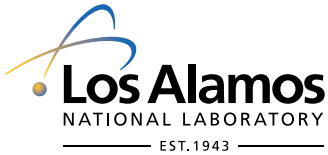
LA-14465-PR
Progress Report

Emissions Inventory Report Summary for Los Alamos National Laboratory for Calendar Year 2011



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Progress Report
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Environmental Stewardship Group

Los Alamos
NATIONAL LABORATORY
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Acronyms

AIRS	Aerometric Information Retrieval System
AQB	Air Quality Bureau
CAS	Chemical Abstracts Service
CO	carbon monoxide
CO2	carbon dioxide
EPA	U.S. Environmental Protection Agency
FGR	flue gas recirculation
HAP	hazardous air pollutant
HCl	hydrochloric acid
LANL	Los Alamos National Laboratory
MSDS	material safety data sheet
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NOx	nitrogen oxides
PM	particulate matter
PM2.5	particulate matter with diameter less than 2.5 micrometers
PM10	particulate matter with diameter less than 10 micrometers
PSD	Prevention of Significant Deterioration
R&D	research and development
SOx	sulfur oxides
SO2	sulfur dioxide
TA	Technical Area
TSP	total suspended particulates
VOC	volatile organic compound

EMISSIONS INVENTORY REPORT SUMMARY FOR LOS ALAMOS NATIONAL LABORATORY FOR CALENDAR YEAR 2011

by

Environmental Stewardship Group

ABSTRACT

Los Alamos National Laboratory (LANL) is subject to annual emissions reporting requirements for regulated air pollutants under Title 20 of the New Mexico Administrative Code, Chapter 2, Part 73 (20.2.73 NMAC), Notice of Intent and Emissions Inventory Requirements. The applicability of the requirements is based on the Laboratory's potential to emit 100 tons per year of suspended particulate matter, nitrogen oxides, carbon monoxide, sulfur oxides, or volatile organic compounds. Additionally, on April 30, 2004, LANL was issued a Title V Operating Permit from the New Mexico Environment Department/Air Quality Bureau, under 20.2.70 NMAC. This permit was modified and renewed on August 7, 2009. This Title V Operating Permit (Permit No. P100R1) includes emission limits and operating limits for all regulated sources of air pollution at LANL. The Title V Operating Permit also requires semiannual emissions reporting for all sources included in the permit. This report summarizes both the annual emissions inventory reporting and the semiannual emissions reporting for LANL for calendar year 2011. LANL's 2011 emissions are well below the emission limits in the Title V Operating Permit.

1.0 INTRODUCTION

1.1 Regulatory Basis

Los Alamos National Laboratory (LANL or the Laboratory) has reported on air pollutants generated from its operations since the 1970s when Air Quality Control Regulation 703, Registration of Air Contaminant Sources, was promulgated. According to the regulation, the Laboratory was required to register air pollutant sources that emitted more than 2,000 lb per year of any air contaminant. This regulatory requirement later evolved into Title 20 of the New Mexico Administrative Code, Chapter 2, Part 73 (20.2.73 NMAC), Notice of Intent and Emissions Inventory Requirements. The objective of the reporting requirement is to provide emissions data to the New Mexico Environment Department (NMED)/Air Quality Bureau (AQB) so its staff can determine whether LANL meets state and federal air pollutant standards.

Annual emissions inventory reporting requirements under 20.2.73 NMAC apply to any stationary source which

- has been issued a construction permit under 20.2.72 NMAC;
- has been required to file a Notice of Intent under 20.2.73.200 NMAC; or
- emits in excess of

- 1 ton per year of lead or
- 10 tons per year of
  - total suspended particulates (TSP);
  - particulate matter (PM) with diameter less than 10 micrometers (PM_{10});
  - PM with diameter less than 2.5 micrometers ($PM_{2.5}$);
  - sulfur dioxide (SO_2);
  - nitrogen oxides (NO_x);
  - carbon monoxide (CO); or
  - volatile organic compounds (VOCs).

The annual emissions inventory must be submitted to NMED/AQB by April 1 of each year. The NMED/AQB enters the data in the Aerometric Information Retrieval System (AIRS) (EPA 2008a). This nationwide system, administered by the U.S. Environmental Protection Agency (EPA), is used to help ensure ambient air quality standards are maintained and to track the state's air pollutant emissions. AIRS is a large air pollution database that contains information, requirements, and data on air pollution and air quality in the United States and various World Health Organization member countries. The program is operated by the EPA and state/local air pollution control agencies. The AIRS database tracks each state's progress towards achieving and maintaining National Ambient Air Quality Standards for criteria pollutants. The database is also used as a tool to help improve each state's air quality programs by enabling program members to access and compare past data and view data from other states.

Additionally, on April 30, 2004, LANL was issued a Title V Operating Permit from the NMED/AQB, under 20.2.70 NMAC. This permit was modified and renewed on August 7, 2009 (P100R1) from the NMED/AQB (NMED 2009b). A condition of the Title V Operating Permit is that LANL must submit semiannual emissions reports to NMED documenting that emissions from all permitted sources are below permitted emission levels. Section 4.0 of the permit states:

Reports of actual emissions from permitted sources in Section 2.0 of the permit shall be submitted on a 6 month basis. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of the permit. The reports shall be submitted within 90 days from the end of the reporting period. The reporting periods are January 1 through June 30, and July 1 through December 31. This condition is pursuant to 20.2.70.302.E.1 NMAC.

Therefore, in 2004 the Laboratory began submitting the semiannual emissions reports as well as the annual emissions inventory. There are a few differences in which sources are included in the two emissions reports. These differences are explained in the following sections.

In the past, LANL submitted carbon dioxide (CO_2) and methane (CH_4) emissions from all stationary combustion sources in the Emissions Inventory Report as required by 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c), and in accordance with New Mexico's 2009 Greenhouse Mandatory Emissions Inventory Emissions Quantification Procedure. However, for 2011 reporting year,

NMED gave facilities the option of reporting their greenhouse gas emissions directly to EPA. LANL submitted the 2011 GHG annual report to the EPA on March 22, 2012.

1.2 Contents of Annual Emissions Inventory Submittal

NMED requested that LANL submit annual emissions inventory data for 2011 via electronic format for entry into AIRS. The information required for submittal includes the following:

- company name, address, and physical location for the facility;
- facility contact information;
- signed certification statement by a responsible facility official; and
- specific information for each emission unit such as stack and exhaust parameters, type and efficiency of control equipment, schedule of operation, annual process or fuel combustion rates, and estimated actual emissions for 2011.

This annual emissions inventory submittal includes air pollutant data for PM, PM_{10}, CO, NO_x, sulfur oxides (SO_x), VOCs, beryllium, hazardous air pollutants (HAPs), and aluminum.

LANL is also required to report $PM_{2.5}$ emissions. Further, ammonia is a precursor to $PM_{2.5}$ formation. It contributes to the secondary aerosol formation of $PM_{2.5}$ by combining with NO_x and SO_x to form ammonium nitrate and fine sulfate particles. LANL is also required to report emissions of ammonia for 2011.

In the 2011 annual emissions inventory submittal, LANL provided $PM_{2.5}$ emissions data for all combustion sources and other emission sources where $PM_{2.5}$ emission factors were readily available. In the absence of $PM_{2.5}$ emission factors, PM or PM_{10} emissions were assumed to be equivalent to $PM_{2.5}$. The Laboratory does not operate any emission units that are sources of ammonia emissions. Ammonia was included in the facility-wide emission estimates for chemical use.

1.3 Contents of the Semiannual Title V Operating Permit Emissions Reports

The semiannual Title V Operating Permit emissions reports include actual estimated emissions for the reporting period for each emission source or source category included in the Title V Operating Permit. For each source category, the actual emissions are compared with emission limits listed in the permit. The emissions are calculated using operating data from logbooks and records maintained on site. All emission calculations are consistent with calculation methods used for the annual emissions inventory.

The semiannual emissions reports include a few source categories not included in the annual emissions inventory. The Laboratory requested emission limits in their Title V Operating Permit for two source categories that are considered insignificant sources for the annual emissions inventory. These source categories are 1) small boilers and heaters, and 2) stationary standby generators. LANL requested emission limits for these source categories to obtain federally enforceable limits that would keep the Laboratory under the major source threshold for Prevention of Significant Deterioration (PSD) applicability (20.2.74 NMAC). LANL's actual emissions from these insignificant sources have historically been very low; however, without federally enforceable limits on their operation, the potential

to emit from these sources was quite high. To demonstrate that LANL is below the PSD applicability and is in compliance with the emission limits placed on these emission sources, LANL now must include these emissions in the semiannual Title V Operating Permit emissions reports.

2.0 REPORTED EMISSION SOURCES

Table 2.0-1 shows the emission sources included in the Laboratory's 2011 annual emissions inventory (LANL 2012a) and the 2011 semiannual emissions reports (LANL 2011 and 2012b). The source categories and the methodology used to calculate emissions are described in the following sections.

The following subsections describe emission sources included in the 2011 emissions inventory and semiannual emissions reports and emission calculation methodology for each source type. A summary table of actual reported emissions by source is included in Section 2.12. Attachment A includes worksheets showing detailed emission calculations for individual emissions sources. A copy of the 2011 emissions inventory as submitted to NMED is presented in Attachment B. The 2011 semiannual emissions reports are included as Attachment C.

2.1 Power Plant

The Laboratory operates a power plant at TA-3. The power plant produces steam for heating and electricity for much of the Laboratory when sufficient power from outside sources is not available. The heat produced from the power plant is used for comfort heat and hot water and to support facility processes. The power plant has three boilers that are fueled primarily with natural gas with No. 2 fuel oil as a backup. In the past, the Laboratory operated a second power plant at TA-21 and it was shut down in 2007.

For the 2011 emissions inventory, NMED requested that emissions from natural gas and No. 2 fuel oil be reported separately for the boilers located at each of the power plants. The TA-3 power plant was originally included in LANL's emissions inventory as a single unit. When a modification to the plant was made in 2001, the TA-3 power plant was separated into three separate units for emissions reporting purposes. Because each of the three boilers has the capability of burning either natural gas or No. 2 fuel oil, the TA-3 power plant is now reported as six units (ID 24, ID 25, and ID 26 for the natural gas and ID 137, ID 138, and ID 141 for the No. 2 fuel).

Table 2.0-1. Sources Included in LANL's 2011 Annual Emissions Inventory and Semiannual Emissions Reports

Included in Annual Emissions Inventory	Included in Semiannual Emissions Reports	Comment
Power Plant (TA-3*)	Power Plant (TA-3)	n/a**
Boilers greater than 5 MMBTU/hr (14 units)	All small and large boilers and heaters (approximately 175 units)	Small boilers less than 5 MMBTU/hr are exempt from annual emissions inventory requirements (see Section 3.1), but are not exempt for greenhouse gas reporting.
Asphalt Plant	Asphalt Plant	n/a
Degreasers	Degreasers	n/a
Carpenter Shops	Carpenter Shops	n/a
Permitted Beryllium Sources	Permitted Beryllium Sources	n/a
Facility-wide Chemical Use	Facility-wide Chemical Use	n/a
Process Generators	Process Generators and Stationary Standby Generators (approximately 45 units)	Stationary standby generators are exempt from annual emissions inventory requirements (see Section 3.2), but are not exempt for greenhouse gas reporting.
TA-3 Turbine	TA-3 Turbine	n/a

* TA = Technical Area. ** n/a = Not Applicable.

The 2011 emissions inventory reporting year used the updated emission factors for fuel oil for PM, PM_{10}, and $PM_{2.5}$ as described for the TA-3 power plant boilers.

Actual estimated emissions are calculated on the basis of metered fuel consumption and emission factors. The primary source of emission factors is AP-42, the EPA's Compilation of Air Pollutant Emission Factors (EPA 1998). However, emission factors from stack tests conducted at the TA-3 power plant when burning natural gas were also used, as appropriate.

The TA-3 power plant has historically been the largest source of NO_x emissions at the Laboratory. In 2002, a voluntary project to install pollution control equipment on the three boilers at the TA-3 power plant was completed. The three boilers were fitted with flue gas recirculation (FGR) equipment to reduce NO_x emissions. Stack testing for NO_x and CO was conducted before FGR equipment was installed and again after it was operational. Based on these stack test results, FGR reduced NO_x emissions by approximately 64%. In 2011, there was no new fuel delivered to the TA-3 power plant. Figure 2.1-1 shows a picture of the TA-3 power plant building and stacks.

Figure 2.1-1. TA-3 power plant.

2.2 Small Boilers and Heaters

The Laboratory operates approximately 200 small boilers and heaters, used primarily for seasonal comfort heat. Most of the boilers are exempt from permitting requirements because of their small size and use as comfort boilers and are not included in the annual emissions inventory. The exemption analysis applied to boilers is discussed in Section 3.1 of this report. While most boilers are exempt from the annual emissions inventory, 160 boilers are being reported for direct CO_2 and CH_4 emissions, as required under 20.2.87 NMAC, Greenhouse Gas Emissions Reporting (NMED 2009c).

The boilers that are not exempt and reported in the 2011 annual emissions inventory include the following:

- three boilers at TA-48 (ID 8, ID 9, and ID 10);
- two boilers at TA-53 (ID 11 and ID 12);
- two boilers at TA-59 (ID 13 and ID 14);
- two boilers at TA-55 (ID 29 and ID 30);
- one process-related boiler at TA-50 (ID 133);
- five boilers at CMRR (ID 90, ID 104, ID 105, ID 106, and ID 107);
- two boilers at TA-16 (ID 134 and ID 53); and
- 160 boilers at various locations for CO_2 emissions only (ID 140).

All of the reported boilers burn natural gas. Operating logs of actual fuel used for the TA-55 and TA-50 boilers were used to quantify emissions from these units. Fuel use for all other boilers was estimated based on the total amount of natural gas used by the Laboratory minus the amount supplied to metered sources. The amount of natural gas left after subtracting out metered sources was apportioned to the various boilers based on their size. Since virtually all of the small boilers are seasonal boilers used for building heating, it was assumed they would all operate approximately the same amount of time over the course of the year. Some emission factors were available from stack tests (TA-55), some were provided by the boiler manufacturer (Sellers Engineering Company), and the rest were taken from AP-42 (EPA

1998). Copies of spreadsheets showing fuel use and emission factors for each boiler are included in Attachment A.

For the semiannual emissions reports, emissions from all small boilers and heaters are included as a source category. The Title V Operating Permit includes emissions limits for this group of emission sources. To estimate emissions, all unmetered fuel use was multiplied by AP-42 emission factors for small boilers burning natural gas (EPA 1998). Total emissions of each pollutant from all boilers and heaters in this source category were then summed and reported on the semiannual emissions reports.

2.3 Asphalt Plant

The TA-60 asphalt plant (ID 116) began operations in July 2005. This unit replaced the TA-3 asphalt plant, which has not operated since June 2003. The TA-3 asphalt plant was dismantled and removed in September 2003. Information on the amount of asphalt produced and the duration of daily operation at the TA-60 asphalt plant was provided as part of a monthly site support contractor data deliverable. The total asphalt produced in 2011 was 1,124 tons.

The emissions from the asphalt plant include criteria pollutants, HAPs and CO_2. None of the emissions were significant in regard to the overall Laboratory emissions. The largest pollutant emitted from the asphalt plant was CO at 1.2 tons per year.

2.4 Data Disintegrator

The data disintegrator is included in the 2011 emissions inventory as ID 89. Operation of this source started in August 2004. Emissions are calculated using the methodology described in the permit application dated June 23, 2003. Emissions of PM, PM_{10}, and $PM_{2.5}$ are calculated based on the number of boxes shredded, the amount of dust estimated to enter the exhaust (provided by the manufacturer), and the control efficiency of the cyclone and baghouse (also provided by the manufacturer). The permit application included $PM_{2.5}$ emission estimates. Therefore, an emission methodology had to be developed for the emission inventory reporting. No specific PM size distribution data were available. However, the manufacturer reported that dust into the exhaust would be in the size range of 5 to 20 µm. Based on visual observation and engineering judgment, a particle size distribution in the exhaust was estimated as follows:

- $PM_{2.5}$ 15%
- PM_{10} 90%
- TSP 100%

The number of boxes of material shredded is provided in a monthly data deliverable from the site support contractor. The total number of boxes shredded at the data disintegrator in 2011 was 1,054.

2.5 Degreasers

The halogenated solvent cleaning machine at TA-55 has a capacity of 18 liters and is registered with NMED/AQB as required under the National Emissions Standards for Hazardous Air Pollutants, 40 CFR 63 Subpart T, Halogenated Solvent Cleaning. The solvent used in the machine, trichloroethylene (Chemical Abstracts Service [CAS] No. 79-01-6), is a VOC and a HAP. This emission unit is included in the annual emissions inventory as ID 21. LANL uses a mass balance approach to estimate emissions.

Logbooks are kept on the amount of solvent added and removed from the machine. Additionally, solvent levels in the machine are logged monthly. LANL has two additional halogenated solvent cleaning machines registered with NMED (ID 29 and ID 30). These units were not operational in 2011. The emissions from the TA-55 degreaser for this reporting period are 20.86 lbs or 0.01 tons per year. This source category is reported in both the annual emissions inventory and the semiannual emissions reports.

2.6 Carpenter Shop

LANL operates a carpenter shop at TA-3 (ID 3) which was operated intermittently throughout the year. This carpenter shop was built before 1960 and is not subject to 20.2.72 NMAC construction permitting. However, LANL included carpenter shops in the Title V Operating Permit. Therefore, this source category is included in the annual emissions inventory as Area 3 and is included on the semiannual emissions reports. Additionally, a carpenter shop located at TA-15 (ID 4) is included in the Operating Permit and began operations in June 2005.

Emissions from the carpenter shops were calculated based on the flow rate out of the cyclone, the estimated concentration of particulate in the exhaust, AP-42 emission factors, and the hours of operation of the cyclones.

In 2011, total operation of the TA-3 carpenter shop was 147 hours and the total operation of the TA-15 carpenter shop was 71 hours. The emissions for both shops can be found in Table 2.6-1.

Table 2.6-1. Emissions for Carpenter Shops

Carpenter Shop	PM_{10} (tons)	$PM_{2.5}$ (tons)	TSP (tons)
TA-3	0.027	0.023	0.050
TA-15	0.018	0.009	0.019

2.7 Oil Storage Tanks

Two large diesel storage tanks are located at the TA-3 power plant for backup fuel to the boilers. Emissions from these tanks are estimated using software developed by EPA for estimating emissions from storage tanks (EPA 2008b). The TANKS 4.0 software requires inputs for tank parameters, site-specific meteorological conditions, and actual fuel throughputs.

The Laboratory included 15 storage tanks in its recently updated Title V permit application because they were subject to 40 CFR 60, Subpart Kb, New Source Performance Standards. Fourteen of the 15 tanks store mineral oil, scintillation oil, or dielectric oil, which all have vapor pressures of <0.01 mm Hg. Applicability of Subpart Kb was modified by EPA in 2003 and these tanks are no longer subject to this regulation and were subsequently removed from the draft LANL Title V permit application.

Emissions from these smaller oil storage tanks were included for the first time in the 2002 annual emissions inventory. With agreement from NMED, emissions from the 14 tanks were summed and listed as one stack entry in the emissions inventory report due to the small quantity of emissions (email correspondence with Jim Shively, NMED/AQB, dated February 3, 2003). In 2011, NMED did not require emissions from these tanks to be included in the annual emissions inventory submittal as the emissions

were insignificant. These tanks are also not included in the Title V Operating Permit semiannual emissions reports.

2.8 Permitted Beryllium-Machining Operations

The Laboratory operates four permitted beryllium-machining operations that are subject to 40 CFR 61, Subpart C, and National Emission Standards for Beryllium. Emissions reported for the Beryllium Test Facility (ID 3) are from actual stack emissions measurements. Emissions for the Target Fabrication Facility (ID 2) are from initial compliance stack testing and are reported as permitted emission levels. In addition, emissions from the Plutonium Facility (ID 6) are reported at permitted emission levels. Foundry operations within the Plutonium Facility did not occur during this reporting period. Total emissions from all permitted beryllium operations are included in the semiannual emissions reports.

2.9 Generators

LANL has four permitted generators (ID 56, ID 119, ID 120, and ID 135) with internal combustion engines located at TA-33 to support research activities. NMED issued a construction permit (Permit No. 2195-F) in October 2002 for installing the initial generator, and this unit is included in LANL's Title V Operating Permit. The unit first operated in May 2006. The unit (ID 56) operated for 229 hours in 2011. Three more units were permitted in August 2007 at TA-33 (Permit No. 2195-P); they operated for a total of 27.4 hours in 2011.

The Laboratory maintains approximately 37 stationary standby generators that are considered exempt sources under the Construction Permit regulations (20.2.72.202.b NMAC) and the annual emissions inventory requirements. However, the generators were included in the 2011 Emissions Inventory report in order to report CO_2 and CH_4 emissions in accordance with greenhouse gas regulations. These sources are also included in LANL's Title V Operating Permit with operating limits and emission limits. Therefore, these sources must be included in the semiannual emissions reports. All stationary standby generators at LANL are exercised on a routine schedule to ensure they are operational and will function properly if needed. All units are equipped with hour meters to document how many hours they are used. The Laboratory maintains records on a semiannual basis to document hour meter readings. The number of hours each generator is used in a reporting period is multiplied by AP-42 emission factors for diesel-fired internal combustion engines or natural-gas-fired internal combustion engines (EPA 1996). Emissions are then summed for each pollutant and reported on the semiannual emissions reports for this source category.

2.10 Combustion Turbine

LANL has one combustion turbine located at the TA-3 power plant (ID 112). A revised construction permit was issued by NMED July 2004 to add the TA-3 combustion turbine as a new permitted source. This unit started operations in September 2007. Emission calculations are based on the initial stack compliance tests performed in 2007, AP-42, Tables 3.1-2a and 3.1-3, and information provided by the manufacturer. In 2011, this combustion turbine operated for 364.2 hours.

2.11 Emissions from Chemical Use Activities

The majority of the Laboratory's work is devoted to research and development (R&D) activities. Varying operating parameters, as well as amounts and types of chemicals, are used in these activities. R&D activities occur at virtually all technical areas within the Laboratory, typically in small quantities in laboratory settings. Figure 2.11-1 shows a typical laboratory at LANL where chemicals are used.

For the purposes of annual emissions inventory reporting, one equipment number has been assigned for all R&D chemical use (ID 7). Facility-wide chemical use emissions are reported on both the annual emissions inventory and the semiannual emissions reports. The methods used to quantify emissions of VOC and HAPs from R&D activities are discussed below.

Figure 2.11-1. Example of a laboratory fume hood at LANL.

2.11.1 VOC Emissions

The Laboratory tracks chemical purchases through a facility-wide chemical tracking system called ChemLog. A download from the ChemLog inventory system was created that included all chemical containers added to LANL's inventory between January 1, 2011, and December 31, 2011. This dataset included 41,254 separate line items of chemicals purchased.

The dataset was reviewed electronically to identify all VOCs purchased and received at LANL in 2011. With the exception of specific listed chemicals, VOCs are any compounds of carbon that participate in atmospheric photochemical reactions. VOCs include commonly used chemicals such as ethanol, methanol, trichloroethylene, and isopropanol. The general assumption used in estimating VOC emissions from chemical use is

Purchasing = Use = Emissions

From the dataset of chemicals purchased in 2011, certain categories of chemicals were separated and eliminated from the analysis. The classifications assigned and corresponding reasons (noted in parentheses) for exclusion of chemicals from inventory records are noted below.

