DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

JAN 2 0 2022

Colonel Jason F. Vattioni
Commander
377th Air Base Wing
2000 Wyoming Blvd SE
Kirtland Air Force Base NM 87117

Mr. Isreal Tavarez
Environmental Health Manager
Albuquerque Environmental Health Department
Air Quality Division
P.O. Box 1293
Albuquerque NM 87103

Dear Mr. Tavarez

Kirtland Air Force Base (KAFB) is submitting a Title V Operating Permit Renewal Application for Title V Operating Permit #527-RN1. The term of Permit 527-RN1 is five (5) years, and will expire on January 22, 2023, which is five years from the date of issuance, pursuant to 20.11.42.12.C.(2) New Mexico Administrative Code (NMAC). This renewal application is due twelve (12) months prior to the date of permit expiration, pursuant to 20.11.42.12.A.(2)(a)(ii) NMAC.

The attached Title V Operating Permit Renewal Application includes the addition of two new emergency generators, one new non-emergency generator, one soil vapor extraction unit and the removal of two emergency generators. A brief summary of this Title V Permit Renewal Application is provided below.

This renewal application is being submitted in accordance with the instructions in the Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD) Guidelines for Title V Operating Permit Renewal Applications. Below is a list of attachments included with this application.

Attachment A – AEHD AQD Operating Permit Application Forms
Attachment B – Process Flow Diagrams
Attachment C – Emission Calculations
Attachment D – Contents of Permit Application
Attachment E – Site Map
Attachment F – Insignificant Sources
Attachment G – Air Dispersion Modeling

KAFB is also including Greenhouse Gases (GHGs) for applicable units included in this permit renewal as required under the Environmental Protection Agency's Tailoring Rule. The Tailoring Rule requires that after 2 January 2011, sources with Title V permits must address GHG requirements when applying for new, renewed, or revised permits. Emissions of GHGs included in this application were based on the permitted operating limits of each emission source. Emission calculation spreadsheets are included in Attachment C for the sources included in this application.

Attachment D, Table D-1 contains a Source Registration and Construction Permit Cross Reference Table that lists all new and modified sources that are included in this permit renewal application along with the corresponding process equipment number from the permit and KAFB Unit Identification (ID) number. Attachment D, Table D-2 includes a summary of required application contents and where those contents are located in the Title V Permit Renewal Application. Attachment D, Table D-3 includes a summary of applicable requirements and the KAFB compliance status for each applicable requirement.

My point of contact for any questions regarding this submittal is Ms. Andria Cuevas, KAFB Air Program Manager, at (505) 846-2522 or by email andria.cuevas.1@us.af.mil.

Sincerely

JASON F. VATTIONI, Colonel, USAF
Commander

1 Attachment:
1. Kirtland AFB Title V Permit Renewal Application, Jan 22

Kirtland Air Force Base

20.11.42 NMAC

Title V Permit Renewal Application

March 2022

377 MSG/CEIEC

Kirtland AFB, New Mexico

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List of Tables

List of Acronyms and Abbreviations

377 ABW	377th Air Base Wing
377 MSG/CEIEC	377th Mission Support Group/Environmental Compliance
58 SOW	58th Special Operations Wing
AAFES	Army and Air Force Exchange Service
AEHD	Albuquerque Environmental Health Department
AFB	Air Force Base
AFRL	Air Force Research Laboratory
AQD	Air Quality Division
AST	above ground storage tank
AVGAS	aviation gasoline
BTU	British thermal unit(s)
CATOX	catalytic oxidation (oxidative catalyst)
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
DOE	Department of Energy
EPA	U.S. Environmental Protection Agency
GAC	granulated activated carbon

List of Acronyms and Abbreviations (Cont.)

HAP	hazardous air pollutant
HVLP	high volume low pressure
hp	horsepower
hr	hour(s)
ID	identification
LRS	Logistics Readiness Squadron
NESHAP	National Emissions Standard for Hazardous Air Pollutants
NMAC	New Mexico Administrative Code
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
ppmv	parts per million by volume
PTE	potential total emissions
$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers
PM_{10}	particulate matter less than or equal to 10 micrometers
R&D	Research and Development
scfm	standard cubic feet per minute
SIC	Standard Industrial Classification
SNL	Sandia National Laboratory
SO_2	Sulfur dioxide

List of Acronyms and Abbreviations (Cont.)

SSM	start-up/shut-down scheduled maintenance
SVE	soil vapor extraction
THC	total hydrocarbons
tpy	tons per year
VOC	volatile organic compound

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1.0 General Information

Kirtland Air Force Base (AFB) is applying to renew Title V Operating Permit 527-RN1, which is being submitted to the Albuquerque Environmental Health Department (AEHD) Air Quality Division (AQD). The term of Permit 527-RN1 is five (5) years, and will expire on January 22, 2023, which is five years from the date of issuance, pursuant to 20.11.42.12C.(2) New Mexico Administrative Code (NMAC). This renewal application is due twelve (12) months prior to the date of permit expiration, pursuant to 20.11.42.12A(2)(a)(ii) NMAC. However, on January 21, 2022 AEHD granted Kirtland AFB an extension to submit the application until they had resolved modeling questions. This permit renewal seeks to authorize the addition of the following:

- Emergency Generator Unit 13 (19181) included in Construction Permit 1786-M5
- Emergency Generator Unit 14 (19182) included in Construction Permit 1786-M5
- Non-Emergency Generator Unit 1 (19183) included in Construction Permit 3366
- Soil Vapor Extraction System Unit 1 (12010) included in Construction Permit 3331

The following equipment will be removed from the permit:

- Emergency Generator (19094) was previously included in Construction Permit 3032-M1-AR. This unit is under the control of the New Mexico Air National Guard and is not under the common control of Kirtland AFB. An Air Quality Notification has been submitted for this unit to meet the requirements of 20.11.39 NMAC.
- Emergency Generator (19180) was previously included in Construction Permit 3323. This unit was never installed and Construction Permit 3323 will be closed.

1.1 General Facility Description

Kirtland AFB is located in Bernalillo County, New Mexico, adjacent to the City of Albuquerque. The 377th Air Base Wing (377 ABW) is the host unit at Kirtland AFB. The mission of the 377 ABW is to execute nuclear, readiness, and support operations for American air power. The primary activity at Kirtland AFB is classified under the Standard Industrial Classification (SIC) code 97, National Security. As the host unit, the 377 ABW maintains a number of utilities, maintenance shops and facility support services.

Kirtland AFB has grouped air emission sources based on the guidance provided in the U.S. Environmental Protection Agency (EPA) Memorandum, *Major Source Determinations for Military Installations under the Air Toxics, New Source Review, and Title V Operating Permit Programs of the Clean Air Act (CAA)*, August 2, 1996 and as approved by the AEHD AQD. As stated in the EPA guidance memo, "When different military services control separate groups of pollutant–emitting activities at a single military installation, the Agency believes it is appropriate to consider these activities not to be under common control when making major source determinations. That is, all pollutant-emitting activities at a military installation under the control of the Army could be considered under separate control from those activities "owned or operated" by the Navy, the Air Force, or the Marine Corps." Activities at Kirtland AFB that are under common control and are related to the primary activity of the installation are included in the Title V Operating Permit. Support activities that are related to the primary activity of the installation are classified under SIC 49 Utilities, SIC 92 Fire Protection/Police, and SIC 45 Transportation by Air, which includes activities performed by the 58th Special Operations Wing (58 SOW).

Activities at Kirtland AFB that were determined to be under separate control are not included in Sections 2.0 through 5.0 of this Title V Operating Permit Renewal Application. Personnel-related activities are not considered to be support facilities to the primary military activities of Kirtland AFB. Any air emission sources that are not under common control and are not related to the primary activity of Kirtland AFB are to be addressed under separate permitting actions. Entities considered to be under separate control are owned or operated by the following organizations:

- New Mexico Air National Guard
- Defense Threat Reduction Agency
- United States Army

Kirtland AFB hosts several types of activities for the convenience of military personnel, their dependents, and Department of Defense (DOD) civilian employees working on Kirtland AFB. These activities do not support the primary activity of Kirtland AFB and are not included in this permit application. These activities include:

- Army and Air Force Exchange Service (AAFES) Gasoline Stations
- 377 Force Support Squadron (Auto Hobby Shop, Arts & Crafts Center, Aero Club, Golf Course)
- Commissary

Miscellaneous paint and chemical usage activities included in this Title V Operating Permit Renewal Application include all miscellaneous paint and chemical usage on Kirtland AFB, regardless if usage is from common or non-common controlled facilities. This is a conservative methodology that overestimates emissions as Kirtland AFB does not include non-common controlled entities in the Title V Permit as stated above. This calculation methodology is employed because it is not time effective to analyze the chemical usage for specific entities, and the chemical usage from the non-common controlled sources will be minor.

The U.S. Department of Energy (DOE) and its primary facility, Sandia National Laboratories (SNL), is one of the tenants of Kirtland AFB. Some of DOE's functions are on property or in buildings leased from Kirtland AFB, while others are on land owned by DOE. This Kirtland AFB Title V Operating Permit Renewal Application will not include DOE; DOE/SNL operates under separate permitting actions that will include operations under the DOE's Kirtland Area Office and the Albuquerque Area Office. Likewise, the Lovelace Respiratory Research Institute is a tenant of DOE at Kirtland AFB and is not included in this Title V Operating Permit Renewal Application.

1.2 Permit Application Content

This application contains only 377 ABW common controlled sources that have been issued or have pending Construction Permits under 20.11.41 NMAC or Source Registrations under 20.11.40 NMAC. Title V Sources are listed in the AEHD AQD Operating Permit Renewal Application Forms located in Attachment A. Process flow diagrams and emission calculations are included in Attachment B and C respectively. Source Registrations and Construction Permit numbers along with the corresponding process equipment numbers from the permit and Kirtland AFB Unit Identification (ID) numbers are included in Attachment D, Table D-1. Attachment D, Table D-2, includes a summary of 20.11.42 NMAC permit application contents and Table D-3 includes a summary of applicable requirements by source category. Attachment E contains a site map of Kirtland AFB and each emission unit identified by Kirtland AFB Unit ID. Attachment F contains a listing of all insignificant activities located at Kirtland AFB. Attachment G contains the final air dispersion modeling report and modeling files for sources required to be modeled under the Title V Permit.

Attachment A – AEHD AQD Operating Permit Renewal Application Forms

Attachment B – Process Flow Diagrams

Attachment C – Emission Calculations

Attachment D – Contents of Permit Application

Attachment E – Site Map

Attachment F – Insignificant Sources

Attachment G– Air Dispersion Modeling

1.3 Permit Shield Request

Kirtland AFB requests that the contents of this permit renewal application, including applicable requirements, listed exemptions, and the dispersion modeling analysis, be included in the permit shield of the final permit issued by the AEHD AQD. Pursuant to 20.11.42.12.C(9) NMAC, compliance with the conditions of the final permit shall be deemed to be in compliance with any applicable requirements existing as of the date of permit issuance and identified by the AEHD AQD in the permit.

2.0 Proposed Exemptions

2.1 Exempt Activities

Kirtland AFB is requesting that the following sources and activities to be trivial and therefore exempt from the Title V permitting requirements. In the Content of Application section, 20.11.42.12A.(4)(h) NMAC states "provide an explanation of any proposed exemptions from otherwise applicable requirements." This determination is based on sources and activities considered by the AEHD AQD to be exempt from new source review and inclusion in facility-wide potential total emissions (PTE) estimates, pursuant to 20.11.41.2F NMAC:

1. Activities which occur strictly for maintenance of grounds or buildings, including: lawn care, pest control, grinding, cutting, welding, painting, woodworking, sweeping, general repairs, janitorial activities, and building roofing operations.
2. Activities for maintenance of equipment or pollution control equipment, either inside or outside of a building, including cutting, welding, and grinding, but excluding painting.
3. Exhaust emissions from forklifts, courier vehicles, front end loaders, graders, carts, and maintenance trucks.
4. Use of firefighting equipment and firefighting training provided the emissions are not subject to any requirement of a New Source Performance Standard (NSPS) or a National Emissions Standard for Hazardous Air Pollutants (NESHAP).
5. Government military activities such as field exercises, explosions, weapons testing and demolition to the extent that such activities do not result in visible emissions entering publicly accessible areas.
6. Use of portable support equipment such as power generation equipment, compressors, heaters, air conditioning and lighting equipment used for activities that include, but are not limited to maintenance and repair if the equipment is used fewer than 12 consecutive months at the same location and the equipment does not directly support an otherwise regulated portable stationary source (such as a screening plant, sand and gravel processing equipment, hot mix asphalt plant, concrete plant or soil vapor extraction system).

7. Gases used to calibrate plant instrumentation, including continuous emission monitoring systems.
8. An applicant for a permit is not required to obtain a permit for the following new or modified sources and activities at a facility, but is required to report the following on permit application forms available from the AEHD AQD: Fuel burning equipment that is used solely for heating buildings for personal comfort or for producing hot water for personal use and that:
    a. Uses gaseous fuel and has a design rate of five million British thermal units (BTU) per hour or less; or
    b. Uses distillate oil, but not including waste oil, and has a design rate of one million BTU per hour or less.

A list of the fuel burning equipment meeting these criteria is provided in the Insignificant Sources List – Attachment F.

In addition, Kirtland AFB considers the following operations and activities to be trivial and exempt as acknowledged by the AEHD AQD in the document "Final Statement of Basis KAFB #527-RN1."

1. Material storage operations that may include storage of laboratory chemicals, fuel storage tanks for exempt space heating equipment, inorganic storage tanks less than accidental release risk program levels, fuel storage day tanks, paint storage, and battery storage room exhausts. Includes pumping and line-loss from tank lines, flanges, and valves for fuel delivery systems. This also applies to tank storage, dispensing, and loading jet fuel and diesel fuel, because the low vapor pressures of these fuels (less than or equal to 10 millimeters of mercury) cause very small emissions. Material storage also includes storage tanks limited to storage of surfactant, waste petroleum oil lubricants, hydraulic fluid, and cooking oils.
2. Personal care activities, including but not limited to, lavatory activities, pumping stations, sewage disposal, laundering, and use of personal care items.
3. Temporary operations, including portable generators, that are conducted for less than one year
4. Safety and security training.

5. Vehicle maintenance, including vehicle testing, maintenance, and repair.
6. Construction activities, including small electrical generators, air compressors, various fueled power tools, and mobile welding units. As long as there are not applicable requirements, construction activities are considered exempt from the Title V Operating Permit program; as such, no emissions or specific application information will be provided. If there are applicable requirements for specific equipment, the individual construction contractors will be required to meet the applicable air quality requirements.
7. Emissions, excluding asbestos, which result from demolition activities. Demolition sources include, but are not limited to, renovation, destruction, demolition, cleanup, and removal of buildings and support structures. Demolition activities also include decontamination and decommissioning operations. Typical activities are temporary, lasting either days or months. The Fugitive Dust Control regulation, 20.11.20 NMAC, including the proper asbestos notifications and worker protection requirements, are strictly followed by Kirtland AFB and its contractors when conducting demolition activities.

These sources, operations, and activities will not be addressed further in the application.

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3.0 Fee Assessment

The annual Operating Permit emission fees will be invoiced by the AEHD AQD using the pollutants emitted, emission rates, and applicable requirements for emission sources presented in the application forms located in Attachment A. No additional information is required to be provided to establish a basis for fees.

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4.0 Emissions Information

4.1 Process Flow Sheets

Process Flow sheets for Kirtland AFB's emission sources can be found in Attachment B – Process Flow Diagrams.

4.2 Calculations

Emission calculation spreadsheets for emission sources in this application can be found in Attachment C – Emission Calculations.

4.3 Summary of Title V Source Emission Limits

Kirtland AFB is a major source for criteria pollutants based on the potential to emit of several criteria air pollutants exceeding 100 tons per year (tpy). Kirtland AFB is a minor source of hazardous air pollutants (HAP), because the potential emissions of any one HAP do not exceed 10 tpy and all combined HAP do not exceed 25 tpy. Kirtland AFB's potential emissions of criteria pollutants and HAPs are reduced through federally enforceable limits contained in the Construction or Authority-to Construct Permit issued to each source. The total Title V Permit emission limits are based on all primary and support sources at Kirtland AFB operating at the maximum capacity contained in their respective Construction Permit or Source Registration Application. A summary of emission limits for the Kirtland AFB Title V sources is included in Table 4-1 below.

Table 4-1. Summary of Kirtland AFB Title V Source Emission Limits[1] (tons/year)

Carbon Monoxide (CO)	Oxides of Nitrogen (NO_x)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO_2)	Total Suspended Particulate Matter (PM)	Particulate Matter (PM_{10})	Particulate Matter ($PM_{2.5}$)	Hazardous Air Pollutants (HAP)
37.1	78.5	144.4	3.5	5.5	5.5	5.5	3.5

[1]The total Title V Permit emission limits are based on all primary and support sources at Kirtland AFB operating at the maximum capacity contained in their respective Construction Permit, or Source Registration Application.

Information required for each permitted emission unit is included in the AEHD AQD Operating Permit Renewal Application Forms found in Attachment A. Process flow diagrams and emission calculations for each permitted unit are presented in Attachment B and Attachment C, respectively. The contents of this renewal application are outlined in Attachment D. Attachment E contains a detailed site map with the exact location of each source. A brief description of the emission sources is included in Section 5.0.

5.0 Work Practice Standards or Limitations

5.1 Internal Combustion Units

Internal combustion units contained in this permit application are used to power generators, provide primary power for research and development (R&D) activities and emergency water pumps at Kirtland AFB.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for an internal combustion engine is contained in Attachment B, and emission calculations for each internal combustion unit are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Design Capacity/Maximum Operating Schedule. The internal combustion sources vary in design capacity from 25 horsepower (hp) to 1490 hp. Emergency generators may be operated any time when grid power is interrupted. There are also engines used to pump water to various locations at Kirtland AFB. To maintain maximum flexibility, it is assumed that internal combustion sources can operate any time, 24 hours per day, 7 days per week, 52 weeks per year; however, emergency generators are operated only a few hours at a time throughout the year.

Emissions Control Equipment and Monitoring Equipment

The internal combustion sources at Kirtland AFB are not equipped with emissions control or monitoring equipment. No applicable requirements mandate the use of such equipment.

5.2 Landfill Mulcher

The landfill mulcher consists of a 425 hp diesel engine (Unit ID 18001) which powers a mechanical mulcher (Unit ID 18002) as is included in construction permit #3048-2TR. The combined unit is on a wheeled trailer. Its primary storage and operating location is the Construction and Demolition Debris Landfill (C&D landfill), also referred to as LF-268. The unit has the potential to be moved and used on other areas of Kirtland AFB. Wood materials processed in the mulcher may consist of any combination of tree trunks, limbs, bushes, segregated lumber, or bush or tree clippings. Mulching makes these items more amenable to biodegradation and/or for use as compost.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for the landfill mulcher is contained in Attachment B, and emission calculations are provided in Attachment C. Attachment E contains a detailed site map with the exact location of the landfill mulcher.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Design Capacity/Maximum Operating Schedule. Maximum hourly usage was assumed to be one 10.8 cubic yard hopper per hour, and maximum annual usage was conservatively estimated to be 500 hours per year. Historical operating data indicates that the mulcher operates far less frequently.

Emission Control Equipment and Monitoring Equipment

Kirtland AFB is subject to the requirements of the NESHAP 40 Code of Federal Regulations (CFR) 63 Subpart ZZZZ Reciprocating Internal Combustion Engines (RICE) for the landfill mulcher. The landfill mulcher engine is categorized as a non-emergency, compression ignition (CI) between 300 and 500 hp and is subject to CO emission control requirements (40 CFR 63.6603 and Table 2d). Kirtland has installed a catalyst on the landfill mulcher. The catalyst is capable of providing a 70% reduction in CO emissions. In addition to the catalyst, a temperature and pressure monitoring system is installed to ensure that the catalyst maintains optimal operating conditions to reduce CO emissions.

5.3 Remediation Units

There are two soil vapor extraction (SVE) systems located at Kirtland AFB that are part of an ongoing environmental restoration projects at Kirtland AFB. The SVE systems, Unit IDs 12009 and 12010, are contained in source registration #3329 and construction permit #3331, respectively. The SVE units are designed to remediate vadose zone contamination.

The SVE systems include SVE wells, aboveground piping manifolds that transport the vapors to a blower skid, and either granulated activated carbon (GAC) or catalytic oxidation (CATOX) units to mitigate/destroy the hydrocarbon vapors in the extracted well gas.

SVE unit 12009 is designed for 50 percent minimum removal of hydrocarbons. It includes an inlet system with a vapor/liquid separator, inlet air filter, a blower and two units placed in the exhaust before discharge to atmosphere. The vacuum blower pulls volatilized total hydrocarbons (THCs) through recovery wells located beneath the surface in vaults. Ambient air is then combined with the THC vapor before the separator removes entrained/condensed water from the mixed vapor stream. The air stream is then discharged at low pressure through the activated carbon filters at 365 standard cubic feet per minute (scfm) for treatment.

The CATOX system (unit 12010) at Site 58 PL-567 will be used to remediate spill contamination and extract gasoline vapors from the vadose zone at Site 58; however, it has not begun operation as of the due date of this application. The SVE will be operated continuously and has a destruction efficiency of 99% using a thermal oxidizer that operates at 467,000 BTU/hour (hr), with a constant air flow of 250 scfm. The unit uses extracted fuel vapors for its operation, relying on propane as a secondary fuel source when extracted vapors are insufficient. The THC-laden air is drawn into the CATOX fan and is discharged into the system's heat exchanger. The air passes through the tube side of the heat exchanger and into the burner, where the contaminated air is raised to the catalyst operating temperature of 600 to 1200 degrees Fahrenheit (°F). When the THC-laden air passes through the catalyst, an exothermic reaction takes place, converting the THC in the air stream to carbon dioxide and water vapor. The air stream is then exhausted out the adjoined 13-foot steel stack. With the high hydrocarbon content of the SVE well gas and the heat recovery exchanger, the CATOX will require very little propane until THC concentrations in the SVE well gas drop below 3500 parts per million by volume (ppmv). Only VOC, CO and NOx are emitted by its operation. While CO and NOx could be considered negligible and the HAP emissions almost zero, estimates are still incorporated into Kirtland AFB's emissions calculations and are included in Attachment A.

Specific information for the SVE systems is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. Simplified process flow diagrams applicable to the SVE systems are contained in Attachment B and emission calculations for the SVE systems are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

<u>Design Capacity/Maximum Operating Schedule</u>. The SVE systems treat vapor phase extracted fuel primarily. The SVE system can be operated 24 hours per day, 7 days per week, 52 weeks per year other than for scheduled maintenance down time. This operating schedule allows for maximum operations to facilitate the maximum removal of soil contamination.

Emissions Control Equipment and Monitoring Equipment

The SVE systems are not equipped with emissions monitoring equipment. No applicable requirements mandate the use of this equipment.

5.4 External Combustion

Kirtland AFB uses external combustion systems (boilers) to provide comfort heat and to produce hot water for individual buildings throughout Kirtland AFB. These systems, permitted and insignificant sources, vary in heat input capacity from about 0.21 million Btu/hour to 6.25 million Btu/hour. Kirtland AFB's external combustion systems are all fueled by pipeline natural gas. Emission unit IDs 14014 and 14166 through 14169 are the five non-exempt permitted external combustion boilers on Kirtland AFB that provide comfort heating.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for an external combustion unit is contained in Attachment B, and emission calculations for each external combustion unit are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Emissions from external combustion occur continuously when the unit is being operated. The maximum operating schedule for most of Kirtland AFB's units is 24 hours per day, 7 days per week, 26 weeks per year, as these units are used only for building heating and are operated only during cold weather months. These external combustion units are turned on in the fall and turned off in the spring. During the period in which the boilers are operating, they are switched on and off automatically by a load demand sensor (e.g., a thermostat). Kirtland AFB has chosen to base allowable emissions on continuous operation (8,760 hours/year) of all external combustion systems.

Emissions Control Equipment and Monitoring Equipment

The external combustion units at Kirtland AFB are not equipped with emissions control or monitoring equipment. There are no specific or general applicable requirements that mandate emissions control or monitoring for gas-fired external combustion units.

5.5 Fuel Dispensing

Fuel dispensing at Kirtland AFB consists of dispensing gasoline, E85, aviation gasoline (AVGAS), jet fuel, and diesel fuel into equipment and vehicles for use at Kirtland AFB. Because jet fuel and diesel fuel have vapor pressures below 10 mm Hg, dispensing of these fuels is defined as an insignificant activity by the AEHD AQD.

<u>Government East Service Station</u>

The dispensing (Unit ID 15001) operation at the Government East Service Station, located adjacent to Building 20359, is used to dispense gasoline to government vehicles. Operations involve transferring fuels from commercial and base-owned delivery trucks into two above ground storage tanks (ASTs), and transferring fuels from the ASTs into government vehicles via two fuel dispensers. Each gasoline AST has a capacity of 10,000 gallons and is equipped with a submersible pump to deliver fuel to the dispenser. Each dispenser has two nozzles, providing for a total of four dispensing nozzles.

The Government East Service Station also dispenses E85 fuel to government vehicles. E85 is an alcohol fuel blend that contains a mixture of 85% denatured fuel ethanol and 15% gasoline by volume. The E85 fuel dispensing (Unit ID 15011) operation is also located adjacent to Building 20359. Operations involve transferring fuels from the AST into vehicles via the dispenser. The dispenser has two nozzles.

Government West Service Station

The gasoline dispensing (Unit ID 15004) operation at the Government West Service Station, located adjacent to Building 471, is used to dispense gasoline to government vehicles. Operations involve dispensing fuels from the vaulted AST into vehicles. The dispenser has two nozzles.

898th Munitions Squadron

The gasoline fuel dispensing (Unit ID 15008) operation located adjacent to Building 27497 is used to dispense motor fuels to all-terrain vehicles (ATVs), off-roading vehicles (HUMVEEs, etc), and occasionally pick-up trucks. Operations involve transferring fuel from the vaulted AST into vehicles via the dispenser. The vaulted AST stores both unleaded gasoline and biodiesel. The gasoline is stored in one compartment of the vaulted AST and has a capacity of 1,000 gallons. The vaulted AST is equipped with a submersible pump to deliver fuel to the dispenser. The dispenser has one nozzle for gasoline.

Startup and shutdown emissions from all storage tank and fuel dispensing operations are not expected to be different from those during normal operations.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for a fuel dispensing operation is contained in Attachment B, and emission calculations for each fuel dispensing unit are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Design Capacity/Maximum Operating Schedule. Gasoline and E85 dispensing operations occur whenever operations at Kirtland AFB are ongoing. To maintain maximum flexibility, it is assumed that fuel dispensing may occur any time, 24 hours per day, 7 days per week, 52 weeks per year. The design capacity of fuel dispensing operations is difficult to define. In general, each fuel dispensing nozzle can dispense approximately 10 gallons of gasoline per minute; however, the process capacity is limited by the requirement to move vehicles to and away from the dispenser and to prepare them for fueling.

Kirtland AFB's normal operating hours for fuel dispensing are approximately 6 a.m. to 5 p.m., 7 days per week. Exact hours cannot be specified because different organizations at Kirtland AFB operate on different schedules. Occasionally, project demands result in operations at other hours of the day or night and on weekends.

Kirtland AFB's dispensing operations at the Government East and West Service Stations have permitted throughput limits of 690,000 gallons per year for Unit ID 15001, 140,000 gallons per year for Unit ID 15004, and 510,000 gallons per year for Unit ID 15011. The dispensing operation at the 898th Munitions Squadron has a permitted throughput limit of 20,000 gallons per year for Unit ID 15008.

Emission Control Equipment and Monitoring Equipment

Emissions reduction resulting from the vapor balance system is not taken into account in the established permit emission limits. The remaining fuel dispensing operations at Kirtland AFB are not equipped with emissions control or monitoring equipment; no applicable requirements mandate the use of such equipment.

5.6 Fuel Loading Racks

Fuel loading rack operations consist of transferring liquid fuel from a fixed storage tank to a tanker truck for subsequent transport to other locations. Emissions occur as a result of fuel vapor displacement when the tanker truck is filled.

<u>Bulk Fuels Facility</u>

The gasoline loading (Unit ID 16001) operation at the Bulk Fuels Facility is located adjacent to Building 1041. Operations involve transferring unleaded gasoline from the AST into government-owned fuel trucks via submerged loading. Operations are limited to a throughput of 90,000 gallons per year and less than 20,000 gallons per day.

Specific information for the emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for a fuel loading operation is contained in Attachment B, and emission calculations for the fuel loading unit are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

<u>Design Capacity/Maximum Operating Schedule</u>. Fuel loading operations occur on an as-needed basis. To maintain maximum flexibility, it is assumed that loading operations could occur any time, 24 hours per day, 7 days per week, 52 weeks per year.

Kirtland AFB's normal operating hours are approximately 6 a.m. to 5 p.m., 5 days per week. Exact hours cannot be specified because different organizations at Kirtland AFB operate on different schedules. Occasionally, project demands result in operations at other hours of the day or night and on weekends.

Kirtland AFB has established throughput limits of 90,000 gallons per year and less than 20,000 gallons per day and with a 300 gallons per minute unloading rate.

Emission Control Equipment and Monitoring Equipment

The gasoline loading rack operations at Kirtland AFB are not equipped with emissions control or monitoring equipment. No applicable requirements dictate the use of such equipment.

5.7 Storage Tanks

Fuels are routinely stored in steel or fiberglass tanks at Kirtland AFB that can be either an AST or installed in a below-grade vault. An AST can have fixed dimensions (fixed roof tanks), or can have a roof that floats on or above the liquid surface (internal or external floating roof tanks). Emissions from storage tanks occur due to vapor displacement as liquid is pumped into the tank and when diurnal temperature changes cause the tanks to "breathe."

<u>Bulk Fuels Facility</u>

The gasoline storage (Unit ID 22005) operation at the Bulk Fuels Facility is located adjacent to Building 1041. Operations involve transferring gasoline from commercial delivery trucks into the AST. The AST associated with this loading operation has a capacity of 10,000 gallons and stores unleaded gasoline. Operations are limited to a throughput of 90,000 gallons per year and less than 20,000 gallons per day.

Government East Service Station

The gasoline storage (Unit IDs 22003/22004) operation at the Government East Service Station, located adjacent to Building 20359, is used to dispense gasoline to government vehicles. Operations involve transferring fuels from commercial and base-owned delivery trucks into two ASTs. Each gasoline AST has a capacity of 10,000 gallons and is equipped with a submersible pump to deliver fuel to the dispenser.

The Government East Service Station also stores and dispenses E85 fuel to government vehicles. E85 is an alcohol fuel blend that contains a mixture of 85% denatured fuel ethanol and 15% gasoline by volume. The E85 fuel storage (Unit ID 22015) operation is also located adjacent to Building 20359. Operations involve transferring fuels from commercial delivery trucks into the AST, and transferring fuels from the AST into vehicles via the dispenser. The E85 AST has a capacity of 10,000 gallons and is equipped with a submersible pump to deliver fuel to the dispenser.

Government West Service Station

The gasoline storage (Unit ID 25012) operation at the Government West Service Station, located adjacent to Building 471, is used to dispense gasoline to government vehicles. Operations involve transferring fuels from commercial and base-owned delivery trucks into an AST installed in a below-grade vault, and dispensing fuels from the vaulted AST into vehicles. The gasoline tank has a capacity of 3,000 gallons and is equipped with a submersible pump to deliver fuel to the dispenser.

898th Munitions Squadron

The gasoline storage (Unit ID 25017) operation located adjacent to Building 27497 is used to dispense motor fuels to off-roading vehicles (HUMVEEs, etc), and occasionally pick-up trucks. Operations involve transferring fuel from delivery trucks into the vaulted AST, and transferring fuel from the vaulted AST into vehicles via the dispenser. The vaulted AST stores both unleaded gasoline and biodiesel. The gasoline is stored in one compartment of the vaulted AST and has a capacity of 1,000 gallons. The vaulted AST is equipped with a submersible pump to deliver fuel to the dispenser.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for a storage tank is contained in Attachment B, and emission calculations for each storage tank are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Design Capacity/Maximum Operating Schedule. There are two components of design capacity that impact emissions from fuel storage tanks; the storage capacity of the tank and the fuel throughput. The storage capacity of each tank sets the upper limit on the vapor space volume, which is a major factor in the standing storage loss portion of storage tank emissions. The fuel throughput is the primary determining factor in the working loss portion of storage tank emissions. Standing storage losses occur as the ambient temperature changes. Working losses occur when fuel is added to the tank; to maintain maximum operating flexibility, it is assumed that storage tanks can be filled any time, 24 hours per day, 365 days per year.

Filling the gasoline storage tanks typically occurs only during Kirtland AFB's normal operating hours, approximately 6 a.m. to 5 p.m. Tanks themselves are in operation 24 hours a day, 7 days per week, 365 days per year.

Emission Control Equipment and Monitoring Equipment

Commercial trucks delivering fuel to Kirtland AFB gasoline and E85 tanks employ vapor balance, and afterwards the vapors that remain in the trucks are contained and not released onsite. Although emissions are reduced because of the vapor balance used, in order to be conservative, all on-site loading, dispensing, and tank filling emissions were estimated in this application assuming there were no vapor balance or controls.

5.8 Engine Test Cell

Test cell operations are located southeast of Building 701 on the test cell pad where performance tests are conducted on uninstalled aircraft engines.

The test cell operations are located at the 58 SOW test facility located southeast of Building 701 on Kirtland AFB. The engine test stands are located on the southeast section of the 58 SOW test facility. The test cell operations currently test uninstalled T400 (Unit ID 20002) helicopter and T700 (Unit ID 20004) helicopter engines. The engines are tested to isolate mechanical problems and to ensure that the engines are running properly once maintenance has been performed. The test cell operations consist of a test stand, trailer and cab. Jet fuel is used in all of the tests.

The exhaust gases consist of combustion products from the jet fuel burned in engines, including CO, NOx, PM, PM_{10}, $PM_{2.5}$, SOx, VOC, and HAP. A simplified process flow diagram for test cell operations is presented in Attachment B. The process inputs are fuel and air and the process outputs are combustion products and mechanical work (engine thrust).

Because tests are conducted as part of maintenance operations to ensure that the engines are operating as close to design specifications as possible, no testing is intentionally done at poor operating conditions. No excess, upset, or malfunction emissions are expected.

Specific information for each emission unit is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram for an engine test cell is contained in Attachment B, and emission calculations for each engine test cell are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

<u>Design Capacity/Maximum Operating Schedule.</u> Equipment located at the facility may operate 24 hours per day, 7 days per week, 52 weeks/year. However, pursuant to Construction Permit #0484-M3, Unit ID 20004 #T700 shall not exceed 235 annual hours of operation based on a 12-month rolling total and Unit ID 20002 #T400 shall not exceed 350 annual hours of operation based on a 12-month rolling total.

Emission Control Equipment and Monitoring Equipment

The engine test cell operations at Kirtland AFB are not equipped with emissions control or monitoring equipment. No applicable requirements dictate the use of such equipment.

5.9 Miscellaneous Paint and Chemical Usage

Miscellaneous paint and chemicals include products such as solvents, adhesives, epoxies, resins, paints, and sealants, which are used for a wide variety of operational and maintenance purposes and are used at locations throughout Kirtland AFB.

Pollutants emitted from the use of paints and miscellaneous chemicals include VOCs, PM, PM_{10}, $PM_{2.5}$, and volatile and particulate HAPs. The process inputs are chemicals and surfaces and the process outputs are HAPs, VOCs, and prepared surfaces.

Miscellaneous paint and chemical usage is conducted as part of maintenance and operations on an as needed basis. There is no (or piece of) automated equipment that would have the potential to run without an operator, therefore, no excess, upset, or malfunction emissions are expected.

Specific information for miscellaneous paint and chemical usage is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram is contained in Attachment B and emission calculations for miscellaneous paint and chemical usage are provided in Attachment C. There is no specific location information for this process since it can occur throughout the entire base, and therefore is not included in Attachment E.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

Design Capacity/Maximum Operating Schedule. Operations and maintenance conducted at the facility may occur 24 hours per day, 7 days per week, 52 weeks/year.

Emission Control Equipment and Monitoring Equipment

The miscellaneous paint and chemical usage operations at Kirtland AFB are not equipped with emissions control or monitoring equipment. No applicable requirements dictate the use of such equipment.

5.10 Surface Coating

Surface coating operations involve the application of protective coatings (e.g., primers, sealers, stains, topcoats) to various types of surfaces to improve their durability and/or appearance. Surface coatings can be applied by brushing, rolling, or spraying the coating on to the surface, or by immersing the surface in the coating. Spray application of coatings is the most common method used in industrial settings; this can involve spraying from an aerosol can, use of a conventional air atomized spray rig, or use of more advanced spray equipment (e.g., high volume low pressure (HVLP), airless, or air-assisted airless) designed to reduce the amount of paint required to coat a surface by reducing the amount of overspray (i.e., coating material that misses or bounces off the surface).

Coating operations are conducted in a paint booth. Paint booths provide a good environment for painting by isolating the activity from wind, dust, and other external effects. Paint booths are typically equipped with filters for particulate matter control. Emissions from surface coating include the VOCs and HAPs in the solvents that are part of the coatings (and the solvents used for thinning and for cleanup) and PM emissions from overspray.

<u>58 Special Operations Wing Training Development Paint Booth at Building 482</u>

The 58 SOW Training Development Facility consists of one enclosed building that contains a small paint booth (Unit ID 21004), a mechanic shop area, classroom space, and an aircraft hangar. The primary function of the paint booth is to paint equipment and aircraft parts used in aircrew training mockups and facilities. Touch-up and surface coating refurbishment operations for aircraft parts such as panels will be accomplished in the paint booth.

<u>58 Special Operations Wing Corrosion Control Facility</u>

The 58 SOW Corrosion Control Facility (Unit ID 21015) consists of a main hangar and an adjacent shop area. The primary function of the main hangar is as an aircraft paint bay. Spot stripping, touch-up and surface coating repair operations for large aircraft and smaller, removable aircraft components are accomplished in the aircraft paint bay.

Specific information for surface coating activities is contained in the AEHD AQD Operating Permit Renewal Application Forms in Attachment A. A simplified process flow diagram is contained in Attachment B and emission calculations for surface coating are provided in Attachment C. Attachment E contains a detailed site map with the exact location of each source.

Maximum and Standard Operating Procedures (Work Practice Standards or Limitations)

The 58 SOW Paint Booth (Unit ID 21004) generally operates during an 8.5 hour per day, 5 day per week, 52 week per year schedule. However, to maintain maximum operating flexibility, it is assumed that these operations could occur any time during a 24 hour per day, 7 day per week, 52 week per year time period. The rated process rate for 58 SOW Paint Booth is 3.0 gal/hr for each spray gun; however, since there is only one gun port in the booth, only one of the two permitted spray guns are used at a time.

The 58 SOW Corrosion Control Facility (Unit ID 21015) generally operates for five days per week, 52 weeks per year. However, to maintain maximum operating flexibility, it is assumed that these operations could occur 7 days per week, 52 weeks per year. The rated process rate for 58 SOW Corrosion Control Facility is 30 lb/hr for each HLVP spray gun, however only two HVLP spray guns are allowed to be used at any one time.

Emission Control Equipment and Monitoring Equipment

Emissions from surface coating operations consist of VOCs and HAP associated with the solvents in paints, thinners, and cleaning solvents. Particulate matter is emitted as a result of paint overspray and the PM may also contain HAP. Emission control equipment consists of particulate filters located in the paint booth. Overspray from painting activities passes through particulate filters and is then exhausted through the paint booth stack(s).

6.0 Operational Plan

Mitigation of Startup, Shutdown, and Emergency Emissions (Operational Plan)

Kirtland AFB assumes that startup, shutdown, and scheduled maintenance (SSM) emissions from the mission support permitted equipment related to training exercises, aircraft refueling and maintenance, engine testing, fuel storage and distribution, and corrosion control/surface coating activities are equal to steady state emissions; therefore it is assumed that the established emission limits contained in Kirtland AFB's Operating Permit for these sources are sufficient to accommodate SSM emissions and an exceedance is not expected. Specific operational conditions related to the potential for SSM emissions from each source category are included below.

Internal Combustion Units

Internal combustion engines typically have increased particulate emissions at startup, until the engine has warmed up. This is normal and no specific mitigation measures will be employed. Shutdown emissions are not anticipated from this type of equipment. Routine emissions from the emergency engines occur during monthly maintenance operations. Emergency engines are only operated for maintenance purposes and during an emergency. Monthly maintenance ensures that the emissions will be normal when an engine is operated in response to an emergency.

Remediation Units

Routine preventative maintenance for the SVE systems will be conducted to assure proper operation and optimize vadose zone treatment. SVE system maintenance activities are documented in quarterly and semi-annual performance and summary reports prepared on behalf of the Kirtland AFB Environmental Restoration Program.

Surface Coating

Emissions from the paint booths at startup and shutdown are not expected to differ from those during normal operations. If a HVLP or an electrostatic spray gun involved in a coating process malfunctions, the desired finish cannot be obtained, and the equipment operator will immediately halt the operation and correct the malfunction. Since all VOC and HAP emissions contained in the coating are assumed to be emitted, there is no malfunction that could increase these emissions. By the nature of the coating application equipment and material, there is no increase in emissions during startup or shutdown.

Emissions from paint booth particulate control equipment are not higher during startup or shutdown than emissions during routine operation. PM emissions from paint booths could be increased by a malfunction of the control device (e.g., a tear in the filter). If the particulate control equipment malfunctions during operation, the operators are trained to discontinue operations until the malfunction has been corrected.

External Combustion

External combustion systems operate only when ambient outdoor temperature fluctuations require the use of the heaters to maintain a consistent indoor temperature. The systems will typically be operated from the fall until they are shut down in the spring, routine (heat demand) startup and shutdown emissions are not expected to differ substantially from steady state emissions. Routine and preventive maintenance are typically performed during the warm months.

Fuel Storage

Startup and shutdown emissions for fuel storage and dispensing are not expected to differ from those during normal operations. The only emergency condition that might result in excess emissions would be a fuel spill or equipment leak. Kirtland AFB personnel routinely check for spills and leaks and correct such situations immediately upon discovery.

Miscellaneous Paint and Chemical Usage

Since there is no specific equipment associated with miscellaneous chemical use, there are no startup, shutdown, or emergency emissions to be addressed.

7.0 Site Diagram

A scaled map of Kirtland AFB illustrating the locations of all permitted equipment, all buildings, and the base fence line can be found in Attachment E – Maps with Emission Unit List. Each emission unit is labeled with the Kirtland AFB Unit ID. Refer to the emission unit list in Attachment E to identify the source description, Kirtland AFB Unit ID, and associated permit number.

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8.0 Alternative Operating Scenarios

Kirtland AFB is not proposing any alternative operating scenarios for the internal combustion, remediation, external combustion, fuel dispensing, fuel loading, fuel storage, engine test cell, miscellaneous paint and chemical usage, or surface coating sources. All operations will conform to the descriptions provided in this section of the Operating Permit Renewal application and each Construction Permit or Source Registration.

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9.0 Insignificant Activities

A list of insignificant activities is required in this application pursuant to 20.11.42.12A(4)(f) NMAC. Insignificant activities include those activities that have the potential to emit less than one ton per year of any regulated criteria pollutant. Any activity for which applicable requirements apply is not insignificant, regardless of whether the activity meets the definition of insignificant as stated. A listing of the insignificant sources is contained in Attachment F-Insignificant Sources.

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10.0 Dispersion Modeling

Air Dispersion Modeling is provided in Attachment G for the sources included in this Title V Operating Permit Renewal Application. The sources that were modeled include:

- Unit ID 12010 - Soil Vapor Extraction System
- Unit ID 18001 - Landfill Mulcher Engine
- Unit ID 19159 - Non-Emergency Generator Engine
- Unit ID 19183 – AFOTEC Generator
- Unit ID 20004 - T700 Kerosene-fired Helicopter Engine
- Unit ID 20002 - T400 Kerosene-fired Helicopter Engine
- Unit ID 21004 - 58 SOW Paint Booth
- Unit ID 21015 - 58 SOW Corrosion Control Facility

Modeling for the external combustion comfort heat boilers was waived by the AEHD AQD in a 30 August 2012 email from Mr. Jeff Stonesifer, AEHD AQD Meteorologist. Mr. Stonesifer stated: "A calculation of the emissions from the five natural gas boilers using AP-42 factors reveals low emissions from these boilers. Even if the emissions were coming from one location it still wouldn't be enough to trigger a permitting action. In short, Kirtland AFB does not need to model the following five boilers: Unit ID 14166 - 5,250,000 BTU/hr natural gas, Unit ID 14167 - 5,250,000 BTU/hr natural gas, Unit ID 14014 - 6,250,000 BTU/hr natural gas, Unit ID 14168 - 5,230,000 BTU/hr natural gas, Unit ID 14169 - 5,230,000 BTU/hr natural gas."

A large number of sources in this permit application are emergency generators. As stated in the AEHD AQD Internal Combustion Engine Permitting Policy, effective November 18, 1998, *internal combustion engines permitted for emergency use do not require an air dispersion modeling analysis*.

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11.0 Certification of Compliance Status

Attachment D, Table D-3, Summary of Applicable Requirements by Source Category provides a detailed summary of Kirtland AFB's compliance with all applicable requirements.

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12.0 Statement of Continued Compliance

Kirtland AFB will continue to be in compliance with requirements for which it is in compliance at the time of this permit renewal application. Kirtland AFB is committed to complying with other applicable requirements as they come into effect during the permit term. Compliance will occur in a timely manner and be consistent with the schedule expressly required by the applicable requirement.

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13.0 Enhanced Monitoring and Compliance Certification

Kirtland AFB is not currently subject to any enhanced monitoring and compliance certification requirements of the Federal Act.

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Attachment A

AEHD AQD Operating Permit Application Forms

City of Albuquerque
Environmental Health Department
Air Quality Division
One Civic Plaza NW
3rd Floor, Room 3023
Albuquerque, New Mexico 87102
Telephone: (505) 768-1972 Fax: (505) 768-1977
20.11.42 NMAC
Operating Permit Application Form

Please answer all questions applicable to your specific business, operation and products. Use the abbreviation "N.A." for "not applicable" wherever appropriate.

SECTION 1 - GENERAL INFORMATION (20.11.42.12A.(4) NMAC)
{Specific instructions corresponding to numbers in brackets are included in the application package.}

1. Company Name:{1} U.S. Air Force - Kirtland Air Force Base (AFB)
2. Application Date: January 2022
3. Company Mailing Address: 377 MSG/CE Environmental, 2050 Wyoming Blvd., SE, Kirtland AFB, NM 87117-5270 4.Phone: (505) 8 53-1588
5. Owner's Name:{2} U.S. Air Force - Kirtland AFB 6. Phone: (505) 846-7377
7. Owner's Address: Same as above
8. Plant Name:{3} {if different from 1.} ________ 9. Phone: ________
10. Plant Address:{if different from 3.} ________
11. Operator of Plant:{4} Melissa Clark 12. Phone: (505) 853-1588
13. Plant Operator Address: N.A.
14. Responsible Official {5}: Jason F. Vattioni, Colonel, USAF Commander 15. Phone: (505) 846-7377
16. Address of Responsible Official: 2000 Wyoming Blvd SE Kirtland AFB, NM, 87117-5000
17. Person to Contact at Site {6}: Andria Cuevas 18. Title: Air Program Manager 19. Phone: (505) 846-2522
20. Owner's Agent(s):{7} N.A. 21. Phone: ________
22. Company's State of Incorporation or Registration to do Business: N.A.
23. Company's Corporate or Partnership Relationship to any other Air Quality Permittee: {8} N.A.
24. Name of Parent Company: {9} N.A.
25. Address of Parent Company: N.A.
26. Names of Subsidiary Companies: {10} N.A.
27. Air Quality Permits for this Source Already Received: (Permit Number(s)) ________
28. Other Air Quality Permits Issued to this Applicant: (Permit Number(s)) Construction Permits: 484-M3, 1759-M1-RV1, 1770-RV3, 1777-RV2, 1786-M5, 1945, 2085, 2100, 2105-RV1, 3048-2TR, 3070-M1-1TR, 3090-RV1, 3101-RV1, 3102, 3128, 3129, 3141-RV1, 3308, 3329, 3331, 3366, Registration Certifications: 3047, 3102, 3329

29. Reason this source must have a Part 42 operating permit: {11} Kirtland AFB's potential emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) are greater than 100 tons per year (tpy).

30. Is U.S.G.S. quadrangular map or equivalent attached? {12} See Attachment E of the Title V operating permit application

31. Ownership of land at plant site (private, State, Federal, Indian, etc.): Federal
NOTE: If the land at the plant site is Indian land, contact the Air Pollution Control Division Engineering staff for assistance.

32. Distance, in meters, of plant site to nearest residence, school or occupied structure:{13} 0 meters, residences and schools are located on Kirtland AFB

33. Location of Plant:

33A. City or County: Bernalillo County 33B. Direction and distance from nearest town: Adjacent to and south of Albuquerque, NM

33C. UTM Zone: 4751 (New Mexico, Central) UTME: 360 km UTMN: 3,900 km

33D. Range:_____ Township:_____ Section:_____ 30E. Latitude:_____ Longitude:

34. Plant Elevation 5,350 ft above mean sea level

35. Describe briefly type of plant and nature of processes (or modification) and products, including primary and secondary SIC codes: {14} The primary activity at Kirtland AFB is classified under SIC code – 97, National Security. Kirtland AFB's primary source of emissions includes boilers, generators, paint booths, remediation activities and fuel loading, storage, and dispensing. Support activities that are related to the primary activity of the installation are classified under SIC code 49, Utilities and SIC code 92, Fire Protection/Police.

36. Describe briefly any processes or products associated with any alternative operating scenarios described in this application, including primary and secondary SIC codes {15}: N.A.

37. Plant's Maximum Allowable Hourly and Annual Capacities (specify units) {16}: Hourly: N.A.
Annual N.A.

38. Permit Renewals or Significant Modifications

38A. Is this an application for an operating permit renewal or significant modification? Yes X No _____.

38B. If yes, when does the current operating permit expire? 22 January 2023

39. Is this a portable or temporary source {17}? Yes _____ No X.

39A. If yes, provide identifying numbers (e.g. serial numbers):_____

39B. If yes, date of anticipated startup: _____ 40C. If yes, date of anticipated relocation: _____

40. Operational Periods: (20 NMAC 11.42.II.1.1.D.5.f.)

40A. Specify **standard** operational periods:

11 hours per day, 6 am to 5 pm, 7 days per week, 4 weeks per month, 12 months per year.

40B. Specify **maximum** operational periods:

24 hours per day, 12 am to 12 pm, 7 days per week, 4 weeks per month, 12 months per year.

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
12009	Soil Vapor Extraction with Granulated Activated Carbon	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Particulate Matter (PM_{10})	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Particulate Matter ($PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12009	Soil Vapor Extraction with Granulated Activated Carbon	Hazardous Air Pollutants (HAP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
12009	Soil Vapor Extraction with Granulated Activated Carbon	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Oxides of Nitrogen (NO_x)	0.17 lb/hr 0.75 tpy	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Carbon Monoxide (CO)	0.08 lb/hr 0.33 tpy	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Volatile Organic Compounds (VOC)	0.28 lb/hr 1.25 tpy	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Particulate Matter (PM_{10})	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	Particulate Matter ($PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
12010	Soil Vapor Extraction with Thermal Oxidizer	Hazardous Air Pollutants (HAP)	0.00086 lb/hr 0.0038 tpy	See Attachment C (Emission Calculations)	20.11.41 NMAC
12010	Soil Vapor Extraction with Thermal Oxidizer	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
14014	Boiler	Oxides of Nitrogen (NO_x)	0.61 lb/hr 2.68 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC
14014	Boiler	Carbon Monoxide (CO)	0.51 lb/hr 2.25 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC
14014	Boiler	Sulfur Dioxide (SO_2)	0.004 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC
14014	Boiler	Volatile Organic Compounds (VOC)	0.16 lb/hr 0.68 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC
14014	Boiler	Total Suspended Particulate Matter (TSP)	0.05 lb/hr 0.2 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC
14014	Boiler	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.05 lb/hr 0.2 tn/yr	See Attachment C (Emission Calculations)	20.11.40 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
14014	Boiler	CO_2e	3,203.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
14166	Boiler	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14166	Boiler	CO_2e	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
14167	Boiler	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		
14167	Boiler	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14167	Boiler	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		
14167	Boiler	Volatile Organic Compounds (VOC)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		
14167	Boiler	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		
14167	Boiler	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		
14167	Boiler	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
			N/A[1]		
14168	Boiler	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			N/A[1]		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
14168	Boiler	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14168	Boiler	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14168	Boiler	Volatile Organic Compounds (VOC)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14168	Boiler	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14168	Boiler	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14168	Boiler	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
14169	Boiler	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14169	Boiler	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
14169	Boiler	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14169	Boiler	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14169	Boiler	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14169	Boiler	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
14169	Boiler	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
15001	Gasoline Dispensing	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
15001	Gasoline Dispensing	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
15001	Gasoline Dispensing	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
15001	Gasoline Dispensing	Volatile Organic Compounds (VOC)	28.08 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			4.04 tn/yr		
15001	Gasoline Dispensing	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15001	Gasoline Dispensing	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15001	Gasoline Dispensing	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
15004	Gasoline Dispensing	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15004	Gasoline Dispensing	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15004	Gasoline Dispensing	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15004	Gasoline Dispensing	Volatile Organic Compounds (VOC)	14.04 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			0.82 tn/yr		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
15004	Gasoline Dispensing	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15004	Gasoline Dispensing	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15004	Gasoline Dispensing	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
15008	Gasoline Dispensing	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15008	Gasoline Dispensing	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15008	Gasoline Dispensing	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15008	Gasoline Dispensing	Volatile Organic Compounds (VOC)	12.00 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			0.2 tn/yr		
15008	Gasoline Dispensing	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
15008	Gasoline Dispensing	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15008	Gasoline Dispensing	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
15011	E85 Fuel Dispensing	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15011	E85 Fuel Dispensing	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15011	E85 Fuel Dispensing	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15011	E85 Fuel Dispensing	Volatile Organic Compounds (VOC)	14.04 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			2.98 tn/yr		
15011	E85 Fuel Dispensing	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
15011	E85 Fuel Dispensing	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
15011	E85 Fuel Dispensing	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
16001	Gasoline Loading	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			N/A[1]		
16001	Gasoline Loading	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			N/A[1]		
16001	Gasoline Loading	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			N/A[1]		
16001	Gasoline Loading	Volatile Organic Compounds (VOC)	105.55 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			0.26 tn/yr		
16001	Gasoline Loading	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			N/A[1]		
16001	Gasoline Loading	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart BBBBB
			N/A[1]		
16001	Gasoline Loading	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
18001	Non-Emergency Landfill Mulcher Engine	Oxides of Nitrogen (NO_x)	13.12 lb/hr 3.29 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	Carbon Monoxide (CO)	2.84 lb/hr 0.71 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	Sulfur Dioxide (SO_2)	0.87 lb/hr 0.22 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	Volatile Organic Compounds (VOC)	1.05 lb/hr 0.26 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	Total Suspended Particulate Matter (TSP)	0.94 lb/hr 0.23 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.94 lb/hr 0.23 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
18001	Non-Emergency Landfill Mulcher Engine	CO_2e	121.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
18002	Landfill Mulcher	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
18002	Landfill Mulcher	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
18002	Landfill Mulcher	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
18002	Landfill Mulcher	Volatile Organic Compounds (VOC)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
18002	Landfill Mulcher	Total Suspended Particulate Matter (TSP)	1.18 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.30 tn/yr		
18002	Landfill Mulcher	Particulate Matter ($PM_{10}/PM_{2.5}$)	1.18 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.30 tn/yr		
18002	Landfill Mulcher	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
19003	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	4.185 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.419 tn/yr		
19003	Emergency Generator Engine	Carbon Monoxide (CO)	0.902 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.09 tn/yr		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19003	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.277 lb/hr 0.028 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19003	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.333 lb/hr 0.033 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19003	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.297 lb/hr 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19003	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.297 lb/hr 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19003	Emergency Generator Engine	CO_2e	15.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19006	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	3.162 lb/hr 0.316 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19006	Emergency Generator Engine	Carbon Monoxide (CO)	0.681 lb/hr 0.068 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19006	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.209 lb/hr 0.021 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19006	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.252 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19006	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19006	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19006	Emergency Generator Engine	CO_2e	11.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19014	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	17.36 lb/hr 1.74 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19014	Emergency Generator Engine	Carbon Monoxide (CO)	4.61 lb/hr 0.46 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19014	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.0082 lb/hr 0.0008 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19014	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.49 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19014	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.54 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19014	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.54 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19014	Emergency Generator Engine	CO_2e	88.8 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19015	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	3.162 lb/hr 0.316 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19015	Emergency Generator Engine	Carbon Monoxide (CO)	0.681 lb/hr 0.068 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19015	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.209 lb/hr 0.021 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19015	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.252 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19015	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19015	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19015	Emergency Generator Engine	CO_2e	11.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19016	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	1.58 lb/hr 0.158 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19016	Emergency Generator Engine	Carbon Monoxide (CO)	0.341 lb/hr 0.034 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19016	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.105 lb/hr 0.011 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19016	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.126 lb/hr 0.013 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19016	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.112 lb/hr 0.011 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19016	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.112 lb/hr 0.011 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19016	Emergency Generator Engine	CO_2e	4.6 tn/yr	See Appendix C (Emission Calculations)	20.11.42 NMAC
19019	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	3.162 lb/hr 0.316 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	Carbon Monoxide (CO)	0.681 lb/hr 0.068 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.209 lb/hr 0.021 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.252 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19019	Emergency Generator Engine	CO_2e	11.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19031	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	12.6 lb/hr 1.26 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	Carbon Monoxide (CO)	2.97 lb/hr 0.3 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.728 lb/hr 0.073 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.877 lb/hr 0.088 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.781 lb/hr 0.078 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.781 lb/hr 0.078 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
19031	Emergency Generator Engine	CO_2e	40.7 tn/yr	See Appendix C (Emission Calculations)	20.11.42 NMAC
19032	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	14.42 lb/hr 1.442 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19032	Emergency Generator Engine	Carbon Monoxide (CO)	3.106 lb/hr 0.311 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19032	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.953 lb/hr 0.095 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19032	Emergency Generator Engine	Volatile Organic Compounds (VOC)	1.149 lb/hr 0.115 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19032	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	1.023 lb/hr 0.102 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19032	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	1.023 lb/hr 0.102 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19032	Emergency Generator Engine	CO_2e	53.3 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19069	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19069	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19069	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19069	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19069	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19069	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19069	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19070	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19070	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19070	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19070	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19070	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19070	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19070	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19071	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19071	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19071	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19071	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19071	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19071	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19071	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19072	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19072	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19072	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19072	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19072	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19072	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19072	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19073	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19073	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19073	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19073	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19073	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19073	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19073	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19074	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19074	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19074	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19074	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19074	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19074	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19074	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19075	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19075	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19075	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19075	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19075	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19075	Emergency Water Pump Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19075	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19076	Emergency Water Pump Engine	Oxides of Nitrogen (NO_x)	10.54 lb/hr 1.054 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19076	Emergency Water Pump Engine	Carbon Monoxide (CO)	2.271 lb/hr 0.227 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19076	Emergency Water Pump Engine	Sulfur Dioxide (SO_2)	0.697 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19076	Emergency Water Pump Engine	Volatile Organic Compounds (VOC)	0.84 lb/hr 0.084 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19076	Emergency Water Pump Engine	Total Suspended Particulate Matter (TSP)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19076	Emergency Water Pump Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.748 lb/hr 0.075 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19076	Emergency Water Pump Engine	CO_2e	38.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19089	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	12.1 lb/hr 1.21 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19089	Emergency Generator Engine	Carbon Monoxide (CO)	2.61 lb/hr 0.26 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19089	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.80 lb/hr 0.08 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19089	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.96 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19089	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.86 lb/hr 0.09 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19089	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.86 lb/hr 0.09 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19089	Emergency Generator Engine	CO_2e	38.4 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19091	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	18.0 lb/hr 1.80 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19091	Emergency Generator Engine	Carbon Monoxide (CO)	4.125 lb/hr 0.413 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19091	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.0091 lb/hr 0.00091 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19091	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.529 lb/hr 0.053 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19091	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.525 lb/hr 0.053 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19091	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.525 lb/hr 0.053 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19091	Emergency Generator Engine	CO_2e	85.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19093	Emergency Fire Pump Engine	Oxides of Nitrogen (NO_x)	15.84 lb/hr 1.584 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19093	Emergency Fire Pump Engine	Carbon Monoxide (CO)	3.63 lb/hr 0.363 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19093	Emergency Fire Pump Engine	Sulfur Dioxide (SO_2)	0.00801 lb/hr 0.0008 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19093	Emergency Fire Pump Engine	Volatile Organic Compounds (VOC)	0.465 lb/hr 0.047 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19093	Emergency Fire Pump Engine	Total Suspended Particulate Matter (TSP)	1.24 lb/hr 0.124 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19093	Emergency Fire Pump Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	1.24 lb/hr 0.124 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19093	Emergency Fire Pump Engine	CO_2e	75.6 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19096	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	17.61 lb/hr 1.761 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19096	Emergency Generator Engine	Carbon Monoxide (CO)	4.134 lb/hr 0.413 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19096	Emergency Generator Engine	Sulfur Dioxide (SO_2)	1.984 lb/hr 0.198 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19096	Emergency Generator Engine	Volatile Organic Compounds (VOC)	1.403 lb/hr 0.140 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19096	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	1.25 lb/hr 0.125 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19096	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	1.25 lb/hr 0.125 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19096	Emergency Generator Engine	CO_2e	65.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19102	Emergency Fire Pump Engine	Oxides of Nitrogen (NO_x)	15.84 lb/hr 1.584 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19102	Emergency Fire Pump Engine	Carbon Monoxide (CO)	3.63 lb/hr 0.363 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19102	Emergency Fire Pump Engine	Sulfur Dioxide (SO_2)	0.00801 lb/hr 0.0008 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19102	Emergency Fire Pump Engine	Volatile Organic Compounds (VOC)	0.465 lb/hr 0.047 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19102	Emergency Fire Pump Engine	Total Suspended Particulate Matter (TSP)	1.24 lb/hr 0.124 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19102	Emergency Fire Pump Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	1.24 lb/hr 0.124 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19102	Emergency Fire Pump Engine	CO_2e	75.6 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19106	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	5.146 lb/hr 0.515 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19106	Emergency Generator Engine	Carbon Monoxide (CO)	1.204 lb/hr 0.12 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19106	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.34 lb/hr 0.034 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19106	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.41 lb/hr 0.041 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19106	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.365 lb/hr 0.037 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19106	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.365 lb/hr 0.037 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19106	Emergency Generator Engine	CO_2e	13.6 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19129	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	6.417 lb/hr 0.642 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	Carbon Monoxide (CO)	1.383 lb/hr 0.138 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.424 lb/hr 0.042 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.511 lb/hr 0.051 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.455 lb/hr 0.046 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.455 lb/hr 0.046 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19129	Emergency Generator Engine	CO_2e	23.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19130	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	28.46 lb/hr 2.846 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	Carbon Monoxide (CO)	22.23 lb/hr 2.223 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.014 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	Volatile Organic Compounds (VOC)	2.615 lb/hr 0.262 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	1.044 lb/hr 0.104 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	1.044 lb/hr 0.104 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19130	Emergency Generator Engine	CO_2e	135.8 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19131	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	5.27 lb/hr 0.53 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19131	Emergency Generator Engine	Carbon Monoxide (CO)	1.14 lb/hr 0.11 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19131	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.35 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19131	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.42 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19131	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.37 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19131	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.37 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19131	Emergency Generator Engine	CO_2e	19.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19132	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	8.59 lb/hr 0.86 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19132	Emergency Generator Engine	Carbon Monoxide (CO)	1.85 lb/hr 0.19 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19132	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.57 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19132	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.68 lb/hr 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19132	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.61 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19132	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.61 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19132	Emergency Generator Engine	CO_2e	31.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19133	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	18.1 lb/hr 1.81 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19133	Emergency Generator Engine	Carbon Monoxide (CO)	4.15 lb/hr 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19133	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.97 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19133	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.53 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.05 tn/yr		
19133	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.53 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.05 tn/yr		
19133	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.53 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.05 tn/yr		
19133	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19134	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	13.5 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			1.35 tn/yr		
19134	Emergency Generator Engine	Carbon Monoxide (CO)	2.91 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.29 tn/yr		
19134	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.89 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.09 tn/yr		
19134	Emergency Generator Engine	Volatile Organic Compounds (VOC)	1.07 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
			0.11 tn/yr		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19134	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.96 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19134	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.96 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19134	Emergency Generator Engine	CO_2e	49.8 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19135	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	52.82 lb/hr 5.28 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19135	Emergency Generator Engine	Carbon Monoxide (CO)	45.67 lb/hr 4.57 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19135	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.0072 lb/hr 0.00072 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19135	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.36 lb/hr 0.036 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19135	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.12 lb/hr 0.012 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 **AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)**

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19135	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.12 lb/hr 0.012 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19135	Emergency Generator Engine	CO_2e	109.3 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19140	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
19140	Emergency Generator Engine	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
19140	Emergency Generator Engine	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
19140	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
19140	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
19140	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19140	Emergency Generator Engine	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
19142	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	3.162 lb/hr 0.316 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	Carbon Monoxide (CO)	0.681 lb/hr 0.0681 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.209 lb/hr 0.021 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.252 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.224 lb/hr 0.022 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19142	Emergency Generator Engine	CO_2e	11.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19143	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	1.55 lb/hr 0.155 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	Carbon Monoxide (CO)	0.334 lb/hr 0.033 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.103 lb/hr 0.010 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.124 lb/hr 0.012 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.11 lb/hr 0.011 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.11 lb/hr 0.011 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19143	Emergency Generator Engine	CO_2e	5.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19147	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	18.6 lb/hr 1.86 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19147	Emergency Generator Engine	Carbon Monoxide (CO)	4.94 lb/hr 0.49 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19147	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.97 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19147	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.52 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19147	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.58 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19147	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.58 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19147	Emergency Generator Engine	CO_2e	43.2 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19148	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	18.2 lb/hr 1.82 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19148	Emergency Generator Engine	Carbon Monoxide (CO)	3.91 lb/hr 0.39 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19148	Emergency Generator Engine	Sulfur Dioxide (SO_2)	1.19 lb/hr 0.12 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19148	Emergency Generator Engine	Volatile Organic Compounds (VOC)	1.44 lb/hr 0.14 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19148	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	1.28 lb/hr 0.13 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19148	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	1.28 lb/hr 0.13 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart ZZZZ
19148	Emergency Generator Engine	CO_2e	61.3 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19151	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	1.39 lb/hr 0.35 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19151	Emergency Generator Engine	Carbon Monoxide (CO)	0.66 lb/hr 0.16 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19151	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.20 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19151	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.24 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19151	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.21 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19151	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.21 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19151	Emergency Generator Engine	CO_2e	28.3 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19153	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19153	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.94 lb/hr 0.79 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19153	Emergency Generator Engine	Carbon Monoxide (CO)	4.34 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19153	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.009 lb/hr 0.0009 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19153	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
			N/A[1]		
19153	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
			0.03 tn/yr		
19153	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.25 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
			0.03 tn/yr		
19153	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19154	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	2.034 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.203 tn/yr		
19154	Emergency Generator Engine	Carbon Monoxide (CO)	0.438 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.044 tn/yr		
19154	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.134 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.013 tn/yr		
19154	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.162 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.016 tn/yr		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19154	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.144 lb/hr 0.014 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19154	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.144 lb/hr 0.014 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19154	Emergency Generator Engine	CO_2e	7.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19155	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.23 lb/hr 0.723 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	Carbon Monoxide (CO)	4.24 lb/hr 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	Sulfur Dioxide (SO_2)	2.13 lb/hr 0.21 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19155	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19155	Emergency Generator Engine	CO_2e	86.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19156	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.23 lb/hr 0.723 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	Carbon Monoxide (CO)	4.24 lb/hr 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	Sulfur Dioxide (SO_2)	2.13 lb/hr 0.21 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19156	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19156	Emergency Generator Engine	CO_2e	86.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19157	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.23 lb/hr 0.723 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	Carbon Monoxide (CO)	4.24 lb/hr 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	Sulfur Dioxide (SO_2)	2.13 lb/hr 0.21 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19157	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19157	Emergency Generator Engine	CO_2e	86.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19158	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.23 lb/hr 0.723 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	Carbon Monoxide (CO)	4.24 lb/hr 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	Sulfur Dioxide (SO_2)	2.13 lb/hr 0.21 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19158	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.19 lb/hr 0.019 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19158	Emergency Generator Engine	CO_2e	86.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19159	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.06 lb/hr 8.81 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	Carbon Monoxide (CO)	4.26 lb/hr 5.33 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.01 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19159	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.14 lb/hr 0.17 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.14 lb/hr 0.17 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19159	Emergency Generator Engine	CO_2e	1090.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19160	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	1.05 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	Carbon Monoxide (CO)	0.63 lb/hr 0.1 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.19 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19160	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.05 lb/hr 0.005 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.05 lb/hr 0.005 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19160	Emergency Generator Engine	CO_2e	10.8 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19161	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	2.29 lb/hr 0.229 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	Carbon Monoxide (CO)	2.00 lb/hr 0.20 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.71 lb/hr 0.071 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19161	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.11 lb/hr 0.011 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.11 lb/hr 0.011 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19161	Emergency Generator Engine	CO_2e	39.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19163	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	2.64 lb/hr 0.26 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	Carbon Monoxide (CO)	2.29 lb/hr 0.23 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.82 lb/hr 0.08 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19163	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.13 lb/hr 0.01 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.13 lb/hr 0.01 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19163	Emergency Generator Engine	CO_2e	45.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19164	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	1.65 lb/hr 0.17 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	Carbon Monoxide (CO)	1.43 lb/hr 0.14 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.51 lb/hr 0.051 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	Volatile Organic Compounds (VOC)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19164	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.083 lb/hr 0.0083 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.083 lb/hr 0.0083 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19164	Emergency Generator Engine	CO_2e	28.6 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19168	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	0.78 lb/hr 0.078 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19168	Emergency Generator Engine	Carbon Monoxide (CO)	0.17 lb/hr 0.017 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19168	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.05 lb/hr 0.005 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19168	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19168	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19168	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
19168	Emergency Generator Engine	CO_2e	2.9 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19169	Emergency Generator Engine	Oxides of Nitrogen (NO_x)	15.44 lb/hr 1.54 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	15.77 lb/hr 1.58 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	Carbon Monoxide (CO)	8.54 lb/hr 0.85 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.36 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	Volatile Organic Compounds (VOC)	0.33 lb/yr 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.49 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19169	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.49 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19169	Emergency Generator Engine	CO_2e	170.6 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19170	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.99 lb/hr 0.80 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19170	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19170	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19170	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19170	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19170	Emergency Generator Engine	CO_2e	87.1 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19171	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.99 lb/hr 0.80 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19171	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19171	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19171	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19171	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19171	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19172	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.99 lb/hr 0.80 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19172	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19172	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19172	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19172	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19172	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19173	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.99 lb/hr 0.80 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19173	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19173	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19173	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19173	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.25 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19173	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19174	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	12.92 lb/hr 1.33 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19174	Emergency Generator Engine	Carbon Monoxide (CO)	7.00 lb/hr 0.70 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19174	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.32 lb/hr 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19174	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.40 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19174	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.40 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19174	Emergency Generator Engine	CO_2e	139.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19176	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.17 lb/hr 0.72 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19176	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19176	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19176	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19176	Emergency Generator Engine	Particulate Matter (PM_{10}/$PM_{2.5}$)	0.25 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19176	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19177	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	7.17 lb/hr 0.72 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19177	Emergency Generator Engine	Carbon Monoxide (CO)	4.33 lb/hr 0.43 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19177	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.01 lb/hr 0.001 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19177	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.25 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19177	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.25 lb/hr 0.025 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19177	Emergency Generator Engine	CO_2e	86.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19178	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	11.71 lb/hr 1.16 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19178	Emergency Generator Engine	Carbon Monoxide (CO)	7.00 lb/hr 0.70 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19178	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.32 lb/hr 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19178	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.40 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19178	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.40 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19178	Emergency Generator Engine	CO_2e	139.7 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	0.57 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	Carbon Monoxide (CO)	0.61 lb/hr 0.06 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.15 lb/hr 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.004 lb/hr 0.0004 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.004 lb/hr 0.0004 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19179	Emergency Generator Engine	CO_2e	8.5 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19181	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	0.93 lb/hr 0.093 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19181	Emergency Generator Engine	Carbon Monoxide (CO)	1.01 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
19181	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.36 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19181	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19181	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19181	Emergency Generator Engine	CO_2e	20.2 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19182	Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	0.91 lb/hr 0.092 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19182	Emergency Generator Engine	Carbon Monoxide (CO)	1.01 lb/hr 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19182	Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.36 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19182	Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
19182	Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.06 lb/hr 0.006 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19182	Emergency Generator Engine	CO_2e	20.2 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
19183	Non-Emergency Generator Engine	Non Methane Hydrocarbons (NMHC) & Oxides of Nitrogen (NOx)	2.89 lb/hr 0.72 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19183	Non-Emergency Generator Engine	Carbon Monoxide (CO)	0.58 lb/hr 0.14 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19183	Non-Emergency Generator Engine	Sulfur Dioxide (SO_2)	0.18 lb/hr 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19183	Non-Emergency Generator Engine	Total Suspended Particulate Matter (TSP)	0.19 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19183	Non-Emergency Generator Engine	Particulate Matter ($PM_{10}/PM_{2.5}$)	0.19 lb/hr 0.05 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 60, Subpart IIII
19183	Non-Emergency Generator Engine	CO_2e	24.8 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
20002	T700 Kerosene-fired helicopter engine	Carbon Monoxide (CO)	N/A[1] 0.46 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Sulfur Dioxide (SO_2)	N/A[1] 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Volatile Organic Compounds (VOC)	N/A[1] 0.42 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Total Suspended Particulate Matter (TSP)	N/A[1] 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Particulate Matter (PM_{10})	N/A[1] 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Particulate Matter ($PM_{2.5}$)	N/A[1] 0.07 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	Hazardous Air Pollutants (HAP)	N/A[1] 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20002	T700 Kerosene-fired helicopter engine	CO_2e	280.0 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
20004	T400 Kerosene-fired helicopter engine	Oxides of Nitrogen (NO_x)	N/A[1] 0.23 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Carbon Monoxide (CO)	N/A[1] 0.38 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Sulfur Dioxide (SO_2)	N/A[1] 0.04 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Volatile Organic Compounds (VOC)	N/A[1] 0.10 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Total Suspended Particulate Matter (TSP)	N/A[1] 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Particulate Matter (PM_{10})	N/A[1] 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Particulate Matter ($PM_{2.5}$)	N/A[1] 0.02 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
20004	T400 Kerosene-fired helicopter engine	Hazardous Air Pollutants (HAP)	N/A[1] 0.03 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	**Quantity {5}**		
20004	T400 Kerosene-fired helicopter engine	CO_2e	290.7 tn/yr	See Attachment C (Emission Calculations)	20.11.42 NMAC
21004	58 SOW Paint Booth	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Volatile Organic Compounds (VOC)	36.30 lb/hr 0.67 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Total Suspended Particulate Matter (TSP)	1.28 lb/hr 0.032 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Particulate Matter (PM_{10}/$PM_{2.5}$)	1.28 lb/hr 0.032 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC
21004	58 SOW Paint Booth	Volatile Hazardous Air Pollutant (VHAP)	N/A[1] 0.14 tn/yr	See Appendix C (Emission Calculations)	20.11.41 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
21004	58 SOW Paint Booth	Particulate Hazardous Air Pollutants (pHAP)	N/A[1]	See Appendix C (Emission Calculations)	20.11.41 NMAC
			0.004 tn/yr		
21004	58 SOW Paint Booth	CO_2e	N/A[1]	See Appendix C (Emission Calculations)	20.11.42 NMAC
21015	58 SOW Corrosion Control Facility (CCF)	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
21015	58 SOW Corrosion Control Facility (CCF)	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
21015	58 SOW Corrosion Control Facility (CCF)	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC
			N/A[1]		
21015	58 SOW Corrosion Control Facility (CCF)	Volatile Organic Compounds (VOC)	60.0 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.95 tn/yr		
21015	58 SOW Corrosion Control Facility (CCF)	Total Suspended Particulate Matter (TSP)	5.16 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.14 tn/yr		
21015	58 SOW Corrosion Control Facility (CCF)	Particulate Matter ($PM_{10}/PM_{2.5}$)	5.16 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC
			0.14 tn/yr		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
21015	58 SOW Corrosion Control Facility (CCF)	Particulate Hazardous Air Pollutants (pHAP)	N/A[1] 0.12 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC
21015	58 SOW Corrosion Control Facility (CCF)	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
22003	Gasoline Storage	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22003	Gasoline Storage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22003	Gasoline Storage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22003	Gasoline Storage	Volatile Organic Compounds (VOC)	2.76 lb/hr 3.78 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22003	Gasoline Storage	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22003	Gasoline Storage	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
22003	Gasoline Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
22004	Gasoline Storage	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	Volatile Organic Compounds (VOC)	2.76 lb/hr 2.90 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22004	Gasoline Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
22005	Gasoline Storage	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
22005	Gasoline Storage	Carbon Monoxide (CO)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
22005	Gasoline Storage	Sulfur Dioxide (SO_2)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
22005	Gasoline Storage	Volatile Organic Compounds (VOC)	30.70 lb/hr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			2.31 tn/yr		
22005	Gasoline Storage	Total Suspended Particulate Matter (TSP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
22005	Gasoline Storage	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		
22005	Gasoline Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
22015	E85 Fuel Storage	Oxides of Nitrogen (NO_x)	N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
			N/A[1]		

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
22015	E85 Fuel Storage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22015	E85 Fuel Storage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22015	E85 Fuel Storage	Volatile Organic Compounds (VOC)	3.75 lb/hr 5.70 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22015	E85 Fuel Storage	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22015	E85 Fuel Storage	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
22015	E85 Fuel Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
25012	Gasoline Storage	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25012	Gasoline Storage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
25012	Gasoline Storage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25012	Gasoline Storage	Volatile Organic Compounds (VOC)	9.96 lb/hr 0.58 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25012	Gasoline Storage	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25012	Gasoline Storage	Particulate Matter ($PM_{10}/PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25012	Gasoline Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
25017	Gasoline Storage	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25017	Gasoline Storage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25017	Gasoline Storage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
25017	Gasoline Storage	Volatile Organic Compounds (VOC)	12.00 lb/hr 0.2 tn/yr	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25017	Gasoline Storage	Total Suspended Particulate Matter (TSP)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25017	Gasoline Storage	Particulate Matter (PM_{10}/$PM_{2.5}$)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.41 NMAC 40 CFR 63, Subpart CCCCCC
25017	Gasoline Storage	CO_2e	N/A[1]	See Attachment C (Emission Calculations)	20.11.42 NMAC
31999	Basewide Miscellaneous Paint and Chemical Usage	Oxides of Nitrogen (NO_x)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
31999	Basewide Miscellaneous Paint and Chemical Usage	Carbon Monoxide (CO)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
31999	Basewide Miscellaneous Paint and Chemical Usage	Sulfur Dioxide (SO_2)	N/A[1] N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC

SECTION 2 AIR POLLUTANT EMISSIONS RATES PRIOR TO CONTROL OR ABATEMENT EQUIPMENT OR TO ATMOSPHERE IF UNCONTROLLED (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

UNIT No. {1}	EMISSIONS UNITS, PROCESS or OPERATION {2}	UNCONTROLLED AIR POLLUTANT EMISSION RATES {3}		MEASUREMENT OR ESTIMATION METHOD {6}	APPLICABLE REQUIREMENT(s) {7}
		Pollutant {4}	Quantity {5}		
31999	Basewide Miscellaneous Paint and Chemical Usage	Volatile Organic Compounds (VOC)	158 lb/hr	See Attachment C (Emission Calculations)	20.11.40 NMAC
			78.03 tn/yr		
31999	Basewide Miscellaneous Paint and Chemical Usage	Total Suspended Particulate Matter (TSP)	2.08 lb/hr	See Attachment C (Emission Calculations)	20.11.40 NMAC
			1.03 tn/yr		
31999	Basewide Miscellaneous Paint and Chemical Usage	Particulate Matter (PM_{10}/$PM_{2.5}$)	2.08 lb/hr	See Attachment C (Emission Calculations)	20.11.40 NMAC
			1.03 tn/yr		
31999	Basewide Miscellaneous Paint and Chemical Usage	Hazardous Air Pollutants (HAP)	N/A[1]	See Attachment C (Emission Calculations)	20.11.40 NMAC
			2.93 tn/yr		

[1] These units do not have permitted emissions listed in their respective permit, emergency permit or source registration, therefore emission rates were listed as N/A.

