by the Department.

20. **Test Exemption.** The Permittee is not required to comply with Conditions 17, 18, and 19 (Test Plans, Test Notification and Test Reports) when exhaust is observed for visible emissions using Method 9.

Section 3 ADEC Notification Form

Stationary Source Name

Air Quality Permit Number

Company Name

When did you discover the Excess Emissions/Permit Deviation?

Date: _____ / _____ / _____ Time: _____ : _____

When did the event/deviation occur?

Begin Date: _____ / _____ / _____ Time: _____ : _____ (please use 24hr clock)

End Date: _____ / _____ / _____ Time: _____ : _____ (please use 24hr clock)

What was the duration of the event/deviation?: _____ : _____ (hrs:min) or _____days

(total # of hrs, min, or days, if intermittent then include only the duration of the actual emissions/deviation)

Reason for Notification: (please check only 1 box and go to the corresponding section)

☐ Excess Emissions - Complete Section 1 and Certify.

☐ Deviation from Permit Condition - Complete Section 2 and Certify

☐ Deviations from COBC, CO, or Settlement Agreement - Complete Section 2 and Certify

Section 1. Excess Emissions

(a) Was the exceedance: ☐ Intermittent or ☐ Continuous

(b) Cause of Event (Check one that applies):

☐ Start Up /Shut Down ☐ Natural Cause (weather/earthquake/flood)

☐ Control Equipment Failure ☐ Scheduled Maintenance/Equipment Adjustment

☐ Bad fuel/coal/gas ☐ Upset Condition ☐ Other _____

(c) Description

Describe briefly, what happened and the cause. Include the parameters/operating conditions exceeded, limits, monitoring data and exceedance.

(d) Emissions Units Involved:

Identify the emission unit involved in the event, using the same identification number and name as in the permit. Identify each emission standard potentially exceeded during the event and the exceedance.

Unit ID	Unit Name	Permit Condition Exceeded/Limit/Potential Exceedance

(e) Type of Incident (Please Check only one).

☐ Opacity _____ % ☐ Venting _____ (gas/scf) ☐ Control Equipment Down

☐ Fugitive Emissions ☐ Emission Limit Exceeded ☐ Flaring

☐ Marine Vessel Opacity ☐ Other: _____

(f) Unavoidable Emissions:

Do you intend to assert that these excess emissions were unavoidable? ☐ Yes ☐ No

Do you intend to assert the affirmative defense of 18 AAC 50.235? ☐ Yes ☐ No

Certify Report (go to end of form)

Section 2 Permit Deviations

(a) Permit Deviation Type (check one only box, corresponding with the section in the permit).

☐ Emission Unit Specific

☐ Failure to monitor/report

☐ General Source Test/Monitoring Requirements

☐ Recordkeeping/Reporting/Compliance Certification

☐ Standard Conditions Not Included in Permit

☐ Generally Applicable Requirements

☐ Reporting/Monitoring for Diesel Engines

☐ Insignificant Emission Unit

☐ Record Keeping Failure

☐ Stationary Source Wide

☐ Other Section _____ (title of section and section number of your permit).

(b) Emission Unit Involved.

Identify the emission unit involved in the event, using the same identification number and name

Unit ID	Unit Name	Permit Condition / Potential Deviation

as in the permit. List the corresponding permit conditions and the deviation.

(c) Description of Potential Deviation:

Describe briefly what happened and the cause. Include the parameters/operating conditions and the potential deviation.

(d) Corrective Actions:
Describe actions taken to correct the deviation or potential deviation and to prevent future recurrence.

Certification:

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.

Printed Name: _____ Title: _____ Date: _____

Signature: _____ Phone Number: _____

To Submit this Report:

Fax to: 907-451-2187;
Email to: DEC.AQ.Airreports@alaska.gov - *if emailed, the report must be certified within the Operating Report required for the same reporting period per Condition 12;*
Mail to: ADEC, Air Permits Program, 610 University Avenue, Fairbanks, AK 99709-3643;
Phone Notification: 907-451-5173 - p*hone notifications require a written follow-up report within the deadline listed in Condition 11; OR*
Online Submission: - *if submitted online, the report must be certified within the Operating Report required for the same reporting period per Condition 12.*

Section 4 Permit Documentation

April 30, 1993	Air Quality Control Permit to Operate No. 9331-AA003.
September 20, 1996	Air Pollution Emission Statement No. 43-EL-5680-96.
June 27, 2000	Letter from Jim Baumgartner (ADEC) to Brian Taylor (US Army) regarding Bassett Hospital Site Preparation Work.
July 21, 2000	US Army submitted historical data for the IRP Sites (on two CD-ROMs).
August 15, 2000	Letter from Jim Baumgartner (ADEC) to Debra Breindel (US Army) regarding Projected VOC Emissions for 2000 at Fort Wainwright IRP Sites
September 11, 2000	US Army Response to Letter regarding Projected VOC Emissions for 2000 at Fort Wainwright IRP Sites.
September 29, 2000	Manuals for the Oxidizer units used at Fort Wainwright.
October 2, 2000	US Army submitted construction permit application, New Source Review/Prevention of Significant Deterioration Evaluation for Modification to the US Army's Ft. Wainwright, Alaska Facility.
October 11, 2000	The CHPP Emission Reduction and Upgrade Project's bid documents (on two CD-ROMs).
October 22, 2000	ADEC letter to US Army finding application complete and requesting additional information.
November 15, 2000	US Army response to ADEC Completeness Review Comments.
February 1, 2001	Air Quality Construction Permit 0031-AC059.
February 1, 2001	Technical Analysis Report (TAR) for Air Quality Construction Permit 0031-AC059.
July 2, 2001	Air Quality Construction Permit 0031-AC059, Revision 1. (TAR for Permit 0031-AC059 still provides the technical analysis for this permit.)
October 30, 2001	Letter from ADEC to the Directorate of Public Works at Fort Wainwright allowing a revised method for demonstrating compliance with the sulfur compound emission limit
April 4, 2008	US Army Garrison Alaska submitted an application for revision to Air Quality Construction Permit 0031-AC059, Revision 1. The application requested to split the emission units into two separate minor permits.
August 25, 2008	US Army Garrison - Alaska Fort Wainwright comments on proposed operating permit and minor permit AQ0236MSS02.