- Solid materials (not a significant source of air emissions based on their low vapor pressure);
- Non-VOC materials as defined by 40 CFR 51.100 (specific chemicals in 40 CFR 51.100 are listed as having negligible photochemical reactivity and are exempt from the definition of VOC);
- Paints (paints were evaluated separately—see Section 3.5);
- Inorganic chemicals (inorganics are not compounds of carbon);
- Oils (not a significant source of air emissions based on low vapor pressure and primarily used for maintenance);
- Fuels used for combustion purposes (emissions from fuel combustion are reported for each combustion unit);
- Furthermore, the following categories of chemicals were eliminated based on guidance from NMED (letter from Mary Uhl, NMED/AQB, dated January 30, 2001);
- Container sizes of 1 lb or less;
- Chemicals with vapor pressures less than 10 mmHg;
- Chemicals used to calibrate equipment;
- Maintenance chemicals;
- Use of office equipment and products;
- Chemicals used for boiler water treatment operations;
- Chemicals used for oxygen scavenging (deaeration) of water; and
- Chemicals used in bench-scale chemical analysis.[*]

After the elimination of chemicals and categories of chemicals listed above, the remaining chemical inventory records were matched with a list of known VOCs by CAS number. For mixtures (chemicals without CAS numbers), material safety data sheets (MSDSs) were reviewed to determine if any VOCs were present and, if so, to determine the associated percent volatile. As a conservative estimate, VOCs identified in ChemLog records were assumed to be 100% emitted to air. Estimated emissions of VOCs from chemical use in 2011 totaled 6.42 tons.

2.11.2 HAP Emissions

Section 112(b) of the 1990 Clean Air Act Amendments listed 188 unique HAPs identified for potential regulation by EPA. In 1995, caprolactam was delisted as a HAP, and methyl ethyl ketone was delisted in 2005. Of the remaining 187 listed HAPs, 17 are classes of compounds (e.g., nickel compounds). Use of

[*]This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied (see Table 3.3-1).

the 187 listed chemicals in activities at the Laboratory was evaluated and quantified for the annual emissions inventory submittal to NMED.

The ChemLog inventory system 2011 dataset was analyzed to identify HAPs. The identification process was similar to that used for VOCs. Pure chemicals (i.e., chemicals with CAS numbers), classes of compounds, and mixtures were evaluated to determine if the chemicals themselves were HAPs or if they contained HAP constituents. For mixtures, MSDSs were reviewed to determine if any HAPs were present and, if so, to determine the associated HAP percentages. Listed below are certain chemical types or categories that were identified and removed from this analysis (refer to Section 2.11.1 and Table 3.3-1 for explanations on removal of these chemicals):

- Paints;
- Oils;
- Maintenance chemicals;
- Chemicals used to calibrate equipment;
- Container sizes of 1 lb or less;
- Chemicals used in bench-scale chemical analysis;
- Use of office equipment and products;
- Chemicals used for boiler water treatment operations; and
- Chemicals used for oxygen scavenging (deaeration) of water.

Total HAP emissions were estimated by summing 1) pure HAP chemicals, 2) classes of compounds that are HAPs, and 3) the HAP constituents from mixtures. The resulting total amount of HAPs from chemical use reported for 2011 was 2.63 tons.

The HAP emissions reported generally reflect quantities procured in the calendar year. In a few cases procurement values and operational processes were further evaluated so that actual air emissions could be reported instead of procurement quantities. Additional analyses for certain metals and acids were performed and are described below.

2.11.3 HAP Metals

Purchases of beryllium, chromium, lead, manganese, mercury, and nickel compounds were evaluated to determine usage and potential air emissions. Several of the purchases were identified as laboratory calibration standards containing only parts per million quantities of the metals. These were exempt from emissions inventory requirements because of their use as standards for calibrating laboratory equipment. Other purchasers of relatively large quantities of metal compounds that were contacted confirmed that the material was still in use or in storage and had not resulted in air emissions.

2.12 Emissions Summary by Source

Table 2.12-1 provides a summary of LANL's 2011 actual emissions, as submitted for the annual emissions inventory. The table presents emissions by pollutant and by source, with a facility total at the

bottom of the table. Attachment A provides detailed information on how emissions were calculated for each emission unit.

Table 2.12-1. Summary of LANL 2011 Reported Emissions for Annual Emissions Inventory

	NO_X (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)
TA-3 Power Plant Boilers	13.04	0.32	1.72	1.72	8.96	1.22	0.42
Non-Exempt Boilers	6.74	0.042	0.61	0.61	4.82	0.405	0.13
Asphalt Plant	0.034	0.003	0.003	0.003	1.17	0.005	0.004
Data Disintegrator	n/a*	n/a	0.06	0.04	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.01	0.01
Carpenter Shops	n/a	n/a	0.055	0.032	n/a	n/a	n/a
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	6.42	2.63
TA-33 Generators	5.02	0.74	0.17	n/a	4.04	0.10	1.09E-03
TA-3 Turbine	1.76	0.12	0.238	0.24	0.37	0.077	0.048
TOTAL	**26.59**	**1.23**	**2.74**	**2.65**	**19.36**	**8.24**	**3.24**

* n/a = Not Applicable. ** GHG = greenhouse gas. ***CO2e = Carbon Dioxide Equivalent from methane emissions

Table 2.12-2 provides a summary of 2011 emissions as reported on the semiannual emissions reports required by the Title V Operating Permit. Attachment A provides detailed information on how emissions were calculated for each emission source category.

Table 2.12-2. Summary of LANL 2011 Semiannual Emissions as Reported Under Title V Operating Permit Requirements

	NO_X (tons/yr)	SO_x (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	CO (tons/yr)	VOC (tons/yr)	HAPs (tons/yr)
TA-3 Power Plant Boilers	13.04	0.32	1.72	1.72	8.96	1.22	0.42
All Small Boilers & Heaters	27.55	0.17	2.19	2.19	22.29	1.55	0.53
Asphalt Plant	0.034	0.003	0.003	0.003	1.17	0.005	0.004
Data Disintegrator	n/a*	n/a	0.06	0.04	n/a	n/a	n/a
Degreaser	n/a	n/a	n/a	n/a	n/a	0.01	0.01
Carpenter Shops	n/a	n/a	0.055	0.032	n/a	n/a	n/a
R&D Chemical Use	n/a	n/a	n/a	n/a	n/a	6.42	2.63
Stationary Standby Generators	6.20	0.18	0.25	0.25	1.45	0.25	0.002
TA-33 Generators	5.02	0.74	0.17	n/a	4.04	0.10	1.09E-03
TA-3 Turbine	1.76	0.12	0.24	0.24	0.37	0.077	0.048
TOTAL	**53.60**	**1.53**	**4.67**	**4.48**	**38.28**	**9.63**	**3.64**

* n/a = Not Applicable. ** Source category not included in Title V Operating Permit.

3.0 REPORTING EXEMPTIONS

Specific activities that are determined to be insignificant under NMED's Operating Permit program (20.2.70 NMAC) are exempt from reporting under the emissions inventory requirements (20.2.73.300 NMAC). NMED has designated exempt sources, activities, or thresholds in the following lists:

- List of Insignificant Activities, March 25, 2005 (NMED 2005), and
- List of Trivial Activities, January 10, 1996 (NMED 1996).

Laboratory sources and activities that qualify as insignificant or trivial as specified in these lists are not included in the annual emissions inventory. The following subsections of this report provide information and examples of the Laboratory's exempt activities as well as analyses performed to determine exempt status.

3.1 Boilers

The Laboratory's boiler inventory was evaluated against the List of Insignificant Activities (NMED 2005). Specifically, boilers were exempted from emissions inventory reporting requirements if they met one of the following requirements:

- Fuel-burning equipment that uses gaseous fuel has a design rate less than or equal to 5M BTU/hr, and is used solely for heating buildings for personal comfort or for producing hot water for personal use, or
- Any emissions unit . . . that has the potential to emit no more than **1 ton/yr** of any regulated pollutant . . . .

Any boiler that was not used exclusively for comfort heating or hot water was evaluated for the one ton per year exemption. For purposes of determining exemptions, boiler design ratings were used to estimate potential to emit. Any boiler not qualifying for one of these two exemptions is included in the annual emissions inventory with its own unique equipment number.

For the semiannual emissions reports, emissions from all boilers and heaters were summed and reported for the entire source category.

3.2 Generators

The Laboratory maintains an inventory of approximately 73 portable generators. Portable generators are used at the Laboratory for temporary operations requiring remote power or to provide emergency backup power during power outages at various sites. The portable generators are fueled by gasoline and/or diesel fuel.

In addition to portable generators, the Laboratory maintains and operates approximately 45 stationary standby generators. Stationary generators are used on standby (emergency) status to provide power to critical systems at the Laboratory during power outages. The stationary generators are fueled by natural gas, propane, gasoline, or diesel.

The insignificant activity exemptions applicable to the Laboratory's generators are the following:

- Portable engines and portable turbines that have a design capacity . . . less than or equal to
  - 200-horsepower engine if fueled by diesel or natural gas, and
  - 500-horsepower engine if fueled by gasoline.
- Emergency generators which on a temporary basis replace equipment used in normal operation, and which either have an allowable emission rate or potential to emit for each pollutant that is equal to or less than the equipment replaced, or which do not operate for a period exceeding 500 hr per calendar year.

On the basis of size, portable generators used for temporary power at remote locations are exempt from emissions inventory reporting requirements. Further, LANL's small portable generators are considered trivial activities and are not included in the Title V Operating Permit or semiannual emissions reports. All stationary generators are designated as standby equipment under the Operating Permit Program and are used solely to provide emergency backup power for less than 500 hours per year. Therefore, they are considered insignificant sources and are also exempt from annual emissions inventory reporting requirements. However, the stationary standby generators were voluntarily included as a source category in the Title V Operating Permit and are included in the semiannual emissions reports.

3.3 VOC Emissions

A number of insignificant and trivial activities were applicable for exempting materials from the VOC chemical use total in the emissions inventory. The basis of the exemptions and corresponding insignificant or trivial activities are explained in Table 3.3-1.

Fuels such as propane, kerosene, and acetylene were analyzed separately and are not listed in Table 3.3-1. When fuels are burned in an open flame, almost all of the fuels are consumed and VOC emissions are minimal. Emissions from fuel combustion are accounted for using emission factors for each fuel-burning unit.

Table 3.3-1. Exemptions Applied for Chemical Use Activities

Basis of Exemption	Activity Type	Activity
Container sizes of 1 pound or less	Trivial	Paint or nonpaint materials dispensed from prepackaged aerosol cans of 16-oz. capacity or less.
Chemicals with vapor pressures less than 10 mmHg	Insignificant	Any emissions unit, operation, or activity that handles or stores a liquid with vapor pressure less than 10 mmHg or in quantities less than 500 gal.
Calibration chemicals	Trivial	Routine calibration and maintenance of laboratory equipment or other analytical instruments, including gases used as part of those processes.

Maintenance chemicals and oils	Trivial	Activities that occur strictly for maintenance of grounds or buildings, including lawn care; pest control; grinding; cutting; welding; painting; woodworking; sweeping; general repairs; janitorial activities; plumbing; re-tarring roofs; installing insulation; steam-cleaning and water-washing activities; and paving of roads, parking lots, and other areas. Activities for maintenance and repair of equipment, pollution-control equipment, or motor vehicles either inside or outside of a building.
Use of office equipment and products	Trivial	Use of office equipment and products, not including printers or businesses primarily involved in photographic reproduction.
Chemicals used for boiler water treatment	Trivial	Boiler water treatment operations, not including cooling towers.
Chemicals used for oxygen scavenging	Trivial	Oxygen scavenging (deaeration of water).
Chemicals used in bench-scale chemical analysis	Trivial	Bench-scale laboratory equipment used for physical or chemical analysis but not lab fume hoods or vents. Note: This exemption was applied only to biological research solutions. Otherwise, this exemption was not applied.

3.4 HAP Emissions

The HAP chemical use exemption analysis, similar to the VOC chemical use exemption analysis, resulted in application of several of the same exemptions from NMED/AQB List of Insignificant Activities (NMED 2005) and List of Trivial Activities (NMED 1996) (refer to Table 3.3-1).

3.5 Paints

An analysis of VOC and HAP emissions resulting from painting activities at the Laboratory was performed to determine if certain exemptions apply. Paint information for 2011 was gathered from the ChemLog chemical inventory system. These records were evaluated for applicability of exemptions for trivial and insignificant activities.

The following exemptions from NMED/AQB Operating Permit Program List of Trivial Activities (NMED 1996) were used in the paint analysis:

- Activities that occur strictly for maintenance of grounds or buildings, including the following: lawn care; pest control; grinding; cutting; welding; painting; woodworking; sweeping; general repairs; janitorial activities; plumbing; re-tarring roofs; installing insulation; steam-cleaning and water-washing activities; and paving of roads, parking lots, and other areas.
- Activities for maintenance and repair of equipment, pollution control equipment, or motor vehicles either inside or outside of a building.
- Paint or nonpaint materials dispensed from prepackaged aerosol cans of 16 oz. or less capacity. The amount of paint that did not qualify for a Trivial Activity totaled to 3,859 pounds (1.93 tons) which is less than the two-ton emission limit for insignificant activities.
- Surface coating of equipment, including spray painting and roll coating, for sources with facility-wide total cleanup solvent and coating actual emissions of less than two tons per year.

4.0 EMISSIONS SUMMARY

4.1 2011 Emissions Summary

Table 4.1-1 presents facility-wide estimated actual emissions of criteria pollutants for 2011 as reported in the annual emissions inventory and the semiannual emissions reports. In addition, the Title V Operating Permit emissions limits are included. Table 4.1-2 presents estimated actual emissions for HAPs from chemical use. Emission unit information and detailed emissions calculations are included in Attachment A. The 2011 emissions inventory report as submitted to NMED is presented in Attachment B. Attachment C includes semiannual emissions reports for 2011.

Table 4.1-1. LANL Facility-Wide Criteria Pollutant Emissions for 2011

Pollutant	Estimated actual Emissions for Annual Emissions Reporting (tons/yr)	Estimated actual Emissions for Semiannual Title V Operating Permit Reporting (tons/yr)	Title V Operating Permit Facility-Wide Emission Limits (tons/yr)
NO_x	26.6	53.6	245
SO_x	1.2	1.5	150
CO	19.4	38.3	225
PM	2.7	4.7	120
PM_{10}	2.7	4.7	120
$PM_{2.5}$	2.7	4.5	—*
VOC	8.2	9.6	200

* No Title V Operating Permit facility-wide emission limits on $PM_{2.5}$.

Table 4.1-2. LANL HAP Emissions from Top Five Chemicals Used in 2011

Pollutant	Chemical Use HAP Emissions* (tons/yr)
Top 5 HAPs	
Hexane	0.58
Glycol ethers	0.38
Methanol	0.36
Hydrochloric Acid	0.24
Chloroform	0.23
All other HAPs from Chemical Use	0.84
Total HAPs	**2.63**

* HAP emissions from combustion sources are included in the emissions reports; however, they are negligible and do not contribute significantly to facility-wide HAP emissions.

HAP emissions from combustion sources are included in the emissions reports, however, they are negligible and do not contribute significantly to facility-wide HAP emissions.

Figure 4.1-1 shows criteria air pollutant emissions by source for 2011, excluding the very small emissions sources such as the data disintegrator, asphalt plant, degreasers, and carpenter shop. As the figure shows,

the TA-3 power plant and the sum of emissions from all small boilers and heaters were the largest sources of CO and NO_x emissions in 2011. R&D chemical use was the largest source of VOC emissions.

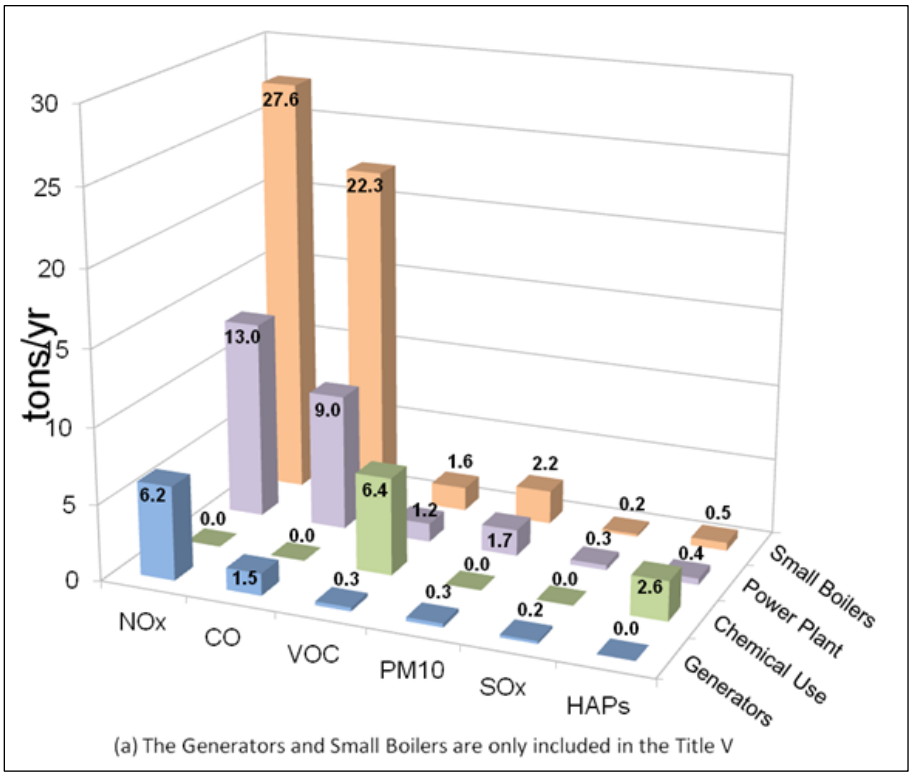

Figure 4.1-1. Emissions of criteria pollutants by source in 2011.

4.2 Emission Trends and Title V Permit Limits

A comparison of historical emissions to the facility-wide emission limits in the Title V Operating Permit is provided in this section. It should be noted that the facility-wide emission limits in the Operating Permit include emissions from some sources that are not included in the annual emissions inventory, most notably small (insignificant) boilers and emergency standby generators. However, historical data are only available for emission sources that were included in the annual emissions inventory submittals.

Figure 4.1-2 provides a comparison of the past 10 years' facility-wide emissions for criteria air pollutants as reported to NMED in the annual emissions inventory submittal. The facility-wide emission limits included in LANL's Title V Operating Permit are also shown on the graph.

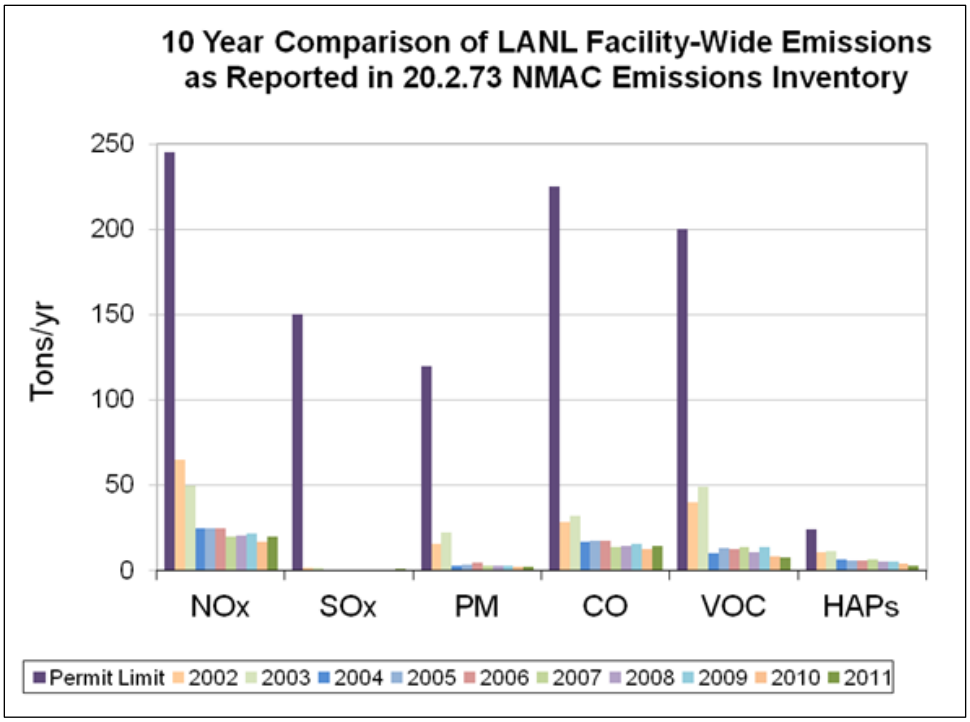

Figure 4.1-2. Comparison of facility-wide annual reported emissions from 2002 to 2011.

Figure 4.1-3 presents VOC and HAP emissions from chemical use activities for the last 10 years. The continued fluctuation in both VOC and HAP emissions is due to both variations in actual chemical purchases and improvements the Laboratory has made to the chemical tracking system.

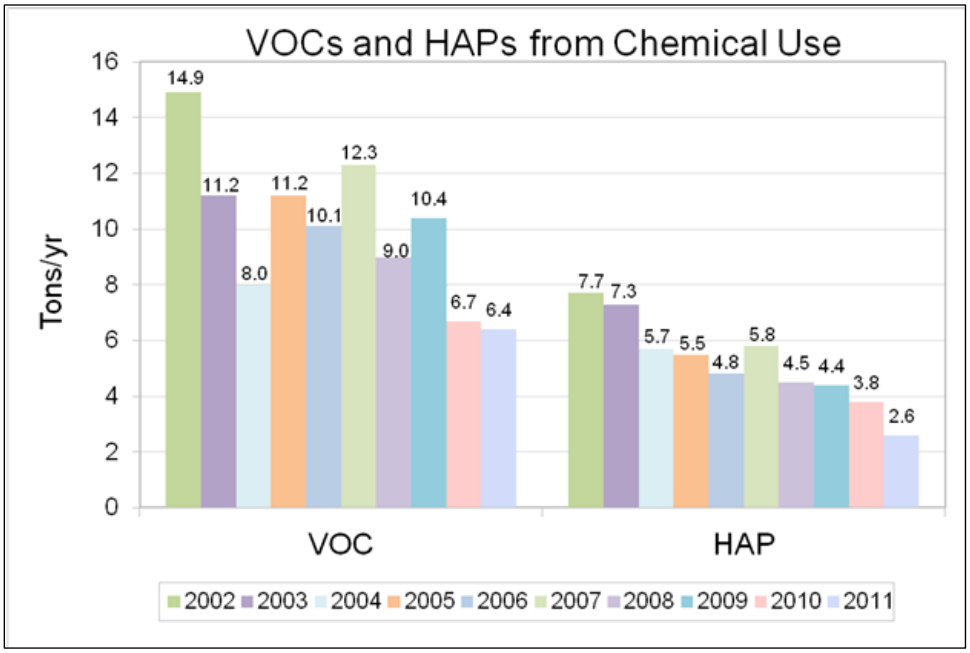

Figure 4.1-3. VOC and HAP emissions from chemical use from 2002 to 2011.

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Federal Register, Vol. 74, No. 209, 2009c. "Default CO2 Emissions Factors and High Heat Values for Various Types if Fuel." 40 CFR Part 98, Subpart C, Table C-1. (October 2009).

Federal Register, Vol. 74, No. 209, 2009d. "Default CH4 and NO2 Emissions Factors for Various Types if Fuel." 40 CFR Part 98, Subpart C, Table C-1. (October 2009).