Section 2: Air Pollutant Emissions Rates Prior to Control or Abatement Equipment, or to Atmosphere if Uncontrolled

Each piece of equipment in the facility that emits air pollutants must be listed in this section. Maximum possible emissions rates prior to air pollution control equipment, waste abatement equipment, process control capture equipment, or to the atmosphere for uncontrolled emissions are to be provided in this section. Calculations made to determine the values shown on the form are to be shown and referenced in Package Element 6 (Emissions Calculations).

These emissions include: pollutants for which the source is major; regulated air pollutants; all fugitive emissions; and any hazardous or toxic air contaminants emitted as part of plant processes. If products or raw materials are stored and pollutants are passively released through off gassing while in storage, these pollutants must also be listed. Emissions from flares and wood waste burners should be listed in this section.

Notes

{1} Use the process or operation equipment unit numbers that were assigned to each piece of equipment in Package Element 4A (Process Flow Sheets) above. For fugitive emissions, describe the source of the emissions. For liquid tank and solid material storage, use the tank or storage unit number.

{2} For example: boiler, catalyst regeneration units, flare, furnace, gas engine, haul road, iron melting cupola, material dryer, process fugitive, silo, smelter furnace, solvent cleaner, storage tanks, etc.

{3} Use one line for each pollutant emitted by each piece of equipment. Attach additional sheets if required.

{4} List each pollutant defined by EPA to be a regulated air pollutant that this source emits. Also list all other pollutants for which this source is major. Provide trade name or common name and chemical composition if known. (E.g. particulate matter (describe composition), SO_2 CO, hydrogen sulfide, nitrogen oxides (as nitrogen dioxide), etc.)

{5} Maximum allowable quantities at maximum allowable production rates and 8760 hours per year unless limited by federally enforceable permit conditions. See Section 1, Line 37. tn = tons (2,000 lb).

{6} Specify how the quantity of emitted pollutant was determined: from actual measurement (specify equipment used) of emissions (preferred), process material balances, equipment manufacturer's information, EPA emission factor, or other source. Show the calculations used to obtain the emission rates in Package Element 4B (Emissions Calculations).

{7} Specify the requirement(s) that is(are) applicable to this process, operation or emission unit. See Part 42 for list of applicable requirements. E.g. 20 NMAC 11.67.II.9; NSPS Subpart GG; 20 NMAC 11.41. If there is insufficient room on the form, please attach a clearly identified additional sheet.

SECTION 3 EMISSIONS FROM AIR POLLUTION CONTROL EQUIPMENT AND FROM UNCONTROLLED PROCESS EQUIPMENT (20.11.42.12A(4) NMAC)

Emission Unit Nos. {1}	CONTROL EQUIPMENT			AIR POLLUTANTS EMITTED {4}				CONTROL EFFICIENCY		APPLICABLE REQUIREMENTS {8}
	Unit No. {2}	Type {3}	Manufacturer and Model No.	Pollutant {5}	Quantity {6} Actual	Units	Allowable	% by Weight	Method of Determination {7}	
12009	12009	Granulated Activated Carbon	N/A	VOC	N/A N/A	lb/hr tn/yr	N/A[1] N/A[1]	50%	Manufacturer's Data	20.11.41 NMAC
12009	12009	Granulated Activated Carbon	N/A	HAP	N/A N/A	lb/hr tn/yr	N/A[1] N/A[1]	50%	Manufacturer's Data	20.11.41 NMAC
12010	12010	Thermal Oxidizer	N/A	NOx	N/A N/A	lb/hr tn/yr	0.17 0.75	99%	Manufacturer's Data	20.11.41 NMAC
12010	12010	Thermal Oxidizer	N/A	CO	N/A N/A	lb/hr tn/yr	0.08 0.23	99%	Manufacturer's Data	20.11.41 NMAC
12010	12010	Thermal Oxidizer	N/A	VOC	N/A N/A	lb/hr tn/yr	0.28 1.25	99%	Manufacturer's Data	20.11.41 NMAC
18001	18001	Catalyst[2]	TBD	CO	TBD TBD	lb/hr tn/yr	TBD TBD	TBD	TBD	40 CFR 63.6603 and Table 2d
21004	21004	Dry Filters	N/A	TSP	N/A N/A	lb/hr tn/yr	1.28 0.032	89.76%	Manufacturer's Data	20.11.41 NMAC
21004	21004	Dry Filters	N/A	Total pHAP	N/A N/A	lb/hr tn/yr	N/A[1] 0.004	89.76%	Manufacturer's Data	20.11.41 NMAC
21015	21015	Dry Filters	N/A	TSP	N/A N/A	lb/hr tn/yr	5.16 0.14	75%	Manufacturer's Data	20.11.41 NMAC
21015	21015	Dry Filters	N/A	Total pHAP	N/A N/A	lb/hr tn/yr	N/A[1] 0.12	75%	Manufacturer's Data	20.11.41 NMAC

[1] These units do not have permitted emissions listed in their respective permit, emergency permit or source registration, therefore emission rates were listed as N/A.

[2] The landfill mulcher (Unit ID 18001) has been modified to incorporate a catalyst to reduce CO emissions according to 40 CFR 63 Subpart ZZZZ. However, Construction Permit 3048-2TR has not yet been revised to include this information, therefore this section will be updated once the revised construction permit has been issued.

Section 3: Emissions From Air Pollution Control Equipment and from Uncontrolled Process Equipment

All emissions to the atmosphere, either controlled or uncontrolled if no control exists, associated with the operation of this facility must be identified in th section. This includes fugitive process emissions, and other fugitive or indirect emissions resulting from activities of this facility, e.g. fugitive dust from hau roads. [Insignificant activities are found in Package Element 9.]

Provide emissions rates from air pollution control equipment, waste abatement equipment, process control capture equipment, and from uncontrolled processes operations or activities. Calculations made to determine the values shown on the form are to be shown and referenced in Package Element 4B (Emission Calculations). These emissions include: pollutants for which the source is major; regulated air pollutants; and any hazardous or toxic air contaminants emitted a part of plant processes. Emissions from flares, sulfur recovery units, VOC afterburners, and wood waste burners must also be listed.

Sufficient information must be included for the department to evaluate, and verify, the operation and stated control efficiencies of the control equipmen involved. Attach additional sheets as needed to list all control equipment. Include references to process flow sheets required in Package Element 4A and attacl any equipment layout and assembly drawings as necessary to describe all air pollution control equipment

Notes:

{1} List the emission unit numbers that feed each individual piece of control equipment. If multiple process units (with individual numbers) discharge to one control equipment unit, list all emission unit numbers that feed that control equipment unit. For liquid tank and solid material storage, use the tank or storage unit number.

{2} Corresponding to control equipment unit numbers from Package Element 4.

{3} Baghouse, cyclone, electrostatic precipitator, enclosures, scrubber, VOC afterburners, etc.

{4} Emissions after gases have passed through control equipment. Use one line for each pollutant emitted. Attach additional sheets if required

{5} SO_2, NO_x, particulate matter, etc.

{6} "Actual" rates are based on actual production and hours of operation. "Allowable" values are based on maximum allowable production rates. If there is no control equipment, the values in the "Allowable" column are the same as the values in the "Quantity" column in Section 2. List quantities in both pounds per hour and tons per year. Yearly values are based on 8760 hours per year unless the applicant desires to restrict hours of operation as a permit condition. If the emission rate is limited by a federally enforceable applicable requirement, then provide the value of this rate

{7} Field test results, manufacturer's data, etc. See note {6} from Section 2, Air Pollutant Emission Rates.

{8} Specify the requirement(s) that apply to this control equipment unit and process.

SECTION 4 COMPLIANCE MONITORING DEVICES AND EQUIPMENT (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Pollutant Monitored or Measured	Type of Instrument {2}	Manufacturer and Model Number	Range {3}	Sensitivity	Accuracy	Emission Units {4}	Location of Monitor {5}
18001	CO	Catalyst [1]	TBD	TBD	TBD	TBD	18001	TBD

[1] The landfill mulcher (Unit ID 18001) has been modified to incorporate a catalyst to reduce CO emissions according to 40 CFR 63 Subpart ZZZZ. However, Construction Permit 3048-2TR has not yet been revised to include this information, therefore this section will be updated once the revised construction permit has been issued.

Section 4: Compliance Monitoring Devices and Equipment

Use this section to list all compliance monitoring devices and equipment used at the facility to verify emission rates and other permit terms and conditions. Use one line for each monitoring device and piece of equipment.

Notes:

{1} List the unit number of the compliance monitoring device as shown in Package Element 4A (Process Flow Sheets).

{2} State the type of the monitoring device. E.g. Ultra Violet Photometric Analyzer, NDIR Photometer, Opacity Meter, EPA Sampling Train (specify the sampling method number), etc.

{3} 0- 1,000 ppm, 0 - 50 g/m3, 0 - 100% opacity, etc.

{4} Provide the unit number(s) (from Package Element 4A -- Process Flow Sheets) of the emissions unit(s) being monitored by each device.

{5} Describe the physical location of the monitoring device and the recording device. E.g. Monitor is located in ductwork 50' upstream from stack. Recorder is located in operating control room.

SECTION 5 FUELS AND FUEL USAGE
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
12010	Soil Vapor Extraction System	Mako	467,000 Btu/hr	Propane	45,203 gal/yr [c]	90,500 Btu/gal	0.0015	
14014	Boiler	Power Flame	6.25 MMBtu/hr	Natural Gas	53.7 x 10^6 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
14166	Boiler	Cleaver Brooks	5.25 MMBtu/hr	Natural Gas	45.1 x 10^6 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
14167	Boiler	Cleaver Brooks	5.25 MMBtu/hr	Natural Gas	45.1 x 10^6 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
14168	Boiler	Cleaver Brooks	5.23 MMBtu/hr	Natural Gas	44.9 x 10^6 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
14169	Boiler	Cleaver Brooks	5.23 MMBtu/hr	Natural Gas	44.9 10^6 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
18001	Non-Emergency Landfill Mulcher Engine	Caterpillar	425 hp	Diesel	10,857.7 gal	137,000 Btu/gal	0.0015	
19003	Emergency Generator Engine	Cummins	135 hp	Diesel	1,379.6 gal	137,000 Btu/gal	0.0015	
19006	Emergency Generator Engine	Cummins	102 hp	Diesel	1,042.3 gal	137,000 Btu/gal	0.0015	
19014	Emergency Generator Engine	Cummins	755 hp	Diesel	7,751.3 gal	137,000 Btu/gal	0.0015	
19015	Emergency Generator Engine	Cummins	102 hp	Diesel	1,042.3 gal	137,000 Btu/gal	0.0015	

SECTION 5 FUELS AND FUEL USAGE
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
19016	Emergency Generator Engine	Onan	40 hp	Diesel	408.8 gal	137,000 Btu/gal	0.0015	
19019	Emergency Generator Engine	Cummins	102 hp	Diesel	1,042.3 gal	137,000 Btu/gal	0.0015	
19028	Emergency Generator Engine	Cummins	355 hp	Diesel	3,627.7 gal	137,000 Btu/gal	0.0015	
19031	Emergency Generator Engine	Cummins	355 hp	Diesel	3,627.7 gal	137,000 Btu/gal	0.0015	
19032	Emergency Generator Engine	Cummins	465 hp	Diesel	4,751.8 gal	137,000 Btu/gal	0.0015	
19069	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19070	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19071	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19072	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19073	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19074	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19075	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	
19076	Emergency Water Pump Engine	Cummins	340 hp	Diesel	3,474.5 gal	137,000 Btu/gal	0.0015	

SECTION 5 FUELS AND FUEL USAGE
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
19089	Emergency Generator Engine	Cummins	390 hp	Diesel	3,985.4 gal	137,000 Btu/gal	0.0015	
19091	Emergency Generator Engine	Cummins	750 hp	Diesel	7,664.2 gal	137,000 Btu/gal	0.0015	
19093	Emergency Fire Pump Engine	Caterpillar	660 hp	Diesel	6,744.5 gal	137,000 Btu/gal	0.0015	
19096	Emergency Generator Engine	Detroit Diesel	568 hp	Diesel	5,804.4 gal	137,000 Btu/gal	0.0015	
19102	Emergency Fire Pump Engine	Caterpillar	660 hp	Diesel	6,744.5 gal	137,000 Btu/gal	0.0015	
19106	Emergency Generator Engine	Cummins	166 hp	Diesel	1,696.4 gal	137,000 Btu/gal	0.0015	
19129	Emergency Generator Engine	Cummins	207 hp	Diesel	2,115.3 gal	137,000 Btu/gal	0.0015	
19130	Emergency Generator Engine	Caterpillar	1,186 hp	Diesel	12,119.7 gal	137,000 Btu/gal	0.0015	
19131	Emergency Generator Engine	Cummins	170 hp	Diesel	1,737.2 gal	137,000 Btu/gal	0.0015	
19132	Emergency Generator Engine	Cummins	277 hp	Diesel	2,830.7 gal	137,000 Btu/gal	0.0015	
19133	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19134	Emergency Generator Engine	Cummins	435 hp	Diesel	4,445.3 gal	137,000 Btu/gal	0.0015	
19135	Emergency Generator Engine	Cummins	1,334 hp	Natural Gas	2,404,220 scf	1,020 Btu/scf	2,000 gr/10^6 scf (EPA AP-42)	
19140	Emergency Generator Engine	Cummins	102 hp	Diesel	1,042.3 gal	137,000 Btu/gal	0.0015	

SECTION 5 FUELS AND FUEL USAGE (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
19142	Emergency Generator Engine	Cummins	102 hp	Diesel	1,042.3 gal	137,000 Btu/gal	0.0015	
19143	Emergency Generator Engine	Cummins	50 hp	Diesel	510.9 gal	137,000 Btu/gal	0.0015	
19147	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19148	Emergency Generator Engine	Cummins	535 hp	Diesel	5,467.2 gal	137,000 Btu/gal	0.0015	
19151	Emergency Generator Engine	Cummins	99 hp	Diesel	2,529.2 gal	137,000 Btu/gal	0.0015	
19153	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19154	Emergency Generator Engine	Perkins	65.6 hp	Diesel	670.4 gal	137,000 Btu/gal	0.0015	
19155	Emergency Generator Engine	Doosan	752 hp	Diesel	7,684.7 gal	137,000 Btu/gal	0.0015	
19156	Emergency Generator Engine	Doosan	752 hp	Diesel	7,684.7 gal	137,000 Btu/gal	0.0015	
19157	Emergency Generator Engine	Doosan	752 hp	Diesel	7,684.7 gal	137,000 Btu/gal	0.0015	
19158	Emergency Generator Engine	Doosan	752 hp	Diesel	7,684.7 gal	137,000 Btu/gal	0.0015	
19159	Non-Emergency Generator Engine	Caterpillar	762 hp	Diesel	97,335.8 gal	137,000 Btu/gal	0.0015	
19160	Emergency Generator Engine	Caterpillar	94.5 hp	Diesel	965.7 gal	137,000 Btu/gal	0.0015	
19161	Emergency Generator Engine	Isuzu/MQ	348 hp	Diesel	3,556.2 gal	137,000 Btu/gal	0.0015	

SECTION 5 FUELS AND FUEL USAGE (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
19163	Emergency Generator Engine	Cummins	399 hp	Diesel	4,077.4 gal	137,000 Btu/gal	0.0015	
19164	Emergency Generator Engine	Cummins	250 hp	Diesel	2,554.7 gal	137,000 Btu/gal	0.0015	
19168	Emergency Generator Engine	Onan	25 hp	Diesel	255.5 gal	137,000 Btu/gal	0.0015	
19169	Emergency Generator Engine	Cummins	1,490 hp	Diesel	15,226.3 gal	137,000 Btu/gal	0.0015	
19170	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19171	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19172	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19173	Emergency Generator Engine	Cummins	755 hp	Diesel	7,715.3 gal	137,000 Btu/gal	0.0015	
19174	Emergency Generator Engine	Cummins	1220 hp	Diesel	12,376.8 gal	137,000 Btu/gal	1.0015	
19176	Emergency Generator Engine	Cummins	755 hp	Diesel	7,659.4 gal	137,000 Btu/gal	2.0015	
19177	Emergency Generator Engine	Cummins	755 hp	Diesel	7,659.4 gal	137,000 Btu/gal	3.0015	
19178	Emergency Generator Engine	Cummins	1220 hp	Diesel	12,376.8 gal	137,000 Btu/gal	4.0015	
19179	Emergency Generator Engine	Kohler	74.3 hp	Diesel	753.8 gal	137,000 Btu/gal	5.0015	

SECTION 5 FUELS AND FUEL USAGE
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Type of Equipment {2}	Equipment Manufacturer	Rated Capacity {3}	FUEL DATA {4}				
				Fuel Type {5}	Amount Per Year {6}[a]	Heating Value (State Units) {7}	Percent Sulfur {8}[b]	Percent Ash {9}
19181	Emergency Generator Engine	Cummins	176 hp	Diesel	1,785.5 gal	137,000 Btu/gal	7.0015	
19182	Emergency Generator Engine	Cummins	176 hp	Diesel	1,785.5 gal	137,000 Btu/gal	8.0015	
19183	Non-Emergency Generator Engine	Caterpillar Olympian	86.5	Diesel	2,193.8 gal	137,000 Btu/gal	9.0015	
20002	T700 Kerosene-fired helicopter engine	General Electric	2,000 hp [d]	Jet Fuel	12,985.1 gal [d]	135,000 Btu/gal	0.042	
20004	T700 Kerosene-fired helicopter engine	Pratt & Whitney	1,100 hp [d]	Jet Fuel	13,478.9 gal [d]	135,000 Btu/gal	0.042	

[a] Annual fuel usage is estimated based on AP-42 fuel specification data, manufacturer capacity data, and maximum permitted operating data. The annual fuel use is not a permit limit for any of the units listed in this table.

[b] Percent for natural gas and propane from AP-42 Section 1.4. Percent for diesel based on ultra low sulfur diesel fuel requirements. Assumed weight percent of sulfur is 0.042 as stated in Table 3-6. Average Sulfur Content Values for Jet Fuel, United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (January 2002, Revised December 2003).

[c] The SVE fuel use is based on the maximum amount of propane used in the system for the thermal oxidizer.

[d] Jet engine test cell fuel use rates are based on the fuel flow and test patterns presented in the emission estimation spreadsheets submitted with the 484-M3 application. Each hour long test is assumed to proceed according to the following operating mode breakdown: 25% idle, 20% intermediate and 15% military. The density of jet fuel is assumed to be 6.67 lb/gal, per the Air Emissions Factor Guide to Air Force Mobile Sources, AFCEE, December 2009. Potential fuel use is estimated by taking the operating hours limits from the issued air permit, and applying the operating mode breakdown and associated fuel consumption rates for each mode.

Section 5: Fuels and Fuel Usage
This section provides information on all the fuel usage for all process equipment at the facility. Flares and waste burners are not listed here unless supplemental fuel is used to sustain combustion. In that case, only the supplemental or auxiliary fuel data is given here.

A material balance for combustion within the plant is required to complete this Section and should be attached to this Section. Show calculations in Package Element 4B.

Only equipment that uses fuel is listed in this section.

Notes:

{1} Corresponding to emissions, process, or operational unit numbers as shown in Package Element 4A (Process Flow Sheets).

{2} State the type of equipment. E.g. Boiler, diesel engine, furnace, gas engine, gas turbine, oven, space heater, etc.

{3} Provide the maximum nameplate rate and the normal rate, if these rates are different, e.g. million btu/hr, HP etc. If these rates have been adjusted for altitude, this should be noted on the form. Ask the Division's Engineering staff for derating procedures.

{4} If auxiliary fuel or different fuel is used "on standby", the data for that fuel must also be provided.

{5} E.g. Natural gas; LPG; No. 1, 2, 4, or 6 fuel oil; refinery gas; coal; wood; etc.

{6} Use the following units depending on the fuel type: Million cubic feet of gas; gallons of fuel oil; pounds of LPG; etc. State what units you are using.

{7} Use the following units depending on the fuel type: Btu/thousand ft3 .or gas, Btu/lb for solid fuel, or Btu/gallon for liquid fuel.

{8} State both average percentage by weight and maximum percentage by weight. Sulfur content is not required if sweet pipeline quality natural gas is used as the fuel. Specify in "fuel type" that sweet pipeline quality gas is used and state specification under "sulfur". Provide fuel supplier specifications for sulfur content.

{9} State both average percentage by weight and maximum percentage by weight. Ash content is not required if sweet pipeline quality natural gas is used as the fuel.

SECTION 6A RAW MATERIALS PROCESSED – Not Applicable (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Unit No. {1}	Material {2a}	Composition {3}	Condition {4}	Quantity Used {5} (Specify Units)

SECTION 6B **MATERIALS PRODUCED – Not Applicable** (DO NOT INCLUDE EMISSIONS AND WASTE PRODUCTS LISTED IN SECTIONS 2, 3, & 10) **(20.11.42.12A(4)(e)(iv) NMAC)**

Unit No. {1}	Material {2a}	Composition {3}	Condition {4}	Production Rates {5} (Specify Units)

Sections 6A and 6B: Raw Materials Processed and Materials Produced

This section addresses any feedstocks or raw materials used in the plant process, and materials or products (not including solid or liquid waste products) that are generated. As an example, sour natural gas is the raw material and sweet pipeline quality gas and natural gas liquids are the products. This section quantifies a portion of the facility material balance. Some unit numbers will correspond to process equipment, as for example where a stream is "refined", such as sour gas to sweet gas, or rock crushing with rock aggregate feed and various products are produced in stages (crushers, screens).

Calculations made to determine the values shown on the form are to be shown and referenced in Package Element 4B (Emissions Calculations).

Notes: (These apply to both 6A and 6B)

{1} Corresponding to emissions, process or operational unit numbers as shown in Package Element 4A (Process Flow Sheets).

{2a} What is the raw material -- for example: crude oil, sour gas, raw ore.

{2b} What is the finished product -- for example: gasoline, diesel fuel, sweet gas.

{3} List each major component with weight percentages and chemical compositions (if known), or attach separate analysis sheet.

{4} Provide typical particle size distribution for aggregates, pumice dust, etc. and average moisture content if known.

{5} Barrels per day, thousands of standard cubic feet per day, tons per hour, etc. Reference process flow sheets required in Package Element 4A, including material balances.

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
12010	12010	13	1.25	1400-2000	25.00	NA	NA	NA	NA
14014	14014	18	2.0	180	7.08	N/A	N/A	N/A	N/A
14166	14166	52.5	2.0	180	5.95	N/A	N/A	N/A	N/A
14167	14167	52.5	2.0	180	5.95	N/A	N/A	N/A	N/A
14168	14168	52.5	2.0	180	5.92	N/A	N/A	N/A	N/A
14169	14169	52.5	2.0	180	5.92	N/A	N/A	N/A	N/A
18001	18001	13.42	0.50	755	213.33	N/A	N/A	N/A	N/A
18002	18002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19003	19003	10	0.25	1070	203.82	N/A	N/A	N/A	N/A
19006	19006	12	0.25	1045	150.49	N/A	N/A	N/A	N/A
19014	19014	14	1*	756	314.82	N/A	N/A	N/A	N/A
19015	19015	10	0.5	1045	37.62	N/A	N/A	N/A	N/A
19016	19016	8	0.5	1009	19.11	N/A	N/A	N/A	N/A

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
19019	19019	12	0.5	1045	37.71	N/A	N/A	N/A	N/A
19028	19028	15	0.5	675	159.15	N/A	N/A	N/A	N/A
19031	19031	22.5	0.5	675	124.10	N/A	N/A	N/A	N/A
19032	19032	10	0.83	756	77.02	N/A	N/A	N/A	N/A
19037	19037	17.7	0.75	756	94.21	N/A	N/A	N/A	N/A
19069	19069	13	0.42	756	286.21	N/A	N/A	N/A	N/A
19070	19070	13	0.42	756	286.21	N/A	N/A	N/A	N/A
19071	19071	13	0.42	756	286.21	N/A	N/A	N/A	N/A
19072	19072	13	0.42	756	286.21	N/A	N/A	N/A	N/A
19073	19073	26.5	0.67	756	112.47	N/A	N/A	N/A	N/A
19074	19074	26.5	0.67	756	112.47	N/A	N/A	N/A	N/A
19075	19075	26.5	0.67	756	112.47	N/A	N/A	N/A	N/A
19076	19076	26.5	0.67	756	112.47	N/A	N/A	N/A	N/A

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
19089	19089	7.84	0.67	756	118.24	N/A	N/A	N/A	N/A
19091	19091	19	0.5	756	118.81	N/A	N/A	N/A	N/A
19093	19093	19	0.92	955	98.05	N/A	N/A	N/A	N/A
19096	19096	12	0.67	705	156.55	N/A	N/A	N/A	N/A
19102	19102	19	0.92	955	98.05	N/A	N/A	N/A	N/A
19106	19106	28	0.21	815	324.97	N/A	N/A	N/A	N/A
19129	19129	6.42	0.42	950	108.08	N/A	N/A	N/A	N/A
19130	19130	10	0.83	965	213.36	N/A	N/A	N/A	N/A
19131	19131	7	0.25	1060	271.76	N/A	N/A	N/A	N/A
19132	19132	7.67	0.42	1008	156.47	N/A	N/A	N/A	N/A
19133	19133	10.7	0.42	898	442.08	N/A	N/A	N/A	N/A
19134	19134	9.54	0.5	975	203.82	N/A	N/A	N/A	N/A
19135	19135	14.5	1	1160	220.59	N/A	N/A	N/A	N/A

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
19140	19140	8	0.25	1045	150.83	N/A	N/A	N/A	N/A
19142	19142	10	0.25	1045	150.83	N/A	N/A	N/A	N/A
19143	19143	10	0.33	1009	44.45	N/A	N/A	N/A	N/A
19147	19147	10.3	0.42	939	474.82	N/A	N/A	N/A	N/A
19148	19148	9.59	0.5	980	270.91	N/A	N/A	N/A	N/A
19151	19151	7.25	0.25	873	184.46	N/A	N/A	N/A	N/A
19153	19153	9.7	0.5	900	307.86	N/A	N/A	N/A	N/A
19154	19054	9.9	0.29	1164	85.33	N/A	N/A	N/A	N/A
19155	19155	11.6	0.5	1300	454.95	N/A	N/A	N/A	N/A
19156	19156	11.6	0.5	1300	454.95	N/A	N/A	N/A	N/A
19157	19157	11.6	0.5	1300	454.95	N/A	N/A	N/A	N/A
19158	19158	11.6	0.5	1300	454.95	N/A	N/A	N/A	N/A
19159	19159	7.8	0.67	951.6	172.87	N/A	N/A	N/A	N/A

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
19160	19160	7	0.5	1108	41.37	N/A	N/A	N/A	N/A
19161	19161	8	0.375	1004	190.38	N/A	N/A	N/A	N/A
19163	19163	9.4	0.48	941	173.52	N/A	N/A	N/A	N/A
19164	19164	8.5	0.33	785	167.28	N/A	N/A	N/A	N/A
19168	19168	10.5	0.25	Unknown	Unknown	N/A	N/A	N/A	N/A
19169	19169	16	1.17	813	163.94	N/A	N/A	N/A	N/A
19170	19170	24	0.67	865	147.09	N/A	N/A	N/A	N/A
19171	19171	24	0.67	865	147.09	N/A	N/A	N/A	N/A
19172	19172	24	0.67	865	147.09	N/A	N/A	N/A	N/A
19173	19173	24	0.67	865	147.09	N/A	N/A	N/A	N/A
19174	19174	12	0.833	888	164.77	N/A	N/A	N/A	N/A
19176	19176	8	0.33	865	606.33	N/A	N/A	N/A	N/A
19177	19177	8	0.33	865	606.33	N/A	N/A	N/A	N/A

SECTION 7 STACK PARAMETERS
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Stack No. {1}	Emission Unit Nos. {2}	Stack Height ft. {3}	Inside Stack Exit Diameter ft. {4}	EXIT GAS CONDITIONS {5}			SAMPLING PORTS		
				Temp. EF	Velocity ft/sec {6}	Moisture % by Vol	Number	Size	Location {7}
19178	19178	12	0.83	709	165.13	N/A	N/A	N/A	N/A
19179	19179	8	0.21	824	161.28	N/A	N/A	N/A	N/A
19181	19181	7	0.17	622	447.4	N/A	N/A	N/A	N/A
19182	19182	7	0.17	697	511.32	N/A	N/A	N/A	N/A
19183	19183	4.5	0.33	806	88.90	N/A	N/A	N/A	N/A
20002	20002	4.0	3.0	1038	50.52	N/A	N/A	N/A	N/A
20004	20004	4.0	3.0	1099	39.37	N/A	N/A	N/A	N/A
21004	21004	22.00	2.50	Ambient[b]	13.12	N/A	N/A	N/A	N/A
21006	21006	40	4.7	Ambient	213.33	N/A	N/A	N/A	N/A
21015	21015	49.54	4.59	Ambient	67.26	N/A	N/A	N/A	N/A

[a] The emissions point for Unit ID 19014 is not a round stack but rather a 12 ft by 12 ft square brick enclosure, the area of this enclosure was used in the calculation.

b The paint booth exhausts at approximately ambient temperature, but has zero entered in the application.

Section 7: Stack Parameters

This section is used to describe the release points of all emissions associated with the facility. This includes actual stacks as well as the release point information in cases where there is no stack, such as where fugitive releases occur.

This information is required for EPA's Aerometric Information Retrieval System database and also for air dispersion modeling that may be required for either this source or another source.

Notes:

{1} Use stack numbers from Package Element 4A (Process Flow Sheets). If there is a release point with no stack, state the location of the release point.

{2} If one stack serves multiple processes, operations, or emissions units, provide unit numbers for all emissions units discharging to this stack.

{3} Height above ground of the stack exit or release point.

{4} If stack is circular, give inside diameter at exit point. If stack is not circular, provide actual exit dimensions. If stack exit is not pointed up, give direction that stack points. State whether rain cap is used.

{5} If conditions are not measured at actual stack exit, specify location at which measurements are made.

{6} Show calculations in sufficient detail to allow permit engineer to verify actual velocity values. These calculations should be shown in Package Element 4B and clearly identified.

{7} Provide the physical location(s) of the sampling ports. For example: 2 ports at 90 degrees, 25 ft. from top of stack.

SECTION 8A LIQUID STORAGE TANKS - MATERIAL DATA
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Tank No. {1}	Material Name {2}	Composition {3}	Liquid Density [a] (lb/gal)	Vapor Molecular Weight (lb/lb-mol)	Average Storage Temp., T_{av} (EF)	True Vapor Pressure at T_{av} (psia)	Maximum Storage Temp., T_{max} (EF)	True Vapor Pressure at T_{max} (psia)
22003	Gasoline	Gasoline	5.6	62	58.54	6.7593	65.66	7.7134
22004	Gasoline	Gasoline	5.6	62	58.54	6.7593	65.66	7.7134
22005	Gasoline	Gasoline	5.6	62	58.54	6.7593	65.66	7.7134
22015	E85	E85	6.008	68	58.54	7.9326	65.66	9.0274
25012	Gasoline	Gasoline	5.6	62	58.54	6.7593	65.66	7.7134
25017	Gasoline	Gasoline	5.6	62	58.54	6.7593	65.66	7.7134

[a] Liquid Density for gasoline is from AP-42 7.1-2. The Liquid Density for E85 was calculated in APIMS using the specific gravity in the MSDS provided for E85 in the Application for Permit 3090.

[b] Substitution of equipment for emission unit 22005 occurred in November 2018. A 5,000-gallon tank was substituted for the permitted 10,000-gallon tank.

Section 8A: Liquid Storage Tanks - Material Data

This section is used to describe any liquid materials that are stored at the plant and are potential sources of gaseous emissions. This includes raw feedstocks, and intermediate and final product storage.
If your plant has no tanks which store volatile organic compounds, or other toxic or hazardous materials, write "NA" on the top of the form.

This information is requested for the calculation and characterization of fugitive emissions. EPA's reference AP-42 Section 12 lists reference data for liquid storage tanks.

The emissions data for the tanks should be provided in Sections 2 and 3 of this application form.

Notes:

{1} The tank numbers are to be assigned by the applicant. Use a unique tank number for each tank. These are the same numbers as are used in Package Element 4A (Process Flow Sheets) to identify each tank.

{2} Give the trade name or commonly used name for the liquid stored in the tanks. E.g. Stoddard Solvent, fuel oil, etc.

{3} Identify each major component (including sulfur) and give its weight percent. If space is insufficient, attach analysis sheet. The material name and tank number should be clearly identified on any attachments.

SECTION 8B LIQUID STORAGE TANKS - TANK DATA
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Tank No. {1}	Date Installed/ Modified {2}	Material(s) Stored {3}	Roof Type {4}	Seal Type {5}	Capacity (gal)	Diameter (ft)	Vapor Space Height (ft) {6}	Roof/ Shell Color {7}	Paint Cond. {8}	Annual Throughput (gal/yr) {9}	Turnovers per Year {10}
22003	1995	Gasoline	FX	N/A	10,000	8	4	WH	Good	510,000	51
22004	1995	Gasoline	FX	N/A	10,000	8	4	WH	Good	210,000	21
22005[a]	1964	Gasoline	FX	N/A	5,000	8	4	WH	Good	90,000	18
22015	04-2008	E85	FX	N/A	10,000	8	4	WH	Good	510,000	51
25012	1997	Gasoline	FX	N/A	3,000	5.5	2.75	WH	Good	140,000	46.7
25017	10-2002	Gasoline	FX	N/A	1,000	4.5	2.25	WH	Good	20,000	20

[a] Substitution of equipment for emission unit 22005 occurred in November 2018. A 5,000-gallon tank was substituted for the permitted 10,000-gallon tank.

Section 8B: Liquid Storage Tanks - Tank Data

Notes:

{1} Use tank number(s) from Section 8A.

{2} Date (mo./yr.) tank was originally installed or constructed. If the tank was later modified or reconstructed, provide the date this work was completed and attach a separate description of the modifications or reconstruction.

{3} If the tank is used to store more than one material, use a separate line for each material and provide all the requested data for each material.

{4} Use the following abbreviations: Fixed roof - FX, Internal Floating Roof - IF, External Floating Roof - EF, Pressure - P.

{5} Select the appropriate number and letter from the following list that describes the tank and seal type (e.g. "2b" indicates welded tank, liquid mounted resilient seal with weather shield): NOTE: For pressure tanks, enter control pressure (psia).
NOTE: For pressure tanks, enter control pressure (psia).

WELDED TANK SEALS

1. Mechanical shoe	2. Liquid mounted resilient	3. Vapor mounted resilient
a. Primary only	a. Primary only	a. Primary only
b. Shoe mounted secondary	b. Weather shield	b. Weather shield
c. Rim mounted secondary	c. Rim mounted secondary	c. Rim mounted secondary

RIVETED TANK

4. Mechanical shoe seal
   - a. Primary only
   - b. Shoe mounted secondary
   - c. Rim mounted secondary

{6} This applies to fixed roof tanks only. Give the average distance from liquid surface to tank roof. For all other tanks, write "N.A."

{7} Use the following abbreviations: White - WH, Aluminum (specular) - AS, Aluminum (diffuse) - AD, Light Gray - LG, Medium Gray - MG, Black - BL, Other - OT.

{8} Describe the condition of the paint on the tank as either: Good or Poor.

{9} Enter throughput, in gallons/year, of each material that is stored in the tank.

{10} Turnover = annual throughput (gal) / tank capacity (gal).

SECTION 9A SOLID MATERIAL STORAGE - MATERIAL DATA – Not Applicable
(20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Storage Unit No. {1}	Material Name	Emissions Unit, Process or Operation Served {2}	Storage Type {3}	Composition {4}	Date Installed or Modified (Mo./Yr)

Section 9A: Solid Material Storage - Material Data

This section is used to describe any solid stored materials used in the plant process which are potential sources of particulate matter. This includes raw feedstocks, intermediate and final product storage. If there is no solid material storage at the plant, write "NA" at the top of the form.

Emissions data for solid material that is stored on the plant site should be provided in Sections 2 and 3.

Notes:

{1} Individual storage unit numbers are assigned by the applicant in Package Element 4A (Process Flow Sheets). These same unit numbers are used in this Section and in Sections 2 and 3 to identify the storage units.

{2} State which process, operation or emissions unit is served and whether transfer equipment is used. E.g. open feed conveyor.

{3} Examples of storage type: silo, open pile, shed, enclosed building, enclosed weigh bin or surge bin.

{4} Give the chemical composition of the material being stored. If space is insufficient, attach analysis sheet. The material name and storage unit number should be identified clearly in any attachments.

SECTION 9B SOLID MATERIAL STORAGE - STORAGE DATA – Not Applicable (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Storage Unit No. {1}	Transfer or Transport Method {2}		Maximum Hourly Throughput (specify units)	Annual Throughput (specify units)	Dust Control Method (Storage or Transfer) {3}
	Incoming	Outgoing			

Section 9B: Solid Material Storage - Storage Data

This section is used to specify the amounts and methods of solid material transfer in the facility process or operation.

Notes:

{1} Use the same storage unit numbers as in Section 9A.

{2} Examples of transfer or transport method:
Incoming: how material is loaded into the storage unit, e.g. truck, rail car, front end loader, etc.

Outgoing: how material is moved from the storage area to the process area, e.g. closed pneumatic feed, closed gravity feed, open gravity feed, enclosed screw conveyor, front end loader, open or enclosed belt conveyor, truck.

{3} State what kind of dust control methods are used in the storage or transfer of material. E.g. silo bin filters, telescoping stacker chutes, enclosures, dust pickup to baghouse, etc.
If the storage unit is equipped with a stack, provide the stack parameters in Section 7 (Stack Parameters)

SECTION 10 WASTE PRODUCT DISPOSAL – Not Applicable (SOLID AND LIQUID WASTES THAT DO NOT RESULT IN AIR EMISSIONS) (20.11.42.12A(4) NMAC)

(Use additional sheets if necessary)

Equipment Unit No. {1}	WASTE MATERIAL		METHOD OF DISPOSAL {4}
	Type {2}	Amount {3}	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	
		/hr /yr	

Section 10: Waste Product Disposal

Use this section to describe solid and liquid waste product disposal. Any waste product disposal that results in emissions of air pollutants, such as flares or wood waste burners, should be listed and characterized in Sections 2 and 3 of this application form.

This form is designed to complete the material and mass balances of the applicant's operation. It is not part of the part of the air emissions characterization.

Be aware that incineration of waste materials is regulated and 20 NMAC 11.68 or 11.69 may apply.

Notes:

{1} Give the control equipment or process unit numbers from Sections 2 through 9 that produce solid or liquid waste products which are then disposed of.

{2} For example: Waste paper, wood chips, rubbish, garbage, acids, oils, fly ash, tailings, sulfur, etc.

{3} Provide the quantity of waste product generated in terms of pounds, tons, or gallons per hour and per year. Specify units used.

{4} For example: Sanitary landfill, waste pickup, sewage treatment plant, etc.

SECTION 11   CERTIFICATION -- (20.11.42.12A.(5) NMAC)

I, Jason F. Vattioni, Colonel, USAF, hereby certify that the information and data submitted in this application package are as complete, true and accurate as possible, to the best of my personal knowledge and professional expertise and experience.

Signed this 20TH day of JANUARY, 20 22, upon my oath of affirmation, before a notary of the State of New Mexico

SIGNATURE (Responsible Official)

20 JANUARY 2022
DATE

JASON F. VATTIONI, Colonel, USAF
PRINTED NAME

Commander, 377th Air Base Wing
TITLE

Subscribed and sworn to before me on this 20th day of January, 20 22.

My authorization as a Notary of the State of NM expires on the N/A day of ~~20~~ mq ____. N/A USC 10 sec 1044a

NOTARY'S SIGNATURE

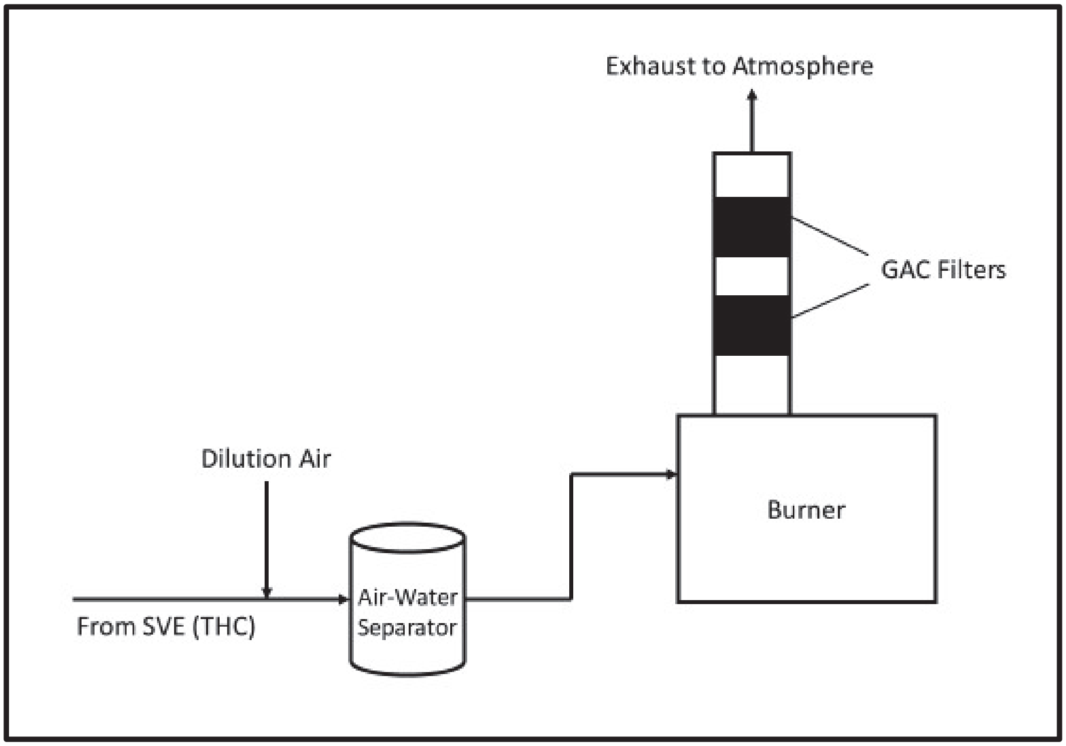
20 January 2022
DATE

UNITED STATES AIR FORCE
MILITARY NOTARY
10 USC 1044a
JUDGE ADVOCATE

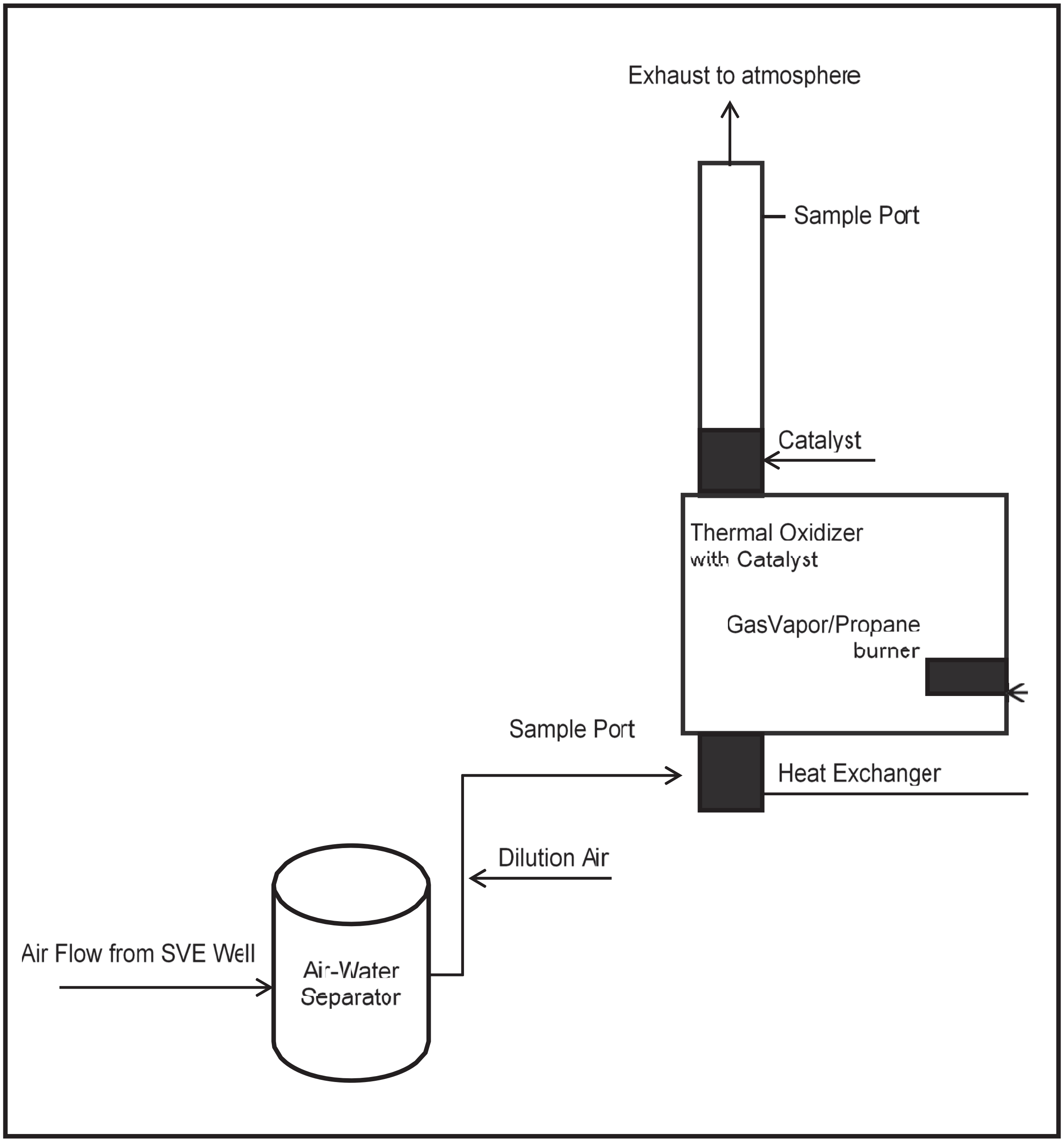
Melinda Quick, GS-9, USAF
NOTARY'S PRINTED NAME

Attachment B

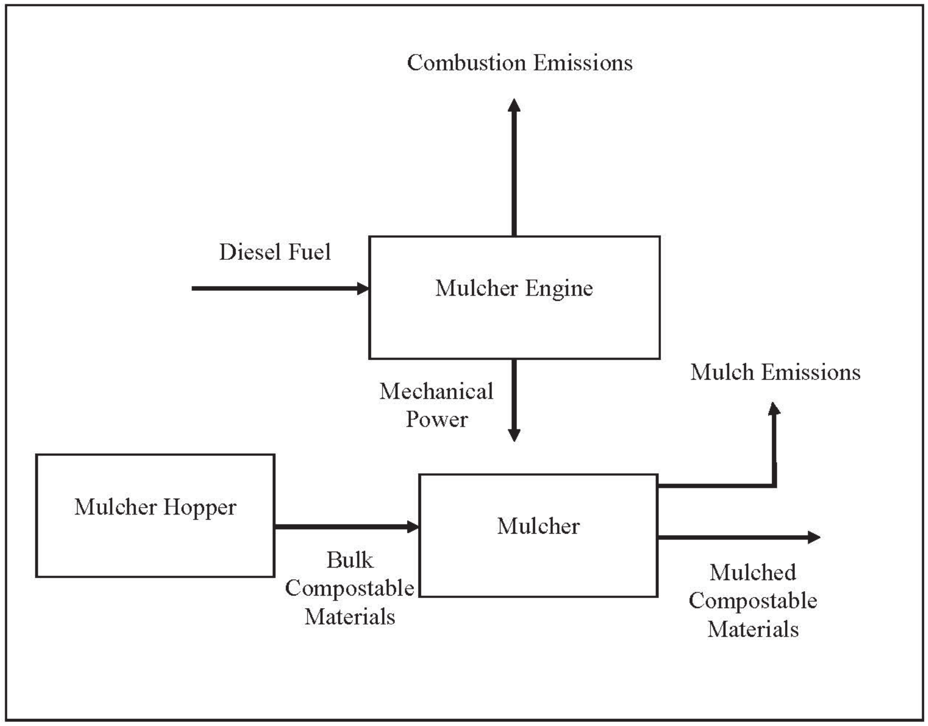
Process Flow Sheets



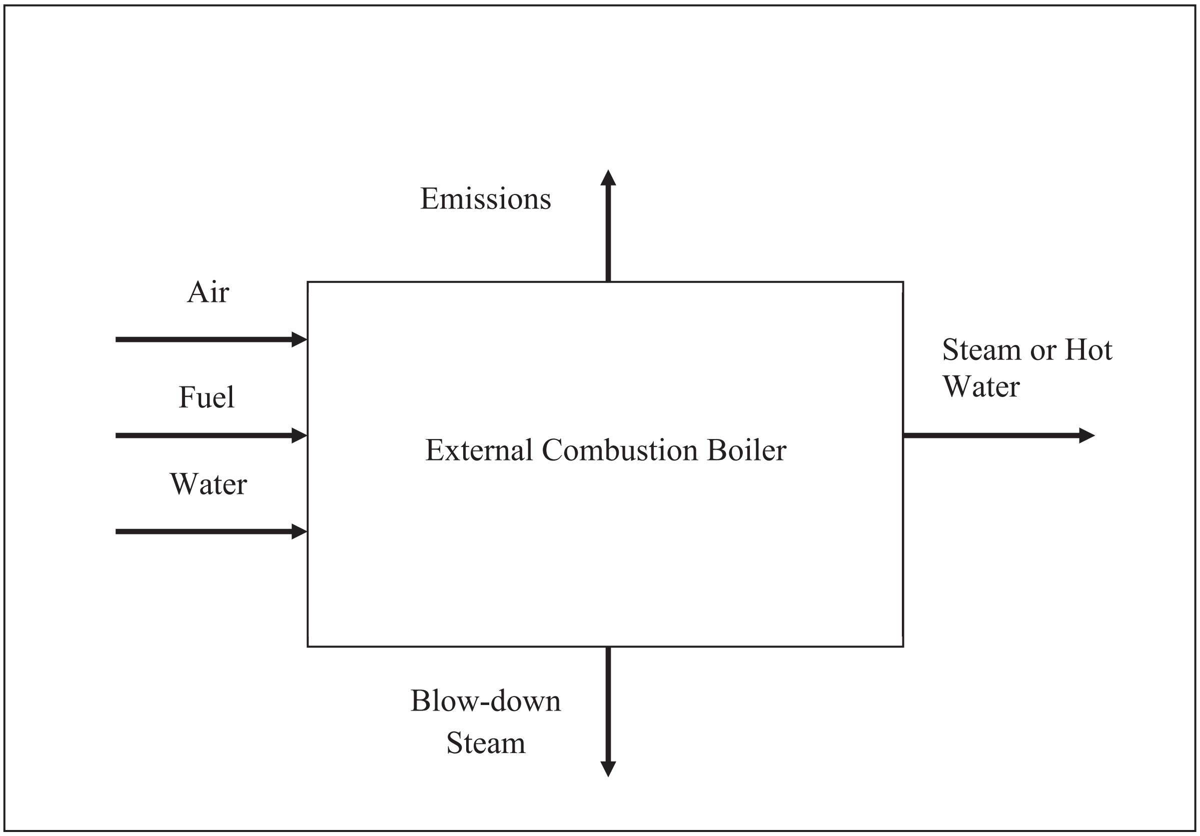
Process Flow Diagram for Soil Vapor Extraction with GAC filters



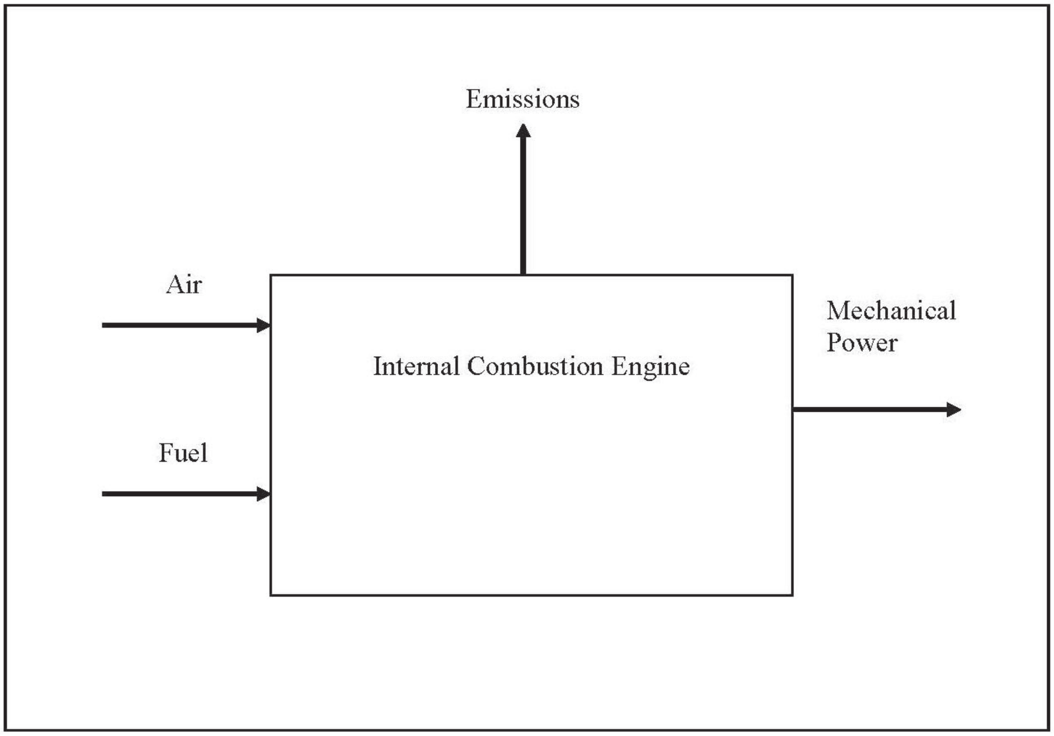
Process Flow Diagram for SVE System with Thermal Oxidizer and Catalyst



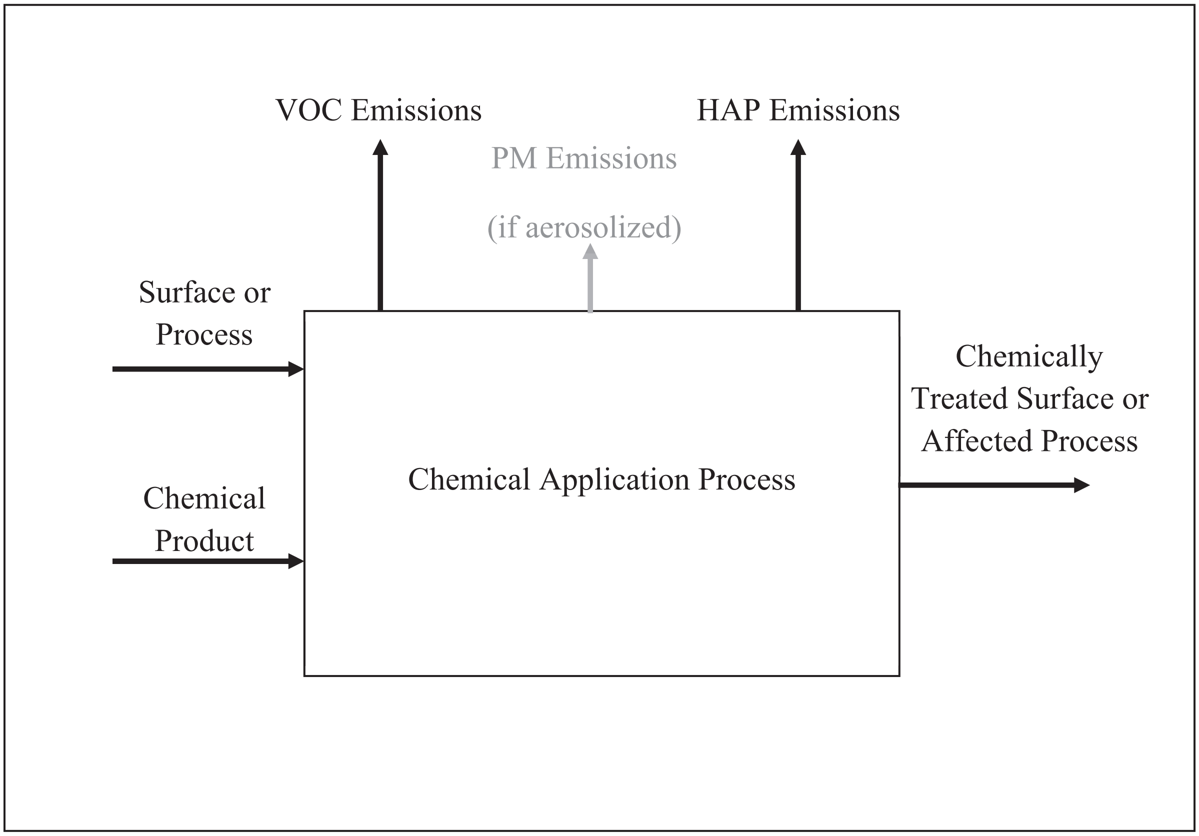
Process Flow Diagram for the Landfill Mulcher



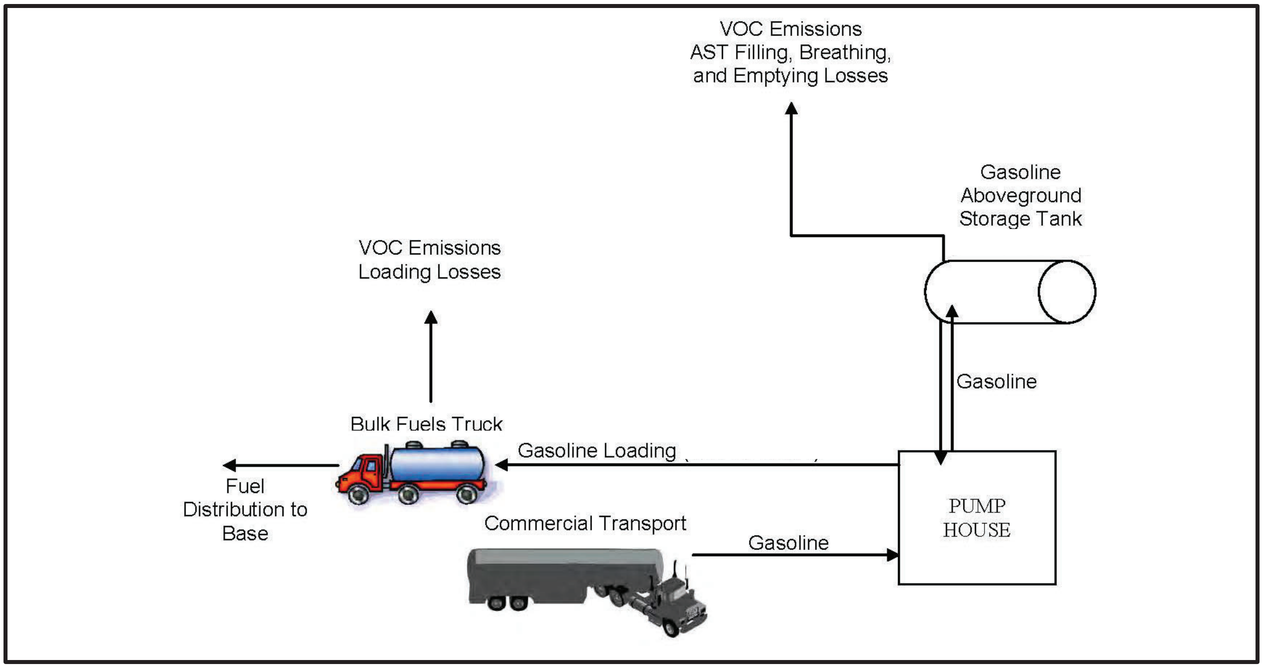
Process Flow Diagram for a Boiler



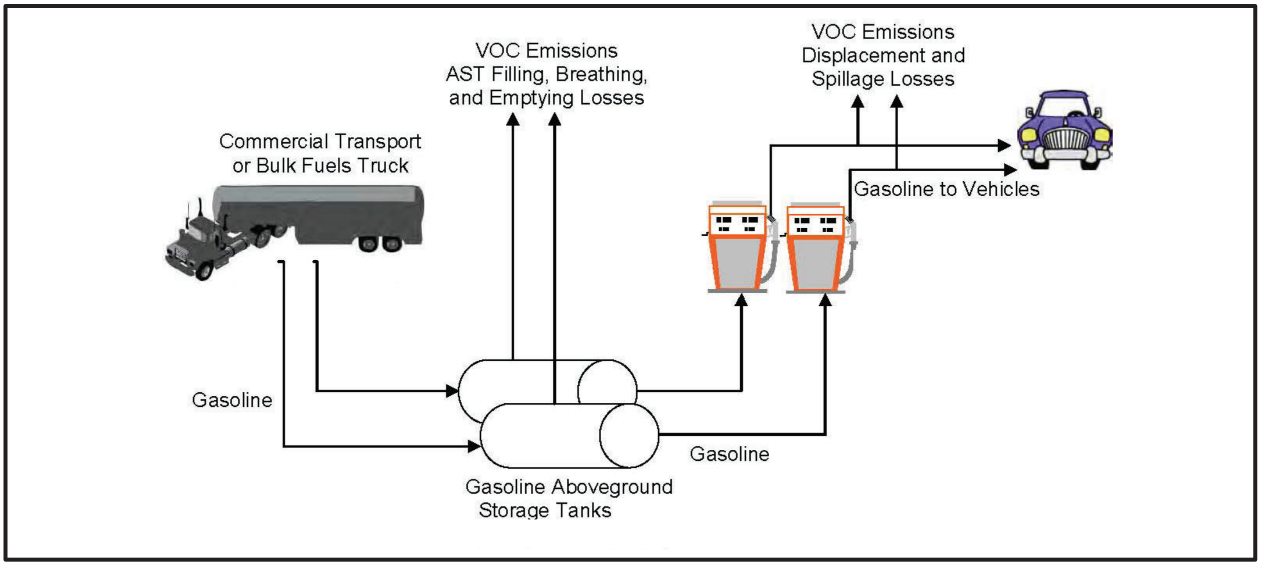
Process Flow Diagram for an Internal Combustion Engine



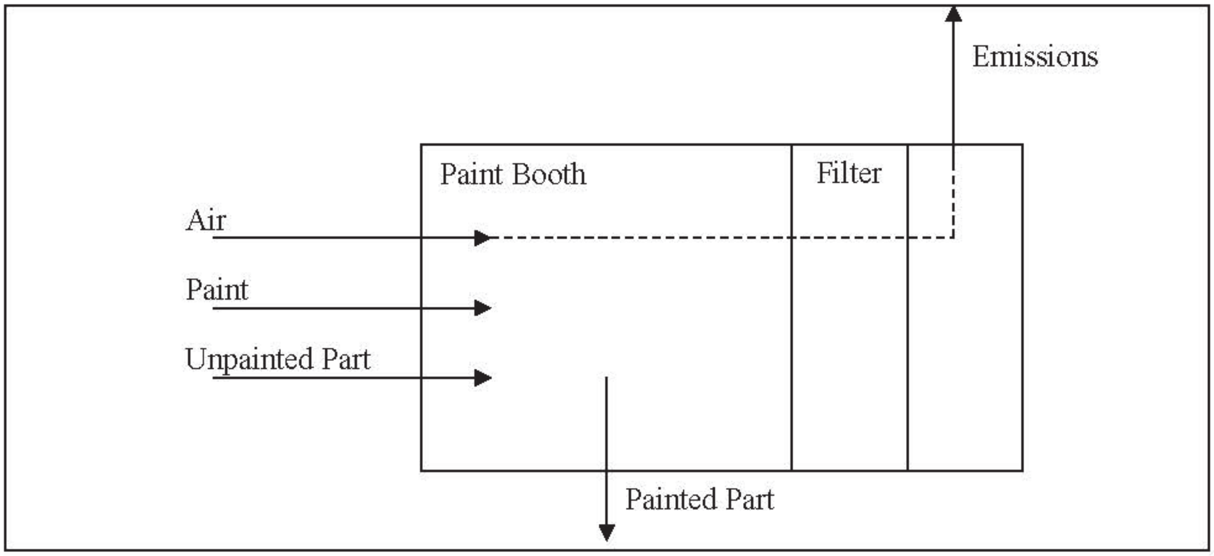
Process Flow Diagram for Miscellaneous Paint and Chemical Use



Process Flow Diagram for Storage Tank and Fuel Loading Operation



Process Flow Diagram for Storage Tank and Fuel Dispensing Operation



Process Flow Diagram for Surface Coating Operations

Attachment C

Emission Calculation Spreadsheets

Emission Estimates

Permit 484-M3 – 58 SOW Test Cells

Emission Unit IDs

20002, 20004

Allowable Criteria Pollutant Emissions from Aircraft Engine Testing at the 58 SOW at Kirtland AFB

T700 Test Cell										
	Emission Factor[1]			Duration[2]			Emissions[3]		Number of Hours per Year[4]	Annual[5] Emissions
	Idle	Intermed.	Military	Idle	Intermed.	Military				
CRITERIA	(lb/hr)			(%)			(lb/hr)	(g/s)		(tons/yr)
Carbon Monoxide	6.19	2.40	2.20	41.7	33.3	25.0	3.93	0.495	235	0.46
Nitrogen Oxides	0.45	5.14	7.43	41.7	33.3	25.0	3.76	0.474	235	0.44
Particulate Matter[6,7]	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	235	0.074
Particulate Matter <10μm	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	235	0.074
Particulate Matter <2.5μm	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	235	0.074
Sulfur Oxides	0.11	0.39	0.53	41.7	33.3	25.0	0.31	0.039	235	0.036
Volatile Organic Compounds	8.24	0.1	0.35	41.7	33.3	25.0	3.55	0.448	235	0.42

T400 Test Cell										
	Emission Factor[1]			Duration[2]			Emissions[3]		Number of Hours per Year[4]	Annual[5] Emissions
	Idle	Intermed.	Military	Idle	Intermed.	Military				
CRITERIA	(lb/hr)			(%)			(lb/hr)	(g/s)		(tons/yr)
Carbon Monoxide	4.39	0.75	0.31	41.7	33.3	25.0	2.16	0.272	350	0.38
Nitrogen Oxides	0.44	1.39	2.75	41.7	33.3	25.0	1.33	0.168	350	0.23
Particulate Matter[6,7]	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	350	0.015
Particulate Matter <10μm	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	350	0.015
Particulate Matter <2.5μm	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	350	0.015
Sulfur Oxides	0.12	0.24	0.35	41.7	33.3	25.0	0.22	0.027	350	0.038
Volatile Organic Compounds	1.24	0.05	0.05	41.7	33.3	25.0	0.55	0.069	350	0.10

[1] The emission factors for the T700 (carbon monoxide, nitrogen oxides, and volatile organic compounds) were obtained from the United States Air Force Institute for Environmental Safety *and Occupational Health Risk Analysis Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary (March 1999) (Report No. IERA-RS-BR-TR-1999-0006).*
Particulate emission factors for the T700 were obtained from the above-referenced report in *Volume 3, Particulate Matter Results (Report No. IERA-RS-BR-TR-1999-0006-Vol.3)*
The emission factors for the T400 were obtained from the Aircraft Environmental Support Office Naval Aviation Depot *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines, June 1990 (AESO Report No. 6-90).* Particulate emissions from the T400 were obtained from the 1978 EPA document *Air Pollutant Emission Factors for Military and Civil Aircraft (EPA-450/3-78-117).*

SO_x emission factors were calculated based on the published fuel flow for each engine in each mode and the average weight percent of sulfur in JP-8 as referenced below (also see Table D-6). The following equation was used to calculate the SO_x emission factors
Sulfur Oxide Emission Factor (lb/hr) = Sulfur wt% / 100 * Fuel Flow Rate by Mode (lb/hr) * 2 (Conversion of 2 lbs of sulfur dioxide for every lb of sulfur)

Assumed weight percent of sulfur is 0.042 as stated in Table 3-6. Average Sulfur Content Values for JP-8 Fuel, United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (January 2002, Revised December 2003) (Report No. IERA-RS-BR-SR-2001-0010).*

Fuel flow rates for the T700 were obtained from the United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary (March 1999) (Report No. IERA-RS-BR-TR-1999-0006).

Fuel flow rates for the T400 were obtained from the Aircraft Environmental Support Office Naval Aviation Depot *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines*, June 1990 (AESO Report No. 6-90).

[2] The following equation was used to calculate the duration of time spent in each mode:
Duration (%) = TIM_i (min) / TTT (min)
where:
TIM_i = time in $mode_i$
TTT = total test time

[3] Pound per hour (lb/hr) and gram per second (g/s) emissions were determined by multiplying the mode duration % by the mode emission factor.

[4] Number of Hours Per Year requested by Kirtland AFB.

[5] The following equation was used to calculate annual emissions for all pollutants.
Emissions (ton/yr) = (Σ (EF_i (lb/hr)) * (Duration (%) / 100)) * (Number of Hours per Year) / (2000 (lbs/ton))
where:
EF_i = Emission Factor_i

[6] Data is total particulate.
[7] Assumed PM emissions equal PM10 emissions and PM2.5 emissions

Allowable VOC HAP Emissions from Aircraft Engine Testing at the 58 SOW at Kirtland AFB

T700

HAP	Emission Factor[1] Idle (lb/hr)	Emission Factor[1] Intermed. (lb/hr)	Emission Factor[1] Military (lb/hr)	Duration[2] Idle (%)	Duration[2] Intermed. (%)	Duration[2] Military (%)	Emissions (lb/hr)	Emissions (g/s)	Number of Hours per Year[3]	Annual[4] Emissions (tons/yr)
1,3-Butadiene				41.7	33.3	25.0	0.00E+00	0.00E+00	235	0.00E+00
Acetaldehyde	2.42E-03	1.42E-04	1.42E-04	41.7	33.3	25.0	1.09E-03	1.37E-04	235	1.28E-04
Acrolein	9.69E-04	4.54E-05	4.54E-05	41.7	33.3	25.0	4.30E-04	5.42E-05	235	5.06E-05
Benzene	6.52E-03	1.39E-04	1.96E-04	41.7	33.3	25.0	2.81E-03	3.54E-04	235	3.30E-04
Ethylbenzene	3.01E-04	2.19E-04	0.00E+00	41.7	33.3	25.0	1.98E-04	2.50E-05	235	2.33E-05
Formaldehyde	2.94E-02	1.92E-03	1.92E-03	41.7	33.3	25.0	1.34E-02	1.68E-03	235	1.57E-03
Naphthalene	9.82E-04	7.32E-05	4.21E-05	41.7	33.3	25.0	4.44E-04	5.60E-05	235	5.22E-05
Phenol				41.7	33.3	25.0	0.00E+00	0.00E+00	235	0.00E+00
Propionaldehyde				41.7	33.3	25.0	0.00E+00	0.00E+00	235	0.00E+00
Styrene	6.92E-04	0.00E+00	0.00E+00	41.7	33.3	25.0	2.88E-04	3.63E-05	235	3.39E-05
Toluene	1.71E-03	1.57E-04	0.00E+00	41.7	33.3	25.0	7.65E-04	9.64E-05	235	8.99E-05
m,p-Xylene	5.83E-04	1.49E-04	2.02E-04	41.7	33.3	25.0	3.43E-04	4.32E-05	235	4.03E-05
o-Xylene	3.75E-04	1.69E-04	1.15E-04	41.7	33.3	25.0	2.41E-04	3.04E-05	235	2.84E-05
TOTAL HAP										**2.35E-03**

T400

HAP	Emission Factor[1] Idle (lb/hr)	Emission Factor[1] Intermed. (lb/hr)	Emission Factor[1] Military (lb/hr)	Duration[2] Idle (%)	Duration[2] Intermed. (%)	Duration[2] Military (%)	Emissions (lb/hr)	Emissions (g/s)	Number of Hours per Year[3]	Annual[4] Emissions (tons/yr)
1,3-Butadiene	2.34E-02	9.45E-04	9.45E-04	41.7	33.3	25.0	1.03E-02	1.30E-03	350	1.81E-03
Acetaldehyde	5.99E-02	2.42E-03	2.42E-03	41.7	33.3	25.0	2.64E-02	3.32E-03	350	4.61E-03
Acrolein	2.95E-02	1.19E-03	1.19E-03	41.7	33.3	25.0	1.30E-02	1.64E-03	350	2.27E-03
Benzene	2.50E-02	1.01E-03	1.01E-03	41.7	33.3	25.0	1.10E-02	1.39E-03	350	1.93E-03
Ethylbenzene	2.23E-03	9.00E-05	9.00E-05	41.7	33.3	25.0	9.83E-04	1.24E-04	350	1.72E-04
Formaldehyde	1.92E-01	7.74E-03	7.74E-03	41.7	33.3	25.0	8.45E-02	1.06E-02	350	1.48E-02
Naphthalene	7.44E-03	3.00E-04	3.00E-04	41.7	33.3	25.0	3.28E-03	4.13E-04	350	5.73E-04
Phenol	3.22E-03	1.30E-04	1.30E-04	41.7	33.3	25.0	1.42E-03	1.79E-04	350	2.48E-04
Propionaldehyde	1.22E-02	4.90E-04	4.90E-04	41.7	33.3	25.0	5.35E-03	6.74E-04	350	9.36E-04
Styrene	5.08E-03	2.05E-04	2.05E-04	41.7	33.3	25.0	2.24E-03	2.82E-04	350	3.92E-04
Toluene	6.82E-03	2.75E-04	2.75E-04	41.7	33.3	25.0	3.00E-03	3.78E-04	350	5.25E-04
m,p-Xylene	3.72E-03	1.50E-04	1.50E-04	41.7	33.3	25.0	1.64E-03	2.06E-04	350	2.87E-04
o-Xylene	2.48E-03	1.00E-04	1.00E-04	41.7	33.3	25.0	1.09E-03	1.38E-04	350	1.91E-04
TOTAL HAP										**2.87E-02**

[1] The emission factors for the T700 were obtained from the United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis *Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary (March 1999) (Report No. IERA-RS-BR-TR-1999-0006).*

Emission factors for the T700 were not provided for military mode for acetaldehyde, acrolein, and formaldehyde; therefore, intermediate emission factors were assumed for military mode.

The emission factors for the T400 were obtained from EPA SPECIATE, Profile No. 1097 for Military Aircraft Landing/Takeoff as obtained from AQUIS Table 3.1.7-7 Speciation Factors for VOC from Jet Engine Testing (January 1995).

HAP	wt%
1,3-Butadiene	1.890
Acetaldehyde	4.830
Acrolein	2.380
Benzene	2.020
Ethylbenzene	0.180
Formaldehyde	15.480
Naphthalene	0.600
Phenol	0.260
Propionaldehyde	0.980
Styrene	0.410
Toluene	0.550
m,p-Xylene	0.300
o-Xylene	0.200

Emission factor values reported as 0.00E+00 indicate a compound that was not detected.

Highlighted green cells indicate that the compound was not reported.

[2] The following equation was used to calculate the duration of time spent in each mode:

Duration (%) = TIM_i (min) / TTT (min)

where:

TIM_i = time in $mode_i$

TTT = total test time

[3] Number of Hours Per Year requested by Kirtland AFB.

[4] The following equation was used to calculate annual emissions for VOC HAP:

Emissions (ton/yr) = (Σ (EF_i (lb/hr)) * (Duration (%) / 100)) * (Number of Hours per Year) / (2000 (lbs/ton))

where:

EF = Emission $Factor_i$

Table D-3

Revised July 2014

Allowable PM HAP Emissions from Aircraft Engine Testing at the 58 SOW at Kirtland AFB

T700						
HAP	PM Emissions (lb/yr)	Speciation Factor[1] (lb/lb)	HAP Emissions[2] (lb/yr)	HAP Emissions[3] (lb/hr)	HAP Emissions[3] (g/s)	HAP Emissions[4] (ton/yr)
Arsenic	147.5	0.0053	0.7816	3.33E-03	4.19E-04	3.91E-04
Cadmium	147.5	0.0005	0.0737	3.14E-04	3.95E-05	3.69E-05
Chromium	147.5	0.0053	0.7816	3.33E-03	4.19E-04	3.91E-04
Lead Compounds	147.5	0.0055	0.8110	3.45E-03	4.35E-04	4.06E-04
Nickel	147.5	0.0005	0.0737	3.14E-04	3.95E-05	3.69E-05
Selenium	147.5	0.0005	0.0737	3.14E-04	3.95E-05	3.69E-05
TOTAL PM HAP						**1.30E-03**

T400						
HAP	PM Emissions (lb/yr)	Speciation Factor[1] (lb/lb)	HAP Emissions[2] (lb/yr)	HAP Emissions[3] (lb/hr)	HAP Emissions[3] (g/s)	HAP Emissions[4] (ton/yr)
Arsenic	29.2	0.0053	0.1546	4.42E-04	5.57E-05	7.73E-05
Cadmium	29.2	0.0005	0.0146	4.17E-05	5.25E-06	7.29E-06
Chromium	29.2	0.0053	0.1546	4.42E-04	5.57E-05	7.73E-05
Lead Compounds	29.2	0.0055	0.1604	4.58E-04	5.78E-05	8.02E-05
Nickel	29.2	0.0005	0.0146	4.17E-05	5.25E-06	7.29E-06
Selenium	29.2	0.0005	0.0146	4.17E-05	5.25E-06	7.29E-06
TOTAL PM HAP						**2.57E-04**

[1] Speciation factors from CARB (1991), Profile No. 110 for SCCs 2-04-001-01 and –02, Internal Combustion – Aircraft Engine Testing as obtained from AQUIS Table 3.1.7-6 Speciation Factors for Particulate Emissions from Jet Engine Testing (January 1995).
Note: Speciation Factor (lb/lb) = Speciation Factor (wt%)/100

[2] The following equation was used to calculate annual PM HAP emissions (lb/yr):
Annual emissions (lb/yr) = PM emissions (lb/yr) * Speciation Factor (lb/lb)

[3] The following equation was used to calculate hourly PM HAP emissions (lb/hr):
Hourly emissions (lb/hr) = PM emissions (lb/hr) * Speciation Factor (lb/lb)
Hourly emissions were converted into a gram per second (g/s) emission rate:
Gram per second emissions (g/s) = Hourly emissions (lb/hr) * (453.6 g/lb) * (1hr/3600s)

[4] The following equation was used to calculate annual PM HAP emissions (ton/yr):
Annual emissions (ton/yr) = Annual emissions (lb/yr) / 2000 (lb/ton)

Table D-4

Potential Criteria Pollutant Emissions from Aircraft Engine Testing at the 58 SOW at Kirtland AFB

T700	Emission Factor[1]			Duration[2]			Emissions		Number of Hours	Annual[4] Emissions
	Idle	Intermed.	Military	Idle	Intermed.	Military				
CRITERIA	(lb/hr)			(%)			(lb/hr)	(g/s)	per Year[3]	(tons/yr)
Carbon Monoxide	6.19	2.40	2.20	41.7	33.3	25.0	3.93	0.495	8760	17.21
Nitrogen Oxides	0.45	5.14	7.43	41.7	33.3	25.0	3.76	0.474	8760	16.46
Particulate Matter[5,6]	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	8760	2.75
Particulate Matter <10μm	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	8760	2.75
Particulate Matter <2.5μm	0.20	0.59	1.39	41.7	33.3	25.0	0.63	0.079	8760	2.75
Sulfur Oxides	0.11	0.39	0.53	41.7	33.3	25.0	0.31	0.039	8760	1.36
Volatile Organic Compounds	8.24	0.10	0.35	41.7	33.3	25.0	3.55	0.448	8760	15.57

T400	Emission Factor[1]			Duration[2]			Emissions		Number of Hours	Annual[4] Emissions
	Idle	Intermed.	Military	Idle	Intermed.	Military				
CRITERIA	(lb/hr)			(%)			(lb/hr)	(g/s)	per Year[3]	(tons/yr)
Carbon Monoxide	4.39	0.75	0.31	41.7	33.3	25.0	2.16	0.272	8760	9.45
Nitrogen Oxides	0.44	1.39	2.75	41.7	33.3	25.0	1.33	0.168	8760	5.84
Particulate Matter[5,6]	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	8760	0.37
Particulate Matter <10μm	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	8760	0.37
Particulate Matter <2.5μm	0.06	0.10	0.10	41.7	33.3	25.0	0.08	0.011	8760	0.37
Sulfur Oxides	0.12	0.24	0.35	41.7	33.3	25.0	0.22	0.027	8760	0.95
Volatile Organic Compounds	1.24	0.05	0.05	41.7	33.3	25.0	0.55	0.069	8760	2.39

[1] The emission factors for the T700, T64, and T56 (carbon monoxide, nitrogen oxides, and volatile organic compounds) were obtained from the United States Air Force Institute for Environmental Safety *and Occupational Health Risk Analysis Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary (March 1999) (Report No. IERA-RS-BR-TR-1999-0006).*
Particulate emission factors for the T700, T64, and T56 were obtained from the above-referenced report in *Volume 3, Particulate Matter Results (Report No. IERA-RS-BR-TR-1999-0006-Vol.3).*
The emission factors for the T400 were obtained from the Aircraft Environmental Support Office Naval Aviation Depot *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines*, June 1990 (AESO Report No. 6-90). Particulate emissions from the T400 were obtained from the 1978 EPA document Air Pollutant Emission Factors for Military and *Civil Aircraft (EPA-450/3-78-117).*

SO_x emission factors were calculated based on the published fuel flow for each engine in each mode and the average weight percent of sulfur in JP-8 as referenced below (also see Table D-6).
The following equation was used to calculate the SO_x emission factors:
Sulfur Oxide Emission Factor (lb/hr) = Sulfur wt% / 100 * Fuel Flow Rate by Mode (lb/hr) * 2 (Conversion of 2 lbs of sulfur dioxide for every lb of sulfur)

Assumed weight percent of sulfur is 0.042 as stated in Table 3-6. Average Sulfur Content Values for JP-8 Fuel, United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations (January 2002, Revised December 2003) (Report No. IERA-RS-BR-SR-2001-0010).*

Fuel flow rates for the T700, T64, and T56 were obtained from the United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary (March 1999) (Report No. IERA-RS-BR-TR-1999-0006).

Fuel flow rates for the T400 were obtained from the Aircraft Environmental Support Office Naval Aviation Depot *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines*, June 1990 (AESO Report No. 6-90).

[2] The following equation was used to calculate the duration of time spent in each mode:
Duration (%) = TIM_i (min) / TTT (min)
where:
TIM_i = time in mode $_i$
TTT = total test time

[3] Number of Hours Per Year requested by Kirtland AFB.

[4] The following equation was used to calculate annual emissions for all pollutants:
Emissions (ton/yr) = (Σ (EF_i (lb/hr)) * (Duration (%) / 100)) * (Number of Hours per Year) / (2000 (lbs/ton))
where:
EF = Emission $Factor_i$

[5] Data is total particulate.

[6] Assumed PM emissions equal PM10 emissions and PM2.5 emissions.

Worst-Case Hourly Emissions by Operating Scenario from Aircraft Engine Testing at the 58 SOW at Kirtland AFB

	Emission Rates by Operating Scenario (lb/hr)						
	1	2,3,4,5	6	7,8	9,10	11	Worst-Case
	T400 (N+S)	T400+T700	T700 (N,S)	T400 (N,S)+T700	T700 (N,S)+T400	T700 (N,S)+T400 (N,S)	Scenario[1]
CRITERIA							
Carbon Monoxide	4.31	6.09	7.86	8.24	10.02	12.17	12.17
Nitrogen Oxides	2.67	5.09	7.52	6.43	8.85	10.19	10.19
Particulate Matter	0.17	0.71	1.26	0.79	1.34	1.42	1.42
Particulate Matter <10µm	0.17	0.71	1.26	0.79	1.34	1.42	1.42
Particulate Matter <2.5µm	0.17	0.71	1.26	0.79	1.34	1.42	1.42
Sulfur Oxides	0.43	0.53	0.62	0.74	0.84	1.05	1.05
Volatile Organic Compounds	1.09	4.10	7.11	4.65	7.65	8.20	8.20

	Emission Rates by Operating Scenario (lb/hr)						
	1	2,3,4,5	6	7,8	9,10	11	Worst-Case
	T400 +T400	T400+T700	T700+T700	T400 (N,S)+T700	T700 (N,S)+T400	T700 (N,S)+T400 (N,S)	Scenario[1]
VOC HAP							
1,3-Butadiene	2.06E-02	1.03E-02	0.00E+00	2.06E-02	1.03E-02	2.06E-02	2.06E-02
Acetaldehyde	5.27E-02	2.75E-02	2.18E-03	5.38E-02	2.85E-02	5.49E-02	5.27E-02
Acrolein	2.60E-02	1.34E-02	8.60E-04	2.64E-02	1.39E-02	2.68E-02	2.60E-02
Benzene	2.21E-02	1.38E-02	5.62E-03	2.49E-02	1.66E-02	2.77E-02	2.21E-02
Ethylbenzene	1.97E-03	1.18E-03	3.97E-04	2.16E-03	1.38E-03	2.36E-03	1.97E-03
Formaldehyde	1.69E-01	9.79E-02	2.67E-02	1.82E-01	1.11E-01	1.96E-01	1.69E-01
Naphthalene	6.55E-03	3.72E-03	8.88E-04	6.99E-03	4.16E-03	7.44E-03	6.55E-03
Phenol	2.84E-03	1.42E-03	0.00E+00	2.84E-03	1.42E-03	2.84E-03	2.84E-03
Propionaldehyde	1.07E-02	5.35E-03	0.00E+00	1.07E-02	5.35E-03	1.07E-02	1.07E-02
Styrene	4.48E-03	2.53E-03	5.77E-04	4.76E-03	2.81E-03	5.05E-03	4.48E-03
Toluene	6.00E-03	3.77E-03	1.53E-03	6.77E-03	4.53E-03	7.53E-03	6.00E-03
m,p-Xylene	3.28E-03	1.98E-03	6.86E-04	3.62E-03	2.32E-03	3.96E-03	3.28E-03
o-Xylene	2.18E-03	1.33E-03	4.83E-04	2.42E-03	1.57E-03	2.67E-03	2.18E-03

	Emission Rates by Operating Scenario (lb/hr)						
	1	2,3,4,5	6	7,8	9,10	11	Worst-Case
	T400 +T400	T400+T700	T700+T700	T400 (N,S)+T700	T700 (N,S)+T400	T700 (N,S)+T400 (N,S)	Scenario[1]
PM HAP							
Arsenic	1.77E-03	4.21E-03	6.65E-03	4.21E-03	7.09E-03	7.53E-03	6.65E-03
Cadmium	1.67E-04	3.97E-04	6.28E-04	3.97E-04	6.69E-04	7.11E-04	6.28E-04
Chromium	1.77E-03	4.21E-03	6.65E-03	4.21E-03	7.09E-03	7.53E-03	6.65E-03
Lead	1.83E-03	4.37E-03	6.90E-03	4.37E-03	7.36E-03	7.82E-03	6.90E-03
Nickel	1.67E-04	3.97E-04	6.28E-04	3.97E-04	6.69E-04	7.11E-04	6.28E-04
Selenium	1.67E-04	3.97E-04	6.28E-04	3.97E-04	6.69E-04	7.11E-04	6.28E-04

[1]Worst-case scenario is the maximum hourly pollutant emission rate of all operating scenarios.

Scenarios

1	T400N	T400S		
2	T400N	T700S		
3	T400N	T700N		
4	T400S	T700S		
5	T400S	T700N		
6	T700N	T700S		
7	T400N	T400S	T700N	
8	T400N	T400S	T700S	
9	T700N	T700S	T400N	
10	T700N	T700S	T400S	
11	T700N	T700S	T400N	T440S

Fuel Flow Rates for Aircraft Engine Testing at the 58 SOW at Kirtland AFB

T700	Fuel Flow Rates (lb/hr)
Idle	134
Intermediate	469
Military	626

T400	Fuel Flow Rates (lb/hr)
Idle	143
Intermediate	283
Military	412

Fuel flow rates for the T700 were obtained from the United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis Aircraft Engine and Auxiliary Power Unit Emissions Testing Report, Volume 1, Executive Summary *(March 1999) (Report No. IERA-RS-BR-TR-1999-0006).*

Fuel flow rates for the T400 were obtained from the Aircraft Environmental Support Office Naval Aviation Depot *Summary Tables of* Gaseous and Particulate Emissions *from Aircraft Engines*, June 1990 (AESO Report No. 6-90).

Emission Estimates

Permit 1759-M1-RV1 – AFRL SOL Facility

Emission Unit IDs

19135, 19155, 19156, 19157, 19158

Summary of Emissions
for the Generators at SOR Location

Process Equipment Unit No.	Emission Source	Hourly Emissions (lb/hr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Emergency Generator, Building 66048, ID 19135	45.67	52.82	0.36	0.0072	0.12	0.12	0.12
2	Emergency Generator, Building 66001, ID 19155	4.24	6.76	0.47	2.13	0.19	0.19	0.19
3	Emergency Generator, Building 66001, ID 19156	4.24	6.76	0.47	2.13	0.19	0.19	0.19
4	Emergency Generator, Building 66001, ID 19157	4.24	6.76	0.47	2.13	0.19	0.19	0.19
5	Emergency Generator, Building 66001, ID 19158	4.24	6.76	0.47	2.13	0.19	0.19	0.19
	Total	**62.62**	**79.85**	**2.26**	**8.51**	**0.89**	**0.89**	**0.89**

Process Equipment Unit No.	Emission Source	Annual Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Emergency Generator, Building 66048, ID 19135	4.57	5.28	0.036	0.0007	0.012	0.012	0.012
2	Emergency Generator, Building 66001, ID 19155	0.42	0.68	0.047	0.21	0.019	0.019	0.019
3	Emergency Generator, Building 66001, ID 19156	0.42	0.68	0.047	0.21	0.019	0.019	0.019
4	Emergency Generator, Building 66001, ID 19157	0.42	0.68	0.047	0.21	0.019	0.019	0.019
5	Emergency Generator, Building 66001, ID 19158	0.42	0.68	0.047	0.21	0.019	0.019	0.019
	Total	**6.26**	**7.98**	**0.23**	**0.85**	**0.089**	**0.089**	**0.089**

Summary of Emissions
for the Generators at SOR Location

Process Equipment Unit No.	Emission Source	Potential Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Emergency Generator, Building 66048, ID 19135	200.03	231.35	1.59	0.032	0.53	0.53	0.53
2	Emergency Generator, Building 66001, ID 19155	18.57	29.60	2.08	9.31	0.84	0.84	0.84
3	Emergency Generator, Building 66001, ID 19156	18.57	29.60	2.08	9.31	0.84	0.84	0.84
4	Emergency Generator, Building 66001, ID 19157	18.57	29.60	2.08	9.31	0.84	0.84	0.84
5	Emergency Generator, Building 66001, ID 19158	18.57	29.60	2.08	9.31	0.84	0.84	0.84
	Total	**274.30**	**349.74**	**9.89**	**37.29**	**3.90**	**3.90**	**3.90**

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Building 66048 (Unit ID 19135)
Process Equipment Unit No. 1

Generator
1334 hp

Criteria Air Pollutants	Emission Estimation Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**45.67**	**4.57**	**200.03**
Nitrogen Oxides	Manufacturer EF (Sheet 1)	**52.82**	**5.28**	**231.35**
Particulate Matter[5]	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.12**	**0.012**	**0.53**
Particulate Matter <10μm	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.12**	**0.012**	**0.53**
Particulate Matter <2.5μm	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.12**	**0.012**	**0.53**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.0072**	**0.00072**	**0.032**
Volatile Organic Compounds	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.36**	**0.036**	**1.59**

The generator operates a maximum of 200 hours per year and is powered by natural gas.

[1] Emission Estimation Data Source Explanations:
Manufacturer EF (Sheet 1): Emission calculations were performed using Manufacturer Emission Factors.
AP-42 EF, Calculated Fuel Flow (Sheet 2): Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow using the manufacturer specified brake specific fuel consumption.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3): Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.
Worst-case emissions are estimated for the generator using the methodology described in each sheet.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] Assumed Particulate Matter emissions equal Particulate Matter < 10μm and Particulate Matter <2.5μm emissions.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 66048 (Unit ID 19135)
Process Equipment Unit No. 1

Generator
1334 hp

Criteria Air Pollutants	Manufacturer Emission Factors[1] (g/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	4.74	**13.94**	**1.39**	**61.06**
Nitrogen Oxides	17.96	**52.82**	**5.28**	**231.35**
Particulate Matter	Manufacturer emission factors not available			
Particulate Matter <10μm				
Particulate Matter <2.5μm				
Sulfur Oxides				
Volatile Organic Compounds[5]	0.23	**0.68**	**0.068**	**2.96**

The generator operates a maximum of 200 hours per year and is powered by natural gas.

[1] The highest emission factor for the load was used.

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] Emission factor is for non-methane hydrocarbons (NMHC). VOC emissions conservatively assumed to be equal to NMHC.

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 66048 (Unit ID 19135)
Process Equipment Unit No. 1

Generator
1334 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (scf/hr)	Heating Value (HV)[3] (Btu/scf)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	3.72	12036.1	1020	**45.67**	**4.57**	**200.03**
Nitrogen Oxides	2.27	12036.1	1020	**27.87**	**2.79**	**122.06**
Particulate Matter[7,8]	0.00991	12036.1	1020	**0.12**	**0.012**	**0.53**
Particulate Matter <10µm	0.00991	12036.1	1020	**0.12**	**0.012**	**0.53**
Particulate Matter <2.5µm	0.00991	12036.1	1020	**0.12**	**0.012**	**0.53**
Sulfur Oxides	0.000588	12036.1	1020	**0.0072**	**0.0007**	**0.032**
Volatile Organic Compounds	0.0296	12036.1	1020	**0.36**	**0.036**	**1.59**

The generator operates a maximum of 200 hours per year and is powered by natural gas.

[1] Emission factors from EPA AP-42 Section 3.2 Natural Gas-fired Reciprocating Engines, Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich Burn Engines (July 2000). Manufacturer emission data sheet reports that the engine exhaust percent oxygen is 2.9% in standby mode and the Cummins representative states this engine is a rich burn engine.

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Manufacturer Specified brake specific fuel consumption (9,203 Btu/hp-hr) * 1/HV (Btu/scf)
The manufacturer specified brake specific fuel consumption resulting in the highest emissions is 9,203 Btu/hp-hr (Continuous Mode).

[3] The heating value (HV) of natural gas is given in AP-42 Section 3.2 Table 3.3-2 (footnote b) as 1020 Btu/scf (July 2000).

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (scf/hr) * HV (Btu/scf) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] Data is total particulate.

[8] Assumed particulate matter (PM) emissions equal PM <10µm and PM <2.5µm emissions.

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 66048 (Unit ID 19135)
Process Equipment Unit No. 1

Generator
1334 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (scf/hr)	Heating Value (HV)[3] (Btu/scf)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	3.72	11600.0	1020	**44.02**	**4.40**	**192.79**
Nitrogen Oxides	2.27	11600.0	1020	**26.86**	**2.69**	**117.64**
Particulate Matter[7,8]	0.00991	11600.0	1020	**0.12**	**0.012**	**0.51**
Particulate Matter <10μm	0.00991	11600.0	1020	**0.12**	**0.012**	**0.51**
Particulate Matter <2.5μm	0.00991	11600.0	1020	**0.12**	**0.012**	**0.51**
Sulfur Oxides	0.000588	11600.0	1020	**0.0070**	**0.00070**	**0.030**
Volatile Organic Compounds	0.0296	11600.0	1020	**0.35**	**0.035**	**1.53**

The generator operates a maximum of 200 hours per year and is powered by natural gas.

[1] Emission factors from EPA AP-42 Section 3.2 Natural Gas-fired Reciprocating Engines, Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich Burn Engines (July 2000). Manufacturer emission data sheet reports that the engine exhaust percent oxygen is 29% in standby mode and the Cummins representative states this engine is a rich burn engine.

[2] Maximum manufacturer specified fuel flow.

[3] The heating value (HV) of natural gas is given in AP-42 Section 3.2 Table 3.3-2 (footnote b) as 1020 Btu/scf (July 2000).

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (scf/hr) * HV (Btu/scf) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] Data is total particulate.

[8] Assumed particulate matter (PM) emissions equal PM <10μm and PM <2.5μm emissions.

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generators at Building 66001 (Unit IDs 19155, 19156, 19157, and 19158)
Process Equipment Unit Nos. 2, 3, 4, and 5

Generator
752 hp

Criteria Air Pollutants	Emission Estimation Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide[5]	AP-42 EF, Manufacturer Fuel Flow (Sheet 3)	**4.24**	**0.42**	**18.57**
Nitrogen Oxides[5]	Manufacturer EF (Sheet 1)	**6.76**	**0.68**	**29.60**
Particulate Matter[5]	Manufacturer EF (Sheet 1)	**0.19**	**0.019**	**0.84**
Particulate Matter <10μm	Manufacturer EF (Sheet 1)	**0.19**	**0.019**	**0.84**
Particulate Matter <2.5μm	Manufacturer EF (Sheet 1)	**0.19**	**0.019**	**0.84**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**2.13**	**0.21**	**9.31**
Volatile Organic Compounds[5]	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.47**	**0.047**	**2.08**

Each generator operates a maximum of 200 hours per year and is powered by diesel fuel.

Please note: These spreadsheets are calculating for one of the four identical generators. The S*ummary of Emissions* sheets show individual emissions for each 752 hp generator and total emissions for the facility.

[1] Emission Estimation Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors.
AP-42 EF, Calculated Fuel Flow (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3) : Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.
Unless the pollutant is subject to an NSPS standard (see footnote 5) and emission estimates exceed the applicable standard, worst-case emissions are estimated for the generator using the methodology described.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] These generators are subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and are equipped with model year 2008 engines rated at 752 hp (560.8 kW). Based on the engine rating (560.8 kW) and displacement of less than 10 liters per cylinder, these generators must comply with the emission standards in 40 CFR 89.112 Table 1 for rated power greater than 560 kW, Tier 2 (Model Year 2006 and beyond). These generators meet the standards outlined in this regulation.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generators at Building 66001 (Unit IDs 19155, 19156, 19157, and 19158)
Process Equipment Unit Nos. 2, 3, 4, and 5

Generator
752 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	0.786	**1.30**	**0.13**	**5.71**
Nitrogen Oxides	4.076	**6.76**	**0.68**	**29.60**
Particulate Matter	0.116	**0.19**	**0.019**	**0.84**
Particulate Matter <10μm[4]	0.116	**0.19**	**0.019**	**0.84**
Particulate Matter <2.5μm[4]	0.116	**0.19**	**0.019**	**0.84**
Sulfur Oxides	Manufacturer emission factor not available			
Volatile Organic Compounds	0.234	**0.39**	**0.039**	**1.70**

Each generator operates a maximum of 200 hours per year and is powered by diesel fuel.

Please note: These spreadsheets are calculating for one of the four identical generators. The S*ummary of Emissions* sheets show individual emissions for each 752 hp generator and total emissions for the facility.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed PM emissions equal Particulate Matter <10μm and Particulate Matter <2.5μm emissions.

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
Emergency Generators at Building 66001 (Unit IDs 19155, 19156, 19157, and 19158)
Process Equipment Unit Nos. 2, 3, 4, and 5

Generator
752 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	38.4	137000	**4.47**	**0.45**	**19.60**
Nitrogen Oxides	3.2	38.4	137000	**16.84**	**1.68**	**73.78**
Particulate Matter	0.1	38.4	137000	**0.53**	**0.053**	**2.31**
Particulate Matter <10μm[7]	0.1	38.4	137000	**0.53**	**0.053**	**2.31**
Particulate Matter <2.5μm[8]	0.1	38.4	137000	**0.53**	**0.053**	**2.31**
Sulfur Oxides[9]	0.404	38.4	137000	**2.13**	**0.21**	**9.31**
Volatile Organic Compounds[10]	0.09	38.4	137000	**0.47**	**0.047**	**2.08**

Each generator operates a maximum of 200 hours per year and is powered by diesel fuel.

Please note: These spreadsheets are calculating for <u>one</u> of the four identical generators. The S*ummary of Emissions* sheets show individual emissions for each 752 hp generator and total emissions for the facility.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985),Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7,8] Assumed Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[9] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.01 * S
where: S = Percent sulfur in diesel fuel (0.4% from AP-42 Appendix A: Miscellaneous Data & Conversion Factors (Septembe r 1985), Typical Parameters of Various Fuels)

[10] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
Emergency Generators at Building 66001 (Unit IDs 19155, 19156, 19157, and 19158)
Process Equipment Unit Nos. 2, 3, 4, and 5

Generator
752 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	36.4	137000	**4.24**	**0.42**	**18.57**
Nitrogen Oxides	3.2	36.4	137000	**15.96**	**1.60**	**69.89**
Particulate Matter	0.1	36.4	137000	**0.50**	**0.050**	**2.18**
Particulate Matter <10μm[7]	0.1	36.4	137000	**0.50**	**0.050**	**2.18**
Particulate Matter <2.5μm[8]	0.1	36.4	137000	**0.50**	**0.050**	**2.18**
Sulfur Oxides[9]	0.404	36.4	137000	**2.01**	**0.20**	**8.82**
Volatile Organic Compounds[10]	0.09	36.4	137000	**0.45**	**0.045**	**1.97**

Each generator operates a maximum of 200 hours per year and is powered by diesel fuel.

Please note: These spreadsheets are calculating for <u>one</u> of the four identical generators. The S*ummary of Emissions* sheets show individual emissions for each 752 hp generator and total emissions for the facility.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, Table 3.4-1 (October 1996).

[2] Maximum manufacturer specified fuel flow.

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7,8] Assumed Particulate Matter <2.5μm and Particulate Matter <10μm equal particulate matter.

Emission Estimates

Permit 1770-RV3 – 58 SOW Corrosion Control Facility

Emission Unit ID

21015

Table E-1. Worst-Case Hourly and Potential Annual Emissions of VOC and Volatile HAPs

Flow Rate (gal/hr)	Average Density (lb/gal)	Max Paint Usage (lb/hr)	Pollutant	Max Pollutant Content (%)	Max Pollutant Emissions (lb/hr)	Potential Hours of Operation	Potential Pollutant Emissions (tpy)	g/s for modeling
6	10	60	VOC	100.0%	60.00	8760	262.8	7.56
6	10	60	Cumene	1.0%	0.60	8760	2.6	0.08
6	10	60	Ethylbenzene	9.0%	5.40	8760	23.7	0.68
6	10	60	Methyl Alcohol	50.0%	30.00	8760	131.4	3.78
6	10	60	Methylene Chloride	50.0%	30.00	8760	131.4	3.78
6	10	60	MIBK	18.6%	11.17	8760	48.9	1.41
6	10	60	PAH	10.0%	6.00	8760	26.3	0.76
6	10	60	Toluene	11.7%	7.03	8760	30.8	0.89
6	10	60	Triethylamine	0.5%	0.30	8760	1.3	0.04
6	10	60	Xylene	10.0%	6.00	8760	26.3	0.76

gal/hr = gallons per hour
lb/gal = pounds per gallon
lb/hr = pounds per hour
tpy = tons per year
VOC = Volatile Organic Compound
MIBK = Methyl Isobutyl Ketone
PAH = Polycyclic Aromatic Hydrocarbon

Table E-2. Worst-Case Hourly and Potential Annual Emissions of Particulate Matter and Particulate HAPs

Flow Rate[1] (gal/hr)	Average Density[2] (lb/gal)	Max Paint Usage (lb/hr)	Pollutant	Max Pollutant Content (%)	Particle Size Distribution[3]	Transfer Efficiency (%)	Control Efficiency[4] (%)	Max Pollutant Emissions (lb/hr)	Controlled Pollutant Emissions (lb/hr)	Potential Hours of Operation	Potential Pollutant Emissions (tpy)	g/s for modeling
6	10	60	PM/PM10/PM2.5	98.3%		65.0%	75.0%	20.65	5.16	8760	90.4	0.65
6	10	60	Cobalt Compounds	0.1%		65.0%	75.0%	0.03	0.01	8760	0.1	0.001
1.5	12.7	19.1	Chromium Compounds - Total	23.2%				1.55	0.05		6.8	0.007
1.5	12.7	19.1	Chromium Compound - <PM2.5	23.2%	10.0%	65.0%	75.0%	0.15	0.04	8760	0.7	
1.5	12.7	19.1	Chromium Compound - <PM10	23.2%	28.0%	65.0%	99.0%	0.43	0.004	8760	1.9	
1.5	12.7	19.1	Chromium Compound - >PM10	23.2%	62.0%	65.0%	99.0%	0.96	0.010	8760	4.2	

Notes:

[1] The flow rates assume two paint guns operating simultaneously.
The maximum amount of chromium containing primers to be used in one hour is one gallon per paint gun. The maximum hourly usage (flow rate) is based on process knowledge as well as historical usage logs from the organization. Both chromium containing primers are mixed in a ratio of 3 parts (Part 1) to 1 part (Part 2).

[2] For the chromium containing primers, the maximum density of the two-part paint was used to illustrate the most conservative scenario.

[3] Particle size distribution was determined based on a study in the Annals of Occupational Hygiene entitled "Size Distribution and Speciation of Chromium in Paint Spray Aerosol at an Aerospace Facility" (Sabty-Daily 2005). A copy of this study is included in Appendix D.

[4] Paint filter control efficiencies for liquids were determined based on the manufacturer filter specifications included in Appendix D.

Table E-3. Weight Percent and Annual Emissions of Volatiles from Each Paint

Material Used	NSN	Material Usage (gal/yr)	Material Density (lbs/gal)	Material Usage (lbs/yr)	VOC lb/gal	VOC (tons/year)	Cumene %	Cumene (tons/year)	Ethylbenzene %	Ethylbenzene (tons/year)	Methyl Alcohol %	Methyl Alcohol (tons/year)	Methylene Chloride %	Methylene Chloride (tons/year)	MIBK %	MIBK (tons/year)	PAH %	PAH (tons/year)	Toluene %	Toluene (tons/year)	Triethylamine %	Triethylamine (tons/yr)	Xylene %	Xylene (tons/year)
Thinners/Reducers																								
Polyurethane Thinner	8010-00-181-8080	5	7.42	37	7.42	0.02			1.17%	0.00022									11.72%	0.002			6.64%	0.001
Epoxy Paint Reducer	8010-01-200-2637	5	7.01	35	7	0.02									18.61%	0.003								
Denatured Alcohol	6810-00-782-2686	5	6.74	34	6.74	0.02									1.00%	0.000								
Paint Stripper PR-3500	8010-00-181-7568	10	9.17	92	9	0.05							1.00%	0.0005										
Poly/Epoxy Stripper	8010PPWC-10-76	10	10.01	100	10.01	0.05					50.00%	0.025	50.00%	0.0250										
Primers																								
Dark Green 34052	8010-01-218-7354																							
	Part 1	15	12.70	191	3.2	0.02	1.00%	0.0010																
	Part 2	5	9.53	48	0.16	0.00																		
Yellow	8010-01-416-6557																							
	Part 1	15	12.70	191	2.92	0.02	0.10%	0.0001																
	Part 2	5	8.05	40	2.16	0.01	1.00%	0.0002									10.00%	0.010						
Polyurethane Coating Kits																								
Black 17038	8010-01-285-3047																							
	Part 1	15	8.84	133	2.87	0.02	0.10%	0.0001																
	Part 2	5	8.11	41	4.09	0.01											7.00%	0.005						
Black 37038	8010-01-285-3555																							
	Part 1	15	9.84	148	3.95	0.03																		
	Part 2	5	9.02	45	2.33	0.01	0.10%	0.0000																
Gray 16187	8010-00-286-7731																							
	Part 1	15	7.51	113	7	0.05															0.500%	0.0003		
	Part 2	5	9.17	46	5.16	0.01			5.00%	0.00115													10.00%	0.002
Gray 16473	8010-01-336-3032																							
	Part 1	15	12.29	184	2.34	0.02																		
	Part 2	5	7.92	40	4.59	0.01	0.10%	0.0000							5.00%	0.001								
26173	8010-01-339-7015																							
	Part 1	15	10.85	163	2.5	0.02																		
	Part 2	5	7.96	40	4.4	0.01	0.10%	0.0000																
Gray 36118	8010-01-305-5551																							
	Part 1	30	10.14	304	3.87	0.06			1.00%	0.00152														
	Part 2	10	9.02	90	2.35	0.01	0.10%	0.0000																
Gray 36173	8010-01-345-6535																							
	Part 1	15	10.27	154	3.85	0.03			1.00%	0.00077														
	Part 2	5	9.02	45	2.35	0.01	0.10%	0.0000																
Gray 36176	8010-01-492-4700																							
	Part 1	15	9.31	140	3.92	0.03	0.10%	0.0001	1.50%	0.00105													7.00%	0.005
	Part 2	5	8.94	45	2.27	0.01																		
Gray 36251	8010-01-492-4699																							
	Part 1	15	9.26	139	3.88	0.03	0.10%	0.0001	1.50%	0.00104													7.00%	0.005
	Part 2	5	8.94	45	2.27	0.01																		
Gray 36293	8010-01-380-3249																							
	Part 1	15	10.32	155	3.65	0.03			1.00%	0.00077														
	Part 2	5	9.02	45	2.35	0.01	0.10%	0.0000																
Gray 36320	8010-01-329-6755																							
	Part 1	15	10.26	154	3.9	0.03			1.00%	0.00077														
	Part 2	5	9.02	45	2.3	0.01	1.00%	0.0002																
Gray 37200	8010-01-397-3981																							
	Part 1	15	9.90	148	3.65	0.03	0.10%	0.0001							1.50%	0.001								
	Part 2	5	9.02	45	2.35	0.01	0.10%	0.0000																
Green 14052	8010-01-362-3876																							
	Part 1	15	10.42	156	2.16	0.02																		
	Part 2	5	8.40	42	3.54	0.01	1.00%	0.0002							5.00%	0.001	1.50%	0.001						
Green 34092	8010-01-336-3035																							
	Part 1	15	10.21	153	3.89	0.03			1.00%	0.00077														
	Part 2	5	9.02	45	2.35	0.01	0.10%	0.0000																
Green 34102	8010-01-336-3036																							
	Part 1	15	10.05	151	3.87	0.03			1.00%	0.00075														
	Part 2	5	9.02	45	2.35	0.01	0.10%	0.0000																
Green 24052	8010-01-305-5555																							
	Part 1	15	9.03	135	4	0.03																		

Table E-3. Weight Percent and Annual Emissions of Volatiles from Each Paint

Material Used	NSN	Material Usage (gal/yr)	Material Density (lbs/gal)	Material Usage (lbs/yr)	VOC lb/gal	VOC (tons/year)	Cumene %	Cumene (tons/year)	Ethylbenzene %	Ethylbenzene (tons/year)	Methyl Alcohol %	Methyl Alcohol (tons/year)	Methylene Chloride %	Methylene Chloride (tons/year)	MIBK %	MIBK (tons/year)	PAH %	PAH (tons/year)	Toluene %	Toluene (tons/year)	Triethylamine %	Triethylamine (tons/yr)	Xylene %	Xylene (tons/year)
	Part 2	5	9.12	46	1.82	0.00	0.10%	0.0000																
Red 11136	8010-01-265-9139																							
	Part 1	15	9.47	142	2.61	0.02																		
	Part 2	5	8.11	41	4.09	0.01	1.00%	0.0002									7.00%	0.005						
White 17925	8010-01-265-9143																							
	Part 1	15	12.92	194	2.29	0.02	0.10%	0.0001																
	Part 2	5	7.92	40	4.59	0.01	0.10%	0.0000							5.00%	0.001								
Enamels																								
Light Gray	8010-00-141-7842	5	10.43	52	5.00	0.01			9.00%	0.00002														
Yellow 13538	8010-00-286-7758	5	9.09	45	2.98	0.01																		
Dur-A-Plex Alkyd Enamel	8010-00-515-1596	5	10.06	50	3.22	0.01																		
Walk Way Dark Gull Gray	8010-00-641-0426	5	10.17	51	3.50	0.01																	1.50%	0.000
Walk Way Black 37038	8010-00-641-0427	5	10.76	54	3.22	0.01																	1.50%	0.000
Centari 5000 Urethane	8010P700A	5	8.14	41	6.11	0.02	1.00%	0.0002															2.00%	0.000
80-Base/Clear Rust	8010P80-34	5	10.37	52	1.85	0.00																		
90-Bases/Colors Rust	8010P90BASES	5	10.39	52	1.84	0.00																		
Aerosols																								
Black 37038	8010-01-331-6108	5	6.29	31	3.08	0.01																		
Red 11105	8010-01-331-6110	5	6.66	33	3.60	0.01																		
Other																								
NOX-RUST Corrosion Preventive	8030-00-231-2354	5	7.51	38	0.4	0.00																		
TOTAL		510		4960		0.9449		0.0027		0.0088		0.0250		0.0255		0.0076		0.0203		0.0022		0.0003		0.0145
								5.46		17.66		50.04		50.96		15.14		40.63		4.35		0.56		28.93

Total Volatile HAP (pounds/year) 213.7

Table E-4. Weight Percent and Annual Emissions of Particulates from Each Paint

Material Used	NSN	Transfer Efficiency %	PM Control Efficiency %	Material Usage (gal/yr)	Material Density (lbs/gal)	Material Usage (lbs/yr)	Solids wt%	PM (tons/year)	Cobalt Compounds %	Cobalt Compounds (tons/year)	Barium Chromate %	Barium Chromate (tons/year)	Sodium Chromate %	Sodium Chromate (tons/year)	Strontium Chromate %	Strontium Chromate (tons/year)	Zinc Chromate %	Zinc Chromate (tons/year)
Thinners/Reducers																		
Polyurethane Thinner	8010-00-181-8080	65%	75%	5	7.42	37	0.00%	0.0000										
Epoxy Paint Reducer	8010-01-200-2637	65%	75%	5	7.01	35	0.08%	0.0000										
Denatured Alcohol	6810-00-782-2686	65%	75%	5	6.74	34	0.00%	0.0000										
Paint Stripper PR-3500	8010-00-181-7568	65%	75%	10	9.17	92	1.90%	0.0001					1.00%	0.00004				
PWC 10-76 Poly/Epoxy Stripper	8010PPWC-10-76	65%	75%	10	10.01	100	0.00%	0.0000										
Primers																		
Dark Green 34052	8010-01-218-7354																	
	Part 1	65%	75%	15	12.70	191	74.81%	0.0062			23.04%	0.00192			0.10%	0.00001	0.10%	0.0000
	Part 2	65%	75%	5	9.53	48	98.32%	0.0021										
Yellow	8010-01-416-6557																	
	Part 1	65%	75%	15	12.70	191	77.01%	0.0064							19.13%	0.00159		
	Part 2	65%	75%	5	8.05	40	73.16%	0.0013										
Polyurethane Coating Kits																		
Black 17038	8010-01-285-3047																	
	Part 1	65%	75%	15	8.84	133	67.54%	0.0039										
	Part 2	65%	75%	5	8.11	41	49.55%	0.0009										
Black 37038	8010-01-285-3555																	
	Part 1	65%	75%	15	9.84	148	59.86%	0.0039										
	Part 2	65%	75%	5	9.02	45	74.16%	0.0015										
Gray 16187	8010-00-286-7731																	
	Part 1	65%	75%	15	7.51	113	6.74%	0.0003										
	Part 2	65%	75%	5	9.17	46	43.75%	0.0009										
Gray 16473	8010-01-336-3032																	
	Part 1	65%	75%	15	12.29	184	80.97%	0.0065										
	Part 2	65%	75%	5	7.92	40	42.07%	0.0007										
Gray 26173	8010-01-339-7015																	
	Part 1	65%	75%	15	10.85	163	76.96%	0.0055										
	Part 2	65%	75%	5	7.96	40	44.76%	0.0008										
Gray 36118	8010-01-305-5551																	
	Part 1	65%	75%	30	10.14	304	61.84%	0.0082										
	Part 2	65%	75%	10	9.02	90	73.93%	0.0029										
Gray 36173	8010-01-345-6535																	
	Part 1	65%	75%	15	10.27	154	62.53%	0.0042										
	Part 2	65%	75%	5	9.02	45	73.93%	0.0015										
Gray 36176	8010-01-492-4700																	
	Part 1	65%	75%	15	9.31	140	57.88%	0.0035										
	Part 2	65%	75%	5	8.94	45	74.61%	0.0015										
Gray 36251	8010-01-492-4699																	
	Part 1	65%	75%	15	9.26	139	58.09%	0.0035										
	Part 2	65%	75%	5	8.94	45	74.61%	0.0015										
Gray 36293	8010-01-380-3249																	
	Part 1	65%	75%	15	10.32	155	62.71%	0.0042										
	Part 2	65%	75%	5	9.02	45	73.93%	0.0015										
Gray 36320	8010-01-329-6755																	
	Part 1	65%	75%	15	10.26	154	61.98%	0.0042										
	Part 2	65%	75%	5	9.02	45	74.49%	0.0015										
Gray 37200	8010-01-397-3981																	
	Part 1	65%	75%	15	9.90	148	61.11%	0.0040										
	Part 2	65%	75%	5	9.02	45	73.93%	0.0015										
Green 14052	8010-01-362-3876																	
	Part 1	65%	75%	15	10.42	156	79.26%	0.0054										
	Part 2	65%	75%	5	8.40	42	57.85%	0.0011										
Green 34092	8010-01-336-3035																	

Table E-4. Weight Percent and Annual Emissions of Particulates from Each Paint

Material Used	NSN	Transfer Efficiency %	PM Control Efficiency %	Material Usage (gal/yr)	Material Density (lbs/gal)	Material Usage (lbs/yr)	Solids wt%	PM (tons/year)	Cobalt Compounds %	Cobalt Compounds (tons/year)	Barium Chromate %	Barium Chromate (tons/year)	Sodium Chromate %	Sodium Chromate (tons/year)	Strontium Chromate %	Strontium Chromate (tons/year)	Zinc Chromate %	Zinc Chromate (tons/year)
	Part 1	65%	75%	15	10.21	153	61.89%	0.0041										
	Part 2	65%	75%	5	9.02	45	73.93%	0.0015										
Green 34102	8010-01-336-3036																	
	Part 1	65%	75%	15	10.05	151	61.49%	0.0041										
	Part 2	65%	75%	5	9.02	45	73.93%	0.0015										
Green 24052	8010-01-305-5555																	
	Part 1	65%	75%	15	9.03	135	55.71%	0.0033										
	Part 2	65%	75%	5	9.12	46	80.05%	0.0016										
Red 11136	8010-01-265-9139																	
	Part 1	65%	75%	15	9.47	142	72.45%	0.0045										
	Part 2	65%	75%	5	8.11	41	49.55%	0.0009										
White 17925	8010-01-265-9143																	
	Part 1	65%	75%	15	12.92	194	82.27%	0.0070										
	Part 2	65%	75%	5	7.92	40	42.07%	0.0007										
Enamels																		
Walk Way Black 37038	8010-00-641-0427	65%	75%	5	10.43	52	52.04%	0.0012										
Yellow 13538	8010-00-286-7758	65%	75%	5	9.09	45	67.22%	0.0013	0.12%	0.005473125								
Dur-A-Plex Alkyd Enamel	8010-00-515-1596	65%	75%	5	10.06	50	68.00%	0.0015										
Centari 5000 Urethane	8010P700A	65%	75%	5	10.17	51	65.60%	0.0015										
Light Gray	8010-00-141-7842	65%	75%	5	10.76	54	70.07%	0.0016										
Walk Way Dark Gull Gray	8010-00-641-0426	65%	75%	5	8.14	41	25.00%	0.0004										
90-Bases/Colors Rust	8010P90BASES	65%	75%	5	10.37	52	82.20%	0.0019										
80-Base/Clear Rust	8010P80-34	65%	75%	5	10.39	52	82.30%	0.0019										
Aerosols																		
Black 37038	8010-01-331-6108	40%	75%	5	6.29	31	51.00%	0.0012										
Red 11105	8010-01-331-6110	40%	75%	5	6.56	33	45.20%	0.0011										
Other																		
NOX-RUST Corrosion Preventive	8030-00-231-2354	65%	75%	5	7.51	38	94.67%	0.0016										
TOTAL				510		4960		0.1353		0.0055		0.0019		0.00004		0.0016		0.00001
										10.95		3.84		0.08		3.21		0.02

PM is assumed to be equal to be PM10 which is assumed to be equal to PM2.5

Total Particulate HAP (pounds/year) 18.1

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Emission Estimates

Permit 1777-RV1 – Four 755 HP Back-Up Generators at Space Missile Command (Bldg. 402)

Emission Unit IDs

19170, 19171, 19172, 19173

Emissions Summary
Four Emergency Generator Engines at the RSC Building 402
Unit IDs 19170, 19171, 19172, 19173

Criteria Air Pollutants	Combined Emission Rate (lb/hr)	Controlled Annual Emissions[1] (ton/yr)	Uncontrolled Potential Annual Emissions[2] (ton/yr)
Carbon Monoxide	17.31	1.73	75.82
Nitrogen Oxides	28.30	2.83	123.94
Particulate Matter	1.00	0.10	4.37
Particulate Matter <10μm	1.00	0.10	4.37
Particulate Matter <2.5μm	1.00	0.10	4.37
Sulfur Oxides	0.04	0.004	0.16
Volatile Organic Compounds	0.40	0.04	1.75

[1] Controlled annual emissions are calculated assuming a maximum of 200 operating hours per year.

[2] Uncontrolled potential annual emissions are calculated assuming unlimited operation for 8760 hours per year.

Engine Combustion Emissions
Emission Calculation Spreadsheet
Emergency Generator #1 at SMC (Unit ID 19170)

Generator
755 hp engine
450 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor[5]	Hourly Emissions		Annual Emissions[6]		PTE[7]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.47	**2.60**	**2.60**	**1963.00**	**4.33**	**865.52**	**0.43**	**18.95**	NSPS Nonroad Tier 2
Nitrogen Oxides	0.024	10.89	**4.25**	-	**4.25**	**3208.75**	**7.07**	**1414.79**	**0.71**	**30.98**	Manufacturer Emission Data
Volatile Organic Compounds	7.05E-04	0.32	**0.06**	-	**0.06**	**45.30**	**0.10**	**19.97**	**0.01**	**0.44**	Manufacturer Emission Data
NO_x + NMHC	Not available		*4.31*	**4.8**	**4.80**	**3624.00**	**7.99**	**1597.88**	**0.80**	**34.99**	NSPS Nonroad Tier 2
Sulfur Oxides[4]	1.21E-05	**0.01**	-	-	**0.01**	**4.16**	**0.01**	**1.83**	**0.001**	**0.04**	EPA AP-42
Particulate Matter[3]	7.00E-04	0.32	0.08	**0.15**	**0.15**	**113.25**	**0.25**	**49.93**	**0.02**	**1.09**	NSPS Nonroad Tier 2

Confirm NOx + NMHC < Emission Limit ---> *Confirmed*

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Manufacturer emission factors presented are the 3/4 Standby values on the specification sheet. These emissions values are consistent with those used in the NSPS rule certification.

[3] Particulate matter emissions are considered to be < 1 μm in size. Therefore PM emissions also reflect particulate matter less than 10 μm (PM_{10}) and particulate matter less than 2.5 μm ($PM_{2.5}$).

[4] SOx emission factor is the EPA AP-42 emission factor, which was used because 15ppm sulfur diesel fuel is used at Kirtland AFB and the AP-42 factor represents the maximum possible emissions via mass balance.

[5] The emissions factors selected for the permit application are the higher of either the manufacturer emission data or the NSPS Subpart IIII emission limits.

[6] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[7] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Engine Combustion Emissions
Emission Calculation Spreadsheet
Emergency Generator #2 at SMC (Unit ID 19171)

Generator
755 hp engine
450 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor[5]	Hourly Emissions		Annual Emissions[6]		PTE[7]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.47	**2.60**	**2.60**	**1963.00**	**4.33**	**865.52**	**0.43**	**18.95**	NSPS Nonroad Tier 2
Nitrogen Oxides	0.024	10.89	**4.25**	-	**4.25**	**3208.75**	**7.07**	**1414.79**	**0.71**	**30.98**	Manufacturer Emission Data
Volatile Organic Compounds	7.05E-04	0.32	**0.06**	-	**0.06**	**45.30**	**0.10**	**19.97**	**0.01**	**0.44**	Manufacturer Emission Data
NO_x + NMHC	Not available		*4.31*	**4.8**	**4.80**	**3624.00**	**7.99**	**1597.88**	**0.80**	**34.99**	NSPS Nonroad Tier 2
Sulfur Oxides[4]	1.21E-05	**0.01**	-	-	**0.01**	**4.16**	**0.01**	**1.83**	**0.001**	**0.04**	EPA AP-42
Particulate Matter[3]	7.00E-04	0.32	0.08	**0.15**	**0.15**	**113.25**	**0.25**	**49.93**	**0.02**	**1.09**	NSPS Nonroad Tier 2

Confirm NOx + NMHC < Emission Limit ---> *Confirmed*

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Manufacturer emission factors presented are the 3/4 Standby values on the specification sheet. These emissions values are consistent with those used in the NSPS rule certification.

[3] Particulate matter emissions are considered to be < 1 μm in size. Therefore PM emissions also reflect particulate matter less than 10 μm (PM_{10}) and particulate matter less than 2.5 μm ($PM_{2.5}$).

[4] SOx emission factor is the EPA AP-42 emission factor, which was used because 15ppm sulfur diesel fuel is used at Kirtland AFB and the AP-42 factor represents the maximum possible emissions via mass balance.

[5] The emissions factors selected for the permit application are the higher of either the manufacturer emission data or the NSPS Subpart IIII emission limits.

[6] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[7] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Engine Combustion Emissions
Emission Calculation Spreadsheet
Emergency Generator #3 at SMC (Unit ID 19172)

Generator
755 hp engine
450 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor[5]	Hourly Emissions		Annual Emissions[6]		PTE[7]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.47	**2.60**	**2.60**	**1963.00**	**4.33**	**865.52**	**0.43**	**18.95**	NSPS Nonroad Tier 2
Nitrogen Oxides	0.024	10.89	**4.25**	-	**4.25**	**3208.75**	**7.07**	**1414.79**	**0.71**	**30.98**	Manufacturer Emission Data
Volatile Organic Compounds	7.05E-04	0.32	**0.06**	-	**0.06**	**45.30**	**0.10**	**19.97**	**0.01**	**0.44**	Manufacturer Emission Data
NO_x + NMHC	Not available		*4.31*	**4.8**	**4.80**	**3624.00**	**7.99**	**1597.88**	**0.80**	**34.99**	NSPS Nonroad Tier 2
Sulfur Oxides[4]	1.21E-05	**0.01**	-	-	**0.01**	**4.16**	**0.01**	**1.83**	**0.001**	**0.04**	EPA AP-42
Particulate Matter[3]	7.00E-04	0.32	0.08	**0.15**	**0.15**	**113.25**	**0.25**	**49.93**	**0.02**	**1.09**	NSPS Nonroad Tier 2

Confirm NOx + NMHC < Emission Limit ---> *Confirmed*

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Manufacturer emission factors presented are the 3/4 Standby values on the specification sheet. These emissions values are consistent with those used in the NSPS rule certification.

[3] Particulate matter emissions are considered to be < 1 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[4] SOx emission factor is the EPA AP-42 emission factor, which was used because 15ppm sulfur diesel fuel is used at Kirtland AFB and the AP-42 factor represents the maximum possible emissions via mass balance.

[5] The emissions factors selected for the permit application are the higher of either the manufacturer emission data or the NSPS Subpart IIII emission limits.

[6] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[7] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Engine Combustion Emissions
Emission Calculation Spreadsheet
Emergency Generator #4 at SMC (Unit ID 19173)

Generator
755 hp engine
450 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor[5]	Hourly Emissions		Annual Emissions[6]		PTE[7]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.47	**2.60**	**2.60**	**1963.00**	**4.33**	**865.52**	**0.43**	**18.95**	NSPS Nonroad Tier 2
Nitrogen Oxides	0.024	10.89	**4.25**	-	**4.25**	**3208.75**	**7.07**	**1414.79**	**0.71**	**30.98**	Manufacturer Emission Data
Volatile Organic Compounds	7.05E-04	0.32	**0.06**	-	**0.06**	**45.30**	**0.10**	**19.97**	**0.01**	**0.44**	Manufacturer Emission Data
NO_x + NMHC	Not available		*4.31*	**4.8**	**4.80**	**3624.00**	**7.99**	**1597.88**	**0.80**	**34.99**	NSPS Nonroad Tier 2
Sulfur Oxides[4]	1.21E-05	**0.01**	-	-	**0.01**	**4.16**	**0.01**	**1.83**	**0.001**	**0.04**	EPA AP-42
Particulate Matter[3]	7.00E-04	0.32	0.08	**0.15**	**0.15**	**113.25**	**0.25**	**49.93**	**0.02**	**1.09**	NSPS Nonroad Tier 2

Confirm NOx + NMHC < Emission Limit ---> *Confirmed*

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Manufacturer emission factors presented are the 3/4 Standby values on the specification sheet. These emissions values are consistent with those used in the NSPS rule certification.

[3] Particulate matter emissions are considered to be < 1 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[4] SOx emission factor is the EPA AP-42 emission factor, which was used because 15ppm sulfur diesel fuel is used at Kirtland AFB and the AP-42 factor represents the maximum possible emissions via mass balance.

[5] The emissions factors selected for the permit application are the higher of either the manufacturer emission data or the NSPS Subpart IIII emission limits.

[6] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[7] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Emission Estimates

Permit 1786-M5 – Water Plant Generators

Emission Unit IDs

19147, 19148, 19174, 19178, 19153, 19089, 19133, 19131, 19132, 19134, 19181, 19182

Summary of Emissions
for the Kirtland AFB Water Plant

Process Equipment Unit No.	Emission Source	Hourly Emissions (lb/hr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Emergency Generator, Pump Station, Bldg 20436, Unit ID 19147	4.94	18.60	0.52	0.97	0.58	0.58	0.58
2	Emergency Generator, Well #3, Bldg 23900, Unit ID 19148	3.91	18.17	1.44	1.19	1.28	1.28	1.28
3	Well Shaft Engine, Well #15, Bldg 900, Unit ID 19103	3.22	8.33	1.52	0.0035	0.060	0.060	0.060
4	Emergency Generator, Well #15, Bldg 900, Unit ID 19145	1.48	1.72	0.075	0.00023	0.0040	0.0040	0.0040
5	Well Shaft Engine, Well #16, Bldg 25952, Unit ID 19104	3.22	8.33	1.52	0.0035	0.060	0.060	0.060
6	Emergency Generator, Well #16, Bldg 25952, Unit ID 19146	1.48	1.72	0.075	0.00023	0.0040	0.0040	0.0040
7	Emergency Generator, Well #20, Unit ID 19153	4.34	7.94 (NMHC+NOx)	0.00 (included in NMHC+NOx)	0.0092	0.25	0.25	0.25
8	Emergency Generator, Bldg 20305, Unit ID 19089	2.61	12.09	0.96	0.80	0.86	0.86	0.86
9	Emergency Generator, Well #14, Bldg 1014, Unit ID 19133	4.15	18.12	0.53	0.97	0.53	0.53	0.53
10	Emergency Generator, Gibson, Bldg 20183, Unit ID 19131	1.14	5.27	0.42	0.35	0.37	0.37	0.37
11	Emergency Generator, Manzano, Bldg 30110, Unit ID 19132	1.85	8.59	0.68	0.57	0.61	0.61	0.61
12	Emergency Generator, Bldg 20550, Unit ID 19134	2.91	13.49	1.07	0.89	0.96	0.96	0.96
	Total	**35.26**	**122.36**	**8.82**	**5.75**	**5.56**	**5.56**	**5.56**

Note: NMHC+NOx is non-methane hydrocarbons (i.e. volatile organic compounds) and nitrogen oxides combined.

Summary of Emissions
for the Kirtland AFB Water Plant

Process Equipment Unit No.	Emission Source	Annual Emissions (ton/yr)							
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm	Hazardous Air Pollutants
1	Emergency Generator, Pump Station, Bldg 20436, Unit ID 19147	0.49	1.86	0.052	0.10	0.058	0.058	0.058	
2	Emergency Generator, Well #3, Bldg 23900, Unit ID 19148	0.39	1.82	0.14	0.12	0.13	0.13	0.13	
3	Well Shaft Engine, Well #15, Bldg 900, Unit ID 19103	2.70	7.05	1.27	0.0030	0.051	0.051	0.051	0.37
4	Emergency Generator, Well #15, Bldg 900, Unit ID 19145	0.15	0.17	0.0075	0.000023	0.00040	0.00040	0.00040	
5	Well Shaft Engine, Well #16, Bldg 25952, Unit ID 19104	2.70	7.05	1.27	0.0030	0.051	0.051	0.051	0.37
6	Emergency Generator, Well #16, Bldg 25952, Unit ID 19146	0.15	0.17	0.0075	0.000023	0.00040	0.00040	0.00040	
7	Emergency Generator, Well #20, Unit ID 19153	0.43	0.79 (NMHC+NOx)	0.00 (included in NMHC+NOx)	0.00092	0.025	0.025	0.025	
8	Emergency Generator, Bldg 20305, Unit ID 19089	0.26	1.21	0.096	0.080	0.086	0.086	0.086	
9	Emergency Generator, Well #14, Bldg 1014, Unit ID 19133	0.42	1.81	0.053	0.097	0.053	0.053	0.053	
10	Emergency Generator, Gibson, Bldg 20183, Unit ID 19131	0.11	0.53	0.042	0.035	0.037	0.037	0.037	
11	Emergency Generator, Manzano, Bldg 30110, Unit ID 19132	0.19	0.86	0.068	0.057	0.061	0.061	0.061	
12	Emergency Generator, Bldg 20550, Unit ID 19134	0.29	1.35	0.11	0.089	0.10	0.10	0.10	
	Total	**8.27**	**24.68**	**3.12**	**0.58**	**0.65**	**0.65**	**0.65**	**0.74**

Note: NMHC+NOx is non-methane hydrocarbons (i.e. volatile organic compounds) and nitrogen oxides combined.

Summary of Emissions
for the Kirtland AFB Water Plant

Process Equipment Unit No.	Emission Source	Potential Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10µm	Particulate Matter <2.5µm
1	Emergency Generator, Pump Station, Bldg 20436, Unit ID 19147	21.64	81.48	2.29	4.23	2.55	2.55	2.55
2	Emergency Generator, Well #3, Bldg 23900, Unit ID 19148	17.14	79.57	6.32	5.23	5.59	5.59	5.59
3	Well Shaft Engine, Well #15, Bldg 900, Unit ID 19103	14.12	36.46	6.64	0.016	0.26	0.26	0.26
4	Emergency Generator, Well #15, Bldg 900, Unit ID 19145	6.50	7.54	0.33	0.0010	0.017	0.017	0.017
5	Well Shaft Engine, Well #16, Bldg 25952, Unit ID 19104	14.12	36.46	6.64	0.016	0.26	0.26	0.26
6	Emergency Generator, Well #16, Bldg 25952, Unit ID 19146	6.50	7.54	0.33	0.0010	0.017	0.017	0.017
7	Emergency Generator, Well #20, Unit ID 19153	19.03	34.79 (NMHC+NOx)	0.00 (included in NMHC+NOx)	0.040	1.09	1.09	1.09
8	Emergency Generator, Bldg 20305, Unit ID 19089	11.41	52.95	4.22	3.50	3.76	3.76	3.76
9	Emergency Generator, Well #14, Bldg 1014, Unit ID 19133	18.19	79.37	2.33	4.23	2.31	2.31	2.31
10	Emergency Generator, Gibson, Bldg 20183, Unit ID 19131	4.97	23.08	1.84	1.53	1.64	1.64	1.64
11	Emergency Generator, Manzano, Bldg 30110, Unit ID 19132	8.10	37.61	3.00	2.49	2.67	2.67	2.67
12	Emergency Generator, Bldg 20550, Unit ID 19134	12.73	59.06	4.71	3.91	4.19	4.19	4.19
	Total	**154.45**	**535.93**	**38.65**	**25.18**	**24.36**	**24.36**	**24.36**

Note: NMHC+NOx is non-methane hydrocarbons (i.e. volatile organic compounds) and nitrogen oxides combined.

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Building 20436, Pump Station (Unit ID 19147)
Process Equipment Unit No. 1

Generator
755 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**4.94**	**0.49**	**21.64**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**18.60**	**1.86**	**81.48**
Particulate Matter[5]	AP-42 EF (Sheet 2)	**0.58**	**0.058**	**2.55**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**0.58**	**0.058**	**2.55**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**0.58**	**0.058**	**2.55**
Sulfur Oxides	Manufacturer EF (Sheet 1)	**0.97**	**0.10**	**4.23**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**0.52**	**0.052**	**2.29**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors.
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 20436, Pump Station (Unit ID 19147)
Process Equipment Unit No. 1

Generator
755 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	1.27	**2.11**	**0.21**	**9.26**
Nitrogen Oxides	9.85	**16.39**	**1.64**	**71.81**
Particulate Matter	0.12	**0.20**	**0.020**	**0.87**
Particulate Matter <10μm[4]	0.12	**0.20**	**0.020**	**0.87**
Particulate Matter <2.5μm[4]	0.12	**0.20**	**0.020**	**0.87**
Sulfur Oxides	0.58	**0.97**	**0.10**	**4.23**
Volatile Organic Compounds	0.20	**0.33**	**0.033**	**1.46**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / (453.6 g/lb)
where: EF = Emission Factor
hp = horsepower

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed PM emissions equal Particulate Matter <10μm and Particulate Matter <2.5μm emissions.

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 20436, Pump Station (Unit ID 19147)
Process Equipment Unit No. 1

Generator
755 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	42.4	137000	**4.94**	**0.49**	**21.64**
Nitrogen Oxides	3.2	42.4	137000	**18.60**	**1.86**	**81.48**
Particulate Matter	0.1	42.4	137000	**0.58**	**0.058**	**2.55**
Particulate Matter <10μm[7]	0.1	42.4	137000	**0.58**	**0.058**	**2.55**
Particulate Matter <2.5μm[8]	0.1	42.4	137000	**0.58**	**0.058**	**2.55**
Sulfur Oxides[9]	0.0015	42.4	137000	**0.0088**	**0.00088**	**0.039**
Volatile Organic Compounds[10]	0.09	42.4	137000	**0.52**	**0.052**	**2.29**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and all Stationary Dual-fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption tested value (7700 Btu/hp-hr) / HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/lb.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[9] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.01 * S
where: S = Percent sulfur in diesel fuel (0.0015%, Kirtland AFB standard)

[10] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Building 23900, Well #3 (Unit ID 19148)
Process Equipment Unit No. 4

Generator

535 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**3.91**	**0.39**	**17.14**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**18.17**	**1.82**	**79.57**
Particulate Matter[5]	AP-42 EF (Sheet 2)	**1.28**	**0.13**	**5.59**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**1.28**	**0.13**	**5.59**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**1.28**	**0.13**	**5.59**
Sulfur Oxides	AP-42 EF (Sheet 2)	**1.19**	**0.12**	**5.23**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**1.44**	**0.14**	**6.32**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission Factor Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors.
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 23900, Well #3 (Unit ID 19148)
Process Equipment Unit No. 4

Generator
535 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	2.25	**2.65**	**0.27**	**11.62**
Nitrogen Oxides	9.25	**10.91**	**1.09**	**47.79**
Particulate Matter	0.17	**0.20**	**0.020**	**0.88**
Particulate Matter <10μm[4]	0.17	**0.20**	**0.020**	**0.88**
Particulate Matter <2.5μm[4]	0.17	**0.20**	**0.020**	**0.88**
Sulfur Oxides	0.59	**0.70**	**0.070**	**3.05**
Volatile Organic Compounds	0.30	**0.35**	**0.035**	**1.55**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / (453.6 g/lb)
where: EF = Emission Factor
hp = horsepower

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed PM emissions equal Particulate Matter <10μm and Particulate Matter <2.5μm emissions.

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 23900, Well #3 (Unit ID 19148)
Process Equipment Unit No. 4

Generator
535 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	30.1	137000	**3.91**	**0.39**	**17.14**
Nitrogen Oxides	4.41	30.1	137000	**18.17**	**1.82**	**79.57**
Particulate Matter	0.31	30.1	137000	**1.28**	**0.13**	**5.59**
Particulate Matter <10μm[7]	0.31	30.1	137000	**1.28**	**0.13**	**5.59**
Particulate Matter <2.5μm[8]	0.31	30.1	137000	**1.28**	**0.13**	**5.59**
Sulfur Oxides	0.29	30.1	137000	**1.19**	**0.12**	**5.23**
Volatile Organic Compounds[9]	0.35	30.1	137000	**1.44**	**0.14**	**6.32**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption tested value (7700 Btu/hp-hr) / HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/lb.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[9] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Emission Calculation Spreadsheet
750 KW Emergency Generator at KAFB Well
#15 (Unit 19174)

Generator
1220 hp engine
750 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2 limits	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor	Hourly Emissions		Annual Emissions[5]		PTE[6]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.28	**2.60**	**2.60**	**3172.0**	**7.0**	**1398.6**	**0.70**	**30.6**	NSPS Nonroad Tier 2 limits
Nitrogen Oxides[7]	0.024	**10.89**	5.87	-	**4.68**	**5709.6**	**12.6**	**2517.5**	**1.3**	**55.1**	NSPS Nonroad Tier 2
Particulate Matter[3]	7.00E-04	**0.32**	0.05	0.15	**0.15**	**183.0**	**0.40**	**80.7**	**0.040**	**1.8**	NSPS Nonroad Tier 2 limits
Sulfur Oxides[4]	1.21E-05	**0.00551**	**0.12**	-	**0.12**	**146.4**	**0.32**	**64.6**	**0.032**	**1.4**	Manufacturer Emission Data
Volatile Organic Compounds[7]	7.05E-04	**0.32**	0.12	-	**0.12**	**146.4**	**0.32**	**64.6**	**0.032**	**1.4**	NSPS Nonroad Tier 2
NO_x + NMHC	Not available		*Not available*	4.8	**4.80**	**5856.0**	**12.9**	**2582.0**	**1.29**	**56.5**	NSPS Nonroad Tier 2 limits

The generator operates a maximum of **200** **hours per year** and must be powered by ultra low sulfur (ULS) diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Diesel Stationary Diesel….. Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Manufacturer emission factors for SOx and hydrocarbons (HCs including TOC/VOC/NMHC) are Full Standby values from Cummins eds-1087c Exhaust Emissions Data Sheet.
The other factors are NSPS IIII based EPA Emission Limits that Cummins provides in spec. sheet epa-1121j.

[3] Particulate matter emissions are considered to be < 10 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[4] SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form.

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Emission Calculation Spreadsheet 750kW
Emergency Generator at Water Plant
Facility Well #16 (Unit 19178)

Generator
1220 hp engine
750 kW generator

Criteria Air Pollutants	EPA AP-42		Manufacturer Emission Data	NSPS Nonroad Tier 2	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Factor[2]	Emission Limit	Emission Factor	Hourly Emissions		Annual Emissions[5]		PTE[6]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	5.50E-03	2.49	0.19	**2.60**	**2.60**	**3172.00**	**6.99**	**1398.59**	**0.70**	**30.63**	NSPS Nonroad Tier 2
Nitrogen Oxides	0.024	10.89	**4.15**	--	**4.15**	**5063.00**	**11.16**	**2232.36**	**1.12**	**48.89**	Manufacturer Emission Data
Particulate Matter[3]	7.00E-04	0.32	0.05	**0.15**	**0.15**	**183.00**	**0.40**	**80.69**	**0.040**	**1.77**	NSPS Nonroad Tier 2
Sulfur Oxides[4]	1.21E-05	**0.01**	0.12	--	**0.12**	**146.40**	**0.32**	**64.55**	**0.032**	**1.41**	Manufacturer Emission Data
Volatile Organic Compounds	7.05E-04	0.32	**0.19**	--	**0.19**	**231.80**	**0.51**	**102.20**	**0.051**	**2.24**	Manufacturer Emission Data
NO_x + NMHC	Not available		--	**4.8**	**4.80**	**5856.00**	**12.91**	**2582.01**	**1.291**	**56.55**	NSPS Nonroad Tier 2

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel Engines, Table 3.4-1 (October 1996), for generators greater than 600 hp.

[2] Manufacturer emission factors presented are the 3/4 Standby values on the specification sheet. According to the manufacturer, the 3/4 Standby values are the most accurate.

[3] Particulate matter emissions are considered to be < 1 μm in size. Therefore PM emissions also reflect particulate matter less than 10 μm (PM_{10}) and particulate matter less than 2.5 μm ($PM_{2.5}$).

[4] SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form.

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Well #20 (Unit ID 19153)
Process Equipment Unit No. 9

Generator

755 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	NSPS IIII, Emission Standards (Sheet 3)	**4.34**	**0.43**	**19.03**
Nitrogen Oxides	*See Non-methane Hydrocarbons and Nitrogen Oxides.*			
Particulate Matter	NSPS IIII, Emission Standards (Sheet 3)	**0.25**	**0.025**	**1.09**
Particulate Matter <10μm	NSPS IIII, Emission Standards (Sheet 3)	**0.25**	**0.025**	**1.09**
Particulate Matter <2.5μm	NSPS IIII, Emission Standards (Sheet 3)	**0.25**	**0.025**	**1.09**
Sulfur Oxides	AP-42 EF (Sheet 2)	**0.0092**	**0.00092**	**0.040**
Volatile Organic Compounds	*See Non-methane Hydrocarbons and Nitrogen Oxides.*			
Non-methane Hydrocarbons and Nitrogen Oxides	NSPS IIII, Emission Standards (Sheet 3)	**7.94**	**0.79**	**34.79**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
See Non-methane Hydrocarbons and Nitrogen Oxides.: Emissions from non-methane hydrocarbons are treated as volatile organic compounds and combined with emissions from nitrogen oxides per the 40 CFR 60 Subpart IIII standard.
AP-42 EF (Sheet 2): Emission calculations were performed using AP-42 Emission Factors.
NSPS IIII, Emission Standards (Sheet 3): Emission calculations were performed using NSPS Subpart IIII Emission Factors for emergency-use diesel engines with <10 l/cyl displacement.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5] This generator is subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Engines.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Well #20 (Unit ID 19153)
Process Equipment Unit No. 9

Generator
755 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	0.31	**0.52**	**0.05**	**2.26**
Nitrogen Oxides	4.85	**8.07**	**0.81**	**35.36**
Particulate Matter	0.05	**0.083**	**0.0083**	**0.36**
Particulate Matter <10μm[4]	0.05	**0.083**	**0.0083**	**0.36**
Particulate Matter <2.5μm[4]	0.05	**0.083**	**0.0083**	**0.36**
Sulfur Oxides	*Manufacturer Emission Factor Not Available*			
Volatile Organic Compounds	0.11	**0.18**	**0.018**	**0.80**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / (453.6 g/lb)
where: EF = Emission Factor, for full standby operation, as provided by the manufacturer
hp = horsepower

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed
Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Well #20 (Unit ID 19153)
Process Equipment Unit No. 9

Generator
755 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	0.0055	**4.15**	**0.42**	**18.19**
Nitrogen Oxides	0.024	**18.12**	**1.81**	**79.37**
Particulate Matter	0.0007	**0.53**	**0.053**	**2.31**
Particulate Matter <10μm[5]	0.0007	**0.53**	**0.053**	**2.31**
Particulate Matter <2.5μm[6]	0.0007	**0.53**	**0.053**	**2.31**
Sulfur Oxides[7]	1.21E-05	**0.0092**	**0.00092**	**0.040**
Volatile Organic Compounds[8]	7.05E-04	**0.53**	**0.053**	**2.33**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and all Stationary Dual-fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5,6] Assumed Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[7] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 8.09 E-03 * S
where: S = Percent sulfur in diesel fuel (0.0015%, Kirtland AFB standard)

[8] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Sheet 3 - NSPS Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Well #20 (Unit ID 19153)
Process Equipment Unit No. 9

Generator
755 hp

Criteria Air Pollutants	NSPS IIII Emission Standards (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	2.61	**4.34**	**0.43**	**19.03**
Nitrogen Oxides	*Emission Standard Not Specified*			
Particulate Matter	0.15	**0.25**	**0.025**	**1.09**
Particulate Matter <10μm[4]	0.15	**0.25**	**0.025**	**1.09**
Particulate Matter <2.5μm[4]	0.15	**0.25**	**0.025**	**1.09**
Sulfur Oxides	*Emission Standard Not Specified*			
Volatile Organic Compounds				
Non-methane Hydrocarbons and Nitrogen Oxides	4.77	**7.94**	**0.79**	**34.79**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / (453.6 g/lb)
where: EF = Emission Factor
hp = horsepower

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * (200 hr/yr) / (2000 lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[4] Assumed Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20305 (Unit ID 19089)
Process Equipment Unit No. 8

Generator

390 hp[1]

Criteria Air Pollutants	AP-42 Emission Factors[2] (lb/hp-hr)	Hourly Emissions[3] (lb/hr)	Annual Emissions[4] (ton/yr)	PTE[5] (ton/yr)
Carbon Monoxide	6.68E-03	**2.61**	**0.26**	**11.41**
Nitrogen Oxides	0.031	**12.09**	**1.21**	**52.95**
Particulate Matter[6]	2.20E-03	**0.86**	**0.086**	**3.76**
Particulate Matter <10µm[7]	2.20E-03	**0.86**	**0.086**	**3.76**
Particulate Matter <2.5µm[7]	2.20E-03	**0.86**	**0.086**	**3.76**
Sulfur Oxides	2.05E-03	**0.80**	**0.080**	**3.50**
Volatile Organic Compounds[8]	2.47E-03	**0.96**	**0.096**	**4.22**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The engine nameplate indicates two "Advertised HP", 340 and 390, at 1500 and 1800 RPM respectively. For emission estimation purposes, it is assumed that the engine is operated at 1800 RPM, and 390 hp was used.

[2] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[3] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[4] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[5] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[6,7] AP-42 emission data given for Particulate Matter (PM). Assumed Particulate Matter <10µm and Particulate Matter <2.5µm emissions were equal to PM emissions.

[8] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Bldg 1014 (Unit ID 19133)
Process Equipment Unit No. 11

Generator

755 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**4.15**	**0.42**	**18.19**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**18.12**	**1.81**	**79.37**
Particulate Matter	AP-42 EF (Sheet 2)	**0.53**	**0.053**	**2.31**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**0.53**	**0.053**	**2.31**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**0.53**	**0.053**	**2.31**
Sulfur Oxides	Manufacturer EF (Sheet 1)	**0.97**	**0.10**	**4.23**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**0.53**	**0.053**	**2.33**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 1014 (Unit ID 19133)
Process Equipment Unit No. 11

Generator
755 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	1.27	**2.11**	**0.21**	**9.26**
Nitrogen Oxides	9.85	**16.40**	**1.64**	**71.81**
Particulate Matter	0.12	**0.20**	**0.020**	**0.87**
Particulate Matter <10μm[4]	0.12	**0.20**	**0.020**	**0.87**
Particulate Matter <2.5μm[4]	0.12	**0.20**	**0.020**	**0.87**
Sulfur Oxides	0.58	**0.97**	**0.10**	**4.23**
Volatile Organic Compounds	0.20	**0.33**	**0.033**	**1.46**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / (453.5924 g/lb)
where: EF = Emission Factor
hp = horsepower

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed
Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 1014 (Unit ID 19133)
Process Equipment Unit No. 11

Generator
755 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	5.50E-03	**4.15**	**0.42**	**18.19**
Nitrogen Oxides	0.024	**18.12**	**1.81**	**79.37**
Particulate Matter	0.0007	**0.53**	**0.053**	**2.31**
Particulate Matter <10μm[5]	0.0007	**0.53**	**0.053**	**2.31**
Particulate Matter <2.5μm[6]	0.0007	**0.53**	**0.053**	**2.31**
Sulfur Oxides[7]	1.21E-05	**0.0092**	**0.00092**	**0.040**
Volatile Organic Compounds[8]	7.05E-04	**0.53**	**0.053**	**2.33**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and all Stationary Dual-fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5,6] AP-42 emission data given for Particulate Matter (PM). Assumed Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

[7] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 8.09 E-03 * S
where: S = Percent sulfur in diesel fuel (0.0015%, Kirtland AFB standard)

[8] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20183 (Unit ID 19131)
Process Equipment Unit No. 12

Generator

170 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**1.14**	**0.11**	**4.97**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**5.27**	**0.53**	**23.08**
Particulate Matter	AP-42 EF (Sheet 2)	**0.37**	**0.037**	**1.64**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**0.37**	**0.037**	**1.64**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**0.37**	**0.037**	**1.64**
Sulfur Oxides	AP-42 EF (Sheet 2)	**0.35**	**0.035**	**1.53**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**0.42**	**0.042**	**1.84**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.
Manufacturer Emission Factors were not available for this unit.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20183 (Unit ID 19131)
Process Equipment Unit No. 12

Manufacturer Specifications Not Available

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20183 (Unit ID 19131)
Process Equipment Unit No. 12

Generator
170 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	6.68E-03	**1.14**	**0.11**	**4.97**
Nitrogen Oxides	0.031	**5.27**	**0.53**	**23.08**
Particulate Matter[5]	2.20E-03	**0.37**	**0.037**	**1.64**
Particulate Matter <10μm[6]	2.20E-03	**0.37**	**0.037**	**1.64**
Particulate Matter <2.5μm[6]	2.20E-03	**0.37**	**0.037**	**1.64**
Sulfur Oxides	2.05E-03	**0.35**	**0.035**	**1.53**
Volatile Organic Compounds[7]	2.47E-03	**0.42**	**0.042**	**1.84**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5,6] AP-42 emission data given for Particulate Matter (PM). Assumed Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

[7] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Bldg 30110 (Unit ID 19132)
Process Equipment Unit No. 13

Generator

277 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**1.85**	**0.19**	**8.10**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**8.59**	**0.86**	**37.61**
Particulate Matter	AP-42 EF (Sheet 2)	**0.61**	**0.061**	**2.67**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**0.61**	**0.061**	**2.67**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**0.61**	**0.061**	**2.67**
Sulfur Oxides	AP-42 EF (Sheet 2)	**0.57**	**0.057**	**2.49**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**0.68**	**0.068**	**3.00**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.
Manufacturer Emission Factors were not available for this unit.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 30110 (Unit ID 19132)
Process Equipment Unit No. 13

Manufacturer Specifications Not Available

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 30110 (Unit ID 19132)
Process Equipment Unit No. 13

Generator
277 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	6.68E-03	**1.85**	**0.19**	**8.10**
Nitrogen Oxides	0.031	**8.59**	**0.86**	**37.61**
Particulate Matter[5]	2.20E-03	**0.61**	**0.061**	**2.67**
Particulate Matter <10μm[6]	2.20E-03	**0.61**	**0.061**	**2.67**
Particulate Matter <2.5μm[6]	2.20E-03	**0.61**	**0.061**	**2.67**
Sulfur Oxides	2.05E-03	**0.57**	**0.057**	**2.49**
Volatile Organic Compounds[7]	2.47E-03	**0.68**	**0.068**	**3.00**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5,6] AP-42 emission data given for Particulate Matter (PM). Assumed Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

[7] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20550 (Unit ID 19134)
Process Equipment Unit No. 14

Generator

435 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 2)	**2.91**	**0.29**	**12.73**
Nitrogen Oxides	AP-42 EF (Sheet 2)	**13.49**	**1.35**	**59.06**
Particulate Matter	AP-42 EF (Sheet 2)	**0.96**	**0.10**	**4.19**
Particulate Matter <10μm	AP-42 EF (Sheet 2)	**0.96**	**0.10**	**4.19**
Particulate Matter <2.5μm	AP-42 EF (Sheet 2)	**0.96**	**0.10**	**4.19**
Sulfur Oxides	AP-42 EF (Sheet 2)	**0.89**	**0.089**	**3.91**
Volatile Organic Compounds	AP-42 EF (Sheet 2)	**1.07**	**0.11**	**4.71**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:
AP-42 EF (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors.
Manufacturer Emission Factors were not available for this unit.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20550 (Unit ID 19134)
Process Equipment Unit No. 14

Manufacturer Specifications Not Available

Sheet 2 - AP-42 Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Bldg 20550 (Unit ID 19134)
Process Equipment Unit No. 14

Generator
435 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/hp-hr)	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	6.68E-03	**2.91**	**0.29**	**12.73**
Nitrogen Oxides	0.031	**13.49**	**1.35**	**59.06**
Particulate Matter[5]	2.20E-03	**0.96**	**0.096**	**4.19**
Particulate Matter <10μm[6]	2.20E-03	**0.96**	**0.096**	**4.19**
Particulate Matter <2.5μm[6]	2.20E-03	**0.96**	**0.096**	**4.19**
Sulfur Oxides	2.05E-03	**0.89**	**0.089**	**3.91**
Volatile Organic Compounds[7]	2.47E-03	**1.07**	**0.11**	**4.71**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/hp-hr) * hp
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly Emissions (lb/hr) * (8760 hr/yr) / (2000 lb/ton)

[5,6] AP-42 emission data given for Particulate Matter (PM). Assumed Particulate Matter <10μm and Particulate Matter <2.5μm emissions were equal to PM emissions.

[7] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Emissions Summary
Two New Emergency Generators
TACLab Pumping Plant, Building 29999 (Unit Code 19181)
Pump House 2 Manzano, Building 37528 (Unit Code 19182)

Hourly Emissions (lb/hr)					
Criteria Air Pollutants	Bldg 29999 (19181) Emission Rate	Bldg 37528 (19182) Emission Rate	Total Modification Emission Rate	Existing Permit 1786-M4 Limit	New Permit 1786-M5 Limit
Carbon Monoxide	1.01	1.01	2.02	39.8	41.82
Nitrogen Oxides	1.25	1.16	2.41	94.4	96.81
Particulate Matter	0.06	0.06	0.12	6.24	6.36
Particulate Matter <10μm	0.06	0.06	0.12	6.24	6.36
Particulate Matter <2.5μm	0.06	0.06	0.12	6.24	6.36
Sulfur Oxides	0.36	0.36	0.72	6.39	7.11
Volatile Organic Compounds	0.10	0.09	0.19	5.62	5.81
NMHC	0.10	0.09	0.19	--	--
NO_x + NMHC	1.16	1.16	2.33	33.7	36.03

Controlled Annual Emissions[1] (ton/yr)					
Criteria Air Pollutants	Bldg 29999 (19181) Emission Rate	Bldg 37528 (19182) Emission Rate	Total Modification Emission Rate	Existing Permit 1786-M4 Limit	New Permit 1786-M5 Limit
Carbon Monoxide	0.10	0.10	0.20	3.98	4.18
Nitrogen Oxides	0.12	0.12	0.24	9.44	9.68
Particulate Matter	0.01	0.01	0.012	0.64	0.65
Particulate Matter <10μm	0.01	0.01	0.012	0.64	0.65
Particulate Matter <2.5μm	0.01	0.01	0.012	0.64	0.65
Sulfur Oxides	0.04	0.04	0.072	0.65	0.72
Volatile Organic Compounds	0.01	0.01	0.019	0.56	0.58
NMHC	0.01	0.01	0.019	--	--
NO_x + NMHC	0.12	0.12	0.23	3.37	3.60

[1] Controlled annual emissions are calculated assuming a maximum of 200 operating hours per year.

Emission Calculation Spreadsheet

Emergency Generator at TACLab Pumping Plant Building 29999 Unit ID 19181

Generator

176 hp engine

50 kW generator

Criteria Air Pollutants	EPA AP-42		NSPS Nonroad Tier [2]	Manufacturer's Emission Factor	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Limit	Emission Factor	Emission Factor[3]	Hourly Emissions		Annual Emissions[7]		PTE[8]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	6.68E-03	3.03E+00	2.6	1.53	**2.60**	**457.6**	**1.009**	**201.76**	**0.101**	**4.42**	TIER 3 NSPS Non-road Engine
Nitrogen Oxides	0.031	1.41E+01	--	3.22	**3.22**	**566.7**	**1.249**	**249.88**	**0.125**	**5.47**	Manufacturer's Emission Factor
Particulate Matter[4]	2.20E-03	9.98E-01	0.15	0.27	**0.15**	**26.40**	**0.058**	**11.64**	**0.006**	**0.25**	TIER 3 NSPS Non-road Engine
Sulfur Oxides[5]	2.05E-03	9.30E-01	0.93	--	**0.93**	**163.68**	**0.361**	**72.17**	**0.036**	**1.58**	TIER 3 NSPS Non-road Engine
Volatile Organic Compounds[6]	2.47E-03	1.12E+00	--	0.26	**0.26**	**45.76**	**0.101**	**20.18**	**0.010**	**0.44**	Manufacturer's Emission Factor
NMHC	Not available		--	0.26	**0.26**	**45.76**	**0.101**	**20.18**	**0.010**	**0.44**	Manufacturer's Emission Factor
NO_x + NMHC			3.00	--	**3.00**	**528.0**	**1.164**	**232.80**	**0.116**	**5.10**	TIER 3 NSPS Non-road Engine

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996), for generators less than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Emission limits for Federal New Source Performance Standards (NSPS) for Stationary EMERGENCY Diesel Engines TIER 3

[3] The NSPS standard is used for all pollutants when available. The manufacturer's emission rates are used for pollutants that do not have an NSPS standard. Manufacturer's emission rates are based on the worst case standby emissions, in this case the 1/4 standby rates. NSPS Nonroad Tier 3 Emission Limits from 40 CFR 89.112 Table 1.