ATTACHMENT A:

Emission Calculation Worksheets for Individual Emission Unit

2011 TA-60 BDM Asphalt Plant

Data Reviewed By / Date: _____

Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total	Month	Data Entry Asphalt Produced (Tons)	12-Month Rolling Total
January	0	1,394	July	405	1,157
February	0	1,305	August	137	1,247
March	72	1,285	September	36	1,228
April	269	1,308	October	108	1,178
May	14	1,120	November	16	1,124
June	58	898	December	9	1,124
6 mo. Total	413		6 mo. Total:	711	

Tons/Asphalt Produced: 1,124

12-Month Rolling Permit Limit is 13,000 Tons

Annual Hours			
Month	Hours	Month	Hours
Jan	0.0	Jul	25
Feb	0.0	Aug	17.3
Mar	14.0	Sep	5.7
Apr	18.3	Oct	19.25
May	1.1	Nov	5.5
Jun	10.2	Dec	3.5
Total:	43.6	Total:	76.3

Annual Total (to date): 119.85 Hours

Hours are Limited to 4380 per Year.

Emission Calculations

Pollutant	Emission Factor (lbs/hr)	Annual Emissions (tons)	Emissions (tons) Jan-June	Emissions July-Dec (tons)	Reference
NOx	0.56	0.034	0.012	0.021	(b)
CO	19.53	1.170	0.426	0.745	(b)
PM	0.33	0.020	0.007	0.013	(b)
Pollutant	**Emission Factor (lb/ton)**	**Annual Emissions (tons)**	**Emissions (tons) Jan-June**	**Emissions (tons) July-Dec**	**Reference**
PM-10	0.006	0.003	0.001	0.002	(c)
PM-2.5	0.006	0.003	0.001	0.002	(c)
SOx	0.0046	0.003	0.001	0.002	(a)
VOC	0.0082	0.005	0.002	0.003	(a)
HAPs					
Acetaldehyde	0.00032	0.000	0.000	0.000	(d)
Benzene	0.00028	0.000	0.000	0.000	(d)
EthylBenzene	0.0022	0.001	0.000	0.001	(d)
Formaldehyde	0.00074	0.000	0.000	0.000	(d)
Napthalene	0.000036	0.0000	0.000	0.000	(d)
POM	0.00011	0.0001	0.000	0.000	(d)
Quinone	0.00027	0.000	0.000	0.000	(d)
Toluene	0.001	0.001	0.000	0.000	(d)
Xylene	0.0027	0.002	0.001	0.001	(d)
TOTAL HAPS		0.004	0.002	0.003	
EPCRA 313		tons	lbs./year		
Lead	8.90E-07	5.00E-07	0.0010		(e)
Sulfuric Acid	0.0046	2.59E-03	5.17		(f)
Mercury	4.10E-07	2.30E-07	0.0005		(e)
PACs	2.70E-08	1.52E-08	3.03E-05		(d)
Benzo(g,h,i) perylene	5.00E-10	2.81E-10	5.62E-07		(g)
Greenhouse Gases Emissions	(kg CO_2/mmbtu)	Calendar Year (metric tons)	Fiscal Year (metric tons)		
Carbon Dioxide (CO_2)	61.46	111.62	67.57		(h)
Methane (CH_4)	0.003	0.0054	0.0033		(i)
Nitrous Oxide (N_2O)	0.0006	0.0011	0.0007		(j)
TOTAL CO_2 EQUIVALENT:		112.07	67.81		(k)

Reference
(a) AP-42, Sec. 11.1, *Hot Mix Asphalt Plants* , Table 11.1-5 & 11.1-6, Updated 4/2004
(b) Calculated using stack test results performed on May 18, 2009 by TRC Air Mesurements. Pound per hour values were determined at a throughput rate of 45 tons/hour (the highest achievable rate during the test).
(c) PM-10 emission factor is calculated as 64% of the PM emission factor, using the same ratio of PM to PM-10 as provided in AP-42 Table 11.1-1. No data provided for PM-2.5, assume same as PM-10.
(d) AP-42, Table 11.1-9, *Hot Mix Asphalt Plants*, Updated 4/2004
(e) AP-42, Table 11.1-11, *Hot Mix Asphalt Plants*, Updated 4/2004
(f) Assume all SOx is converted to sulfuric acid
(g) EPCRA PAC Guidance Document, EPA-260-B-01-03, June 2001, Table 2-3
(h) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).
(i) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).
(j) Heat content was taken from National Propane Gas Association web page (http://npga.org/i4a/pages/index.cfm?pageid=633). The EPA value of 0.091 mmBtu/gallon, listed in 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel" is consistant with this value. The NPGA value is used as it includes more accuracy.
(k) CO_2 equivalent values were calculated using 40 CFR Part 98, Subpart A, Table A-1, "Global Warming Potentials." (Federal Register/Vol. 74, No. 209, 10/30/2009).
(l) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

2011 TA-3 & TA-15 Carpenter Shops

NMED ID -- TA-3 (AREA 3) and TA-15 (AREA 4)

TA-3	Data Entry	TA-3	Data Entry
	Hours of Operation[1]		Hours of Operation[1]
Month	TA-3	Month	TA-3
January	6.9	July	8.6
February	3.9	August	3.4
March	3.0	September	19.4
April	7.6	October	13.2
May	7.5	November	15.1
June	10.1	December	48.1
6 mo. Total	39.0	6 mo. Total:	107.8

TA-15	Data Entry	TA-15	Data Entry
	Hours of Operation[1]		Hours of Operation[1]
Month	TA-15	Month	TA-15
January	9.9	July	3.5
February	3.2	August	7.1
March	6.4	September	5.1
April	6.4	October	8.3
May	5.2	November	9.2
June	4.0	December	2.2
6 mo. Total	35.1	6 mo. Total:	35.4

Saws, drills, shaping and sanding equipment shall each not operate in excess of 4368 hours per year.

Reference
1. Based on information provided monthly by the shop foreman from each shop.

Reviewed By/Date: _____

Carpenter Shop Emissions Calculations for 2011

ANNUAL EMISSIONS

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons/year)		
	Exhaust Flow (ft3/min)	Hours of[3] Operation (hr/yr)	(tons/year)	tons/yr	(PM) (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)
TA-3-38	2706	147	0.140	0.051	0.003	0.024	0.023
TA-15-563	2100	71	0.052	0.019	0.001	0.009	0.009

January through June Emissions

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons)		
	Exhaust Flow (ft3/min)	Hours of[3] Operation (hr/period)	tons	tons	(PM) (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)
TA-3-38	2706	39	0.037	0.014	0.001	0.007	0.006
TA-15-563	2100	35	0.026	0.009	0.001	0.005	0.004

July through December Emissions

	Operation Parameters		TSP Prior to Cyclone	TSP Post Cyclone	PM Post Cyclone Emissions (tons)		
	Exhaust[1] Flow (ft3/min)	Hours of[3] Operation (hr/period)	tons	tons	(PM) (PM > 40µm)	(PM 10) (PM 5-20 µm)	(PM 2.5) (PM <2.5 µm)
TA-3-38	2706	108	0.103	0.038	0.003	0.018	0.017
TA-15-563	2100	35	0.026	0.010	0.001	0.005	0.004

Conversions:

lb/ton	lb/grain	min/hr	ton/lb
2000	0.00014	60	0.0005

Assumptions:

	Cyclone[4] Efficiencies	% PM in Wood Dust Prior[5] to Cyclone
PM < 2.5	0.45	0.30
PM 5-20 microns	0.65	0.50
PM > 40 microns	0.95	0.50

Post Cyclone Emission Factor:

grain/ft^3 [2]
0.03

	Shop Location	Flow Rate
Maximum permitted exhaust flow rate is:	TA-3-38	5000 cfm
	TA-15-563	5471 cfm

Allowable Emission Limits are: **3.07 tpy of PM10 for the TA-3-38 shop**
2.81 tpy of PM10 for the TA-15-563 shop

References:

1.) Exhaust Rate calculated by Victor Martinez.

2.) Emission Factor obtained from AP-42, Section 10.4 Woodworking Waste Collection Operations, post cyclone emissions, Table 10.4.1, February 1980.

3.) Based on information provided monthly by the shop foreman.

4.) K. Wark & C.F. Warner, Air Pollution - Its Origin and Control, Table 5-9, pg 186 (1976).

5.) Emissions Inventory Improvement Program (EIIP) Uncontrolled Emission Factor Listing for Criteria Air Pollutants, Volume II: Chapter 14, July 2001 And AP-42 Appendix B, Section 10.5 Woodworking Waste Collection Operations: Belt Sander Hood Exhaust Cyclone.

Reviewed By/Date: _____

2011 TA-52 Data Disintegrator (EQPT 89)

Reviewed By / Date: _____

	Data Entry		Data Entry
Month	Boxes[c] Shredded	**Month**	Boxes[c] Shredded
January	144	**July**	114
February	105	**August**	144
March	110	**September**	152
April	108	**October**	102
May	153	**November**	118
June	102	**December**	125
6 mo. Total:	722	**6 mo. Total:**	755

Annual Boxes:	**1,477**

Emission Calculations

	Emission[b] Factor	% in Exhaust[e]	Control[d] Efficiency (Cyclone)	Control[d] Efficiency (Baghouse)
PM 2.5	15%	15%	0%	95.0%
PM 10	15%	90%	75%	95.0%
TSP	15%	100%	75%	95.0%

Average Box Weight[a]	
45	Pounds

	Amount Processed (pounds)	PM-2.5 Emissions (pounds)	PM-2.5 Emissions (tons)	PM-10 Emissions (pounds)	PM-10 Emissions (tons)	TSP Emissions (pounds)	TSP Emissions (tons)
Annual	66,465	74.8	0.04	112.2	0.06	124.6	0.06
January - June	32,490	36.6	0.02	54.8	0.03	60.9	0.03
July - December	33,975	38.2	0.02	57.3	0.03	63.7	0.03

Reference				
(a). Estimated maximum box weight is 45 pounds. Information provided by shredding operations. Full box weight of tightly packed paper.	**(b).** Emission Factor (percentage of material shredded that will enter into the exhaust) obtained from the manufacturer of the air handling system, AGET Manufacturing Co. 15% is also listed in the construction permit application.	**(c).** Information provided by the shredding operations personnel.	**(d).** Information on control equipment efficiencies was provided by the manufacturer (SEM) of the Data Disintegrator. Those values not given were extrapolated using manufacturer data. Efficiencies of 75% for the Cyclone and 95% for the bag house are listed in the construction permit application. (see cyclone efficiency tab for more info.)	**(e).** Manufacturer provided info that the dust into the exhaust would be in the size range of 5-20 um. Conservative assumption that 15% is PM2.5, and 90% is PM10.

Maximum Annual emission rate is: **9.9 tpy or 2.3 lb/hr of Total Suspended Particulate (TSP) per year.**
9.9 tpy or 2.3 lb/hr of Particulate Matter <10µm (PM-10) per year.

Permitted Generators

									First Half 2011			Second Half 2011		
TA	Bldg	ID #	Manufacturer	Serial #	MODEL	KW	Fuel Type	Reading 2nd half of previous year	6 Month Reading Date	Reading	Hours Run	12 Month Reading Date	Reading	Hours Run
33	290	G-0012	Kohler	375801	1600ROZD	1600	Diesel	Dec. 10	99.0	Jun-11	326.1	227.1	Dec-11	327.9	1.8
33	151	G-0007	Caterpillar	6PK01065	XQ225	225	Diesel	Dec. 10	3407.0	Jun-11	3419.0	12.0	Dec-11	3422.0	3
33	209	G-0008	Kohler	2025460	20EORZ	20	Diesel	Dec. 10	393.0	Jun-11	394.5	1.5	Dec-11	401.7	7.2
33	280	G-0010	Kohler	2025461	20EORZ	20	Diesel	Dec. 10	182.0	Jun-11	182.0	0.0	Dec-11	185.7	3.7

*** The 225 kW and the two 20 kW generators have a limit of 500 hours of operation per year. The 1600 kW unit is limited to 900 hours per year.**

			First 6 Month Emissions of 2011						Second 6 Month Emissions of 2011					
Permit ID	ID #	Unit	NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)	NOx (lbs)	CO (lbs)	SOx (lbs)	PM (lbs)	VOC (lbs)	HAPs (lbs)
TA-33-G-1	G-0012	33-290	9810.7	7993.9	1453.4	327.0	181.7	2.1E+00	77.8	63.4	11.5	2.6	1.4	1.7E-02
TA-33-G-4	G-0007	33-151	113.4	24.3	8.1	8.1	8.1	3.7E-02	28.4	6.1	2.0	2.0	2.0	9.1E-03
TA-33-G-2	G-0008	33-209	1.3	0.3	0.1	0.1	0.1	4.1E-04	6.0	1.3	0.4	0.4	0.4	1.9E-03
TA-33-G-3	G-0010	33-280	0.0	0.0	0.0	0.0	0.0	0.0E+00	3.1	0.7	0.2	0.2	0.2	1.0E-03
Permit ID	ID #	Unit	NOx (tons)	CO (tons)	SOx (tons)	PM (tons)	VOC (tons)	HAPs (tons)	NOx (tons)	CO (tons)	SOx (tons)	PM (tons)	VOC (tons)	HAPs (tons)
TA-33-G-1	G-0012	33-290	4.905	3.997	0.727	0.164	0.091	1.06E-03	0.039	0.032	0.006	0.001	0.001	8.38E-06
TA-33-G-4	G-0007	33-151	0.057	0.012	0.004	0.004	0.004	1.83E-05	0.014	0.003	0.001	0.001	0.001	4.56E-06
TA-33-G-2	G-0008	33-209	0.001	0.000	0.000	0.000	0.000	2.03E-07	0.003	0.001	0.000	0.000	0.000	9.73E-07
TA-33-G-3	G-0010	33-280	0.000	0.000	0.000	0.000	0.000	0.00E+00	0.002	0.000	0.000	0.000	0.000	5.00E-07

ANNUAL TOTALS (tons)

Pollutant	NOx	CO	SOx	PM	VOC	HAPs
TA-33-G-1	4.944	4.029	0.732	0.165	0.092	1.1E-03
TA-33-G-4	0.071	0.015	0.005	0.005	0.005	2.3E-05
TA-33-G-2	0.004	0.001	0.000	0.000	0.000	1.2E-06
TA-33-G-3	0.002	0.000	0.000	0.000	0.000	5.0E-07
Tons/Year	**5.02**	**4.04**	**0.74**	**0.17**	**0.10**	**1.09E-03**

Reviewed by / Date: _____

* Total Run Hours	EMISSION FACTORS	NOx lb/kw-hr	CO lb/kw-hr	SOx lb/kw-hr	PM lb/kw-hr	PM_{10} lb/kw-hr	VOC lb/kw-hr
228.9	1600kw Generator [a]	0.027	0.022	0.004	0.0009	0.0009	0.0005
15.0	Small Diesel fired [b]	0.042	0.009	0.003	0.003	0.003	0.003
8.7							
3.7							

References:

447	kw is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application.

(a) Manufacturer supplied emission factors for NOx, CO, and VOCs. Emission factors for SOx, PM, and PM10 from AP-42, Table 3.3-1 & Table 3.4-1. The AP-42 (fifth edition) emissions factor uses units of lb/hp-hr. There are 1.341 hp-hrs in a kwh. Therefore, take pounds/hp-hr x 1.341 hp-hr/kwh to obtain the emission factor in lb/kwh.

(b) Emission factors for small diesel fired boilers were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.

TA-33-G-1
(1600 kW Generator, 1500 kW Derated for Altitude)
12-Month Rolling kilowatt-hours

Month	Hour Meter Reading	Hours Operated	Rolling Total kw-hr	Month	Hour Meter Reading	Hours Operated	Rolling Total kw-hr
January	102.0	1.0	25,500	July	326.1	0.0	357,900
February	112.9	10.9	40,950	August	327.4	1.3	358,950
March	243.5	130.6	236,550	September	327.4	0.0	358,950
April	326.1	82.6	359,850	October	327.9	0.5	358,950
May	326.1	0.0	357,900	November	327.9	0.0	342,900
June	326.1	0.0	357,900	December	327.9	0.0	340,350

Generator is limited to 1,350,000 kWh/year

	HAPS (lbs)									
Emission Factors (lb/kwh)	Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde	
Diesel (small)	3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06	
Diesel (large)	2.65E-06		9.60E-07		6.59E-07				2.69E-07	
Location	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
33-290	9.63E-01	7.63E-03	3.49E-01	2.76E-03	2.40E-01	1.90E-03	0.00E+00	0.00E+00	9.79E-02	7.76E-04
33-151	8.60E-03	2.15E-03	3.77E-03	9.43E-04	2.63E-03	6.57E-04	3.61E-04	9.01E-05	1.09E-02	2.72E-03
33-209	9.56E-05	4.59E-04	4.19E-05	2.01E-04	2.92E-05	1.40E-04	4.01E-06	1.92E-05	1.21E-04	5.80E-04
33-280	0.00E+00	2.36E-04	0.00E+00	1.03E-04	0.00E+00	7.20E-05	0.00E+00	9.88E-06	0.00E+00	2.98E-04
Total Emissions (lbs)	**9.72E-01**	**1.05E-02**	**3.53E-01**	**4.01E-03**	**2.42E-01**	**2.77E-03**	**3.65E-04**	**1.19E-04**	**1.09E-01**	**4.37E-03**
Tons/Half/HAP	**4.86E-04**	**5.24E-06**	**1.76E-04**	**2.01E-06**	**1.21E-04**	**1.38E-06**	**1.82E-07**	**5.96E-08**	**5.45E-05**	**2.19E-06**
Tons/year/HAP	**4.91E-04**		**1.78E-04**		**1.22E-04**		**2.42E-07**		**5.66E-05**	
Tons/Year Total	**1.09E-03**									

Emission Factors from AP-42, Volume 1, Fifth Edition (Small Diesel Engines Table 3.3-2, Large Diesel Engines Table 3.4-4, Natural Gas 4-Stroke Engines Table 3.2

Greenhouse Gas Emission Calculations

Unit		Fuel Use		Calendar Year			Fiscal Year [e]		
Permit ID	***Unit Location***	***Fuel Use Rate [d] (GPH)***	***Annual Fuel Use (Gal.)***	***CO2 (metric tons)***	***CH4 (metric tons)***	***N2O (metric tons)***	***CO2 (metric tons)***	***CH4 (metric tons)***	***N2O (metric tons)***
TA-33-G-1	TA-33-290	148	33877.2	345.77	1.40E-02	2.81E-03	353.09	1.43E-02	2.86E-03
TA-33-G-4	TA-33-151	15.8	237	2.42	9.81E-05	1.96E-05	3.31	1.34E-04	2.68E-05
TA-33-G-2	TA-33-209	1.7	14.79	0.15	6.12E-06	1.22E-06	0.14	5.67E-06	1.13E-06
TA-33-G-3	TA-33-114	1.7	6.29	0.06	2.60E-06	5.21E-07	0.08	3.13E-06	6.26E-07
			Totals:	**348.40**	**1.41E-02**	**2.83E-03**	**356.62**	**0.014**	**0.003**
			Total CO_2 Equivalent:	**349.57**			**357.82**		

HAPS (lbs)								Individual Generator HAP Emissions (lbs)	
Acetaldehyde		Acrolein		Naphthalene		PAH			
2.62E-06		3.16E-07		2.90E-07		5.74E-07			
8.61E-08		2.69E-08		4.44E-07		7.24E-07			
1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
3.13E-02	2.48E-04	9.78E-03	7.75E-05	1.61E-01	1.28E-03	2.63E-01	2.09E-03	2.11E+00	1.68E-02
7.07E-03	1.77E-03	8.53E-04	2.13E-04	7.82E-04	1.95E-04	1.55E-03	3.87E-04	3.65E-02	9.13E-03
7.86E-05	3.77E-04	9.48E-06	4.55E-05	8.69E-06	4.17E-05	1.72E-05	8.26E-05	4.06E-04	1.95E-03
0.00E+00	1.94E-04	0.00E+00	2.34E-05	0.00E+00	2.14E-05	0.00E+00	4.25E-05	0.00E+00	1.00E-03
3.84E-02	**2.59E-03**	**1.06E-02**	**3.60E-04**	**1.62E-01**	**1.54E-03**	**2.65E-01**	**2.60E-03**	**2.15E+00**	**2.88E-02**
1.92E-05	**1.29E-06**	**5.32E-06**	**1.80E-07**	**8.11E-05**	**7.69E-07**	**1.32E-04**	**1.30E-06**		
2.05E-05		**5.50E-06**		**8.18E-05**		**1.34E-04**			

?-3)

References:
(a) Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009)
(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).
(c) Hour readings for each of the generators listed are collected twice a year by ENV-ES.
(d) Fuel use rates were taken from manufacturer literature. Data for some units may not be available due to age, but data for a similar unit was used when unit specific data was not available.
(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

Emission Factors			
Fuel Oil Heat Value[(a)] (mmBtu/Gal)	CO2[(a)] (kg/mmBtu)	CH4[(b)] (kg/mmBtu)	N2O[(b)] (kg/mmBtu)
0.138	73.96	0.003	0.0006

2011 Portable Generator Hours

									First 6 Month Readings			Second 6 Month Readings		
TA	*Bldg*		*Manufacturer*	*MODEL*	*KW*	*Fuel Type*	*Previous Reading Date*	*Previous Reading*	*6 Month Reading Date*	*Reading*	*Hours Run*	*12 Month Reading Date*	*Reading*	*Hours Run*
60	1	G-0015	Onan Sons [1]	H1750DSG15	175	Diesel	Dec-10	3062.1	Jun-11	3062.1	0.0	Dec-11	3062.1	0.00
60	1	G-0016	Onan Sons [1]	350DFCC	350	Diesel	Dec-10	2832.8	Jun-11	2838	5.2	Dec-11	2986.0	148.00
60	1	G-0014	Cummins [1]	150DGFA	150	Diesel	Dec-10	2506	Jun-11	2541.0	35.0	Dec-11	2542.0	1.00
60	1	G-0029	Coleman [1]	CJ47605Q	60	Diesel	Dec-10	13673	Jun-11	13709.0	36.0	Dec-11	13710.0	1.00
60	1	G-0028	MQ Power [1]	Whisper Watt DCA-455514	45	Diesel	Dec-10	185	Jun-11	326.0	141.0	Dec-11	329.0	3.00
60	1	G-0026	Onan [1]	30.0DDA	30	Diesel	Dec-10	4601.7	Jun-11	4601.7	0.0	Dec-11	4601.7	0.00
60	1	G-0027	Onan	50DVA	50	Diesel	Dec-10	5033.6	Jun-11	5033.6	0.0	Dec-11	5033.6	0.00
60	1	G-0025	Olympian [1]	95A010565	50	Diesel	Dec-10	5467.1	Jun-11	5635.0	167.9	Dec-11	5641.0	6.00
33	20	G-0002	Kohler	30ROZJ81	30	Diesel	Dec-10	954	Jun-11	955.3	1.3	Dec-11	957.3	2.00
33	20	G-0001	Olympian	96A03928-5	25	Diesel	Dec-10	62.8	Jun-11	64.0	1.2	Dec-11	66.1	2.10
33	20	G-0006	Lister Petter	ST-BY	12.5	Diesel	Dec-10	139	Jun-11	140.7	1.7	Dec-11	142.7	2.00
33	151	G-0003	Kurz & Root	MEP006A, 51-19905	60	Diesel	Dec-10	1626.3	Jun-11	1631.6	5.3	Dec-11	1633.6	2.00
60	Yard	G-0056	Dyna Tech.	35ED4G-237A17 096	35	Diesel	Dec-10	623.4	Jun-11	632.0	8.6	Dec-11	632.4	0.40

13 **Portable generators in use** **TOTAL** 403.2 **TOTAL** 167.5

N/R = Not Read
(1) = Belongs to LANL MSS Generator Pool

First half average hours per unit **31.0** **Second half average hours per unit** **12.9**

Annual Average of hours per unit **22.0**

Reviewed By / Date: _____

0.0

EMISSION FACTORS	NOx	CO	SOx[e]	PM	PM10	VOC
	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr	lb/kw-hr
Large Diesel fired [a][b]	0.032	0.007	5.4E-04	0.001	0.001	0.001
Small Diesel fired [a][c]	0.042	0.009	0.003	0.003	0.003	0.003
Natural Gas Fired[d]	0.008	0.013	2.0E-06	3.4E-05	3.2E-05	1.0E-04

447	447 kw (600 hp) is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application and is also found in AP-42.