[4] Particulate matter emissions are considered to be < 1µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[5] SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form.

[6] Volatile Organic Compounds not provided in the manufacturer emission data.

[7] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[8] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Emission Calculation Spreadsheet

Emergency Generator at Pump House 2 Manzano Building 37528 Unit ID 19182

Generator

176 hp engine

60 kW generator

Criteria Air Pollutants	EPA AP-42		NSPS Nonroad Tier [2]	Manufacturer's Emission Factor	Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Limit	Emission Factor	Emission Factor[3]	Hourly Emissions		Annual Emissions[7]		PTE[8]	
	(lb/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	6.68E-03	3.03E+00	2.6	1.33	**2.60**	**457.6**	**1.009**	**201.76**	**0.101**	**4.42**	TIER 3 NSPS Non-road Engine
Nitrogen Oxides	0.031	1.41E+01	--	3.00	**3.00**	**528.0**	**1.164**	**232.80**	**0.116**	**5.10**	Manufacturer's Emission Factor
Particulate Matter[4]	2.20E-03	9.98E-01	0.15	0.24	**0.15**	**26.40**	**0.058**	**11.64**	**0.006**	**0.25**	TIER 3 NSPS Non-road Engine
Sulfur Oxides[5]	2.05E-03	9.30E-01	0.93	--	**0.93**	**163.68**	**0.361**	**72.17**	**0.036**	**1.58**	TIER 3 NSPS Non-road Engine
Volatile Organic Compounds[6]	2.47E-03	1.12E+00	--	0.22	**0.22**	**38.72**	**0.085**	**17.07**	**0.009**	**0.37**	Manufacturer's Emission Factor
NMHC	Not available		--	0.22	**0.22**	**38.72**	**0.085**	**17.07**	**0.009**	**0.37**	Manufacturer's Emission Factor
NO_x + NMHC			3.00	--	**3.00**	**528.0**	**1.164**	**232.80**	**0.116**	**5.10**	TIER 3 NSPS Non-road Engine

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996), for generators less than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] Emission limits for Federal New Source Performance Standards (NSPS) for Stationary EMERGENCY Diesel Engines TIER 3

[3] The NSPS standard is used for all pollutants when available. The manufacturer's emission rates are used for pollutants that do not have an NSPS standard. Manufacturer's emission rates are based on the worst case standby emissions, in this case the 1/4 standby rates. NSPS Nonroad Tier 3 Emission Limits from 40 CFR 89.112 Table 1.

[4] Particulate matter emissions are considered to be < 1 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[5] SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form.

[6] Volatile Organic Compounds not provided in the manufacturer emission data.

[7] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[8] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Emission Estimates

Permit 1945 – Emergency Generator Bldg. 1037

Emission Unit ID

19151

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
58th SOW - Building 1037
Fuel Cell Maintenance Facility (Unit Code 19151)

Generator
99 hp

NOx values adjusted based on Manufacturer emission factor which is subject to NSPS

Criteria Air Pollutants	Emission Factor Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.66**	**0.16**	**2.88**
Nitrogen Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**1.39**	**0.35**	**6.08**
Particulate Matter[5]	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.21**	**0.054**	**0.94**
Particulate Matter <10µm	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.21**	**0.054**	**0.94**
Particulate Matter <2.5µm	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.21**	**0.054**	**0.94**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.20**	**0.050**	**0.88**
Volatile Organic Compounds	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.24**	**0.061**	**1.06**

The generator operates 500 hours per year and is powered by diesel fuel.

[1] Emission Factor Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors
AP-42 EF, Calculated Fuel Flow (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3) : Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 500 hours operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] Assumed Particulate Matter emissions equal Particulate Matter < 10µm and Particulate Matter <2.5µm emissions.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
58th SOW - Building 1037
Fuel Cell Maintenance Facility (Unit Code 19151)

Generator
99 hp

Criteria Air Pollutants	Manufacturer Emission Factors (g/hp-hr)	Hourly Emissions[1] (lb/hr)	Annual Emissions[2] (ton/yr)	PTE[3] (ton/yr)
Carbon Monoxide	0.36	**0.08**	**0.02**	**0.34**
Nitrogen Oxides	6.36	**1.39**	**0.35**	**6.08**
Particulate Matter	0.10	**0.02**	**0.01**	**0.10**
Particulate Matter <10μm[4]	0.10	**0.02**	**0.01**	**0.10**
Particulate Matter <2.5μm[4]	0.10	**0.02**	**0.01**	**0.10**
Sulfur Oxides	Manufacturer specifications not available			
Volatile Organic Compounds	0.34	**0.07**	**0.02**	**0.33**

The generator operates 500 hours per year and is powered by diesel fuel.

[1] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.5924 (lb/g)
where: EF = Emission Factor
hp = horse power

[2] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hrs/yr) / 2000 (lb/ton)

[3] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[4] Manufacturer exhaust emission data given for Particulate Matter (PM). Assumed PM emissions equal Particulate Matter <10μm and Particulate Matter <2.5μm emissions.

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
58th SOW - Building 1037
Fuel Cell Maintenance Facility (Unit Code 19151)

Generator
99 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	5.1	137000	**0.66**	**0.16**	**2.88**
Nitrogen Oxides	4.41	5.1	137000	**3.06**	**0.76**	**13.39**
Particulate Matter[7]	0.31	5.1	137000	**0.21**	**0.054**	**0.94**
Particulate Matter <10μm	0.31	5.1	137000	**0.21**	**0.054**	**0.94**
Particulate Matter <2.5μm[8]	0.31	5.1	137000	**0.21**	**0.054**	**0.94**
Sulfur Oxides	0.29	5.1	137000	**0.20**	**0.050**	**0.88**
Volatile Organic Compounds[9]	0.35	5.1	137000	**0.24**	**0.061**	**1.06**

The generator operates 500 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996)

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Section 3.3 (October 1996), Table 3.3-1(footnote c) as 19300 Btu/lb. The HV was converted into units of Btu/gal using the following equation:
Heating Value (HV) (Btu/gal) = HV (Btu/lb) * Density of diesel fuel (lb/gal)
The density of diesel fuel is 7.1 lb/gal (Emission Factor Documentation for Section 3.3, Gasoline and Diesel Industrial Engines (April 1993)).
Heating Value (HV) (Btu/gal) = 19300 (Btu/lb) * 7.1 (lb/gal) = 137000 Btu/gal (rounded to the nearest 100)

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] No emission factor data for Particulate Matter (PM) is included in AP-42, assumed PM emission factors are equal to Particulate Matter <10μm.

[8] Assumed Particulate Matter <2.5μm equals Particulate Matter <10μm.

[9] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
58th SOW - Building 1037
Fuel Cell Maintenance Facility (Unit Code 19151)

Generator
99 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Manufacturer Fuel Use (gal/hr)	Heating Value (HV)[2] (Btu/gal)	Hourly Emissions[3] (lb/hr)	Annual Emissions[4] (ton/yr)	PTE[5] (ton/yr)
Carbon Monoxide	0.95	5.0	137000	**0.65**	**0.16**	**2.85**
Nitrogen Oxides	4.41	5.0	137000	**3.02**	**0.76**	**13.23**
Particulate Matter[6]	0.31	5.0	137000	**0.21**	**0.053**	**0.93**
Particulate Matter <10μm	0.31	5.0	137000	**0.21**	**0.053**	**0.93**
Particulate Matter <2.5μm[7]	0.31	5.0	137000	**0.21**	**0.053**	**0.93**
Sulfur Oxides	0.29	5.0	137000	**0.20**	**0.050**	**0.87**
Volatile Organic Compounds[8]	0.35	5.0	137000	**0.24**	**0.060**	**1.05**

The generator operates 500 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996)

[2] The heating value (HV) of diesel fuel is given in AP-42 Section 3.3 (October 1996), Table 3.3-1(footnote c) as 19300 Btu/lb. The HV was converted into units of Btu/gal using the following equation:
Heating Value (HV) (Btu/gal) = HV (Btu/lb) * Density of diesel fuel (lb/gal)
The density of diesel fuel is 7.1 lb/gal (Emission Factor Documentation for Section 3.3, Gasoline and Diesel Industrial Engines (April 1993)).
Heating Value (HV) (Btu/gal) = 19300 (Btu/lb) * 7.1 (lb/gal) = 137000 Btu/gal (rounded to the nearest 100)

[3] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[4] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hrs/yr) / 2000 (lb/ton)

[5] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[6] No emission factor data for Particulate Matter (PM) is included in AP-42, assumed PM emission factors are equal to Particulate Matter <10μm.

[7] Assumed Particulate Matter <2.5μm equals Particulate Matter <10μm.

[8] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Emission Estimates

Permit 2085 – Emergency Generator Bldg. 416

Emission Unit ID

19160

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Building 416 (Unit ID 19160)

Generator
94.5 hp

Criteria Air Pollutants	Emission Estimation Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.63**	**0.063**	**2.75**
Nitrogen Oxides	Manufacturer EF (Sheet 1)	**0.99**	**0.099**	**4.35**
Particulate Matter	Manufacturer EF (Sheet 1)	**0.047**	**0.0047**	**0.20**
Particulate Matter <10μm	Manufacturer EF (Sheet 1)	**0.047**	**0.0047**	**0.20**
Particulate Matter <2.5μm	Manufacturer EF (Sheet 1)	**0.047**	**0.0047**	**0.20**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.19**	**0.019**	**0.84**
Volatile Organic Compounds	Manufacturer EF (Sheet 1)	**0.062**	**0.0062**	**0.27**
NMHC + NOx	Manufacturer EF (Sheet 1)	**1.03**	**0.10**	**4.49**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission Estimation Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer-Supplied Emission Factors.
AP-42 EF, Calculated Fuel Flow (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3) : Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.
Unless the pollutant is subject to an NSPS standard (see footnote 5) and AP-42 emission estimates exceed the applicable standard, worst-case emissions are estimated for the generator using the methodology described.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

General Note: This generator is subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and is equipped with a 2006 model year engine (manufactured 1 June 2006) rated at 94.5 hp (70.5 kW).
Based on the install date (post-2008), the engine rating (94.5 hp) and displacement of less than 10 liters per cylinder, this generator must comply with the Tier 2 Emission Standards in Table 1 of 40 CFR 89.112. For this generator (engine 37 <=kW< 75), the emission standards are 7.5 g/kW-hr NMHC + NOx, 5.0 g/kW-hr CO, and 0.40 g/kW-hr PM.
This generator meets the Emission Standards.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 416 (Unit ID 19160)

Generator
94.5 hp

Criteria Air Pollutants	Manufacturer Supplied Emission Factors (g/kW-hr)	Converted Manufacturer Emission Factors (g/hp-hr)[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide[5]	0.8	0.6	**0.12**	**0.012**	**0.54**
Nitrogen Oxides[6]	6.40	4.77	**0.99**	**0.099**	**4.35**
Particulate Matter[7]	0.30	0.22	**0.047**	**0.0047**	**0.20**
Particulate Matter <10μm[7]	0.30	0.22	**0.047**	**0.0047**	**0.20**
Particulate Matter <2.5μm[7]	0.30	0.22	**0.047**	**0.0047**	**0.20**
Sulfur Oxides	Manufacturer emission factor not available				
Volatile Organic Compounds[8]	0.40	0.30	**0.062**	**0.0062**	**0.27**
NMHC + NOx[9]	6.6	4.9	**1.03**	**0.10**	**4.49**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1]Emission factors in g/kW-hr obtained from Wagner Equipment, with a conversion to g/hp-hr made using 1 kW=1.341 hp.

[2] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[3] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] The carbon monoxide emission factor for Engine 6PKXL04.4RG1 was provided by the manufacturer.

[6] The nitrogen oxides emission factor for a similar 1104C engine was provided by the manufacturer.
The Engine 6PKXL04.4RG1 factor was not used since it represented NMHC + NOx.

[7] The particulate matter emission factor for Engine 6PKXL04.4RG1 was provided by the manufacturer.
The particulate matter emission factor was conservatively assumed to represent both PM10 and PM2.5 as well.

[8] A hydrocarbons (HC) emission factor for a similar 1104C engine provided by the manufacturer was used to conservatively represent VOC. The Engine 6PKXL04.4RG1 factor was not used since it represented NMHC + NOx.

[9] The NMHC + NOx emission factor for engine 6PKXL04.4RG1 was provided by the manufacturer.
This emission calculation is included since there is an NSPS limit for this engine.

NMHC = Non-methane Hydrocarbons
NOx = Nitrogen oxides

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 416 (Unit ID 19160)

Generator
94.5 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	4.8	137000	**0.63**	**0.063**	**2.75**
Nitrogen Oxides	4.41	4.8	137000	**2.92**	**0.29**	**12.78**
Particulate Matter[7]	0.31	4.8	137000	**0.21**	**0.021**	**0.90**
Particulate Matter <10μm[7]	0.31	4.8	137000	**0.21**	**0.021**	**0.90**
Particulate Matter <2.5μm[7]	0.31	4.8	137000	**0.21**	**0.021**	**0.90**
Sulfur Oxides	0.29	4.8	137000	**0.19**	**0.019**	**0.84**
Volatile Organic Compounds[8]	0.35	4.8	137000	**0.23**	**0.023**	**1.01**
NMHC + VOC	AP-42 emission factor not available.					

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] Hourly fuel use is an interim value calculated only for purposes of converting the max hp into useful units and does not represent the engine's actual fuel use.
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985),Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] The AP-42 Table 3.3-1 emission factor table indicates that all particulate is assumed to be <= 1 μm in size. Therefore the same emission factor is shown here for PM, PM10, and PM2.5.

[8] Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 416 (Unit ID 19160)

Generator
94.5 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	4.2	137000	**0.55**	**0.055**	**2.39**
Nitrogen Oxides	4.41	4.2	137000	**2.54**	**0.25**	**11.11**
Particulate Matter[7]	0.31	4.2	137000	**0.18**	**0.018**	**0.78**
Particulate Matter <10μm[7]	0.31	4.2	137000	**0.18**	**0.018**	**0.78**
Particulate Matter <2.5μm[7]	0.31	4.2	137000	**0.18**	**0.018**	**0.78**
Sulfur Oxides	0.29	4.2	137000	**0.17**	**0.017**	**0.73**
Volatile Organic Compounds[8]	0.35	4.2	137000	**0.20**	**0.020**	**0.88**
NMHC + VOC	AP-42 emission factor not available.					

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] Maximum manufacturer specified fuel flow.

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] The AP-42 Table 3.3-1 emission factor table indicates that all particulate is assumed to be <= 1 μm in size. Therefore the same emission factor is shown here for PM, PM10, and PM2.5.

[8] Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

Emission Estimates

Permit 2100 –Battlespace Environment Laboratory (BEL) Emergency Generator

Emission Unit ID

19161

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
Emergency Generator at Building 570 (Unit ID 19161)

Generator
348 hp

Criteria Air Pollutants	Emission Estimation Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	Tier 3 EF (Sheet 4)	**2.00**	**0.20**	**8.77**
Nitrogen Oxides	Manufacturer EF (Sheet 1)	**1.77**	**0.18**	**7.77**
Particulate Matter	Tier 3 EF (Sheet 4)	**0.11**	**0.011**	**0.50**
Particulate Matter <10µm	Tier 3 EF (Sheet 4)	**0.11**	**0.011**	**0.50**
Particulate Matter <2.5µm	Tier 3 EF (Sheet 4)	**0.11**	**0.011**	**0.50**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.71**	**0.071**	**3.09**
Volatile Organic Compounds	Manufacturer EF (Sheet 1)	**0.11**	**0.011**	**0.50**
NMHC + NOx[5]	Tier 3 EF (Sheet 4)	**2.29**	**0.23**	**10.02**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission Estimation Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer-Supplied Emission Factors.
AP-42 EF, Calculated Fuel Flow (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3) : Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.
Tier 3 EF (Sheet 4) : Emission calculations were performed using Tier 3 Standards to represent the worst-case emission factors.
If the pollutant is subject to an NSPS standard (see footnote 5) then the Tier 3 EF sheet is used to estimate the worst-case emissions.
For the other pollutants worst-case emissions are estimated for the generator using the methodology described.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] This generator is subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and will be equipped with either a 2009 or 2010 model year engine rated at 348 hp (220 kW). The manufacturer provided a compliance demonstration for 2009 and 2010 model year engines with the emission standards on the Exhaust Emission Data Sheet included in Attachment C of this application. Certified engine emissions are the same for both model years. Based on the install date (2010), the engine rating (348 hp) and displacement of less than 10 liters per cylinder, this generator must comply with the Tier 3 Emission Standards in Table 1 of 40 CFR 89.112. For this generator (engine 225<=kW<450), the emission standards are 4.0 g/kW-hr NMHC + NOx, 3.5 g/kW-hr CO, and 0.20 g/kW-hr PM. This generator meets the emission standards.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 570 (Unit ID 19161)

Generator
348 hp

Criteria Air Pollutants	Manufacturer Supplied Emission Factors (g/kW-hr)[1]	Manufacturer Supplied Emission Factors (g/hp-hr)[2]	Hourly Emissions[3] (lb/hr)	Annual Emissions[4] (ton/yr)	PTE[5] (ton/yr)
Carbon Monoxide[6]	0.6	0.45	**0.34**	**0.034**	**1.50**
Nitrogen Oxides[7]	3.1	2.31	**1.77**	**0.18**	**7.77**
Particulate Matter[8]	0.09	0.07	**0.051**	**0.0051**	**0.23**
Particulate Matter <10μm[8]	0.09	0.07	**0.051**	**0.0051**	**0.23**
Particulate Matter <2.5μm[8]	0.09	0.07	**0.051**	**0.0051**	**0.23**
Sulfur Oxides	Manufacturer emission factor not available				
Volatile Organic Compounds[9]	0.2	0.15	**0.11**	**0.011**	**0.50**
NMHC + NOx[10]	3.3	2.46	**1.89**	**0.19**	**8.27**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1]Certified engine emission factors provided by the engine manufacturer, Isuzu Motors Limited. Specifically, the data can be found on the last page of Attachment C of this application at Item 19 (Certification Levels) of the EPA Certificate of Conformity and test information forms document corresponding to EPA Engine Family Number 9SZXL09.8HXB which applies to 6UZ1X engines built in 2009.

[2] Manufacturer emission factors converted to g/hp-hr using 1 kW=1.341 hp.

[3] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[4] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[5] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[6] The carbon monoxide emission factor for Engine Model 6UZ1X was provided by the manufacturer.

[7] The nitrogen oxides emission factor for Engine Model 6UZ1X was provided by the manufacturer.

[8] The particulate matter emission factor for Engine Model 6UZ1X was provided by the manufacturer.
The particulate matter emission factor was conservatively assumed to represent both PM10 and PM2.5.

[9] The HC/OMHCE emission factor for Engine Model 6UZ1X was provided by the manufacturer.

[10] The NMHC + NOx emission factor for Engine Model 6UZ1X was provided by the manufacturer.
This emission calculation is included since there is an NSPS limit for this engine.

HC = Hydrocarbons
NMHC = Non-methane Hydrocarbons
NOx = Nitrogen oxides
OMHCE = Organic Material Hydrocarbon Equivalent

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 570 (Unit ID 19161)

Generator
348 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	17.8	137000	**2.31**	**0.23**	**10.14**
Nitrogen Oxides	4.41	17.8	137000	**10.74**	**1.074**	**47.05**
Particulate Matter[7]	0.31	17.8	137000	**0.76**	**0.076**	**3.31**
Particulate Matter <10μm[7]	0.31	17.8	137000	**0.76**	**0.076**	**3.31**
Particulate Matter <2.5μm[7]	0.31	17.8	137000	**0.76**	**0.076**	**3.31**
Sulfur Oxides	0.29	17.8	137000	**0.71**	**0.071**	**3.09**
Volatile Organic Compounds[8]	0.35	17.8	137000	**0.85**	**0.085**	**3.73**
NMHC + NOx	AP-42 emission factor not available.					

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] Hourly fuel use is an interim value calculated only for purposes of converting the max hp into useful units and does not represent the engine's actual fuel use.
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] The AP-42 Table 3.3-1 emission factor table indicates that all particulate is assumed to be <= 1 μm in size. Therefore the same emission factor is shown here for PM, PM10, and PM2.5.

[8] Volatile Organic Compounds assumed to be the exhaust portion of the Total Organic Compounds (TOC).

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
Emergency Generator at Building 570 (Unit ID 19161)

Generator
348 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	14.7	137000	**1.91**	**0.19**	**8.38**
Nitrogen Oxides	4.41	14.7	137000	**8.88**	**0.89**	**38.90**
Particulate Matter[7]	0.31	14.7	137000	**0.62**	**0.062**	**2.73**
Particulate Matter <10μm[7]	0.31	14.7	137000	**0.62**	**0.062**	**2.73**
Particulate Matter <2.5μm[7]	0.31	14.7	137000	**0.62**	**0.062**	**2.73**
Sulfur Oxides	0.29	14.7	137000	**0.58**	**0.058**	**2.56**
Volatile Organic Compounds[8]	0.35	14.7	137000	**0.70**	**0.070**	**3.09**
NMHC + NOx	AP-42 emission factor not available.					

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] Maximum manufacturer specified fuel flow.

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] The AP-42 Table 3.3-1 emission factor table indicates that all particulate is assumed to be <= 1 μm in size. Therefore the same emission factor is shown here for PM, PM10, and PM2.5.

[8] Volatile Organic Compounds assumed to be the exhaust portion of the Total Organic Compounds (TOC).

Sheet 4 - Tier 3 Standards as Worst-case Emission Factors
Emission Calculation Spreadsheet
Emergency Generator at Building 570 (Unit ID 19161)

Generator
348 hp

Criteria Air Pollutants	Tier 3 Emission Standards[1] (g/kW-hr)	Converted Emission Factors[2] (g/hp-hr)	Hourly Emissions[3] (lb/hr)	Annual Emissions[4] (ton/yr)	PTE[5] (ton/yr)
Carbon Monoxide	3.5	2.6	**2.00**	**0.20**	**8.77**
Nitrogen Oxides	Tier 3 Standard not set for this pollutant				
Particulate Matter[6]	0.20	0.15	**0.11**	**0.011**	**0.50**
Particulate Matter <10μm[6]	0.20	0.15	**0.11**	**0.011**	**0.50**
Particulate Matter <2.5μm[6]	0.20	0.15	**0.11**	**0.011**	**0.50**
Sulfur Oxides Volatile Organic Compounds	Tier 3 Standard not set for these pollutants				
NMHC + NOx[7]	4.0	3.0	**2.29**	**0.23**	**10.02**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] The applicable Tier 3 Emission Standards are from the engine rating of 225<=kW<450 in Table 1 of 40 CFR 89.112.

[2] Worst-case emission factors assumed to be equal to the required Tier 3 standards which are provided in g/kW-hr. Values converted to g/hp-hr using 1 kW=1.341 hp.

[3] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[4] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[5] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[6] The particulate matter emission factor was conservatively assumed to represent both PM10 and PM2.5 as well.

[7] This emission calculation is included since there is an NSPS limit for this engine.

NMHC = Non-methane Hydrocarbons
NOx = Nitrogen oxides

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01) Emission Factor (lb/hp-hr) (power output)	Gasoline Fuel Emission Factor (lb/MMBtu) (fuel input)	Diesel Fuel (SCC 2-02-001-02, 2-03-001-01) Emission Factor (lb/hp-hr) (power output)	Diesel Fuel Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 µm aerodynamic diameter. All particulate is assumed to be ≤ 1 µm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Emission Estimates

Permit 2105-RV1 – AFRL Bldg. 277 Diesel Generator

Emission Unit ID

19159

Summary of Worst-Case Generator Emissions
Emission Calculation Spreadsheet
AFRL/RVEI Generator at Building 277 (Unit ID 19159)

Generator
762 hp

Criteria Air Pollutants	Emission Estimation Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide[5]	AP-42 EF, Manufacturer Fuel Flow (Sheet 3)	**4.26**	**5.33**	**18.67**
Nitrogen Oxides	Manufacturer EF (Sheet 1)	**6.58**	**8.22**	**28.81**
Particulate Matter[5]	Manufacturer EF (Sheet 1)	**0.14**	**0.17**	**0.60**
Particulate Matter <10μm	Manufacturer EF (Sheet 1)	**0.14**	**0.17**	**0.60**
Particulate Matter <2.5μm	Manufacturer EF (Sheet 1)	**0.14**	**0.17**	**0.60**
Sulfur Oxides	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**2.15**	**2.69**	**9.44**
Volatile Organic Compounds	AP-42 EF, Calculated Fuel Flow (Sheet 2)	**0.48**	**0.60**	**2.10**
NMHC + NO_x[5]	Manufacturer EF (Sheet 1)	**7.06**	**8.82**	**30.91**

The generator operates a maximum of 2,500 hours per year and is powered by diesel fuel.

[1] Emission Estimation Data Source Explanations:
Manufacturer EF (Sheet 1) : Emission calculations were performed using Manufacturer Emission Factors.
AP-42 EF, Calculated Fuel Flow (Sheet 2) : Emission calculations were performed using AP-42 Emission Factors and calculated Fuel Flow.
AP-42 EF, Manufacturer Fuel Flow (Sheet 3) : Emission calculations were performed using AP-42 Emission Factors and Manufacturer Specified Fuel Flow.

Unless the pollutant is subject to an NSPS standard (see footnote 5) and emission estimates exceed the applicable standard, worst-case emissions are estimated for the generator using the methodology described.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 2,500 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[5] This generator is subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and is equipped with a model year 2010 engine rated at 762 hp (568.2 kW). Based on the engine rating (568.2 kW) and displacement of less than 10 liters per cylinder, this generator must comply with the emission standards in 40 CFR 89.112 Table 1 for rated power greater than 560 kW, Tier 2 (Model Year 2006 and beyond). This generator meets the standards outlined in this regulation.

Sheet 1 - Manufacturer Emission Factors
Emission Calculation Spreadsheet
AFRL/RVEI Generator at Building 277 (Unit ID 19159)

Generator
762 hp

Criteria Air Pollutants	Manufacturer Emission Factors[1] (g/kW-hr)	Manufacturer Emission Factors[2] (g/hp-hr)	Hourly Emissions[3] (lb/hr)	Annual Emissions[4] (ton/yr)	PTE[5] (ton/yr)
Carbon Monoxide	2.11	1.57	**2.64**	**3.30**	**11.58**
Nitrogen Oxides	5.25	3.91	**6.58**	**8.22**	**28.81**
Particulate Matter	0.11	0.082	**0.14**	**0.17**	**0.60**
Particulate Matter <10µm[6]	0.11	0.082	**0.14**	**0.17**	**0.60**
Particulate Matter <2.5µm[7]	0.11	0.082	**0.14**	**0.17**	**0.60**
Sulfur Oxides	Manufacturer emission factor not available				
Volatile Organic Compounds	0.11	0.082	**0.14**	**0.17**	**0.60**
NMHC + NO_x[8]	5.36	4.00	**6.71**	**8.39**	**29.41**

The generator operates a maximum of 2,500 hours per year and is powered by diesel fuel.

[1]Manufacturer Emission Factors taken from the D2 cycle emission factor calculations in Appendix F.

[2] Conversion of factors from g/kW-hr to g/hp-hr was made using 1 kW=1.341 hp.

[3] Hourly emissions (lb/hr) = EF (g/hp-hr) * hp / 453.6 (g/lb)
where: EF = Emission Factor
hp = horse power

[4] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 2500 (hrs/yr) / 2000 (lb/ton)

[5] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[6,7] Assumed Particulate Matter <2.5µm and Particulate Matter <10µm equal Particulate Matter.

[8] The NMHC + NOx emission factor is the sum of the nitrogen oxides emission factor and the volatile organic compounds emission factor. This emission factor calculation is included because there is an NSPS limit for this engine

Sheet 2 - AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
AFRL/RVEI Generator at Building 277 (Unit ID 19159)

Generator
762 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	38.9	137000	**4.53**	**5.67**	**19.86**
Nitrogen Oxides	3.2	38.9	137000	**17.07**	**21.34**	**74.76**
Particulate Matter	0.1	38.9	137000	**0.53**	**0.67**	**2.34**
Particulate Matter <10µm[7]	0.1	38.9	137000	**0.53**	**0.67**	**2.34**
Particulate Matter <2.5µm[8]	0.1	38.9	137000	**0.53**	**0.67**	**2.34**
Sulfur Oxides[9]	0.404	38.9	137000	**2.15**	**2.69**	**9.44**
Volatile Organic Compounds[10]	0.09	38.9	137000	**0.48**	**0.60**	**2.10**
NMHC + NO_x	AP-42 emission factor not available					

The generator operates a maximum of 2,500 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 2500 (hrs/yr) / 2000 (lb/ton

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton

[7,8] Assumed Particulate Matter <2.5µm and Particulate Matter <10µm equal Particulate Matter.

[9] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.01 * S
where: S = Percent sulfur in diesel fuel (0.4% from AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels)

[10] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Sheet 3 - AP-42 Emission Factors, Manufacturer Specification Fuel Flow
Emission Calculation Spreadsheet
AFRL/RVEI Generator at Building 277 (Unit ID 19159)

Generator
762 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	36.6	137000	**4.26**	**5.33**	**18.67**
Nitrogen Oxides	3.2	36.6	137000	**16.05**	**20.06**	**70.28**
Particulate Matter	0.1	36.6	137000	**0.50**	**0.63**	**2.20**
Particulate Matter <10µm[7]	0.1	36.6	137000	**0.50**	**0.63**	**2.20**
Particulate Matter <2.5µm[8]	0.1	36.6	137000	**0.50**	**0.63**	**2.20**
Sulfur Oxides[9]	0.404	36.6	137000	**2.03**	**2.53**	**8.87**
Volatile Organic Compounds[10]	0.09	36.6	137000	**0.45**	**0.56**	**1.98**
NMHC + NO_x	AP-42 emission factor not available					

The generator operates a maximum of 2,500 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines, Table 3.4-1 (October 1996).

[2] Maximum manufacturer specified fuel flow from the Gen Set Package Performance Data Sheet in Appendix F.

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 2500 (hrs/yr) / 2000 (lb/ton

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7,8] Assumed Particulate Matter <2.5µm and Particulate Matter <10µm equal Particulate Matter.

[9] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.01 * S
where: S = Percent sulfur in diesel fuel (0.4% from AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels)

[10] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Emission Estimates

Permit 2147 –AFSPC RADOME Emergency Generator

Emission Unit ID

19163

Section 4. Potential Emission Rate (Uncontrolled Emissions)

Use manufacturer's data, compliance performance stack test data or the attached USEPA Emission Factors in grams per horsepower-hour (g/Hp-hr) associated with the Engine's Horsepower Rating and Model Year

Model Year	Pollutant	Emission Factors g/Hp-hr	TIMES	Actual Engine Hp	EQUALS	Emission In Grams Per Hour	DIVIDE	Grams Per Pound	EQUALS	Emission in Pounds Per Hour	TIMES	Potential Operating Hours Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
2010 or 2011	CO	2.60	x	399 hp	=	1037.40	÷	453.6	=	2.29	x	8,760	÷	2,000	=	10.02
	NO_x	2.70	x		=	1077.30	÷		=	2.38	x	8,760	÷	2,000	=	10.40
	NMHC	0.08	x		=	31.92	÷		=	0.07	x	8,760	÷	2,000	=	0.31
	*NOx + NMHC	3.00	x		=	1197.00	÷		=	2.64	x	8,760	÷	2,000	=	11.56
	**SO_x	0.93	x		=	371.02	÷		=	0.82	x	8,760	÷	2,000	=	3.58
	***PM	0.15	x		=	59.85	÷		=	0.13	x	8,760	÷	2,000	=	0.58

* If the USEPA Emission Factor or manufacturer's data is given as combined NOx + NMHC, also provide individual emission factors for NOx and NMHC from the manufacturer or other approved methodology for estimating individual emission factors.
** Manufacturer's SOx factor shall be used when larger than the USEPA Emission Factor.
*** Particulate Matter (PM) emissions are considered to be < 1μm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.

Section 5. Potential to Emit (Requested allowable rate) (Controlled Emissions)

Transfer each pollutant Emission in Pounds Per Hour from column above to the Emission in Pounds Per Hour column below. Complete the equation after inserting the Requested Operating Hours Per Year. Pound Per Hour rate for each pollutant must be met if performance testing is requested.

Pollutant	Emission in Pounds Per Hour	TIMES	Requested Operating Hours Per Year	EQUALS	Pounds Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
CO	2.29	x	200	=	457.41	÷	2,000	=	0.23
NO_x	2.38	x	200	=	475.00	÷	2,000	=	0.24
NMHC	0.07	x	200	=	14.07	÷	2,000	=	0.007
*NOx + NMHC	2.64	x	200	=	527.78	÷	2,000	=	0.26
**SO_x	0.82	x	200	=	163.59	÷	2,000	=	0.082
***PM	0.13	x	200	=	26.39	÷	2,000	=	0.013

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting source registration and air quality permit.

Note: The following shall be protected as confidential if requested (checked) by the applicant. Provide detailed nature of request as an attachment.

- ☐ Any information relating to processes or production techniques, which are unique to owner / operator
- ☐ Data relating to owner / operator profits and costs, which have not previously been made public

Robert L. Maness, Colonel, USAF	[signature]	Installation Commander, Kirtland AFB	1 / 11 /20 11
Print Name	Sign Name	Title	Date

METHOD OF SUBMITTAL: **Mail OR Hand deliver (8:00am – 5:00pm ; Monday – Friday) to the Address at the top of Page 1.**

Emission Estimates

Permit 3013-RV1 – AFRL/RV ISOON Telescope Facility

Emission Unit ID

19164

Section 4. Potential Emission Rate (Uncontrolled Emissions)

Use manufacturer's data, compliance performance stack test data or the attached USEPA Emission Factors in grams per horsepower-hour (g/Hp-hr) associated with the Engine's Horsepower Rating and Model Year

Model Year	Pollutant	Emission Factors g/Hp-hr	TIMES	Actual Engine Hp	EQUALS	Emission In Grams Per Hour	DIVIDE	Grams Per Pound	EQUALS	Emission in Pounds Per Hour	TIMES	Potential Operating Hours Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
2011	CO	2.6	x	250 Hp	=	650	÷	453.6	=	1.43	x	8,760	÷	2,000	=	6.26
	NO_x	2.0	x	250 Hp	=	500	÷	453.6	=	1.10	x	8,760	÷	2,000	=	4.82
	NMHC	0.05	x	250 Hp	=	12.5	÷	453.6	=	0.028	x	8,760	÷	2,000	=	0.12
	*NOx + NMHC	3.0	x	250 Hp	=	750	÷	453.6	=	1.65	x	8,760	÷	2,000	=	7.23
	**SO_x	0.93	x	250 Hp	=	232.5	÷	453.6	=	0.51	x	8,760	÷	2,000	=	2.23
	***PM	0.15	x	250 Hp	=	37.5	÷	453.6	=	0.083	x	8,760	÷	2,000	=	0.36

* If the USEPA Emission Factor or manufacturer's data is given as combined NOx + NMHC, also provide individual emission factors for NOx and NMHC from the manufacturer or other approved methodology for estimating individual emission factors.

** Manufacturer's SOx factor shall be used when larger than the USEPA Emission Factor.

*** Particulate Matter (PM) emissions are considered to be < 1μm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.

Section 5. Potential to Emit (Requested allowable rate) (Controlled Emissions)

Transfer each pollutant Emission in Pounds Per Hour from column above to the Emission in Pounds Per Hour column below. Complete the equation after inserting the Requested Operating Hours Per Year. Pound Per Hour rate for each pollutant must be met if performance testing is requested.

Pollutant	Emission in Pounds Per Hour	TIMES	Requested Operating Hours Per Year	EQUALS	Pounds Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
CO	1.43	x	200	=	286	÷	2,000	=	0.14
NO_x	1.10	x	200	=	220	÷	2,000	=	0.11
NMHC	0.028	x	200	=	5.6	÷	2,000	=	0.0028
*NOx + NMHC	1.65	x	200	=	330	÷	2,000	=	0.17
**SO_x	0.51	x	200	=	102	÷	2,000	=	0.051
***PM	0.083	x	200	=	16.6	÷	2,000	=	0.0083

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting source registration and air quality permit.

Note: The following shall be protected as confidential if requested (checked) by the applicant. Provide detailed nature of request as an attachment.

- ☐ Any information relating to processes or production techniques, which are unique to owner / operator
- ☐ Data relating to owner / operator profits and costs, which have not previously been made public

MAR 07 2012

John C. Kubinec, Colonel, USAF		Installation Commander, Kirtland AFB	/ /20
Print Name	Sign Name	Title	Date

METHOD OF SUBMITTAL: **Mail OR Hand deliver (8:00am – 5:00pm ; Monday – Friday) to the Address at the top of Page 1.**

Emission Estimates

Permit 3016-RV2 – U.S. Customs and Border Protection Facility

Emission Unit IDs

19091, 19093, 19102

Section 4.1 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19091)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x	8,760	÷	2,000	=	
	NO_x	0.031		x		=		x	8,760	÷	2,000	=	
	VOC	0.00247		x		=		x	8,760	÷	2,000	=	
	SO_x	0.00205		x		=		x	8,760	÷	2,000	=	
	*PM	0.0022		x		=		x	8,760	÷	2,000	=	
Diesel > 600 Hp	CO	0.0055	n/a	x	750	=	4.125	x	8,760	÷	2,000	=	18.068
	NO_x	0.024	n/a	x	750	=	18.000	x	8,760	÷	2,000	=	78.840
	**VOC	0.000705	n/a	x	750	=	0.529	x	8,760	÷	2,000	=	2.316
	***SO_x	0.0000121	n/a	x	750	=	0.00910	x	8,760	÷	2,000	=	0.040
	*PM	0.0007	n/a	x	750	=	0.525	x	8,760	÷	2,000	=	2.300

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21 x 10^{-5}.

Section 5.1 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19091)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x		÷	2,000	=	
	NO_x	0.031		x		=		x		÷	2,000	=	
	VOC	0.00247		x		=		x		÷	2,000	=	
	SO_x	0.00205		x		=		x		÷	2,000	=	
	*PM	0.0022		x		=		x		÷	2,000	=	
Diesel >600 Hp	CO	0.0055	n/a	x	750	=	4.125	x	200	÷	2,000	=	0.413
	NO_x	0.024	n/a	x	750	=	18.000	x	200	÷	2,000	=	1.800
	**VOC	0.000705	n/a	x	750	=	0.529	x	200	÷	2,000	=	0.053
	***SO_x	0.0000121	n/a	x	750	=	0.00910	x	200	÷	2,000	=	0.00091
	*PM	0.0007	n/a	x	750	=	0.525	x	200	÷	2,000	=	0.053

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21 x 10^{-5}.

Section 4.2 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19093)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x	8,760	÷	2,000	=	
	NO_x	0.031		x		=		x	8,760	÷	2,000	=	
	VOC	0.00247		x		=		x	8,760	÷	2,000	=	
	SO_x	0.00205		x		=		x	8,760	÷	2,000	=	
	*PM	0.0022		x		=		x	8,760	÷	2,000	=	
Diesel > 600 Hp	CO	0.0055	0.000833	x	660	=	3.630	x	8,760	÷	2,000	=	15.899
	NO_x	0.024	0.01847	x	660	=	15.840	x	8,760	÷	2,000	=	69.379
	**VOC	0.000705	0.000106	x	660	=	0.465	x	8,760	÷	2,000	=	2.038
	***SO_x	0.0000121	0.0000108	x	660	=	0.00801	x	8,760	÷	2,000	=	0.035
	*PM	0.0007	0.001879	x	660	=	1.240	x	8,760	÷	2,000	=	5.431

* Particulate Matter (PM) emissions are considered to be < 1μm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21 x 10^{-5}.
*** The manufacturer SO_x emission factor is calculated as 1.998 x (0.36 lb fuel per hp-hour) x (0.0015 wt. % sulfur in diesel fuel/100) = 1.08 x 10^{-5}.

Section 5.2 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19093)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x		÷	2,000	=	
	NO_x	0.031		x		=		x		÷	2,000	=	
	VOC	0.00247		x		=		x		÷	2,000	=	
	SO_x	0.00205		x		=		x		÷	2,000	=	
	*PM	0.0022		x		=		x		÷	2,000	=	
Diesel >600 Hp	CO	0.0055	0.000833	x	660	=	3.630	x	200	÷	2,000	=	0.363
	NO_x	0.024	0.01847	x	660	=	15.840	x	200	÷	2,000	=	1.584
	**VOC	0.000705	0.000106	x	660	=	0.465	x	200	÷	2,000	=	0.047
	***SO_x	0.0000121	0.0000108	x	660	=	0.00801	x	200	÷	2,000	=	0.00080
	*PM	0.0007	0.001879	x	660	=	1.240	x	200	÷	2,000	=	0.124

* Particulate Matter (PM) emissions are considered to be < 1μm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21 x 10^{-5}.
*** The manufacturer SO_x emission factor is calculated as 1.998 x (0.36 lb fuel per hp-hour) x (0.0015 wt. % sulfur in diesel fuel/100) = 1.08 x 10^{-5}.

Section 4.3 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19102)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available. Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x	8,760	÷	2,000	=	
	NO_x	0.031		x		=		x	8,760	÷	2,000	=	
	VOC	0.00247		x		=		x	8,760	÷	2,000	=	
	SO_x	0.00205		x		=		x	8,760	÷	2,000	=	
	*PM	0.0022		x		=		x	8,760	÷	2,000	=	
Diesel > 600 Hp	CO	0.0055	0.000833	x	660	=	3.630	x	8,760	÷	2,000	=	15.899
	NO_x	0.024	0.01847	x	660	=	15.840	x	8,760	÷	2,000	=	69.379
	**VOC	0.000705	0.000106	x	660	=	0.465	x	8,760	÷	2,000	=	2.038
	***SO_x	0.0000121	0.0000108	x	660	=	0.00801	x	8,760	÷	2,000	=	0.035
	*PM	0.0007	0.001879	x	660	=	1.240	x	8,760	÷	2,000	=	5.431

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21×10^{-5}.
*** The manufacturer SO_x emission factor is calculated as 1.998 x (0.36 lb fuel per hp-hour) x (0.0015 wt. % sulfur in diesel fuel/100) = 1.08×10^{-5}.

Section 5.3 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19102)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668		x		=		x		÷	2,000	=	
	NO_x	0.031		x		=		x		÷	2,000	=	
	VOC	0.00247		x		=		x		÷	2,000	=	
	SO_x	0.00205		x		=		x		÷	2,000	=	
	*PM	0.0022		x		=		x		÷	2,000	=	
Diesel >600 Hp	CO	0.0055	0.000833	x	660	=	3.630	x	200	÷	2,000	=	0.363
	NO_x	0.024	0.01847	x	660	=	15.840	x	200	÷	2,000	=	1.584
	**VOC	0.000705	0.000106	x	660	=	0.465	x	200	÷	2,000	=	0.047
	***SO_x	0.0000121	0.0000108	x	660	=	0.00801	x	200	÷	2,000	=	0.00080
	*PM	0.0007	0.001879	x	660	=	1.240	x	200	÷	2,000	=	0.124

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 1.21×10^{-5}.
*** The manufacturer SO_x emission factor is calculated as 1.998 x (0.36 lb fuel per hp-hour) x (0.0015 wt. % sulfur in diesel fuel/100) = 1.08×10^{-5}.

Emission Estimates

Permit 3031-RV2 – Fire Department Emergency Generators

Emission Unit IDs

19015, 19016, 19019, 19069, 19070, 19071, 19072, 19073, 19074, 19075, 19076, 19129, 19130

Section 4.1 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19015)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	8,760	÷	2,000	=	2.984
	NO_x	0.03100	n/a	x	102	=	3.162	x	8,760	÷	2,000	=	13.850
	VOC	0.00247	n/a	x	102	=	0.252	x	8,760	÷	2,000	=	1.103
	SO_x	0.00205	n/a	x	102	=	0.209	x	8,760	÷	2,000	=	0.916
	*PM	0.00220	n/a	x	102	=	0.224	x	8,760	÷	2,000	=	0.983
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

*Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.1 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19015)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	200	÷	2,000	=	0.068
	NO_x	0.03100	n/a	x	102	=	3.162	x	200	÷	2,000	=	0.316
	VOC	0.00247	n/a	x	102	=	0.252	x	200	÷	2,000	=	0.025
	SO_x	0.00205	n/a	x	102	=	0.209	x	200	÷	2,000	=	0.021
	*PM	0.00220	n/a	x	102	=	0.224	x	200	÷	2,000	=	0.022
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.1 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19016 / Unit#2)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	**8,760**	÷	**2,000**	=	
	NO_x	0.011		x		=		x	**8,760**	÷	**2,000**	=	
	VOC	0.015		x		=		x	**8,760**	÷	**2,000**	=	
	SO_x	0.000591		x		=		x	**8,760**	÷	**2,000**	=	
	*PM	0.000721		x		=		x	**8,760**	÷	**2,000**	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	51	=	0.341	x	**8,760**	÷	**2,000**	=	**1.494**
	NO_x	0.03100	n/a	x	51	=	1.581	x	**8,760**	÷	**2,000**	=	**6.925**
	VOC	0.00247	n/a	x	51	=	0.126	x	**8,760**	÷	**2,000**	=	**0.552**
	SO_x	0.00205	n/a	x	51	=	0.105	x	**8,760**	÷	**2,000**	=	**0.460**
	*PM	0.00220	n/a	x	51	=	0.112	x	**8,760**	÷	**2,000**	=	**0.491**
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.1 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19016 / Unit#2)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	**2,000**	=	
	NO_x	0.011		x		=		x		÷	**2,000**	=	
	VOC	0.015		x		=		x		÷	**2,000**	=	
	SO_x	0.000591		x		=		x		÷	**2,000**	=	
	*PM	0.000721		x		=		x		÷	**2,000**	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	51	=	0.341	x	**200**	÷	**2,000**	=	**0.034**
	NO_x	0.03100	n/a	x	51	=	1.581	x	**200**	÷	**2,000**	=	**0.158**
	VOC	0.00247	n/a	x	51	=	0.126	x	**200**	÷	**2,000**	=	**0.013**
	SO_x	0.00205	n/a	x	51	=	0.105	x	**200**	÷	**2,000**	=	**0.011**
	*PM	0.00220	n/a	x	51	=	0.112	x	**200**	÷	**2,000**	=	**0.011**
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.3 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19019)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	8,760	÷	2,000	=	2.984
	NO_x	0.03100	n/a	x	102	=	3.162	x	8,760	÷	2,000	=	13.850
	VOC	0.00247	n/a	x	102	=	0.252	x	8,760	÷	2,000	=	1.103
	SO_x	0.00205	n/a	x	102	=	0.209	x	8,760	÷	2,000	=	0.916
	*PM	0.00220	n/a	x	102	=	0.224	x	8,760	÷	2,000	=	0.983
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.3 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19019)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	200	÷	2,000	=	0.068
	NO_x	0.03100	n/a	x	102	=	3.162	x	200	÷	2,000	=	0.316
	VOC	0.00247	n/a	x	102	=	0.252	x	200	÷	2,000	=	0.025
	SO_x	0.00205	n/a	x	102	=	0.209	x	200	÷	2,000	=	0.021
	*PM	0.00220	n/a	x	102	=	0.224	x	200	÷	2,000	=	0.022
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.4 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19069)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.4 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19069)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.5 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19070)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available. Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.5 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19070)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.6 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19071)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available. Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.6 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19071)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.7 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19072)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214. .

Section 5.7 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19072)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.8 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19073)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.8 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19073)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.9 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19074)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.9 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19074)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.10 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19075)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.10 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19075)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.11 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19076)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	8,760	÷	2,000	=	9.948
	NO_x	0.03100	n/a	x	340	=	10.540	x	8,760	÷	2,000	=	46.165
	VOC	0.00247	n/a	x	340	=	0.840	x	8,760	÷	2,000	=	3.678
	SO_x	0.00205	n/a	x	340	=	0.697	x	8,760	÷	2,000	=	3.053
	*PM	0.00220	n/a	x	340	=	0.748	x	8,760	÷	2,000	=	3.276
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.11 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19076)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	340	=	2.271	x	200	÷	2,000	=	0.227
	NO_x	0.03100	n/a	x	340	=	10.540	x	200	÷	2,000	=	1.054
	VOC	0.00247	n/a	x	340	=	0.840	x	200	÷	2,000	=	0.084
	SO_x	0.00205	n/a	x	340	=	0.697	x	200	÷	2,000	=	0.070
	*PM	0.00220	n/a	x	340	=	0.748	x	200	÷	2,000	=	0.075
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.12 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19129)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available. Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	207	=	1.383	x	8,760	÷	2,000	=	6.056
	NO_x	0.03100	n/a	x	207	=	6.417	x	8,760	÷	2,000	=	28.106
	VOC	0.00247	n/a	x	207	=	0.511	x	8,760	÷	2,000	=	2.239
	SO_x	0.00205	n/a	x	207	=	0.424	x	8,760	÷	2,000	=	1.859
	*PM	0.00220	n/a	x	207	=	0.455	x	8,760	÷	2,000	=	1.995
Diesel > 600 Hp	CO	0.0055						x	8,760	÷	2,000	=	
	NO_x	0.024						x	8,760	÷	2,000	=	
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.12 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19129)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	207	=	1.383	x	200	÷	2,000	=	0.138
	NO_x	0.03100	n/a	x	207	=	6.417	x	200	÷	2,000	=	0.642
	VOC	0.00247	n/a	x	207	=	0.511	x	200	÷	2,000	=	0.051
	SO_x	0.00205	n/a	x	207	=	0.424	x	200	÷	2,000	=	0.042
	*PM	0.00220	n/a	x	207	=	0.455	x	200	÷	2,000	=	0.046
Diesel >600 Hp	CO	0.0055						x		÷	2,000	=	
	NO_x	0.024						x		÷	2,000	=	
	**VOC	0.000705											
	***SO_x	0.00001214											
	*PM	0.0007											

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 4.13 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19130)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available. Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668		x		=		x	8,760	÷	2,000	=	
	NO_x	0.03100		x		=		x	8,760	÷	2,000	=	
	VOC	0.00247		x		=		x	8,760	÷	2,000	=	
	SO_x	0.00205		x		=		x	8,760	÷	2,000	=	
	*PM	0.00220		x		=		x	8,760	÷	2,000	=	
Diesel > 600 Hp	CO	0.0055	0.01874	x	1186	=	22.226	x	8,760	÷	2,000	=	97.350
	NO_x	0.024	0.01521	x	1186	=	28.464	x	8,760	÷	2,000	=	124.672
	**VOC	0.000705	0.002205	x	1186	=	2.615	x	8,760	÷	2,000	=	11.454
	***SO_x	0.00001214	n/a	x	1186	=	0.014	x	8,760	÷	2,000	=	0.061
	*PM	0.0007	0.00088	x	1186	=	1.044	x	8,760	÷	2,000	=	4.573

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Section 5.13 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19130)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668		x		=		x		÷	2,000	=	
	NO_x	0.03100		x		=		x		÷	2,000	=	
	VOC	0.00247		x		=		x		÷	2,000	=	
	SO_x	0.00205		x		=		x		÷	2,000	=	
	*PM	0.00220		x		=		x		÷	2,000	=	
Diesel >600 Hp	CO	0.0055	0.01874	x	1186	=	22.226	x	200	÷	2,000	=	2.223
	NO_x	0.024	0.01521	x	1186	=	28.464	x	200	÷	2,000	=	2.846
	**VOC	0.000705	0.002205	x	1186	=	2.615	x	200	÷	2,000	=	0.262
	***SO_x	0.00001214	n/a	x	1186	=	0.014	x	200	÷	2,000	=	0.001
	*PM	0.0007	0.00088	x	1186	=	1.044	x	200	÷	2,000	=	0.104

* Particulate matter (PM) emissions also reflect PM_{10} and $PM_{2.5}$ emissions.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.0015 wt. % sulfur in diesel fuel = 0.00001214.

Emission Estimates

Permit 3032-M1 Power Production Emergency Generators

Emission Unit IDs

19003, 19006, 19032, 19094, 19096, 19106, 19142, 19143, 19154, 19168, 19176, 19177

Section 4.1 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19003)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	135	=	0.902	x	8,760	÷	2,000	=	3.950
	NO_x	0.03100	n/a	x	135	=	4.185	x	8,760	÷	2,000	=	18.330
	**VOC	0.00247	n/a	x	135	=	0.333	x	8,760	÷	2,000	=	1.461
	SO_x	0.00205	n/a	x	135	=	0.277	x	8,760	÷	2,000	=	1.212
	*PM	0.00220	n/a	x	135	=	0.297	x	8,760	÷	2,000	=	1.301
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.1 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19003)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	135	=	0.902	x	200	÷	2,000	=	0.090
	NO_x	0.03100	n/a	x	135	=	4.185	x	200	÷	2,000	=	0.419
	**VOC	0.00247	n/a	x	135	=	0.333	x	200	÷	2,000	=	0.033
	SO_x	0.00205	n/a	x	135	=	0.277	x	200	÷	2,000	=	0.028
	*PM	0.00220	n/a	x	135	=	0.297	x	200	÷	2,000	=	0.030
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.3 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19006)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	8,760	÷	2,000	=	2.984
	NO_x	0.03100	n/a	x	102	=	3.162	x	8,760	÷	2,000	=	13.850
	**VOC	0.00247	n/a	x	102	=	0.252	x	8,760	÷	2,000	=	1.103
	SO_x	0.00205	n/a	x	102	=	0.209	x	8,760	÷	2,000	=	0.916
	*PM	0.00220	n/a	x	102	=	0.224	x	8,760	÷	2,000	=	0.983
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.3 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19006)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	200	÷	2,000	=	0.068
	NO_x	0.03100	n/a	x	102	=	3.162	x	200	÷	2,000	=	0.316
	**VOC	0.00247	n/a	x	102	=	0.252	x	200	÷	2,000	=	0.025
	SO_x	0.00205	n/a	x	102	=	0.209	x	200	÷	2,000	=	0.021
	*PM	0.00220	n/a	x	102	=	0.224	x	200	÷	2,000	=	0.022
Diesel >600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.5 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19032)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	465	=	3.106	x	8,760	÷	2,000	=	13.605
	NO_x	0.03100	n/a	x	465	=	14.415	x	8,760	÷	2,000	=	63.138
	**VOC	0.00247	n/a	x	465	=	1.149	x	8,760	÷	2,000	=	5.031
	SO_x	0.00205	n/a	x	465	=	0.953	x	8,760	÷	2,000	=	4.175
	*PM	0.00220	n/a	x	465	=	1.023	x	8,760	÷	2,000	=	4.481
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.5 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19032)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	465	=	3.106	x	200	÷	2,000	=	0.311
	NO_x	0.03100	n/a	x	465	=	14.415	x	200	÷	2,000	=	1.442
	**VOC	0.00247	n/a	x	465	=	1.149	x	200	÷	2,000	=	0.115
	SO_x	0.00205	n/a	x	465	=	0.953	x	200	÷	2,000	=	0.095
	*PM	0.00220	n/a	x	465	=	1.023	x	200	÷	2,000	=	0.102
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.13 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19094)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.01056	x	68	=	0.718	x	8,760	÷	2,000	=	3.145
	NO_x	0.03100	0.01642	x	68	=	2.108	x	8,760	÷	2,000	=	9.233
	**VOC	0.00247	0.00060	x	68	=	0.168	x	8,760	÷	2,000	=	0.736
	SO_x	0.00205	0.00141	x	68	=	0.139	x	8,760	÷	2,000	=	0.611
	*PM	0.00220	n/a	x	68	=	0.150	x	8,760	÷	2,000	=	0.655
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.13 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19094)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.01056	x	68	=	0.718	x	200	÷	2,000	=	0.072
	NO_x	0.03100	0.01642	x	68	=	2.108	x	200	÷	2,000	=	0.211
	**VOC	0.00247	0.00060	x	68	=	0.168	x	200	÷	2,000	=	0.017
	SO_x	0.00205	0.00141	x	68	=	0.139	x	200	÷	2,000	=	0.014
	*PM	0.00220	n/a	x	68	=	0.150	x	200	÷	2,000	=	0.015
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.14 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19096)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00728	x	568	=	4.134	x	8,760	÷	2,000	=	18.105
	NO_x	0.03100	0.02290	x	568	=	17.608	x	8,760	÷	2,000	=	77.123
	**VOC	0.00247	0.00060	x	568	=	1.403	x	8,760	÷	2,000	=	6.145
	SO_x	0.00205	0.00349	x	568	=	1.984	x	8,760	÷	2,000	=	8.690
	*PM	0.00220	n/a	x	568	=	1.250	x	8,760	÷	2,000	=	5.473
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.14 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19096)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00728	x	568	=	4.134	x	200	÷	2,000	=	0.413
	NO_x	0.03100	0.02290	x	568	=	17.608	x	200	÷	2,000	=	1.761
	**VOC	0.00247	0.00060	x	568	=	1.403	x	200	÷	2,000	=	0.140
	SO_x	0.00205	0.00349	x	568	=	1.984	x	200	÷	2,000	=	0.198
	*PM	0.00220	n/a	x	568	=	1.250	x	200	÷	2,000	=	0.125
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.15 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19106)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00725	x	166	=	1.204	x	8,760	÷	2,000	=	5.274
	NO_x	0.03100	0.02348	x	166	=	5.146	x	8,760	÷	2,000	=	22.539
	**VOC	0.00247	0.00071	x	166	=	0.410	x	8,760	÷	2,000	=	1.796
	SO_x	0.00205	0.0013	x	166	=	0.340	x	8,760	÷	2,000	=	1.491
	*PM	0.00220	0.00055	x	166	=	0.365	x	8,760	÷	2,000	=	1.600
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.15 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit 19106)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00725	x	166	=	1.204	x	200	÷	2,000	=	0.120
	NO_x	0.03100	0.02348	x	166	=	5.146	x	200	÷	2,000	=	0.515
	**VOC	0.00247	0.00071	x	166	=	0.410	x	200	÷	2,000	=	0.041
	SO_x	0.00205	0.0013	x	166	=	0.340	x	200	÷	2,000	=	0.034
	*PM	0.00220	0.00055	x	166	=	0.365	x	200	÷	2,000	=	0.037
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.18 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19142)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	8,760	÷	2,000	=	2.984
	NO_x	0.03100	n/a	x	102	=	3.162	x	8,760	÷	2,000	=	13.850
	**VOC	0.00247	n/a	x	102	=	0.252	x	8,760	÷	2,000	=	1.103
	SO_x	0.00205	n/a	x	102	=	0.209	x	8,760	÷	2,000	=	0.916
	*PM	0.00220	n/a	x	102	=	0.224	x	8,760	÷	2,000	=	0.983
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.18 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19142)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	102	=	0.681	x	200	÷	2,000	=	0.068
	NO_x	0.03100	n/a	x	102	=	3.162	x	200	÷	2,000	=	0.316
	**VOC	0.00247	n/a	x	102	=	0.252	x	200	÷	2,000	=	0.025
	SO_x	0.00205	n/a	x	102	=	0.209	x	200	÷	2,000	=	0.021
	*PM	0.00220	n/a	x	102	=	0.224	x	200	÷	2,000	=	0.022
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.19 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19143)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	50	=	0.334	x	8,760	÷	2,000	=	1.463
	NO_x	0.03100	n/a	x	50	=	1.550	x	8,760	÷	2,000	=	6.789
	**VOC	0.00247	n/a	x	50	=	0.124	x	8,760	÷	2,000	=	0.541
	SO_x	0.00205	n/a	x	50	=	0.103	x	8,760	÷	2,000	=	0.449
	*PM	0.00220	n/a	x	50	=	0.110	x	8,760	÷	2,000	=	0.482
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.19 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19143)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	n/a	x	50	=	0.334	x	200	÷	2,000	=	0.033
	NO_x	0.03100	n/a	x	50	=	1.550	x	200	÷	2,000	=	0.155
	**VOC	0.00247	n/a	x	50	=	0.124	x	200	÷	2,000	=	0.012
	SO_x	0.00205	n/a	x	50	=	0.103	x	200	÷	2,000	=	0.010
	*PM	0.00220	n/a	x	50	=	0.110	x	200	÷	2,000	=	0.011
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.22 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19154)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH air contaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	65.6	=	0.438	x	8,760	÷	2,000	=	1.919
	NO_x	0.03100	n/a	x	65.6	=	2.034	x	8,760	÷	2,000	=	8.907
	**VOC	0.00247	n/a	x	65.6	=	0.162	x	8,760	÷	2,000	=	0.710
	SO_x	0.00205	n/a	x	65.6	=	0.134	x	8,760	÷	2,000	=	0.589
	*PM	0.00220	n/a	x	65.6	=	0.144	x	8,760	÷	2,000	=	0.632
Diesel > 600 Hp	CO	0.0055		x		=		x	8,760	÷	2,000	=	
	NO_x	0.024		x		=		x	8,760	÷	2,000	=	
	VOC	0.000705		x		=		x	8,760	÷	2,000	=	
	SO_x	0.003236		x		=		x	8,760	÷	2,000	=	
	*PM	0.0007		x		=		x	8,760	÷	2,000	=	

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.22 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19154)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	65.6	=	0.438	x	200	÷	2,000	=	0.044
	NO_x	0.03100	n/a	x	65.6	=	2.034	x	200	÷	2,000	=	0.203
	**VOC	0.00247	n/a	x	65.6	=	0.162	x	200	÷	2,000	=	0.016
	SO_x	0.00205	n/a	x	65.6	=	0.134	x	200	÷	2,000	=	0.013
	*PM	0.00220	n/a	x	65.6	=	0.144	x	200	÷	2,000	=	0.014
Diesel >600 Hp	CO	0.0055		x		=		x		÷	2,000	=	
	NO_x	0.024		x		=		x		÷	2,000	=	
	VOC	0.000705		x		=		x		÷	2,000	=	
	SO_x	0.003236		x		=		x		÷	2,000	=	
	*PM	0.0007		x		=		x		÷	2,000	=	

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.23 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19168)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH aircontaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	25	=	0.167	x	8,760	÷	2,000	=	0.731
	NO_x	0.03100	n/a	x	25	=	0.775	x	8,760	÷	2,000	=	3.395
	**VOC	0.00247	n/a	x	25	=	0.062	x	8,760	÷	2,000	=	0.270
	SO_x	0.00205	n/a	x	25	=	0.051	x	8,760	÷	2,000	=	0.224
	*PM	0.00220	n/a	x	25	=	0.055	x	8,760	÷	2,000	=	0.241
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 5.23 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19168)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel $\leq$ 600 Hp	CO	0.00668	n/a	x	25	=	0.167	x	200	÷	2,000	=	0.017
	NO_x	0.03100	n/a	x	25	=	0.775	x	200	÷	2,000	=	0.078
	**VOC	0.00247	n/a	x	25	=	0.062	x	200	÷	2,000	=	0.006
	SO_x	0.00205	n/a	x	25	=	0.051	x	200	÷	2,000	=	0.005
	*PM	0.00220	n/a	x	25	=	0.055	x	200	÷	2,000	=	0.006
Diesel > 600 Hp	CO	0.0055											
	NO_x	0.024											
	VOC	0.000705											
	SO_x	0.003236											
	*PM	0.0007											

* Particulate Matter (PM) emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for the exhaust portion of Total Organic Compounds (TOC).

Section 4.1 Potential Emission Rate Uncontrolled Emissions (Unit ID 19176)

Use manufacturer's data, compliance performance stack test data or the attached USEPA Emission Factors in grams per horsepower-hour (g/Hp-hr) associated with the Engine's Horsepower Rating and Model Year

Model Year	Pollutant	Emission Factors g/Hp-hr	TIMES	Actual Engine Hp	EQUALS	Emission In Grams Per Hour	DIVIDE	Grams Per Pound	EQUALS	Emission in Pounds Per Hour	TIMES	Potential Operating Hours Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
Likely ~2016	CO	2.60	x	755	=	1963.0	÷	453.6	=	4.33	x	8,760	÷	2,000	=	18.95
	NO_x	4.25	x	755	=	3208.75	÷	453.6	=	7.07	x	8,760	÷	2,000	=	30.98
	NMHC	0.06	x	755	=	45.30	÷	453.6	=	0.10	x	8,760	÷	2,000	=	0.44
	*NOx + NMHC	4.80	x	755	=	3624.0	÷	453.6	=	7.99	x	8,760	÷	2,000	=	34.99
	**SO_x	0.01	x	755	=	4.16	÷	453.6	=	0.01	x	8,760	÷	2,000	=	0.040
	***PM	0.15	x	755	=	113.25	÷	453.6	=	0.25	x	8,760	÷	2,000	=	1.09

* If the USEPA Emission Factor or manufacturer's data is given as combined NOx + NMHC, also provide individual emission factors for NOx and NMHC from the manufacturer or other approved methodology for estimating individual emission factors.

** Manufacturer's SOx factor shall be used when larger than the USEPA Emission Factor.

*** Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.

Section 5.1 Potential to Emit (Requested allowable rate) (Controlled Emissions) (Unit ID 19176)

Transfer each pollutant Emission in Pounds Per Hour from column above to the Emission in Pounds Per Hour column below. Complete the equation after inserting the Requested Operating Hours Per Year. Pound Per Hour rate for each pollutant must be met if performance testing is requested.

Pollutant	Emission in Pounds Per Hour	TIMES	Requested Operating Hours Per Year	EQUALS	Pounds Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
CO	4.33	x	200	=	865.52	÷	2,000	=	0.43
NO_x	7.07	x	200	=	1414.79	÷	2,000	=	0.71
NMHC	0.10	x	200	=	19.97	÷	2,000	=	0.010
*NOx + NMHC	7.99	x	200	=	1597.88	÷	2,000	=	0.799
**SO_x	0.01	x	200	=	1.83	÷	2,000	=	0.001
***PM	0.25	x	200	=	49.93	÷	2,000	=	0.025

Section 4.2 Potential Emission Rate (Uncontrolled Emissions) (Unit ID 19177)

Use manufacturer's data, compliance performance stack test data or the attached USEPA Emission Factors in grams per horsepower-hour (g/Hp-hr) associated with the Engine's Horsepower Rating and Model Year

Model Year	Pollutant	Emission Factors g/Hp-hr	TIMES	Actual Engine Hp	EQUALS	Emission In Grams Per Hour	DIVIDE	Grams Per Pound	EQUALS	Emission in Pounds Per Hour	TIMES	Potential Operating Hours Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
Likely ~2016	CO	2.60	x	755	=	1963.0	÷	453.6	=	4.33	x	8,760	÷	2,000	=	18.95
	NO_x	4.25	x	755	=	3208.75	÷	453.6	=	7.07	x	8,760	÷	2,000	=	30.98
	NMHC	0.06	x	755	=	45.30	÷	453.6	=	0.10	x	8,760	÷	2,000	=	0.44
	*NOx + NMHC	4.80	x	755	=	3624.0	÷	453.6	=	7.99	x	8,760	÷	2,000	=	34.99
	**SO_x	0.01	x	755	=	4.16	÷	453.6	=	0.01	x	8,760	÷	2,000	=	0.040
	***PM	0.15	x	755	=	113.25	÷	453.6	=	0.25	x	8,760	÷	2,000	=	1.09

* If the USEPA Emission Factor or manufacturer's data is given as combined NOx + NMHC, also provide individual emission factors for NOx and NMHC from the manufacturer or other approved methodology for estimating individual emission factors.
** Manufacturer's SOx factor shall be used when larger than the USEPA Emission Factor.
*** Particulate Matter (PM) emissions are considered to be < 1μm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.

Section 5.2 Potential to Emit (Requested allowable rate) (Controlled Emissions) (Unit ID 19177)

Transfer each pollutant Emission in Pounds Per Hour from column above to the Emission in Pounds Per Hour column below. Complete the equation after inserting the Requested Operating Hours Per Year. Pound Per Hour rate for each pollutant must be met if performance testing is requested.

Pollutant	Emission in Pounds Per Hour	TIMES	Requested Operating Hours Per Year	EQUALS	Pounds Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
CO	4.33	x	200	=	865.52	÷	2,000	=	0.43
NO_x	7.07	x	200	=	1414.79	÷	2,000	=	0.71
NMHC	0.10	x	200	=	19.97	÷	2,000	=	0.010
*NOx + NMHC	7.99	x	200	=	1597.88	÷	2,000	=	0.799
**SO_x	0.01	x	200	=	1.83	÷	2,000	=	0.001
***PM	0.25	x	200	=	49.93	÷	2,000	=	0.025

Emission Estimates

3047 - Source Registration – West Side Steam Boilers

Emission Unit IDs

14166, 14167

Summary of Criteria Emissions
for Kirtland AFB Steam Boiler, West Side

Process Equipment Unit No.	Emission Source	Potential Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 278, ID 14166	1.89	2.25	0.12	0.014	0.17	0.17	0.17
2	Boiler, Bldg 278, ID 14167	1.89	2.25	0.12	0.014	0.17	0.17	0.17
	Total	**3.79**	**4.51**	**0.25**	**0.03**	**0.34**	**0.34**	**0.34**

Process Equipment Unit No.	Emission Source	Annual Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 278, ID 14166	1.26	1.50	0.08	0.009	0.11	0.11	0.11
2	Boiler, Bldg 278, ID 14167	1.26	1.50	0.08	0.009	0.11	0.11	0.11
	Total	**2.52**	**3.00**	**0.17**	**0.02**	**0.23**	**0.23**	**0.23**

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 278 (Unit ID 14166)
Process Equipment Unit No. 1

Boiler

5,250,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Criteria Air Pollutants	AP-42 Emission Factors[2] ($lb/10^6$ scf)	Emission Factors (lb/MMBtu)[3]	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	84	0.082	**0.43**	**1.26**	**1.89**
Nitrogen Oxides	100	0.098	**0.51**	**1.50**	**2.25**
Particulate Matter	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <10μm[7]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <2.5μm[8]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Sulfur Oxides	0.6	0.00059	**0.0031**	**0.0090**	**0.014**
Volatile Organic Compounds	5.5	0.0054	**0.028**	**0.083**	**0.12**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-1, 1.4-2 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from $lb/10^6$ scf to lb/MMBtu.
EF (lb/MMBtu) = EF ($lb/10^6$ scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

AP-42 Emission Factors
Hazardous Air Pollutant (HAP) Emission Estimation Spreadsheet
Natural Gas Boiler at Building 278 (Unit ID 14166)
Process Equipment Unit No. 1

Boiler

5,250,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Hazardous Air Pollutants	CAS No.	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors[3] (lb/MMBtu)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
2-Methylnaphthalene[7]	91-57-6	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
3-Methylchloranthrene[7, 9]	56-49-5	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
7,12-Dimethylbenz(a)anthracene[7, 9]	57-97-6	1.6E-05	1.6E-08	**8.2E-08**	**2.4E-07**	**3.6E-07**
Acenaphthene[7, 9]	83-32-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Acenaphthylene[7, 9]	208-96-8	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Anthracene[7, 9]	120-12-7	2.4E-06	2.4E-09	**1.2E-08**	**3.6E-08**	**5.4E-08**
Arsenic[8]	7440-38-2	2.0E-04	2.0E-07	**1.0E-06**	**3.0E-06**	**4.5E-06**
Benz(a)anthracene[7, 9]	56-55-3	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Benzene	71-43-2	2.1E-03	2.1E-06	**1.1E-05**	**3.2E-05**	**4.7E-05**
Benzo(a)pyrene[7, 9]	50-32-8	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(b)fluoranthene[7, 9]	205-99-2	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Benzo(g,h,i)perylene[7, 9]	191-24-2	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(k)fluoranthene[7, 9]	207-08-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Beryllium[8, 9]	7440-41-7	1.2E-05	1.2E-08	**6.2E-08**	**1.8E-07**	**2.7E-07**
Cadmium[8]	7440-43-9	1.1E-03	1.1E-06	**5.7E-06**	**1.7E-05**	**2.5E-05**
Chromium[8]	7440-47-3	1.4E-03	1.4E-06	**7.2E-06**	**2.1E-05**	**3.2E-05**
Chrysene[7, 9]	218-01-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Cobalt[8]	7440-48-4	8.4E-05	8.2E-08	**4.3E-07**	**1.3E-06**	**1.9E-06**
Dibenzo(a,h)anthracene[7, 9]	53-70-3	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Dichlorobenzene	25321-22-6	1.2E-03	1.2E-06	**6.2E-06**	**1.8E-05**	**2.7E-05**
Fluoranthene[7]	206-44-0	3.0E-06	2.9E-09	**1.5E-08**	**4.5E-08**	**6.8E-08**
Fluorene[7]	86-73-7	2.8E-06	2.7E-09	**1.4E-08**	**4.2E-08**	**6.3E-08**
Formaldehyde	50-00-0	7.5E-02	7.4E-05	**3.9E-04**	**1.1E-03**	**1.7E-03**
Hexane	110-54-3	1.8E+00	1.8E-03	**9.3E-03**	**2.7E-02**	**4.1E-02**
Indeno(1,2,3-cd)pyrene[7, 9]	193-39-5	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Lead	7439-92-1	5.0E-04	4.9E-07	**2.6E-06**	**7.5E-06**	**1.1E-05**
Manganese[8]	7439-96-5	3.8E-04	3.7E-07	**2.0E-06**	**5.7E-06**	**8.6E-06**
Mercury[8]	7439-97-6	2.6E-04	2.5E-07	**1.3E-06**	**3.9E-06**	**5.9E-06**
Naphthalene	91-20-3	6.1E-04	6.0E-07	**3.1E-06**	**9.2E-06**	**1.4E-05**
Nickel[8]	7440-02-0	2.1E-03	2.1E-06	**1.1E-05**	**3.2E-05**	**4.7E-05**
Phenanathrene[7]	85-01-8	1.7E-05	1.7E-08	**8.8E-08**	**2.6E-07**	**3.8E-07**
Pyrene[7]	129-00-0	5.0E-06	4.9E-09	**2.6E-08**	**7.5E-08**	**1.1E-07**
Selenium[8, 9]	7782-49-2	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
Toluene	108-88-3	3.4E-03	3.3E-06	**1.8E-05**	**5.1E-05**	**7.7E-05**
Total POM[10]		8.8E-05	8.6E-08	**4.5E-07**	**1.3E-06**	**2.0E-06**
Total HAP				**9.7E-03**	**2.8E-02**	**4.3E-02**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)

where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7] Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-3 (July 1998).

[8] Metals from natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-4 (July 1998).

[9] All emission factors where the value was less than, i.e., <1, a conservative approach was used and the value shown was used, i.e., 1.

[10] Total POM is not in the sum because individual constituents are already accounted for.

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 278 (Unit ID 14167)
Process Equipment Unit No. 2

Boiler

5,250,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Criteria Air Pollutants	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors (lb/MMBtu)[3]	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	84	0.082	**0.43**	**1.26**	**1.89**
Nitrogen Oxides	100	0.098	**0.51**	**1.50**	**2.25**
Particulate Matter	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <10μm[7]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <2.5μm[8]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Sulfur Oxides	0.6	0.00059	**0.0031**	**0.0090**	**0.014**
Volatile Organic Compounds	5.5	0.0054	**0.028**	**0.083**	**0.12**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-1, 1.4-2 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

AP-42 Emission Factors
Hazardous Air Pollutant (HAP) Emission Estimation Spreadsheet
Natural Gas Boiler at Building 278 (Unit ID 14167)
Process Equipment Unit No. 2

Boiler

5,250,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Hazardous Air Pollutants	CAS No.	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors[3] (lb/MMBtu)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
2-Methylnaphthalene[7]	91-57-6	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
3-Methylchloranthrene[7, 9]	56-49-5	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
7,12-Dimethylbenz(a)anthracene[7, 9]	57-97-6	1.6E-05	1.6E-08	**8.2E-08**	**2.4E-07**	**3.6E-07**
Acenaphthene[7, 9]	83-32-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Acenaphthylene[7, 9]	208-96-8	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Anthracene[7, 9]	120-12-7	2.4E-06	2.4E-09	**1.2E-08**	**3.6E-08**	**5.4E-08**
Arsenic[8]	7440-38-2	2.0E-04	2.0E-07	**1.0E-06**	**3.0E-06**	**4.5E-06**
Benz(a)anthracene[7, 9]	56-55-3	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Benzene	71-43-2	2.1E-03	2.1E-06	**1.1E-05**	**3.2E-05**	**4.7E-05**
Benzo(a)pyrene[7, 9]	50-32-8	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(b)fluoranthene[7, 9]	205-99-2	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Benzo(g,h,i)perylene[7, 9]	191-24-2	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(k)fluoranthene[7, 9]	207-08-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Beryllium[8, 9]	7440-41-7	1.2E-05	1.2E-08	**6.2E-08**	**1.8E-07**	**2.7E-07**
Cadmium[8]	7440-43-9	1.1E-03	1.1E-06	**5.7E-06**	**1.7E-05**	**2.5E-05**
Chromium[8]	7440-47-3	1.4E-03	1.4E-06	**7.2E-06**	**2.1E-05**	**3.2E-05**
Chrysene[7, 9]	218-01-9	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Cobalt[8]	7440-48-4	8.4E-05	8.2E-08	**4.3E-07**	**1.3E-06**	**1.9E-06**
Dibenzo(a,h)anthracene[7, 9]	53-70-3	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Dichlorobenzene	25321-22-6	1.2E-03	1.2E-06	**6.2E-06**	**1.8E-05**	**2.7E-05**
Fluoranthene[7]	206-44-0	3.0E-06	2.9E-09	**1.5E-08**	**4.5E-08**	**6.8E-08**
Fluorene[7]	86-73-7	2.8E-06	2.7E-09	**1.4E-08**	**4.2E-08**	**6.3E-08**
Formaldehyde	50-00-0	7.5E-02	7.4E-05	**3.9E-04**	**1.1E-03**	**1.7E-03**
Hexane	110-54-3	1.8E+00	1.8E-03	**9.3E-03**	**2.7E-02**	**4.1E-02**
Indeno(1,2,3-cd)pyrene[7, 9]	193-39-5	1.8E-06	1.8E-09	**9.3E-09**	**2.7E-08**	**4.1E-08**
Lead	7439-92-1	5.0E-04	4.9E-07	**2.6E-06**	**7.5E-06**	**1.1E-05**
Manganese[8]	7439-96-5	3.8E-04	3.7E-07	**2.0E-06**	**5.7E-06**	**8.6E-06**
Mercury[8]	7439-97-6	2.6E-04	2.5E-07	**1.3E-06**	**3.9E-06**	**5.9E-06**
Naphthalene	91-20-3	6.1E-04	6.0E-07	**3.1E-06**	**9.2E-06**	**1.4E-05**
Nickel[8]	7440-02-0	2.1E-03	2.1E-06	**1.1E-05**	**3.2E-05**	**4.7E-05**
Phenanathrene[7]	85-01-8	1.7E-05	1.7E-08	**8.8E-08**	**2.6E-07**	**3.8E-07**
Pyrene[7]	129-00-0	5.0E-06	4.9E-09	**2.6E-08**	**7.5E-08**	**1.1E-07**
Selenium[8, 9]	7782-49-2	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
Toluene	108-88-3	3.4E-03	3.3E-06	**1.8E-05**	**5.1E-05**	**7.7E-05**
Total POM[10]		8.8E-05	8.6E-08	**4.5E-07**	**1.3E-06**	**2.0E-06**
Total HAP				**9.7E-03**	**2.8E-02**	**4.3E-02**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7] Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-3 (July 1998).

[8] Metals from natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-4 (July 1998).

[9] All emission factors where the value was less than, i.e., <1, a conservative approach was used and the value shown was used, i.e., 1.

[10] Total POM is not in the sum because individual constituents are already accounted for.