(a) The AP-42 (fifth edition), table 3.4-1,emissions factor uses units of lb/hp-hr. There are 1.341 hp-hrs in a kwh. Therefore, take pounds/hp-hr x 1.341 hp-hr/kwh to obtain the emission factor in lb/kwh.

(b) Emission factors for **large diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4.

(c) Emission factors for **small diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.

(d) The AP-42 (fifth edition) emission factors for **natural gas burning** 4-stroke rich-burn engines (Table 3.2-3) provides units of lb/MMBTU. There are 3413 Btus in a kilowatt-hr (kwh) or 2.928 x 10-4 kwh per BTU. Therefore, take lb/MMBTU x 3413 / 1 x 10^{6} or lb/MMbtu /106/2.928 x 10^{-4} to obtain the emissions factor in lb/kwh. The differences between the Title V application emission factors and those listed here, are that the application used the 2-stroke table, and the above emission factors are for rich burn 4-stroke engines. Most generator engines have been verified with the KSL generator crew to be 4-stroke.

(e) The Sulfur Oxide (SOx) emission factor for large diesel engines was calculated using AP-42 Table 3.4-1(fifth edition). The calculation requires the sulfur percent found in the fuel. It was verified in March of 2007, that future fuel supplied to the generators around LANL will be Ultra Low Sulfur Diesel (ULSD) (Sulfur <=15 ppm). Due to the low hours (and associated low fuel use) of most generators, the previous LANL tested fuel sulfur concentration of 0.05% will continue to be used for the rest of 2007 to allow for refueling of generators and use of the new ULSD. Calculation is 0.00809 * 0.05 * 0.608 * 2.2 = **5.4×10^{-4}**

2011 Portable Generator Hours

	First 6 Month Emissions						Second 6 Month Emissions					
Location	NOx (lb)	CO (lb)	SOx (lb)	PM (lb)	VOC (lb)	HAPs (lb)	NOx (lb)	CO (lb)	SOx (lb)	PM (lb)	VOC (lb)	HAPs (lb)
60-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60-1	76.4	16.4	5.5	5.5	5.5	0.0	2175.6	466.2	155.4	155.4	155.4	0.7
60-1	220.5	47.3	15.8	15.8	15.8	0.1	6.3	1.4	0.5	0.5	0.5	0.0
60-1	90.7	19.4	6.5	6.5	6.5	0.0	2.5	0.5	0.2	0.2	0.2	0.0
60-1	266.5	57.1	19.0	19.0	19.0	0.1	5.7	1.2	0.4	0.4	0.4	0.0
60-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60-1	352.6	75.6	25.2	25.2	25.2	0.1	12.6	2.7	0.9	0.9	0.9	0.0
33-20	1.6	0.4	0.1	0.1	0.1	0.0	2.5	0.5	0.2	0.2	0.2	0.0
33-20	1.3	0.3	0.1	0.1	0.1	0.0	2.2	0.5	0.2	0.2	0.2	0.0
33-20	0.9	0.2	0.1	0.1	0.1	0.0	1.1	0.2	0.1	0.1	0.1	0.0
33-151	13.4	2.9	1.0	1.0	1.0	0.0	5.0	1.1	0.4	0.4	0.4	0.0
60-Yard	12.6	2.7	0.9	0.9	0.9	0.0	0.6	0.1	0.0	0.0	0.0	0.0
Total Emissions lbs/6 months	1036.5	222.1	74.0	74.0	74.0	0.3	2214.1	474.4	158.1	158.1	158.1	0.7
Tons/6 months	**0.52**	**0.11**	**0.04**	**0.04**	**0.04**	**1.7E-04**	**1.11**	**0.24**	**0.08**	**0.08**	**0.08**	**3.6E-04**

YEARLY TOTAL	NOx	CO	SOx	PM	VOC	HAPs
Tons/Year	1.63	0.35	0.12	0.12	0.12	0.001

Greenhouse Gas Emission Calculations

Unit Data				Calender Year			Fiscal Year [e]		
Location	ID	Fuel Use Rate [d] (GPH)	Annual Fuel Use (Gal.)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)
60-1	G-0015	14.9	0.0	0.000	0.000	0.000	0.000	0.000	0.000
60-1	G-0016	24.4	3738.1	38.153	0.002	0.000	20.147	0.001	0.000
60-1	G-0014	11.1	399.6	4.079	0.000	0.000	5.155	0.000	0.000
60-1	G-0029	4.7	173.9	1.775	0.000	0.000	11.897	0.000	0.000
60-1	G-0028	2.6	374.4	3.821	0.000	0.000	4.997	0.000	0.000
60-1	G-0026	2.9	0.0	0.000	0.000	0.000	0.000	0.000	0.000
60-1	G-0027	4.3	0.0	0.000	0.000	0.000	0.000	0.000	0.000
60-1	G-0025	4.3	747.8	7.632	0.000	0.000	7.500	0.000	0.000
33-20	G-0002	2.9	9.6	0.098	0.000	0.000	0.090	0.000	0.000
33-20	G-0001	4.7	15.5	0.158	0.000	0.000	0.216	0.000	0.000
33-20	G-0006	2.9	10.7	0.110	0.000	0.000	0.095	0.000	0.000
33-151	G-0003	4.7	34.3	0.350	0.000	0.000	0.302	0.000	0.000
60-Yard	G-0056	3.5	31.5	0.322	0.000	0.000	0.314	0.000	0.000
Totals (metric tons):				56.50	0.002	0.000	50.71	0.0021	0.0004
Total Carbon Equivalents (metric tons):				56.69			50.88		

References

(a) Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel."

(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel." (Federal Register/Vol. 74, No. 209, 10/30/2009).

(c) Hour readings were taken from the criteria pollutant emission calculation spreadsheet for standby generators. Hours are collected twice a year.

(d) Fuel use rates were taken from manufacturer literature. Data for some units may not be available due to age, but data for a similar unit was used when unit specific data was not available.

(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

Emission Factors

Fuel Oil Heat Value [a] (mmBtu/Gal)	CO_2 [a] (kg/mmBtu)	CH_4 [b] (kg/mmBtu)	N_2O [b] (kg/mmBtu)
0.138	73.96	0.003	0.0006

2011 Portable Generator Hours

Emission Factors (lb/kwh)	HAPS (lbs)												HAPS (lbs)				HAPS (lbs)			
	Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphthalene		PAH		Individual Generator HAP Emissions (lbs)	
Diesel (small)	3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E-07		5.74E-07			
60-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-1	5.80E-03	1.65E-01	2.54E-03	7.24E-02	1.77E-03	5.04E-02	2.43E-04	6.92E-03	7.33E-03	2.09E-01	4.77E-03	1.36E-01	5.75E-04	1.64E-02	5.27E-04	1.50E-02	1.04E-03	2.97E-02	2.46E-02	7.00E-01
60-1	1.67E-02	4.78E-04	7.33E-03	2.10E-04	5.11E-03	1.46E-04	7.01E-04	2.00E-05	2.12E-02	6.05E-04	1.38E-02	3.93E-04	1.66E-03	4.74E-05	1.52E-03	4.34E-05	3.01E-03	8.61E-05	7.10E-02	2.03E-03
60-1	6.88E-03	1.91E-04	3.02E-03	8.38E-05	2.10E-03	5.84E-05	2.88E-04	8.01E-06	8.70E-03	2.42E-04	5.66E-03	1.57E-04	6.82E-04	1.90E-05	6.26E-04	1.74E-05	1.24E-03	3.44E-05	2.92E-02	8.11E-04
60-1	2.02E-02	4.30E-04	8.86E-03	1.89E-04	6.18E-03	1.31E-04	8.47E-04	1.80E-05	2.56E-02	5.44E-04	1.66E-02	3.54E-04	2.00E-03	4.26E-05	1.84E-03	3.91E-05	3.64E-03	7.75E-05	8.58E-02	1.83E-03
60-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60-1	2.68E-02	9.56E-04	1.17E-02	4.19E-04	8.17E-03	2.92E-04	1.12E-03	4.01E-05	3.38E-02	1.21E-03	2.20E-02	7.86E-04	2.65E-03	9.48E-05	2.43E-03	8.69E-05	4.82E-03	1.72E-04	1.13E-01	4.06E-03
33-20	1.24E-04	1.91E-04	5.45E-05	8.38E-05	3.80E-05	5.84E-05	5.21E-06	8.01E-06	1.57E-04	2.42E-04	1.02E-04	1.57E-04	1.23E-05	1.90E-05	1.13E-05	1.74E-05	2.24E-05	3.44E-05	5.27E-04	8.11E-04
33-20	9.56E-05	1.67E-04	4.19E-05	7.33E-05	2.92E-05	5.11E-05	4.01E-06	7.01E-06	1.21E-04	2.12E-04	7.86E-05	1.38E-04	9.48E-06	1.66E-05	8.69E-06	1.52E-05	1.72E-05	3.01E-05	4.06E-04	7.10E-04
33-20	6.77E-05	7.97E-05	2.97E-05	3.49E-05	2.07E-05	2.43E-05	2.84E-06	3.34E-06	8.56E-05	1.01E-04	5.57E-05	6.55E-05	6.71E-06	7.90E-06	6.15E-06	7.24E-06	1.22E-05	1.43E-05	2.87E-04	3.38E-04
33-151	1.01E-03	3.82E-04	4.44E-04	1.68E-04	3.10E-04	1.17E-04	4.25E-05	1.60E-05	1.28E-03	4.84E-04	8.33E-04	3.14E-04	1.00E-04	3.79E-05	9.21E-05	3.48E-05	1.82E-04	6.89E-05	4.30E-03	1.62E-03
60-Yard	9.59E-04	4.46E-05	4.20E-04	1.96E-05	2.93E-04	1.36E-05	4.02E-05	1.87E-06	1.21E-03	5.64E-05	7.88E-04	3.67E-05	9.51E-05	4.42E-06	8.72E-05	4.05E-06	1.73E-04	8.03E-06	4.07E-03	1.89E-04
Total Emissions lbs	**7.86E-02**	**1.68E-01**	**3.45E-02**	**7.36E-02**	**2.40E-02**	**5.13E-02**	**3.30E-03**	**7.04E-03**	**9.95E-02**	**2.12E-01**	**6.46E-02**	**1.38E-01**	**7.80E-03**	**1.67E-02**	**7.15E-03**	**1.53E-02**	**1.42E-02**	**3.02E-02**	**3.34E-01**	**7.13E-01**
Tons/Half/HAP	**3.93E-05**	**8.40E-05**	**1.72E-05**	**3.68E-05**	**1.20E-05**	**2.57E-05**	**1.65E-06**	**3.52E-06**	**4.97E-05**	**1.06E-04**	**3.23E-05**	**6.90E-05**	**3.90E-06**	**8.33E-06**	**3.57E-06**	**7.63E-06**	**7.08E-06**	**1.51E-05**		
Tons/year/HAP	**1.23E-04**		**5.41E-05**		**3.77E-05**		**5.17E-06**		**1.56E-04**		**1.01E-04**		**1.22E-05**		**1.12E-05**		**2.22E-05**			
Tons/Year Total	**5.23E-04**																			

Emission Factors from AP-42, Volume 1, Fifth Edition (Small Diesel Engines Table 3.3-2, Large Diesel Engines Table 3.4-4, Natural Gas 4-Stroke Engines Table 3.2-3)

									First 6 Month Readings			Second 6 Month Readings		
TA	Bldg	ID #	Manufacturer	MODEL	KW	Fuel Type	Previous Reading Date	Previous Reading	6 Month Reading Date	Reading	Hours Run	Month Reading Date	Reading	Hours Run
3	40	G-0013	Onan Sons	1500DVE15R31374B	150	Diesel	Dec-10	32.0	Jun-11	34.0	2.0	Dec-11	37.0	3.0
3	440	G-0020	Cummins	DFGA-5005210	500	Diesel	Dec-10	126.7	Jun-11	133.0	6.3	Dec-11	140.0	7.0
3	1076	G-0022	Cummins	DGBB-5601289	35	Diesel	Dec-10	232.6	Jun-11	232.6	0.0	Dec-11	235.8	3.2
3	1400	G-0024	Cummins	DFEH-5699616	400	Diesel	Dec-10	164	Jun-11	171.0	7.0	Dec-11	177.0	6.0
3	1404	G-0023	Cummins	DFLC-5554001	1250	Diesel	Dec-10	503	Jun-11	527.0	24.0	Dec-11	553.0	26.0
3	1498	G-0017	Caterpillar	SR-4	600	Diesel	Dec-10	367	Jun-11	374.0	7.0	Dec-11	384.0	10.0
3	2322	G-0021	Onan Sons	DGDA-5005757	80	Diesel	Dec-10	389.3	Jun-11	396.0	6.7	Dec-11	403.0	7.0
16	980	G-0033	Cummins	KTA50-G2	1100	Diesel	Dec-10	383	Jun-11	402.0	19.0	Dec-11	414.2	12.2
16	1374	G-0032	Onan Sons	60ENA	60	Nat. Gas	Dec-10	1265	Jun-11	1305.0	40.0	Dec-11	1326.0	21.0
35	2	G-0034	Onan Sons	100DGDB	100	Diesel	Dec-10	115.5	Jun-11	115.5	0.0	Dec-11	115.5	0.0
35	402	G-0037	Cummins	DGCB-5674244	60	Diesel	Dec-10	289	Jun-11	311.0	22.0	Dec-11	330.0	19.0
43	1	G-0031	Cummins	4BT3.9-GC	50	Diesel	Dec-10	419.5	Jun-11	439.0	19.5	Dec-11	443.0	4.0
43	1	G-0030	Onan Sons	DVE	150	Diesel	Dec-10	795	Jun-11	822.0	27.0	Dec-11	841.0	19.0
46	335	G-0036	Onan Sons	300DEFCB	300	Diesel	Dec-10	1187	Jun-11	1223.0	36.0	Dec-11	1271.9	48.9
48	45	G-0043	Onan Sons	DFCB-5740130	300	Diesel	Dec-10	158	Jun-11	169.0	11.0	Dec-11	177.0	8.0
50	37	G-0039	Cummins	680FDR5059FF	500	Diesel	Dec-10	502.8	Jun-11	502.8	0.0	Dec-11	502.8	0.0
50	69	G-0040	Onan	DGDB4487482	100	Diesel	Dec-10	327	Jun-11	335.0	8.0	Dec-11	343.0	8.0
50	184	G-0044	Onan Sons	DGFA-568741	150	Diesel	Dec-10	376	Jun-11	409.0	33.0	Dec-11	434.0	25.0
50	188	G-0038	Onan Sons	L940563879	1250	Diesel	Dec-10	149	Jun-11	149.0	0.0	Dec-11	149.0	0.0
53	1	G-0004	Onan Sons	60ENA	60	Nat. Gas	Dec-10	1646	Jun-11	1680.0	34.0	Dec-11	1833.0	153.0
53	2	G-0005	Kato Eng.	Kamag-14	50	Diesel	Dec-10	194.7	Jun-11	194.7	0.0	Dec-11	196.5	1.8
53	3N	G-0011	Onan	15.0JC-18R	15	Propane	Dec-10	384.9	Jun-11	389.3	4.4	Dec-11	397.0	7.7
54	412	G-0045	Olympian	95M-07874-F	500	Diesel	Dec-10	349.1	Jun-11	349.1	0.0	Dec-11	349.1	0.0
55	5	G-0049	Kohler	100RZ71	100	Propane	Dec-10	137	Jun-11	164.0	27.0	Dec-11	171.0	7.0
55	8	G-0050	Delco/Detroit	E7014DD	600	Diesel	Dec-10	875.8	Jun-11	879.5	3.7	Dec-11	889.2	9.7
55	364	G-0051	Onan Sons	1250DFLC-4987	1250	Diesel	Dec-10	195	Jun-11	204.5	9.5	Dec-11	218.9	14.4
55	28	G-0047	Onan Sons	40DL6T	40	Diesel	Dec-10	112	Jun-11	126.0	14.0	Dec-11	135.0	9.0
55	47	G-0048	Onan Sons	1465	200	Diesel	Dec-10	603.2	Jun-11	609.0	5.8	Dec-11	615.0	6.0
55	142	G-0046	Cummins	DFEB-4963414	400	Diesel	Dec-10	158	Jun-11	160.0	2.0	Dec-11	168.0	8.0
55	440	G-0058	Cummins	DFLE-5754172	1500	Diesel	Dec-10	15.8	Jun-11	18.8	3.0	Dec-11	37.2	18.4
55	440	G-0059	Cummins	DFLE-5754172	1500	Diesel	Dec-10	15	Jun-11	20.2	5.2	Dec-11	44.8	24.6
55	440	G-0060	Cummins	DFLE-5754172	1500	Diesel	Dec-10	15.8	Jun-11	20.9	5.1	Dec-11	30.5	9.6
60	yard	G-0053	Cummins	DFHD-4964979	1000	Diesel	Dec-10	667	Jun-11	669.0	2.0	Dec-11	669.0	0.0
64	1	G-0041	Onan Sons	250DVG	250	Diesel	Dec-10	204	Jun-11	211.0	7.0	Dec-11	217.0	6.0
69	33	G-0055	Cummins	DFLC-5568730	1250	Diesel	Dec-10	124	Jun-11	142.0	18.0	Dec-11	155.0	13.0
	35	**Generators**								**TOTAL**	409.2		**TOTAL**	515.5

N/R = Not Read

First half average hours per unit	**11.7**
Second half average hours per unit	**14.7**
Annual Average of hours per unit	**13.2**

Reviewed By / Date: _____

EMISSION FACTORS	NOx lb/kw-hr	CO lb/kw-hr	SOx[(b)] lb/kw-hr	PM lb/kw-hr	PM10 lb/kw-hr	VOC lb/kw-hr
Large Diesel fired [(a)(b)]	0.032	0.007	5.4E-04	0.001	0.001	0.001
Small Diesel fired [(a)(c)]	0.042	0.009	0.003	0.003	0.003	0.003
Natural Gas Fired [(d)]	0.008	0.013	2.0E-06	3.4E-05	3.2E-05	1.0E-04

References:

447	447 kw (600 hp) is the size limit for determining large vs. small diesel fired generator. This information was taken from the operating permit application and is also found in AP-42.

(a) The AP-42 (fifth edition), table 3.4-1,emissions factor uses units of lb/hp-hr. There are 1.341 hp-hrs in a kwh. Therefore, take pounds/hp-hr x 1.341 hp-hr/kwh to obtain the emission factor in lb/kwh.

(b) Emission factors for **large diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.4-1, 3.4-2, 3.4-3, and 3.4-4.

(c) Emission factors for **small diesel fired engines** were taken from AP-42 (fifth edition) Tables 3.3-1 and 3.3-2.

(d) The AP-42 (fifth edition) emission factors for **natural gas burning** 4-stroke rich-burn engines (Table 3.2-3) provides units of lb/MMBTU. There are 3413 Btus in a kilowatt-hr (kwh) or 2.928 x 10-4 kwh per BTU. Therefore, take lb/MMBTU x 3413 / 1 x 10^6 or lb/MMbtu /106/2.928 x 10^4 to obtain the emissions factor in lb/kwh. The differences between the Title V application emission factors and those listed here, are that the application used the 2-stroke table, and the above emission factors are for rich burn 4-stroke engines. Most generator engines have been verified with the KSL generator crew to be 4-stroke.

(e) The Sulfur Oxide (SO_X) emission factor for large diesel engines was calculated using AP-42 Table 3.4-1(fifth edition). The calculation requires the sulfur percent found in the fuel. It was verified in March of 2007, that future fuel supplied to the generators around LANL will be Ultra Low Sulfur Diesel (ULSD) (Sulfur <=15 ppm). Due to the low hours (and associated low fuel use) of most generators, the previous LANL tested fuel sulfur concentration of 0.05% will continue to be used for the rest 2007 to allow for refueling of generators and use of the new ULSD. Calculation is 0.00809 * 0.05 * 0.608 * 2.2 **5.4 x 10^{-4}**

	First 6 Month Emissions							Second 6 Month Emissions						
Location	*NOx (lb/yr)*	*CO (lb/yr)*	*SOx (lb/yr)*	*PM (lb/yr)*	*VOC (lb/yr)*	*HAPs (lb/yr)*		*NOx (lb/yr)*	*CO (lb/yr)*	*SOx (lb/yr)*	*PM (lb/yr)*	*VOC (lb/yr)*	*HAPs (lb/yr)*	
3-40	12.6	2.7	0.9	0.9	0.9	4.2E-03		18.9	4.1	1.4	1.4	1.4	6.1E-03	
3-440	100.8	22.1	1.7	3.2	3.2	2.1E-02		112.0	24.5	1.9	3.5	3.5	2.0E-02	
3-1076	0.0	0.0	0.0	0.0	0.0	0.0E+00		4.7	1.0	0.3	0.3	0.3	1.5E-03	
3-1400	117.6	25.2	8.4	8.4	8.4	3.9E-02		100.8	21.6	7.2	7.2	7.2	3.2E-02	
3-1404	960.0	210.0	16.2	30.0	30.0	2.0E-01		1040.0	227.5	17.6	32.5	32.5	1.9E-01	
3-1498	134.4	29.4	2.3	4.2	4.2	2.8E-02		192.0	42.0	3.2	6.0	6.0	3.5E-02	
3-2322	22.5	4.8	1.6	1.6	1.6	7.5E-03		23.5	5.0	1.7	1.7	1.7	7.6E-03	
16-980	668.8	146.3	11.3	20.9	20.9	1.4E-01		429.4	93.9	7.2	13.4	13.4	7.8E-02	
16-1374	19.2	31.2	0.0	0.1	0.2	2.7E-01		10.1	16.4	0.0	0.0	0.1	1.4E-01	
35-2	0.0	0.0	0.0	0.0	0.0	0.0E+00		0.0	0.0	0.0	0.0	0.0	0.0E+00	
35-402	55.4	11.9	4.0	4.0	4.0	1.9E-02		47.9	10.3	3.4	3.4	3.4	1.5E-02	
43-1	41.0	8.8	2.9	2.9	2.9	1.4E-02		8.4	1.8	0.6	0.6	0.6	2.7E-03	
43-1	170.1	36.5	12.2	12.2	12.2	5.7E-02		119.7	25.7	8.6	8.6	8.6	3.9E-02	
46-335	453.6	97.2	32.4	32.4	32.4	1.5E-01		616.1	132.0	44.0	44.0	44.0	2.0E-01	
48-45	138.6	29.7	9.9	9.9	9.9	4.6E-02		100.8	21.6	7.2	7.2	7.2	3.2E-02	
50-37	0.0	0.0	0.0	0.0	0.0	0.0E+00		0.0	0.0	0.0	0.0	0.0	0.0E+00	
50-69	33.6	7.2	2.4	2.4	2.4	1.1E-02		33.6	7.2	2.4	2.4	2.4	1.1E-02	
50-194	207.9	44.6	14.9	14.9	14.9	6.9E-02		157.5	33.8	11.3	11.3	11.3	5.1E-02	
50-198	0.0	0.0	0.0	0.0	0.0	0.0E+00		0.0	0.0	0.0	0.0	0.0	0.0E+00	
53-1	16.3	26.5	0.0	0.1	0.2	2.3E-01		73.4	119.3	0.0	0.3	0.9	1.0E+00	
53-2	0.0	0.0	0.0	0.0	0.0	0.0E+00		3.8	0.8	0.3	0.3	0.3	1.2E-03	
53-3N	0.5	0.9	0.0	0.0	0.0	6.6E-03		0.9	1.5	0.0	0.0	0.0	1.2E-02	
54-412	0.0	0.0	0.0	0.0	0.0	0.0E+00		0.0	0.0	0.0	0.0	0.0	0.0E+00	
55-5	21.6	35.1	0.0	0.1	0.3	2.7E-01		5.6	9.1	0.0	0.0	0.1	7.0E-02	
55-8	71.0	15.5	1.2	2.2	2.2	1.5E-02		186.2	40.7	3.1	5.8	5.8	3.4E-02	
55-364	380.0	83.1	6.4	11.9	11.9	8.0E-02		576.0	126.0	9.7	18.0	18.0	1.0E-01	
55-28	23.5	5.0	1.7	1.7	1.7	7.9E-03		15.1	3.2	1.1	1.1	1.1	4.9E-03	
55-47	48.7	10.4	3.5	3.5	3.5	1.6E-02		50.4	10.8	3.6	3.6	3.6	1.6E-02	
55-142	33.6	7.2	2.4	2.4	2.4	1.1E-02		134.4	28.8	9.6	9.6	9.6	4.3E-02	
55-440	144.0	31.5	2.4	4.5	4.5	1.4E-02		883.2	193.2	14.9	27.6	27.6	0.0E+00	
55-440	249.6	54.6	4.2	7.8	7.8	2.5E-02		1180.8	258.3	19.9	36.9	36.9	2.0E-02	
55-440	244.8	53.6	4.1	7.7	7.7	1.5E-01		460.8	100.8	7.8	14.4	14.4	9.5E-02	
60-yard	64.0	14.0	1.1	2.0	2.0	1.4E-02		0.0	0.0	0.0	0.0	0.0	0.0E+00	
64-1	73.5	15.8	5.3	5.3	5.3	2.5E-02		63.0	13.5	4.5	4.5	4.5	2.0E-02	
69-33	720.0	157.5	12.2	22.5	22.5	1.5E-01		520.0	113.8	8.8	16.3	16.3	9.5E-02	
lbs/6 months	5227.3	1218.2	165.4	219.3	219.8	2.1		7169.2	1688.2	201.2	281.8	282.6	2.4	
Tons/6 months	**2.61**	**0.61**	**0.08**	**0.11**	**0.11**	**1.05E-03**		**3.58**	**0.84**	**0.10**	**0.14**	**0.14**	**1.20E-03**	

YEARLY TOTAL	NOx	CO	SOx	PM	VOC	HAPs
Tons/Year	6.20	1.45	0.18	0.25	0.25	0.002

Emission Factors (lb/kwh)	HAPS (lbs)																							
	Benzene		Toluene		Xylenes		1,3-Butadiene		Formaldehyde		Acetaldehyde		Acrolein		Naphthalene		1,1,2,2-Tetrachloroethane		1,1,2-Trichloroethane	
Natural Gas	5.40E-06		1.91E-06		6.66E-07		2.26E-06		7.00E-05		9.53E-06		8.98E-06		3.32E-07		8.64E-08		5.22E-08	
Diesel (small)	3.19E-06		1.40E-06		9.73E-07		1.34E-07		4.03E-06		2.62E-06		3.16E-07		2.90E-07					
Diesel (large)	2.66E-06		9.60E-07		6.59E-07				2.69E-07		8.61E-08		2.69E-08		4.44E-07					
Location	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
3-40	9.56E-04	1.43E-03	5.72E-04	6.29E-04	2.92E-04	4.38E-04	4.01E-05	6.01E-05	1.21E-03	1.81E-03	7.86E-04	1.18E-03	9.48E-05	1.42E-04	8.69E-05	1.30E-04				
3-440	8.35E-03	9.28E-03	6.00E-03	3.36E-03	2.08E-03	2.31E-03	0.00E+00	0.00E+00	8.49E-04	9.43E-04	2.71E-04	3.01E-04	8.48E-05	9.42E-05	1.40E-03	1.55E-03				
3-1076	0.00E+00	3.57E-04	0.00E+00	1.56E-04	0.00E+00	1.09E-04	0.00E+00	1.50E-05	0.00E+00	4.51E-04	0.00E+00	2.93E-04	0.00E+00	3.54E-05	0.00E+00	3.24E-05				
3-1404	8.92E-03	7.85E-03	5.34E-03	3.35E-03	2.73E-03	2.34E-03	3.74E-04	3.20E-04	1.13E-02	9.67E-03	7.33E-03	6.29E-03	8.85E-04	7.58E-04	8.11E-04	6.95E-04				
3-1404	7.95E-02	8.61E-02	5.72E-02	3.12E-02	1.98E-02	2.14E-02	0.00E+00	0.00E+00	8.08E-03	8.76E-03	2.58E-03	2.80E-03	8.07E-04	8.75E-04	1.33E-02	1.44E-02				
3-1498	1.11E-02	1.59E-02	8.00E-03	5.76E-03	2.77E-03	3.95E-03	0.00E+00	0.00E+00	1.13E-03	1.62E-03	3.61E-04	5.16E-04	1.13E-04	1.61E-04	1.86E-03	2.66E-03				
3-2322	1.71E-03	1.78E-03	1.02E-03	7.82E-04	5.22E-04	5.45E-04	7.16E-05	7.48E-05	2.16E-03	2.26E-03	1.40E-03	1.47E-03	1.69E-04	1.77E-04	1.55E-04	1.62E-04				
16-980	5.54E-02	3.56E-02	3.98E-02	1.29E-02	1.38E-02	8.85E-03	0.00E+00	0.00E+00	5.63E-03	3.62E-03	1.80E-03	1.16E-03	5.62E-04	3.61E-04	9.28E-03	5.96E-03				
16-1374	1.30E-02	6.80E-03	4.57E-03	2.40E-03	1.60E-03	8.39E-04	5.43E-03	2.85E-03	1.68E-01	8.82E-02	2.29E-02	1.20E-02	2.16E-02	1.13E-02	7.96E-04	4.18E-04	2.07E-04	1.09E-04	1.25E-04	6.58E-05
35-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
35-402	4.21E-03	3.63E-03	2.52E-03	1.59E-03	1.28E-03	1.11E-03	1.76E-04	1.52E-04	5.32E-03	4.59E-03	3.46E-03	2.99E-03	4.17E-04	3.60E-04	3.82E-04	3.30E-04				
43-1	3.11E-03	6.37E-04	1.86E-03	2.79E-04	9.49E-04	1.95E-04	1.30E-04	2.67E-05	3.93E-03	8.06E-04	2.55E-03	5.24E-04	3.08E-04	6.32E-05	2.82E-04	5.79E-05				
43-1	1.29E-02	9.08E-03	7.72E-03	3.98E-03	3.94E-03	2.77E-03	5.41E-04	3.81E-04	1.63E-02	1.15E-02	1.06E-02	7.47E-03	1.28E-03	9.00E-04	1.17E-03	8.25E-04				
46-335	3.44E-02	4.67E-02	2.06E-02	2.05E-02	1.05E-02	1.43E-02	1.44E-03	1.96E-03	4.35E-02	5.91E-02	2.83E-02	3.84E-02	3.41E-03	4.63E-03	3.13E-03	4.25E-03				
48-45	1.05E-02	7.65E-03	6.29E-03	3.35E-03	3.21E-03	2.34E-03	4.41E-04	3.20E-04	1.33E-02	9.67E-03	8.64E-03	6.29E-03	1.04E-03	7.58E-04	9.56E-04	6.95E-04				
50-37	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
50-69	2.55E-03	2.55E-03	1.52E-03	1.12E-03	7.79E-04	7.79E-04	1.07E-04	1.07E-04	3.22E-03	3.22E-03	2.10E-03	2.10E-03	2.53E-04	2.53E-04	2.32E-04	2.32E-04				
50-184	1.58E-02	1.19E-02	9.43E-03	5.24E-03	4.82E-03	3.65E-03	6.61E-04	5.01E-04	1.99E-02	1.51E-02	1.30E-02	9.82E-03	1.56E-03	1.18E-03	1.43E-03	1.09E-03				
50-188	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
53-1	1.10E-02	4.96E-02	3.89E-03	1.75E-02	1.36E-03	6.11E-03	4.62E-03	2.08E-02	1.43E-01	6.43E-01	1.94E-02	8.75E-02	1.83E-02	8.25E-02	6.77E-04	3.04E-03	1.76E-04	7.93E-04	1.07E-04	4.80E-04
53-2	0.00E+00	2.87E-04	0.00E+00	1.26E-04	0.00E+00	8.76E-05	0.00E+00	1.20E-05	0.00E+00	3.63E-04	0.00E+00	2.36E-04	0.00E+00	2.84E-05	0.00E+00	2.61E-05				
53-3N	3.56E-04	6.23E-04	1.26E-04	2.20E-04	4.40E-05	7.69E-05	1.49E-04	2.62E-04	4.62E-03	8.09E-03	6.29E-04	1.10E-03	5.93E-04	1.04E-03	2.19E-05	3.83E-05				
54-412	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
55-5	1.46E-02	3.78E-03	5.15E-03	1.33E-03	1.80E-03	4.66E-04	6.11E-03	1.59E-03	1.89E-01	4.90E-02	2.57E-02	6.67E-03	2.43E-02	6.29E-03	8.95E-04	2.32E-04				
55-8	5.88E-03	1.54E-02	4.23E-03	5.59E-03	1.46E-03	3.84E-03	0.00E+00	0.00E+00	5.98E-04	1.57E-03	1.91E-04	5.01E-04	5.97E-05	1.57E-04	9.86E-04	2.58E-03				
55-364	3.15E-02	4.77E-02	2.26E-02	1.73E-02	1.19E-02	7.83E-03	0.00E+00	0.00E+00	3.20E-03	4.85E-03	1.02E-03	1.55E-03	3.20E-04	4.84E-04	5.27E-03	7.99E-03				
55-28	1.76E-03	1.15E-03	1.07E-03	5.02E-04	5.45E-04	3.50E-04	7.48E-05	4.81E-05	2.26E-03	1.45E-03	1.47E-03	9.43E-04	1.77E-04	1.14E-04	1.62E-04	1.04E-04				
55-47	3.70E-03	3.82E-03	2.21E-03	1.68E-03	1.13E-03	1.17E-03	1.55E-04	1.60E-04	4.67E-03	4.84E-03	3.04E-03	3.14E-03	3.66E-04	3.79E-04	3.36E-04	3.48E-04				
55-142	2.55E-03	1.02E-02	1.52E-03	4.47E-03	7.79E-04	3.11E-03	1.07E-04	4.27E-04	3.22E-03	1.29E-02	2.10E-03	8.38E-03	2.53E-04	1.01E-03	2.32E-04	9.27E-04				
55-440	1.19E-02	7.31E-02	8.58E-03	2.65E-02	2.97E-03	1.82E-02	0.00E+00	0.00E+00	1.21E-03	7.44E-03	3.87E-04	2.38E-03	1.21E-04	7.43E-04	2.00E-03	1.23E-02				
55-440	2.07E-02	9.78E-02	1.49E-02	3.54E-02	5.14E-03	2.43E-02	0.00E+00	0.00E+00	2.10E-03	9.94E-03	6.71E-04	3.18E-03	2.10E-04	9.93E-04	3.46E-03	1.64E-02				
55-440	2.03E-02	3.82E-02	1.46E-02	1.38E-02	5.04E-03	9.49E-03	0.00E+00	0.00E+00	2.06E-03	3.88E-03	6.58E-04	1.24E-03	2.06E-04	3.88E-04	3.40E-03	6.39E-03				
60-yard	5.30E-03	0.00E+00	3.81E-03	0.00E+00	1.32E-03	0.00E+00	0.00E+00	0.00E+00	5.39E-04	0.00E+00	1.72E-04	0.00E+00	5.38E-05	0.00E+00	8.88E-04	0.00E+00				
64-1	5.58E-03	4.78E-03	3.34E-03	2.10E-03	1.70E-03	1.46E-03	2.34E-04	2.00E-04	7.05E-03	6.05E-03	4.58E-03	3.93E-03	5.53E-04	4.74E-04	5.07E-04	4.34E-04				
69-33	5.96E-02	4.31E-02	4.29E-02	1.56E-02	1.48E-02	1.07E-02	0.00E+00	0.00E+00	6.06E-03	4.38E-03	1.94E-03	1.40E-03	6.06E-04	4.37E-04	9.99E-03	7.21E-03				
lbs	**4.57E-01**	**6.37E-01**	**3.01E-01**	**2.39E-01**	**1.13E-01**	**1.57E-01**	**2.09E-02**	**3.03E-02**	**6.73E-01**	**9.79E-01**	**1.68E-01**	**2.16E-01**	**7.86E-02**	**1.17E-01**	**6.41E-02**	**9.15E-02**	**3.84E-04**	**9.02E-04**	**2.32E-04**	**5.46E-04**
Tons/Half/HAP	**2.29E-04**	**3.18E-04**	**1.51E-04**	**1.19E-04**	**5.75E-05**	**7.86E-05**	**1.04E-05**	**1.51E-05**	**3.37E-04**	**4.89E-04**	**8.40E-05**	**1.08E-04**	**3.93E-05**	**5.85E-05**	**3.21E-05**	**4.57E-05**	**1.92E-07**	**4.51E-07**	**1.16E-07**	**2.73E-07**
Tons/year/HAP	5.47E-04		2.70E-04		1.36E-04		2.56E-05		8.26E-04		1.92E-04		9.79E-05		7.78E-05		6.43E-07		3.89E-07	
Tons/Year Total	**2.40E-03**																			

Emission Factors from AP-42, Volume 1, Fifth Edition (Small Diesel Engines Table 3.3-2, Large Diesel Engines Table 3.4-4, Natural Gas 4-Stroke Engines Table 3.2-3)

HAPS (lbs)																												Individual Generator HAP Emissions (lbs)	
1,3-Dichloropropene		Carbon Tetrachloride		Chlorobenzene		Chloroform		Ethylbenzene		Ethylene Dibromide		Methanol		Methylene Chloride		PAH		Styrene		Toluene		Vinyl Chloride			
4.34E-08		6.05E-08		4.41E-08		4.68E-08		8.47E-08		7.27E-08		1.05E-05		1.41E-07		4.82E-07 5.74E-07 7.24E-07		4.06E-08		1.91E-06		2.45E-08			
1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
																1.72E-04	2.58E-04											4.21E-03	6.08E-03
																2.28E-03	2.53E-03											2.13E-02	2.04E-02
																0.00E+00	6.43E-05											0.00E+00	1.51E-03
																1.61E-03	1.38E-03											3.93E-02	3.24E-02
																2.17E-02	2.35E-02											2.03E-01	1.89E-01
																3.04E-03	4.34E-03											2.84E-02	3.49E-02
																3.08E-04	3.21E-04											7.52E-03	7.57E-03
																1.51E-02	9.72E-03											1.41E-01	7.81E-02
1.04E-04	5.47E-05	1.45E-04	7.62E-05	1.06E-04	5.55E-05	1.12E-04	5.90E-05	2.03E-04	1.07E-04	1.75E-04	9.17E-05	2.51E-02	1.32E-02	3.38E-04	1.77E-04	1.16E-03	6.07E-04	9.75E-05	5.12E-05	4.57E-03	2.40E-03	5.89E-05	3.09E-05	2.70E-01	1.42E-01			1.42E-02	7.81E-02
																0.00E+00	0.00E+00											0.00E+00	0.00E+00
																7.57E-04	6.54E-04											1.85E-02	1.54E-02
																5.59E-04	1.15E-04											1.37E-02	2.70E-03
																2.32E-03	1.64E-03											5.68E-02	3.85E-02
																6.20E-03	8.42E-03											1.52E-01	1.98E-01
																1.89E-03	1.38E-03											4.63E-02	3.24E-02
																0.00E+00	0.00E+00											0.00E+00	0.00E+00
																4.59E-04	4.59E-04											1.12E-02	1.08E-02
																2.84E-03	2.15E-03											6.94E-02	5.07E-02
																0.00E+00	0.00E+00											0.00E+00	0.00E+00
8.85E-05	3.98E-04	1.23E-04	5.55E-04	8.99E-05	4.04E-04	9.55E-05	4.30E-04	1.73E-04	7.78E-04	1.48E-04	6.68E-04	2.13E-02	9.59E-02	2.87E-04	1.29E-03	9.82E-04	4.42E-03	8.29E-05	3.73E-04	3.89E-03	1.75E-02	5.00E-05	2.25E-04	2.30E-01	1.03E+00			2.30E-01	1.03E+00
																0.00E+00	5.16E-05											0.00E+00	1.22E-03
																3.18E-05	5.56E-05											6.57E-03	1.15E-02
																0.00E+00	0.00E+00											0.00E+00	0.00E+00
																1.30E-03	3.37E-04											2.69E-01	6.97E-02
																1.61E-03	4.21E-03											1.50E-02	3.39E-02
																8.60E-03	1.30E-02											8.03E-02	1.05E-01
																3.21E-04	2.07E-04											7.86E-03	4.97E-03
																6.66E-04	6.89E-04											1.63E-02	1.62E-02
																4.59E-04	1.84E-03											1.12E-02	4.33E-02
																3.26E-03	2.00E-02											3.04E-02	1.61E-01
																5.65E-03	2.67E-02											5.28E-02	2.15E-01
																5.54E-03	1.04E-02											5.18E-02	8.38E-02
																1.45E-03	0.00E+00											1.35E-02	0.00E+00
																1.00E-03	8.61E-04											2.45E-02	2.03E-02
																1.63E-02	1.18E-02											1.52E-01	9.46E-02
1.93E-04	4.53E-04	2.68E-04	6.31E-04	1.96E-04	4.60E-04	2.08E-04	4.88E-04	3.76E-04	8.84E-04	3.23E-04	7.59E-04	4.64E-02	1.09E-01	6.25E-04	1.47E-03	1.08E-01	1.52E-01	1.80E-04	4.24E-04	8.46E-03	1.99E-02	1.09E-04	2.56E-04	2.04E+00	2.75E+00				
9.63E-08	2.26E-07	1.34E-07	3.16E-07	9.78E-08	2.30E-07	1.04E-07	2.44E-07	1.88E-07		1.61E-07	3.80E-07	2.32E-05	5.46E-05	3.12E-07	7.35E-07	5.38E-05	7.61E-05	9.02E-08	2.12E-07	4.23E-06	9.95E-06	5.44E-08	1.28E-07						
3.23E-07		4.50E-07		3.28E-07		3.49E-07		1.88E-07		5.41E-07		7.78E-05		1.05E-06		1.30E-04		3.02E-07		1.42E-05		1.82E-07							

2011 Small Boilers Data Entry / Gas Use

		Metered Boilers			Total Gas Use[a]		Non-Metered Gas Use	12-Month Rolling Total for all Small Boilers (MMscf)[e]
		TA-55 Boiler Gas Use (Mscf)[c]		RLUOB Gas Use (Cscf)				
	Month	BHW-1B (B-602) ID (B-0016)	BHW-2B (B-603) ID (B-0017)	All 3 Boilers NMED IDs 90, 104, and 105	(Mscf)	(MMscf)	(MMscf)	
Data Entry	January	1	3639	765	81,127	81.13	77.41	547.43
	February	0	2454	860	75,899	75.90	73.36	553.88
	March	1	2256	870	51,890	51.89	49.55	540.55
	April	170	1716	613	45,023	45.02	43.08	536.87
	May	1791	4	754	33,201	33.20	31.33	534.51
	June	1655	23	855	14,465	14.47	12.70	520.47
	July	525	2	392	13,438	13.44	12.87	510.77
	August	1263	1	674	20,741	20.74	19.41	519.98
	September	1292	13	744	35,559	35.56	34.18	543.44
	October	203	1809	962	44,155	44.16	42.05	545.86
	November	0	2157	1842	64,341	64.34	62.00	545.14
	December	2418	254	3286	76,969	76.97	73.97	556.81
	TOTAL	9319	14328	12617	556,808	556.81	531.90	
					12 Month Limit (MMscf) =			870

2011 Non Metered Boiler Pool Capacity:	**303.5**	MMBTU/hr[f]
Estimated Gas-Use per MMBtu rating Jan-June:	0.95	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu rating July-Dec:	0.81	MMscf/MMBtu/hr
Estimated Gas-Use per MMBtu - Annual	1.75	MMscf/MMBtu/hr

Defi MMSCF= Million Standard Cubic Feet

MSCF = Thousand Standard Cubic Feet

Metered/Non-metered: Metered boilers are those units that have unit specific volumetric flow meters for the boiler(s) only.