Emission Estimates

Permit 3048-2TR – Construction and Demolition Debris Landfill

Emission Unit IDs

18001, 18002

Engine Combustion Emissions
Emission Estimation Spreadsheet
Mulcher Engine at the Construction and Demolition Debris Landfill (Unit ID 18001)

Mulcher Engine
425 hp

Criteria Air Pollutants	AP-42 Emission Factors (EF)[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Controlled Annual Emissions[5] (ton/yr)	Uncontrolled Potential Annual Emissions[6]
Carbon Monoxide	0.95	21.72	137000	2.83	0.71	12.38
Nitrogen Oxides	4.41	21.72	137000	13.12	3.28	57.46
Particulate Matter[7]	0.31	21.72	137000	0.92	0.23	4.04
Particulate Matter <10μm	0.31	21.72	137000	0.92	0.23	4.04
Particulate Matter <2.5μm[8]	0.31	21.72	137000	0.92	0.23	4.04
Sulfur Oxides	0.29	21.72	137000	0.86	0.22	3.78
Volatile Organic Compounds[9]	0.35	21.72	137000	1.04	0.26	4.56

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] Hourly fuel usage was calculated using the following equation:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is listed as 137,000 Btu/gal in *AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels.*

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * fuel use (gal/hr) * HV (Btu/gal) / 1,000,000

[5] The following equation was used to estimate controlled annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hr/yr) / 2000 (lb/ton)

[6] The following equation was used to estimate uncontrolled potential annual emissions for each pollutant:
Potential annual emissions (ton/yr) = Hourly emissions (lb/hr) * 8760 (hr/yr) / 2000 (lb/ton)

[7] No emission factor data for total Particulate Matter (PM) is included in AP-42, assume that all PM emission factors are equal to factor for PM<10μm.

[8] Emissions of PM<2.5μm equal emissions of PM<10μm.

[9] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Mulching Emissions
Emission Estimation Spreadsheet
Mulcher at the Construction and Demolition Debris Landfill (Unit ID 18002)

Criteria Air Pollutants[1]	AP-42 Emission Factor (EF)[2] (lb/ton material)	Density[3] (lb/yd^3)	Maximum Mulching Rate[4] (yd^3/hr)	Hourly Emissions[5] (lb/hr)	Controlled Annual Emissions[6] (ton/yr)	Uncontrolled Potential Annual Emissions[7] (ton/yr)
Particulate Matter	0.35	625	10.8	1.18	0.30	5.17
Particulate Matter <10μm[8]	0.35	625	10.8	1.18	0.30	5.17
Particulate Matter <2.5μm[8]	0.35	625	10.8	1.18	0.30	5.17

[1] Particulate emissions are the only emissions resulting from mulching organic material.

[2] Particulate matter emission factor (EF) from EPA *AP-42 Section 10.0 Wood Products Industry (February 1980), Table 10.3-1 Uncontrolled Fugitive Particulate Emission Factors for Plywood Veneer and Layout Operations; Log Sawing (AP-42, Fourth Edition)* . Particulate emissions equal PM<10μm.

[3] Density assumed to equal that for chipped wood as listed in the EPA document *Measuring Recycling: A Guide for State and Local Governments, Appendix B: Standard Volume-to-Weight Conversion Factors, EPA530-R-97-011 (1997).*

[4] Manufacturer specifications state that the hopper size is 10.8 cubic yards. Conservatively assumed maximum material-mulching rate equals one hopper per hour.

[5] The following equation was used to estimate hourly emissions:

Hourly emissions (lb/hr) = Mulching rate (yd^3/hr) * Density of mulched materials (lb/yd^3) * EF (lb/ton material) / 2000 (lb/ton)

[6] The following equation was used to estimate controlled annual emissions:

Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hr/yr) / 2000 (lb/ton)

[7] The following equation was used to estimate uncontrolled potential annual emissions:

Potential annual emissions (ton/yr) = Hourly emissions (lb/hr) * 8760 (hr/yr) / 2000 (lb/ton)

[8] Emissions of PM<2.5μm and PM<10μm equal emissions of total PM.

Emission Estimates

Permit 3070-M1 – Basewide Miscellaneous Paint and Chemical Usage

Emission Unit ID

31999

Table C-4. Maximum Hourly Emission Estimations (lb/hr) by Organization Specific ID

Basewide Unit ID	Organization Specific ID	Maximum Hourly Usage Rate (lb/hr)	VOC (lb/hr)	PM (lb/hr)	Total HAP (lb/hr)
31999	31060	7.1	6.9	0	0.008
	31062	8.0	4.3	0.3	2.149
	31063	139.3	60.0	0.7	1.389
	31064	91.5	75.7	0.2	0.812
	31066	3.8	2.0	0.3	0.101
	31069	0.5	0.2	0.02	0.017
	31073	2.1	1.6	0.2	0.082
	31074	0.01	0.006	0	0
	31075	1.7	1.1	0.3	0.128
	31079	7.1	6.1	0.1	1.147
	31080	0.3	0.2	0.04	0.093
Basewide Totals (lb/hr)			**158.00**	**2.08**	**5.93**

Table C-5. Potential Uncontrolled Annual Emission Estimations (lb/yr) by Organization Specific ID

Basewide Unit ID	Organization Specific ID	Potential Uncontrolled Annual Usage Rate (lb/yr)	VOC (lb/yr)	PM (lb/yr)	Total HAP (lb/yr)
31999	31060	14847.0	14368.1	0	16.66
	31062	16705.1	8852.9	538.3	4469.63
	31063	289693.2	124754.2	1429.3	2889.14
	31064	190226.3	157381.7	361.4	1688.08
	31066	7848.0	4081.5	621.7	210.93
	31069	966.2	442.4	37.8	35.19
	31073	4366.0	3428.8	430.1	170.29
	31074	25.5	12.8	0	0
	31075	3603.2	2257.5	571.4	267.02
	31079	14794.8	12649.8	259.9	2385.47
	31080	547.1	411.4	76.8	193.84
Basewide Totals (lb/yr)			**328641.15**	**4326.77**	**12326.26**
Basewide Totals (tpy)			**164.32**	**2.16**	**6.16**

Table C-6. Proposed Annual Emission Estimations (lb/yr) by Organization Specific ID

Basewide Unit ID	Organization Specific ID	Anticipated Annual Usage Rate (lb/yr)	VOC (lb/yr)	PM (lb/yr)	Total HAP (lb/yr)
31999	31060	7050.6	6823.2	0	7.91
	31062	7933.0	4204.1	255.6	2122.56
	31063	137571.2	59244.0	678.8	1372.01
	31064	90335.8	74738.4	171.6	801.65
	31066	3726.9	1938.3	295.2	100.17
	31069	458.8	210.1	17.9	16.71
	31073	2073.4	1628.3	204.3	80.87
	31074	12.1	6.1	0	0
	31075	1711.1	1072.1	271.3	126.80
	31079	7025.9	6007.2	123.4	1132.83
	31080	259.8	195.4	36.5	92.05
Basewide Totals (lb/yr)			**156067.03**	**2054.72**	**5853.56**
Basewide Totals (tpy)			**78.03**	**1.03**	**2.93**

Emission Estimates

Permit 3090-RV1 – Government Fuels Distribution Operations

Emission Unit IDs

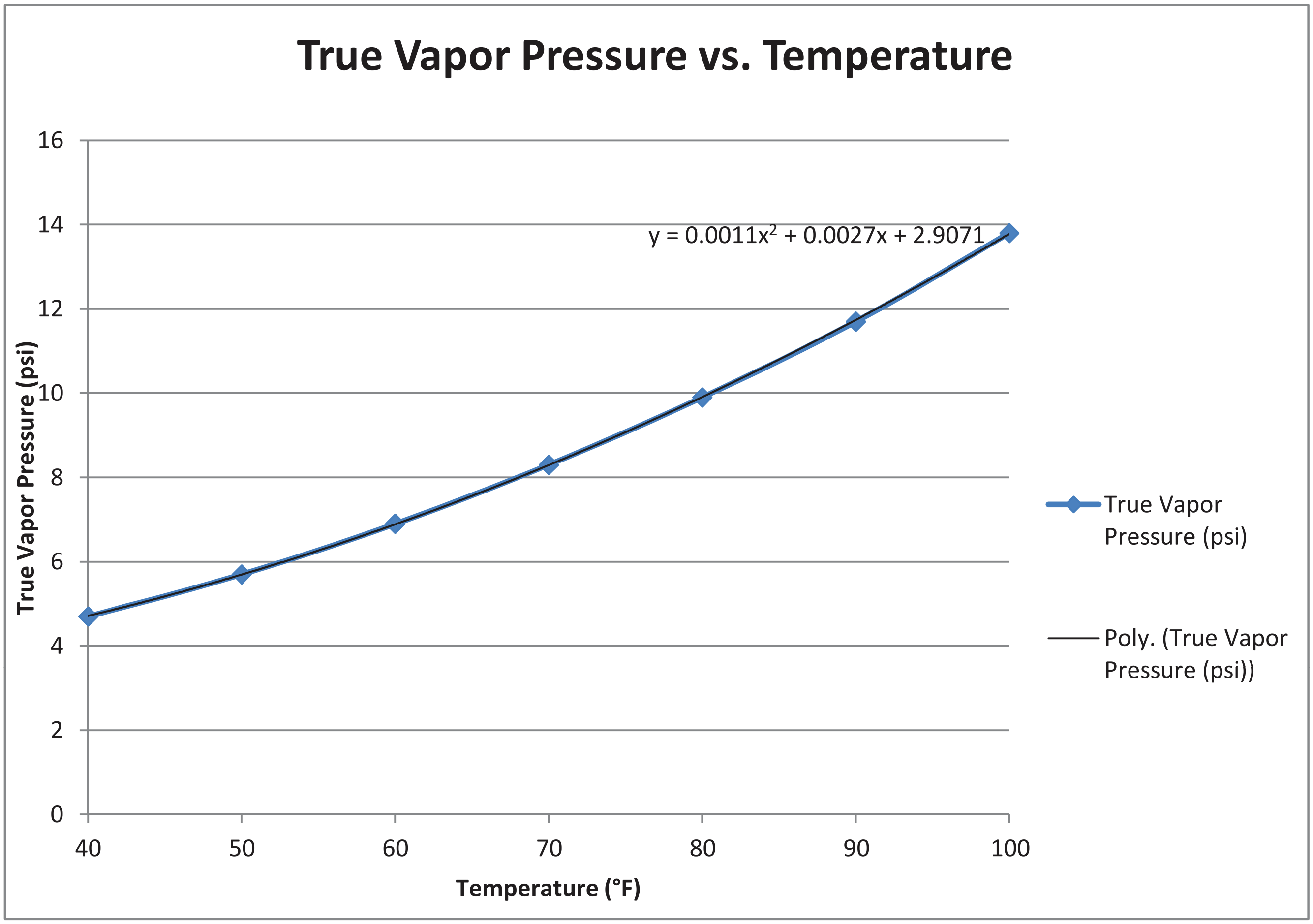
15001, 15004, 15011, 16001, 22003, 22004, 22005, 22015, 25012

Summary of VOC Emissions
for Kirtland AFB Government Fuels Distribution

Process Equipment Unit No.	Emission Source	VOC Emissions (ton/yr)		
		Hourly Emissions (lbs/hr)	Annual Emissions (ton/yr)	Potential Emissions (ton/yr)
1	Gasoline Storage, Bulk Fuels Facility, Bldg 1041, Unit ID 22005	30.70	2.31	134.47
	Gasoline Loading, Bulk Fuels Facility, Bldg 1041, Unit ID 16001	105.55	0.26	462.29
	Total	**136.25**	**2.57**	**596.76**
2	Gasoline Storage, Govt East Service Station, Bldg 20359, Unit ID 22003	2.76	3.78	12.09
	Gasoline Storage, Govt East Service Station, Bldg 20359, Unit ID 22004	2.76	2.90	12.09
	Gasoline Dispensing, Govt East Service Station, Bldg 20359, Unit ID 15001	28.08	4.04	122.99
	Total	**33.60**	**10.72**	**147.18**
3	E85 Storage , Govt East Service Station, Building 20359, Unit ID 22015	3.75	5.70	16.41
	E85 Dispensing , Govt East Service Station, Building 20359, Unit ID 15011	14.04	2.98	61.50
	Total	**17.79**	**8.69**	**77.91**
4	Fuel Storage, Govt West Service Station, Bldg 471, Unit ID 25012	9.96	0.58	43.62
	Fuel Dispensing, Govt West Service Station, Bldg 471, Unit ID 15004	14.04	0.82	61.50
	Total	**24.00**	**1.40**	**105.12**
	Grand Total	**211.63**	**23.38**	**926.97**

AP-42 Section 7.1: Organic Liquid Storage Tanks, Table 7.1-2 (November 2006)
Gasoline RVP 13,True Vapor Pressure Extrapolation
Gasoline Loading at Building 1041 (Unit ID 16001)
Process Equipment Unit No. 1

								Bulk Temperature of Liquid Loaded (°F)	True Vapor Pressure (psi)
Temperature (°F)	40	50	60	70	80	90	100		
True Vapor Pressure (psi)	4.7	5.7	6.9	8.3	9.9	11.7	13.8	56.174167	6.529860993



AP-42 Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Loading at Building 1041 (Unit ID 16001)
Bulk Fuels Facility
Process Equipment Unit No. 1

VOC Emissions from Gasoline Loading

300	**Loading Rate (gal/min)**
62	**Vapor Molecular Weight of Gasoline RVP 13[1] (lb/lb-mole)**
516.17	**Bulk Liquid Temperature[2] (°R)**
6.53	**True Vapor Pressure[3] (psia)**
0.6	**Saturation Factor[4]**
0	**Capture Efficiency[5] (%)**
0	**Control Efficiency[5] (%)**
90,000	**Annual Throughput[6] (gal/yr)**

Loading Loss[7] (lb/1000-gal)	Hourly Emissions[8] (lb/hr)	Annual Emissions[9] (ton/yr)	Potential to Emit[10] (ton/yr)
5.9	105.55	0.26	462.29

1 Vapor molecular weight from AP-42 Section 7.1: Organic Liquid Storage Tanks, Table 7.1-2 (November 2006).

2 Temperature in °F was obtained based on atmospheric calculations in EPA Tanks, version 4.09d (see Attachment G1).
The following equation, from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids (June 2008), was used to calculate bulk liquid temperature:
T(°R) = °F + 460

3 True Vapor Pressure was obtained based on extrapolation of data in AP-42 AP-42 Section 7.1: Organic Liquid Storage Tanks, Table 7.1-2 (November 2006).
See Gasoline RVP 13, True Vapor Pressure Extrapolation Sheet

4 Saturation Factor (S Factor) from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids, Table 5.2-1 (June 2008).

5 No vapor recovery control system is used during loading.

6 Annual requested throughput

7 Loading loss calculation methodology from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids (June 2008).
The following equation was used to calculate loading losses:
Loading Loss (lbs/1000-gal) = 12.46 * [(SPM) / T] * [1 - (Cap_{eff}/100 * Con_{eff}/100)]
where: S = a saturation factor obtained from Table 5.2-1
P = true vapor pressure of liquid loaded (psia)
M = vapor molecular weight (lb/lb-mole)
T = Bulk Liquid Temperature (°R)
Cap_{eff} = Capture Efficiency (%)
Con_{eff} = Control Efficiency (%)

8 The following equation was used to calculate hourly emissions:
Hourly Emissions (lb/hr) = Loading Loss (lb/1000-gal) * Loading Rate (gal/min) * 60 (min/hr) / 1000

9 The following equation was used to calculate annual emissions:
Annual emissions (ton/yr) = Annual Throughput (1000-gal/yr) * Loading Loss (lb/1000-gal) / 2000 (lb/ton)

10 Potential to emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hr/yr) / 2000 (lb/ton)

TANKS 4.09d Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Storage at Building 1041 (Unit ID 22005)
Bulk Fuels Facility
Process Equipment Unit No. 1

VOC Emissions from Gasoline Storage

300 **Unloading Rate (gal/min)**
157,680,000 **Potential Annual Throughput[1] (gal/yr)**
90,000 **Annual Throughput[2] (gal/yr)**

Emission Type[3]	Annual Emissions[4] (ton/yr)	Potential to Emit[5] (ton/yr)	Hourly Emissions[6] (lbs/hr)
Working Losses	0.45	132.61	30.28
Breathing Losses	1.86	1.86	0.42
Total Losses	**2.31**	**134.47**	**30.70**

[1] Potential annual throughput was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate potential annual throughput:
Potential Annual Throughput (gal/yr) = Unloading Rate (gal/min) * 60 (min/hr) * 8760 (hrs/yr)

[2] Annual requested throughput

[3] Working Losses, Breathing Losses, and Total Losses were calculated using EPA Tanks, version 4.09d (see Attachments G1 and G2).

[4] Calculated in TANKS 4.09d using the annual throughput.

[5] Calculated in TANKS 4.09d using the potential annual throughput.

[6] Hourly emissions are back-calculated from PTE using the following equation:
Hourly Emissions (lbs/hr) = PTE (ton/yr) * 2000 (lb/ton) / 8760 (hrs/yr)

AP-42 Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Dispensing at Building 20359 (Unit ID 15001)
Government East Service Station
Process Equipment Unit No. 2

VOC Emissions from Gasoline Dispensing

40 Nozzle Dispensing Rate[1] (gal/min)

690,000 Annual Throughput[2] (gal/yr)

Loss Category	VOC Emission Factor[3] (lb/1000-gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	Potential to Emit VOC[6] (ton/yr)
Displacement Losses from Vehicle Fueling[7]	11	26.40	3.80	115.63
Spillage during Vehicle Fueling	0.7	1.68	0.24	7.36
Total Loss from Vehicle Fueling	**11.70**	**28.08**	**4.04**	**122.99**

[1] Nozzle dispensing rate based on four standard gas station pump nozzles, two nozzles per AST, that can all be operated simultaneously at a rate of 10 gal/min.

[2] Annual requested throughput

[3] Emission factors (EF) are from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids, Table 5.2-7 (June 2008).

[4] The following equation was used to calculate hourly emissions:
Hourly Emissions (lb/hr) = VOC Emission Factor (lb/1000-gal) * Nozzle Dispensing Rate (gal/min) * 60 (min/hr) / 1000

[5] The following equation was used to calculate annual emissions:
Annual emissions (ton/yr) = Annual Throughput (1000-gal/yr) * VOC Emission Factor (lb/1000-gal) / 2000 (lb/ton)

[6] Potential to emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hr/yr) / 2000 (lb/ton)

[7] EF for Displacement Losses is for uncontrolled losses.

TANKS 4.09d Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Storage at Building 20359 (Unit IDs 22003 and 22004)
Government East Service Station
Process Equipment Unit No. 2

VOC Emissions from Gasoline Storage

20	**Unloading Rate (gal/min)**
10,512,000	**Potential Annual Throughput[1] (gal/yr)**
510,000	**Annual Throughput of Unit ID 22003[2] (gal/yr)**
210,000	**Annual Throughput of Unit ID 22004[2] (gal/yr)**

Emission Type[3]	Annual Emissions[4] (ton/yr)	Potential to Emit VOC[5] (ton/yr)	Hourly Emissions[6] (lbs/hr)
Working Losses 22003	1.92	10.24	2.34
Working Losses 22004	1.05	10.24	2.34
Breathing Losses 22003	1.86	1.86	0.42
Breathing Losses 22004	1.86	1.86	0.42
Total Losses	**6.68**	**24.19**	**5.52**

[1] Potential annual throughput was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate potential annual throughput:
Potential Annual Throughput (gal/yr) = Unloading Rate (gal/min) * 60 (min/hr) * 8760 (hrs/yr)

[2] Annual requested throughput

[3] Working Losses, Breathing Losses, and Total Losses were calculated using EPA Tanks, version 4.09d (see Attachments G3 - G6).

[4] Calculated in TANKS 4.09d using the annual throughput.

[5] Calculated in TANKS 4.09d using the potential annual throughput.

[6] Hourly emissions are back-calculated from PTE using the following equation:
Hourly Emissions (lbs/hr) = PTE (ton/yr) * 2000 (lb/ton) / 8760 (hrs/yr)

AP-42 Emission Methodology
VOC Emission Estimation Spreadsheet
E85 Dispensing at Building 20359 (Unit ID 15011)
Government East Service Station
Process Equipment Unit No. 3

VOC Emissions from E85 Dispensing

20 Nozzle Dispensing Rate[1] (gal/min)

510,000 Annual Throughput[2] (gal/yr)

VOC Emission Factors[3]		Hourly Emissions[5] (lb/hr)	Annual Emissions[6] (ton/yr)	Potential to Emit[7] (ton/yr)
Displacement Losses from Vehicle Fueling[4] (lb/1000-gal)	Spillage during Vehicle Fueling (lb/1000-gal)			
11.0	0.7	14.04	2.98	61.50

[1] Nozzle dispensing rate based on two standard service station pump nozzles that can be operated simultaneously at a rate of 10 gal/min.

[2] Annual requested throughput

[3] Emission factors (EF) are from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids, Table 5.2-7 (June 2008).

[4] EF for Displacement Losses is for uncontrolled losses.

[5] The following equation was used to calculate hourly emissions:
Hourly Emissions (lb/hr) = Total Loss (lb/1000-gal) * [Nozzle Dispensing Rate (gal/min) * 60 (min/hr) / 1000]
where Total Loss (lb/1000-gal) = Displacement Loss (lbs/1000-gal) + Spillage Loss (lb/1000-gal)

[6] The following equation was used to calculate annual emissions:
Annual emissions (ton/yr) = Annual Throughput (1000-gal/yr) * Total Loss (lb/1000-gal) / 2000 (lbs/ton)
where Total Loss (lb/1000-gal) = Displacement Loss (lbs/1000-gal) + Spillage Loss (lb/1000-gal)

[7] Potential to emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

TANKS 4.09d Emission Methodology
VOC Emission Estimation Spreadsheet
E85 Storage at Building 20359 (Unit ID 22015)
Government East Service Station
Process Equipment Unit No. 3

VOC Emissions from E85 Storage

20	**Unloading Rate (gal/min)**
10,512,000	**Potential Annual Throughput[1] (gal/yr)**
510,000	**Annual Throughput[2] (gal/yr)**

Emission Type[3]	Annual Emissions[4] (ton/yr)	Potential to Emit[5] (ton/yr)	Hourly Emissions[6] (lbs/hr)
Working Losses	2.47	13.18	3.01
Breathing Losses	3.23	3.23	0.74
Total Losses	**5.70**	**16.41**	**3.75**

[1] Potential annual throughput was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate potential annual throughput:
Potential Annual Throughput (gal/yr) = Unloading Rate (gal/min) * 60 (min/hr) * 8760 (hrs/yr)

[2] Annual requested throughput

[3] Working Losses, Breathing Losses, and Total Losses were calculated using EPA Tanks, version 4.09d (see Attachments G7 and G8).

[4] Calculated in TANKS 4.09d using the annual throughput.

[5] Calculated in TANKS 4.09d using the potential annual throughput.

[6] Hourly emissions are back-calculated from PTE using the following equation:
Hourly Emissions (lbs/hr) = PTE (ton/yr) * 2000 (lb/ton) / 8760 (hrs/yr)

AP-42 Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Service Station at Building 471 (Unit IDs 15004 and 25012)
Government West Service Station
Process Equipment Unit No. 4

VOC Emissions from Gasoline Storage and Dispensing

20 **Nozzle Dispensing Rate[1] (gal/min)**

140,000 **Annual Throughput[2] (gal/yr)**

Loss Category	VOC Emission Factor[3] (lb/1000-gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	Potential to Emit[6] (ton/yr)
UST Filling[7]	7.30	8.76	0.51	38.37
UST Breathing & Emptying	1.00	1.20	0.070	5.26
Displacement Losses from Vehicle Fueling[8]	11.00	13.20	0.77	57.82
Spillage during Vehicle Fueling	0.70	0.84	0.049	3.68
Total Loss from Vehicle Fueling	**20.00**	**24.00**	**1.40**	**105.12**

[1] Nozzle dispensing rate based on two standard gas station pump nozzles that can be operated simultaneously at a rate of 10 gal/min.

[2] Annual requested throughput

[3] Emission factors (EF) are from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids, Table 5.2-7 (June 2008).

[4] The following equation was used to calculate hourly emissions:
Hourly Emissions (lb/hr) = VOC Emission Factor (lbs/1000-gal) * Nozzle Dispensing Rate (gal/min) * 60 (min/hr) / 1000

[5] The following equation was used to calculate annual emissions:
Annual emissions (ton/yr) = Annual Throughput (1000-gal/yr) * VOC Emission Factor (lb/1000-gal) / 2000 (lbs/ton)

[6] Potential to emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] EF for UST Filling is for unbalanced, submerged filling, although vapor balance is employed during filling.

[8] EF for Displacement Losses is for uncontrolled losses.

EPA Tanks 4.09d Output Files
for Unit ID 22005 Annual Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22005
City:	Albuquerque
State:	New Mexico
Company:	KAFB
Type of Tank:	Horizontal Tank
Description:	Gasoline AST, Bulk Fuels

Tank Dimensions

Shell Length (ft):	27.00
Diameter (ft):	8.00
Volume (gallons):	10,000.00
Turnovers:	9.00
Net Throughput(gal/yr):	90,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22005 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22005 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	898.0191
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	90,000.0000
Annual Turnovers:	9.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	4,611.4907

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22005 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	898.02	3,713.47	4,611.49

EPA Tanks 4.09d Output Files
for Unit ID 22005 Potential Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22005
City:	Albuquerque
State:	New Mexico
Company:	KAFB
Type of Tank:	Horizontal Tank
Description:	Gasoline AST, Bulk Fuels

Tank Dimensions

Shell Length (ft):	27.00
Diameter (ft):	8.00
Volume (gallons):	10,000.00
Turnovers:	15,768.00
Net Throughput(gal/yr):	157,680,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22005 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22005 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	265,214.9786
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	157,680,000.0000
Annual Turnovers:	15,768.0000
Turnover Factor:	0.1686
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	268,928.4502

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22005 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	265,214.98	3,713.47	268,928.45

EPA Tanks 4.09d Output Files
for Unit ID 22003 Annual Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22003
City:	Albuquerque
State:	New Mexico
Company:	Kirtland AFB
Type of Tank:	Horizontal Tank
Description:	Gasoline fuel AST, Gov't East Service Station

Tank Dimensions

Shell Length (ft):		27.00
Diameter (ft):		8.00
Volume (gallons):		10,000.00
Turnovers:		51.00
Net Throughput(gal/yr):		510,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22003 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22003 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	3,841.5262
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	510,000.0000
Annual Turnovers:	51.0000
Turnover Factor:	0.7549
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	7,554.9978

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22003 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	3,841.53	3,713.47	7,555.00

EPA Tanks 4.09d Output Files
for Unit ID 22003 Potential Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22003
City:	Albuquerque
State:	New Mexico
Company:	Kirtland AFB
Type of Tank:	Horizontal Tank
Description:	Gasoline fuel AST, Gov't East Service Station

Tank Dimensions

Shell Length (ft):		27.00
Diameter (ft):		8.00
Volume (gallons):		10,000.00
Turnovers:		1,051.20
Net Throughput(gal/yr):		10,512,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22003 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22003 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	20,474.8358
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	10,512,000.0000
Annual Turnovers:	1,051.2000
Turnover Factor:	0.1952
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	24,188.3074

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22003 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	20,474.84	3,713.47	24,188.31

EPA Tanks 4.09d Output Files
for Unit ID 22004 Annual Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22004	
City:	Albuquerque	
State:	New Mexico	
Company:	Kirtland AFB	
Type of Tank:	Horizontal Tank	
Description:	Gasoline fuel AST, Gov't East Service Station	

Tank Dimensions

Shell Length (ft):		27.00
Diameter (ft):		8.00
Volume (gallons):		10,000.00
Turnovers:		21.00
Net Throughput(gal/yr):		210,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22004 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22004 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	2,095.3779
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	210,000.0000
Annual Turnovers:	21.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	5,808.8495

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22004 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	2,095.38	3,713.47	5,808.85

EPA Tanks 4.09d Output Files
for Unit ID 22004 Potential Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22004
City:	Albuquerque
State:	New Mexico
Company:	Kirtland AFB
Type of Tank:	Horizontal Tank
Description:	Gasoline fuel AST, Gov't East Service Station

Tank Dimensions

Shell Length (ft):	27.00
Diameter (ft):	8.00
Volume (gallons):	10,000.00
Turnovers:	1,051.20
Net Throughput(gal/yr):	10,512,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22004 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 13)	All	58.54	51.41	65.66	56.17	6.7593	5.9014	7.7134	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22004 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	3,713.4716
Vapor Space Volume (cu ft):	864.4382
Vapor Density (lb/cu ft):	0.0754
Vapor Space Expansion Factor:	0.3800
Vented Vapor Saturation Factor:	0.4110
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	864.4382
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	16.5879
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	27.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0754
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.3800
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.8120
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	5.9014
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.7134
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.4110
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	6.7593
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	20,474.8358
Vapor Molecular Weight (lb/lb-mole):	62.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	6.7593
Annual Net Throughput (gal/yr.):	10,512,000.0000
Annual Turnovers:	1,051.2000
Turnover Factor:	0.1952
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	24,188.3074

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22004 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 13)	20,474.84	3,713.47	24,188.31

EPA Tanks 4.09d Output Files
for Unit ID 22015 Annual Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22015
City:	Albuquerque
State:	New Mexico
Company:	Kirtland AFB
Type of Tank:	Horizontal Tank
Description:	E85 Tank at Gov't East Service Station

Tank Dimensions

Shell Length (ft):		28.60
Diameter (ft):		8.00
Volume (gallons):		10,000.00
Turnovers:		51.00
Net Throughput(gal/yr):		510,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22015 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
E-85 Fuel	All	58.54	51.41	65.66	56.17	7.9326	6.9456	9.0274	68.0000			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22015 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	6,459.2274
Vapor Space Volume (cu ft):	915.6642
Vapor Density (lb/cu ft):	0.0970
Vapor Space Expansion Factor:	0.5343
Vented Vapor Saturation Factor:	0.3729
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	915.6642
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	17.0723
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	28.6000
Vapor Density	
Vapor Density (lb/cu ft):	0.0970
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.9326
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.5343
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	2.0818
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.9326
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	6.9456
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	9.0274
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3729
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	7.9326
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	4,944.6540
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.9326
Annual Net Throughput (gal/yr.):	510,000.0000
Annual Turnovers:	51.0000
Turnover Factor:	0.7549
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	11,403.8814

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22015 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
E-85 Fuel	4,944.65	6,459.23	11,403.88

EPA Tanks 4.09d Output Files
for Unit ID 22015 Potential Emissions

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	22015
City:	Albuquerque
State:	New Mexico
Company:	Kirtland AFB
Type of Tank:	Horizontal Tank
Description:	E85 Tank at Gov't East Service Station

Tank Dimensions

Shell Length (ft):	28.60
Diameter (ft):	8.00
Volume (gallons):	10,000.00
Turnovers:	1,051.20
Net Throughput(gal/yr):	10,512,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

22015 - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
E-85 Fuel	All	58.54	51.41	65.66	56.17	7.9326	6.9456	9.0274	68.0000			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

22015 - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	6,459.2274
Vapor Space Volume (cu ft):	915.6642
Vapor Density (lb/cu ft):	0.0970
Vapor Space Expansion Factor:	0.5343
Vented Vapor Saturation Factor:	0.3729
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	915.6642
Tank Diameter (ft):	8.0000
Effective Diameter (ft):	17.0723
Vapor Space Outage (ft):	4.0000
Tank Shell Length (ft):	28.6000
Vapor Density	
Vapor Density (lb/cu ft):	0.0970
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.9326
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700

Daily Total Solar Insulation	
Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.5343
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	2.0818
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	7.9326
Vapor Pressure at Daily Minimum Liquid	
Surface Temperature (psia):	6.9456
Vapor Pressure at Daily Maximum Liquid	
Surface Temperature (psia):	9.0274
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3729
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	7.9326
Vapor Space Outage (ft):	4.0000
Working Losses (lb):	26,354.3637
Vapor Molecular Weight (lb/lb-mole):	68.0000
Vapor Pressure at Daily Average Liquid	
Surface Temperature (psia):	7.9326
Annual Net Throughput (gal/yr.):	10,512,000.0000
Annual Turnovers:	1,051.2000
Turnover Factor:	0.1952
Tank Diameter (ft):	8.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	32,813.5910

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

22015 - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
E-85 Fuel	26,354.36	6,459.23	32,813.59

Emission Estimates

Permit 3101-RV1 – 898 Munition Squadron

Emission Unit IDs

19014, 14014, 25017, 15008

Summary of Criteria Emissions
for Kirtland AFB 898th Munitions Squadron

Process Equipment Unit No.	Emission Source	Potential Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 27497, Unit ID 14014	2.25	2.68	0.68	0.016	0.20	0.20	0.20
2	Emergency Generator, Bldg 27497, Unit ID 19014	20.20	76.04	2.14	0.036	2.38	2.38	2.38
3	Gasoline Service Station, Building 27497, Unit IDs 15008 and 25017	0.00	0.00	52.56	0.00	0.00	0.00	0.00
	Total	**22.45**	**78.72**	**55.38**	**0.052**	**2.58**	**2.58**	**2.58**

Process Equipment Unit No.	Emission Source	Annual Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 27497, Unit ID 14014	2.25	2.68	0.68	0.016	0.20	0.20	0.20
2	Emergency Generator, Bldg 27497, Unit ID 19014	0.46	1.74	0.049	0.00082	0.054	0.054	0.054
3	Gasoline Service Station, Building 27497, Unit IDs 15008 and 25017	0.00	0.00	0.20	0.00	0.00	0.00	0.00
	Total	**2.71**	**4.42**	**0.93**	**0.017**	**0.25**	**0.25**	**0.25**

Summary of Worst-Case Boiler Emissions
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 27497 (Unit ID 14014)
Process Equipment Unit No. 1

Boiler

6,250,000 Btu/hour

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 1)	**0.51**	**2.25**	**2.25**
Nitrogen Oxides	AP-42 EF (Sheet 1)	**0.61**	**2.68**	**2.68**
Particulate Matter	AP-42 EF (Sheet 1)	**0.047**	**0.20**	**0.20**
Particulate Matter <10μm	AP-42 EF (Sheet 1)	**0.047**	**0.20**	**0.20**
Particulate Matter <2.5μm	AP-42 EF (Sheet 1)	**0.047**	**0.20**	**0.20**
Sulfur Oxides	AP-42 EF (Sheet 1)	**0.0037**	**0.016**	**0.016**
Volatile Organic Compounds	Manufacturer EF (Sheet 2)	**0.16**	**0.68**	**0.68**

The boiler operates a maximum of 8,760 hours per year and is powered by natural gas

[1] Worst-Case Data Source Explanations:
AP-42 EF (Sheet 1) : Emission calculations were performed using AP-42 Emission Factors
Manufacturer EF (Sheet 2) : Emission calculations were performed using Manufacturer Emission Factors

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 8,760 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Sheet 1 - AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 27497 (Unit ID 14014)
Process Equipment Unit No. 1

Boiler
6,250,000 Btu/hour
1,020 Btu/scf Heating Value of Natural Gas[1]
8,760 Annual Hours of Operation

Criteria Air Pollutants	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors (lb/MMBtu)[3]	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	84.0	0.0824	**0.51**	**2.25**	**2.25**
Nitrogen Oxides	100.0	0.0980	**0.61**	**2.68**	**2.68**
Particulate Matter	7.6	0.0075	**0.047**	**0.20**	**0.20**
Particulate Matter <10μm[7]	7.6	0.0075	**0.047**	**0.20**	**0.20**
Particulate Matter <2.5μm[8]	7.6	0.0075	**0.047**	**0.20**	**0.20**
Sulfur Oxides	0.6	0.0006	**0.0037**	**0.016**	**0.016**
Volatile Organic Compounds	5.5	0.0054	**0.034**	**0.15**	**0.15**

The boiler operates a maximum of 8,760 hours per year and is powered by natural gas

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-1, 1.4-2 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 8,760

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

Sheet 2 - Manufacturer Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 27497 (Unit ID 14014)
Process Equipment Unit No. 1

Boiler

6,250,000 Btu/hour

1,020 Btu/scf Heating Value of Natural Gas[1]

8,760 Annual Hours of Operation

Criteria Air Pollutants	Manufacturer Emission Factors (lb/MMBtu)	Hourly Emissions[2] (lb/hr)	Maximum Anticipated Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	0.037	**0.23**	**1.01**	**1.01**
Nitrogen Oxides	0.088	**0.55**	**2.41**	**2.41**
Particulate Matter	0.0048	**0.030**	**0.13**	**0.13**
Particulate Matter <10μm[5]	0.0048	**0.030**	**0.13**	**0.13**
Particulate Matter <2.5μm[6]	0.0048	**0.030**	**0.13**	**0.13**
Sulfur Oxides[7]	0.00	**0.00**	**0.00**	**0.00**
Volatile Organic Compounds[8]	0.025	**0.16**	**0.68**	**0.68**

The boiler operates a maximum of 8,760 hours per year and is powered by natural gas

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[3] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 8,760

[4] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[5,6] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[7] The following manufacturer-provided equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.05 * S
where: S = Percent sulfur by weight in fuel (Neglible from AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels)

[8] Volatile Organic Compounds assumed to be equal to Hydrocarbons (HC)

AP-42 Emission Factors
Hazardous Air Pollutant (HAP) Emission Estimation Spreadsheet
Natural Gas Boiler at Building 27497 (Unit ID 14014)
Process Equipment Unit No. 1

Boiler
6,250,000 Btu/hour
1,020 Btu/scf Heating Value of Natural Gas[1]
8,760 Annual Hours of Operation

Hazardous Air Pollutants	CAS No.	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors[3] (lb/MMBtu)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
2-Methylnaphthalene[7]	91-57-6	2.40E-05	2.35E-08	**1.47E-07**	**6.44E-07**	**6.44E-07**
3-Methylchloranthrene[7,9]	56-49-5	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
7,12-Dimethylbenz(a)anthracene[7,9]	57-97-6	1.60E-05	1.57E-08	**9.80E-08**	**4.29E-07**	**4.29E-07**
Acenaphthene[7,9]	83-32-9	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Acenaphthylene[7,9]	208-96-8	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Anthracene[7,9]	120-12-7	2.40E-06	2.35E-09	**1.47E-08**	**6.44E-08**	**6.44E-08**
Arsenic[8]	7440-38-2	2.00E-04	1.96E-07	**1.23E-06**	**5.37E-06**	**5.37E-06**
Benz(a)anthracene[7,9]	56-55-3	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Benzene	71-43-2	2.10E-03	2.06E-06	**1.29E-05**	**5.64E-05**	**5.64E-05**
Benzo(a)pyrene[7,9]	50-32-8	1.20E-06	1.18E-09	**7.35E-09**	**3.22E-08**	**3.22E-08**
Benzo(b)fluoranthene[7,9]	205-99-2	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Benzo(g,h,i)perylene[7,9]	191-24-2	1.20E-06	1.18E-09	**7.35E-09**	**3.22E-08**	**3.22E-08**
Benzo(k)fluoranthene[7,9]	207-08-9	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Beryllium[8,9]	7440-41-7	1.20E-05	1.18E-08	**7.35E-08**	**3.22E-07**	**3.22E-07**
Cadmium[8]	7440-43-9	1.10E-03	1.08E-06	**6.74E-06**	**2.95E-05**	**2.95E-05**
Chromium[8]	7440-47-3	1.40E-03	1.37E-06	**8.58E-06**	**3.76E-05**	**3.76E-05**
Chrysene[7,9]	218-01-9	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Cobalt[8]	7440-48-4	8.40E-05	8.24E-08	**5.15E-07**	**2.25E-06**	**2.25E-06**
Dibenzo(a,h)anthracene[7,9]	53-70-3	1.20E-06	1.18E-09	**7.35E-09**	**3.22E-08**	**3.22E-08**
Dichlorobenzene	25321-22-6	1.20E-03	1.18E-06	**7.35E-06**	**3.22E-05**	**3.22E-05**
Fluoranthene[7]	206-44-0	3.00E-06	2.94E-09	**1.84E-08**	**8.05E-08**	**8.05E-08**
Fluorene[7]	86-73-7	2.80E-06	2.75E-09	**1.72E-08**	**7.51E-08**	**7.51E-08**
Formaldehyde	50-00-0	7.50E-02	7.35E-05	**4.60E-04**	**2.01E-03**	**2.01E-03**
Hexane	110-54-3	1.80E+00	1.76E-03	**1.10E-02**	**4.83E-02**	**4.83E-02**
Indeno(1,2,3-cd)pyrene[7,9]	193-39-5	1.80E-06	1.76E-09	**1.10E-08**	**4.83E-08**	**4.83E-08**
Lead	7439-92-1	5.00E-04	4.90E-07	**3.06E-06**	**1.34E-05**	**1.34E-05**
Manganese[8]	7439-96-5	3.80E-04	3.73E-07	**2.33E-06**	**1.02E-05**	**1.02E-05**
Mercury[8]	7439-97-6	2.60E-04	2.55E-07	**1.59E-06**	**6.98E-06**	**6.98E-06**
Naphthalene	91-20-3	6.10E-04	5.98E-07	**3.74E-06**	**1.64E-05**	**1.64E-05**
Nickel[8]	7440-02-0	2.10E-03	2.06E-06	**1.29E-05**	**5.64E-05**	**5.64E-05**
Phenanathrene[7]	85-01-8	1.70E-05	1.67E-08	**1.04E-07**	**4.56E-07**	**4.56E-07**
Pyrene[7]	129-00-0	5.00E-06	4.90E-09	**3.06E-08**	**1.34E-07**	**1.34E-07**
Selenium[8,9]	7782-49-2	2.40E-05	2.35E-08	**1.47E-07**	**6.44E-07**	**6.44E-07**
Toluene	108-88-3	3.40E-03	3.33E-06	**2.08E-05**	**9.13E-05**	**9.13E-05**
Total POM[10]		8.82E-05	8.65E-08	**5.40E-07**	**2.37E-06**	**2.37E-06**
Total HAP				**1.16E-02**	**5.07E-02**	**5.07E-02**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 8,760

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7] Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-3 (July 1998).

[8] Metals from natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-4 (July 1998).

[9] All emission factors where the value was less than, i.e., <1, a conservative approach was used and the value shown was used, i.e., 1.

[10] Total POM is not in the sum because individual constituents are already accounted for.

Summary of Worst-Case Generator Emissions
Criteria Pollutant Emission Estimation Spreadsheet
Emergency Generator at Building 27497 (Unit ID 19014)
Process Equipment Unit No. 2

Generator

775 hp

Criteria Air Pollutants	Worst-Case Data Source[1]	Hourly Emissions[2] (lb/hr)	Annual Emissions[3] (ton/yr)	PTE[4] (ton/yr)
Carbon Monoxide	AP-42 EF (Sheet 1)	4.61	0.46	20.20
Nitrogen Oxides	AP-42 EF (Sheet 1)	17.36	1.74	76.04
Particulate Matter	AP-42 EF (Sheet 1)	0.54	0.05	2.38
Particulate Matter <10μm	AP-42 EF (Sheet 1)	0.54	0.05	2.38
Particulate Matter <2.5μm	AP-42 EF (Sheet 1)	0.54	0.05	2.38
Sulfur Oxides	AP-42 EF (Sheet 1)	0.0082	0.00082	0.036
Volatile Organic Compounds	AP-42 EF (Sheet 1)	0.49	0.05	2.14

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Worst-Case Data Source Explanations:

AP-42 EF (Sheet 1) : Emission calculations were performed using AP-42 Emission Factors.

Manufacturer EF (Sheet 2) : Manufacturer emission factors were not available.

[2] Refer to calculations on specific sheet for emission calculation methodology.

[3] Annual emissions are based on 200 hours of operation per year.
Refer to calculations on specific sheet for emission calculation methodology.

[4] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Sheet 1 - AP-42 Emission Factors, Calculated Fuel Flow
Criteria Pollutant Emission Estimation Spreadsheet
Emergency Generator at Building 27497 (Unit ID 19014)
Process Equipment Unit No. 2

Generator

775 hp

200 Annual Hours of Operation

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.85	39.6	137000	4.61	0.46	20.20
Nitrogen Oxides	3.2	39.6	137000	17.36	1.74	76.04
Particulate Matter	0.1	39.6	137000	0.54	0.054	2.38
Particulate Matter <10μm[7]	0.1	39.6	137000	0.54	0.054	2.38
Particulate Matter <2.5μm[8]	0.1	39.6	137000	0.54	0.054	2.38
Sulfur Oxides[9]	**0.0015**	39.6	137000	**0.0082**	**0.00082**	**0.036**
Volatile Organic Compounds[10]	0.09	39.6	137000	0.49	0.049	2.14

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.4 Large Stationary Diesel and all Stationary Dual-fuel Engines, Table 3.4-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

[9] The following equation was used to calculate the sulfur oxides emission factor:
Sulfur oxides emission factor = 1.01 * S
where: S = Percent sulfur in diesel fuel (Kirtland Air Force Base Standard of **0.0015%**)

[10] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Sheet 2 - Manufacturer Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Emergency Generator at Building 27497 (Unit ID 19014)
Process Equipment Unit No. 2

Manufacturer Emission Factors Not Available

AP-42 Emission Methodology
VOC Emission Estimation Spreadsheet
Gasoline Service Station at Building 27497 (Unit IDs 15008 and 25017)
Process Equipment Unit No. 3

VOC Emissions from Gasoline Storage and Dispensing

10 Nozzle Dispensing Rate[1] (gal/min)

20,000 Annual Throughput[2] (gal/yr)

Loss Category	VOC Emission Factor[3] (lb/1000-gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	Potential to Emit VOC[6] (ton/yr)
UST Filling[7]	7.30	4.38	0.073	19.18
UST Breathing & Emptying	1.00	0.60	0.010	2.63
Displacement Losses from Vehicle Fueling[8]	11.00	6.60	0.11	28.91
Spillage during Vehicle Fueling	0.70	0.42	0.007	1.84
Total Loss from Vehicle Fueling	**20.0**	**12.00**	**0.20**	**52.56**

[1] Nozzle dispensing rate based on the standard rate specified by 40 CFR 80.22 (j).

[2] Annual requested throughput.

[3] Emission factors (EF) are from AP-42 Section 5.2: Transportation and Marketing of Petroleum Liquids, Table 5.2-7 (June 2008).

[4] The following equation was used to calculate hourly emissions:
Hourly Emissions (lb/hr) = VOC Emission Factor (lbs/1000-gal) * Nozzle Dispensing Rate (gal/min) * 60 (min/hr) / 1000

[5] The following equation was used to calculate annual emissions:
Annual emissions (ton/yr) = Annual Throughput (gal/yr) / 1000 * VOC Emission Factor (lb/1000-gal) / 2000 (lbs/ton)

[6] Potential to emit (PTE) was calculated based on the number of hours in a year (8760 hours per year)
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] EF for UST Filling is for unbalanced, submerged filling.

[8] EF for Displacement Losses is for uncontrolled losses.

Emission Estimates

Permit 3102 – Airfield Operations (SR)

Emission Unit IDs

14168, 14169, 19140

Summary of Criteria Emissions for Kirtland AFB Airfield Operations

Process Equipment Unit No.	Emission Source	Potential Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 334, ID 14168	1.89	2.25	0.12	0.013	0.17	0.17	0.17
2	Boiler, Bldg 334, ID 14169	1.89	2.25	0.12	0.013	0.17	0.17	0.17
3	Emergency Generator, Building 334, ID 19140	2.97	13.79	1.09	0.91	0.97	0.97	0.97
	Total	**6.74**	**18.28**	**1.34**	**0.93**	**1.31**	**1.31**	**1.31**

Process Equipment Unit No.	Emission Source	Annual Emissions (lb/hr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 334, ID 14168	0.43	0.51	0.03	0.003	0.04	0.04	0.04
2	Boiler, Bldg 334, ID 14169	0.43	0.51	0.03	0.003	0.04	0.04	0.04
3	Emergency Generator, Building 334, ID 19140	0.68	3.15	0.25	0.21	0.22	0.22	0.22
	Total	**1.54**	**4.17**	**0.31**	**0.21**	**0.30**	**0.30**	**0.30**

Process Equipment Unit No.	Emission Source	Annual Emissions (ton/yr)						
		Carbon Monoxide	Nitrogen Oxides	Volatile Organic Compounds	Sulfur Oxides	Particulate Matter	Particulate Matter <10μm	Particulate Matter <2.5μm
1	Boiler, Bldg 334, ID 14168	1.26	1.50	0.08	0.009	0.11	0.11	0.11
2	Boiler, Bldg 334, ID 14169	1.26	1.50	0.08	0.009	0.11	0.11	0.11
3	Emergency Generator, Building 334, ID 19140	0.07	0.31	0.02	0.02	0.02	0.02	0.02
	Total	**2.58**	**3.31**	**0.19**	**0.04**	**0.25**	**0.25**	**0.25**

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 334 (Unit ID 14168)
Process Equipment Unit No. 1

Boiler

5,230,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Criteria Air Pollutants	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors (lb/MMBtu)[3]	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	84	0.082	**0.43**	**1.26**	**1.89**
Nitrogen Oxides	100	0.098	**0.51**	**1.50**	**2.25**
Particulate Matter	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <10µm[7]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <2.5µm[8]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Sulfur Oxides	0.6	0.00059	**0.0031**	**0.0090**	**0.013**
Volatile Organic Compounds	5.5	0.0054	**0.028**	**0.082**	**0.12**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-1, 1.4-2 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7,8] Assume Particulate Matter <2.5µm and Particulate Matter <10µm equal Particulate Matter.

AP-42 Emission Factors
Hazardous Air Pollutant (HAP) Emission Estimation Spreadsheet
Natural Gas Boiler at Building 334 (Unit ID 14168)
Process Equipment Unit No. 1

Boiler

5,230,000 Btu/Hour

1,020 Btu/scf Heating Value of Natural Gas[1]

5,832 Annual Hours of Operation (1 Oct - 31 May)

Hazardous Air Pollutants	CAS No.	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors[3] (lb/MMBtu)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
2-Methylnaphthalene[7]	91-57-6	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
3-Methylchloranthrene[7, 9]	56-49-5	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
7,12-Dimethylbenz(a)anthracene[7, 9]	57-97-6	1.6E-05	1.6E-08	**8.2E-08**	**2.4E-07**	**3.6E-07**
Acenaphthene[7, 9]	83-32-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Acenaphthylene[7, 9]	208-96-8	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Anthracene[7, 9]	120-12-7	2.4E-06	2.4E-09	**1.2E-08**	**3.6E-08**	**5.4E-08**
Arsenic[8]	7440-38-2	2.0E-04	2.0E-07	**1.0E-06**	**3.0E-06**	**4.5E-06**
Benz(a)anthracene[7, 9]	56-55-3	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Benzene	71-43-2	2.1E-03	2.1E-06	**1.1E-05**	**3.1E-05**	**4.7E-05**
Benzo(a)pyrene[7, 9]	50-32-8	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(b)fluoranthene[7, 9]	205-99-2	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Benzo(g,h,i)perylene[7, 9]	191-24-2	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(k)fluoranthene[7, 9]	207-08-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Beryllium[8, 9]	7440-41-7	1.2E-05	1.2E-08	**6.2E-08**	**1.8E-07**	**2.7E-07**
Cadmium[8]	7440-43-9	1.1E-03	1.1E-06	**5.6E-06**	**1.6E-05**	**2.5E-05**
Chromium[8]	7440-47-3	1.4E-03	1.4E-06	**7.2E-06**	**2.1E-05**	**3.1E-05**
Chrysene[7, 9]	218-01-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Cobalt[8]	7440-48-4	8.4E-05	8.2E-08	**4.3E-07**	**1.3E-06**	**1.9E-06**
Dibenzo(a,h)anthracene[7, 9]	53-70-3	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Dichlorobenzene	25321-22-6	1.2E-03	1.2E-06	**6.2E-06**	**1.8E-05**	**2.7E-05**
Fluoranthene[7]	206-44-0	3.0E-06	2.9E-09	**1.5E-08**	**4.5E-08**	**6.7E-08**
Fluorene[7]	86-73-7	2.8E-06	2.7E-09	**1.4E-08**	**4.2E-08**	**6.3E-08**
Formaldehyde	50-00-0	7.5E-02	7.4E-05	**3.8E-04**	**1.1E-03**	**1.7E-03**
Hexane	110-54-3	1.8E+00	1.8E-03	**9.2E-03**	**2.7E-02**	**4.0E-02**
Indeno(1,2,3-cd)pyrene[7, 9]	193-39-5	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Lead	7439-92-1	5.0E-04	4.9E-07	**2.6E-06**	**7.5E-06**	**1.1E-05**
Manganese[8]	7439-96-5	3.8E-04	3.7E-07	**1.9E-06**	**5.7E-06**	**8.5E-06**
Mercury[8]	7439-97-6	2.6E-04	2.5E-07	**1.3E-06**	**3.9E-06**	**5.8E-06**
Naphthalene	91-20-3	6.1E-04	6.0E-07	**3.1E-06**	**9.1E-06**	**1.4E-05**
Nickel[8]	7440-02-0	2.1E-03	2.1E-06	**1.1E-05**	**3.1E-05**	**4.7E-05**
Phenanathrene[7]	85-01-8	1.7E-05	1.7E-08	**8.7E-08**	**2.5E-07**	**3.8E-07**
Pyrene[7]	129-00-0	5.0E-06	4.9E-09	**2.6E-08**	**7.5E-08**	**1.1E-07**
Selenium[8, 9]	7782-49-2	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
Toluene	108-88-3	3.4E-03	3.3E-06	**1.7E-05**	**5.1E-05**	**7.6E-05**
Total POM[10]		8.8E-05	8.6E-08	**4.5E-07**	**1.3E-06**	**2.0E-06**
Total HAP				**9.7E-03**	**2.8E-02**	**4.2E-02**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7] Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-3 (July 1998).

[8] Metals from natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-4 (July 1998).

[9] All emission factors where the value was less than, i.e., <1, a conservative approach was used and the value shown was used, i.e., 1.

[10] Total POM is not in the sum because individual constituents are already accounted for.

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Natural Gas Boiler at Building 334 (Unit ID 14169)
Process Equipment Unit No. 2

Boiler

5,230,000 Btu/Hour
1,020 Btu/scf Heating Value of Natural Gas[1]
5,832 Annual Hours of Operation (1 Oct - 31 May)

Criteria Air Pollutants	AP-42 Emission Factors[2] ($lb/10^6$ scf)	Emission Factors (lb/MMBtu)[3]	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	84	0.082	**0.43**	**1.26**	**1.89**
Nitrogen Oxides	100	0.098	**0.51**	**1.50**	**2.25**
Particulate Matter	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <10μm[7]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Particulate Matter <2.5μm[8]	7.6	0.0075	**0.039**	**0.11**	**0.17**
Sulfur Oxides	0.6	0.00059	**0.0031**	**0.0090**	**0.013**
Volatile Organic Compounds	5.5	0.0054	**0.028**	**0.082**	**0.12**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-1, 1.4-2 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from $lb/10^6$ scf to lb/MMBtu.
EF (lb/MMBtu) = EF ($lb/10^6$ scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8,760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter <10μm equal Particulate Matter.

AP-42 Emission Factors
Hazardous Air Pollutant (HAP) Emission Estimation Spreadsheet
Natural Gas Boiler at Building 334 (Unit ID 14169)
Process Equipment Unit No. 2

Boiler
5,230,000 Btu/Hour
1,020 Btu/scf Heating Value of Natural Gas[1]
5,832 Annual Hours of Operation (1 Oct - 31 May)

Hazardous Air Pollutants	CAS No.	AP-42 Emission Factors[2] (lb/10^6 scf)	Emission Factors[3] (lb/MMBtu)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
2-Methylnaphthalene[7]	91-57-6	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
3-Methylchloranthrene[7, 9]	56-49-5	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
7,12-Dimethylbenz(a)anthracene[7, 9]	57-97-6	1.6E-05	1.6E-08	**8.2E-08**	**2.4E-07**	**3.6E-07**
Acenaphthene[7, 9]	83-32-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Acenaphthylene[7, 9]	208-96-8	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Anthracene[7, 9]	120-12-7	2.4E-06	2.4E-09	**1.2E-08**	**3.6E-08**	**5.4E-08**
Arsenic[8]	7440-38-2	2.0E-04	2.0E-07	**1.0E-06**	**3.0E-06**	**4.5E-06**
Benz(a)anthracene[7, 9]	56-55-3	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Benzene	71-43-2	2.1E-03	2.1E-06	**1.1E-05**	**3.1E-05**	**4.7E-05**
Benzo(a)pyrene[7, 9]	50-32-8	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(b)fluoranthene[7, 9]	205-99-2	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Benzo(g,h,i)perylene[7, 9]	191-24-2	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Benzo(k)fluoranthene[7, 9]	207-08-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Beryllium[8, 9]	7440-41-7	1.2E-05	1.2E-08	**6.2E-08**	**1.8E-07**	**2.7E-07**
Cadmium[8]	7440-43-9	1.1E-03	1.1E-06	**5.6E-06**	**1.6E-05**	**2.5E-05**
Chromium[8]	7440-47-3	1.4E-03	1.4E-06	**7.2E-06**	**2.1E-05**	**3.1E-05**
Chrysene[7, 9]	218-01-9	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Cobalt[8]	7440-48-4	8.4E-05	8.2E-08	**4.3E-07**	**1.3E-06**	**1.9E-06**
Dibenzo(a,h)anthracene[7, 9]	53-70-3	1.2E-06	1.2E-09	**6.2E-09**	**1.8E-08**	**2.7E-08**
Dichlorobenzene	25321-22-6	1.2E-03	1.2E-06	**6.2E-06**	**1.8E-05**	**2.7E-05**
Fluoranthene[7]	206-44-0	3.0E-06	2.9E-09	**1.5E-08**	**4.5E-08**	**6.7E-08**
Fluorene[7]	86-73-7	2.8E-06	2.7E-09	**1.4E-08**	**4.2E-08**	**6.3E-08**
Formaldehyde	50-00-0	7.5E-02	7.4E-05	**3.8E-04**	**1.1E-03**	**1.7E-03**
Hexane	110-54-3	1.8E+00	1.8E-03	**9.2E-03**	**2.7E-02**	**4.0E-02**
Indeno(1,2,3-cd)pyrene[7, 9]	193-39-5	1.8E-06	1.8E-09	**9.2E-09**	**2.7E-08**	**4.0E-08**
Lead	7439-92-1	5.0E-04	4.9E-07	**2.6E-06**	**7.5E-06**	**1.1E-05**
Manganese[8]	7439-96-5	3.8E-04	3.7E-07	**1.9E-06**	**5.7E-06**	**8.5E-06**
Mercury[8]	7439-97-6	2.6E-04	2.5E-07	**1.3E-06**	**3.9E-06**	**5.8E-06**
Naphthalene	91-20-3	6.1E-04	6.0E-07	**3.1E-06**	**9.1E-06**	**1.4E-05**
Nickel[8]	7440-02-0	2.1E-03	2.1E-06	**1.1E-05**	**3.1E-05**	**4.7E-05**
Phenanathrene[7]	85-01-8	1.7E-05	1.7E-08	**8.7E-08**	**2.5E-07**	**3.8E-07**
Pyrene[7]	129-00-0	5.0E-06	4.9E-09	**2.6E-08**	**7.5E-08**	**1.1E-07**
Selenium[8, 9]	7782-49-2	2.4E-05	2.4E-08	**1.2E-07**	**3.6E-07**	**5.4E-07**
Toluene	108-88-3	3.4E-03	3.3E-06	**1.7E-05**	**5.1E-05**	**7.6E-05**
Total POM[10]		8.8E-05	8.6E-08	**4.5E-07**	**1.3E-06**	**2.0E-06**
Total HAP				**9.7E-03**	**2.8E-02**	**4.2E-02**

[1] The heating value (HV) of natural gas is given in AP-42 Section 1.4.1 Natural Gas Combustion, General (July 1998) as 1,020 Btu/scf.

[2] Emission factors from EPA AP-42 Section 1.4 Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4 (July 1998).

[3] The following equation was used to convert the AP-42 emission factors from lb/10^6 scf to lb/MMBtu.
EF (lb/MMBtu) = EF (lb/10^6 scf) / Heating value of natural gas (BTU/scf)
where: EF = Emission Factor

[4] The following equation was used to estimate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MMBtu) * (Btu Rating (Btu/hr) / 1,000,000)
where: EF = Emission Factor

[5] The following equation was used to estimate annual emissions for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * Annual hours (hrs/yr) / 2,000 (lb/ton)
where: Annual hours = 5,832

[6] Potential to Emit (PTE) was estimated based on the number of hours in a year (8760 hours per year).
The following equation was used to estimate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8,760 (hrs/yr) / 2,000 (lb/ton)

[7] Polycyclic Organic Matter (POM) POM is a HAP as defined by Section 112(b) of the Clean Air Act from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-3 (July 1998).

[8] Metals from natural gas combustion from AP-42 Section 1.4 Natural Gas Combustion, Table 1.4-4 (July 1998).

[9] All emission factors where the value was less than, i.e., <1, a conservative approach was used and the value shown was used, i.e., 1.

[10] Total POM is not in the sum because individual constituents are already accounted for.

AP-42 Emission Factors, Calculated Fuel Flow
Emission Estimation Spreadsheet
Emergency Generator at Building 334 (Unit ID 19140)
Process Equipment Unit No. 3

Generator
102 hp
200 Annual Hours of Operation

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Maximum Anticipated Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	5.2	137000	**0.68**	**0.068**	**2.971**
Nitrogen Oxides	4.41	5.2	137000	**3.15**	**0.315**	**13.791**
Particulate Matter[7]	0.31	5.2	137000	**0.22**	**0.022**	**0.969**
Particulate Matter <10μm	0.31	5.2	137000	**0.22**	**0.022**	**0.969**
Particulate Matter <2.5μm[8]	0.31	5.2	137000	**0.22**	**0.022**	**0.969**
Sulfur Oxides	0.29	5.2	137000	**0.21**	**0.021**	**0.907**
Volatile Organic Compounds[9]	0.35	5.2	137000	**0.25**	**0.025**	**1.095**

The generator operates a maximum of 200 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996).

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Appendix A: Miscellaneous Data & Conversion Factors (September 1985), Typical Parameters of Various Fuels as 137,000 Btu/gal.

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7,8] Assume Particulate Matter <2.5μm and Particulate Matter equal Particulate Matter <10mm.

[9] Volatile Organic Compounds assumed to be Total Organic Compounds (TOC).

Emission Estimates

Permit 3128 – 58 SOW Bldg. 482 Paint Booth

Emission Unit ID

21004

Table C-1. Worst-Case Hourly and Potential Annual Emissions of VOC and Volatile HAPs							
Flow Rate[1] (gal/hr)	Maximum Density[2] (lb/gal)	Maximum Paint Usage[3] (lb/hr)	Pollutant	Maximum Pollutant Content[4] (wt. %)	Maximum Pollutant Emissions[5] (lb/hr)	Potential Hours of Operation (hr/yr)	Potential Uncontrolled Pollutant Emissions[6] (ton/yr)
3.0	12.10	36.3	VOC	100.0%	36.30	8760	158.99
3.0	12.10	36.3	Benzene	1.0%	0.36	8760	1.6
3.0	12.10	36.3	Cobalt 2-Ethylhexanoate	0.5%	0.18	8760	0.8
3.0	12.10	36.3	Diethylene Glycol Monobutyl Ether	1.0%	0.36	8760	1.6
3.0	12.10	36.3	Diethylene Glycol Monoethyl Ether	3.0%	1.09	8760	4.8
3.0	12.10	36.3	Diethylene Glycol Monomethyl Ether	5.0%	1.82	8760	7.9
3.0	12.10	36.3	Ethylbenzene	10.0%	3.63	8760	15.9
3.0	12.10	36.3	Ethylene Glycol	5.0%	1.82	8760	7.9
3.0	12.10	36.3	Ethylene Glycol Monopropyl Ether	20.0%	7.26	8760	31.8
3.0	12.10	36.3	Formaldehyde	1.0%	0.36	8760	1.6
3.0	12.10	36.3	Toluene	30.0%	10.89	8761	47.7
3.0	12.10	36.3	Xylene	100.0%	36.30	8760	159.0

[1] Flow rate based on maximum of one gun spraying at a time at an assumed 3.0 gal/hr per gun.

[2] Maximum density is based on the maximum density of all products.

[3] The following equation was used to calculate maximum paint usage:
Maximum Paint Usage (lb/hr) = Flow Rate (gal/hr) * Maximum Density (lb/gal)

[4] Maximum pollutant content obtained by evaluating all coatings listed on sheet "C-3" for the highest percentage by weight content of the constituent.

[5] The following equation was used to calculate maximum pollutant emissions for VOC and Volatile HAP:
Maximum Pollutant Emissions (lb/hr) = Maximum Paint Usage (lb/hr) * Maximum Pollutant Content (wt.%) / 100

[6] The following equation was used to calculate potential uncontrolled pollutant emissions:
Potential Uncontrolled Pollutant Emissions (ton/yr) = Maximum Pollutant Emissions (lb/hr) * Potential Hours of Operation (hr/yr) / 2000 (lb/ton)

Table C-2. Worst-Case Hourly and Potential Annual Emissions of Particulate Matter (PM) and Particulate HAPs

Flow Rate[1] (gal/hr)	Maximum Density[2] (lb/gal)	Maximum Paint Usage[3] (lb/hr)	Pollutant	Maximum Pollutant Content[4] (wt. %)	Transfer Efficiency[5] (%)	Control Efficiency[6] (%)	Maximum Uncontrolled Pollutant Emissions[7] (lb/hr)	Controlled Pollutant Emissions[8] (lb/hr)	Potential Hours of Operation (hr/yr)	Potential Uncontrolled Pollutant Emissions[9] (ton/yr)
3.0	12.10	36.3	PM	98.6%	65.0%	89.8%	12.53	1.28	8760	54.87
3.0	12.10	36.3	PM-10	98.6%	65.0%	89.8%	12.53	1.28	8760	54.87
3.0	12.10	36.3	PM-2.5	98.6%	65.0%	89.8%	12.53	1.28	8760	54.87
3.0	12.10	36.3	C.I. Pigment Red 3	10.0%	65.0%	89.8%	1.271	0.13	8760	5.56
3.0	12.10	36.3	Copper Phthalocyanine	1.4%	65.0%	89.8%	0.18	0.02	8760	0.78

[1] Flow rate based on maximum of one gun spraying at a time at an assumed 3.0 gal/hr per gun.

[2] Maximum density is based on the maximum density of all products.

[3] The following equation was used to calculate maximum paint usage:

Maximum Paint Usage (lb/hr) = Flow Rate (gal/hr) * Maximum Density (lb/gal)

[4] Maximum pollutant content obtained by evaluating all coatings listed on sheet "C-4" for the highest percentage by weight content of the constituent.

[5] Since most coatings are applied with an HVLP spray gun only, assumed a transfer efficiency of 65%.

[6] Paint filter control efficiencies for liquids were determined based on the manufacturer filter specifications included in Attachment I.

[7] The following equation was used to calculate maximum uncontrolled pollutant emissions for PM, PM-10, PM-2.5, and HAP:

Maximum Uncontrolled Pollutant Emissions (lb/hr) = Maximum Paint Usage (lb/hr) * [Maximum Pollutant Content (wt. %) / 100] * [1-Transfer Efficiency (% / 100)]

[8] The following equation was used to calculate controlled pollutant emissions for PM, PM-10, PM-2.5, and HAP:

Controlled Pollutant Emissions (lb/hr) = Maximum Uncontrolled Pollutant Emissions (lb/hr) * [1-Control Efficiency (% / 100)]

[9] The following equation was used to calculate potential uncontrolled pollutant emissions:

Potential Uncontrolled Pollutant Emissions (ton/yr) = Maximum Uncontrolled Pollutant Emissions (lb/hr) * Potential Hours of Operation (hr/yr) / 2000 (lb/ton)

Table C-3. Weight Percent and Annual Emissions of Volatiles from Each Paint

Material Used	National Stock Number (NSN)	Maximum Material Usage[1] (gal/yr)	Material Density[2] (lb/gal)	Maximum Material Usage[3] (lb/yr)	VOC[4] (lb/gal)	VOC[5] (ton/yr)	Benzene[6] (wt. %)	Benzene[7] (ton/yr)	Cobalt 2-Ethylhexanoate (wt. %)	Cobalt 2-Ethylhexanoate (ton/yr)	Diethylene Glycol Monobutyl Ether (wt. %)	Diethylene Glycol Monobutyl Ether (ton/yr)
Aerosol Paints/Primers												
Hard Hat Lspr - Flat Black	8010016003259	10	6.83	68	5.60	0.03						
Painters Touch Spray Paint - Deep Forest Green	8010P1919830	10	6.34	63	5.82	0.03						
Hard Hat LSPR Flat Black	8010P2178838	10	6.83	68	5.60	0.03						
Hard Hat Industrial Enamel Primer	8010P2182838	10	7.18	72	5.31	0.03						
Rustoleum Stops Rust Hammered Metal Finish - Light Blue	8010P7212830	10	6.26	63	6.00	0.03						
SS4004 Silicone Polymer	8010P7212830	10	6.68	67	5.81	0.03	1.00%	0.0003				
Hard Hat Lspr Gloss White	8010P7792	10	7.01	70	5.61	0.03						
Utilac High Gloss Metal And Wood Enamel	8010PUTILAC490	10	7.00	70	6.30	0.03			0.50%	0.0002		
Thinners/Reducers												
Klean-Strip Xylene	6810PXY24	10	7.18	72	7.18	0.04						
Activators												
Concrete Saver WB Epoxy Activator	8010P6001604	10	8.70	87	2.98	0.01						
Other												
Walk Way Type II Rough - Black	8010006410427	10	10.80	108	3.22	0.02						
Rustoleum Enamel Topcoat - Safety Yellow	801000D004815	10	9.01	90	3.34	0.02						
Behr 6730 Premium Plus Int/Ext Porch And Floor Base	8010P06730	10	8.35	83	0.83	0.004						
Regal Wall Satin	8010P16782154A	10	12.10	121	6.66	0.03						
DTM Acrylic Heavy Duty Primer 180-11	8010P18011	10	10.85	108	4.93	0.02					1.00%	0.0005
Painters Touch Topcoat - Flat Black	8010P1976730	10	9.86	99	1.59	0.008						
225 Minwax Wood Finish - Red Mahogany	8010P253682	10	7.18	72	4.23	0.02						
Clear Wood Finish Interior Semigloss	8010P27X2	10	7.52	75	5.61	0.03						
3210 Minwax In/Out Helmsman Spar Urethane SG	8010P3210	10	7.76	78	3.65	0.02						
Hp Industrial Enamel Topcoat - Flat Black	8010P412402	10	9.01	90	3.33	0.02						
Behr 4300 Premium Plus Exterior Flat Paint Deep Base	8010P4300	10	12.02	120	0.17	0.0008						
Behr 4560 Premium Plus Exterior Flat Pastel Base	8010P4560	10	12.00	120	0.40	0.002						
Behr 4670 Premium Plus Exterior Flat Accent Base	8010P4670	10	12.00	120	0.40	0.002						
Behr 4853 Premium Plus Ultra Exterior Flat Deep	8010P4853	10	12.02	120	0.17	0.0008						
Behr 5856 Premium Plus Ultra Semi Gloss Exterior Accent	8010P5856	10	10.00	100	0.54	0.003						
Concrete Saver WB Epoxy	8010P6082408	10	10.66	107	2.08	0.01						
Rustoleum Stops Rust Hammered Metal Finish - Blue	8010P7212-502	10	7.77	78	3.59	0.02						
Rustoleum Stops Rust Hammered Metal Finish - Gray	8010P7214502	10	8.35	83	7.87	0.04						
Rustoleum Stops Rust Hammered Metal Finish - Black	8010P7215504	10	8.35	83	7.88	0.04						
Rustoleum Stops Rust Enamel - Gloss Black	8010P7779504	10	8.74	87	4.17	0.02						
BR-56 Gel Stain - Jet Mahogany	8010P871944	10	7.50	75	4.27	0.02						
A100 Exterior Flat Latex - White	8010PA100	10	11.02	110	0.77	0.004						
Evermore Interior Latex Enamel Semi-Gloss	8010PHD6480	10	10.52	105	0.34	0.002						
Moorcraft Super Spec Latex House Paint - Flat Black	8010PVINYLATEX	10	11.10	111	7.22	0.04						
TOTAL		**340**		**3,045**		**0.67**		**0.0003**		**0.0002**		**0.0005**
								0.67 lb/yr		0.35 lb/yr		1.08 lb/yr

Material Used	Diethylene Glycol Monoethyl Ether (wt. %)	Diethylene Glycol Monoethyl Ether (ton/yr)	Diethylene Glycol Monomethyl Ether (wt. %)	Diethylene Glycol Monomethyl Ether (ton/yr)	Ethylbenzene (wt. %)	Ethylbenzene (ton/yr)	Ethylene Glycol (wt. %)	Ethylene Glycol (ton/yr)	Ethylene Glycol Monopropyl Ether (wt. %)	Ethylene Glycol Monopropyl Ether (ton/yr)	Formaldehyde (wt. %)	Formaldehyde (ton/yr)	Toluene (wt. %)	Toluene (ton/yr)	Xylene (wt. %)	Xylene (ton/yr)
Aerosol Paints/Primers																
Hard Hat Lspr - Flat Black					1.00%	0.0003							5.00%	0.002	5.00%	0.002
Painters Touch Spray Paint - Deep Forest Green					10.00%	0.003							10.00%	0.003	20.00%	0.006
Hard Hat LSPR Flat Black					1.00%	0.0003							5.00%	0.002	5.00%	0.002
Hard Hat Industrial Enamel Primer					5.00%	0.002									10.00%	0.004
Rustoleum Stops Rust Hammered Metal Finish - Light Blue					5.00%	0.002									10.00%	0.003
SS4004 Silicone Polymer													30.00%	0.01		
Hard Hat Lspr Gloss White					5.00%	0.002									10.00%	0.004
Utilac High Gloss Metal And Wood Enamel					0.50%	0.0002			15.00%	0.005			20.00%	0.007	5.00%	0.002
Thinners/Reducers																
Klean-Strip Xylene															100.00%	0.04
Activators																
Concrete Saver WB Epoxy Activator									20.00%	0.009	1.00%	0.0004				
Other																
Walk Way Type II Rough - Black													0.01%	0.000005	1.15%	0.0006
Rustoleum Enamel Topcoat - Safety Yellow																
Behr 6730 Premium Plus Int/Ext Porch And Floor Base							5.00%	0.002								
Regal Wall Satin																
DTM Acrylic Heavy Duty Primer 180-11	3.00%	0.002														
Painters Touch Topcoat - Flat Black			5.00%	0.002												
225 Minwax Wood Finish - Red Mahogany																
Clear Wood Finish Interior Semigloss					1.00%	0.0004									5.00%	0.002
3210 Minwax In/Out Helmsman Spar Urethane SG					0.30%	0.0001									1.00%	0.0004
Hp Industrial Enamel Topcoat - Flat Black																
Behr 4300 Premium Plus Exterior Flat Paint Deep Base																
Behr 4560 Premium Plus Exterior Flat Pastel Base																
Behr 4670 Premium Plus Exterior Flat Accent Base																
Behr 4853 Premium Plus Ultra Exterior Flat Deep																
Behr 5856 Premium Plus Ultra Semi Gloss Exterior Accent																
Concrete Saver WB Epoxy									10.00%	0.005						
Rustoleum Stops Rust Hammered Metal Finish - Blue					5.00%	0.002									5.00%	0.002
Rustoleum Stops Rust Hammered Metal Finish - Gray					5.00%	0.002									5.00%	0.002
Rustoleum Stops Rust Hammered Metal Finish - Black					5.00%	0.002									5.00%	0.002
Rustoleum Stops Rust Enamel - Gloss Black																
BR-56 Gel Stain - Jet Mahogany																
A100 Exterior Flat Latex - White							2.00%	0.001								
Evermore Interior Latex Enamel Semi-Gloss							5.00%	0.003								
Moorcraft Super Spec Latex House Paint - Flat Black																
TOTAL		**0.002**		**0.002**		**0.02**		**0.006**		**0.02**		**0.0004**		**0.02**		**0.07**
		3.25 lb/yr		4.93 lb/yr		31.50 lb/yr		11.64 lb/yr		38.55 lb/yr		0.87 lb/yr		47.21 lb/yr		133.24 lb/yr

Total VOC HAP **0.14** **tons/year**
273.29 lb/yr

[1] Maximum material usage (gal/yr) is based on historical recordkeeping logs and expected future use.

[2] Material density was supplied by the paint manufacturers in the Material Safety Data Sheets (MSDS).

[3] The following equation was used to calculate maximum material usage in pounds per year:
Maximum Material Usage (lb/yr) = Maximum Material Usage (gal/yr) * Material Density (lb/gal)

[4] VOC content was supplied by the paint manufacturers in the Material Safety Data Sheets (MSDS).

[5] The following equation was used to calculate maximum annual VOC emissions:
VOC (ton/yr) = Maximum Material Usage (gal/yr) * VOC Content (lb/gal) / 2,000 (lb/ton)

[6] All constituent weight percents were supplied by the paint manufacturers in the Material Safety Data Sheets (MSDS).

[7] The following equation was used to calculate maximum annual emissions for each volatile HAP:
Volatile HAP (ton/yr) = Maximum Material Usage (lb/yr) * (HAP Weight Percent / 100) / 2,000 (lb/ton)

Table C-4. Weight Percent and Annual Emissions of Particulates from Each Paint

Material Used	National Stock Number (NSN)	Transfer Efficiency[1] %	PM Control Efficiency[2] %	Maximum Material Usage[3] (gal/yr)	Material Density[4] (lb/gal)	Maximum Material Usage[5] (lb/yr)	Solids Content[6] (wt. %)	PM[7] (tons/year)	C.I. Pigment Red 3[8] (wt. %)	C.I. Pigment Red 3[9] (tons/year)	Copper Phthalocyanine (wt. %)	Copper Phthalocyanine (tons/year)
Aerosol Paints/Primers												
Hard Hat Lspr - Flat Black	8010016003259	30%	90%	10	6.83	68	18.00%	0.0004				
Painters Touch Spray Paint - Deep Forest Green	8010P1919830	30%	90%	10	6.34	63	8.30%	0.00019				
Hard Hat LSPR Flat Black	8010P2178838	30%	90%	10	6.83	68	18.02%	0.0004				
Hard Hat Industrial Enamel Primer	8010P2182838	30%	90%	10	7.18	72	26.05%	0.0007				
Rustoleum Stops Rust Hammered Metal Finish - Light Blue	8010P7212830	30%	90%	10	6.26	63	4.20%	0.00009				
SS4004 Silicone Polymer	8010P7212830	30%	90%	10	6.68	67	13.00%	0.0003				
Hard Hat Lspr Gloss White	8010P7792	30%	90%	10	7.01	70	20.00%	0.0005				
Utilac High Gloss Metal And Wood Enamel	8010PUTILAC490	30%	90%	10	7.00	70	10.00%	0.0003			1.40%	0.00004
Thinners/Reducers												
Klean-Strip Xylene	6810PXY24	65%	90%	10	7.18	72	0.10%	0.000001				
Activators												
Concrete Saver WB Epoxy Activator	8010P6001604	65%	90%	10	8.70	87	65.74%	0.001				
Other												
Walk Way Type II Rough - Black	8010006410427	65%	90%	10	10.80	108	70.18%	0.001				
Rustoleum Enamel Topcoat - Safety Yellow	801000D004815	65%	90%	10	9.01	90	62.90%	0.001	10.00%	0.0002		
Behr 6730 Premium Plus Int/Ext Porch And Floor Base	8010P06730	65%	90%	10	8.35	83	90.10%	0.001				
Regal Wall Satin	8010P16782154A	65%	90%	10	12.10	121	45.00%	0.001				
DTM Acrylic Heavy Duty Primer 180-11	8010P18011	65%	90%	10	10.85	108	54.60%	0.001				
Painters Touch Topcoat - Flat Black	8010P1976730	65%	90%	10	9.86	99	83.93%	0.001				
225 Minwax Wood Finish - Red Mahogany	8010P253682	65%	90%	10	7.18	72	41.00%	0.0005				
Clear Wood Finish Interior Semigloss	8010P27X2	65%	90%	10	7.52	75	25.43%	0.0003				
3210 Minwax In/Out Helmsman Spar Urethane SG	8010P3210	65%	90%	10	7.76	78	52.00%	0.0007				
Hp Industrial Enamel Topcoat - Flat Black	8010P412402	65%	90%	10	9.01	90	63.00%	0.001	10.00%	0.0002		
Behr 4300 Premium Plus Exterior Flat Paint Deep Base	8010P4300	65%	90%	10	12.02	120	98.61%	0.002				
Behr 4560 Premium Plus Exterior Flat Pastel Base	8010P4560	65%	90%	10	12.00	120	96.66%	0.002				
Behr 4670 Premium Plus Exterior Flat Accent Base	8010P4670	65%	90%	10	12.00	120	96.66%	0.002				
Behr 4853 Premium Plus Ultra Exterior Flat Deep	8010P4853	65%	90%	10	12.02	120	98.61%	0.002				
Behr 5856 Premium Plus Ultra Semi Gloss Exterior Accent	8010P5856	65%	90%	10	10.00	100	94.58%	0.002				
Concrete Saver WB Epoxy	8010P6082408	65%	90%	10	10.66	107	53.00%	0.001				
Rustoleum Stops Rust Hammered Metal Finish - Blue	8010P7212-502	65%	90%	10	7.77	78	53.81%	0.0007				
Rustoleum Stops Rust Hammered Metal Finish - Gray	8010P7214502	65%	90%	10	8.35	83	5.65%	0.00008				
Rustoleum Stops Rust Hammered Metal Finish - Black	8010P7215504	65%	90%	10	8.35	83	5.60%	0.00008				
Rustoleum Stops Rust Enamel - Gloss Black	8010P7779504	65%	90%	10	8.74	87	52.24%	0.0008				
BR-56 Gel Stain - Jet Mahogany	8010P871944	65%	90%	10	7.50	75	43.10%	0.0006				
A100 Exterior Flat Latex - White	8010PA100	65%	90%	10	11.02	110	93.00%	0.002				
Evermore Interior Latex Enamel Semi-Gloss	8010PHD6480	65%	90%	10	10.52	105	96.77%	0.002				
Moorcraft Super Spec Latex House Paint - Flat Black	8010PVINYLATEX	65%	90%	10	11.10	111	35.00%	0.0007				
TOTAL				**340**		**3,045**		**0.0316**		**0.0003**		**0.00004**
										0.65 lb/yr		0.07 lb/yr

Total PM HAP	**0.0003582**	**tons/year**
	0.72	lb/yr
Total VOC and PM HAP	**274.01**	**lb/yr**
	0.14	tons/yr

[1] Assumed that all coatings except aerosols are applied with an HVLP spray gun only, which has a transfer efficiency of 65%. A transfer efficiency of 30% was assumed for aerosol coatings.