Gas Use Non-Metered[g] (MMSCF)										
NMED ID:	8	9	10	11	12	13	14	53 &134	133	Insignificant Units[h]
Location:	TA-48-1	TA-48-1	TA-48-1	TA-53-365	TA-53-365	TA-59-1	TA-59-1	TA-16-1484	TA-50-2[d]	Lab Wide
Equipment ID:	BS-1	BS-2	BS-6	BHW-1	BHW-2	BHW-1	BHW-2	Plant 5	BS-1	Various
Database ID:	B-0023	B-0024	B-0022	B-0042	B-0043	B-0006	B-0007	B-0093/0092	B-0152	
Design Rate[i] (MMBTU/hr)	**5.336**	**5.335**	**7.140**	**7.115**	**7.115**	**5.335**	**5.335**	**12.700**	**10.670**	**237**
Calculated Gas Use-Jan-June	5.054	5.053	6.762	6.738	6.738	5.053	5.053	12.027	10.105	224.842
Calculated Gas Use-July-Dec	4.299	4.298	5.751	5.731	5.731	4.298	4.298	10.230	8.595	191.246
Calculated Gas Use-Annual	9.352	9.351	12.513	12.469	12.469	9.351	9.351	22.257	18.700	416.088

Reviewed By / Date: _____

Emission Factors (lb/MMscf)				
Criteria Pollutant	**Small Uncontrolled Boilers[1]**	**TA-16 Low NOx Boilers[4]**	**TA-55-6 Boilers[3]**	**RLUOB Boilers**
NOx	100	37.08	138	29.9
SOx	0.6	0.6	0.6	0.6
PM[2]	7.6	7.6	14.2	4.9
PM-10[2]	7.6	7.6	14.2	4.9
PM-2.5[2]	7.6	7.6	14.2	4.9
CO	84	37.08	38.2	38.1
VOC	5.5	5.5	5.98	25.8
HAPs[5]				
Arsenic	0.0002			
Benzene	0.0021			
BE	0.000012			
Cadmium	0.0011			
Chromium	0.0014			
Cobalt	0.000084			
Dichlorobenzene	0.0012			
Formaldehyde	0.075			
Hexane	1.8			
Lead	0.0005			
Mangenese	0.00038			
Mercury	0.00026			
Napthalene	0.00061			
Nickel	0.0021			
POM	0.000088			
Selenium	0.000024			
Toluene	0.0034			

References for Emission Factors
(1) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers.
(2) Emission factors for natural gas of PM-10 and PM-2.5 are roughly equal to those of PM, Natural Gas Combustion, Table 1.4-2
(3) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers for SOx. Stack test on 3/00 for NOx. Otherwise, Emission factors from Sellers Engineering Co.
(4) AP-42, 7/98, Section 1.4, Natural Gas Combustion, Small Boilers; Emission factors for NOx and CO from Sellers Engineering Co (low-NOx boilers).
(5) All HAP emission factors from AP-42 7/98, Section 1.4, Natural Gas Combustion, Tables 1.4-3, 1.4-4

2011 Small Boilers Emission Summary

	Total Emissions (tons)		
Pollutant	**Annual Emissions (Includes Insignificant Sources)**	**Jan-June (Includes Insignificant Sources)**	**July-Dec (Includes Insignificant Sources)**
Criteria			
NOx	27.545	14.946	12.599
SOx	0.167	0.090	0.077
PM	2.192	1.191	1.002
PM-10	2.192	1.191	1.002
PM-2.5	2.192	1.191	1.002
CO	22.293	12.060	10.233
VOC	1.550	0.837	0.712
HAPs			
Arsenic	5.57E-05	3.02E-05	2.55E-05
Benzene	5.85E-04	3.17E-04	2.68E-04
BE	3.34E-06	1.81E-06	1.53E-06
Cadmium	3.06E-04	1.66E-04	1.40E-04
Chromium	3.90E-04	2.11E-04	1.79E-04
Cobalt	2.34E-05	1.27E-05	1.07E-05
Dichlorobenzene	3.34E-04	1.81E-04	1.53E-04
Formaldehyde	2.09E-02	1.13E-02	9.57E-03
Hexane	5.01E-01	2.71E-01	2.30E-01
Lead	1.39E-04	7.54E-05	6.38E-05
Mangenese	1.06E-04	5.73E-05	4.85E-05
Mercury	7.24E-05	3.92E-05	3.32E-05
Napthalene	1.70E-04	9.20E-05	7.78E-05
Nickel	5.85E-04	3.17E-04	2.68E-04
POM	2.45E-05	1.33E-05	1.12E-05
Selenium	6.68E-06	3.62E-06	3.06E-06
Toluene	9.47E-04	5.13E-04	4.34E-04
TOTAL HAPS	0.526	0.285	0.241

The totals include exempt, non-exempt, metered, and non-metered boilers
(all boilers except Power Plant boilers).

REFERENCES
(a) Information on non-metered boilers is provided in the facility wide gas use report by Utilities and Infrastructure and contains all gas use at LANL minus those non-LANL sources which feed from the LANL main line and LANL sources that are individually metered. Total Gas use does not include the TA-3 Power Plant. All other sources are included in this total.
(b) TA-16 Boilers include 2 boilers in plant 5. Gas use was difficult to obtain, so, the boilers were included in the "boiler pool" to determine gas use. Plant 6 has been taken off line and is not expected to be reused or boilers relocated. The removal of these boilers will be requested in the next operating permit revision.
(c) TA-55 has two boilers with separate AIRs numbers. Each boiler has a gas meter. The gas use information is provided monthly by the Utility and Infrastruction personnel and is included in the facility wide gas report.
(d) The TA-50-RLWTF boiler was added to EI as a new source in 2003. This boiler was removed from LANL in 2011. EI calculations will be completed for 2011, but unit will be removed from 2012 calculations. The boiler was owned by a contractor. The boiler was not replaced.
(e) The 12-month rolling average includes all gas use from all boilers listed in this spreadsheet. Boilers not included in this report due to their large size or design are powerplant boilers at TA-3. A gas use limit of 870 MMscf/yr, 12-month rolling average is a permit limit in Section 2.4 of the LANL operating permit.
(f) The non-metered boiler pool capacity is the sum of all active non-metered boilers design ratings (derated value, called design rating in boiler data base) in MMBTU. This number is used to estimate the gas use rate (total non-metered gas use divided by the non-metered boiler pool capacity number). This value is taken from the boilers database (Access) on the database drive on the cleanair server within ENV-ES.
(g) The non-metered boilers gas use section provides estimates of gas use for each boiler. This is calculated using the non-metered gas rate, as discussed in reference (f). The individual boiler design rating is mutiplied by the gas use rate to provide the estimated gas used per reporting period (in MMSCF).
(h) NMED List of Insignificant Activities (9/95), Item (3.) exempts fuel burning equipment which uses gaseous fuel, has a design rate less than or equal to 5 MMBTU/hr, and is used for heating buildings for personal comfort or for producing hot water for personal use. This value contains natural gas fired HVAC units as well as some NG heating units.
(i) The design rate for boilers includes a correction for elevation. LANL is at approximately 7,500 feet above sea level. Corrections are made for atmospheric boilers using 4% reduction (derated) for each 1,000 feet above sea level (4% x 7.5 = 30%). For forced draft and power burner boilers, the reduction is half that of atmospheric at 15%. The correction is made using the boiler plate input rating minus the appropriate percentage.

2011 Non-Exempt Boiler Emissions for Annual EI Reporting (Tons)

Pollutant Criteria	AIRS 015 TA-48-1 BS-1	AIRS 016 TA-48-1 BS-2	AIRS 017 TA-48-1 BS-6	AIRS 018 TA-53-365 BHW-1	AIRS 019 TA-53-365 BHW-2	AIRS 020 TA-59-1 BHW-1	AIRS 021 TA-59-1 BHW-2	AIRS 024 TA-16 BS-1	AIRS 024 TA-16 BS-2	AIRS 037 TA-55-6 BHW-1B	AIRS 038 TA-55-6 BHW-2B	AIRS New TA-50-2 BS-1	TA-55-440 B-1	TA-55-440 B-2	TA-55-440 B-3	Total
NOx	0.468	0.468	0.626	0.623	0.623	0.468	0.468	0.206	0.206	0.643	0.989	0.935	0.006	0.006	0.006	6.741
SOx	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.004	0.006	0.0001	0.0001	0.0001	0.042
PM	0.036	0.036	0.048	0.047	0.047	0.036	0.036	0.042	0.042	0.066	0.102	0.071	0.001	0.001	0.001	0.611
PM-10	0.036	0.036	0.048	0.047	0.047	0.036	0.036	0.042	0.042	0.066	0.102	0.071	0.001	0.001	0.001	0.611
PM-2.5	0.036	0.036	0.048	0.047	0.047	0.036	0.036	0.042	0.042	0.066	0.102	0.071	0.001	0.001	0.001	0.611
CO	0.393	0.393	0.526	0.524	0.524	0.393	0.393	0.206	0.206	0.178	0.274	0.785	0.008	0.008	0.008	4.818
VOC	0.026	0.026	0.034	0.034	0.034	0.026	0.026	0.031	0.031	0.028	0.043	0.051	0.005	0.005	0.005	0.405
HAPs																
Arsenic	9.35E-07	9.35E-07	1.25E-06	1.25E-06	1.25E-06	9.35E-07	9.35E-07	1.11E-06	1.11E-06	9.32E-07	1.43E-06	1.87E-06	4.21E-08	4.21E-08	4.21E-08	1.41E-05
Benzene	9.82E-06	9.82E-06	1.31E-05	1.31E-05	1.31E-05	9.82E-06	9.82E-06	1.17E-05	1.17E-05	9.78E-06	1.50E-05	1.96E-05	4.42E-07	4.42E-07	4.42E-07	1.48E-04
BE	5.61E-08	5.61E-08	7.51E-08	7.48E-08	7.48E-08	5.61E-08	5.61E-08	6.68E-08	6.68E-08	5.59E-08	8.60E-08	1.12E-07	2.52E-09	2.52E-09	2.52E-09	8.44E-07
Cadmium	5.14E-06	5.14E-06	6.88E-06	6.86E-06	6.86E-06	5.14E-06	5.14E-06	6.12E-06	6.12E-06	5.13E-06	7.88E-06	1.03E-05	2.31E-07	2.31E-07	2.31E-07	7.74E-05
Chromium	6.55E-06	6.55E-06	8.76E-06	8.73E-06	8.73E-06	6.55E-06	6.55E-06	7.79E-06	7.79E-06	6.52E-06	1.00E-05	1.31E-05	2.94E-07	2.94E-07	2.94E-07	9.85E-05
Cobalt	3.93E-07	3.93E-07	5.26E-07	5.24E-07	5.24E-07	3.93E-07	3.93E-07	4.67E-07	4.67E-07	3.91E-07	6.02E-07	7.85E-07	1.77E-08	1.77E-08	1.77E-08	5.91E-06
Dichlorobenzene	5.61E-06	5.61E-06	7.51E-06	7.48E-06	7.48E-06	5.61E-06	5.61E-06	6.68E-06	6.68E-06	5.59E-06	8.60E-06	1.12E-05	2.52E-07	2.52E-07	2.52E-07	8.44E-05
Formaldehyde	3.51E-04	3.51E-04	4.69E-04	4.68E-04	4.68E-04	3.51E-04	3.51E-04	4.17E-04	4.17E-04	3.49E-04	5.37E-04	7.01E-04	1.58E-05	1.58E-05	1.58E-05	5.28E-03
Hexane	8.42E-03	8.42E-03	1.13E-02	1.12E-02	1.12E-02	8.42E-03	8.42E-03	1.00E-02	1.00E-02	8.39E-03	1.29E-02	1.68E-02	3.79E-04	3.79E-04	3.79E-04	1.27E-01
Lead	2.34E-06	2.34E-06	3.13E-06	3.12E-06	3.12E-06	2.34E-06	2.34E-06	2.78E-06	2.78E-06	2.33E-06	3.58E-06	4.67E-06	1.05E-07	1.05E-07	1.05E-07	3.52E-05
Mangenese	1.78E-06	1.78E-06	2.38E-06	2.37E-06	2.37E-06	1.78E-06	1.78E-06	2.11E-06	2.11E-06	1.77E-06	2.72E-06	3.55E-06	7.99E-08	7.99E-08	7.99E-08	2.67E-05
Mercury	1.22E-06	1.22E-06	1.63E-06	1.62E-06	1.62E-06	1.22E-06	1.22E-06	1.45E-06	1.45E-06	1.21E-06	1.86E-06	2.43E-06	5.47E-08	5.47E-08	5.47E-08	1.83E-05
Napthalene	2.85E-06	2.85E-06	3.82E-06	3.80E-06	3.80E-06	2.85E-06	2.85E-06	3.39E-06	3.39E-06	2.84E-06	4.37E-06	5.70E-06	1.28E-07	1.28E-07	1.28E-07	4.29E-05
Nickel	9.82E-06	9.82E-06	1.31E-05	1.31E-05	1.31E-05	9.82E-06	9.82E-06	1.17E-05	1.17E-05	9.78E-06	1.50E-05	1.96E-05	4.42E-07	4.42E-07	4.42E-07	1.48E-04
POM	4.11E-07	4.11E-07	5.51E-07	5.49E-07	5.49E-07	4.11E-07	4.11E-07	4.90E-07	4.90E-07	4.10E-07	6.30E-07	8.23E-07	1.85E-08	1.85E-08	1.85E-08	6.19E-06
Selenium	1.12E-07	1.12E-07	1.50E-07	1.50E-07	1.50E-07	1.12E-07	1.12E-07	1.34E-07	1.34E-07	1.12E-07	1.72E-07	2.24E-07	5.05E-09	5.05E-09	5.05E-09	1.69E-06
Toluene	1.59E-05	1.59E-05	2.13E-05	2.12E-05	2.12E-05	1.59E-05	1.59E-05	1.89E-05	1.89E-05	1.58E-05	2.44E-05	3.18E-05	7.15E-07	7.15E-07	7.15E-07	2.39E-04
TOTAL HAPS	8.83E-03	8.83E-03	1.18E-02	1.18E-02	1.18E-02	8.83E-03	8.83E-03	1.05E-02	1.05E-02	8.80E-03	1.35E-02	1.77E-02	3.97E-04	3.97E-04	3.97E-04	0.13

EPCRA 313 Chemical[a]	Emissions from all Small Boilers[b]	
	Emission Factor (lbs/MMscf)	Emission (lbs)
Lead[c]	5.0E-04	2.97E-01
Sulfuric Acid[d]	0.6	355.84
Mercury[c]	2.6E-04	1.54E-01
PACs[e]	8.69E-07	5.15E-04
perylene[c]	1.20E-06	7.12E-04

References

(a) Amount of EPCRA chemical in fuel is considered "otherwise used" for EPCRA 313 threshold determination

(b) Combustion compounds emitted are considered "manufactured" for EPCRA 313 threshold deteminations. Lead and mercury are included with lead compounds and mercury compounds respectively.

(c) Emission Factors from AP-42, Section 1.4, Natural Gas Combustion, Tables 1.4-2, 1.4-3 and 1.4-4, July 1998

(d) Assume all SOx emissions are converted to sulfuric acid in the stack.

(e) EPCRA PAC Guidance Document, Table 2-3

Greenhouse Gas Emissions

Emission Factors			References
CO_2 [(a)]	53.02	kg/mmBtu	(a) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel."
CH_4 [(b)]	0.001	kg/mmBtu	(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel."
N_2O [(b)]	0.0001	kg/mmBtu	(c) The average high heat value (HHV) is shown. Initial HHV is provided in Btu/SCF. HHV is taken from the monthly "Totalizer Report".
			(d) Boiler Pool Capacity and Design Ratings were determined using the EAQ boilers data base.
			(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

LANL Natural Gas High Heat Value[(c)]: **1024.8** mmBtu/mmSCF — Equation: Fuel Use MMscf/year * Nat. Gas MMBTU/MMscf * Emission Factor kg/MMBTU * metric ton/1000 kg

Metered Boilers			Calender Year				Fiscal Year			
Location	Unit No.	NMED ID	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)
TA-55-6	BHW-1	29	506.336	0.010	0.001	506.8	450.750	0.009	0.001	451.2
TA-55-6	BHW-2	30	778.536	0.015	0.001	779.3	798.31	0.015	0.002	799.1
TA-55-440	B-1thru3		68.557	0.001	0.0001	68.6	1004.17	0.019	0.0019	1005.2
		Metered Total	1353.428	0.026	0.003	1286.1	2253.2	0.0	0.0	1250.3

Non-Metered Boilers			Calender Year				Fiscal Year			
Location	Unit No.	NMED ID	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	Total CO2 Equivalents (metric tons)
TA-48-1	BS-1	8	508.165	0.010	0.001	508.7	502.51	0.009	0.001	503.0
TA-48-1	BS-2	9	508.084	0.010	0.001	508.6	502.43	0.009	0.001	502.9
TA-48-1	BS-6	10	679.927	0.013	0.001	680.6	672.36	0.013	0.001	673.0
TA-53-365	BHW-1	11	677.499	0.013	0.001	678.2	669.96	0.013	0.001	670.6
TA-53-365	BHW-2	12	677.499	0.013	0.001	678.2	669.96	0.013	0.001	670.6
TA-59-1	BHW-1	13	508.084	0.010	0.001	508.6	502.43	0.009	0.001	502.9
TA-59-1	BHW-2	14	508.084	0.010	0.001	508.6	502.43	0.009	0.001	502.9
TA-16-1484	Plant 5	53	1209.394	0.023	0.002	1210.6	1195.94	0.023	0.022	1203.2
TA-50-2	BS-1	None	1016.086	0.019	0.002	1017.1	1004.78	0.019	0.002	1005.8
Lab Wide	Various	None	22608.840	0.426	0.043	22631.0	22357.29	0.422	0.042	22379.2
		Non-Metered Total	28901.660	0.545	0.055	28930.0	28580.1	0.5	0.1	28614.3
			Small Boiler Total CO2 Equivalents (metric tons)			30216.1	Small Boiler Total CO2 Equivalents (metric tons)			29864.5

FY2011 Daily Turbine Gas Use (MCF), 12 Month Rolling Total Gas Use, & Hours of Operation

	Jan		Feb		Mar		Apr		May		Jun		July		Aug		Sept		Oct		Nov		Dec	
Day	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs	Gas Use	Hrs
1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	1637	10.0	0	0.0	1883	8.7	891	4.3
2	0	0.0	1	0.0	803	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1545	10.0	0	0.0	0	0.0	0	0.0
3	30	0.0	61	2.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1915	9.2	0	0.0	0	0.0
4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	25	0.2	0	0.0	1968	8.7	3	0.0	0	0.0
5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2009	9.2	0	0.0	0	0.0
6	48	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	1470	6.9	0	0.0	1	0.0
7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	47	0.5	71	1.4	1	0.0
8	0	0.0	104	2.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	12	0.0	0	0.0	714	4.0	392	2.5	0	0.0	1752	8.1	0	0.0
10	0	0.0	753	5.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
11	0	0.0	56	1.9	0	0.0	63	0.8	0	0.0	0	0.0	0	0.0	11	0.5	0	0.0	0	0.0	0	0.0	1	0.0
12	1	0.0	0	0.0	0	0.0	0	0.0	212	2.0	0	0.0	0	0.0	0	0.0	0	0.0	1083	5.7	0	0.0	18	0.4
13	885	4.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0	0	0.0	0	0.0	1770	8.6	0	0.0	0	0.0
14	0	0.0	0	0.0	0	0.0	757	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	873	5.0	10	0.0	0	0.0	0	0.0	890	4.4
16	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	895	5.0	0	0.0	0	0.0	0	0.0	0	0.0
17	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1267	7.0	0	0.0	0	0.0	918	5.4	0	0.0
18	2754	12.4	879	4.9	0	0.0	0	0.0	6	0.0	0	0.0	0	0.0	14	0.0	0	0.0	0	0.0	0	0.0	0	0.0
19	5886	24.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	18	0.4	634	4.0	0	0.0	1664	7.8	0	0.0	0	0.0
20	3553	12.1	0	0.0	0	0.0	0	0.0	26	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1616	7.6	0	0.0	24	0.5
21	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	734	4.5	0	0.0	801	5.7	1873	9.4	0	0.0	0	0.0
22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1099	6.0	0	0.0	0	0.0	0	0.0	898	5.0
23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	710	4.0	0	0.0	999	6.5	0	0.0	0	0.0	0	0.0	0	0.0
24	0	0.0	1296	4.6	778	4.8	0	0.0	23	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1711	9.7	0	0.0	0	0.0
26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1712	6.7	0	0.0	0	0.0
27	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	795	3.8	1	0.0	0	0.0
28	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1112	7.8	0	0.0	0	0.0	0	0.0
29	0	0.0			0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	4174	24.0	0	0.0	0	0.0	0	0.0
30	0	0.0			56	1.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2993	16.1	0	0.0	0	0.0	0	0.0
31	0	0.0			0	0.0			0	0.0			0	0.0	1264	7.0			1913	8.8			0	0.0
SUM	13158	53.4	3151	21.5	1639	10.3	820	5.25	267	2	723	4	754	4.9	7797	45.5	12664	76.1	21546	103	4628	23.6	2724	14.6
12 Month Rolling Gas Use (MCF)	91239		94388		94523		92003		89306		75352		63866		71523		84129		85461		83235		69871	

First Half Gas Use: 19758 MCF **Second Half Gas Use: 50113 MCF** **Annual Gas Use: 69,871 MCF**

Permit Limit (12 mo rolling): 646 mmscf or **646,000 mscf** High Heat Value (HHV) for natural gas[k] = 1024.8 mmBtu/mscf

Reviewed by/date: _____

2011 Combustion Turbine Emissions (Actual)

Pollutant / Criteria	Factors	Unit Emissions (Tons) TA-3-2422 Combustion Turbine Annual	Jan-June	July-Dec	Reference
NOx	50.5	1.764	0.499	1.265	a
SOx	3.5	0.122	0.035	0.088	b
PM	6.8	0.238	0.067	0.170	c
PM_{10}	6.8	0.238	0.067	0.170	c
CO	10.5	0.367	0.104	0.263	a
VOC	2.2	0.077	0.022	0.055	d
HAPs / TRI					
Acetaldehyde	4.12E-02	1.44E-03	4.07E-04	1.03E-03	e, f, g
Acrolein	6.59E-03	2.30E-04	6.51E-05	1.65E-04	e, f, g
Benzene	1.24E-02	4.32E-04	1.22E-04	3.10E-04	e, f,g
Benzo (a) anthracene	3.09E-03	1.08E-04	3.05E-05	7.74E-05	f, h
1,3-Butadiene	4.43E-04	1.55E-05	4.38E-06	1.11E-05	e, f, g
Cadmium	7.11E-03	2.48E-04	7.02E-05	1.78E-04	f, h
Chromium	1.34E-02	4.68E-04	1.32E-04	3.36E-04	f, h
Copper	7.11E-02	2.48E-03	7.02E-04	1.78E-03	f, h
Ethylbenzene	3.30E-02	1.15E-03	3.26E-04	8.26E-04	e, f, g
Fluoranthene	1.24E-03	4.32E-05	1.22E-05	3.10E-05	f, h
Formaldehyde	7.31E-01	2.55E-02	7.22E-03	1.83E-02	e, f, g
Manganese	8.24E-02	2.88E-03	8.14E-04	2.06E-03	f, h
Mercury	6.80E-03	2.37E-04	6.72E-05	1.70E-04	f, h
Napthalene	1.34E-03	4.68E-05	1.32E-05	3.36E-05	e, f, g
Nickel	1.18E-01	4.14E-03	1.17E-03	2.97E-03	f, h
PAH	2.27E-03	7.92E-05	2.24E-05	5.68E-05	e, f, g
Phenol	1.34E-02	4.68E-04	1.32E-04	3.36E-04	e, f, h
Propylene Oxide	2.99E-02	1.04E-03	2.95E-04	7.48E-04	e, f, g
Toluene	1.34E-01	4.68E-03	1.32E-03	3.36E-03	e, f, g
Xylenes (isomers)	6.59E-02	2.30E-03	6.51E-04	1.65E-03	e, f, g
TOTAL HAPS		**4.80E-02**	**1.36E-02**	**3.45E-02**	

Greenhouse Gases	Emission Factors (kg/mmBtu)	Calender Yr (metric tons)	Fiscal Yr (metric tons)	Reference
CO_2	53.02	3796.6	4571.3	i, l
CH_4	0.001	0.072	0.086	j, l
N_2O	0.0001	0.007	0.009	j, l
CO_2 Equivalent Emissions (metric tons):		3800.3	4575.8	

References:

(a) Values are from the initial compliance test (TRC - October 22, 2007). Test shows average NOx as 11.29 lbs/hr and CO as 2.35 lbs/hr. These were divided by the gas flow rate of 0.223620 MMscf/hr to get 50.48 lb/MMscf (rounded to 50.5) for NOx and 10.5 lb/MMscf for CO.The SCFH value (fuel flow rate) from the compliance test report (223620 SCFH or 223.6 MSCFH)

(b) The SOx emission factor was taken from AP-42 Table 3.1-2a. The default value is used when percent sulfur is unknown (0.0034 lb/mmbtu). This is equivilant to converting the 2 grains per 100 scf to percent. The 0.0034 lb/mmbtu was converted to lb/mmscf by multiplying by 1030 btu/scf (the heat value of natural gas), to provide 3.5 lb/mmscf.

(c) PM was calculated by taking the AP-42, Table 3.1-2a, EF of 6.6E-3 lb/MMBtu and multiplying it by 1030 BTU/scf to get 6.8 lb/MMscf. PM10 was calculated the same as PM, as most PM from natural gas combustion is less than 1 micrometer.

(d) The VOC emission factor was taken from AP-42 Table 3.1-2a. The factor, 2.1 E-03 lb/mmbtu, was converted to lb/mmscf by multiplying by 1030 giving 2.2 lbs/mmscf.

(e) These chemicals are HAPs

(f) These chemicals are EPCRA 313 listed chemicals.

(g) Emission factor from AP-42, table 3.1-3 (lb/mmbtu). This was multiplied by 1030 Btu/scf to provide the lb./mmscf factor.

(h) Emission factors from EPA FIRE database (SCC: 20300202 & 20200201). These values were also converted from lb/mmbtu to lb/mmscf. Retrieved 4-14-08.

(i) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO2 Emission Factors and High Heat Values for Various Types of Fuel." Units are kg/mmBtu.

(j) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH4 and N2O Emission Factors for Various Types of Fuel." Units are kg/mmBtu.

(k) Average high heat values for natural gas used at LANL were calculated each month. The average was taken from the monthly "TA-3 Power Plant Totalizer Report."

(l) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

Reviewed by/date: _____

TA-3 Power Plant Fuel Use Totals 2011 (Data Entry)

	DATA ENTRY							
	TA-3-22 Power Plant[b] Boiler # 1 (Edgemoor Iron Works, 210 mmBtu/hr)		TA-3-22 Power Plant[b] Boiler # 2 (Edgemoor Iron Works, 210 mmBtu/hr)		TA-3-22 Power Plant[b] Boiler # 3 (Union Iron Works, 210 mmBtu/hr)		Monthly Totals	
Month	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mscf)[a]	Fuel Oil (gallons)[a]	Natural Gas (mmscf)[a]	Fuel Oil (gallons)[a]
January	37,995	572	21,512	0	4,669	0	64.177	572
February	40,628	21,178	8,047	27,456	1,792	0	50.467	48634
March	24,059	20	18,764	74	54	0	42.877	94
April	3,976	0	31,332	0	0	0	35.308	0
May	0	57	33,136	0	0	0	33.136	57
June	0	0	15,488	0	0	0	15.488	0
July	9,426	0	6,957	0	13	0	16.396	0
August	17,133	0	1	0	1	0	17.135	0
September	12,049	0	0	0	7,444	0	19.493	0
October	25,615	0	0	0	6,694	0	32.309	0
November	43,550	0	4,348	114	430	0	48.328	114
December	2,790	629	63,964	0	1	0	66.755	629
Annual Totals:	217,221	22,456	203,549	27,644	21,098	0	441.867	50100
Jan. - June	106,658	21,827	128,279	27,530	6,515	0	241.451	49357
July - Dec.	110,563	629	75,270	114	14,583	0	200.416	743

Month	12-Mo. Rolling Total Natural Gas (mmscf)	12-Mo. Rolling Total Fuel Oil (gallons)
January	451.8	1261
February	442.9	49785
March	433.0	49742
April	430.4	49578
May	434.4	49635
June	432.3	49635
July	434.3	49635
August	433.1	49357
September	435.9	49357
October	435.8	49357
November	432.5	49471
December	441.9	50100

Permit Limits:	2000 mmscf	500,000 gallons

For References, See "Emission Summary Sheet"

Data Reviewed By: _____

12 Month Rolling Total for each Individual Boiler

	Boiler 1		Boiler 2		Boiler 3	
Month	Natural Gas (mmscf)	Fuel Oil (gal.)	Natural Gas (mmscf)	Fuel Oil (gal.)	Natural Gas (mmscf)	Fuel Oil (gal.)
January	176	572	118	411	158	278
February	200	21,750	107	27,757	136	278
March	199	21,770	121	27,694	114	278
April	203	21,770	151	27,530	76	278
May	203	21,827	184	27,530	48	278
June	203	21,827	199	27,530	30	278
July	212	21,827	195	27,530	27	278
August	229	21,827	177	27,530	27	0
September	241	21,827	160	27,530	34	0
October	247	21,827	150	27,530	39	0
November	242	21,827	155	27,644	35	0
December	217	22,456	204	27,644	21	0

Individual Unit Permit Limits:	**1200 mmscf Natural Gas**	**170,00 gallons Fuel Oil**

Month	Boiler 1 Hours	Boiler 2 Hours	Boiler 3 Hours	Total Hours
January	474.0	281.0	89.0	844.0
February	619.0	208.0	48.0	875.0
March	405.0	335.0	1.0	741.0
April	86.0	633.0	0.0	719.0
May	0.0	744.0	0.0	744.0
June	0.0	567.0	0.0	567.0
July	410.0	331.0	0.0	741.0
August	744.0	0.0	0.0	744.0
September	455.0	0.0	262.0	717.0
October	581.0	0.0	167.0	748.0
November	645.0	67.0	5.0	717.0
December	42.0	718.0	0.0	760.0

Emissions by Boiler 2011

Pollutant Criteria	Emission Factor		Unit Emissions				Unit Emissions				Unit Emissions			
			Boiler #1, Stack 032				Boiler #2, Stack 033				Boiler #3, Stack 034			
	Natural Gas (lb/mmscf)[a]	Fuel Oil[f] Pounds/ 1000 gal	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)	Annual Natl Gas (tons)	Annual Fuel Oil (tons)	Jan-June (gas&oil) (tons)	July-Dec (gas&oil) (tons)
NOx[c]	58	8.64	6.299	0.097	3.187	3.209	5.903	0.119	3.839	2.183	0.612	0.000	0.189	0.423
SOx[g]	0.6	7.4	0.065	0.083	0.113	0.035	0.061	0.102	0.140	0.023	0.006	0.000	0.002	0.004
PM[d]	7.6	3.3	0.825	0.037	0.441	0.421	0.773	0.046	0.533	0.286	0.080	0.000	0.025	0.055
PM-10[d]	7.6	2.3	0.825	0.026	0.430	0.421	0.773	0.032	0.519	0.286	0.080	0.000	0.025	0.055
PM-2.5[d]	7.6	1.55	0.825	0.017	0.422	0.421	0.773	0.021	0.509	0.286	0.080	0.000	0.025	0.055
CO[e]	40	5.0	4.344	0.056	2.188	2.213	4.071	0.069	2.634	1.506	0.422	0.000	0.130	0.292
VOC	5.5	0.2	0.597	0.0022	0.295	0.304	0.560	0.0028	0.356	0.207	0.058	0.000	0.018	0.040
HAPs[h]														
Arsenic	0.0002	0.00055	2.17E-05	6.15E-06	1.66E-05	1.12E-05	2.04E-05	7.57E-06	2.04E-05	7.56E-06	2.11E-06	0.00E+00	6.52E-07	1.46E-06
Benzene	0.0021	-	2.28E-04	0.0	1.12E-04	1.16E-04	2.14E-04	0.0	1.35E-04	7.90E-05	2.22E-05	0.0	6.84E-06	1.53E-05
Beryllium	0.000012	0.00041	1.30E-06	4.61E-06	5.13E-06	7.93E-07	1.22E-06	5.68E-06	6.43E-06	4.75E-07	1.27E-07	0.00E+00	3.91E-08	8.75E-08
Cadmium	0.0011	0.00041	1.19E-04	4.61E-06	6.31E-05	6.09E-05	1.12E-04	5.68E-06	7.62E-05	4.14E-05	1.16E-05	0.00E+00	3.58E-06	8.02E-06
Chromium	0.0014	0.00041	1.52E-04	4.61E-06	7.91E-05	7.75E-05	1.42E-04	5.68E-06	9.55E-05	5.27E-05	1.48E-05	0.00E+00	4.56E-06	1.02E-05
Cobalt	0.000084	-	9.12E-06	0.0	4.48E-06	4.64E-06	8.55E-06	0.0	5.39E-06	3.16E-06	8.86E-07	0.0	2.74E-07	6.12E-07
Dichlorobenzene	0.0012	-	1.30E-04	0.0	6.40E-05	6.63E-05	1.22E-04	0.0	7.70E-05	4.52E-05	1.27E-05	0.0	3.91E-06	8.75E-06
Formaldehyde	0.075	0.048	8.15E-03	5.39E-04	4.52E-03	4.16E-03	7.63E-03	6.63E-04	5.47E-03	2.83E-03	7.91E-04	0.00E+00	2.44E-04	5.47E-04
Hexane	1.8	-	1.95E-01	0.0	9.60E-02	9.95E-02	1.83E-01	0.0	1.15E-01	6.77E-02	1.90E-02	0.0	5.86E-03	1.31E-02
Lead	0.0005	0.00123	5.43E-05	1.38E-05	4.01E-05	2.80E-05	5.09E-05	1.70E-05	4.90E-05	1.89E-05	5.27E-06	0.00E+00	1.63E-06	3.65E-06
Mangenese	0.00038	0.00082	4.13E-05	9.23E-06	2.92E-05	2.13E-05	3.87E-05	1.14E-05	3.57E-05	1.43E-05	4.01E-06	0.00E+00	1.24E-06	2.77E-06
Mercury[i]	0.00026	0.00041	2.82E-05	4.61E-06	1.84E-05	1.45E-05	2.65E-05	5.68E-06	2.23E-05	9.81E-06	2.74E-06	0.00E+00	8.47E-07	1.90E-06
Napthalene	0.00061	-	6.63E-05	0.0	3.25E-05	3.37E-05	6.21E-05	0.0	3.91E-05	2.30E-05	6.43E-06	0.0	1.99E-06	4.45E-06
Nickel	0.0021	0.00041	2.28E-04	4.61E-06	1.16E-04	1.16E-04	2.14E-04	5.68E-06	1.40E-04	7.91E-05	2.22E-05	0.00E+00	6.84E-06	1.53E-05
POM	0.000088	0.0033	9.56E-06	3.71E-05	4.07E-05	5.90E-06	8.96E-06	4.56E-05	5.11E-05	3.50E-06	9.28E-07	0.00E+00	2.87E-07	6.42E-07
Selenium	0.000024	0.00206	2.61E-06	2.31E-05	2.37E-05	1.97E-06	2.44E-06	2.84E-05	2.98E-05	1.02E-06	2.53E-07	0.00E+00	7.82E-08	1.75E-07
Toluene	0.0034	-	3.69E-04	0.0	1.81E-04	1.88E-04	3.46E-04	0.0	2.18E-04	1.28E-04	3.59E-05	0.0	1.11E-05	2.48E-05
TOTAL HAPS			2.05E-01	6.51E-04	1.01E-01	1.04E-01	1.92E-01	8.02E-04	1.22E-01	7.11E-02	1.99E-02	0.00E+00	6.15E-03	1.38E-02

For References, see Emission Summary.

Data Reviewed By: _____

Greenhouse Gas Emissions

CALENDER YEAR	Natural Gas Emissions			Fuel Oil Emissions			Total Emissions		
Emission Unit Number	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons
TA-3-22-1	11803.1	0.223	0.022	229.2	0.009	0.002	12032.3	0.232	0.024
TA-3-22-2	11060.2	0.209	0.021	282.1	0.011	0.002	11342.3	0.220	0.023
TA-3-22-3	1146.4	0.022	0.002	0.0	0.000	0.000	1146.4	0.022	0.002
Fuel Type Totals:	24009.6	0.453	0.045	511.344	0.021	0.004			
Plant Totals (metric tons):							**24520.9**	**0.474**	**0.049**
CO_2 Equivalent Total Emissions (metric tons):							**24546.2**		

FISCAL YEAR [e]	Natural Gas Emissions			Fuel Oil Emissions			Total Emissions		
Emission Unit Number	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons	CO2 metric tons	CH4 metric tons	N2O metric tons
TA-3-22-1	13118.2	0.247	0.025	222.8	0.009	0.002	13340.9	0.256	0.027
TA-3-22-2	8715.3	0.164	0.016	281.0	0.011	0.002	8996.3	0.176	0.019
TA-3-22-3	1849.5	0.035	0.003	0.0	0.000	0.000	1849.5	0.035	0.003
Fuel Type Totals:	23683.0	0.447	0.045	503.8	0.020	0.004			
Plant Totals (metric tons):							**24186.7**	**0.467**	**0.049**
CO_2 Equivalent Total Emissions (metric tons):							**24211.6**		

LANL Natural Gas High Heat Value[c]:	**1024.8**	mmBtu/mmscf
Fuel Oil Default High Heat Value[a]:	**0.138**	mmBtu/gallon

GHG Emission Factors

Pollutant	Natural Gas		Fuel Oil	
CO_2 [a]	53.02	kg/mmBtu	73.96	kg/mmBtu
CH_4 [b]	0.001	kg/mmBtu	0.003	kg/mmBtu
N_2O [b]	0.0001	kg/mmBtu	0.0006	kg/mmBtu

References

(a) Emission Factor/High Heat Value is from 40 CFR Part 98, Subpart C, Table C-1, "Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel."

(b) Emission Factor is from 40 CFR Part 98, Subpart C, Table C-2, "Default CH_4 and N_2O Emission Factors for Various Types of Fuel."

(c) Natural gas was analyzed and averaged for each month. Average high heat value for the year was taken from the monthly "TA-3 Power Plant Totalizer Report" provided by Utilities and Infrastructure.

(d) Fuel use values for natural gas and fuel oil are taken from the monthly "TA-3 Power Plant Totalizer Report".

(e) Fiscal year begins on October 1st of the following year and ends on September 30th of the current year.

12 Month Rolling Emissions 2011 (Tons)

Pollutant	TSP	PM10	NOx	CO	VOC	SO_2
Permit Limit (tons/yr) 12-Month Rolling Total	**8.4**	**8.2**	**60.2**	**41.3**	**5.6**	**7.9**
January	1.719	1.718	13.108	9.039	1.243	0.140
February	1.765	1.740	13.060	8.983	1.223	0.317
March	1.728	1.703	12.773	8.785	1.196	0.314
April	1.717	1.692	12.695	8.731	1.188	0.312
May	1.733	1.708	12.813	8.813	1.200	0.314
June	1.725	1.700	12.751	8.770	1.194	0.313
July	1.732	1.707	12.810	8.810	1.199	0.314
August	1.727	1.703	12.773	8.786	1.196	0.312
September	1.738	1.713	12.853	8.841	1.204	0.313
October	1.738	1.713	12.852	8.840	1.203	0.313
November	1.725	1.700	12.756	8.774	1.194	0.312
December	1.762	1.737	13.031	8.963	1.220	0.318

Monthly Emission Totals (Tons)

Pollutant	TSP	PM10	NOx	CO	VOC	SO_2
January	0.245	0.245	1.864	1.285	0.177	0.021
February	0.272	0.248	1.674	1.131	0.144	0.195
March	0.163	0.163	1.244	0.858	0.118	0.013
April	0.134	0.134	1.024	0.706	0.097	0.011
May	0.126	0.126	0.961	0.663	0.091	0.010
June	0.059	0.059	0.449	0.310	0.043	0.005
July	0.062	0.062	0.475	0.328	0.045	0.005
August	0.065	0.065	0.497	0.343	0.047	0.005
September	0.074	0.074	0.565	0.390	0.054	0.006
October	0.123	0.123	0.937	0.646	0.089	0.010
November	0.184	0.184	1.402	0.967	0.133	0.015
December	0.255	0.254	1.939	1.337	0.184	0.022
Annual Totals	1.762	1.737	13.031	8.963	1.220	0.318

Data Reviewed By: _____

Emission Summary TA-3 Power Plant 2011

Pollutant Criteria	Emission Factor		Annual Emissions (Natural Gas + Fuel Oil) (tons)	Jan-June Emissions (Natural Gas + Fuel Oil) (tons)	July-Dec Emissions (Natural Gas + Fuel Oil) (tons)	Reference	
	Natural Gas (lb/MMscf)[a]	Fuel Oil[f] (lb/1000 gal.)				Gas	Oil
NOx	58	8.64	13.031	7.215	5.815	(c)	(c)
SOx	0.6	7.4	0.318	0.255	0.063	(a)(j)	(g)(j)
PM	7.6	3.3	1.762	0.999	0.763	(d)	(d)
PM-10	7.6	2.3	1.737	0.974	0.762	(d)	(d)
PM-2.5	7.6	1.55	1.718	0.956	0.762	(d)	(d)
CO	40	5.0	8.963	4.952	4.010	(b)	(g)
VOC	5.5	0.2	1.220	0.669	0.551	(b)	(i)
HAPs[h]							
Arsenic	0.0002	0.00055	5.79E-05	3.77E-05	2.02E-05	(a)	(k)
Benzene	0.0021	-	4.64E-04	2.54E-04	2.10E-04	(c)	
Beryllium	0.000012	0.00041	1.29E-05	1.16E-05	1.36E-06	(c)	(k)
Cadmium	0.0011	0.00041	2.53E-04	1.43E-04	1.10E-04	(c)	(k)
Chromium	0.0014	0.00041	3.20E-04	1.79E-04	1.40E-04	(c)	(k)
Cobalt	0.000084	-	1.86E-05	1.01E-05	8.42E-06	(c)	
Dichlorobenzene	0.0012	-	2.65E-04	1.45E-04	1.20E-04	(c)	
Formaldehyde	0.075	0.048	1.78E-02	1.02E-02	7.53E-03	(c)	(k)
Hexane	1.8	-	3.98E-01	2.17E-01	1.80E-01	(c)	
Lead	0.0005	0.001233	1.41E-04	9.08E-05	5.06E-05	(c)	(k)
Manganese	0.00038	0.000822	1.05E-04	6.62E-05	3.84E-05	(c)	(k)
Mercury	0.00026	0.000411	6.77E-05	4.15E-05	2.62E-05	(i)(c)	(i)(k)
Napthalene	0.00061	-	1.35E-04	7.36E-05	6.11E-05	(c)	
Nickel	0.0021	0.000411	4.74E-04	2.64E-04	2.11E-04	(c)	(k)
POM	0.000088	0.0033	1.02E-04	9.21E-05	1.00E-05	(c)	(k)
Selenium	0.000024	0.002055	5.68E-05	5.36E-05	3.17E-06	(c)	(k)
Toluene	0.0034	-	7.51E-04	4.10E-04	3.41E-04	(c)	
TOTAL HAPS			4.19E-01	2.29E-01	1.89E-01		
EPCRA 313				lbs./year			
Lead	0.0005	0.00123	1.41E-04	0.283		(c)	(i)(k)
Sulfuric Acid	0.60	0.285	1.40E-01	279.40		(e)(j)	(e)(h)
Mercury	0.00026	0.00041	6.77E-05	0.135		(c)	(i)(k)
PACs	8.69E-07	1.65E-05	6.05E-07	1.21E-03		(f)(l)	(f)(l)
Benzo(g,h,i) perylene	1.20E-06	2.26E-06	3.22E-07	6.43E-04		(i)(k)(c)	(f)
Zinc	-	0.00055	1.37E-05	2.75E-02			(k)

Reference

(a) AP-42, 7/98, Section. 1.4, *Natural Gas Combustion* , Tables 1.4-1, 1.4-2

(b) Fuel usage obtained from Jerry Gonzales (FWO-UI). Values are provided in a monthly data deliverable from KSL.

(c) Average of source tests conducted on all 3 boilers September 2002 burning natural gas after FGR installed. Assumed FGR resulted in similar Nox reduction for oil.

(d) All PM from natural gas is assumed <1µ, so PM-10, PM-2.5 and total PM have equal EFs, AP-42, Natural Gas Combustion, Table 1.4-2. The PM emission factor for fuel oil is the sum of filterable and condensable PM.

(e) AP-42, 1/95, Section. 1.4, Natural Gas Combustion, Table 1.4-2. Consistent with previous stack tests.

(f) AP-42, 9/98, Section. 1.3, *Fuel Oil Combustion* , Table 1.3-1 with Errata, Table 1.3-3, and Table 1.3-6.

(g) Boilers>100 MMBtu/hr: SOx Emission Factor (SO_2 {142S} + SO_3 {5.7S}) = 147.7 * S (from AP-42, Table 1.3-1 w/Errata) (S = weight % sulfur in oil)(Sulfur content per analysis on oil in tanks in August 01', no new oil delivered in 02'/03')

S(%)= 0.05

(h) HAP emission factors for natural gas from AP-42, Tables 1.4-3 an 1.4-4, for fuel oil from AP-42 Tables 1.3-8 and 1.3-10.

(i) AP-42, Table 1.4-2, 1.4-3, and 1.4-4, July 1998

(j) Assume all SO_3 is converted to sulfuric acid.

(k) AP-42, tables 1.3-9 and 1.3-10, September 1998.

(l) EPCRA PAC Guidance Document, Table 2-3.