[2] Paint filter control efficiencies for liquids were determined based on the manufacturer filter specifications included in Attachment I.

[3] Maximum material usage (gal/yr) is based on expected future use.

[4] Material density was supplied by the paint manufacturers in the Material Safety Data Sheets (MSDS).

[5] The following equation was used to calculate maximum material usage in pounds per year:
Maximum Material Usage (lb/yr) = Maximum Material Usage (gal/yr) * Material Density (lb/gal)

[6] The solids content was either provided in the MSDS or was calculated based on the following equation:
Solids Content (wt. %) = Material Density (lb/gal) - VOC (lb/gal) / Material Density (lb/gal)

[7] The following equation was used to calculate maximum annual PM emissions:
PM (ton/yr) = Maximum Material Usage (lb/yr) * [Solids Content (wt. %) / 100] * [1-Transfer Efficiency (% / 100)] * [1-Control Efficiency (% / 100)] / 2,000 (lb/ton)

[8] All constituent weight percents were supplied by the paint manufacturers in the Material Safety Data Sheets (MSDS).

[9] The following equation was used to calculate maximum annual emissions for each particulate HAP:
Particulate HAP (ton/yr) = Maximum Material Usage (lb/yr) * (HAP Weight Percent / 100) * [1-Transfer Efficiency (% / 100)] * [1-Control Efficiency (% / 100)] / 2,000 (lb/ton)

Emission Estimates

Permit 3129 – 58 SOW Generator at Bldg. 1017

Emission Unit ID

19031

Section 4.1 Potential Emission Rates (PER) or Uncontrolled Emissions (Unit ID 19031)

To calculate emissions in the table below, use the EPA Emission Factors (Given) OR Manufacturers Emission Factors in (lbs/Hp-hr) if available.
Note: Choose the factors (EPA or Manufacturers) that will generate the highest Lbs/Hr and Tons/Year emission rate for EACH aircontaminant.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Potential Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x	8,760	÷	2,000	=	
	NO_x	0.011		x		=		x	8,760	÷	2,000	=	
	VOC	0.015		x		=		x	8,760	÷	2,000	=	
	SO_x	0.000591		x		=		x	8,760	÷	2,000	=	
	*PM	0.000721		x		=		x	8,760	÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00838	x	355	=	2.974	x	8,760	÷	2,000	=	13.026
	NO_x	0.031	0.03549	x	355	=	12.600	x	8,760	÷	2,000	=	55.190
	VOC	0.00247	0.00110	x	355	=	0.877	x	8,760	÷	2,000	=	3.841
	SO_x	0.00205		x	355	=	0.728	x	8,760	÷	2,000	=	3.189
	*PM	0.0022		x	355	=	0.781	x	8,760	÷	2,000	=	3.421
Diesel > 600 Hp	CO	0.0055		x		=		x	8,760	÷	2,000	=	
	NO_x	0.024		x		=		x	8,760	÷	2,000	=	
	**VOC	0.000705		x		=		x	8,760	÷	2,000	=	
	***SO_x	0.003236		x		=		x	8,760	÷	2,000	=	
	*PM	0.0007		x		=		x	8,760	÷	2,000	=	

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.4 wt. % sulfur in diesel fuel = 0.003236.

Section 5.1 Controlled Emission Rates (Requested Permitted Allowable Rates) (Unit ID 19031)

If using the same emission factors as above to calculate the Controlled Emission Rates, start the table below by transferring the Emissions in Lbs/Hour from the column above and then complete the remainder of the equation starting with the Requested Operating Hours/Year.
Note: You may choose different factors for calculating Controlled Emission Rates, however the Engine must meet the Lbs/Hour rate given for each regulated air contaminant if performance testing is requested.

Engine Fuel Type	Pollutants	EPA Emission Factors (Lbs/ Hp–hour)	Manufacturers Emission Factors (Lbs/ Hp–hour)	TIMES	Size of Engine In Horsepower	EQUALS	Emissions in Lbs / Hour	TIMES	Requested Operating Hours / Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons / Year
Gasoline	CO	0.439		x		=		x		÷	2,000	=	
	NO_x	0.011		x		=		x		÷	2,000	=	
	VOC	0.015		x		=		x		÷	2,000	=	
	SO_x	0.000591		x		=		x		÷	2,000	=	
	*PM	0.000721		x		=		x		÷	2,000	=	
Diesel ≤ 600 Hp	CO	0.00668	0.00838	x	355	=	2.974	x	200	÷	2,000	=	0.297
	NO_x	0.031	0.03549	x	355	=	12.600	x	200	÷	2,000	=	1.260
	VOC	0.00247	0.00110	x	355	=	0.877	x	200	÷	2,000	=	0.088
	SO_x	0.00205		x	355	=	0.728	x	200	÷	2,000	=	0.073
	*PM	0.0022		x	355	=	0.781	x	200	÷	2,000	=	0.078
Diesel >600 Hp	CO	0.0055		x		=		x		÷	2,000	=	
	NO_x	0.024		x		=		x		÷	2,000	=	
	**VOC	0.000705		x		=		x		÷	2,000	=	
	***SO_x	0.003236		x		=		x		÷	2,000	=	
	*PM	0.0007		x		=		x		÷	2,000	=	

* Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.
** The EPA Volatile Organic Compounds (VOC) emission factor is the AP-42 emission factor for Total Organic Compounds (TOC).
*** The EPA Sulfur Oxides (SO_x) emission factor is calculated as 0.00809 x 0.4 wt. % sulfur in diesel fuel = 0.003236.

Emission Estimates

Permit 3141 – Sustainment Facility Emergency Generator

Emission Unit ID

19169

Section 4. Potential Emission Rate (Uncontrolled Emissions)

Use manufacturer's data, compliance performance stack test data or the attached USEPA Emission Factors in grams per horsepower-hour (g/Hp-hr) associated with the Engine's Horsepower Rating and Model Year

Model Year	Pollutant	Emission Factors g/Hp-hr	TIMES	Actual Engine Hp	EQUALS	Emission In Grams Per Hour	DIVIDE	Grams Per Pound	EQUALS	Emission in Pounds Per Hour	TIMES	Potential Operating Hours Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
2013	CO	2.60	x	1,490	=	3,874	÷	453.6	=	8.54	x	8,760	÷	2,000	=	37.41
	NO_x	4.70	x	1,490	=	7,003	÷	453.6	=	15.44	x	8,760	÷	2,000	=	67.62
	NMHC	0.10	x	1,490	=	149	÷	453.6	=	0.33	x	8,760	÷	2,000	=	1.44
	*NOx + NMHC	4.80	x	1,490	=	7152	÷	453.6	=	15.77	x	8,760	÷	2,000	=	69.06
	**SO_x	0.11	x	1,490	=	163.9	÷	453.6	=	0.36	x	8,760	÷	2,000	=	1.58
	***PM	0.15	x	1,490	=	223.5	÷	453.6	=	0.49	x	8,760	÷	2,000	=	2.16

* If the USEPA Emission Factor or manufacturer's data is given as combined NOx + NMHC, also provide individual emission factors for NOx and NMHC from the manufacturer or other approved methodology for estimating individual emission factors.
** Manufacturer's SOx factor shall be used when larger than the USEPA Emission Factor.
*** Particulate Matter (PM) emissions are considered to be < 1µm (micron). Therefore, PM emissions also reflect PM_{10} & $PM_{2.5}$.

Section 5. Potential to Emit (Requested allowable rate) (Controlled Emissions)

Transfer each pollutant Emission in Pounds Per Hour from column above to the Emission in Pounds Per Hour column below. Complete the equation after inserting the Requested Operating Hours Per Year. Pound Per Hour rate for each pollutant must be met if performance testing is requested.

Pollutant	Emission in Pounds Per Hour	TIMES	Requested Operating Hours Per Year	EQUALS	Pounds Per Year	DIVIDE	Pounds Per Ton	EQUALS	Emission In Tons Per Year
CO	8.54	x	200	=	1,708.11	÷	2,000	=	0.85
NO_x	15.44	x	200	=	3,087.74	÷	2,000	=	1.54
NMHC	0.33	x	200	=	65.70	÷	2,000	=	0.033
*NOx + NMHC	15.77	x	200	=	3,153.44	÷	2,000	=	1.58
**SO_x	0.36	x	200	=	72.27	÷	2,000	=	0.036
***PM	0.49	x	200	=	98.54	÷	2,000	=	0.049

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting source registration and air quality permit.

Note: The following shall be protected as confidential if requested (checked) by the applicant. Provide detailed nature of request as an attachment.

- ❑ Any information relating to processes or production techniques, which are unique to owner / operator
- ❑ Data relating to owner / operator profits and costs, which have not previously been made public

Print Name	Sign Name	Title	Date
Tom D. Miller, Colonel, USAF	(signature on original application submitted Dec 17, 2013)	Installation Commander, Kirtland AFB	

METHOD OF SUBMITTAL: **Mail OR Hand deliver (8:00am – 5:00pm ; Monday – Friday) to the Address at the top of Page 1.**

Federal New Source Performance Standards (NSPS) for Stationary EMERGENCY Diesel Engines (40CFR 60.4202 & 60.4205) in Grams Per Horsepower Hour (g/hp-hr) for Engines with a displacement of < 10 Liters Per Cylinder

Horsepower / kW	Tier (CFR Section)	Year Of Manufacture	CO (g/hp-hr)	NOx[1] (g/hp-hr)	NMHC[1] (g/hp-hr)	NOx + NMHC[1] (g/hp-hr)	SOx[2] (g/hp-hr)	Particulate Matter (PM) (g/hp-hr)	Notes
< 11 Hp < 8 kW	1 (60.4205)	Pre 2007[3]	6.0			7.8	0.93*	0.75	* Use AP-42 Section 3.3 SOx factors if <600Hp and Section 3.4 if >600Hp, as shown on this table, or manufacturer's factors. Manufacturer's factors shall be used when larger than AP-42 factors.
	2 (60.4202) - (89.112)	2007	6.0			5.6	0.93*	0.6	
	4 (60.4202)	2008 +	6.0			5.6	0.93*	0.3	
≥ 11 Hp < 25 Hp ≥ 8 kW < 19 kW	1 (60.4205)	Pre 2007[3]	4.9			7.1	0.93*	0.6	
	2 (60.4202) - (89.112)	2007	4.9			5.6	0.93*	0.6	
	4 (60.4202)	2008 +	4.9			5.6	0.93*	0.3	
≥ 25 Hp < 50 Hp ≥ 19 kW < 37 kW	1 (60.4205)	Pre 2007[3]	4.1			7.1	0.93*	0.6	
	2 (60.4202) - (89.112)	2007	4.1			5.6	0.93*	0.45	
	4 (60.4202)	2008 +	4.1			5.6	0.93*	0.22	
≥ 50 Hp < 100 Hp ≥ 37 kW < 75 kW	1 (60.4205)	Pre 2007[3]	3.03**	6.9	1.12**		0.93*	1.0**	** Use AP-42 Section 3.3 factors for CO, NMHC, and PM as shown on this table, or manufacturer's factors. Manufacturer's factors shall be used when larger than AP-42 factors.
	2 (60.4202) - (89.112)	2007	3.7			5.6	0.93*	0.3	
	3 (60.4202) - (89.112)	2008 +	3.7			3.5	0.93*	0.3	
≥ 100 Hp < 175 Hp ≥ 75 kW < 130 kW	1 (60.4205)	Pre 2007[3]	3.03**	6.9	1.12**		0.93*	1.0**	
	3 (60.4202) - (89.112)	2007 +	3.7			3.0	0.93*	0.22	
≥ 175 Hp ≤ 750 Hp ≥ 130 kW ≤ 560 kW	1 (60.4205)	Pre 2007[3]	8.5	6.9	1.0		0.93*for < 600Hp or 3.67* for > 600Hp	0.4	
	3 (60.4202) - (89.112)	2007 +	2.6			3.0		0.15	
> 750 Hp > 560 kW	1 (60.4205)	Pre 2007[3]	8.5	6.9	1.0		3.67	0.4	
	2~~3~~ (60.4202) - (89.112)	2007***	2.6			4.8		0.15	
		*** 2007 – 2010 Model Year Engines > 3,000 Hp shall meet the Pre 2007 standards and beginning with the 2011 model year, Engines > 3,000 Hp shall meet the 2007 standards							

[1] When an emission factor is given for combined NOx + NMHC, individual emission factors for NOx and NMHC must be obtained from the manufacturer.

[2] SOx emission factors shall be based on AP-42 Section 3.3 for engines less than (<) 600 Hp and Section 3.4 for engines greater than (>) 600 Hp, or manufacturer's factors since SOx emission standards were not established for non-road diesel engine rulemaking. Manufacturer's factors shall be used when larger than the AP-42 factors. For engines > 600 Hp, the "S" multiplier is 0.05 (5%) if calculating SOx to reflect the current low sulfur diesel fuel standard of 500 ppm. Percent sulfur in diesel fuel transitions to Ultra Low Sulfur Diesel (15 ppm) by October 2010. For engines operated after October 2010, with a year of manufacture of 2010 or later, the "S" multiplier is 0.0015 (0.15%) if calculating SOx to reflect the proposed new standard.

[3] Pre 2007 means each stationary Compression Ignition Internal Combustion Engine (CI ICE) whose construction, modification or reconstruction commenced after July 11, 2005. The date of construction is the date the engine is ordered by the owner or operator. Stationary CI ICE manufactured prior to April 1, 2006, that are not fire pump engines are not subject to NSPS, unless the engines are modified or reconstructed after July 11, 2005. A modified or reconstructed CI ICE must meet the emission standards for the model year in which the engine was originally new, not the year the engine is modified or reconstructed (Preamble language – Section II. E).

Emission Estimates

Permit 3331 – PL 567 SVE System

Emission Unit ID

12010

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
L-567 SVE System (Unit ID 12010)
ThermAIR TA040

Estimated Emissions

Compound	(lb/hr)	(ton/yr)
NOx	0.171	0.747
CO	0.076	0.333

flow rate $(Q)_{air}$ 250 ft^3/min

NOx Concentration $(C)_{air}$[1] 85 ppm 110 ppm

CO Concentration $(C)_{air}$[2] 49 ppm

Emission Calculation Methodology

NOx

$M_{air} = C_{air} \times Q_{air} \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$

$M_{air} = 141\ (mg/m^3) \times 250\ (ft^3/min) \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$

CO

$M_{air} = C_{air} \times Q_{air} \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$

$M_{air} = 141\ (mg/m^3) \times 250\ (ft^3/min) \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$

Where:

$(M)_{air}$ = Mass loading rate (lb/hr)

$(Q)_{air}$ = Flow rate in standard ft^3/min

$(C)_{air}$ = NOx concentration (mg/m^3) or CO concentration (mg/m^3)

Convert concentration of NOx from ppm to mg/m^3

$(C)_{air} = (110\ ppm / 10^6) \times (1\ mole / 24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times MWgas\ (grams/mole)$

$(110\ ppm / 10^6) \times (1\ mole / 24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times (40.03\ grams/mole)$

$(C)_{air} = 183$

Convert concentration of NOx from ppm to mg/m^3

$(C)_{air} = (49\ ppm / 10^6) \times (1\ mole / 24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times MWgas\ (grams/mole)$

$(49\ ppm / 10^6) \times (1\ mole / 24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times (28.01\ grams/mole)$

$(C)_{air} = 81$

1. Due to operating temperatures being higher than 1400 F, NOx emissions were raised approximately 30%.
2. Due to operating temperatures being higher than 1400 F CO emissions were estimated to be below 50ppm hence 49 ppm was used for conservative measures.

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Site 58 PL-567 SVE System (Unit ID 12010)
ThermAIR TA040

Estimated Emissions

Compound	Maximum Removal Concentration (ppm)	Maximum Hourly Rate (lb/hr)	Maximum Annual Rate (ton/yr)	Controlled Hourly Rate (lb/hr)	Controlled Annual Rate (lb/yr)	Controlled Annual Rate (ton/yr)
VOC	7000	28.48	124.75	0.28	2495.02	1.25

Estimated Gasoline Removal Rate

Vapor flow rate $(Q)_{air}$ 250 ft^3/min

Vapor Concentration $(C)_{air}$ 7000 ppm

Emission Calculation Methodology

$$M_{air} = C_{air} \times Q_{air} \text{ x } 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$$

$$M_{air} = 30498\ (mg/m^3) \text{ x } 250\ (ft^3/min) \text{ x } 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$$

Where:

$(M)_{air}$ = Mass loading rate (lb/hr)

$(Q)_{air}$ = Flow rate in standard ft^3/min

$(C)_{air}$ = Gasoline vapor concentration (mg/m^3)

Convert concentration of gasoline from ppm to mg/m^3

$$(C)_{air} = (7000\ ppm / 10^6) \text{ x } (1\ mole/ 24.1L) \text{ x } (1000\ L/m^3) \text{ x } (1000\ mg/g) \text{ x MWgas (grams/mole)}$$

$$(7000\ ppm / 10^6) \text{ x } (1\ mole/ 24.1L) \text{ x } (1000\ L/m^3) \text{ x } (1000\ mg/g) \text{ x } (105\ grams/mole)$$

$$(C)_{air} = 30498$$

Thermox Control System rated with minimum destruction efficiency of 99%

Controlled emission rates = Maximum emission rate x control efficiency

Emission Estimates

Permit 3329 – ST-070E SVE System

Emission Unit ID

12009

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Site 070CE SVE System (Unit ID 12009)

Estimated Emissions

Compound	Maximum Removal Concentration (ppm) 1)	Maximum Hourly Rate (lb/hr)	Maximum Annual Rate (ton/yr)	Controlled Hourly Rate (lb/hr)	Controlled Annual Rate (ton/yr)
VOC	400	2.49	10.90	1.24	5.45

Estimated Gasoline Removal Rate

Vapor flow rate $(Q)_{air}$ 365 ft^3/min

Vapor Concentration $(C)_{air}$ 400 ppm

Emission Calculation Methodology

$$M_{air} = C_{air} \times Q_{air} \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$$

$$M_{air} = 1826\ (mg/m^3) \times 250\ (ft^3/min) \times 0.0283\ (m^3/ft^3) \times 2.2\ (lb/mg) \times 60\ (min/hr) \times 10^{-6}$$

Where:

$(M)_{air}$ = Mass loading rate (lb/hr)

$(Q)_{air}$ = Flow rate in standard ft^3/min

$(C)_{air}$ = Gasoline vapor concentration (mg/m^3)

Convert concentration of gasoline from ppm to mg/m^3

$$(C)_{air} = (400\ ppm/10^6) \times (1\ mole/24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times MWgas\ (grams/mole)$$

$$(400\ ppm/10^6) \times (1\ mole/24.1L) \times (1000\ L/m^3) \times (1000\ mg/g) \times (110\ grams/mole)$$

$$(C)_{air} = 1826$$

Granulated Activated Carbon Unit rated with minimum control efficiency of 50%

Controlled emission rates = Maximum emission rate x control efficiency

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Site 070CE SVE System (Unit ID 12009)

HAP Emission Estimate								
Analyte	Concentration[1]	Concentration[1.] (ppmv)	Molecular Weight (g/mol)	Maximum Hourly Rate (lb/hr)	Maximum Annual Rate (ton/yr)	Controlled Hourly Rate (lb/hr)	Controlled Annual Rate (ton/yr)	Controlled Annual Rate (lbs/yr)
Benzene	59	0.059	78.11	0.0003	0.0011	0.0001	0.0006	1.14
Bromoform	190	0.19	252.73	0.0027	0.0119	0.0014	0.0059	11.90
Bromomethane	290	0.29	108.97	0.0018	0.0078	0.0009	0.0039	7.83
2-Butanone (MEK)	150	0.15	72.11	0.0006	0.0027	0.0003	0.0013	2.68
Carbon tetrachloride	230	0.23	153.82	0.0020	0.0088	0.0010	0.0044	8.77
Chlorobenzene	85	0.085	112.56	0.0005	0.0024	0.0003	0.0012	2.37
Chloroethane	200	0.2	64.51	0.0007	0.0032	0.0004	0.0016	3.20
Chloroform	54	0.054	119.38	0.0004	0.0016	0.0002	0.0008	1.60
Chloromethane	77	0.077	50.49	0.0002	0.0010	0.0001	0.0005	0.96
1,4-Dichlorobenzene	220	0.22	147.00	0.0018	0.0080	0.0009	0.0040	8.01
1,2-Dichloroethane	75	0.075	98.96	0.0004	0.0018	0.0002	0.0009	1.84
1,1-Dichloroethane	75	0.075	98.96	0.0004	0.0018	0.0002	0.0009	1.84
1,1-Dichloroethene	56	0.056	96.94	0.0003	0.0013	0.0002	0.0007	1.35
1,2-Dichloropropane	340	0.34	115.96	0.0022	0.0098	0.0011	0.0049	9.77
trans-1,3-Dichloropropene	84	0.084	110.97	0.0005	0.0023	0.0003	0.0012	2.31
Ethylbenzene	81	0.081	106.17	0.0005	0.0021	0.0002	0.0011	2.13
Methylene Chloride	64	0.064	84.93	0.0003	0.0013	0.0002	0.0007	1.35
4-Methyl-2-pentanone (MIBK)	150	0.15	100.16	0.0009	0.0037	0.0004	0.0019	3.72
Styrene	79	0.079	104.15	0.0005	0.0020	0.0002	0.0010	2.04
1,1,2,2-Tetrachloroethane	130	0.13	167.85	0.0012	0.0054	0.0006	0.0027	5.41
Tetrachloroethylene	320	0.32	165.83	0.0030	0.0131	0.0015	0.0066	13.15
Toluene	70	0.07	92.14	0.0004	0.0016	0.0002	0.0008	1.60
1,1,1-Trichloroethane	100	0.1	133.40	0.0008	0.0033	0.0004	0.0017	3.31
1,1,2-Trichloroethane	100	0.1	133.40	0.0008	0.0033	0.0004	0.0017	3.31
Trichloroethylene	1600	1.6	131.40	0.0119	0.0521	0.0059	0.0260	52.10
Vinyl chloride	95	0.095	62.50	0.0003	0.0015	0.0002	0.0007	1.47
Xylenes, Total	240	0.24	106.16	0.0014	0.0063	0.0007	0.0032	6.31
				Total	0.16	0.018	0.081	161.46

1. Concentrations of HAPs were obtained from samples collected duirng 2018 system operations.

Emission Calculation Methodology

M_{air} = $C_{air} \times Q_{air}$ x 0.0283 (m^3/ft^3) × 2.2 (lb/mg) × 60 (min/hr) × 10^{-6}

M_{air} = 1826 (mg/m^3) x 250 (ft^3/min) x 0.0283 (m^3/ft^3)× 2.2 (lb/mg) × 60 (min/hr) × 10^{-6}

Where:

$(M)_{air}$ = Mass loading rate (lb/hr)

$(Q)_{air}$ = Flow rate in standard ft^3/min

Vapor flow rate $(Q)_{air}$ = 365 ft3/min (operational data)

$(C)_{air}$ = HAP (mg/m^3)

Convert concentration of HAPs from ppm to mg/m^3

$(C)_{air}$ = (400 ppm /10^6) x (1 mole/ 24.1L) x (1000 L/m^3) x (1000 mg/g) x MW (grams/mole)

(400 ppm /10^6) x (1 mole/ 24.1L) x (1000 L/m^3) x (1000 mg/g) x HAP(MW)(grams/mole)

Granulated Activated Carbon Unit rated with minimum collection efficiency of 50%

1 - 0.98 =0.02

Controlled emission rates = Maximum emission rate x 0.02

Emission Estimates

Permit 3308 – DISA Antenna Tower

Emission Unit ID

19179

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Emergency Generator at DISA Antenna Tower Generator Shelter (Unit ID 19179)

Criteria Air Pollutants	Emission Rate (lb/hr)	Controlled Annual Emissions[1] (ton/yr)	Uncontrolled Potential Annual Emissions[2] (ton/yr)
Carbon Monoxide	0.61	0.061	2.68
Nitrogen Oxides	0.37	0.04	1.62
Particulate Matter	0.004	0.0004	0.02
Particulate Matter <10μm	0.004	0.0004	0.02
Particulate Matter <2.5μm	0.004	0.0004	0.02
Sulfur Oxides	0.15	0.02	0.67
Volatile Organic Compounds	0.18	0.02	0.80
NMHC	0.004	0.0004	0.02
NO_x + NMHC	0.57	0.06	2.51

[1] Controlled annual emissions are calculated assuming a maximum of 200 operating hours per year.

[2] Uncontrolled potential annual emissions are calculated assuming unlimited operation for 8760 hours per year.

AP-42 Emission Factors
Criteria Pollutant Emission Estimation Spreadsheet
Emergency Generator at DISA Antenna Tower Generator Shelter (Unit ID 19179)

74.3 hp engine
48 kW generator

Criteria Air Pollutants	EPA AP-42		EPA Tier 4		Manufacturer's Statement		Values for Permit Application Forms						Emission Factor Reference
	Emission Factor[1]		Emission Limit[2]		Emission Factor[3]		Emission Factor	Hourly Emissions		Annual Emissions[7]		PTE[8]	
	(lb/hp-hr)	(g/hp-hr)	g/kWh	g/hp-hr	g/kWh	g/hp-hr	(g/hp-hr)	g/hr	lb/hr	lb/yr	ton/yr	ton/yr	
Carbon Monoxide	6.68E-03	3.03	5	3.7	0.31	0.23	**3.73**	**277.0**	**0.61**	**122.15**	**0.06**	**2.68**	EPA Tier 4
Nitrogen Oxides	0.031	14.06	-	-	3.02	2.25	**2.25**	**167.3**	**0.37**	**73.78**	**0.04**	**1.62**	Manufacturer's Statement
Particulate Matter[4]	2.20E-03	1.00	0.03	0.02	0.02	0.01	**0.02**	**1.66**	**0.004**	**0.73**	**0.00**	**0.02**	Manufacturer's Statement
Sulfur Oxides[5]	2.05E-03	0.93	-	-	-	-	**0.93**	**69.09**	**0.15**	**30.46**	**0.02**	**0.67**	EPA AP-42
Volatile Organic Compounds[6]	2.47E-03	1.12	-	-	-	-	**1.12**	**83.25**	**0.18**	**36.70**	**0.02**	**0.80**	EPA AP-42
NMHC	Not available		-	-	0.03	0.02	**0.02**	**1.66**	**0.004**	**0.73**	**0.00**	**0.02**	Manufacturer's Statement
NO_x + NMHC			4.7	3.5	-	-	**3.50**	**260.1**	**0.57**	**114.66**	**0.06**	**2.51**	EPA Tier 4

The generator operates a maximum of **200** **hours per year** and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996), for generators less than 600 hp.
AP-42 Volatile Organic Compounds conservatively assumed to be Total Organic Compounds (TOC).

[2] EPA Tier 4 Nonroad Compression-Ignition Engines: Emission Standards
Nitrogen and NMHC estimated based on Tier 4 Standards:

[3] Manufacturer's statement that contained Exhaust Emission Data with values in g/kWh

[4] Particulate matter emissions are considered to be < 1 µm in size. Therefore PM emissions also reflect particulate matter less than 10 µm (PM_{10}) and particulate matter less than 2.5 µm ($PM_{2.5}$).

[5] SOx emission factor is the maximum value of the manufacturer emission factor and the EPA AP-42 emission factor, as specified by the AEHD NSPS generator application form.

[6] Volatile Organic Compounds not provided in the manufacturer emission data.

[7] The following equation was used to calculate annual emissions for each pollutant:
Annual emissions (lb/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr)
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 200 (hrs/yr) / 2000 (lb/ton)

[8] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

Emission Estimates

Permit 3366 – AFOTEC Bivouac Area 3

Emission Unit ID

19183

AP-42 Emission Factors, Calculated Fuel Flow
Emission Calculation Spreadsheet
AFOTEC Building 20130
Bivuoac 3 Area

Generator
86.5 hp

Criteria Air Pollutants	AP-42 Emission Factors[1] (lb/MMBtu)	Fuel Use[2] (gal/hr)	Heating Value (HV)[3] (Btu/gal)	Hourly Emissions[4] (lb/hr)	Annual Emissions[5] (ton/yr)	PTE[6] (ton/yr)
Carbon Monoxide	0.95	4.4	137000	**0.58**	**0.14**	**2.52**
Nitrogen Oxides	4.41	4.4	137000	**2.67**	**0.67**	**11.70**
Particulate Matter[7]	0.31	4.4	137000	**0.19**	**0.05**	**0.82**
Particulate Matter <10μm	0.31	4.4	137000	**0.19**	**0.05**	**0.82**
Particulate Matter <2.5μm[8]	0.31	4.4	137000	**0.19**	**0.05**	**0.82**
Sulfur Oxides	0.29	4.4	137000	**0.18**	**0.04**	**0.77**
Volatile Organic Compounds[9]	0.35	4.4	137000	**0.21**	**0.053**	**0.93**

The generator operates 500 hours per year and is powered by diesel fuel.

[1] Emission factors from EPA AP-42 Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3-1 (October 1996)

[2] The following equation was used to calculate hourly fuel use:
Hourly fuel use = hp * Brake specific fuel consumption (7000 Btu/hp-hr) * 1/HV (Btu/gal)

[3] The heating value (HV) of diesel fuel is given in AP-42 Section 3.3 (October 1996), Table 3.3-1(footnote c) as 19300 Btu/lb. The HV was converted into units of Btu/gal using the following equation:
Heating Value (HV) (Btu/gal) = HV (Btu/lb) * Density of diesel fuel (lb/gal)
The density of diesel fuel is 7.1 lb/gal (Emission Factor Documentation for Section 3.3, Gasoline and Diesel Industrial Engines (April 1993)).
Heating Value (HV) (Btu/gal) = 19300 (Btu/lb) * 7.1 (lb/gal) = 137000 Btu/gal (rounded to the nearest 100)

[4] The following equation was used to calculate hourly emissions for each pollutant:
Hourly emissions (lb/hr) = EF (lb/MM Btu) * fuel use (gal/hr) * HV (Btu/gal) / 1000000
where: EF = Emission Factor
HV = Heating Value

[5] The following equation was used to calculate annual emissons for each pollutant:
Annual emissions (ton/yr) = Hourly emissions (lb/hr) * 500 (hrs/yr) / 2000 (lb/ton)

[6] Potential to Emit (PTE) was calculated based on the number of hours in a year (8760 hours per year).
The following equation was used to calculate PTE:
PTE (ton/yr) = Hourly emissions (lb/hr) * 8760 (hrs/yr) / 2000 (lb/ton)

[7] No emission factor data for Particulate Matter (PM) is included in AP-42, assumed PM emission factors are equal to Particulate Matter <10μm.

[8] Assumed Particulate Matter <2.5μm equals Particulate Matter <10μm.

[9] Volatile Organic Compounds assumed to be the exhaust portion of Total Organic Compounds (TOC).

Emission Estimates for Kirtland AFB Greenhouse Gas

All Emission Unit IDs with Permitted Emission Limits

Potential Greenhouse Gas Emissions from Title V Permitted Units[1]									
	Unit ID	Fuel Type	Emission Unit Size (Hp)	Maximum Permitted Hours	Fuel Use (gal or MMScf)	PTE CO2 Emissions (lbs)	PTE CH4 Emissions (lbs)	PTE N2O Emissions (lbs)	PTE CO2e Emissions (tons)
Test Cell[2]	20002	Jet Fuel	1100	235	12985.1	279102	11.6	2.3	140.0
	20004	Jet Fuel	2000	350	13478.9	289717	12.0	2.4	145.4
Test Cell Subtotals:						568819	24	5	285
Internal Combustion[3]	18001	Diesel	425	500	10779.0	242539	9.8	2.0	121.7
	19003	Diesel	135	200	1369.6	30817	1.3	0.3	15.5
	19006	Diesel	102	200	1034.8	23284	0.9	0.2	11.7
	19014	Diesel	775	200	7862.3	176910	7.2	1.4	88.8
	19015	Diesel	102	200	1034.8	23284	0.9	0.2	11.7
	19016	Diesel	40	200	405.8	9131	0.4	0.1	4.6
	19019	Diesel	102	200	1034.8	23284	0.9	0.2	11.7
	19031	Diesel	355	200	3601.4	81036	3.3	0.7	40.7
	19032	Diesel	465	200	4717.4	106146	4.3	0.9	53.3
	19069	Diesel	340	200	3449.3	77612	3.1	0.6	38.9
	19074	Diesel	340	200	3449.3	77612	3.1	0.6	38.9
	19076	Diesel	340	200	3449.3	77612	3.1	0.6	38.9
	19089	Diesel	335	200	3398.6	76471	3.1	0.6	38.4
	19091	Diesel	750	200	7608.7	171204	6.9	1.4	85.9
	19093	Diesel	660	200	6695.7	150659	6.1	1.2	75.6
	19096	Diesel	568	200	5762.3	129658	5.3	1.1	65.1
	19102	Diesel	660	200	6695.7	150659	6.1	1.2	75.6
	19106	Diesel	166	200	1684.1	37893	1.5	0.3	19.0
	19129	Diesel	207	200	2100.0	47252	1.9	0.4	23.7
	19130	Diesel	1186	200	12031.9	270730	11.0	2.2	135.8
	19131	Diesel	170	200	1724.6	38806	1.6	0.3	19.5
	19132	Diesel	277	200	2810.1	63231	2.6	0.5	31.7
	19133	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19134	Diesel	435	200	4413.0	99298	4.0	0.8	49.8
	19135	Natural Gas	1334	200	1.8	218298	4.1	0.4	109.3
	19142	Diesel	102	200	1034.8	23284	0.9	0.2	11.7
	19143	Diesel	50	200	507.2	11414	0.5	0.1	5.7
	19147	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19148	Diesel	535	200	5427.5	122125	5.0	1.0	61.3
	19151	Diesel	99	500	2510.9	56497	2.3	0.5	28.3
	19153	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19154	Diesel	65.6	200	665.5	14975	0.6	0.1	7.5
	19155	Diesel	752	200	7629.0	171660	7.0	1.4	86.1
	19156	Diesel	752	200	7629.0	171660	7.0	1.4	86.1
	19157	Diesel	752	200	7629.0	171660	7.0	1.4	86.1
	19158	Diesel	752	200	7629.0	171660	7.0	1.4	86.1
	19159	Diesel	762	2500	96630.4	2174287	88.2	17.6	1090.9
	19160	Diesel	94.5	200	958.7	21571.7	0.875	0.175	10.8
	19161	Diesel	348	200	3530.4	79438.5	3.222	0.644	39.9
	19163	Diesel	399	200	4047.8	91080.4	3.694	0.739	45.7
	19164	Diesel	250	200	2536.2	57068	2.3	0.5	28.6
	19168	Diesel	25	200	253.6	5707	0.2	0.0	2.9
	19169	Diesel	1490	200	15115.9	340125	13.8	2.8	170.6
	19170	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19171	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19172	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19173	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19174	Diesel	1220	200	12376.8	278491	11.3	2.3	139.7
	19176	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19177	Diesel	755	200	7659.4	172345	7.0	1.4	86.5
	19178	Diesel	1220	200	12376.8	278491	11.3	2.3	139.7
	19179	Diesel	74.3	200	753.8	16961	0.7	0.1	8.5
	19181	Diesel	176	200	1785.5	40176	1.6	0.3	20.2
	19182	Diesel	176	200	1785.5	40176	1.6	0.3	20.2
	19183	Diesel	86.5	500	2193.8	49364	2.0	0.4	24.8
ICOM Subtotals:						8,342,405	334	66	4,185
	14014	Nat Gas	6.25	8760.0	53.3	6399570	120.7	12.1	3203.1
	14166	Nat Gas	5.25	8760.0	44.7	5375639	101.4	10.1	2687.8
External Combustion[4]	14167	Nat Gas	5.25	8760.0	44.7	5375639	101.4	10.1	2687.8
ECOM Subtotals:						17,150,848	323	32	8,579

[1] The Title V Permitted Units include those units that have construction permits with permitted emission limits, those units tha t do not have permitted emissions listed in their respective permit, emergency permit or source registration are not included.

[2] Jet engine test cell fuel use rates are based on the fuel flow (Construction permit application for Permit 484-M2-RV3, pg. 61 Table 6-1 Fuel Flow Rate Table) and test patterns (Construction permit application

[3] For permitted diesel-fired and natural gas-fired internal combustion engines, potential fuel use is estimated based either on operating hours limits or fuel use limits estabilished in issued air permits. For all hour use estimations, a BSFC of 7,000 BTU/hp-hr was assumed, per AP-42.

[4] For external combustion units, potential fuel use is based on 8,760 operating hours.

Example jet engine test cell calculation: Potential Operating Time (hr) x Operating Mode (%) x Fuel Consumption Factor (lb/hr) ÷ Fuel Density (lb/gal) x Emission Factor (lb/gal) = Emissions (lb)

Example internal combustion engine calculation: Potential Operating time (hr) x BSFC (BTU/hp-hr) x Power of unit (hp) ÷ Heat Co ntent of Fuel (BTU/gal) x Emission Factor (lb/gal) = Emissions (lb)

Example soil vapor extraction calculation: [Potential Operating Time (hr) x BSFC (BTU/hp-hr) x Power of Unit (hp) ÷ Heat Conten t of Fuel (BTU/gal) x Emission Factor (lb/gal)] + [CO Emission Rate (lb/hr) x Potential Operating Time (hr) ÷ (1 - Control Efficiency) x Control Efficiency x (Molecular Weight of CO_2 ÷ Molecular Weight of CO)] = Emissions (lb)

Example external combustion calculation: Potential Operating Time (hr) x Maximum Heat Input (MMBtu/hr) x Emission Factor (lb/ MMBtu) = Emissions (lb)

Emission Factors				
	Heat Content	CO_2	CH_4	N_2O
Nat Gas	1028	117	0.002	0.0002
Diesel	138000	163	0.007	0.0013
JP-8	135000	159	0.007	0.0013
Propane	91000	135	0.007	0.0013
Gasoline	125000	155	0.007	0.0013

[a] Heat content and CO_2 emission factors are from Table D-2 of the Federal Greenhouse Gas Accounting and Reporting Guidance, Technical Support Document, October 2010.

[b] CH_4 and N_2O emission factors are from Table D-3 of the Federal Greenhouse Gas Accounting and Reporting Guidance, Technical Support Document, October 2010.

Global Warming Potential	
Multipliers for the conversion to CO_2 Equivalent (CO_2e)[c]	
Pollutant	Multiplier
CO_2	1
CH_4	21
N_2O	310

[c] CO_2 Equivalent multiplier values are from Table A-5 of the AFMC Interim Greenhouse Gas Inventory Guideance, AFCEE, February 2009.

Title V Source Emissions Summary

Kirtland AFB Title V Source Emissions

Source Category	Permit Limits (tons/year)							Notes
	CO	NOx	PM	$PM_{10}/PM_{2.5}$	SOx	VOC	HAP	
Aircraft Engine Testing - Unit ID #s 20002, 20004								
(58 SOW Test Cells - Permit # 484-M3)	0.84	0.68	0.09	0.09	0.07	0.51	0.03	All
Internal Combustion –Unit ID # 19135	4.57	5.28	0.012	0.012	0.001	0.036		19135
(SOR TAC Lab – Permit # 1759-M1-RV1)								
(Unit ID #s 19135, 19155, 19156, 19157, 19158)	0.424	0.723	0.019	0.019	0.213	0.723		19155 Combined NMHC + NOX of 0.723 tpy
	0.424	0.723	0.019	0.019	0.213	0.723		19156 Combined NMHC + NOX of 0.723 tpy
	0.424	0.723	0.019	0.019	0.213	0.723		19157 Combined NMHC + NOX of 0.723 tpy
	0.424	0.723	0.019	0.019	0.213	0.723		19158 Combined NMHC + NOX of 0.723 tpy
Surface Coating - Unit ID # 21015								
(58th SOW Corrosion Control Facility - Permit # 1770-RV3)			0.14	0.14		0.95	0.12	21015
Internal Combustion – Unit ID #s 19170, 19171, 19172, 19173	0.43	0.80	0.02	0.02	0.001	0.14		19170 Combined NMHC + NOX of 0.80 tpy
(Building 402 – Permit # 1777-RV2)	0.43	0.80	0.02	0.02	0.001	0.14		19171 Combined NMHC + NOX of 0.80 tpy
	0.43	0.80	0.02	0.02	0.001	0.14		19172 Combined NMHC + NOX of 0.80 tpy
	0.43	0.80	0.02	0.02	0.001	0.14		19173 Combined NMHC + NOX of 0.80 tpy
Internal Combustion –	0.49	1.86	0.06	0.06	0.1	0.05		19147
(Water Plant – Permit # 1786-M5)	0.39	1.82	0.13	0.13	0.12	0.14		19148
	0.43	0.79	0.03	0.03	0.0009	0.79		19153 Combined NMHC + NOX of 0.79 tpy
	0.26	1.21	0.09	0.09	0.08	0.1		19089
	0.42	1.81	0.05	0.05	0.1	0.05		19133
	0.11	0.53	0.04	0.04	0.04	0.04		19131
	0.19	0.86	0.06	0.06	0.06	0.07		19132
	0.29	1.35	0.1	0.1	0.09	0.11		19134
	0.7	1.33	0.04	0.04	0.03	1.300		19174 Combined NMHC + NOX of 1.33 tpy
	0.7	1.33	0.04	0.04	0.03	1.300		19178 Combined NMHC + NOX of 1.16 tpy
	0.1	0.093	0.06	0.06	0.04	0.002		19181 Combined NMHC + NOX of 0.93 tpy
	0.1	0.092	0.06	0.06	0.04	0.002		19182 Combined NMHC + NOX of 0.92 tpy
Internal Combustion - Unit ID # 19151								
(Building 1037 - Permit # 1945)	0.16	0.35	0.05	0.05	0.05	0.06		19151
Remediation - Unit ID # 12009								
(Bulk Fuels Facility - Emergency Permit # 3329						10.9		12009 Application 3329 ST-070E for SVE
Remediation - Unit ID # 12010								
(Bulk Fuels Facility - Emergency Permit # 3331	0.33	0.75				1.25		12010 Application 3331 PL-567 for SVE
Internal Combustion - Unit ID # 19160								
(AFRL Building 416 - Permit # 2085)	0.1	0.1	0.005	0.005	0.02	0.1		19140 Combined NMHC + NOX of 0.1 tpy
Internal Combustion - Unit ID # 19161								
(AFRL Building 570 - Permit # 2100)	0.2	0.229	0.011	0.011	0.071	0.229		19161 Combined NMHC + NOX of 0.1 tpy
Internal Combustion - Unit ID # 19159								
(AFRL Building 570 - Permit # 2105-RV1)	5.33	8.81	0.17	0.17	0.01	8.81		19159 Combined NMHC + NOX of 8.81 tpy
Internal Combustion - Unit ID # 19163								
(AFSPC Radome - Permit # 2147)	0.23	0.26	0.01	0.01	0.08	0.26		19163 Combined NMHC + NOX of 0.26 tpy
Internal Combustion - Unit ID # 19164								
(AFRL/RV ISOON Telescope - Permit # 3013-RV1)	0.14	0.17	0.0083	0.0083	0.051	0.17		19163 Combined NMHC + NOX of 0.17 tpy
Internal Combustion - Unit ID #s 19091, 19093, 19102	0.413	1.8	0.053	0.053	0.00091	0.053		19091
(US Customs and Border Patrol Bldg 291/320 - Permit # 3016-RV2)	0.363	1.584	0.124	0.124	0.0008	0.047		19093
	0.363	1.584	0.124	0.124	0.0008	0.047		19102
Internal Combustion	0.068	0.316	0.022	0.022	0.021	0.025		19015
(Fire Department - Permit # 3031-RV2)	0.034	0.158	0.011	0.011	0.011	0.013		19016
	0.068	0.316	0.022	0.022	0.021	0.025		19019
	0.227	1.054	0.075	0.075	0.07	0.084		19069
	0.227	1.054	0.075	0.075	0.07	0.084		19070
	0.227	1.054	0.075	0.075	0.07	0.084		19071
	0.227	1.054	0.075	0.075	0.07	0.084		19072
	0.227	1.054	0.075	0.075	0.07	0.084		19073
	0.227	1.054	0.075	0.075	0.07	0.084		19074
	0.227	1.054	0.075	0.075	0.07	0.084		19075
	0.227	1.054	0.075	0.075	0.07	0.084		19076
	0.138	0.642	0.046	0.046	0.042	0.051		19129
	2.223	2.846	0.104	0.104	0.001	0.262		19130
Internal Combustion	0.09	0.419	0.03	0.03	0.028	0.033		19003
(Power Production - Permit # 3032-M1)	0.068	0.316	0.022	0.022	0.021	0.025		19006
	0.311	1.442	0.102	0.102	0.095	0.115		19032
	0.413	1.761	0.125	0.125	0.198	0.14		19096
	0.12	0.515	0.037	0.037	0.034	0.041		19106
	0.068	0.316	0.022	0.022	0.021	0.025		19142
	0.033	0.155	0.011	0.011	0.01	0.012		19143
	0.044	0.203	0.014	0.014	0.013	0.016		19154
	0.017	0.078	0.006	0.006	0.005	0.006		19168
	0.43	0.72	0.025	0.025	0.001	0.010		19176 Combined NMHC + NOX of 0.72 tpy
	0.43	0.72	0.025	0.025	0.001	0.010		19177 Combined NMHC + NOX of 0.72 tpy
External Combustion - Unit ID #s 14166 and 14167	1.26	1.5	0.11	0.11	0.009	0.083	0.028	14166
(West Side Steam Boiler - Source Registration # 3047)	1.26	1.5	0.11	0.11	0.009	0.083	0.028	14167
Landfill Mulcher - Unit ID #s 18001 and 18002	0.71	3.29	0.23	0.23	0.22	0.26		18001
(C&D Debris Landfill Mulcher - Permit # 3048-RV1)			0.3	0.3				18002
Miscellaneous Chemicals - Unit ID # 31999								
(Basewide Misc Chem - Permit # 3070-M1)			1.03	1.03		78.03	2.93	31999 Exempt from PSD

Kirtland AFB Title V Source Emissions

Source Category	Permit Limits (tons/year)							Notes
	CO	NOx	PM	$PM_{10}/PM_{2.5}$	SOx	VOC	HAP	
Fuel Dispensing - Unit ID #s 15001, 15004, and 15011						4.04		15001
(Government Fuels Distribution - Permit # 3090-RV1)						0.82		15004
						2.98		15011
Fuel Loading - Unit ID # 16001								
(Government Fuels Distribution - Permit # 3090-RV1)						0.26		16001
Storage Tanks - Unit ID #s 22003, 22004, 22005, 22015, and 25012						3.78		22003
(Government Fuels Distribution - Permit # 3090-RV1)						2.9		22004
						2.31		22005
						5.7		22015
						0.58		25012
Fuel Dispensing - Unit ID # 15008								
(898 MUNS - Permit # 3101-RV1)						0.117		15008
Storage Tanks - Unit ID # 25017								
(898 MUNS - Permit # 3101-RV1)						0.083		25017
External Combustion - Unit ID # 14014								
(898 MUNS - Permit # 3101-RV1)	2.25	2.68	0.2	0.2	0.02	0.68		14014
Internal Combustion - Unit ID # 19014								
(898 MUNS - Permit # 3101-RV1)	0.46	1.74	0.05	0.05	0.0008	0.05		19014
Internal Combustion - Unit ID # 19140								
(Airfield Operations - Source Registration # 3102)	0.068	0.31	0.022	0.022	0.021	0.025		19140
External Combustion - Unit ID #s 14168 and 14169	1.26	1.5	0.11	0.11	0.009	0.082	0.028	14168
(Airfield Operations - Permit # 3102)	1.26	1.5	0.11	0.11	0.009	0.082	0.028	14169
Internal Combustion - Unit ID # 19169								
(Sustainment Facility Emergency Generator - Permit # 3141-RV1)	0.85	1.58	0.05	0.05	0.04	1.58		19169 Combined NMHC + NOX of 1.58 tpy
Surface Coating - Unit Id # 21004								
(58th SOW Bldg. 482 Paint Booth - Permit # 3128)			0.032	0.032		0.67	0.144	21004
Internal Combustion - Unit Id # 19031								
(58th SOW Generator at Bldg. 1017 - Permit # 3129)	0.3	1.26	0.078	0.078	0.073	0.088		19031
Remediation - Unit ID # 12009								
(Bulk Fuels Facility - Permit # 3329)						5.45	0.16	12009 From 3329 Application for SVE
Remediation - Unit ID # 12010								
(PL 567 - Permit # 3331)	0.23	0.75				1.25		12010
Internal Combustion - Unit Id # 19179								
(KAFB DISA Antenna Tower - Permit # 3308)	0.06	0.06	0.0004	0.0004	0.02	0.06		19179
Internal Combustion - Unit Id # 19183								
(AFOTEC - Permit # 3366)	0.14	0.67	0.05	0.05	0.04			19183
Total	**37.1**	**78.5**	**5.4**	**5.4**	**3.5**	**144.4**	**3.5**	

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Attachment D

Table D-1: Construction/Authority-to-Construct Permit and Source Registration List

Table D-2: Contents of the Permit Application

Table D-3: Applicable Requirements and Compliance Status

Table D-1. Construction Permit List

Regulatory Citation	Tracking/Permit Number	Permit Title	Permit Process Equipment Number	Kirtland AFB Unit ID
20.11.41 NMAC Construction Permit	484-M3	58 SOW Test Cells	T400	20002
			T700	20004
20.11.41 NMAC Construction Permit	1759-M1-RV1	AFRL SOR Facility	1	19135
			2	19155
			3	19156
			4	19157
			5	19158
20.11.41 NMAC Construction Permit	1770-RV3	58 SOW Corrosion Control Facility	1	21015
20.11.41 NMAC Construction Permit	1777-RV2	Four 755 HP Back-Up Generators at Space Missile Command	1	19170
			2	19171
			3	19172
			4	19173
20.11.41 NMAC Construction Permit	1786-M5	Kirtland AFB Water Plant	1	19147
			2	19148
			4	19174
			6	19178
			7	19153
			8	19089
			9	19133
			10	19131
			11	19132
			12	19134
			13	19181
			14	19182
20.11.41 NMAC Construction Permit	1945	Emergency Generator Bldg. 1037	1	19151
20.11.41 NMAC Construction Permit	2085	AFRL/RDLAS Bldg. 416 Emergency Generator	1	19160
20.11.41 NMAC Construction Permit	2100	Battlespace Environment Laboratory (BEL) Emergency Generator	1	19161

Table D-1. Construction Permit List *(Continued)*

Regulatory Citation	Tracking/Permit Number	Permit Title	Permit Process Equipment Number	Kirtland AFB Unit ID
20.11.41 NMAC Construction Permit	2105-RV1	AFRL Bldg. 277 Diesel Generator	1	19159
20.11.41 NMAC Construction Permit	2147	AFSPC RADOME Emergency Generator	1	19163
20.11.41 NMAC Construction Permit	3013-RV1	AFRL/RV ISOON Telescope Facility	1	19164
20.11.41 NMAC Construction Permit	3016-RV2	U.S. Customs and Border Protection Facility	1	19091
			2	19093
			3	19102
20.11.41 NMAC Construction Permit	3031-RV2	Fire Department	1	19015
			2	19016
			3	19019
			4	19069
			5	19070
			6	19071
			7	19072
			8	19073
			9	19075
			11	19076
			12	19129
			13	19130
20.11.41 NMAC Construction Permit	3032-M1-1AR	Power Production Emergency Power Generators	1	19003
			3	19006
			5	19032
			8	19096
			9	19106
			12	19142
			13	19143
			16	19154
			17	19168
			18	19176
			19	19177
			1	14166
			2	14167
20.11.40 NMAC Source Registration	3047	Steam Boiler, West Side	1	14166
			2	14167
			3	14014
20.11.41 NMAC Construction Permit	3048-2TR	Construction and Demolition Debris Landfill	1	18001
			2	18002
20.11.41 NMAC Construction Permit	3070-M1-1TR	Basewide Miscellaneous Paint and Chemical Usage	1	31999

Table D-1. Construction Permit List *(Continued)*

Regulatory Citation	Tracking/Permit Number	Permit Title	Permit Process Equipment Number	Kirtland AFB Unit ID
20.11.41 NMAC Construction Permit	3090-RV1	Government Fuels Distribution Operations	1	15001
			2	15004
			3	15011
			4	16001
			5	22003[a]
			6	22004
			8	22005
			9	22015
			10	25012
20.11.41 NMAC Construction Permit	3101-RV1	898th Munition Squadron	1	19014
			2	14014
			3	25017
			4	15008
20.11.40 NMAC Source Registration	3102	Airfield Operations	1	14168
			2	14169
			3	19140
20.11.41 NMAC Construction Permit	3128	58th SOW Bldg. 482 Paint Booth	1	21004
20.11.41 NMAC Construction Permit	3129	58th SOW Generator at Bldg. 1017	1	19031
20.11.41 NMAC Construction Permit	3141-RV1	Sustainment Facility Emergency Generator	1	19169
20.11.40 NMAC Source Registration	3329	ST-070E SVE System	1	12009
20.11.41 NMAC Construction Permit	3331	PL567 SVE System	1	12010
20.11.41 NMAC Construction Permit	3308	DISA Antenna Tower	1	19179
20.11.41 NMAC Construction Permit	3366	AFOTEC Bivouac Area 3	1	19183

[a] Substitution of equipment for emission unit 22005 occurred in November 2018. A 5,000-gallon tank was substituted for the permitted 10,000-gallon tank.

Table D-2. Contents of Permit Application

Requirement	NMAC Citation	Location in Application
Application to be made on forms furnished by the AEHD AQD	20.11.42.12.A. (4)(a)	Attachment A
Name and address of applicant, owner(s) or operator(s) of the source, responsible officials, and telephone numbers and names of agent(s) and site contact(s) familiar with operations.	20.11.42.12.A. (4)(b)	Attachment A
Date of the application.	20.11.42.12.A. (4)(c)	Attachment A
Description of processes and products (by SIC code); a map, such as the United States Geological Survey 7.5 minute Topographic Quadrangle map; and the source location (UTM coordinates or latitude and longitude).	20.11.42.12.A. (4)(d)	Attachment E
Emissions information and calculations for the source and each nonexempt emission unit including: process flow sheets; identification of emission points in sufficient detail to establish fees and applicable requirements; emission rates; specific fuels, fuel use, raw materials, or production rate information; identification of air pollution control equipment and monitoring devices; maximum and standard operating schedules; alternative operating scenarios; measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies; any assumptions made in the emissions calculations; the basis for emission factors and control efficiencies used; and other relevant information the AEHD AQD may reasonably require.	20.11.42.12.A. (4)(e)	Written Section of the Title V Permit Renewal Application: Sections 5, 6, 8 Attachment A Attachment B Attachment C
A list of insignificant activities at the source, their emissions (to the extent required by the department), and any information necessary to determine applicable requirements.	20.11.42.12.A. (4)(f)	Written Section of the Title V Permit Application: Section 9 Attachment F
A citation and description of all applicable air pollution control requirements.	20.11.42.12.A. (4)(g)	Written Section of the Title V Permit Application: Section 5
An explanation of any proposed exemptions from otherwise applicable requirements.	20.11.42.12.A. (4)(f)	Written Section of the Title V Permit Application: Section 2
Information related to emissions or emission points that is required to establish the basis for fees under 20.11.2, Fees.	20.11.42.12.A. (4)(i)	Written Section of the Title V Permit Application: Section 4
A dispersion modeling analysis (as required) using EPA-approved models and procedures, showing whether emissions from the source would cause or contribute to an exceedance of any New Mexico ambient air quality standard.	20.11.42.12.A. (4)(j)	Attachment G

Table D-2. Contents of Permit Application *(Continued)*

Requirement	NMAC Citation	Location in Current Application
Certification of compliance, including: a certification, by a responsible official, of the source's compliance status for each applicable requirement; a statement of methods used for determining compliance; a statement that the source will remain in compliance with existing and new applicable requirements; a schedule of submission of compliance certifications during the permit term; and a statement indicating the source's compliance status with any enhanced monitoring and compliance certification requirements of the Federal Act.	20.11.42.12.A. (4)(k)	Attachment A
For sources that are not in compliance with all applicable requirements at the time of permit application, provide a description of the compliance status with respect to all applicable requirements, a narrative of how the source will achieve compliance, a schedule of remedial measures, including an enforceable sequence of actions, and a schedule for submission of certified progress reports.	20.11.42.12.A. (4)(l)	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application

Table D-3. Summary of Applicable Requirements by Source Category

Table D-3. Summary of Applicable Requirements by Source Category

Source Category	Applicable Requirements	Compliance Status
External Combustion	20.11.67 NMAC, Equipment, Emissions, Limitations	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Fuel Dispensing	40 CFR Part 80 Subparts B and C 40 CFR Part 63 Subpart CCCCCC, Gasoline Dispensing Facilities	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Fuel Loading	40 CFR Part 63 Subpart BBBBBB, Gasoline Distribution Bulk Terminals	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Internal Combustion	20.11.63 NMAC, New Source Performance Standards for Stationary Sources 20.11.64 NMAC, Emission Standards for Hazardous Air Pollutants for Stationary Sources	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Landfills	20.11.71 NMAC, Municipal Solid Waste Landfills	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Miscellaneous Chemical and Paint Usage	None	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Remediation	20.11.65 NMAC, Volatile Organic Compounds 20.11.63 NMAC, New Source Performance Standards for Stationary Sources 20.11.64 NMAC, Emission Standards for Hazardous Air Pollutants for Stationary Sources	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Storage Tanks	40 CFR Part 60 Subpart Kb 20.11.65 NMAC, Volatile Organic Compounds	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application Kirtland AFB is in compliance with all applicable requirements at the time of this permit application

Table D-3. Summary of Applicable Requirements by Source Category *(Continued)*

Source Category	Applicable Requirements	Compliance Status
Surface Coating - Paint Booths	None	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
Basewide	20.11.2 NMAC, Fees	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.5 NMAC, Visible Air Contaminants	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.8 NMAC, Ambient Air Quality Standards	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.20 NMAC, Fugitive Dust Control	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.21 NMAC, Open Burning	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.22 NMAC, Woodburning	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.23 NMAC, Stratospheric Ozone Protection	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.40 NMAC, Source Registration	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.41 NMAC, Construction Permit	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.42 NMAC, Operating Permits	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.43 NMAC, Stack Height Requirements	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.47 NMAC, Emissions Inventory Requirements	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.49 NMAC, Excess Emissions	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application

Table D-3. Summary of Applicable Requirements by Source Category *(Continued)*

Basewide (Continued)	20.11.63 NMAC, New Source Performance Standards for Stationary Sources	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.64 NMAC, Emission Standards for Hazardous Air Pollutants for Stationary Sources	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 60 Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 63 Subpart ZZZZ, Stationary Reciprocating Internal Combustion Engines at Area Sources NESHAP	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 61 Subpart M, Asbestos NESHAP	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.90 NMAC, Administration, Enforcement, Inspection	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.100 NMAC, Motor Vehicle Inspection – Decentralized	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	20.11.101 NMAC, Motor Vehicle Inspection – Centralized	N/A. This regulation is not effective until the EPA issues a notice requiring that inspections become centralized.
	20.11.102 NMAC, Oxygenated Fuels	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 82 Subpart B, Stratospheric Ozone Protection Program, Servicing of Motor Vehicle Air Conditioners	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 82 Subpart D, Stratospheric Ozone Protection Program, Federal Agencies	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Part 82 Subpart F, Stratospheric Ozone Protection Program, Recycling/Recovery	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application
	40 CFR Parts 89 and 90, Non-Road Engine	Kirtland AFB is in compliance with all applicable requirements at the time of this permit application

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Attachment E

Site Map

Kirtland AFB - Title V Emission Unit List						
Feature Description	Kirtland Unit ID	Permit Number	WGS_1984_UTM_Zone_13S		UTM coordinates	
			Latitude	Longitude	Easting m E	Northing m N
RDL – 12009 – Soil Vapor Extraction System	12009	3329	35.05361	-106.598916	354185	3880157
RDL – 12010 – Soil Vapor Extraction System	12010	3331	34.993295	-106.497567	363328	3873324
ECOM – 14014 – Boiler - B27497 - Natural Gas - 6.25 MMBtu/hr	14014	3101-RV1	35.010505	-106.546407	358899.94	3875300.64
ECOM – 14166 – Boiler -B278 - Natural Gas - 5.25 MMBtu/hr	14166	3047	35.049034	-106.607178	353423.29	3879661.54
ECOM – 14167 – Boiler -B278 - Natural Gas - 5.25 MMBtu/hr	14167	3047	35.049034	-106.607178	353423.29	3879661.54
ECOM – 14168– Boiler - B334 - Natural Gas - 5.23 MMBtu/hr	14168	3102	35.047761	-106.605551	353569.42	3879517.96
ECOM – 14169– Boiler - B334 - Natural Gas - 5.23 MMBtu/hr	14169	3102	35.047761	-106.605551	353569.42	3879517.96
FUEL – 15001– Gasoline Dispensing - B20359 - Gasoline - 2400 gal/hr	15001	3090-RV1	35.0515	-106.553554	358318.55	3879857.55
FUEL – 15004 – Gasoline Dispensing - B471 - Gasoline - 1200 gal/hr	15004	3090-RV1	35.053915	-106.601081	353988.08	3880193.96
FUEL – 15008– Gasoline Dispensing - B27497 - Gasoline - 20000 gal/yr	15008	3101-RV1	35.010505	-106.546407	358899.94	3875300.64
FUEL – 15011 – E85 Fuel Dispensing - B20359 - E85 - 1200 gal/hr	15011	3090-RV1	35.0515	-106.553554	358318.55	3879857.55
FUEL – 16001 – Gasoline Loading - B1041 - Gasoline - 300 gal/min	16001	3090-RV1	35.05142	-106.595184	354521.49	3879908.61
ICOM – 18001 – Landfill Mulcher Engine - LF268 - Diesel - 425 hp	18001	3048-RV1	35.03309	-106.527087	360701.23	3877778.41
ICOM – 18002 – Landfill Mulcher - LF268 - Mulch - 10.8 yd^3	18002	3048-RV1	35.03309	-106.527087	360701.23	3877778.41
ICOM – 19003 – Emergency Generator -B1004 - Diesel - 135 hp	19003	3032-M1	35.050931	-106.592067	354804.91	3879849.84
ICOM – 19006 – Emergency Generator -B29010 - Diesel - 102 hp	19006	3032-M1	34.968975	-106.490911	363895.26	3870617.56
ICOM – 19014 – Emergency Generator - B27497 - Diesel - 755 hp	19014	3101-RV1	35.010505	-106.546407	358899.94	3875300.64
ICOM – 19015 – Emergency Generator -B20217 - Diesel - 102 hp	19015	3031-RV2	35.055244	-106.551176	358541.89	3880269.43
ICOM – 19016 – Emergency Generator -B638 - Diesel - 40 hp	19016	3031-RV2	35.039688	-106.601607	353914.78	3878616.78
ICOM – 19019 – Emergency Generator -B30158 - Diesel - 102 hp	19019	3031-RV2	35.003325	-106.50811	362382.55	3874450.85
ICOM – 19031 – Emergency Generator - B1017 - Diesel - 355 hp	19031	3129	35.049476	-106.593301	354689.79	3879690.26
ICOM – 19032 – Emergency Generator -B20604 - Diesel - 465 hp	19032	3032-M1	35.049516	-106.548779	358750.64	3879630.73
ICOM – 19069 – Emergency Water Pump Engine -B1021 - Diesel - 340 hp	19069	3031-RV2	35.050498	-106.592061	354804.69	3879801.8
ICOM – 19070 –Emergency Water Pump Engine -B1021 - Diesel - 340 hp	19070	3031-RV2	35.050498	-106.592061	354804.69	3879801.8
ICOM – 19071 – Emergency Water Pump Engine -B1021 - Diesel - 340 hp	19071	3031-RV2	35.050498	-106.592061	354804.69	3879801.8
ICOM – 19072 – Emergency Water Pump Engine -B1021 - Diesel - 340 hp	19072	3031-RV2	35.050498	-106.592061	354804.69	3879801.8
ICOM – 19073 – Emergency Water Pump Engine -B758 - Diesel - 340 hp	19073	3031-RV2	35.040808	-106.573619	356469.79	3878700.38
ICOM – 19074 – Emergency Water Pump Engine -B758 - Diesel - 340 hp	19074	3031-RV2	35.040808	-106.573619	356469.79	3878700.38
ICOM – 19075 – Emergency Water Pump Engine -B758 - Diesel - 340 hp	19075	3031-RV2	35.040811	-106.57362	356469.7	3878700.71
ICOM – 19076 – Emergency Water Pump Engine -B758 - Diesel - 340 hp	19076	3031-RV2	35.040808	-106.57362	356469.7	3878700.71
ICOM – 19089 – Emergency Generator -B20305- Diesel - 390 hp	19089	1786-M2	35.050584	-106.557016	358001.21	3879760.88
ICOM – 19091 – Emergency Generator -B291 - Diesel - 750 hp	19091	3016-RV2	35.049884	-106.607625	353384.04	3879756.47
ICOM – 19093 – Fire Pump Engine -B320 - Diesel - 660 hp	19093	3031-RV2	35.051277	-106.605684	353563.56	3879908.12
ICOM – 19096 – Emergency Generator -B472 - Diesel - 568 hp	19096	3032-M1	35.05375	-106.601775	353924.5	3880176.67
ICOM – 19102 – Fire Pump Engine -B320 - Diesel - 660 hp	19102	3031-RV2	35.051277	-106.605684	353563.56	3879908.12
ICOM – 19106 – Emergency Generator -B20604 - Diesel - 166 hp	19106	3032-M1	35.049562	-106.548438	358781.82	3879635.35
ICOM – 19129 – Generator -B66701 - Diesel - 207 hp	19129	3031-RV2	34.97521	-106.443954	368192.26	3871246.13
ICOM – 19130 – Emergency Generator -B1005 - Diesel - 1186 hp	19130	3031-RV2	35.047343	-106.585107	355433.39	3879441.77
ICOM – 19131 – Emergency Generator -B20183- Diesel - 170 hp	19131	1786-M2	35.058542	-106.564464	357335.74	3880654.15
ICOM – 19132 – Emergency Generator -B30110- Diesel - 277 hp	19132	1786-M2	35.005362	-106.514152	361834.59	3874685.12
ICOM – 19133 – Emergency Generator -B1014 - Natural Gas - 57hp	19133	1786-M2	35.050323	-106.596014	354443.84	3879788.16
ICOM – 19134 – Emergency Generator -B20550- Diesel - 435 hp	19134	1786-M2	35.03504	-106.559726	357727.08	3878040.74
ICOM – 19135 – Generator -B66048 - Natural Gas - 1334 hp	19135	1759-M1	34.962551	-106.45979	366726.09	3869863.15
ICOM – 19140 – Emergency Generator - B334 - Diesel - 102 hp	19140	3102	35.047761	-106.605551	353569.42	3879517.96
ICOM – 19142 – Emergency Generator -B20420 - Diesel - 102 hp	19142	3032-M1	35.047536	-106.552437	358174.79	3879928.91
ICOM – 19143 – Emergency Generator -B20220 - Diesel - 50 hp	19143	3032-M1	35.056187	-106.556432	358064.17	3880381.49
ICOM – 19147 – Emergency Generator (Pump Station) -B20436 - Diesel - 755 hp	19147	1786-M2	35.049417	-106.556986	358001.92	3879631.41
ICOM – 19148 – Emergency Generator (Well #3) -B23900- Diesel - 535 hp	19148	1786-M2	35.065146	-106.562983	357482.29	3881384.49
ICOM – 19151 – Emergency Generator -B1037 - Diesel - 99 hp	19151	1945	35.048188	-106.586016	355351.97	3879536.81

Feature Description	Kirtland Unit ID	Permit Number	WGS_1984_UTM_Zone_13S		UTM coordinates	
			Latitude	Longitude	Easting m E	Northing m N
ICOM – 19153 – Emergency Generator (Well #20) -Well #20 - Diesel - 755 hp	19153	1786-M2	35.049349	-106.557502	357954.74	3879624.6
ICOM – 19154 – Emergency Generator -B20684 - Diesel - 65.6 hp	19154	3032-M1	35.047668	-106.549535	358678.5	3879426.84
ICOM – 19155 – Emergency Generator -B66001 - Diesel - 752 hp	19155	1759-M1	34.963011	-106.463768	366363.64	3869919.48
ICOM – 19156 – Emergency Generator -B66001 - Diesel - 752 hp	19156	1759-M1	34.962991	-106.463745	366365.7	3869917.23
ICOM – 19157 – Emergency Generator -B66001 - Diesel - 752 hp	19157	1759-M1	34.962965	-106.463724	366367.58	3869914.32
ICOM – 19158 – Emergency Generator -B66001 - Diesel - 752 hp	19158	1759-M1	34.96294	-106.463701	366369.64	366369.64
ICOM – 19159 – Generator - B277 - Diesel - 762 hp	19159	2105-RV1	35.048868	-106.607626	353382.13	3879643.79
ICOM – 19160 – Emergency Generator -B416 - Diesel - 94.5 hp	19160	2085	35.053321	-106.606502	353492.61	3880136.03
ICOM – 19161 – Emergency Generator -B570 - Diesel - 348 hp	19161	2100	35.05611	-106.602483	353864.13	3880439.46
ICOM – 19163 – Emergency Generator -RADOME - Diesel - 399 hp	19163	2147	34.993411	-106.506722	362492.63	3873349.39
ICOM – 19164 – Emergency Generator -B80006 - Diesel - 250 hp	19164	3013-RV1	34.948069	-106.511697	361962.5	3868327.41
ICOM – 19168 – Emergency Generator -B20683 - Diesel - 25 hp	19168	3032-M1	35.045495	-106.546585	358943.83	3879181.66
ICOM – 19169 – Emergency Generator - B20332 - Diesel - 1490 hp	19169	3141-RV1	35.053507	-106.552439	358423.71	3880078.57
ICOM – 19170 – Emergency Generator - B402 - Diesel - 755 hp	19170	1777-RV1	35.052817	-106.604987	353630.21	3880081.45
ICOM – 19171 – Emergency Generator - B402 - Diesel - 755 hp	19171	1777-RV1	35.052849	-106.604984	353630.21	3880081.45
ICOM – 19172 – Emergency Generator - B402 - Diesel - 755 hp	19172	1777-RV1	35.052902	-106.604986	353630.12	3880087.33
ICOM – 19173 – Emergency Generator - B402 - Diesel - 755 hp	19173	1777-RV1	35.052933	-106.604987	353630.09	3880090.77
ICOM – 19174 – Emergency Generator - QSK23-G7NR2 - B900 Well #15- Diesel - 1220 hp	19174	1786-M5	35.06184511	-106.5456811	359054.39	3880993.77
ICOM – 19176 – Emergency Generator - QSX15-G9NR2 - B498 - Diesel - 755 hp	19176	3032-M1-1AR	35.05899906	-106.6005904	354041.92	3880757.12
ICOM – 19177 – Emergency Generator - QSX15-G9NR2 - B20449- Diesel - 755 hp	19177	3032-M1-1AR	35.047941	-106.550532	358542.35	3879443.2
ICOM – 19178 – Emergency Generator - QSK23-G7NR2 - B25952 Well #16 - Diesel - 1220 hp	19178	1786-M5	35.050899	-106.56734	356834.19	3879964.04
ICOM – 19179 – Emergency Generator - KOi 3404 TCR 4 - B323 - Diesel - 74.3 hp	19179	3308	35.048699	-106.602164	353880	3879617
ICOM – 19181 – Emergency Generator - QSB5-G5 - B29999 - Diesel - 176 hp	19181	1786-M5	Build. 29999			
ICOM – 19182 – Emergency Generator - QSB5-G5 -B37528 - Diesel - 176 hp	19182	1786-M5	35.010847	-106.494559	363214.89	3875209.57
AFOTEC – 19183 – Non-Emergency Generator - D60-P2 - Bivouac Area 3 - Diesel - 86.5 hp	19183	3366	34.990235	-106.476552	365241	3872956
JET – 20002 – T700 Test Cell -BXXX - Kerosene- 1100 hp	20002	0484-M3	35.032988	-106.599754	354071.89	3877870.96
JET – 20004 – T400 Test Cell -BXXX - Kerosene- 2000 hp	20004	0484-M3	35.033079	-106.59991	354057.82	3877881.29
SURF – 21004 – Paint Booth - B482 - Paint -3.0 gal//hr	21004	3128	35.054097	-106.598336	354238.76	3880210.13
SURF – 21015 – Paint Booth -B985 - Paint - 30 lb/hr	21015	1770-RV3	35.052442	-106.596065	354442.95	3880023.25
FUEL – 22003 – Gasoline Storage - B20359 - Gasoline - 10000 gal	22003	3090-RV1	35.0515	-106.553554	358318.55	3879857.55
FUEL – 22004– Gasoline Storage - B20359 - Gasoline - 10000 gal	22004	3090-RV1	35.0515	-106.553554	358318.55	3879857.55
FUEL – 22005– Gasoline Storage - B1041 - Gasoline - 10000 gal	22005	3090-RV1	35.04899	-106.579494	355948.25	3879616.32
FUEL – 22015 – E85 Fuel Storage - B20359- E85 - 10000 gal	22015	3090-RV1	35.0515	-106.553554	358318.55	3879857.55
FUEL – 25012 – Gasoline Storage - B471 - Gasoline- 3000 gal	25012	3090-RV1	35.054019	-106.601088	353987.63	3880205.5
FUEL – 25017– Gasoline Storage - B27497 - Gasoline - 20000 gal/yr	25017	3101-RV1	35.010505	-106.546407	358899.94	3875300.64

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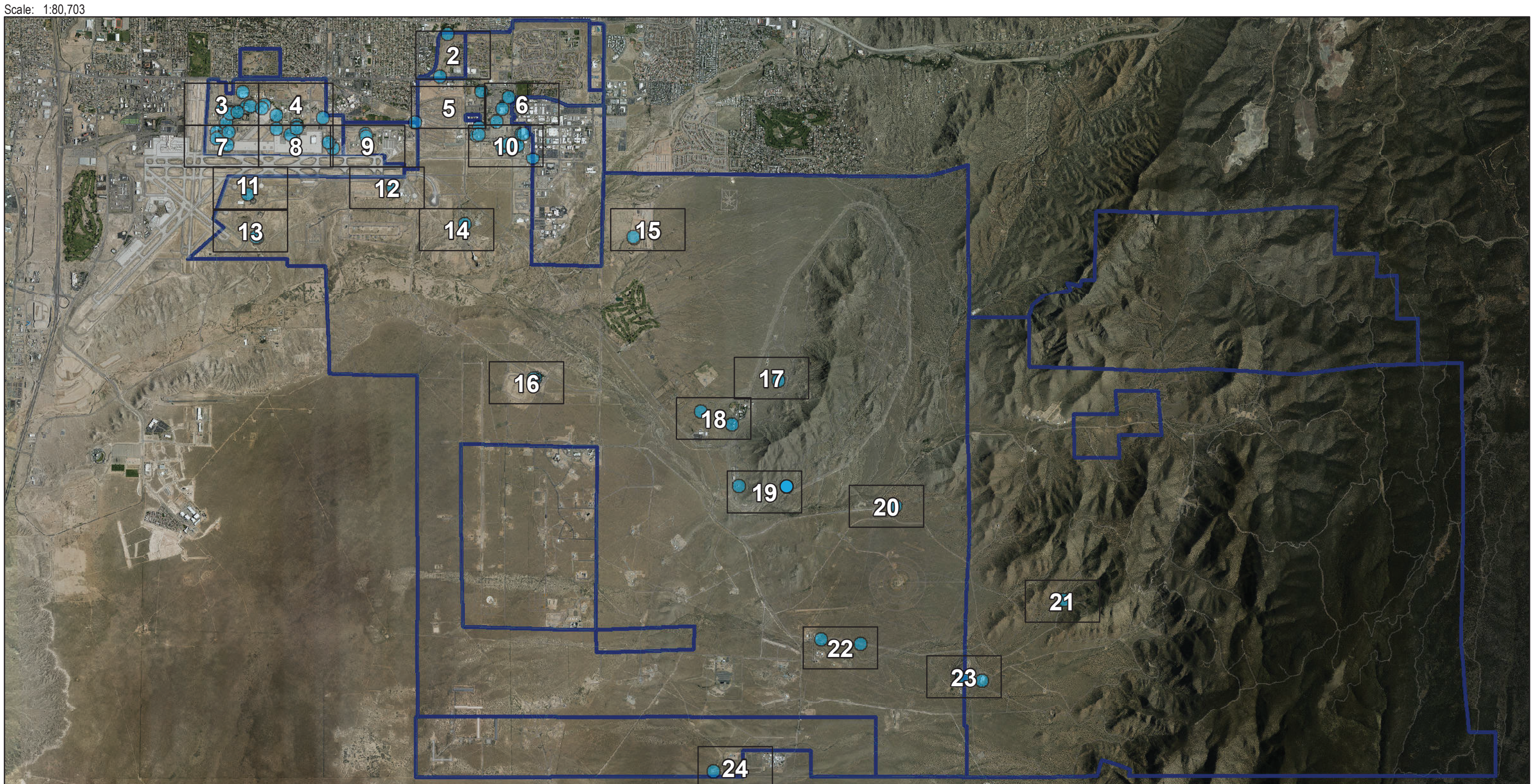

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.5 1 2 3 4 Miles

Kirtland AFB

Page:
1 of 24

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

Prepared By: Aric Mccrumb, CSU-CEMML GIS Analyst, Aric.Mccrumb.ctr@us.af.mil, **Last Save Date:** 1/18/2022

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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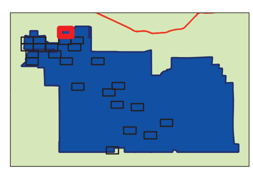

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2 of 24

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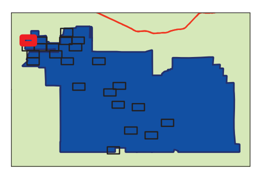

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

Miles

0 0.03 0.06 0.12 0.18 0.24

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

Prepared By: Aric Mccrumb, CSU-CEMML GIS Analyst, Aric.Mccrumb.ctr@us.af.mil, **Last Save Date: 1/20/2022**

Scale: 1:5,020

Legend

Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

Miles

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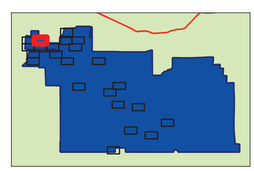

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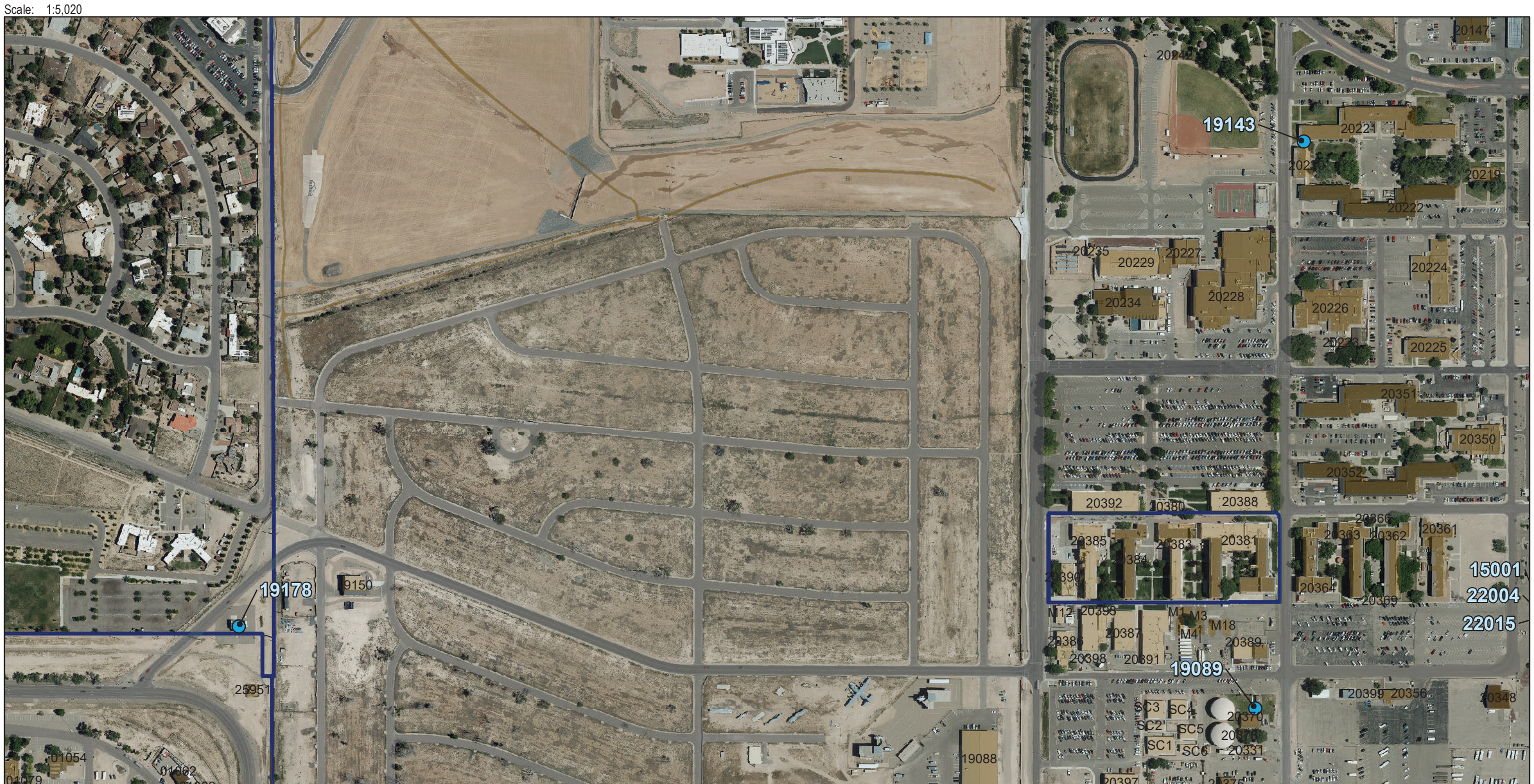

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

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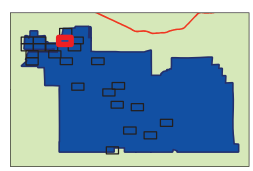

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5 of **24**

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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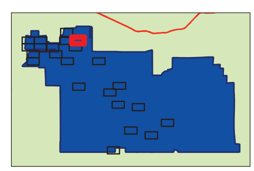

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Prepared By: Aric Mccrumb, CSU-CEMML GIS Analyst, Aric.Mccrumb.ctr@us.af.mil, **Last Save Date: 1/20/2022**

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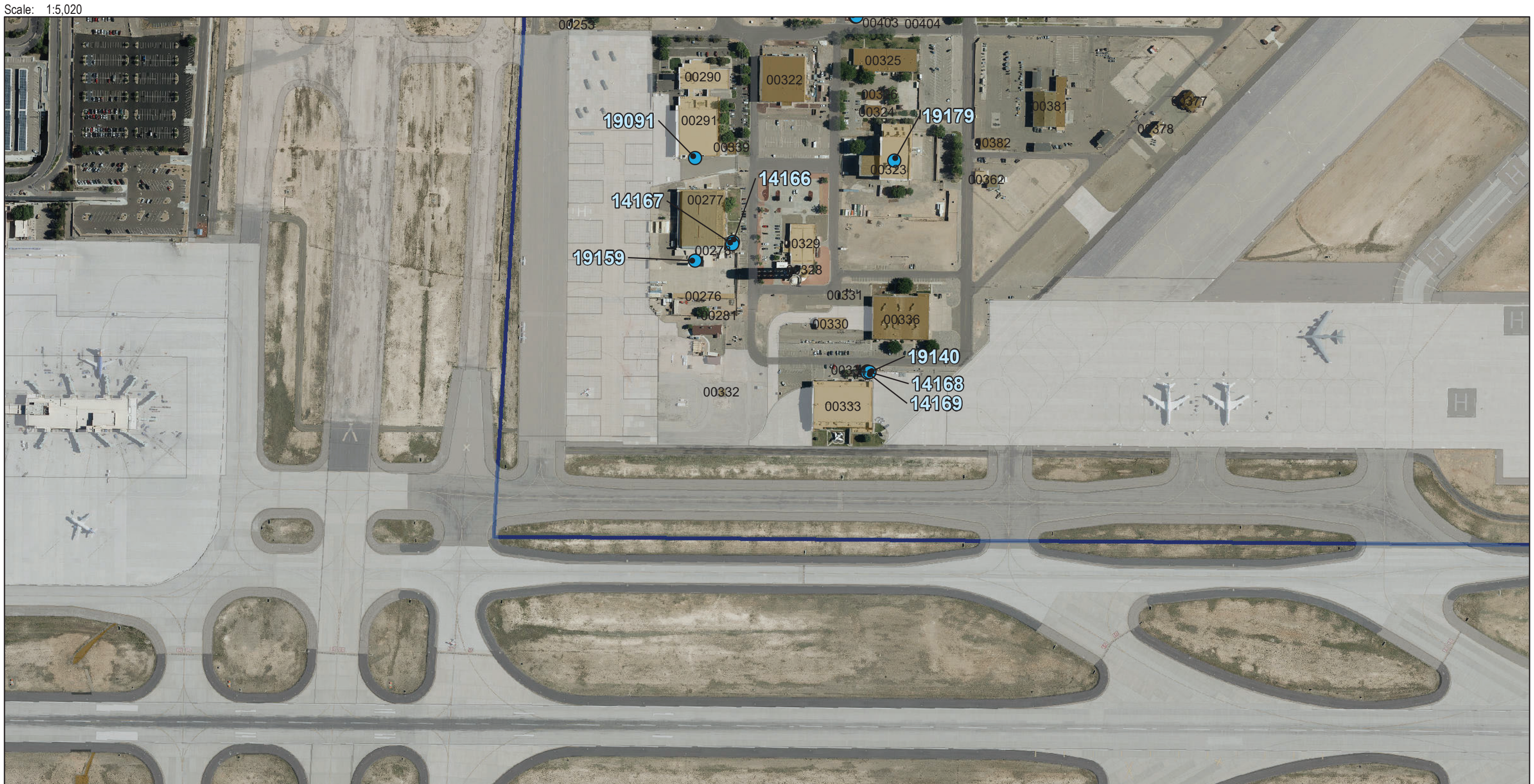

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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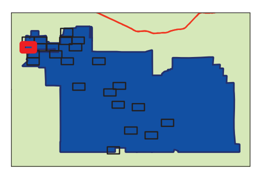

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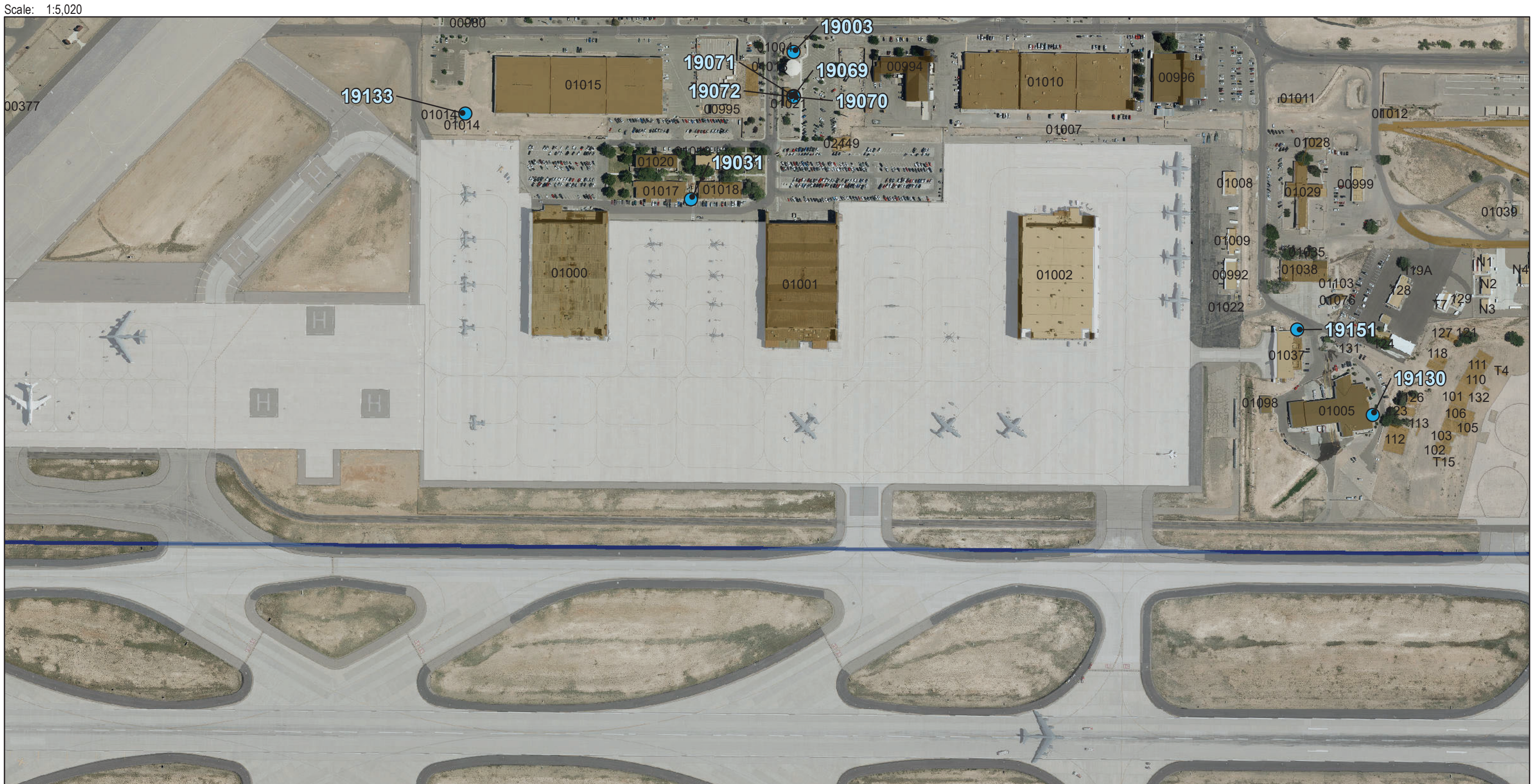

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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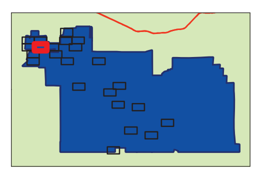

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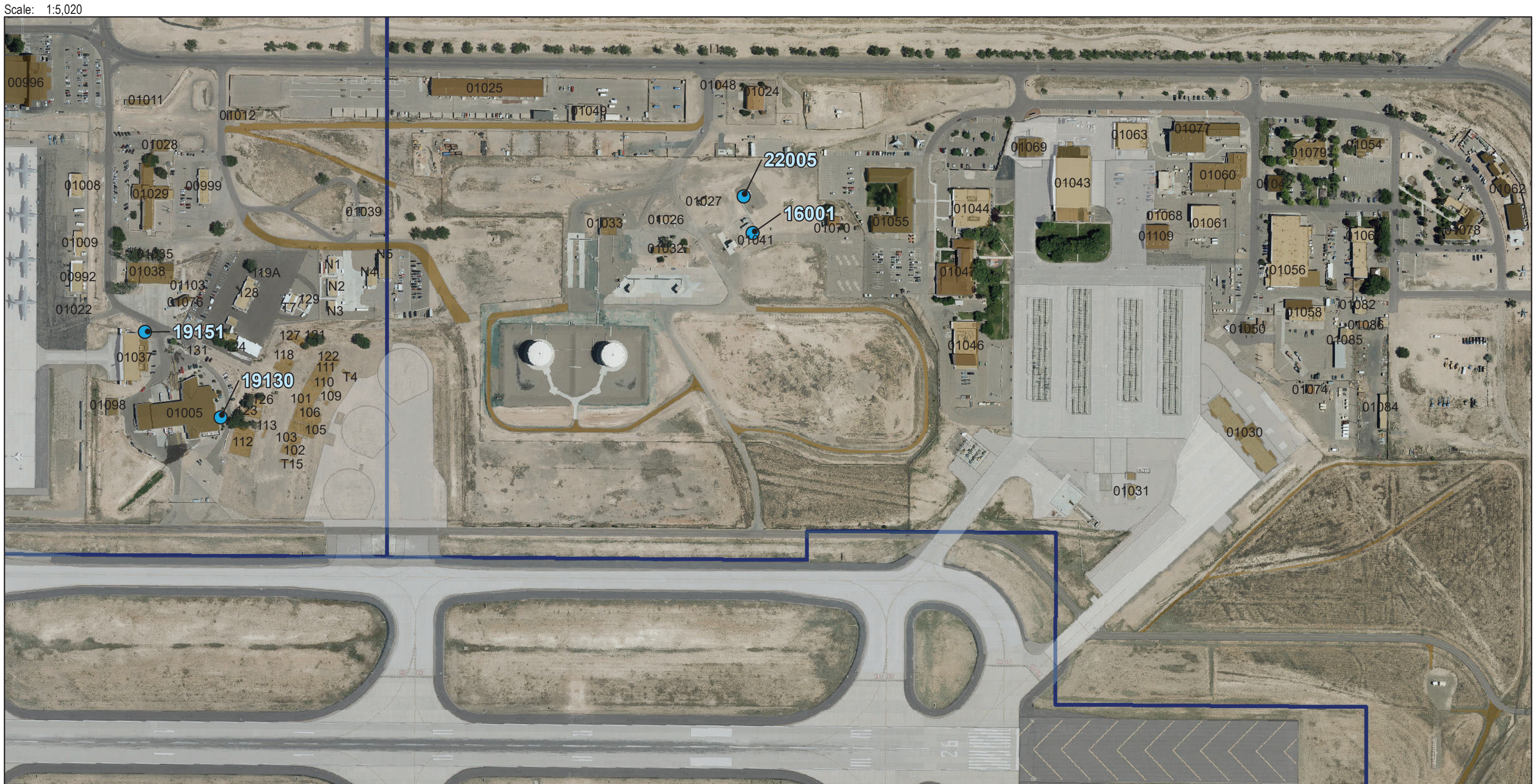

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Air Emission Source

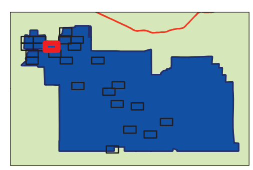
Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles



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Legend

Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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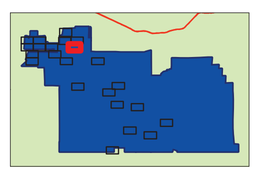

Page: **10** of **24**

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

Prepared By: Aric Mccrumb, CSU-CEMML GIS Analyst, Aric.Mccrumb.ctr@us.af.mil, **Last Save Date: 1/20/2022**

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Legend

Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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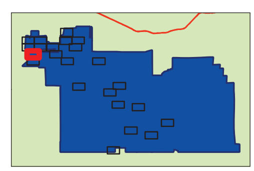

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11 of 24

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Legend

Air Emission Source

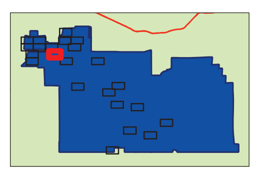
Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles



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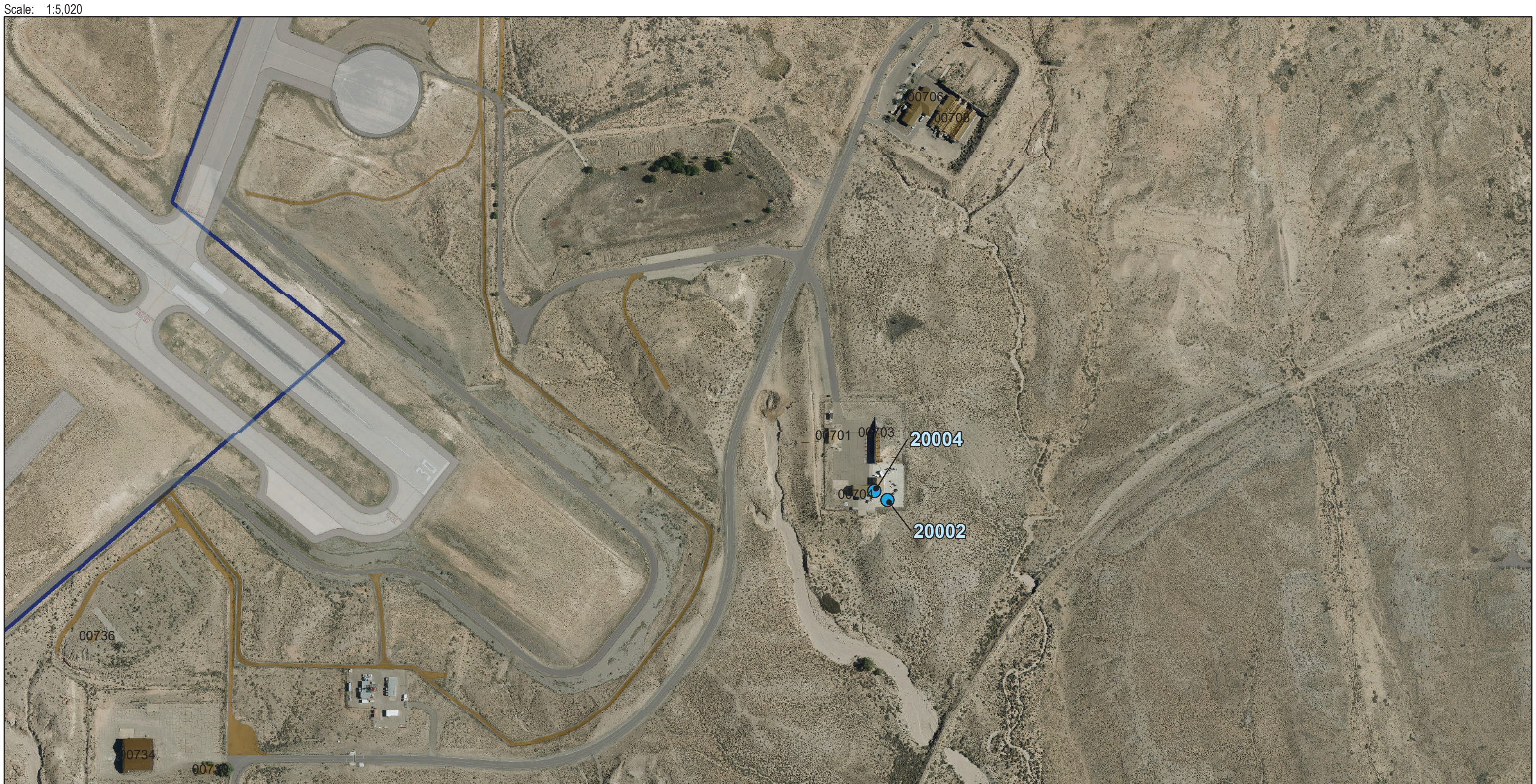

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

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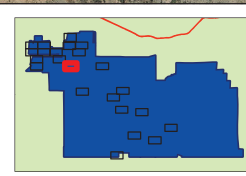

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

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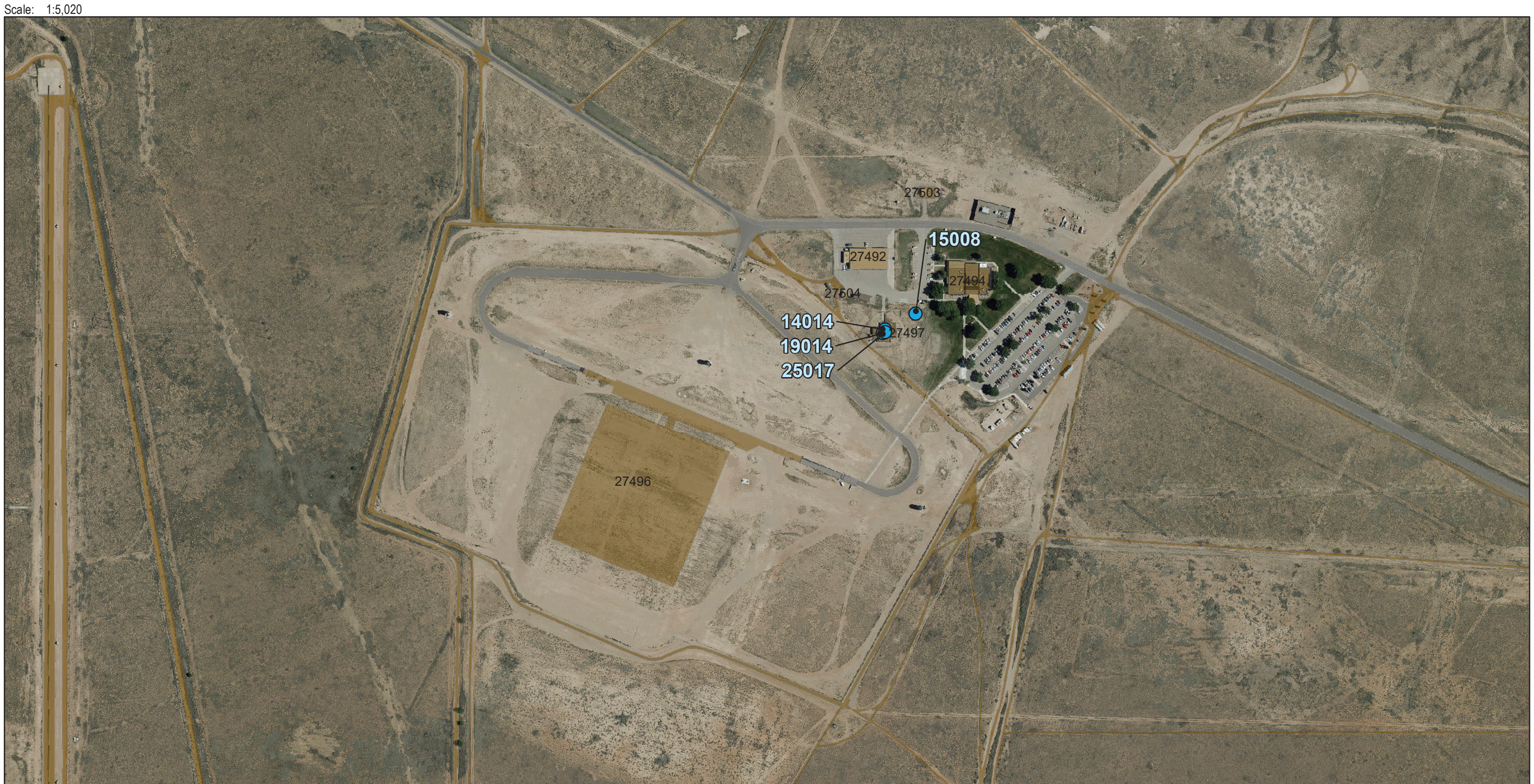

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

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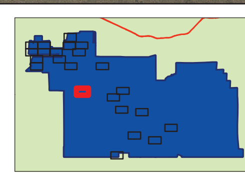

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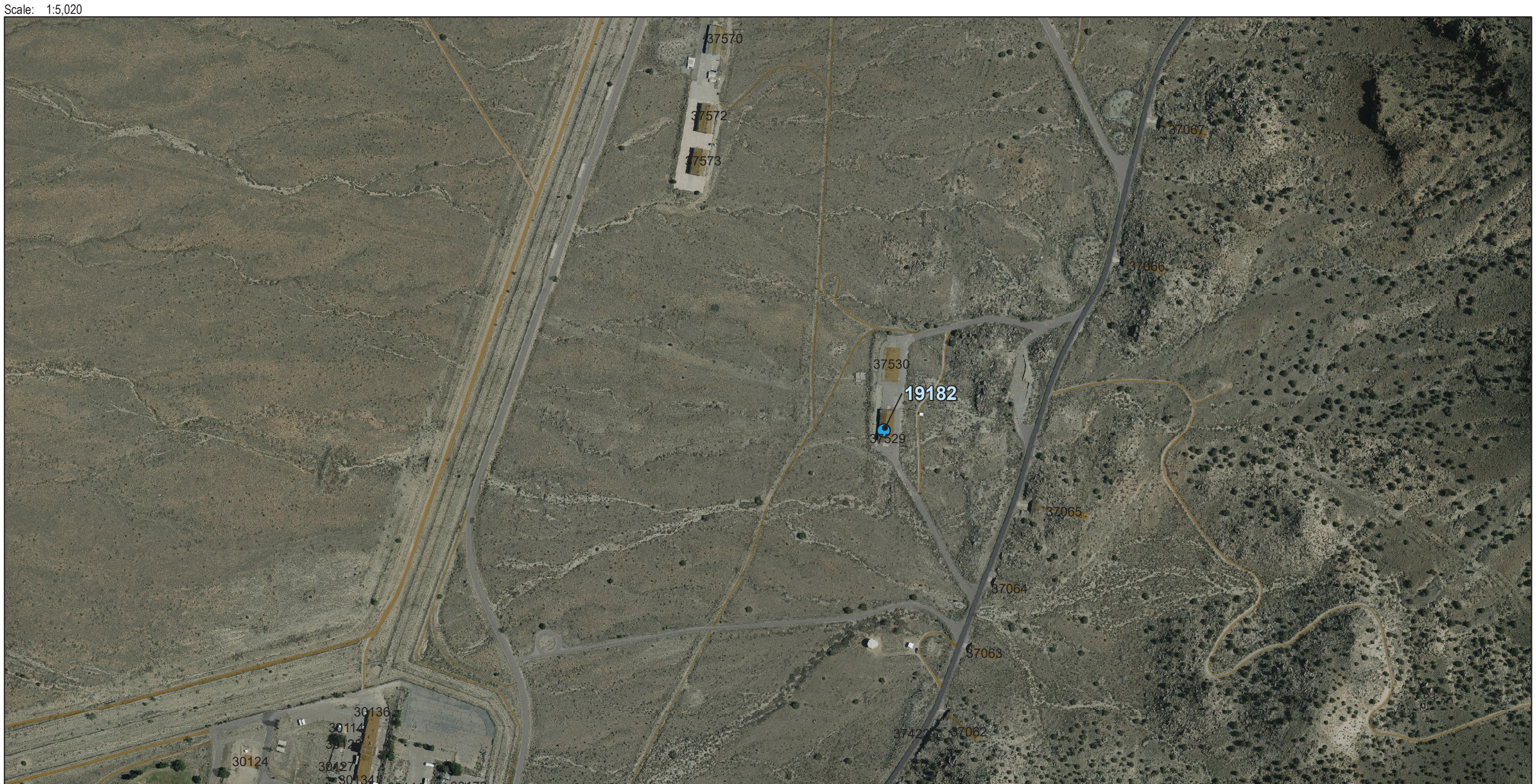

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

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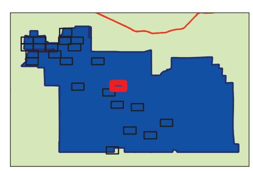

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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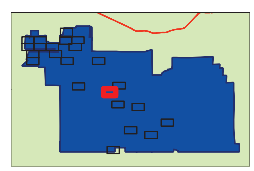

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

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Air Emission Source

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0 0.03 0.06 0.12 0.18 0.24 Miles

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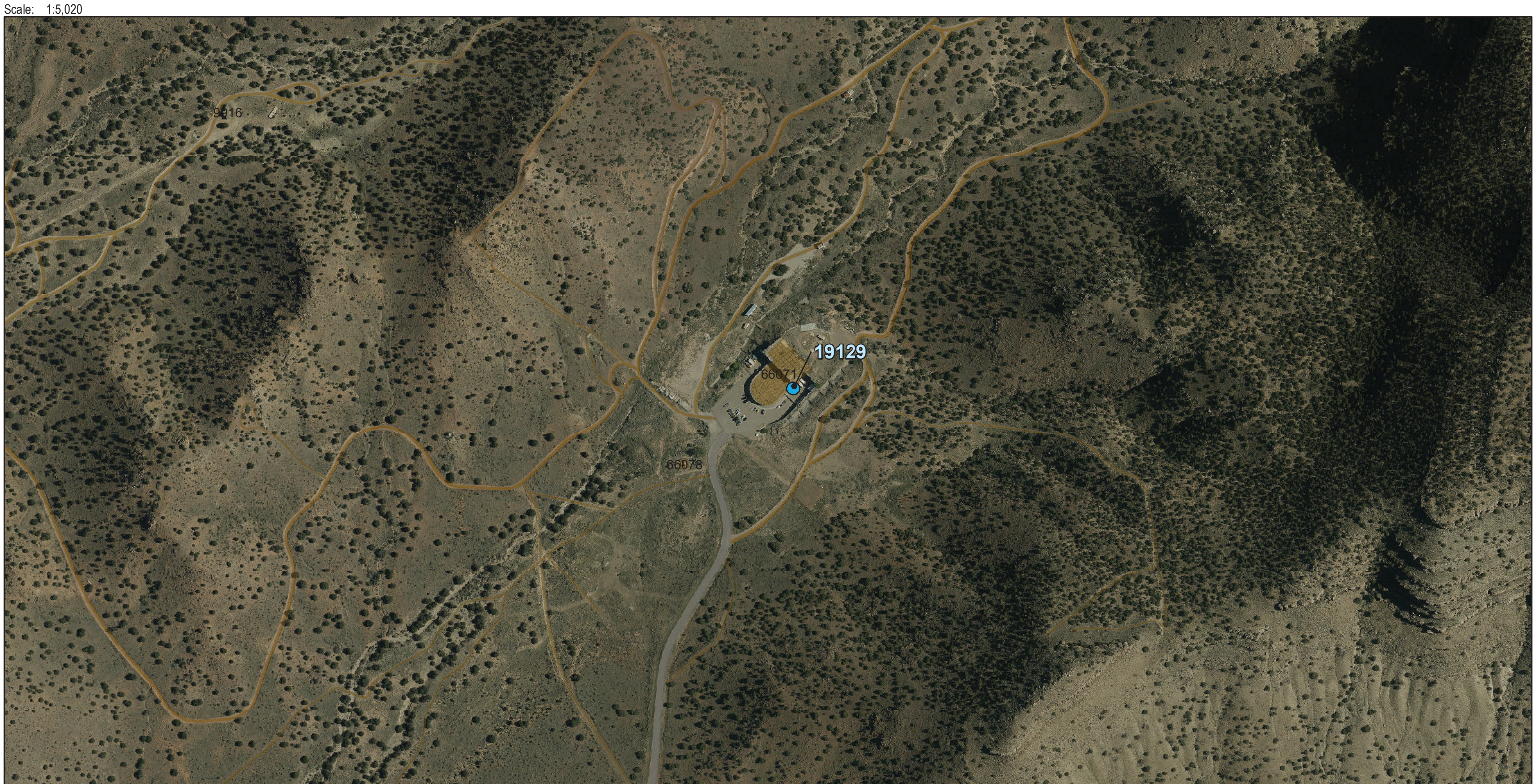

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

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Legend

Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles

Page:
22 of **24**

Scale: 1:5,020

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

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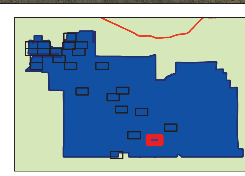

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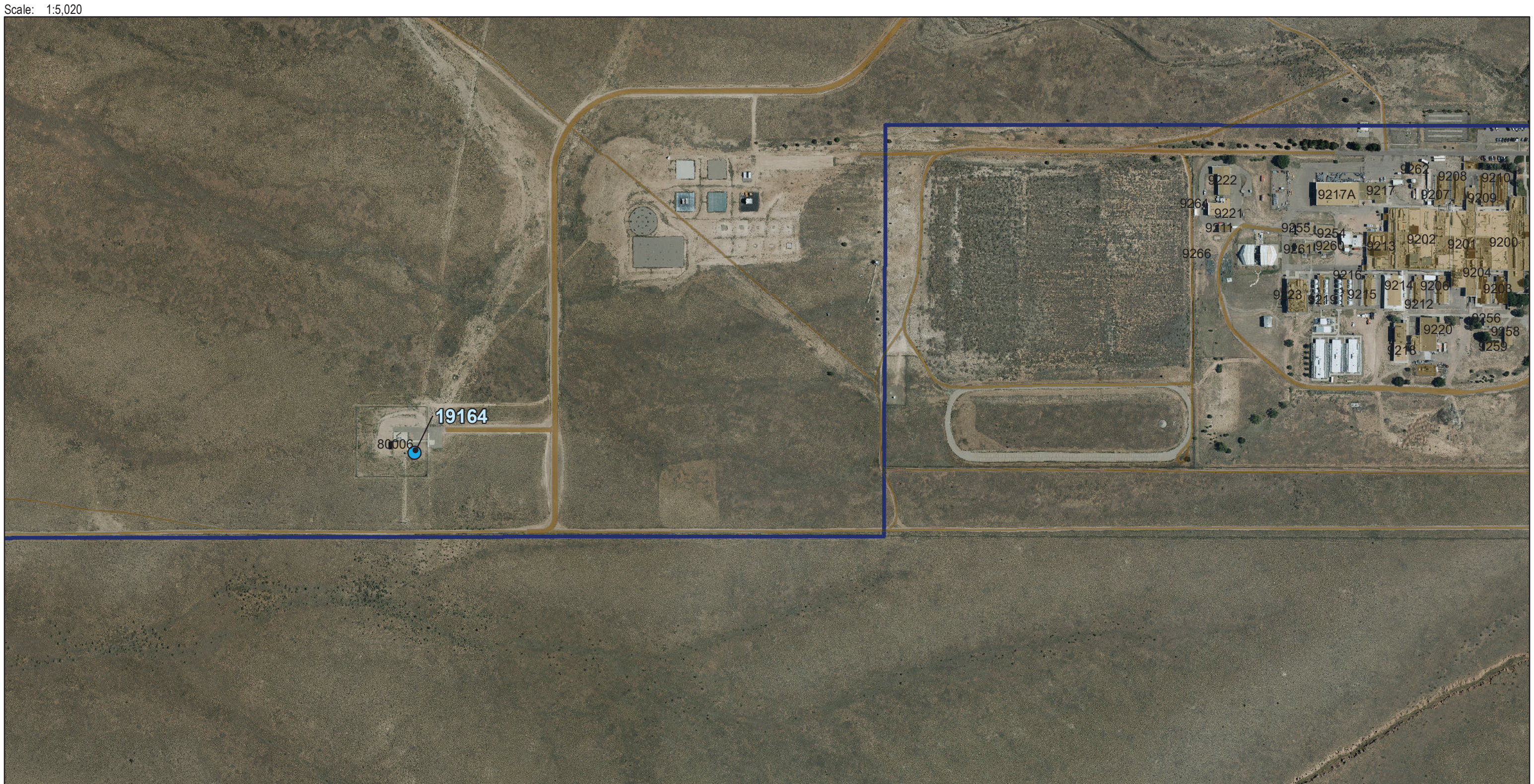

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Air Emission Source

Installation Boundary

Kirtland AFB

Air Emission Sources

N

0 0.03 0.06 0.12 0.18 0.24 Miles

Cooperative Agreement Number: W9126G-14-2-0018 - W9126G- 0-2-0004

Prepared By: Aric Mccrumb, CSU-CEMML GIS Analyst, Aric.Mccrumb.ctr@us.af.mil, **Last Save Date: 1/20/2022**

Attachment F

Insignificant Inventory

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	201	377 CE	2.1600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	322	377 CE	2.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	323	377 CE	4.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	325	377 CE	0.5758	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	325	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	325	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	336	377 CE	2.8600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	377	377 CE	1.2000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	377	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	381	377 CE	0.8950	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	381	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	382	377 CE	0.2600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	400	377 CE	1.2550	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	400	377 CE	0.2210	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	402	377 CE	2.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	402	377 CE	2.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	405	377 CE	0.5250	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	412	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	412	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	413	377 CE	2.5200	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	415	377 CE	0.2100	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	415	377 CE	0.2100	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	416	377 CE	0.9660	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	416	377 CE	2.3730	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	418	377 CE	1.1600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	419	377 CE	0.6800	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	422	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	423	377 CE	0.9660	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	424	377 CE	0.6270	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	425	377 CE	0.3950	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	426	377 CE	0.9660	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	472	377 CE	2.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	497	377 CE	2.1000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	498	377 CE	0.7940	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	499	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	570	377 CE	4.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	585	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	585	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	589	377 CE	0.7200	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	593	377 CE	0.7600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	593	377 CE	0.9000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	595	377 CE	0.9700	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	638	377 CE	1.2000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	706	377 CE	0.2880	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	733	377 CE	1.0400	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	734	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	737	377 CE	1.1700	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	751	377 CE	1.0800	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	760	377 CE	2.9290	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	760	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	761	377 CE	2.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	909	377 CE	1.3570	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	914	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	914	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	915	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	916	377 CE	0.6500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	917	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	918	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	922	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	923	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	923	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	924	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	926	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	942	377 CE	2.0500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	945	377 CE	0.2100	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	948	377 CE	0.9410	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	949	377 CE	1.7300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	950	377 CE	0.5200	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	950	377 CE	0.6000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	952	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	956	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	957	377 CE	0.7600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	975	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	979	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	985	377 CE	0.2700	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	986	377 CE	2.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	986	377 CE	2.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	986	377 CE	0.1600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	986	377 CE	0.3999	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	994	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	996	377 CE	0.8500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1000	377 CE	2.0900	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1000	377 CE	1.9999	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1001	377 CE	4.2000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1002	377 CE	2.1000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1002	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1002	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1005	377 CE	1.2500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1005	377 CE	0.3999	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1015	377 CE	3.5200	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1017	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1018	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1020	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1025	377 CE	0.2850	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1029	377 CE	0.6900	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1029	377 CE	0.8800	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1037	377 CE	0.9990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1037	377 CE	0.9990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1043	377 CE	0.3999	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	1044	377 CE	0.1990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1044	377 CE	0.1990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1047	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1047	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1055	377 CE	1.8900	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1056	377 CE	1.6380	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1056	377 CE	0.6380	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1060	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1062	377 CE	0.3600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1062	377 CE	0.3600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1062	377 CE	0.1750	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1063	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1069	377 CE	0.9360	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1069	377 CE	0.3990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1077	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1078	377 CE	0.8000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1900	377 CE	0.9000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1911	377 CE	0.9830	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	1914	377 CE	1.0500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	19100	377 CE	1.4400	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	19100	377 CE	1.4400	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20107	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20129	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20130	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20130	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20130	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20140	377 CE	1.4300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20160	377 CE	0.9000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20170	377 CE	1.4300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20170	377 CE	1.2000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20201	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20202	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20203	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	20203	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20203	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20210	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20219	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20220	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20221	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20221	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20221	377 CE	0.0300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20221	377 CE	0.0300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20222	377 CE	0.0300	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20222	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20224	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20226	377 CE	0.7000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20228	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20228	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20228	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20228	377 CE	0.2850	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20229	377 CE	3.0500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20234	377 CE	0.9900	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20235	377 CE	3.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20245	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20245	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20325	377 CE	1.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20332	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20332	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20332	377 CE	2.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20332	377 CE	2.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20350	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20350	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20350	377 CE	3.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20351	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20351	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20351	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	20351	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20352	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20352	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20352	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20352	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20356	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20362	377 CE	2.5110	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20362	377 CE	2.0090	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20413	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20420	377 CE	0.7500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20449	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20449	377 CE	0.2600	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20451	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20600	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20602	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20604	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20604	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20616	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20616	377 CE	2.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20616	377 CE	2.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20676	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20684	377 CE	0.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	20685	377 CE	0.4200	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	21996	377 CE	0.3990	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	21996	377 CE	1.6250	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22000	377 CE	4.1800	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22000	377 CE	0.3000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22001	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22002	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22003	377 CE	1.4000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22010	377 CE	0.6280	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22011	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22012	377 CE	0.9500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Exempt Sources - External Combustion

Process Name	Building Number	Organization	Capacity (MMBtu/hr)	Fuel Type	Reason for Insignificance
EXTERNAL COMBUSTION - BOILER	22018	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22018	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22018	377 CE	1.0500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	22018	377 CE	0.9400	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	24499	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	24499	377 CE	1.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	24499	377 CE	0.2700	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	27494	377 CE	0.2999	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	28054	377 CE	0.6500	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	30116	377 CE	0.3360	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	37200	377 CE	1.1130	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	57001	377 CE	0.7220	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	66000	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	66000	377 CE	1.0000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	66048	377 CE	4.5000	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.
EXTERNAL COMBUSTION - BOILER	66071	377 CE	0.6290	Natural Gas	Comfort heating or hot water production for personal use and is rated less than 5 MMBtu/hr.

Insignificant Sources - Abrasive Blasting

Process Name	Building Number	Organization	Reason for Insignificance
ABRASIVE BLASTING - GLASS BEADS	00291	US CUSTOMS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
ABRASIVE BLASTING -GLASS BEADS	00322	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant
ABRASIVE BLASTING - WALNUT SHELL MEDIA	20678	377 CE	Potential to emit is no more than one ton per year of any regulated criteria pollutant
ABRASIVE BLASTING - 58 SOW - BLDG 336 - ALUMINUM OXIDE BEADS	336	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
ABRASIVE BLASTING - SAND BLAST	20432	377 TRANS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
ABRASIVE BLASTING -GLASS BEADS	66071	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant

Insignificant Sources - Degreasers

Process Name	Building Number	Model Number	Serial Number	Capacity	Capacity UOM	Organization	Reason for Insignificance
INLAND TECHNOLOGIES DEGREASER--	00291	IT-40MP	110242825	-	-	US CUSTOMS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 58TH AGE	00381	IT-40MP	70242076	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECH DEGREASER AT 58TH TEST CELL	00702	IT-40MP	60343908	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 58TH HEAVY LIFT	01000	IT-40MP	60343989	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGREASER - COLD CLEANER - A/R	01002	F4000-P-ZX	18865	50.0000	GAL	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGREASER - COLD CLEANER	01006	U-DEGR-CDTANK-007	048617	5.0000	GAL	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECHNOLOGY DEGREASER	1001	IT-40MP	60343988	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 58TH HYDRO SHOP	1002	IT-95	80344256	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT NMANG VEHICEL MAINT	1058	IT-40MP	60343922	-	-	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT NMANG TIRE SHOP	1061	IT-40MP	60343983	-	-	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECH. DEGREASER-150TH SECURITY FORCES	1062	IT-48M4	111111	-	-	150TH SECURITY FORCES	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECH. DEGREASER-150TH SECURITY FORCES	1062	IT-48-M4	119935368	-	-	150TH SECURITY FORCES	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND MACHINE AT NMANG WHEEL AND TIRE SHOP	1063	IT-95	9044493	-	-	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT NMANG WELDING SHOP	1064	IT-40MP	60343984	-	-	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGREASER - COLD CLEANER	20147	30.3 R	30229390	17.0000	GAL	AAFES	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 SFS ARMORY	20221	IT-48	119935366	-	-	377 SFS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20338	IT-40MP	60343982	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20338	IT-40MP	90242499	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20338	IT-40MP	90242501	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT BASE BODY SHOP	20344	-	-	-	-	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20349	IT-40MP	60343990	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20349	IT-40MP	60343991	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20349	IT-40MP	90242500	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT AUTO HOBBY SHOP	20375	IT-40MP	60343987	-	-	377 FSS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT AUTO HOBBY SHOP	20375	IT-40MP	90242502	-	-	377 FSS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	20423	IT-40MP	60343985	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGREASER COLD	20616	1601	8086667	16.0000	GAL	MARINES	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECHNOLOGY DEGREASER AT POWER PRO	20678	IT-40MP	60343917	-	-	377 CE	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGREASER COLD CLEANER	29053	MODEL 34	-	30.0000	GAL	377 SFS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND DEGREASER AT 377 TRANS	333	IT-40MP	60343986	30.0000	GAL	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 336	336	-	-	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 482	482	WASHER-01	UNKNOWN	5.0000	GAL	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECHNOLOGIES DEGREASER 1 - CATUM	706	IT48M6	11058159	50.0000	GAL	377 SFS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECHNOLOGIES DEGREASER 2 - CATUM	706	IT48M6	11058172	50.0000	GAL	377 SFS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
INLAND TECHNOLOGIES DEGREASER FOR PJS BLDG 937	937	IT48WC	90744571	50.0000	GAL	PJS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 979	979	CE2000-27	20013	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 979	979	CE2000-27	20323	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 979	979	50381	60MG5038NW353	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
DEGR - 58 SOW - BLDG 985	985	IT-4500	70855337	-	-	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant

Insignificant Sources - Woodworking

Process Name	Building Number	Organization	Reason for Insignificance
WOODWORKING	20679	377 CE	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WOODWORKING	1060	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WOODWORKING	1064	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WOODWORKING - AFRL RV - BUILDING 570	570	AFRL RV	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WOODWORKING - 58 SOW - BUILDING 482	482	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant

Insignificant Sources - Welding

Process Name	Building Number	Organization	Reason for Insignificance
WELDING	00406	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	482	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	570	AFRL RV	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	01001	58 SOW	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	1064	NMANG	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	20375	377 FSS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	20423	377 LRS	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	20680	377 CE	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	20749	DTRA	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	30136	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	472-RM126	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant
WELDING	66008	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant

Insignificant Sources - Above Ground Storage Tanks

Process Name	Building Number	Equipment ID	Capacity	Capacity UOM	Organization	Reason for Insignificance
DIESEL AST	20359	22001	6,000	GAL	GOVERNMENT EAST	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.
DIESEL AST	1036	22002	10,000	GAL	MAIN FUELS	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.
DIESEL AST	1036	22006-2	10,000	GAL	MAIN FUELS	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.
JP-8 AST	1036	22016	1.7m	GAL	MAIN FUELS	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.
JP-8 AST	1032	22017	1.7m	GAL	MAIN FUELS	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.
DIESEL AST	00471	25008	3,000	GAL	GOVERNMENT WEST	Storage tanks, vessels, and containers holding or storing low vapor pressure (≤10 mmHg) liquid substances.

Insignificant Sources - Fuel Leaks

Process Name	Building Number	Organization	Fuel Type	Reason for Insignificance
Fuel Equipment Leaks	Basewide	Basewide	Gasoline	Potential to emit is no more than one ton per year of any regulated criteria pollutant

Insignificant Sources - Shredding Activities

Process Name	Building Number	Organization	Reason for Insignificance
Shredding Activities	66019	AFRL	Potential to emit is no more than one ton per year of any regulated criteria pollutant
Shredding Activities	20404	377 CE	Potential to emit is no more than one ton per year of any regulated criteria pollutant

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Attachment G

Air Dispersion Modeling

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Kirtland Air Force Base

Title V Operating Permit #527-RN1
Renewal Application
Air Quality Modeling Protocol

October 2021

377 MSG/CEIE
Kirtland AFB, New Mexico 87117-5270

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Summary

Kirtland Air Force Base (KAFB) is planning to submit a Title V Permit Renewal Application for KAFB's Title V Operating Permit #527-R1. The application, to be filed in accordance with the requirements of 20.11.42.12.A.(2)(a)(ii) NMAC. The permit renewal will include new sources of emissions that commenced operation within 12 months prior to the previous permit application, along with other emission inventory changes.

KAFB has previously submitted base-wide Title V air quality dispersion modeling to demonstrate compliance with the appropriate National Ambient Air Quality Standards (NAAQS). The most recent demonstration did not include the recently installed equipment and therefore the KAFB base-wide modeling will be updated to include all appropriate Title V operating equipment and sources of regulated air pollutants.

The modeling assessment to be completed will conform with the latest City of Albuquerque Environmental Health Department (AEHD) Air Dispersion Modeling Guidelines for Air Quality Permitting (October 2019) and will include:

- Use of the most recent version of AERMOD (version 21112) in regulatory default mode
- Permitted emission rates from Title V permitted emission sources at KAFB
- Good Engineering Practice (GEP) stack downwash assessment
- Use of AERMET surface and profile data for the five-year period (2014-2018) as provided by the AEHD – Air Quality Division (AQD)
- A comprehensive and updated grid of ambient receptor locations
- Representative ambient background values as obtained from the AEHD-AQD
- Inclusion of an offsite inventory of emitting sources per AEHD-AQD

The inputs noted above are further described in subsequent sections. A modeling report documenting the results of the proposed modeling analysis will be provided along with electronic modeling files.

Model Input Development

The latest version of the approved air quality dispersion model AERMOD (21112) will be used in the modeling assessment and is an appropriate model version for the assessment. The AERMOD model has several required inputs to allow the model to simulate regulated air pollutant emissions to the atmosphere and subsequent downwind transport.

The model requires input parameters to define how the pollutants will be exhausted to the atmosphere which are typically through point or area/volume source types. For point source parameters, the location of the source, height above grade, exhaust temperature, exit velocity, and stack diameter and orientation (vertical, horizontal, capped) are necessary input values. These values can vary greatly depending upon the type of source modeled.

Buoyant plumes from stacks with high exhaust temperatures will typically rise higher into the atmosphere than less-buoyant, colder exhaust plumes. The temperature difference between ambient and stack exhaust is used to calculate the individual stack buoyancy flux and therefore, determine plume rise above grade elevation.

The plume rise can also be affected by momentum flux which is due to high exit velocity plumes. High exit velocities tend to move emitted plumes higher into the atmosphere than lower velocity exhausts. The combined effects of buoyancy and momentum are calculated for each hour of meteorological data, meaning that plume heights can differ each hour for different emission sources depending on the input parameters.

KAFB Title V Emission Inventory

The KAFB Title V source emission inventory and input parameters to be used in the modeling assessment are provided in Table 1. The modeled source descriptions, including location and exhaust parameters, are shown. As seen in Table 1, some sources will be modeled with the source type nomenclature of "point", whereas others will be modeled as "pointhor" or "pointcap". The "point" source nomenclature is applied to exhaust stacks that are vertically oriented without obstruction. The "pointhor" source nomenclature is applied to exhaust stacks that are horizontally oriented and the "pointcap" nomenclature to stacks that are vertically oriented but are capped to prevent rain from entering the stack.

The AERMOD model treats each of these source types differently, but in so doing requires the same input parameters for each type, in that, for sources subject to downwash, the actual exit temperature, exit diameter, and exit velocity are used. Hence, the values provided in Table 1represent the model input values to be used by AERMOD.

Of note, the value of zero entered in the temperature column (e.g., for AERMOD Model ID 21004;58 SOW Paint Booth) instructs AERMOD to assign the hourly ambient temperature, found in the meteorological data record, as the exit stack temperature. This approach is consistent with that used for dispersion modeling provided the AEHD in support of the application to install the 58 SOW Paint Booth (September 2013). This approach was used for all exit temperatures that would be considered "ambient".

The source locations provided in Table 1 are based on North American Datum (NAD) 83 and Universal Transverse Mercator (UTM) projection in Zone 13 and are shown in units of meters. The base elevations are also shown in meters as measured above mean sea level (msl). The source locations for Model IDs 20002 and 20004 (Test Cells) and Model ID 19104 (Well Shaft Engine) have been updated based on aerial imagery.

Not all the emission sources in the KAFB Title V inventory operate continuously. In fact, most do not. However, in accordance with regulatory guidance, including that of the New Mexico Environment Department's Air Dispersion Modeling Guidelines, modeled emission rates should reflect maximum or permitted emission rates. The NMED guidelines state on page 42, that "all averaging periods shall be modeled using the maximum short-term emission rate allowed in the permit."

Because of the form of the 1-hour NO2 NAAQS, the US EPA issued guidance on intermittent usage of equipment and how best to model those intermittent emissions to conform to the form of the standard. The guidance suggests that for those units that operate intermittently that either they not be modeled in the 1-hour NO2 assessment or that the emission rate be "annualized", whereby the maximum short-term emission rate is multiplied by the hours of operation and then divided by the hours per year.

Table 1. Kirtland AFB – Modeled Source Inventory – Description and Model Parameters

Construction Permit	Unit Number	Model ID	Source Description	Source Type	Location (UTM) NAD83 Zone 13			Model Exhaust Parameters			
					X (m)	Y (m)	Z (m msl)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
484-M3	20002	20002A	T700 Test Cell, 2000 hp, Jet Fuel, General Electric	pointhor	354076.2	3877891.6	1602.35	1.22	832.04	15.398	0.914
		20002B		pointhor	354069.9	3877875.8	1602.35	1.22	832.04	15.398	0.914
	20004	20004A	T400 Test Cell, 1100 hp, Jet Fuel, Pratt & Whitney	pointhor	354076.7	3877902.9	1602.35	1.22	865.93	12.000	0.914
		20004B		pointhor	354064.6	3877870.8	1602.35	1.22	865.93	12.000	0.914
1770-RV3	21015	21015EF6	58 SOW Corrosion Control Facility	point	354439.4	3880000.8	1622.34	15.09	0	20.500	1.400
		21015EF7		point	354443.9	3880005.3	1622.48	15.09	0	20.500	1.400
		21015EF8		point	354447.2	3880008.3	1622.60	15.09	0	20.500	1.400
		21015EF9		point	354450.3	3880009.1	1622.71	15.09	0	20.500	1.400
		21015E10		point	354453.1	3880006.7	1622.81	15.09	0	20.500	1.400
		21015E11		point	354466.3	3880019.0	1623.00	15.09	0	20.500	1.400
		21015E12		point	354463.0	3880022.1	1623.00	15.09	0	20.500	1.400
		21015E13		point	354464.5	3880025.3	1623.00	15.09	0	20.500	1.400
		21015E14		point	354467.5	3880028.2	1623.00	15.09	0	20.500	1.400
		21015E15		point	354471.9	3880032.2	1623.00	15.09	0	20.500	1.400
3048-RV1	18001	18001PRI	Non-Emergency Landfill Mulcher Engine, 425 hp, Diesel, Caterpillar - Construction and Demolition Landfill (LF-268)	point	360696.2	3877703.1	1648.15	4.09	674.82	65.023	0.152
3331	12010	12010	Soil Vapor Extraction (SVE) Unit Site 58, PL-657	point	363328.76	3873324.72	1743.15	3.96	1366.5	7.62	0.40
3366	19183	AFOTECGEN	AFOTEC Generator	pointhor	365241.4	3872956.5	1774.20	1.37	703.15	27.08	0.1006
3128	21004	21004	58 SOW Paint Booth	pointcap	354279.4	3880193.4	1622.00	6.71	0	4.001	0.762

Note: The previous modeling protocol included Construction Permit 2105, Unit 19159. This unit has been removed from the modeling analysis because it has been reclassified an emergency generator and dispersion modeling is not required for emergency generators.

The US EPA intermittent usage guidance will be applied to one the emission sources noted in Table 1; the AFOTEC Generator (source ID AFOTECGEN, EQ ID 19183). The hours of operation for this emission unit are provided in Table 2 and indicate its infrequent use. An annual hours usage level of 100 hours per year will be applied to the maximum hourly emission rate and that lb/year value divided by the number of hours per year (8760) to calculate an "annualized" short-term emission rate in lb/hr for use in the NOx emission modeling.

Table 2. KAFB – Monthly Hours Actual Usage for Equipment ID 19183

Month/Year	Actual Hours of Operation
August 2019	4
September 2019	0
October 2019	0
November 2019	0
December 2019	3.9
January 2020	2.8
February 2020	0
March 2020	0
April 2020	0
May 2020	0
June 2020	0
July 2020	0.4
August 2020	0
September 2020	0
October 2020	0
November 2020	0.1
December 2020	0.5
January 2021	0.1
February 2021	0.1
March 2021	0
April 2021	0.4
May 2021	0.1
June 2021	3.5
July 2021	3.0
August 2021	3.1

The maximum short-term emission rates are provided in the right-hand section of Table 3 and the modeled emission rates are noted in the left-hand section of Table 3. These emission rates conform with the application of US EPA intermittent usage guidance for NOx for the AFOTECGEN emission source with limited actual operating hours; as provided in Table 2.

For example, the maximum short-term NOx emission rate shown in the right-hand portion of Table 3 for the modeled source 19183, the AFOTECGEN, is noted at 2.67 lb/hr. As this equipment operates less than 100 hours per year (Table 2), a conservative 100 hour per year usage level is applied to conform with the intermittent guidance policy. Hence the modeled short-term intermittent usage policy emission rate for source 19183 is 2.67 lb/hr * 100 hr/year = 267 lb/year which divided by 8760 hours per year returns an hourly emission rate of 0.0305 lb/hr or a modeled emission rate of 0.00384 gram/second as shown in the left-hand portion of Table 3.

Table 3. Kirtland AFB - Modeled Source Inventory – Maximum Modeled Emission Rates

Model ID	Maximum Short-term Modeled Emission Rates (g/s)						Maximum Short-term Emission Rates (lb/hr)					
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_2	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_2
20002A	0.49507	0.47354	0.07906	0.07906	0.07906	0.03902	3.929	3.758	0.628	0.628	0.628	0.310
20002B	0.49507	0.47354	0.07906	0.07906	0.07906	0.03902	3.929	3.758	0.628	0.628	0.628	0.310
20004A	0.27174	0.16810	0.01050	0.01050	0.01050	0.02719	2.157	1.334	0.083	0.083	0.083	0.216
20004B	0.27174	0.16810	0.01050	0.01050	0.01050	0.02719	2.157	1.334	0.083	0.083	0.083	0.216
21015EF6	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF7	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF8	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF9	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF10	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF11	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF12	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF13	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF14	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF15	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
18001PRI	0.35783	1.65312	0.11844	0.11844	0.11844	0.110	2.840	13.120	0.940	0.940	0.940	0.870
21004	0	0	0.16128	0.16128	0.16128	0	0	0	1.280	1.280	1.280	0
12010	0.00958	0.02155	0	0	0	0	0.076	0.171	0	0	0	0
AFOTECGEN	0.07308	0.00384	0.02394	0	0	0.00268	0.580	2.670	0.190	0.190	0.190	0.180

This approach, while likely applicable to other emission units at KAFB (e.g., the landfill mulcher) because of actual hours of operation, is only applied to the AFOTECGEN operations for the assessment of compliance with the 1-hour NO2 NAAQS in accordance with the intermittent usage guidance.

For those emission sources which are precluded from operating continuously on a 24-hour period and wherein permit restrictions may be applied, the AERMOD model can simulate daily operating periods by using an hour-of-day emission factor. Because the landfill mulcher can only operate during daylight hours, KAFB has restricted the operation of the landfill mulcher (modeled source ID 18001PRI) to daylight periods between 0700-1700 local time.

This is simulated in AERMOD by invoking the HROFDY EMISFACT and instructing AERMOD to model those hours for which operation could occur. In using this approach, the model applies the emission rate to those hours assigned with a “1” and not to those hours assigned with a “0”. For the landfill mulcher the hourly values used were 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0. This emission factor approach will be used for all emitted pollutants, including NOx to allow use of the maximum short-term emission rate while accounting for the restricted hours of operations.

KAFB Good Engineering Practice and Downwash Analysis

Another important consideration in plume behavior is the potential effects of nearby structure or building downwash. Downwash effects can affect plume rise and the initial spreading of plumes as they leave a stack.

To determine the potential downwash effects, nearby building and structure dimensions are determined including heights above grade. For multi-tiered structures and buildings, the height of each tier and the corner coordinates are input. This information will be passed along to the building profile input program (BPIP) with the PRIME downwash version (BPIPPRM version 04274) together with stack locations and heights to calculate direction-specific building dimensions.

The downwash building dimensions are used as inputs to the AERMOD model so that the simulation of direction-specific plume downwash can be made. The BPIP program also calculates the Good Engineering Practice (GEP) stack height for each modeled stack so that a direct determination can be made of appropriate GEP heights for dispersion modeling purposes. It is likely that none of the modeled stack heights will exceed GEP heights and therefore the actual stack heights as shown in Table 1 will be modeled.

Each emission source in the KAFB modeled inventory will be reviewed for the possibility of downwash effects from nearby buildings/structures. For those structures or buildings which have recently been constructed and are near enough to be included in the downwash assessment, the corner UTM coordinates, in meters, will be input to the BPIP program along with appropriate building heights.

The KAFB Title V emission inventory sources potentially influenced by nearby structures are depicted on Figure 1 and Figure 2. The appropriate building footprint coordinates as depicted will be used to determine the direction-specific building dimension data used in the AERMOD assessment.

Figure 1. KAFB Title V Emission Source/Structure Locations

Figure 2. KAFB Title V Emission Source/Structure Locations – Test Cells

KAFB Receptor Grid

To allow the calculation of ground-level concentrations, a grid of receptor locations is required in AERMOD. The receptor locations begin at the ambient air boundary and extend outward at regular intervals.

A Cartesian grid of receptors as used in prior KAFB modeling assessments has been updated to reflect changes to the KAFB southern boundary. The change in the southern boundary receptors encompasses the current Lovelace Biomedical Research Institute facility, as this facility is located outside of KAFB ambient air.

The receptor grid, as updated, is depicted on Figure 3 along with the KAFB Title V emission source locations. The rectangular “bump” along the southern boundary includes the updated receptor locations to conform with the Lovelace facility boundary.

As with the prior receptor grids used in support of KAFB modeling assessments, the receptor grid includes 50-meter (m) receptor placement along the KAFB fence line (ambient air boundary). Outside the fence line, a 100 m grid spacing interval will be used to a distance of 0.5 kilometers (km), and then a 500 m spacing extended beyond that to a distance of 2 km from the fence line.

In addition to these regularly spaced receptor locations, sensitive receptors will be included in the modeling for the following areas:

1. Base Housing – An arbitrary property line was included at the south border of the onsite base housing developments spaced 50 m apart. Onsite base housing is the housing area on both sides of Wyoming Blvd and north of Gibson and Frost Ave. Receptors will also be included for offsite base housing at Maxwell Street and Gibson Ave. Sensitive receptors will be spaced 100 m apart throughout the base housing locations.

2. The Base Commissary, Base Exchange, Child Care Center and Sandia Elementary School are all covered by the 100 m receptor spacing described in the base housing section above.

3. Outdoor recreation area including softball fields and tennis courts.

4. Boys and Girls Club.

5. Tijeras Arroyo Golf Course.

6. Additional sensitive receptors including Kirtland Elementary, Wherry Elementary, the Veterans Affairs Hospital, and Lovelace Hospital are located outside of the Kirtland AFB fence line and are contained within the 100 m receptor grid along Kirtland AFB’s perimeter.

Because of the need to model an offsite emission inventory that includes the Lovelace Biomedical facility, two receptor grids will be used in the modeling assessment. The first grid (Figure 3/Figure 4) for the KAFB inventory, whereas the second grid (Figure 5) will be used for the KAFB/offsite inventory modeling.

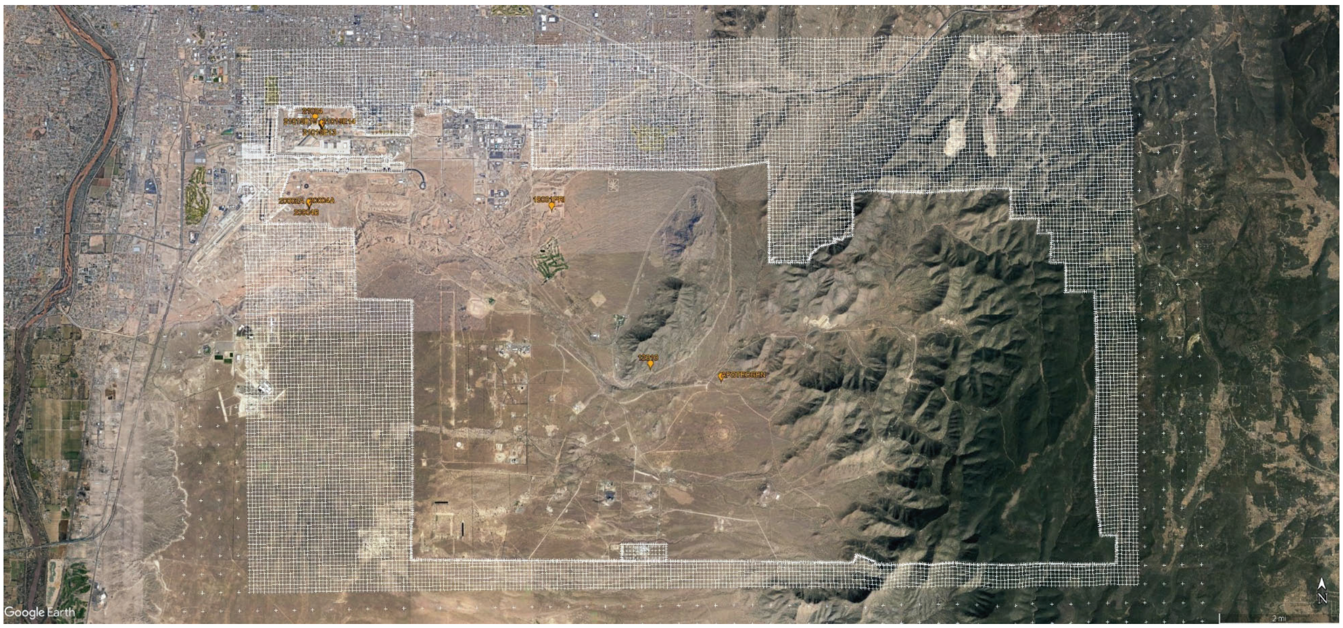

Figure 3. KAFB Title V Receptor Grid and Emission Source Locations

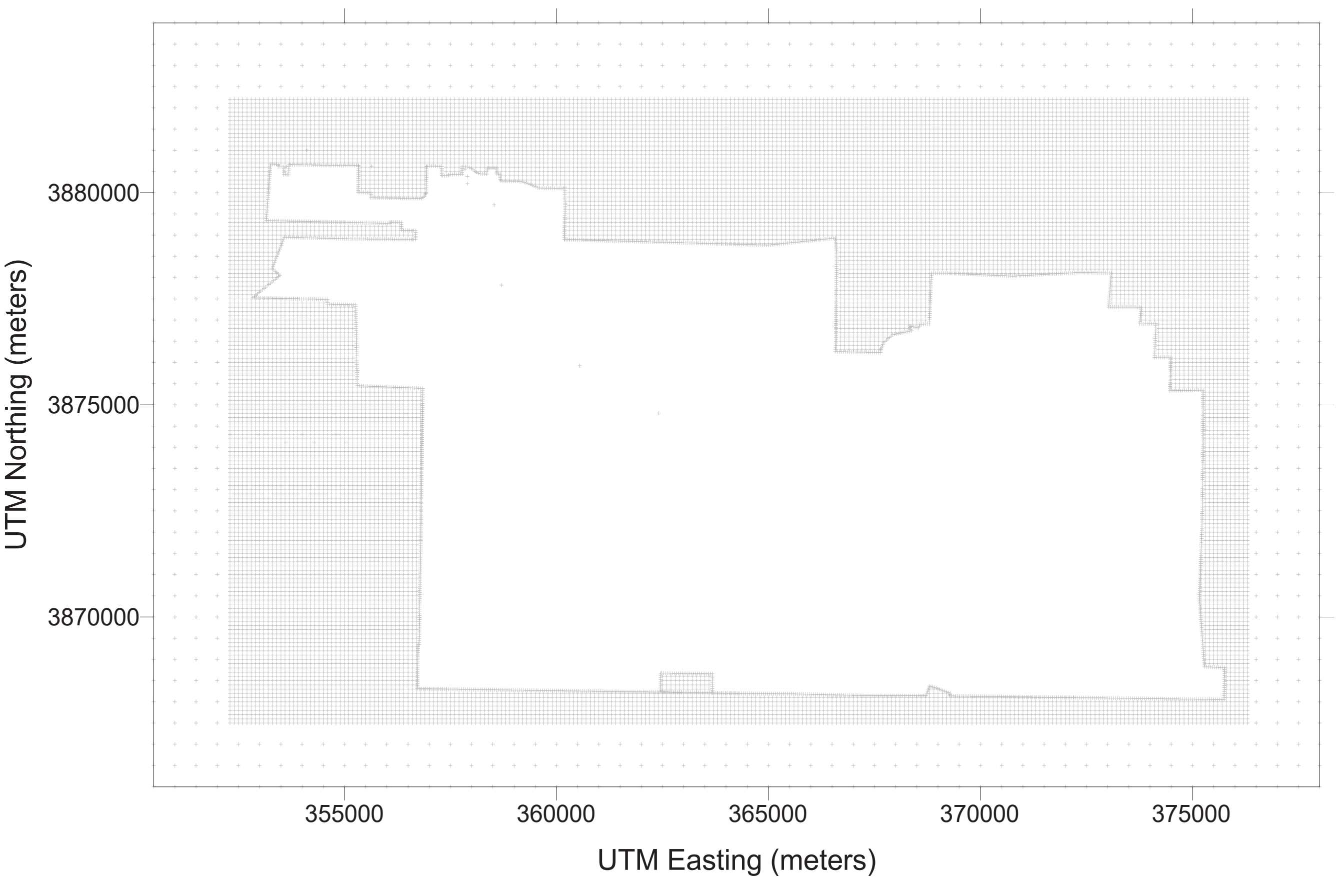

Figure 4. KAFB Title V Receptor Grid

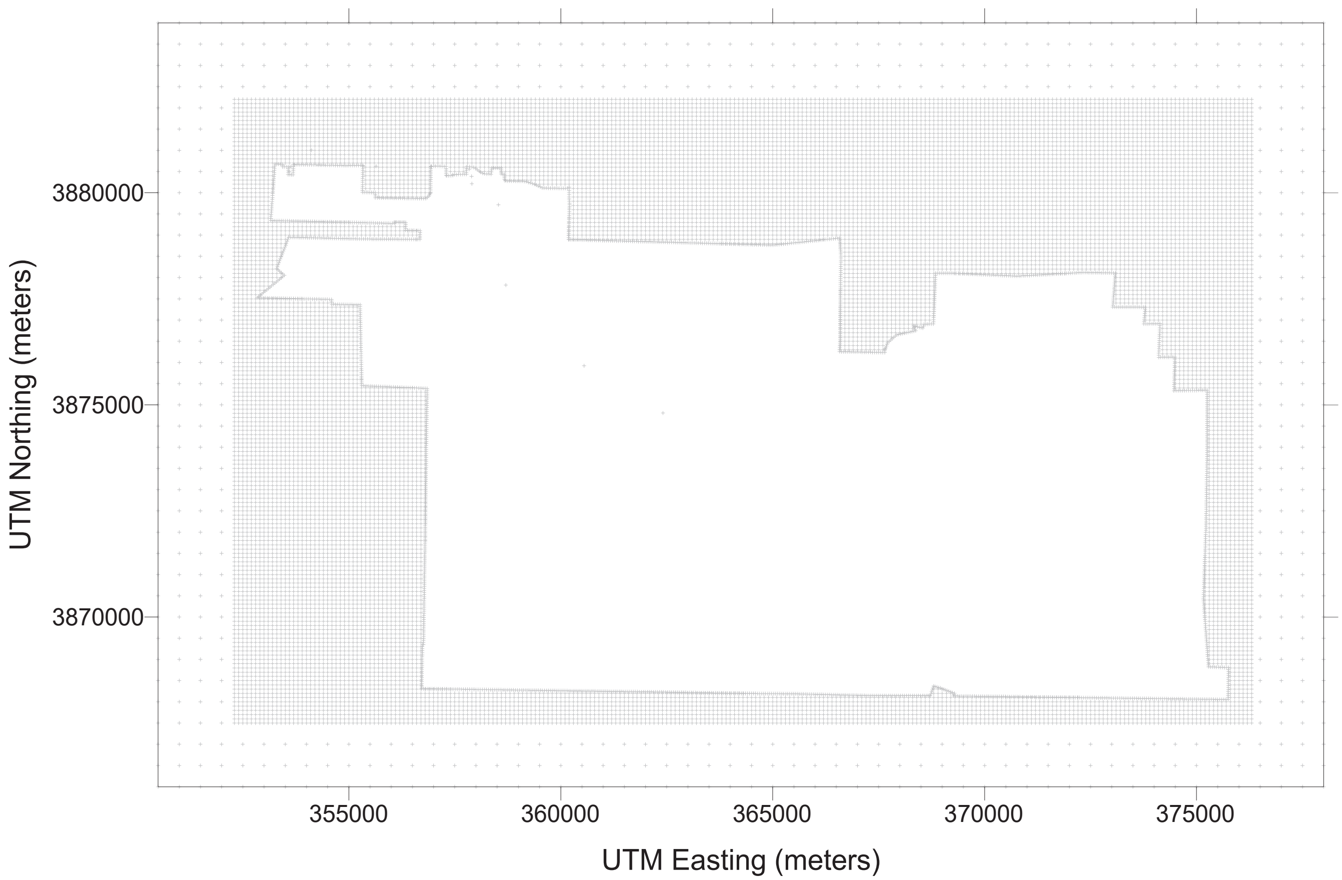

Figure 5. KAFB Title V and Off-site Inventory Receptor Grid

The second grid removes the receptors located within the Lovelace Biomedical facility as the reporting of modeled concentrations from the Lovelace emission sources on receptors located within the Lovelace Biomedical facility boundary is not required, as those receptor locations would be considered ambient air, *vis a vis,* Lovelace facility emissions.

KAFB has examined other areas of the KAFB ambient boundary/fence line, including those between Louisiana Blvd and Wherry Elementary, and found no other portions (apart from the Lovelace Biomedical facility area) as being within the KAFB boundary. Therefore, only the adjustment to the southern boundary receptor locations to accommodate the Lovelace Biomedical facility is necessary.

Terrain heights and base elevations will be obtained from National Elevation Data (NED) information and processed through AERMAP (18081). Both the receptor height above mean sea level along with critical hill heights for each receptor location will be used in the AERMOD evaluation.

KAFB Meteorological Data

Another key component in the modeling assessment is the use of recent and representative meteorological data. The AEHD-AQD has provided a model-ready, five-year (2014-2018) meteorological data set from the Albuquerque airport which combines hourly surface data measured at the airport together with twice daily radiosonde sounding data also obtained at the Albuquerque atmospheric sounding facility. The hourly data were processed in AERMET (version 19191) along with geophysical surface parameters appropriate for the location.

As the airport is adjacent KAFB, this data is considered representative and qualifies as site-specific data. This data will be used in the KAFB Title V modeling as it is compatible with the newest version of AERMOD. All five years of meteorological data will be used in the modeling assessment.

A wind rose of the five years of meteorological data, as processed by the AEHD-AQD, is shown on Figure 6. As seen in the wind rose, which depicts the frequency with which winds blow from specific directions and the percentage occurring at specific wind speeds, the winds generally occur from all directions except for the northeast, due to the high blocking terrain in that direction. The largest percentage of the highest wind speeds are shown to occur with winds from the east.

Based on the wind statistics for the hourly 2014-2018 Albuquerque surface meteorological data, over 40 percent of the time wind speeds are greater than, or equal to, approximately 7 knots (8 mile/hour; 3.6 meter/sec), and over 80 percent of the time wind speeds exceed 4 knots (4.6 mile/hour).

Wind speeds of this magnitude can efficiently transport emitted pollutants downwind. Since the general land use for the KAFB is rural, there are few impediments to this efficient transport and dispersion of pollutants to downwind receptor locations.

All available hours of meteorological data over the entire five-year meteorological period will be used in the AERMOD simulation of the KAFB Title V and off-site emission inventory modeling.

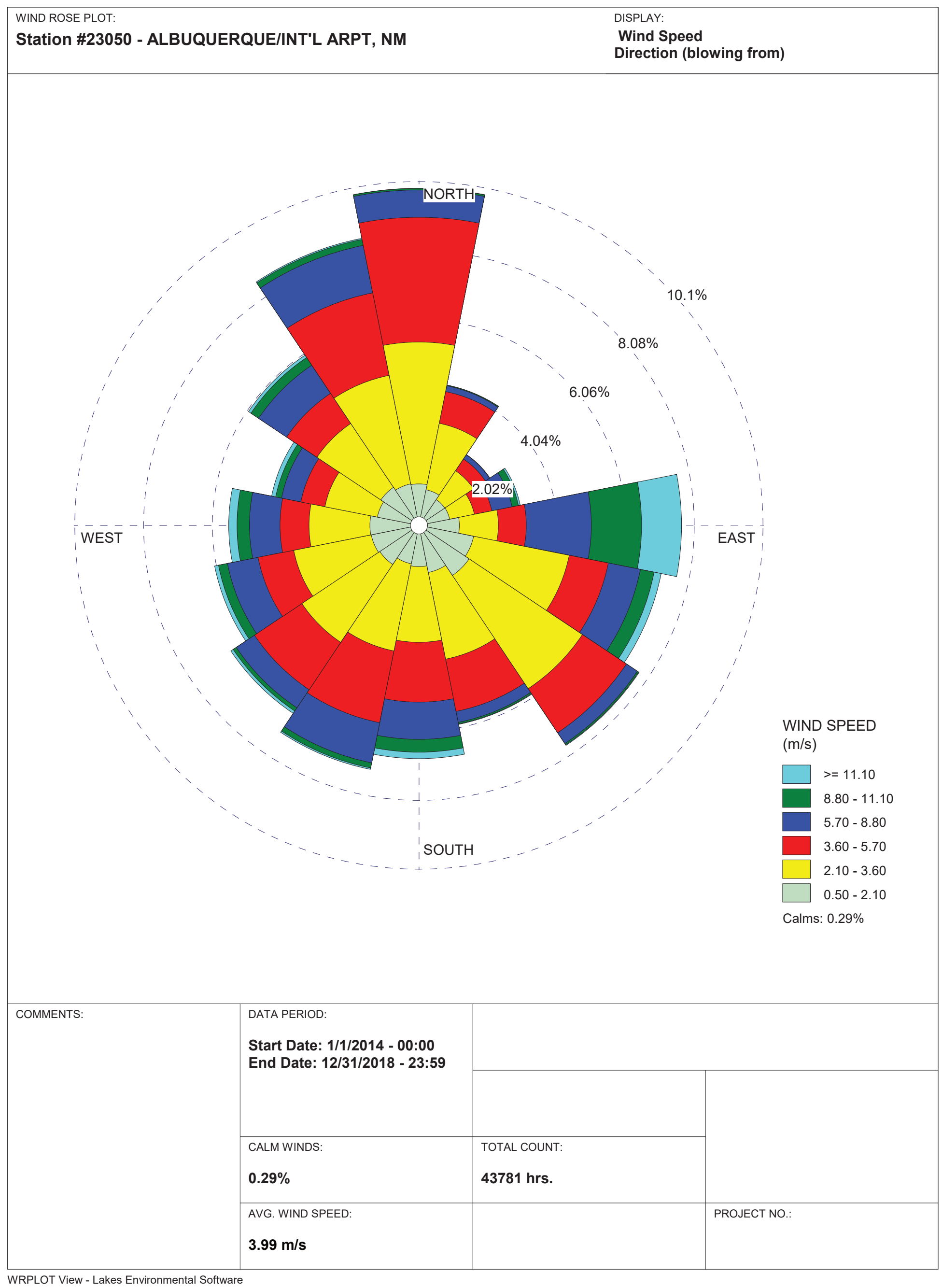

Figure 6. Five Year Wind Rose (2014-2018) Albuquerque

Modeling Methodology

As provided in Table 3, the modeling of regulated air pollutants includes the emissions of carbon monoxide (CO), nitrogen oxides (NO_x) with subsequent downwind conversion to the regulated pollutant nitrogen dioxide (NO_2), particulate matter (PM), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), PM with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur dioxide (SO_2).

The emission rates (Table 3) and the other model input parameters (Table 1) as well as the discussions of GEP footprints, receptor locations, and meteorological data, as described, will all be used as input to the AERMOD modeling analysis. Modeling will be completed for each pollutant, again using the appropriate emission rates per New Mexico guidance (maximum short-term). Each year of meteorological data will be modeled for the inventory of emitting sources (KAFB Title V and off-site) and concentrations calculated for each hour at each receptor location.

Modeling for NO2

The modeling of the emissions of NOx differs from other criteria pollutants as NOx is not the form of the regulated pollutant and converts from NOx, once emitted, to the regulated compound NO2 in the free atmosphere. The US EPA has provided guidance on how to account for this conversion mechanism through a three-tiered process which includes a first-tiered no conversion mechanism to a third-tiered conversion mechanism based on the chemical interaction of emitted NOx with atmospheric ozone.

Modeling of the emissions of NOx from the KAFB Title V and off-site emission inventory will be completed using the ozone-limiting-method (OLM) and appropriate in-stack NO2/NOx ratios (ISR) to allow for the simulation of the downwind conversion of emitted NOx to NO2.

To facilitate OLM, a fixed or an attendant hourly ozone data value or file is required. Such a data set is available from the AEHD-AQD for the southern Albuquerque area and will be used in the modeling for both 1-hour and annual NO2 concentration calculations. The hourly ozone data file will be invoked in AERMOD using the command line prompt "CO OZONEFIL SV-2014-2018-O3-data.txt ppm."

The US EPA suggests a default in-stack NO2/NOx value of 0.5 when equipment-specific ISR values are not available. The AEHD-AQD has suggested an ISR value of 0.15 for those emission source engines that combust diesel fuel as well as an ISR value of 0.2 for off-site sources within 1-3 km and an ISR value of 0.3 for off-site sources within 1 km.

A combination of these ISR values will be applied in the modeling analysis with a default ISR value of 0.5 applied to all emitting sources modeled except for model ID18001PRI (landfill mulcher) in the KAFB Title V inventory, and in the off-site inventory for emission source ID RBGS (RBGS 0694-M2; Diesel fired electrical generating unit). These different ISR values will be invoked in AERMOD using the command prompt "CO NO2STACK 0.5" and the source qualifier "SO NO2RATIO ……0.15" for ID 18001PRI and "SO NO2RATIO…..0.3" for ID RBGS.

Therefore, a mix of in-stack NO2/NOx ratios will be applied along with the appropriate NOx emission rate and an agency provided hourly ozone data file to allow AERMOD to simulate the emissions and downwind conversion of NOx to NO2 using the OLM. The US EPA and AEHD-AQD suggested "OLMGROUP ALL" will be used so that ozone concentrations are applied to all emitted plumes.

KAFB Title V Inventory Modeling

The results of modeling of the KAFB Title V emission inventory, based on AERMOD inputs from information in Table 1 and Table 3, will be compared with the modeling values provided in Table 4. The KAFB Title V modeled concentrations for appropriate time-period averages and applicable average ranked values will be determined from the model runs and compared with the appropriate significance and ambient air quality values listed in Table 4.

Comparison of the KAFB Title V emission inventory impacts with different ambient air quality levels in Table 4 include the Significant Impact Level (SIL), the National Ambient Air Quality Standard (NAAQS), and the New Mexico standards (NMAAQS) values, which are shown for the appropriate pollutant, averaging period and rank; all in units of micrograms per cubic meter ($\mu g/m^3$).

Any modeled KAFB Title V inventory impacts that are below the Significant Impact Level values provided in Table 4 may exempt that pollutant and averaging period from further modeling as a modeled concentration less than a respective SIL means that pollutant/averaging period cannot "cause or contribute to" a violation of a NAAQS or PSD increment level and therefore satisfies the requirements of demonstrating compliance.

For those KAFB Title V emitted pollutants with modeled concentrations/averaging periods in excess of a SIL value, further modeling including an off-site inventory will likely be required. As prior modeling of KAFB Title V emission inventories has suggested the need for further modeling an off-site inventory of emission sources has been examined in the event more comprehensive modeling is required.

Table 4. KAFB – Significance and Ambient Air Quality Levels to be Used in Modeling Demonstration

Pollutant	Averaging Period	Significance Level ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	NMAAQS ($\mu g/m^3$)
CO	1-hour	2000	40069.6	14997.5
	8-hour	500	10303.6	9960.1
NO_2	1-hour	7.52	188.03	
	24-hour	5		188.03
	Annual	1	99.66	94.02
$PM_{2.5}$	24-hour	1.2	35	
	Annual	0.2	12	
PM_{10}	24-hour	5	150	
	Annual	1		

SO_2	1-hour	7.8	196.4	
	3-hour	25	1309.3	
	24-hour	5		261.9
	Annual	1		52.4

KAFB Title V and Off-Site Inventory

The AEHD-AQD has previously provided information on an appropriate off-site emission inventory of sources to include in a comprehensive assessment of air quality impacts for the likely KAFB impact affected area. The off-site inventory (Table 5) includes sources as operated by the Lovelace Biomedical Research Institute facility located to the south of KAFB and Rio Bravo Generating Station (RBGS) located to the west of KAFB.

Depending on the results of the KAFB Title V emission inventory modeling, the off-site inventory as depicted on Table 5 will be modeled together with the appropriate pollutant and averaging period specific KAFB Title V emission inventory to develop maximal overlapping impacts for comparison to the appropriate NAAQS and NMAAQS.

To develop a comprehensive impact while modeling some, but not all, off-site emission sources of a similar pollutant, requires application of representative ambient background concentration values. The ambient background concentration values to be used in the comprehensive modeling analysis (KAFB Title V and off-site emission inventory) are provided in Table 6.

The maximum combined inventory (KAFB and off-site) impacts will be added to the ambient background values in Table 6 to develop aggregate total impact values for direct comparison with the NAAQS and NMAAQS. Values that are less than the NAAQS and NMAAQS will serve to demonstrate compliance with the standards.

A full description of the modeling conducted will be prepared and provided to the AEHD-AQD along with appropriate modeling files upon completion of the modeling updates.

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Table 5. Proposed Off-Site Modeled Emission Inventory

Off-Site Emission Source	Emission Unit Type	Fuel Fired	Model ID	Model Type	Location UTM			Stack Exhaust Parameters				Modeled Emission Rates (g/s)				
					Easting (m)	Northing (m)	Elevation (m msl)	Height (m)	Temp (K)	Vel (m/s)	Diam (m)	NOx	CO	SO2	PM25	PM10
Lovelace	Boiler	NatGas	BS_004	pointcap	362899	3868454	1728.2	5.7912	505.37	2.757	0.254	0.02016	0.01764	0.003024	0.001512	0.001512
	Boiler	Diesel	BS_005	pointcap	363108	3868522	1728.2	5.7912	505.37	2	0.526	0.0945	0.05418	0.03402	0.00945	0.00945
	Boiler	Diesel	BS_006	pointcap	363106	3868514	1728.2	7.3152	505.37	2	0.526	0.0945	0.05418	0.03402	0.00945	0.00945
	Boiler	Diesel	BS_007	pointcap	363107	3868538	1728.2	10.363	505.37	2.413	0.526	0.1134	0.06552	0.04032	0.01134	0.01134
	Thermal Oxidizer	NatGas	Thermox	point	363136	3868524	1728.2	10.872	1033.15	2.757	0.406	0.0252	0.02016	0.003654	0.00189	0.00189
RBGS	Electrical Generating Unit	Diesel	RBGS	point	350169.6	3877287.7	1538.3	15.24	855.93	29.962	5.182	36.3006	0.00000	10.6848	0.00000	0.00000

Table 6. KAFB – Ambient Background Levels to be Used in Modeling Demonstration

Pollutant	Averaging Period	Background Concentration Value (µg/m³)
CO	1-hour	2366
	8-hour	1450
NO_2	1-hour	84.6
	Annual	30
$PM_{2.5}$	24-hour	20
	Annual	7.8
PM_{10}	24-hour	35
	Annual	35
SO_2	1-hour	13.1
	24-hour	0
	Annual	0

Reference: AQP document "current backgrounds 20Dec2019.docx"

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Kirtland Air Force Base

Title V Operating Permit #527 Renewal
Air Quality Modeling Assessment Report

March 2022

377 MSG/CEIE
Kirtland AFB, New Mexico 87117-5270

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Summary

Kirtland Air Force Base (KAFB) is submitting a Title V Permit Renewal Application for KAFB's Title V Operating Permit #527-RN1. This renewal application is due twelve (12) months prior to the date of permit expiration, pursuant to 20.11.42.12A(2)(a)(ii) NMAC. KAFB was granted an extension to submit this application on January 21, 2022.

KAFB has previously submitted base-wide Title V air quality dispersion modeling to demonstrate compliance with the appropriate National Ambient Air Quality Standards (NAAQS). The most recent demonstration, however, did not include the recently installed equipment and therefore the KAFB base-wide modeling has been updated to include all appropriate Title V operating equipment and sources of regulated air pollutants.

The modeling assessment completed and described herein, conforms with the latest City of Albuquerque Environmental Health Department (AEHD) Air Dispersion Modeling Guidelines for Air Quality Permitting (October 2019) and included:

- Use of the most recent version of AERMOD (version 21112) in regulatory default mode
- Permitted emission rates from Title V permitted emission sources at KAFB
- Good Engineering Practice (GEP) stack downwash assessment
- Use of AERMET surface and profile data for the five-year period (2014-2018) as provided by the AEHD – Air Quality Division (AQD)
- A comprehensive grid of ambient receptor locations
- Representative ambient background values as obtained from the AEHD-AQD
- Inclusion of an offsite inventory of emitting sources per AEHD-AQD

The inputs noted above are further described in subsequent sections. Compliance with the appropriate NAAQS is demonstrable for the KAFB emission inventory.

Model Input Description

The latest version of the approved air quality dispersion model AERMOD (21112) was used in the modeling assessment and is an appropriate model version for the assessment. The AERMOD model has several required inputs to allow the model to simulate regulated air pollutant emissions to the atmosphere and subsequent downwind transport.

The model requires input parameters to define how the pollutants will be exhausted to the atmosphere which are typically through point or area/volume source types. For point source parameters, the location of the source, height above grade, exhaust temperature, exit velocity, and stack diameter and orientation (vertical, horizontal, capped) are necessary input values. These values can vary greatly depending upon the type of source modeled.

Buoyant plumes from stacks with high exhaust temperatures will typically rise higher into the atmosphere than less-buoyant, colder exhaust plumes. The temperature difference between ambient and stack exhaust is used to calculate the individual stack buoyancy flux and therefore, determine plume rise above grade elevation.

The plume rise can also be affected by momentum flux which is due to high exit velocity plumes. High exit velocities tend to move emitted plumes higher into the atmosphere than lower velocity exhausts. The combined effects of buoyancy and momentum are calculated for each hour of meteorological data, meaning that plume heights can differ each hour for different emission sources depending on the input parameters.

KAFB Title V Emission Inventory

The KAFB Title V source emission inventory and input parameters used in the modeling assessment are provided in Table 1. The modeled source descriptions, including location and exhaust parameters, are shown. As seen in Table 1, some sources were modeled with the source type nomenclature of “point”, whereas others will be modeled as “pointhor” or “pointcap”. The “point” source nomenclature is applied to exhaust stacks that are vertically oriented without obstruction. The “pointhor” source nomenclature is applied to exhaust stacks that are horizontally oriented and the “pointcap” nomenclature to stacks that are vertically oriented but are capped to prevent rain from entering the stack.

The AERMOD model treats each of these source types differently, but in so doing requires the same input parameters for each type, in that, for sources subject to downwash, the actual exit temperature, exit diameter, and exit velocity are used. Hence, the values provided in Table 1 represent the model input values used in AERMOD.

Of note, the value of zero entered in the temperature column (e.g., for AERMOD Model ID 21004;58 SOW Paint Booth) instructs AERMOD to assign the hourly ambient temperature, found in the meteorological data record, as the exit stack temperature. This approach is consistent with that used for dispersion modeling provided the AEHD in support of the application to install the 58 SOW Paint Booth (September 2013). This approach was used for all exit temperatures that would be considered “ambient”.

The source locations provided in Table 1 are based on North American Datum (NAD) 83 and Universal Transverse Mercator (UTM) projection in Zone 13 and are shown in units of meters. The base elevations are also shown in meters as measured above mean sea level (msl). The source locations for Model IDs 20002 and 20004 (Test Cells) and Model ID 19104 (Well Shaft Engine) have been updated based on aerial imagery.

Not all the emission sources in the KAFB Title V inventory operate continuously. In fact, most do not. However, in accordance with regulatory guidance, including that of the New Mexico Environment Department’s Air Dispersion Modeling Guidelines, modeled emission rates should reflect maximum or permitted emission rates. The NMED guidelines state on page 42, that “all averaging periods shall be modeled using the maximum short-term emission rate allowed in the permit.”

Because of the form of the 1-hour NO2 NAAQS, the US EPA issued guidance on intermittent usage of equipment and how best to model those intermittent emissions to conform to the form of the standard. The guidance suggests that for those units that operate intermittently that either they not be modeled in the 1-hour NO2 assessment or that the emission rate be “annualized”, whereby the maximum short-term emission rate is multiplied by the hours of operation and then divided by the hours per year.

Table 1. Kirtland AFB – Modeled Source Inventory – Description and Model Parameters

Construction Permit	Unit Number	Model ID	Source Description	Source Type	Location (UTM) NAD83 Zone 13			Model Exhaust Parameters			
					X (m)	Y (m)	Z (m msl)	Height (m)	Temp (K)	Velocity (m/s)	Diameter (m)
484-M3	20002	20002A	T700 Test Cell, 2000 hp, Jet Fuel, General Electric	pointhor	354076.2	3877891.6	1602.35	1.22	832.04	15.398	0.914
		20002B		pointhor	354069.9	3877875.8	1602.35	1.22	832.04	15.398	0.914
	20004	20004A	T400 Test Cell, 1100 hp, Jet Fuel, Pratt & Whitney	pointhor	354076.7	3877902.9	1602.35	1.22	865.93	12.000	0.914
		20004B		pointhor	354064.6	3877870.8	1602.35	1.22	865.93	12.000	0.914
1770-RV3	21015	21015EF6	58 SOW Corrosion Control Facility	point	354439.4	3880000.8	1622.34	15.09	0	20.500	1.400
		21015EF7		point	354443.9	3880005.3	1622.48	15.09	0	20.500	1.400
		21015EF8		point	354447.2	3880008.3	1622.60	15.09	0	20.500	1.400
		21015EF9		point	354450.3	3880009.1	1622.71	15.09	0	20.500	1.400
		21015E10		point	354453.1	3880006.7	1622.81	15.09	0	20.500	1.400
		21015E11		point	354466.3	3880019.0	1623.00	15.09	0	20.500	1.400
		21015E12		point	354463.0	3880022.1	1623.00	15.09	0	20.500	1.400
		21015E13		point	354464.5	3880025.3	1623.00	15.09	0	20.500	1.400
		21015E14		point	354467.5	3880028.2	1623.00	15.09	0	20.500	1.400
		21015E15		point	354471.9	3880032.2	1623.00	15.09	0	20.500	1.400
3048-RV1	18001	18001PRI	Non-Emergency Landfill Mulcher Engine, 425 hp, Diesel, Caterpillar - Construction and Demolition Landfill (LF-268)	point	360696.2	3877703.1	1648.15	4.09	674.82	65.023	0.152
3331	12010	12010	Soil Vapor Extraction (SVE) Unit Site 58, PL-657	point	363328.76	3873324.72	1743.15	3.96	1366.5	7.62	0.40
3366	19183	AFOTECGEN	AFOTEC Generator	pointhor	365241.4	3872956.5	1774.20	1.37	703.15	27.08	0.1006
3128	21004	21004	58 SOW Paint Booth	pointcap	354279.4	3880193.4	1622.00	6.71	0	4.001	0.762

The US EPA intermittent usage guidance will be applied to one of the emission sources noted in Table 1; the AFOTEC Generator (source ID AFOTECGEN, EQ ID 19183). The hours of operation for this emission unit are provided in Table 2 and indicate its infrequent use. An annual hours usage level of 100 hours per year will be applied to the maximum hourly emission rate and that lb/year value divided by the number of hours per year (8760) to calculate an "annualized" short-term emission rate in lb/hr for use in the NOx emission modeling.

Table 2. KAFB – Monthly Hours Actual Usage for Equipment ID 19183

Month/Year	Actual Hours of Operation
August 2019	4
September 2019	0
October 2019	0
November 2019	0
December 2019	3.9
January 2020	2.8
February 2020	0
March 2020	0
April 2020	0
May 2020	0
June 2020	0
July 2020	0.4
August 2020	0
September 2020	0
October 2020	0
November 2020	0.1
December 2020	0.5
January 2021	0.1
February 2021	0.1
March 2021	0
April 2021	0.4
May 2021	0.1
June 2021	3.5
July 2021	3.0
August 2021	3.1

The maximum short-term emission rates are provided in the right-hand section of Table 3 and the modeled emission rates are noted in the left-hand section of Table 3. These emission rates conform with the application of US EPA intermittent usage guidance for NOx for the AFOTECGEN emission source with limited actual operating hours; as provided in Table 2.

For example, the maximum short-term NOx emission rate shown in the right-hand portion of Table 3 for the modeled source 19183, the AFOTECGEN, is noted at 2.67 lb/hr. As this equipment operates less than 100 hours per year (Table 2), a conservative 500 hour per year usage level (per US EPA guidance) was applied to conform with the intermittent guidance policy. Hence the modeled short-term intermittent usage policy emission rate for source 19183 is 2.67 lb/hr * 500 hr/year = 1335 lb/year which divided by 8760 hours per year returns an hourly emission rate of 0.1524 lb/hr or a modeled emission rate of 0.0192 gram/second as shown in the left-hand portion of Table 3.

Table 3. Kirtland AFB - Modeled Source Inventory – Maximum Modeled Emission Rates

Model ID	Maximum Short-term Modeled Emission Rates (g/s)						Maximum Short-term Emission Rates (lb/hr)					
	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_2	CO	NO_x	PM	PM_{10}	$PM_{2.5}$	SO_2
20002A	0.49507	0.47354	0.07906	0.07906	0.07906	0.03902	3.929	3.758	0.628	0.628	0.628	0.310
20002B	0.49507	0.47354	0.07906	0.07906	0.07906	0.03902	3.929	3.758	0.628	0.628	0.628	0.310
20004A	0.27174	0.16810	0.01050	0.01050	0.01050	0.02719	2.157	1.334	0.083	0.083	0.083	0.216
20004B	0.27174	0.16810	0.01050	0.01050	0.01050	0.02719	2.157	1.334	0.083	0.083	0.083	0.216
21015EF6	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF7	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF8	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF9	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF10	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF11	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF12	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF13	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF14	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
21015EF15	0	0	0.06501	0.06501	0.06501	0	0	0	0.516	0.516	0.516	0
18001PRI	0.35783	1.65312	0.11844	0.11844	0.11844	0.110	2.840	13.120	0.940	0.940	0.940	0.870
21004	0	0	0.16128	0.16128	0.16128	0	0	0	1.280	1.280	1.280	0
12010	0.00958	0.02155	0	0	0	0	0.076	0.171	0	0	0	0
AFOTECGEN	0.07308	0.0192	0.02394	0	0	0.00268	0.580	2.670	0.190	0.190	0.190	0.180

This approach, while likely applicable to other emission units at KAFB (e.g., the landfill mulcher) because of actual hours of operation, is only applied to the AFOTECGEN operations for the assessment of compliance with the 1-hour NO2 NAAQS in accordance with the intermittent usage guidance.

For those emission sources which are precluded from operating continuously on a 24-hour period and wherein permit restrictions may be applied, the AERMOD model can simulate daily operating periods by using an hour-of-day emission factor. Because the landfill mulcher can only operate during daylight hours, KAFB has restricted the operation of the landfill mulcher (modeled source ID 18001PRI) to daylight periods between 0700-1700 local time.

This is simulated in AERMOD by invoking the HROFDY EMISFACT and instructing AERMOD to model those hours for which operation could occur. In using this approach, the model applies the emission rate to those hours assigned with a "1" and not to those hours assigned with a "0". For the landfill mulcher the hourly values used were 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0. This emission factor approach was used for all emitted pollutants, including NOx to allow use of the maximum short-term emission rate while accounting for the restricted hours of operations.

KAFB Good Engineering Practice and Downwash Analysis

Another important consideration in plume behavior is the potential effects of nearby structure or building downwash. Downwash effects can affect plume rise and the initial spreading of plumes as they leave a stack.

To determine the potential downwash effects, nearby building and structure dimensions were determined including heights above grade. For multi-tiered structures and buildings, the height of each tier and the corner coordinates were input. This information was passed along to the building profile input program (BPIP) with the PRIME downwash version (BPIPPRM version 04274) together with stack locations and heights to calculate direction-specific building dimensions.

The downwash building dimensions are used as inputs to the AERMOD model so that the simulation of direction-specific plume downwash can be completed. The BPIP program also calculates the Good Engineering Practice (GEP) stack height for each modeled stack so that a direct determination can be made of appropriate GEP heights for dispersion modeling purposes. None of the modeled stack heights exceed GEP heights and therefore the actual stack heights as shown in Table 1 were modeled.

Each emission source in the KAFB modeled inventory was reviewed for the possibility of downwash effects from nearby buildings/structures. For those structures or buildings which have recently been constructed and are near enough to be included in the downwash assessment, the corner UTM coordinates, in meters, were input to the BPIP program along with appropriate building heights.

The KAFB Title V emission inventory sources potentially influenced by nearby structures are depicted on Figure 1 and Figure 2. The appropriate building footprint coordinates as depicted were used to determine the direction-specific building dimension data used in the AERMOD assessment.

Figure 1. KAFB Title V Emission Source/Structure Locations

Figure 2. KAFB Title V Emission Source/Structure Locations – Test Cells

KAFB Receptor Grid

To allow the calculation of ground-level concentrations, a grid of receptor locations is required in AERMOD. The receptor locations begin at the ambient air boundary and extend outward at regular intervals.

A Cartesian grid of receptors as used in prior KAFB modeling assessments has been updated to reflect changes to the KAFB southern boundary. The change in the southern boundary receptors encompasses the current Lovelace Biomedical Research Institute facility, as this facility is located outside of KAFB ambient air.

The receptor grid, as updated, is depicted on Figure 3 along with the KAFB Title V emission source locations. The rectangular "bump" along the southern boundary includes the updated receptor locations to conform with the Lovelace facility boundary.

As with the prior receptor grids used in support of KAFB modeling assessments, the receptor grid includes 50-meter (m) receptor placement along the KAFB fence line (ambient air boundary). Outside the fence line, a 100 m grid spacing interval was used to a minimum distance of 0.5 kilometers (km), and then a 500 m spacing extended beyond that to a distance of 2 km from the fence line. Near the KAFB emission sources the receptor grid exceeds the AEHD grid requirements.

In addition to these regularly spaced receptor locations, sensitive receptors were included in the modeling for the following areas:

1. Base Housing – An arbitrary property line was included at the south border of the onsite base housing developments spaced 50 m apart. Onsite base housing is the housing area on both sides of Wyoming Blvd and north of Gibson and Frost Ave. Receptors will also be included for offsite base housing at Maxwell Street and Gibson Ave. Sensitive receptors will be spaced 100 m apart throughout the base housing locations.
2. The Base Commissary, Base Exchange, Child Care Center and Sandia Elementary School are all covered by the 100 m receptor spacing described in the base housing section above.
3. Outdoor recreation area including softball fields and tennis courts.
4. Boys and Girls Club.
5. Tijeras Arroyo Golf Course.
6. Additional sensitive receptors including Kirtland Elementary, Wherry Elementary, the Veterans Affairs Hospital, and Lovelace Hospital are located outside of the Kirtland AFB fence line and are contained within the 100 m receptor grid along Kirtland AFB's perimeter.

Because of the need to model an offsite emission inventory that includes the Lovelace Biomedical facility, two receptor grids were used in the modeling assessment. The first grid (Figure 3/Figure 4) for the KAFB inventory, whereas the second grid (Figure 5) was used for the KAFB/off-site inventory modeling.

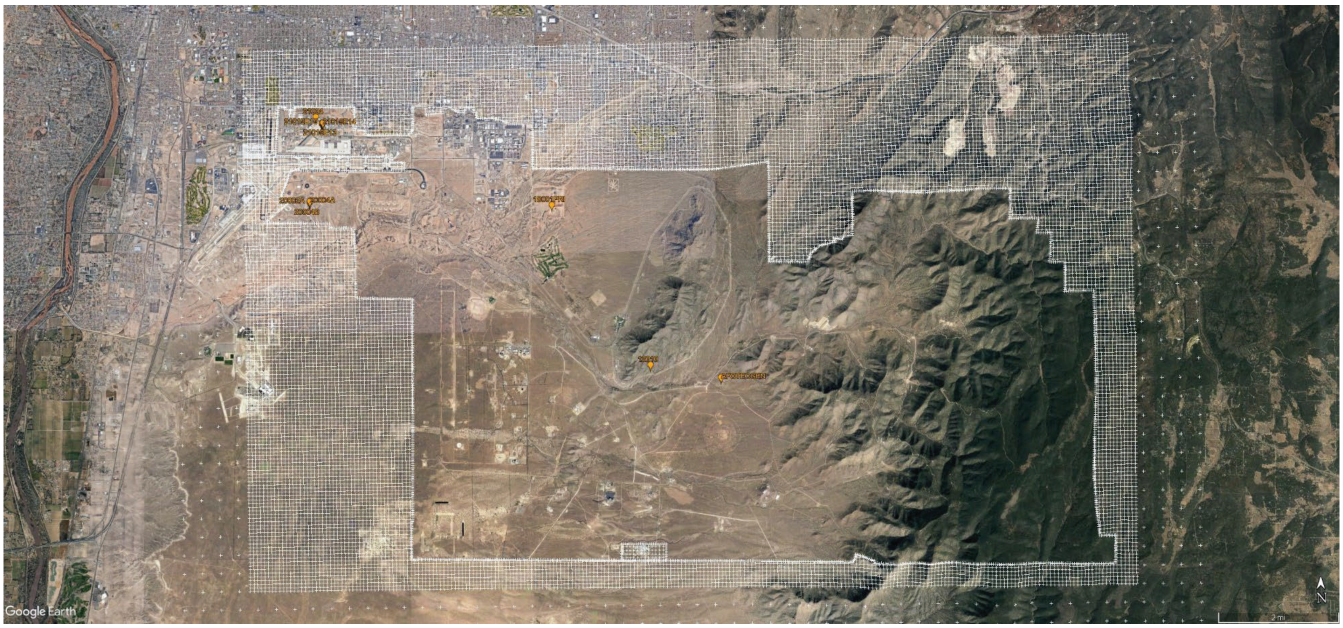


Figure 3. KAFB Title V Receptor Grid and Emission Source Locations

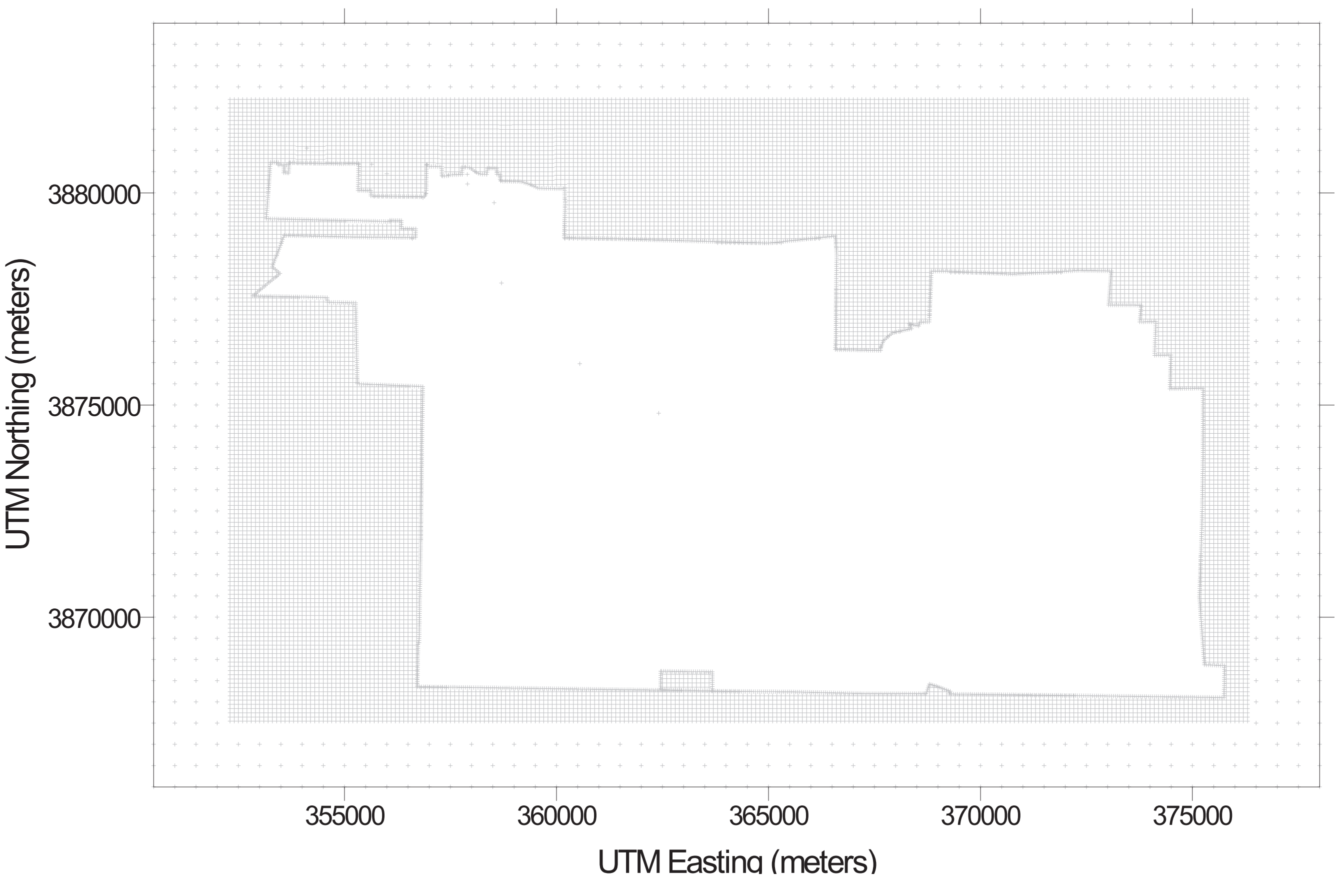


Figure 4. KAFB Title V Receptor Grid

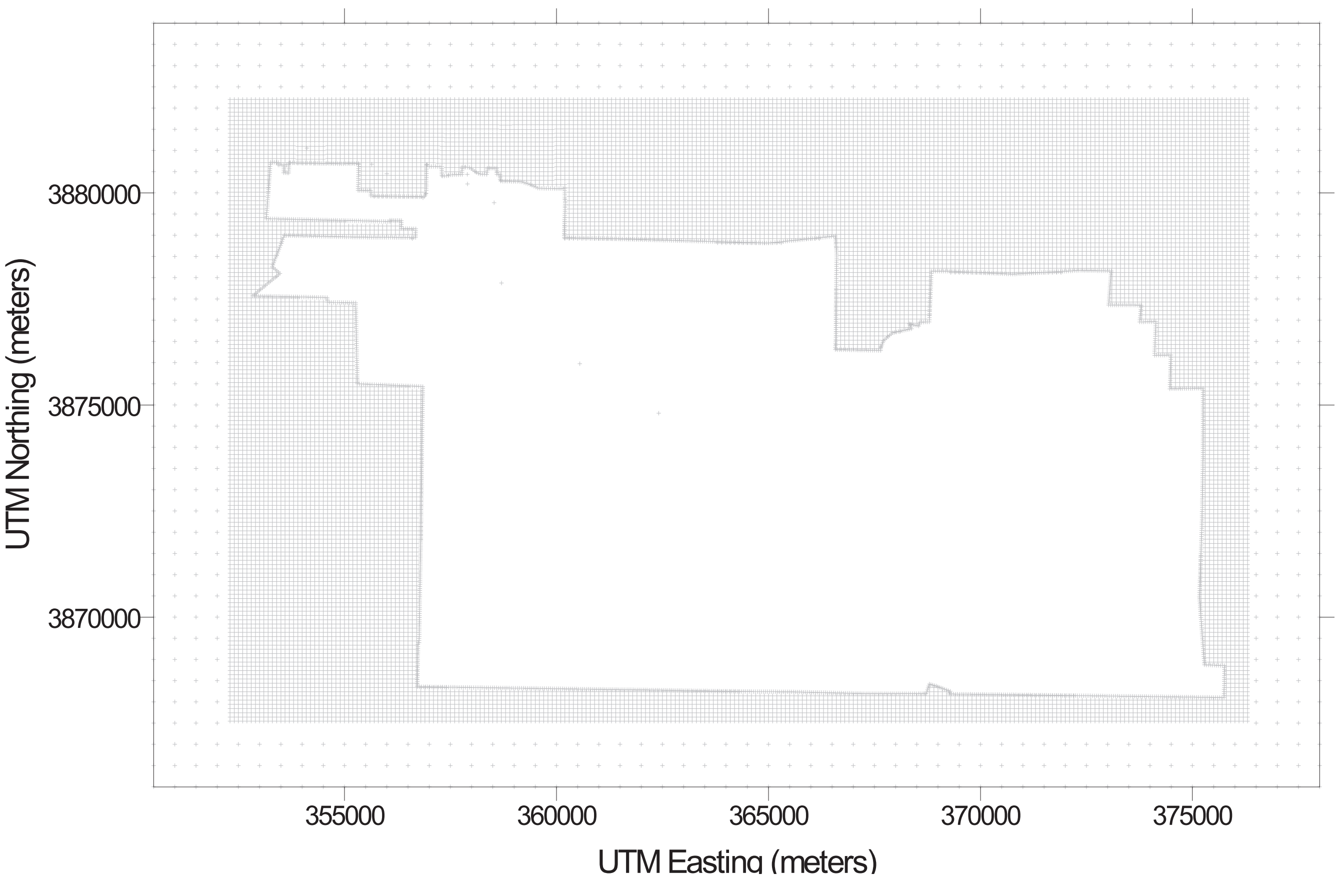


Figure 5. KAFB Title V and Off-site Inventory Receptor Grid

The second grid removes the receptors located within the Lovelace Biomedical facility as the reporting of modeled concentrations from the Lovelace emission sources on receptors located within the Lovelace Biomedical facility boundary is not required, as those receptor locations would be considered ambient air, *vis a vis,* Lovelace facility emissions.

KAFB has examined other areas of the KAFB ambient boundary/fence line, including those between Louisiana Blvd and Wherry Elementary, and found no other portions (apart from the Lovelace Biomedical facility area) as being within the KAFB boundary. Therefore, only the adjustment to the southern boundary receptor locations to accommodate the Lovelace Biomedical facility was necessary.

Terrain heights and base elevations were obtained from National Elevation Data (NED) information and processed through AERMAP (18081). Both the receptor height above mean sea level along with critical hill heights for each receptor location were used in the AERMOD evaluation.

KAFB Meteorological Data

Another key component in the modeling assessment is the use of recent and representative meteorological data. The AEHD-AQD has provided a model-ready, five-year (2014-2018) meteorological data set from the Albuquerque airport which combines hourly surface data measured at the airport together with twice daily radiosonde sounding data also obtained at the Albuquerque atmospheric sounding facility. The hourly data were processed in AERMET (version 19191) along with geophysical surface parameters appropriate for the location.

As the airport is adjacent KAFB, this data is considered representative and qualifies as site-specific data. This data was used in the KAFB Title V modeling as it is compatible with the newest version of AERMOD. All five years of meteorological data were used in the modeling assessment.

A wind rose of the five years of meteorological data, as processed by the AEHD-AQD, is shown on Figure 6. As seen in the wind rose, which depicts the frequency with which winds blow from specific directions and the percentage occurring at specific wind speeds, the winds generally occur from all directions except for the northeast, due to the high blocking terrain in that direction. The largest percentage of the highest wind speeds are shown to occur with winds from the east.

Based on the wind statistics for the hourly 2014-2018 Albuquerque surface meteorological data, over 40 percent of the time wind speeds are greater than, or equal to, approximately 7 knots (8 mile/hour; 3.6 meter/sec), and over 80 percent of the time wind speeds exceed 4 knots (4.6 mile/hour).

Wind speeds of this magnitude can efficiently transport emitted pollutants downwind. Since the general land use for the KAFB is rural, there are few impediments to this efficient transport and dispersion of pollutants to downwind receptor locations.

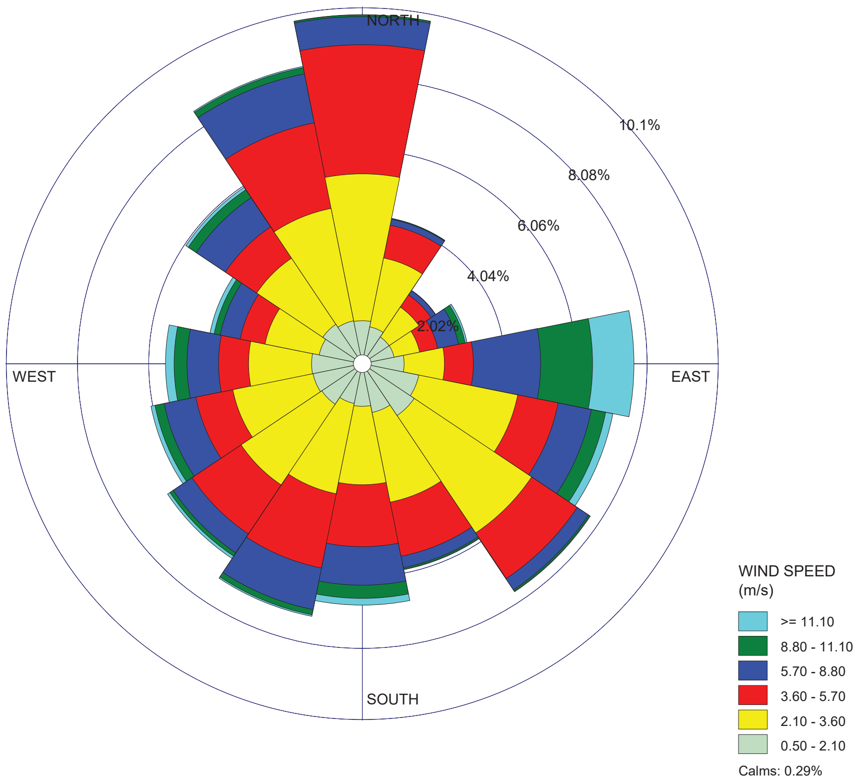
All available hours of meteorological data over the entire five-year meteorological period were used in the AERMOD simulation of the KAFB Title V and off-site emission inventory modeling.

WIND ROSE PLOT:

Station #23050 - ALBUQUERQUE/INT'L ARPT, NM

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

DATA PERIOD:

Start Date: 1/1/2014 - 00:00
End Date: 12/31/2018 - 23:59

CALM WINDS:

0.29%

TOTAL COUNT:

43781 hrs.

AVG. WIND SPEED:

3.99 m/s

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 6. Five Year Wind Rose (2014-2018) Albuquerque

Modeling Methodology

As provided in Table 3, the modeling of regulated air pollutants includes the emissions of carbon monoxide (CO), nitrogen oxides (NO_x) with subsequent downwind conversion to the regulated pollutant nitrogen dioxide (NO_2), particulate matter (PM), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), PM with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur dioxide (SO_2).

The emission rates (Table 3) and the other model input parameters (Table 1) as well as the discussions of GEP footprints, receptor locations, and meteorological data, as described, were used as input to the AERMOD modeling analysis. Modeling was completed for each pollutant, again using the appropriate emission rates per New Mexico guidance (maximum short-term). Each year of meteorological data was modeled for the inventory of emitting sources (KAFB Title V and off-site) and concentrations calculated for each hour at each receptor location.

Modeling for NO2

The modeling of the emissions of NOx differs from other criteria pollutants as NOx is not the form of the regulated pollutant and once emitted, converts from NOx to the regulated compound NO2 in the free atmosphere. The US EPA has provided guidance on how to account for this conversion mechanism through a three-tiered process which includes a first-tiered no conversion mechanism to a third-tiered conversion mechanism based on the chemical interaction of emitted NOx with atmospheric ozone.

Modeling of the emissions of NOx from the KAFB Title V and off-site emission inventory was completed using the ozone-limiting-method (OLM) and appropriate in-stack NO2/NOx ratios (ISR) to allow for the simulation of the downwind conversion of emitted NOx to NO2.

To facilitate OLM, a fixed or an attendant hourly ozone data value or file is required. Such a data set is available from the AEHD-AQD for the southern Albuquerque area and was used in the modeling for both 1-hour and annual NO2 concentration calculations. The hourly ozone data file was invoked in AERMOD using the command line prompt "CO OZONEFIL SV-2014-2018-O3-data.txt ppm."

The US EPA suggests a default in-stack NO2/NOx value of 0.5 when equipment-specific ISR values are not available. The AEHD-AQD has suggested an ISR value of 0.15 for those emission source engines that combust diesel fuel as well as an ISR value of 0.2 for off-site sources within 1-3 km and an ISR value of 0.3 for off-site sources within 1 km.

A combination of these ISR values were used in the NO2 modeling analysis. For the KAFB Title V inventory assessment the default ISR value of 0.5 was applied to all emitting sources modeled except for model ID18001PRI (landfill mulcher) as this is an emission unit that combusts diesel fuel and therefore the appropriate ISR value of 0.15 was used and invoked in AERMOD using the source qualifier "SO NO2RATIO ……0.15" for ID 18001PRI.

A seasonal and hourly NO2 ambient background data file was also used as provided by the AEHD-AQD. The 96 separate values noted in Table 4 were applied in AERMOD to simulate the different ambient NO2 concentrations during those hourly periods occurring within those representative seasons. The values shown in Table 4 are in units of micrograms per cubic meter.

Table 4. KAFB – Seasonal and Hourly Background NO2 Ambient Concentrations (μg/m^3)

Hour	Winter	Spring	Summer	Fall
1	72.1	47.6	29.3	65.6
2	67.8	48.3	27.7	59.7
3	67.7	46	26.4	57.9
4	68.4	48.9	26.6	58.9
5	69.1	51.7	32.7	58
6	69.7	63.9	39.3	57.8
7	72.8	70.7	46.4	63.5
8	77.6	71.8	48.5	64.5
9	80	61.1	34.2	65.9
10	71.4	48	27.3	55
11	62	28.6	24.3	47.3
12	48.1	18.9	19.9	35.4
13	36.9	17.6	17	28.2
14	35.1	15.7	15.9	25.3
15	33.6	14.8	17.4	24.2
16	37.2	15.3	19.4	28
17	48.4	17.1	20.4	38
18	73	19.4	19.3	69.6
19	79.3	38.5	21.7	79.1
20	78.1	53.2	30.9	77.1
21	77.3	48	34.1	73.4
22	76.5	56.3	30.8	70.4
23	75	58.8	34.9	69.7
24	72.4	57.9	33.6	70.9

The NO2 modeling used the Tier 3 US EPA guidance together with appropriate in-stack ratios, background ozone and NO2 values, along with the EPA and AEHD-AQD suggested "OLMGROUP ALL", to ensure that the background ozone concentrations were applied to all emitted plumes.

Model Results Discussion

The results of modeling of the KAFB Title V emission inventory, based on the AERMOD inputs previously described and tabulated above, are provided in Table 5. Again, the results provided in Table 5 are based on the inputs from Table 1 (parameters) and Table 3 (emission rates). Noted in Table 5 are the criteria pollutants modeled, the averaging period for which the modeled concentration is reported, the rank of that modeled concentration, and the ambient modeled concentration value for that rank, averaging period, and pollutant.

Table 5. KAFB – Title V Emission Inventory Modeled Results

Pollutant	Averaging Period	Reported Value	Maximum Modeled Concentration ($\mu g/m^3$)	Location of Modeled Concentration UTM Zone 16 X (m)	Location of Modeled Concentration UTM Zone 16 Y (m)	Significant Impact Level ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	
CO	1-hour	H1H	56.7	354194	3877494	2,000		Not Significant – No further modeling
		H2H	53.4	354194	3877494		40,000	
	8-hour	H1H	24.1	354194	3877494	500		Not Significant – No further modeling
		H2H	22.8	354244	3877493		10,000	
NO_2	1-hour	H1H	52.8	361300	3878900	7.5		Significant – Further modeling needed
		H8H	28.8	354194	3877494		188	
	Annual	H1H	0.83	354194	3877494	1	100	Not Significant – No further modeling
PM_{10}	24-hour	H1H	10.2	353926	3880659	5		Significant – Further modeling needed
		H2H	9.03	353926	3880659		150	
	Annual	H1H	1.75	353926	3880659	1	50	Significant – Further modeling needed
$PM_{2.5}$	24-hour	H1H	10.2	353926	3880659	1.2		Significant – Further modeling needed
		H8H	6.8	353688	3880517		35	
	Annual	H1H	1.75	353926	3880659	0.3	12	Significant – Further modeling needed
SO_2	1-hour	H1H	5.64	354194	3877494	7.9		Not Significant – No further modeling
		H4H	5.24	354194	3877494		196	
	3-hour	H1H	3.93	354194	3877494	25		Not Significant – No further modeling
		H2H	3.06	354194	3877494		1,300	
	24-hour	H1H	1.14	354294	3877492	5		Not Significant – No further modeling
		H2H	1.06	354194	3877494		365	
	Annual	H1H	0.11	354194	3877494	1	80	Not Significant – No further modeling

The rank or reported value is based on the form of the standard as some standards are not to be exceeded (H1H or highest first highest modeled value), whereas others are not to be exceeded more than once per year (H2H or highest second highest value). The statistical forms of the 1-hour NO2 and SO2 standards as well as the 24-hour PM2.5 standard require other ranked or reporting values including the highest-eighth-highest (H8H) value over a five-year period for both 1-hour NO2 and 24-hour PM2.5 and the highest-fourth-highest (H4H) value over a five-year period for the 1-hour SO2 standard.

Notwithstanding the forms of the respective air quality standards, as shown in Table 5, the Significant Impact Level (SIL) values are all based on the highest-first-highest (H1H) modeled concentration. The SIL value is a level at which the US EPA has determined that a modeled concentration cannot "cause or contribute" to an exceedance of a NAAQS or PSD increment level.

A comparison of the modeled concentrations from the KAFB Title V emission inventory to the respective Significant Impact Levels is shown. As shown, two of the five modeled criteria pollutants return modeled concentrations less than the respective SIL values (CO and SO2), whereas the remaining pollutants do not. Modeled KAFB Title V inventory impacts that are below the SIL values are exempt from further analysis as a showing of impacts below the respective SIL satisfies the requirements of demonstrating compliance with the NAAQS.

Therefore, no further modeling was completed for the emissions of CO or SO2. However, as the KAFB Title V emission inventory modeled concentrations of NO2, PM10, and PM2.5 did exceed the respective SIL thresholds, further modeling to include an off-site inventory of emitting sources was completed.

In establishing a distance to include for the off-site emission inventory the significant impact area (SIA) is typically determined. This SIA is an area wherein modeled concentrations likely exceed the respective SIL threshold and therefore areas wherein the modeled source could contribute to a violation of a NAAQS or PSD increment.

Off-site emission sources of the same criteria pollutant that has been modeled from a source and shown to be significant, are then typically included in any off-site inventory modeling assessment to demonstrate compliance from any aggregated (modeled source plus off-site inventory source) impacts together with a representative ambient background concentration.

The KAFB 1-hour NO2 SIA is depicted on Figure 7 along with the locations of the off-site emission inventory provided by AEHD-AQD. The SIA is the area within the isopleth (line of concentration concentration) corresponding with the 1-hour NO2 SIL value of 7.5 $\mu g/m^3$. Also shown on Figure 7 are the KAFB boundary receptor locations.

The KAFB 24-hour PM2.5 SIA is depicted on Figure 8 noting the much smaller area associated with the KAFB Title V PM2.5 emission inventory impacts. Notwithstanding the smaller areal extent of the PM2.5 SIA the KAFB impacts still extend outward into ambient air locations that include off-site inventory locations and therefore off-site inventory modeling was completed for both PM10 and PM2.5.

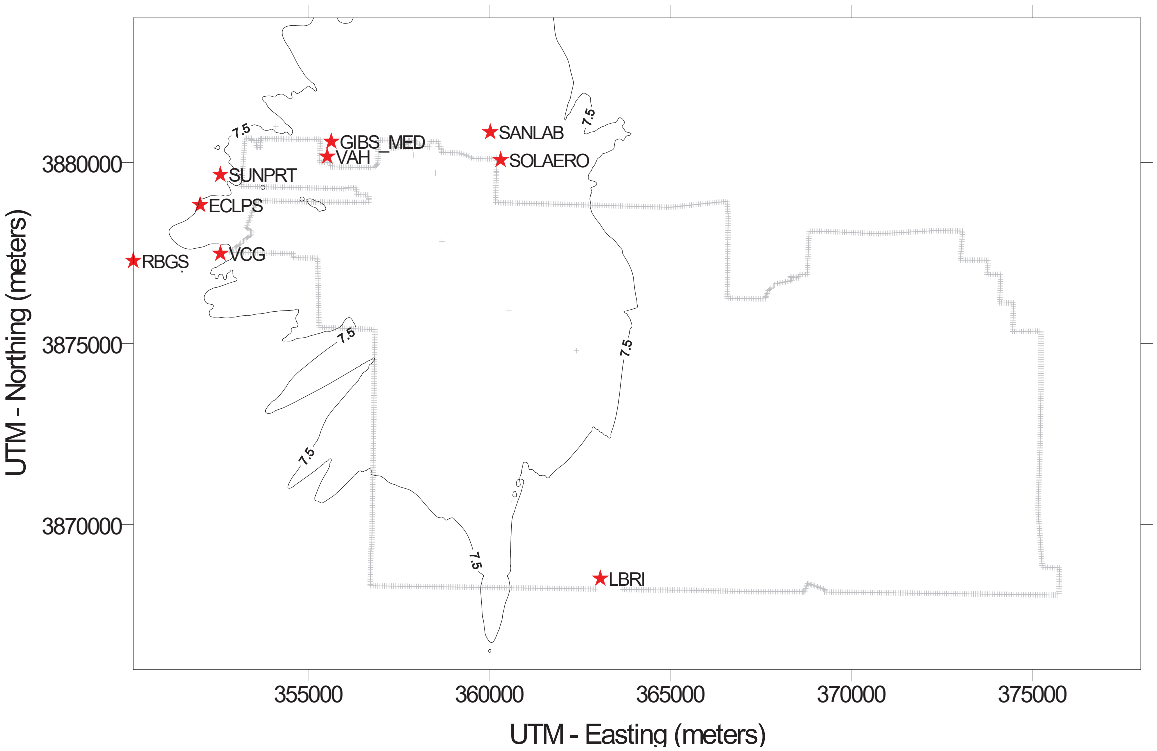


Figure 7. KAFB – Title V Emission Inventory 1-hour NO2 Significant Impact Area

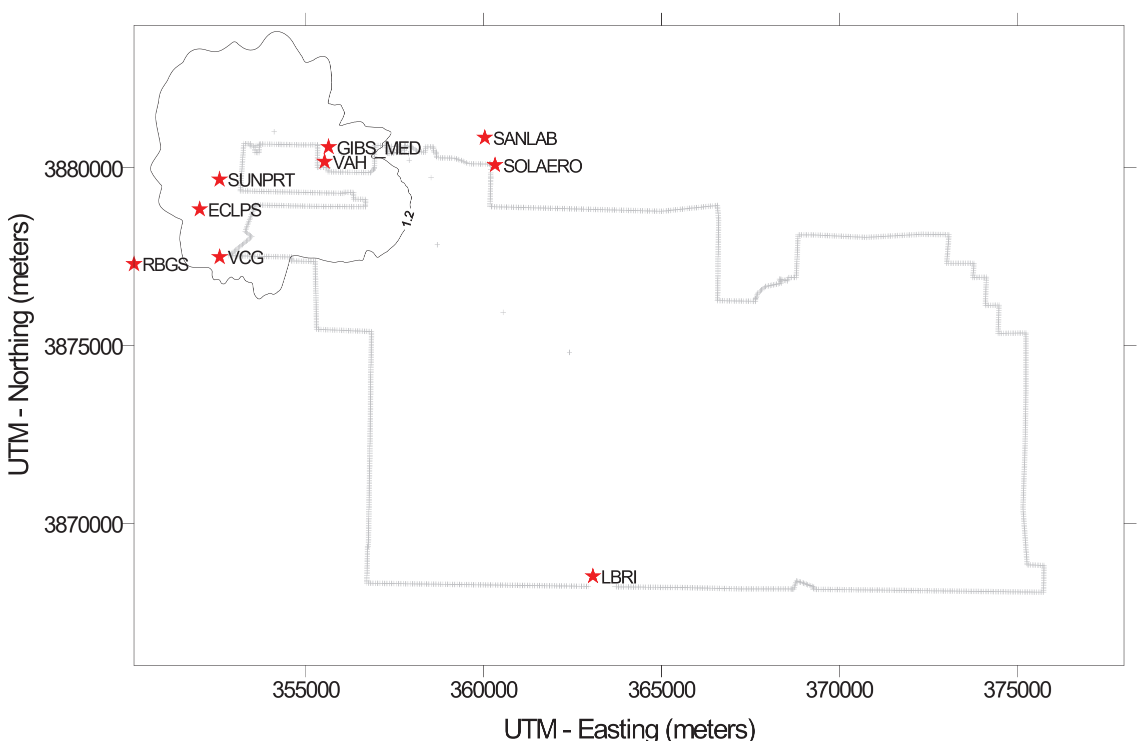


Figure 8. KAFB – Title V Emission Inventory 24-hour PM2.5 Significant Impact Area

KAFB Title V and Off-Site Inventory Assessment

The AEHD-AQD has provided information on an appropriate off-site emission inventory of sources to include in a comprehensive assessment of air quality impacts within the KAFB impact affected area (SIAs). The off-site inventory of emission sources is provided in Table 6 and the locations of the inventory facilities have been previously shown on Figures 7 and 8.

Emissions of NOx, PM10, and PM2.5 from nine nearby facilities are tabulated (Table 6) along with the modeled exhaust parameters. As with the KAFB Title V inventory, not all of the off-site emission sources vent vertically through unhindered stacks, and some are identified as volume type sources.

The information provided in Table 6 includes the facility identifier as well as the model ID used in the AERMOD input stream along with the location of the emitting unit in UTM. The elevation of the source above mean sea level (msl) is shown and where not provided by the agency was determined from aerial imagery.

Also shown in Table 6 are the source type (point, pointhor, pointcap, volume) and the parameters associated with each of those source types. The volume sources include the height above grade level (agl) of the release as with the point source type entries, however, rather than an exhaust temperature and exit velocity, the appropriate headings for the volume sources are in units of meters and describe the initial lateral and vertical dimensions of the volume source. These are denoted as sigma-y-naught (σ_{y0}), initial lateral dimension, and sigma-z-naught (σ_{z0}), the initial vertical dimension.

The modeled emission rates are provided in the last three columns in Table 6 and the emission values as provided by the AEHD in units of grams per second (g/s). As with the modeling of NOx for the KAFB Title V emission inventory, the US EPA Tier 3 NOx modeling guidance was again used for the full inventory (KAFB Title V plus the off-site emission inventory).

This included again use of the hourly ozone date, NO2 seasonal and hourly background values, and in-stack NO2/NOx ratios. The ratios used for the KAFB emission inventory were the same and the in-stack ratios used for the off-site inventory are presented in Table 7 and are based on AEHD-AQD guidance.

The aggregated NOx, PM10, and PM2.5 emission inventories from the KAFB Title V inventory (as presented in Table 1 and Table 3) and the off-site source inventory (as presented in Table 6) were combined into a single AERMOD input file and iterated using the full five-years of meteorological data and the full grid of receptors as shown on Figure 5.

Results of the aggregated inventory (KAFB plus off-site) for NO2 are provide in Table 8 along with the individual source modeled concentrations. As the NO2 modeling invoked the seasonal/hourly NO2 background values, the maximum full facility modeling results include the contribution of background already. The maximum modeled background concentration as calculated in AERMOD was 80 micrograms per cubic meter ($\mu g/m^3$). This compares with the single maximum 1-hour value provided by AEHD of 84.6 $\mu g/m^3$ for Del Norte. Annual values were not modeled as the KAFB Title V inventory annual NO2 SIL was not exceeded per the results in Table 5.

Table 6. KAFB – Title V – Off-Site Emission Modeled Inventory Parameters

			Location UTM Zone 13			Modeled Exhaust Parameters				Modeled Emission Rate (g/s)		
Facility	Model ID	Type	Easting (m)	Northing (m)	Elevation (m msl)	Height (m)	Temp (K); σ_{y0} (m)	Velocity (m/s); σ_{z0} (m)	Diameter (m)	NOx	PM10	PM25
LBRI	LBRI_B4	pointcap	362899.0	3868454.0	1728.2	5.79	505.37	2.757	0.254	0.02016	0.00151	0.00151
	LBRI_B5	pointcap	363108.0	3868522.0	1728.2	5.79	505.37	2.000	0.526	0.09450	0.00945	0.00945
	LBRI_B6	pointcap	363106.0	3868514.0	1728.2	7.32	505.37	2.000	0.526	0.09450	0.00945	0.00945
	LBRI_B7	pointcap	363107.0	3868538.0	1728.2	10.36	505.37	2.413	0.526	0.11340	0.01134	0.01134
	LBRI_TO	point	363136.0	3868524.0	1728.2	10.87	1033.15	2.757	0.406	0.02520	0.00189	0.00189
RBGS	RBGS	point	350169.6	3877287.7	1538.3	15.24	855.93	29.962	5.182	36.30000	3.89340	3.89340
SolAero	SOLAERO_A1	point	360343.0	3880087.0	1669.1	5.18	505.37	42.977	0.203	0.05922	0.00113	0.00113
	SOLAERO_A2	point	360343.0	3880091.0	1669.1	5.18	505.37	42.977	0.203	0.05922	0.00113	0.00113
	SOLAERO_RB	point	360300.0	3880076.0	1669.1	12.19	394.26	14.783	0.366	0.03402	0.00064	0.00064
	SOLAERO_O1	point	360316.0	3880069.0	1669.1	12.19	449.82	24.293	0.152	0.01260	0.00024	0.00024
	SOLAERO_O2	point	360315.0	3880040.0	1669.1	12.19	449.82	13.533	0.203	0.02016	0.00038	0.00038
	SOLAERO_PB	point	360282.0	3880073.0	1669.1	12.19	291.48	3.078	0.972	0.00844	0.00020	0.00020
Sandia Labs	SANLAB_B1	pointcap	360023.8	3880811.0	1667.3	1.80	588.00	10.000	0.240	0.07560	0.00630	0.00630
	SANLAB_B2	pointcap	360023.3	3880812.7	1667.3	1.80	588.00	10.000	0.240	0.07560	0.00630	0.00630
	SANLAB_H1	point	360019.7	3880867.3	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H2	point	360020.6	3880866.0	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H3	point	360024.2	3880862.4	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H4	point	360025.3	3880861.3	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H5	point	360040.5	3880835.5	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H6	point	360041.0	3880834.2	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_H7	point	360042.6	3880829.2	1667.3	1.80	588.00	10.000	0.240	0.01008	0.00126	0.00126
	SANLAB_BAG	pointhor	359408.2	3874086.0	1650.0	3.63	0.00	4.602	0.396	0	0.63000	0.63000
Sunport	SUNPRT_BLR	pointcap	352574.6	3879666.5	1622.2	16.15	510.93	2.621	0.762	0.33012	0.03402	0.03402
VA Hospital	VAH_BLR1	point	355554.0	3880059.0	1630.4	11.58	485.37	16.429	0.509	0.25956	0.02016	0.02016
	VAH_BLR2	point	355557.0	3880052.0	1630.4	11.58	485.37	16.429	0.509	0.25956	0.02016	0.02016
	VAH_BLR3	point	355558.0	3880045.0	1630.4	11.58	485.37	16.429	0.509	0.25956	0.02016	0.02016

Facility	Model ID	Type	Location UTM Zone 13			Modeled Exhaust Parameters				Modeled Emission Rate (g/s)		
			Easting (m)	Northing (m)	Elevation (m msl)	Height (m)	Temp (K); σ_{y0} (m)	Velocity (m/s); σ_{z0} (m)	Diameter (m)	NOx	PM10	PM25
	VAH_DRY1	point	355569.0	3880130.0	1630.4	12.19	366.48	15.240	0.152	0.03150	0.00239	0.00239
	VAH_DRY2	point	355572.0	3880119.0	1630.4	12.19	366.48	15.240	0.152	0.03150	0.00239	0.00239
	VAH_GEN9	point	355352.0	3880587.0	1630.4	4.57	955.37	128.930	0.076	0.06174	0.00025	0.00025
Gibson Medical	GIBS_MED	point	355640.0	3880578.0	1622.8	8.78	435.93	5.791	0.509	0.13860	0.07560	0.07560
Eclipse	ECLPS_6a	point	352036.0	3878862.0	1619.7	19.81	322.04	10.058	1.280	0.10206	0	0
	ECLPS_6b	point	352036.0	3878802.0	1619.7	19.81	322.04	10.058	1.280	0.10206	0	0
	ECLPS_8a	point	352008.0	3878808.0	1619.7	19.81	322.04	1.798	0.914	0.04032	0	0
	ECLPS_8b	point	352008.0	3878808.0	1619.7	19.81	297.04	7.193	0.914	0.04032	0	0
	ECLPS_8c	point	352008.0	3878853.0	1619.7	19.81	322.04	1.798	0.914	0.04032	0	0
	ECLPS_8d	point	352008.0	3878853.0	1619.7	19.81	297.04	7.193	0.914	0.04032	0	0
VCG	VCG_CBPE	point	352576.2	3877483.0	1620.3	3.66	761.87	46.177	0.204	0.66402	0.01890	0.01890
	VCG_CMBH	pointhor	352577.2	3877490.0	1620.3	2.44	0.00	13.716	0.710	0	0.12424	0.12424
	VCG_FH1	volume	352601.3	3877488.0	1620.3	4.00	1.16	2.33		0	0.01900	0.00290
	VCG_FH2	volume	352601.3	3877483.0	1620.3	4.00	1.16	2.33		0	0.01900	0.00290
	VCG_FH3	volume	352601.5	3877478.1	1620.3	4.00	1.16	2.33		0	0.01900	0.00290
	VCG_FH4	volume	352601.1	3877473.3	1620.3	4.00	1.16	2.33		0	0.01900	0.00290
	VCG_TP1	volume	352598.9	3877487.6	1620.3	2.00	0.47	0.93		0	0.00059	0.00016
	VCG_TP2	volume	352599.1	3877483.0	1620.3	2.00	0.47	0.93		0	0.00059	0.00016
	VCG_TP3	volume	352599.1	3877478.3	1620.3	2.00	0.47	0.93		0	0.00059	0.00016
	VCG_TP4	volume	352598.3	3877473.9	1620.3	2.00	0.47	0.93		0	0.00059	0.00016
	VCG_AB	volume	352580.1	3877480.8	1620.3	4.00	1.16	2.33		0	0.07625	0.01159
	VCG_WH	volume	352580.1	3877480.8	1620.3	2.00	1.16	2.33		0	0.00238	0.00063
	VCG_SP1	volume	352634.5	3877496.3	1620.3	2.44	8.50	2.27		0	0.03325	0.00508
	VCG_SP2	volume	352634.7	3877480.4	1620.3	2.44	8.50	2.27		0	0.03325	0.00508
	VCG_SP3	volume	352634.5	3877464.6	1620.3	2.44	8.50	2.27		0	0.03325	0.00508
	VCG_HR1_1	volume	352548.0	3877525.0	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_2	volume	352553.1	3877513.0	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_3	volume	352558.1	3877501.1	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_4	volume	352569.7	3877497.7	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_5	volume	352582.6	3877497.4	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_6	volume	352595.1	3877499.2	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_7	volume	352598.6	3877510.2	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR1_8	volume	352595.3	3877522.8	1620.3	3.40	6.05	3.16		0	0.00400	0.00040
	VCG_HR2_1	volume	352595.0	3877524.0	1620.3	3.40	6.05	3.16		0	0.00475	0.00048

			Location UTM Zone 13			Modeled Exhaust Parameters				Modeled Emission Rate (g/s)		
Facility	Model ID	Type	Easting (m)	Northing (m)	Elevation (m msl)	Height (m)	Temp (K); σ_{y0} (m)	Velocity (m/s); σ_{z0} (m)	Diameter (m)	NOx	PM10	PM25
	VCG_HR2_2	volume	352602.0	3877513.1	1620.3	3.40	6.05	3.16		0	0.00475	0.00048
	VCG_HR2_3	volume	352609.4	3877502.4	1620.3	3.40	6.05	3.16		0	0.00475	0.00048
	VCG_HR2_4	volume	352614.2	3877490.9	1620.3	3.40	6.05	3.16		0	0.00475	0.00048
	VCG_HR2_5	volume	352614.6	3877477.9	1620.3	3.40	6.05	3.16		0	0.00475	0.00048
	VCG_HR2_6	volume	352615.0	3877466.0	1620.3	3.40	6.05	3.16		0	0.00475	0.00048

Table 7. KAFB – Off-Site NO2 Emission Inventory In-stack NO2/NOx Ratios

Facility	Model ID	NO2/NOx Ratio
LBRI	LBRI_B4	0.2
	LBRI_B5	0.2
	LBRI_B6	0.2
	LBRI_B7	0.2
	LBRI_TO	0.3
RBGS	RBGS	0.2
SolAero	SOLAERO_A1	0.3
	SOLAERO_A2	0.3
	SOLAERO_RB	0.3
	SOLAERO_O1	0.3
	SOLAERO_O2	0.3
	SOLAERO_PB	0.3
Sandia Labs	SANLAB_B1	0.2
	SANLAB_B2	0.2
	SANLAB_H1	0.3
	SANLAB_H2	0.3
	SANLAB_H3	0.3
	SANLAB_H4	0.3
	SANLAB_H5	0.3
	SANLAB_H6	0.3
	SANLAB_H7	0.3
	SANLAB_BAG	0.2
Sunport	SUNPRT_BLR	0.2
VA Hospital	VAH_BLR1	0.2
	VAH_BLR2	0.2
	VAH_BLR3	0.2
	VAH_DRY1	0.3
	VAH_DRY2	0.3
	VAH_GEN9	0.3
Gibson Medical	GIBS_MED	0.2
Eclipse	ECLPS_6a	0.2
	ECLPS_6b	0.2
	ECLPS_8a	0.2
	ECLPS_8b	0.2
	ECLPS_8c	0.2
	ECLPS_8d	0.2
VCG	VCG_CBPE	0.3
	VCG_CMBH	0.3

Table 8. KAFB – Title V – Off-Site NO2 Emission Modeled Inventory Results

Modeled Source	Criteria Pollutant	Averaging Period	Averaging Rank	Modeled Concentration ($\mu g/m^3$)	Location of Modeled Concentration UTM Zone 16		Ambient Background Concentration ($\mu g/m^3$)	Aggregate Impact Facility plus Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Aggregate Impact Percentage of NAAQS
					Easting (m)	Northing (m)				
KAFB + Off-Site Inventory	NO_2	1-hour	H8H	156.0	355365	3880009	--	156.0	188	83.0%
KAFB				28.8	354194	3877494	84.6	113.4		
LBRI				50.3	363034	3868217	84.6	134.9		
RBGS				15.9	362412	3874806	84.6	100.5		
SolAero				34.8	360400	3880100	84.6	119.4		
Sandia Labs				73.3	360000	3880700	84.6	157.9		
Sunport				16.2	352600	3879600	84.6	100.8		
VA Hospital				89.6	355700	3880000	84.6	174.2		
Gibson Medical				15.1	355700	3880500	84.6	99.7		
Eclipse				8.8	352000	3879000	84.6	93.4		
VCG				36.3	352838	3877523	84.6	120.9		

Remembering that the full grid of receptors as depicted on Figure 5 was used in the aggregated NO2 emission inventory (KAFB plus off-site sources) and knowing that many of the receptor locations extended over the locations of most of the off-site inventory sources, a preliminary run of some of the receptor/source locations suggested compromised modeling results because of receptor locations atop modeled off-site inventory locations.

Therefore, and as with the discussion of receptors and the Lovelace (LBRI) facility boundary, and to ensure that the modeled concentrations for a particular facility were not being reported within air that would not be deemed "ambient" from that facility perspective, the receptor grid was reviewed, and receptors located atop a modeled facility property were removed from the modeling grid and the modeling analysis. This resulted in the removal of 167 receptor locations (140 of them associated with the VCG operational area and boundary) to avoid calculating concentrations what for that modeled source would not need to be reported as it would not be considered ambient air.

These 167 receptor locations are depicted on Figure 9 along with the location of the nearby off-site inventory emitting facilities. Not all receptors that were found to lay atop these facilities were removed. For example, the VCG facility boundary as provided by the AEHD, is equivalent to the Albuquerque Sunport International airport boundary. That boundary is extensive and so only those receptors within the boundary within a certain distance from the VCG operations area were removed.

The 167 receptors were retained in the modeling files but were not accessed in the modeling runs through use of the AERMOD "**" prefacing text limiter and can be verified by AEHD-AQD as appropriate removals from the receptor field. Noting again that these 167 receptor locations had already been modeled to account for the KAFB impacts on those off-site facility receptor locations and for many (as shown on Figures 7 and 8) were not significant.

The results provided in Table 8 do show that modeling of the KAFB Title V emission inventory along with an off-site emission inventory, together with appropriate in-stack NO2/NOx ratios, background ozone and seasonal/hourly NO2 data, application of the ozone-limiting-method, and more appropriate "ambient" receptors for the modeled off-site inventory, combined, return modeled concentrations less than the 1-hour NO2 NAAQS.

The maximum aggregate modeled concentration shown in Table 8 (top row) is located along the KAFB boundary shared with the VA Hospital and represents the overlap of the KAFB and off-site inventory impacts at that location.

Modeling of the off-site particulate emitting inventory was completed using the same set of receptors as used in the off-site NO2 modeling. The inputs used are those provided in Table 6 under the "PM10" and "PM2.5" columns.

The results of the PM2.5 inventory modeling are shown in Table 9 and are the modeled 24-hour highest-eighth-highest PM2.5 concentration. Results are provided for both the collective KAFB plus Off-Site emitting inventory (top row) and for each of the individual modeled facilities and its associated PM2.5 emission inventory. Also provided in Table 9 are the impact locations and the suggested ambient background concentration (as provided by AEHD-AQD).

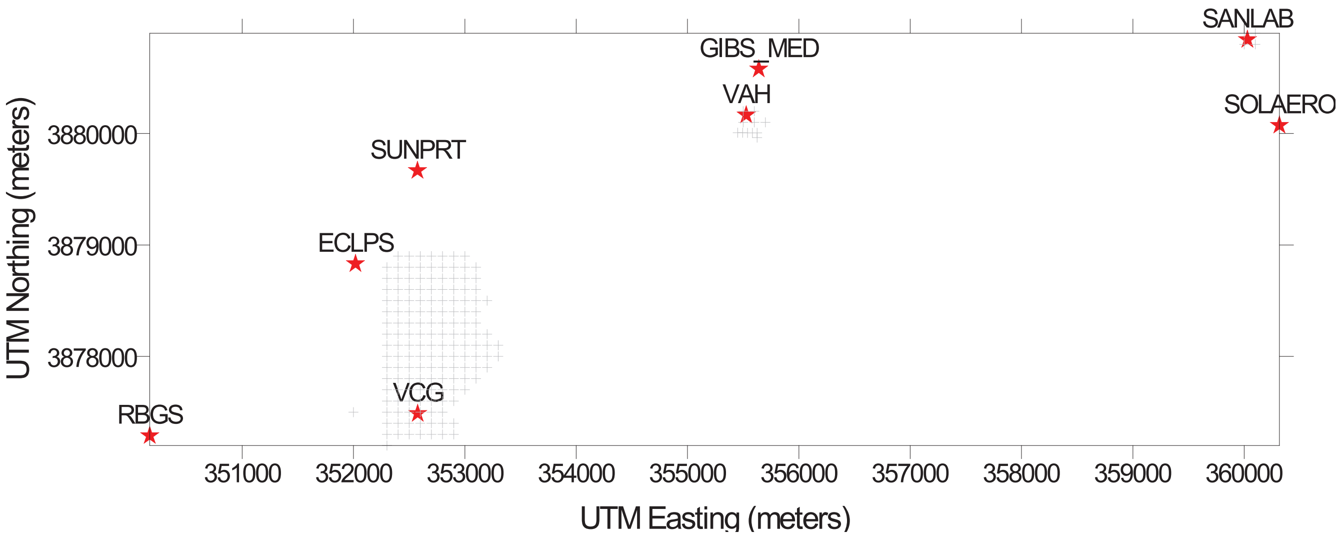


Figure 9. KAFB and Off-Site Emission Inventory – Location of Receptors Removed from the Off-Site Inventory Modeling Runs

Table 9. KAFB – Title V – Off-Site PM2.5 24-hour Highest-Eighth-Highest Individual Facility Modeled Results

Modeled Source	Modeled Concentration (µg/m^3)	Location of Modeled Concentration UTM Zone 16		Ambient Background Concentration (µg/m^3)	Aggregate Impact Plus Background (µg/m^3)
		Easting (m)	Northing (m)		
KAFB + Off-Site Inventory	8.3	352500	3877200	22	30.3
KAFB	6.8	353688	3880516	22	28.8
LBRI	0.9	363801	3868216	22	22.9
RBGS	0.3	350500	3877000	22	22.3
SolAero	0.1	360400	3880100	22	22.1
Sandia Labs	1.7	360000	3880700	22	23.7
Sunport	0.5	352600	3879500	22	22.5
VA Hospital	2.0	355624	3879222	22	24.0
Gibson Medical	2.8	355500	3880600	22	24.8
Eclipse	0.0	--	--	22	22.0
VCG	7.9	352500	3877200	22	29.9

The particulate matter full inventory modeling results are provided in Table 10. As shown, the modeled inventory results added to the ambient background values returns combined concentrations less than the respective PM10 and PM2.5 NAAQS.

The findings of the modeling for both the KAFB Title V emission inventory alone and through the modeling of the combined KAFB and off-site AEHD provided inventory along with the addition of appropriate ambient background concentrations return modeled concentrations either less than respective SIL values (KAFB sources only) or less than applicable NAAQS. Therefore, the KAFB Title V emission inventory will not adversely impact nearby airshed ambient air concentrations and are protective of the NAAQS in the vicinity of the KAFB operations.

Table 10. KAFB – Title V – KAFB Plus Off-Site Particulate Matter Emission Modeled Inventory Results

Criteria Pollutant	Averaging Period	Averaging Rank	Modeled Concentration (μg/m^3)	Location of Modeled Concentration UTM Zone 16		Ambient Background Concentration (μg/m^3)	Aggregate Impact Facility plus Background (μg/m^3)	NAAQS (μg/m^3)	Aggregate Impact Percentage of NAAQS
				Easting (m)	Northing (m)				
PM_{10}	24-hour	H2H	29.0	352500	3877200	42	71.0	150	47.3%
$PM_{2.5}$	24-hour	H8H	8.3	352500	3877200	22	30.3	35	86.6%
	Annual	H1H	2.1	352500	3877200	8.4	10.5	12	87.5%

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From: Pomo, Elizabeth
To: CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC; Tavarez, Isreal L.; Munoz-Dyer, Carina G.
Cc: CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW; kafbemctr; Stonesifer, Jeff W.; Tumpane, Kyle
Subject: RE: Request Extension: Permit 527-RN1 Renewal Application
Date: Friday, 21 January, 2022 13:54:43
Attachments: image001.png

Good afternoon Andria,

An extension has been granted. Please wait to submit the Title V renewal application until the recent modeling questions have been answered.

Thank you,

Elizabeth M. Pomo, MPH
environmental health scientist | environmental health department
o 505.768.2638
m 505.239.7094
cabq.gov/environmentalhealth/

From: CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC <andria.cuevas.1@us.af.mil>
Sent: Wednesday, January 19, 2022 11:39 AM
To: Tavarez, Isreal L. <ITavarez@cabq.gov>; Munoz-Dyer, Carina G. <cmunoz-dyer@cabq.gov>; Pomo, Elizabeth <epomo@cabq.gov>
Cc: CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI <melissa.clark.8@us.af.mil>; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW <kevin.villalobos@us.af.mil>; kafbemctr <kafbemctr@navarro-inc.com>
Subject: Request Extension: Permit 527-RN1 Renewal Application

Good Morning Isreal, Carina, Liz!

Kirtland AFB is due to submit Permit 527-RN1 Title V renewal application (due 22 January 2022). Although the application is at the Wing pending the Commander's signature, we are experiencing some administrative issues with COVID protocol to telework, and we are having some difficulties with obtaining the notary certification page. I am respectfully requesting if KAFB may obtain an extension to submit the complete/signed application by Friday, 27 January 2022.

I appreciate your consideration…THX!
-Andria

(Happy New Year!)

From:	Stonesifer, Jeff W.
To:	CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC
Cc:	kafbemctr; Lutz, Jon; Munoz-Dyer, Carina G.; Pomo, Elizabeth; CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI; Tumpane, Kyle; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW
Subject:	RE: Permit 527-RN1 Renewal Application Modeling Protocol
Date:	Tuesday, 22 February, 2022 10:49:08
Attachments:	image001.png image002.png VitalCombustionROI.BST VitalPMROI.BST

Andria,

The Air Quality Program has determined that none of the landfills at Kirtland Air Force Base need to be included in the modeling for the Title V renewal.

The modeling files for VCG's concrete batch plant on Airport property are attached.

Regards,

JEFF STONESIFER
senior environmental health scientist | environmental health department
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From: CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC <andria.cuevas.1@us.af.mil>
Sent: Thursday, February 3, 2022 2:09 PM
To: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Cc: kafbemctr <kafbemctr@navarro-inc.com>; Lutz, Jon <tlutz@cabq.gov>; Munoz-Dyer, Carina G. <cmunoz-dyer@cabq.gov>; Pomo, Elizabeth <epomo@cabq.gov>; CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI <melissa.clark.8@us.af.mil>; Tumpane, Kyle <ktumpane@cabq.gov>; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW <kevin.villalobos@us.af.mil>
Subject: RE: Permit 527-RN1 Renewal Application Modeling Protocol

Hi Jeff!

After reviewing some documents, and discussion with our Restoration team it was determined that the reference to "general refuse" is limited to the construction and demolition waste, and the municipal solid waste (no other waste). Also, the modeler is respectfully requesting a copy of the VCG modeling files.

Please let me know if you have any additional questions/concerns.

I appreciate the help…THX!

-Andria

From: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Sent: Wednesday, February 2, 2022 11:56 AM
To: CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC <andria.cuevas.1@us.af.mil>
Cc: kafbemctr <kafbemctr@navarro-inc.com>; Lutz, Jon <tlutz@cabq.gov>; Munoz-Dyer, Carina G. <cmunoz-dyer@cabq.gov>; Pomo, Elizabeth <epomo@cabq.gov>; CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI <melissa.clark.8@us.af.mil>; Tumpane, Kyle <ktumpane@cabq.gov>; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW <kevin.villalobos@us.af.mil>
Subject: [Non-DoD Source] RE: Permit 527-RN1 Renewal Application Modeling Protocol

Andria,

Air Quality Program staff are not familiar with the term "general refuse". What is meant by general refuse? Do you have a definition of the term or possibly a list of items that fall under the category of general refuse? Once it has been determined if general refuse is municipal solid waste or not, we may have additional questions.

The permit for the concrete batch plant located on the Sunport property allows for 24/7 operation. They were able to pass modeling this way and so didn't bother to limit hours of operation in the modeling. No data on actual hours of operation for the VCG plant is available. PM10 emissions from the central mixer baghouse may indeed be somewhat greater than PM2.5 emissions. Once again , VCG was able to pass modeling without differentiating between PM10 and PM2.5 emissions from the baghouse. If VCG is causing problems in getting the Kirtland modeling to pass, Air Quality Program staff are available to discuss the situation with Kirtland's environmental team. Would it help Kirtland's team to have the actual modeling files from the VCG modeling? We can certainly provide those files including the modeling results.

Regards,

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From: CUEVAS, ANDRIA R CIV USAF AFGSC 377 MSG/CEIEC <andria.cuevas.1@us.af.mil>
Sent: Wednesday, January 12, 2022 12:11 PM
To: Stonesifer, Jeff W. <JStonesifer@cabq.gov>
Cc: kafbemctr <kafbemctr@navarro-inc.com>; Lutz, Jon <tlutz@cabq.gov>; Munoz-Dyer, Carina G. <cmunoz-dyer@cabq.gov>; Pomo, Elizabeth <epomo@cabq.gov>; CLARK, MELISSA B GS-14 USAF AFGSC 377 MSG/CEI <melissa.clark.8@us.af.mil>; Tumpane, Kyle <ktumpane@cabq.gov>; VILLALOBOS, KEVIN R GS-13 USAF AFMC AFCEC/CZOW <kevin.villalobos@us.af.mil>
Subject: FW: Permit 527-RN1 Renewal Application Modeling Protocol