Reviewed By/Date:

ATTACHMENT B:

2011 Annual Emissions Inventory Submittal to NMED

New Mexico Environment Department

Subject Item List

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Facility Annual Emissions - Subject Item List

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Subject Item/Equipment

	Type	ID	Designation	Description	Complete
○	Federal Agency	856	2195R50	Los Alamos National Laboratory	
◉	Asphalt Drum/Burner	116	TA-60-BDM	Asphalt Plant Dryer - Propane	☑
○	Beryllium Work	2	TA-35-213	Be Target Fabrication Facility - Machining TA-35-213	☑
○	Beryllium Work	3	TA-3-141	Be Test Facility - Machining TA-3-141	☑
○	Beryllium Work	6	TA-55-PF4 (a)	Plutonium Facility Beryllium machining, weld cutting / dressing and metallography	☑
○	Beryllium Work	41	TA-3-66	Sigma Facility-electroplating/metallography	☑
○	Boiler	8	TA-48-1-BS-1	Boiler TA-48-1-BS-1	☑
○	Boiler	9	TA-48-1-BS-2	Boiler TA-48-1-BS-2	☑
○	Boiler	10	TA-48-1-BS-6	Boiler TA-48-1-BS-6	☑
○	Boiler	11	TA-53-365-BHW-1	Boiler TA-53-365-BHW-1	☑
○	Boiler	12	TA-53-365-BHW-2	Boiler TA-53-365-BHW-2	☑
○	Boiler	13	TA-59-1-BHW-1	Boiler TA-59-1-BHW-1	☑
○	Boiler	14	TA-59-1-BHW-2	Boiler 59-1-BHW-2	☑
○	Boiler	24	TA-3-22-1	Power Plant Boiler (pph, Natural Gas)	☑
○	Boiler	25	TA-3-22-2	Power Plant Boiler (pph, Natural Gas)	☑
○	Boiler	26	TA-3-22-3	Power Plant Boiler (pph, Natural Gas)	☑
○	Boiler	29	TA-55-6-BHW-1	Sellers Boiler TA-55-6-BHW-1	☑
○	Boiler	30	TA-55-6-BHW-2	Sellers Boiler TA-55-6-BHW-2	☑
○	Boiler	53	TA-16-1484-BS-2	Low NOx Boiler TA-16-1484-BS-2	☑
○	Boiler	90	B-1	Boiler-CMRR	☑
○	Boiler	104	B-2	Boiler-CMRR	☑
○	Boiler	105	B-3	Boiler-CMRR	☑
○	Boiler	106	B-4	Boiler-CMRR	☑
○	Boiler	107	B-5	Boiler-CMRR	☑
○	Boiler	133	TA-50-2-BS-1	Superior Model M56-5-1500-S260	☑
○	Boiler	134	TA-16-1484-BS-1	Low NOx Boiler TA-16-1484-BS-1	☑
○	Boiler	137	TA-3-22-2	Power Plant Boiler (pph, No. 2 fuel oil)	☑
○	Boiler	138	TA-3-22-3	Power Plant Boiler (pph, No. 2 fuel oil)	☑
○	Boiler	140	BOILERS	Boilers - GHG only	☑
○	Boiler	141	TA-3-22-1	Power Plant Boiler (pph, No. 2 fuel oil)	☑
○	Boiler	144	All Boilers	Natural Gas and No. 2 Fuel Boilers (cap)	☑
○	Internal combustion engine	56	TA-33-G-1	Kohler Diesel Generator TA-33-G-1	☑
○	Internal combustion engine	119	TA-33-G-2	Kohler Diesel Generator TA-33-G-2	☑

○	Internal combustion engine	120	TA-33-G-3	Kohler Diesel Generator TA-33-G-3	☑
○	Internal combustion engine	135	TA-33-G-4	Caterpillar Diesel Generator TA-33-G-4	☑
○	Internal combustion engine	139	GENERATORS	Generators - GHG only	☑
○	Parts Washer	21	TA-55-DG-1	Degreaser - Ultrasonic Cold Batch TA-55-4	☑
○	Processing	3	TA-3-38	Carpenter Shop - General Construction	☑
○	Processing	4	TA-15-563	Carpenter Shop - Test Stands	☑
○	Research/Testing	7	LANL-FW-CHEM	R & D Activities - Labwide (031)	☑
○	Shredder	89	TA-52-11	Data Disintegrator/industrial Shredder	☑
○	Turbine	112	TA-3-22-CT-1	Combustion Turbine	☑

Detail | Emissions | Print | Export | Total Emissions | Review for Submittal

Submittal Comments

2000 character maximum

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File Attachments

Attach File to Submittal

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 116
Designation: TA-60-BDM
Description: Asphalt Plant Dryer - Propane
Type: Asphalt Drum/Burner
SCC: Industrial Processes, Mineral Products, Asphalt Concrete, Drum Mix Plant: Rotary Drum Dryer / Mixer, Natural Gas - Fired
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Propane	
Input Materials Processed:	Asphalt (OUTPUT)	
Materials Consumed:	16240.0	M gal/y
Fuel Heating Value:	91547.0	BTU/gal
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	8
Operating Time in Days per Week:	5
Operating Time in Weeks per Year:	26
Operating Time in Hours per Year:	1040
Percent of Operation During Winter:	10
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	1.2	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.03	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.003	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.003	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.02	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.005	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 2
Designation: TA-35-213
Description: Be Target Fabrication Facility - Machining TA-35-213
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1920
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Estimate
Particulate Matter (total suspended):	0.0	tons/y	Estimate

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 3
Designation: TA-3-141
Description: Be Test Facility - Machining TA-3-141
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Engineer Calculation
Particulate Matter (total suspended):	0.0	tons/y	Engineer Calculation

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 6
Designation: TA-55-PF4 (a)
Description: Plutonium Facility Beryllium machining, weld cutting / dressing and metallography
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Machining Operations, Specify Material**
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1920
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 41
Designation: TA-3-66
Description: Sigma Facility-electroplating/metallography
Type: Beryllium Work
SCC: Industrial Processes, Fabricated Metal Products, Abrasive Cleaning of Metal Parts, Polishing
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Metal (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	8
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	2912
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Beryllium:	0.0	tons/y	Design calculation

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 8
Designation: TA-48-1-BS-1
Description: Boiler TA-48-1-BS-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.352	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.39	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.47	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 9
Designation: TA-48-1-BS-2
Description: Boiler TA-48-1-BS-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.351	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.39	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.47	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 10
Designation: TA-48-1-BS-6
Description: Boiler TA-48-1-BS-6
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.513	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.53	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.011	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.63	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.048	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.048	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.048	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.034	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 11
Designation: TA-53-365-BHW-1
Description: Boiler TA-53-365-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.469	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.52	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.011	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.62	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.034	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 12
Designation: TA-53-365-BHW-2
Description: Boiler TA-53-365-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	12.469	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.52	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.011	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.62	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.034	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 13
Designation: TA-59-1-BHW-1
Description: Boiler TA-59-1-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.351	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.39	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.47	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 14
Designation: TA-59-1-BHW-2
Description: Boiler 59-1-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.351	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.39	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.47	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.036	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.026	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 24
Designation: TA-3-22-1
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	217.2	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	4.34	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.2	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	6.3	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.83	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.83	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.83	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.07	tons/y	EPA emission factors (e.g., AP-42)

Toluene; (Methyl benzene):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.6	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

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Facility Annual Emissions - Subject Item Submittal Review

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 25
Designation: TA-3-22-2
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	203.5	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	4.1	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.18	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	5.9	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.77	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.77	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.77	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.06	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.56 tons/y EPA emission factors (e.g., AP-42)

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Facility Annual Emissions - Subject Item Submittal Review

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Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 26
Designation: TA-3-22-3
Description: Power Plant Boiler (pph, Natural Gas)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	21.1	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.42	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.02	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.61	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.08	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.08	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.08	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC): 0.06 tons/y EPA emission factors (e.g., AP-42)

Subject Item Comments

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 29
Designation: TA-55-6-BHW-1
Description: Sellers Boiler TA-55-6-BHW-1
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	9.319	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.18	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.64	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.066	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.066	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.066	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.028	tons/y	Manufacturer Specification

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 30
Designation: TA-55-6-BHW-2
Description: Sellers Boiler TA-55-6-BHW-2
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	14.328	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	15
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	33
Operating Time in Hours per Year:	3465
Percent of Operation During Winter:	40
Percent of Operation During Spring:	20
Percent of Operation During Summer:	0
Percent of Operation During Fall:	40

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.27	tons/y	Manufacturer Specification
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.013	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	Manufacturer Specification
Nitrogen Dioxide:	0.99	tons/y	Actual stack test
Particulate Matter (10 microns or less):	0.1	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.1	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.1	tons/y	Manufacturer Specification
Sulfur Dioxide:	0.004	tons/y	EPA emission factors (e.g., AP-42)

Volatile Organic Compounds (VOC):	0.043	tons/y	Manufacturer Specification

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 53
Designation: TA-16-1484-BS-2
Description: Low NOx Boiler TA-16-1484-BS-2
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.13	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.21	tons/y	Design calculation
Lead:	0.0	tons/y	Design calculation
Nitrogen Dioxide:	0.21	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.042	tons/y	Design calculation
Particulate Matter (2.5 microns or less):	0.042	tons/y	Design calculation
Particulate Matter (total suspended):	0.042	tons/y	Design calculation
Sulfur Dioxide:	0.003	tons/y	Design calculation
Volatile Organic Compounds (VOC):	0.031	tons/y	Design calculation

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 90
Designation: B-1
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.421	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.005	tons/y	EPA emission factors (e.g., AP-42)

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 104
Designation: B-2
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.421	MM gal/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.005	tons/y	EPA emission factors (e.g., AP-42)

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 105
Designation: B-3
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.421	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.008	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.001	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.005	tons/y	EPA emission factors (e.g., AP-42)

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Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 106
Designation: B-4
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not been built.

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 107
Designation: B-5
Description: Boiler-CMRR
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This unit has not been built.

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 133
Designation: TA-50-2-BS-1
Description: Superior Model M56-5-1500-S260
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	18.7	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	2
Operating Time in Weeks per Year:	12
Operating Time in Hours per Year:	576
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.79	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.94	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.071	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.071	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.006	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.051	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 134
Designation: TA-16-1484-BS-1
Description: Low NOx Boiler TA-16-1484-BS-1
Type: Boiler
SCC: External Combustion Boilers, Commercial/Institutional, Natural Gas, < 10 Million Btu/hr
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	11.16	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.21	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.21	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.042	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.003	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.031	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 137
Designation: TA-3-22-2
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Distillate Oil, Grades 1 and 2 Oil
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	27644.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.069	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.001	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.12	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.032	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.021	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.046	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.1	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.003	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 138
Designation: TA-3-22-3
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Distillate Oil, Grades 1 and 2 Oil
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Formaldehyde:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Hexane:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 140
Designation: BOILERS
Description: Boilers - GHG only
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers < 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	556.81	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method

Subject Item Comments

This SI is for greenhouse gases for small boilers and we are leaving the emissions blank because we are reporting all of our greenhouse gases directly to EPA.

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 141
Designation: TA-3-22-1
Description: Power Plant Boiler (pph, No. 2 fuel oil)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	22456.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.05	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	30
Percent of Operation During Spring:	20
Percent of Operation During Summer:	20
Percent of Operation During Fall:	30

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.056	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.097	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.026	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.017	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.037	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.083	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.002	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 144
Designation: All Boilers
Description: Natural Gas and No. 2 Fuel Boilers (cap)
Type: Boiler
SCC: External Combustion Boilers, Electric Generation, Natural Gas, Boilers > 100 Million Btu/hr except Tangential
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	0.0	MM SCF/y
Fuel Heating Value:	0.0	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.0	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	0.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	0
Operating Time in Days per Week:	0
Operating Time in Weeks per Year:	0
Operating Time in Hours per Year:	0
Percent of Operation During Winter:	0
Percent of Operation During Spring:	0
Percent of Operation During Summer:	0
Percent of Operation During Fall:	0

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

This facility ID represents the total from the 3 power plant boilers for both natural gas and fuel oil. However, these emissions are already captured in facility IDs 24, 25, and 26 for natural gas and facility IDs 137, 138, and 141 for Fuel Oil. In order to avoid counting the emissions twice, Rhonda Payne has asked us to enter zeros for this facility ID.

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 56
Designation: TA-33-G-1
Description: Kohler Diesel Generator TA-33-G-1
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	33877.2	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	5
Operating Time in Days per Week:	4
Operating Time in Weeks per Year:	16
Operating Time in Hours per Year:	320
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	4.03	tons/y	Design calculation
Nitrogen Dioxide:	4.94	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.17	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.17	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.17	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.73	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.09	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 119
Designation: TA-33-G-2
Description: Kohler Diesel Generator TA-33-G-2
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	14.8	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	9
Operating Time in Hours per Year:	9
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.001	tons/y	Design calculation
Nitrogen Dioxide:	0.004	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 120
Designation: TA-33-G-3
Description: Kohler Diesel Generator TA-33-G-3
Type: Internal combustion engine
SCC: Internal Combustion Engines, Industrial, Natural Gas, Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	6.3	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	4
Operating Time in Hours per Year:	4
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.0	tons/y	Design calculation
Nitrogen Dioxide:	0.002	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.0	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.0	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 135
Designation: TA-33-G-4
Description: Caterpillar Diesel Generator TA-33-G-4
Type: Internal combustion engine
SCC: Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Rich Burn
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	237.0	gal/y
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	8.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	1
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	15
Operating Time in Hours per Year:	15
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.015	tons/y	Design calculation
Nitrogen Dioxide:	0.071	tons/y	Design calculation
Particulate Matter (10 microns or less):	0.005	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.005	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.005	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.005	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 139
Designation: GENERATORS
Description: Generators - GHG only
Type: Internal combustion engine
SCC: Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Diesel	
Input Materials Processed:	Diesel (INPUT)	
Materials Consumed:	0.0	g/yr
Fuel Heating Value:	138.0	MM BTU/M gal
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.01	percent
Percent Carbon Content:	83.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8736
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method

Subject Item Comments

This SI is for greenhouse gases for generators and we are leaving the emissions blank because we are reporting all of our greenhouse gases directly to EPA.

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 21
Designation: TA-55-DG-1
Description: Degreaser - Ultrasonic Cold Batch TA-55-4
Type: Parts Washer
SCC: Petroleum and Solvent Evaporation, Organic Solvent Evaporation, Degreasing, Trichloroethylene: General Degreasing Units
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Solvents: All (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	4
Operating Time in Days per Week:	1
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	208
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
TCE; (Trichloroethylene); (Trichloroethene):	0.011	tons/y	Material balance

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 3
Designation: TA-3-38
Description: Carpenter Shop - General Construction
Type: Processing
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Wood Working Operations, Sanding/Planning Operations: Specify
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Wood (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	12
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	4368
Percent of Operation During Winter:	20
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	20

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.047	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.023	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.05	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 4
Designation: TA-15-563
Description: Carpenter Shop - Test Stands
Type: Processing
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Wood Working Operations, Sanding/Planning Operations: Specify
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Wood (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	12
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	4368
Percent of Operation During Winter:	20
Percent of Operation During Spring:	30
Percent of Operation During Summer:	30
Percent of Operation During Fall:	20

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.018	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.009	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.019	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 7
Designation: LANL-FW-CHEM
Description: R & D Activities - Labwide (031)
Type: Research/Testing
SCC: Industrial Processes, Photographic Equipment/Health Care/Laboratories, Laboratories, Bench Scale Reagents: Research
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Operating Detail

	Value
Operating Time in Hours per Day:	24
Operating Time in Days per Week:	7
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	8760
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Acetaldehyde; (Ethyl aldehyde):	0.0	tons/y	Material balance
Acetonitrile; (Methyl cyanide):	0.0	tons/y	Material balance
Acetophenone:	0.0	tons/y	Material balance
Acrylamide:	0.0	tons/y	Material balance
Acrylic acid:	0.0	tons/y	Material balance
Acrylonitrile:	0.0	tons/y	Material balance
Ammonia:	0.0	tons/y	Material balance
Aniline:	0.0	tons/y	Material balance
Antimony:	0.0	tons/y	Material balance
Antimony compounds:	0.0	tons/y	Material balance
Arsenic Compounds:	0.0	tons/y	Material balance
Benzene:	0.0	tons/y	Material balance
Benzyl Chloride:	0.0	tons/y	Material balance
Biphenyl:	0.0	tons/y	Material balance
Bromoform; (Tribromomethane):	0.0	tons/y	Material balance
Butadiene(1,3-):	0.0	tons/y	Material balance
Cadmium:	0.0	tons/y	Material balance
Cadmium compounds:	0.0	tons/y	Material balance
Carbon Disulfide:	0.0	tons/y	Material balance
Carbon tetrachloride; (Tetrachoromethane):	0.0	tons/y	Material balance
Carbonyl sulfide:	0.0	tons/y	Material balance

Catechol (Pyrocatechol):	0.0	tons/y	Material balance
Chlorine:	0.0	tons/y	Material balance
Chloroacetic Acid:	0.0	tons/y	Material balance
Chlorobenzene(Phenyl Chloride):	0.0	tons/y	Material balance
Chloroform; (Trichloromethane):	0.0	tons/y	Material balance
Chromium:	0.0	tons/y	Material balance
Cobalt Compounds:	0.0	tons/y	Material balance
Cresol(m-); (Methylphenol, 3-):	0.0	tons/y	Material balance
Cumene:	0.0	tons/y	Material balance
Cyanide compounds:	0.0	tons/y	Material balance
Dibutylphthalate; (Di-n-butyl phthalate):	0.0	tons/y	Material balance
Diethanolamine:	0.0	tons/y	Material balance
Dimethyl Sulfate:	0.0	tons/y	Material balance
Dimethyl formamide:	0.0	tons/y	Material balance
Dimethylhydrazine(1,1-):	0.0	tons/y	Material balance
Dioxane(1,4-) (1,4-Diethyleneoxide):	0.0	tons/y	Material balance
Epichlorohydrin; (1-Chloro-2,3-epoxypropane):	0.0	tons/y	Material balance
Epoxybutane(1,2-) (1,2-Butylene oxide):	0.0	tons/y	Material balance
Ethyl Acrylate:	0.0	tons/y	Material balance
Ethyl chloride; (Chloroethane):	0.0	tons/y	Material balance
Ethylene Glycol:	0.0	tons/y	Material balance
Ethylene dibromide; (EDB); (1.2-Dibromoethane):	0.0	tons/y	Material balance
Formaldehyde:	0.0	tons/y	Material balance
Glycol Ethers:	0.0	tons/y	Material balance
Hexachlorocyclopentadiene:	0.0	tons/y	Material balance
Hexamethylphosphoramide:	0.0	tons/y	Material balance
Hexane:	0.58	tons/y	Material balance
Hydrazine:	0.0	tons/y	Material balance
Hydrochloric acid (HCl):	0.0	tons/y	Material balance
Hydrofluoric Acid; (Hydrogen fluoride):	0.0	tons/y	Material balance
Hydroquinone:	0.0	tons/y	Material balance
Iodomethane (Methyl iodide):	0.0	tons/y	Material balance
Lead Compounds:	0.0	tons/y	Material balance
Manganese:	0.0	tons/y	Material balance
Manganese compounds:	0.0	tons/y	Material balance
Mercury compounds:	0.0	tons/y	Material balance
Methanol; (Methyl alcohol):	0.0	tons/y	Material balance
Methyl Ethyl Ketone; (MEK); (2-Butanone):	0.0	tons/y	Material balance
Methyl Methacrylate:	0.0	tons/y	Material balance
Methyl bromide; (Bromomethane):	0.0	tons/y	Material balance
Methyl chloride; (Chloromethane):	0.0	tons/y	Material balance
Methyl isobutyl ketone; (Hexone); (4-Methyl-2-pentanone):	0.0	tons/y	Material balance
Methyl tert butyl ether:	0.0	tons/y	Material balance
Methylene chloride; (Dichloromethane):	0.0	tons/y	Material balance
Methylenebiphenyl isocyanate; (MDI); (Diphenylmethane diisocyanate):	0.0	tons/y	Material balance
Naphthalene:	0.0	tons/y	Material balance
Nickel:	0.0	tons/y	Material balance
Nickel compounds:	0.0	tons/y	Material balance
Nitrobenzene; (nitro-Benzene):	0.0	tons/y	Material balance
Nitrophenol(4-); (p-Nitrophenol):	0.0	tons/y	Material balance
PCE; (Perchloroethylene); (Tetrachloroethylene); (Tetrachloroethene):	0.0	tons/y	Material balance

Phenol:	0.0	tons/y	Material balance
Phenylenediamine(p-); (Phenylenediamine):	0.0	tons/y	Material balance
Phosphine:	0.0	tons/y	Material balance
Phosphorus:	0.0	tons/y	Material balance
Phthalic anhydride:	0.0	tons/y	Material balance
Polycylic Organic Matter:	0.0	tons/y	Material balance
Propylene oxide:	0.0	tons/y	Material balance
Selenium:	0.0	tons/y	Material balance
Selenium compounds:	0.0	tons/y	Material balance
Styrene:	0.0	tons/y	Material balance
TCE; (Trichloroethylene); (Trichloroethene):	0.0	tons/y	Material balance
Tetrachloroethane(1,1,2,2-):	0.0	tons/y	Material balance
Titanium tetrachloride:	0.0	tons/y	Material balance
Toluene diisocyanate(2,4-):	0.0	tons/y	Material balance
Toluene; (Methyl benzene):	0.0	tons/y	Material balance
Total HAP:	2.6	tons/y	Material balance
Trichloroethane(1,1,1-) (Methyl Chloroform):	0.0	tons/y	Material balance
Trichloroethane(1,1,2-):	0.0	tons/y	Material balance
Triethylamine:	0.0	tons/y	Material balance
Trimethylpentane(2,2,4-):	0.0	tons/y	Material balance
Urethane; (Ethyl carbamate):	0.0	tons/y	Material balance
Vinyl acetate; (Vinyl acetate monomer):	0.0	tons/y	Material balance
Volatile Organic Compounds (VOC):	0.0	tons/y	Material balance
Xylene(m-); (1,3-Dimethylbenzene); (meta-Xylene):	0.0	tons/y	Material balance
Xylene(o-); (1,2-Dimethylbenzene); (ortho-Xylene):	0.0	tons/y	Material balance
Xylenes (total); (Xylol):	0.0	tons/y	Material balance
bis(2-ethylhexyl) phthalate; (Di-2-ethylhexyl phthalate); (DEHP):	0.0	tons/y	Material balance

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review

Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 89
Designation: TA-52-11
Description: Data Disintegrator/industrial Shredder
Type: Shredder
SCC: Industrial Processes, Pulp and Paper and Wood Products, Miscellaneous Paper Products, Other Not Classified
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

Input Materials Processed: Paper (INPUT)

Operating Detail

	Value
Operating Time in Hours per Day:	7
Operating Time in Days per Week:	5
Operating Time in Weeks per Year:	52
Operating Time in Hours per Year:	1820
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Particulate Matter (10 microns or less):	0.06	tons/y	Manufacturer Specification
Particulate Matter (2.5 microns or less):	0.04	tons/y	Manufacturer Specification
Particulate Matter (total suspended):	0.06	tons/y	Manufacturer Specification

Subject Item Comments

Print Close

Facility Annual Emissions - Subject Item Submittal Review
Tuesday, March 20, 2012

Agency ID: 856
Facility Name: Los Alamos National Laboratory
Organization Name: U.S. Department of Energy National Nuclear Security Administration
Submittal Status: 2011 Submittal (In Process)

Facility ID: 112
Designation: TA-3-22-CT-1
Description: Combustion Turbine
Type: Turbine
SCC: Internal Combustion Engines, Electric Generation, Natural Gas, Turbine
GHG Reporting: Reports GHG to EPA

Supplemental Parameters

	Amount	Unit of Measure
Fuel Type:	Natural Gas	
Input Materials Processed:	Natural Gas (INPUT)	
Materials Consumed:	69.9	MM SCF/y
Fuel Heating Value:	1024.8	MM BTU/MM SCF
Percent Sulfur of Fuel:	0.001	percent
Percent Ash of Fuel:	0.0	percent
Percent Carbon Content:	65.0	percent

Operating Detail

	Value
Operating Time in Hours per Day:	7
Operating Time in Days per Week:	4
Operating Time in Weeks per Year:	12
Operating Time in Hours per Year:	336
Percent of Operation During Winter:	25
Percent of Operation During Spring:	25
Percent of Operation During Summer:	25
Percent of Operation During Fall:	25

Actual Pollutants

Pollutant	Amount	Unit of Measure	Calculation Method
Carbon Monoxide:	0.37	tons/y	EPA emission factors (e.g., AP-42)
Lead:	0.0	tons/y	EPA emission factors (e.g., AP-42)
Nitrogen Dioxide:	1.76	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (10 microns or less):	0.24	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (2.5 microns or less):	0.24	tons/y	EPA emission factors (e.g., AP-42)
Particulate Matter (total suspended):	0.24	tons/y	EPA emission factors (e.g., AP-42)
Sulfur Dioxide:	0.12	tons/y	EPA emission factors (e.g., AP-42)
Volatile Organic Compounds (VOC):	0.077	tons/y	EPA emission factors (e.g., AP-42)

Subject Item Comments

ATTACHMENT C:

2011 Semiannual Emissions Reports

Submitted Under Title V Operating Permit Requirements

Los Alamos
NATIONAL LABORATORY
EST.1943

Associate Directorate for ES&H
P.O. Box 1663, MS K491
Los Alamos, New Mexico 87545
505-667-4218/Fax 505-665-3811

Date: March 27, 2012
Refer To: ADESH-12-022

Compliance Reporting Manager
Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, NM 87507

Dear Compliance Reporting Manager:

SUBJECT: TITLE V SEMI-ANNUAL EMISSIONS REPORT FOR PERMIT P100R1
JULY 1, 2011 - DECEMBER 31, 2011
AI NO. 856 – LOS ALAMOS NATIONAL LABORATORY (LANL)

Enclosed is Los Alamos National Laboratory's (LANL) Semi-Annual Emissions report for the period July 1, 2011 through December 31, 2011. This report is required by permit condition 4.1 and is submitted within 90 days from the end of the reporting period as required by permit condition 4.3.

The semi-annual emissions report includes actual emissions from permitted sources included in section 2.0 of LANL's Operating Permit. Emissions are also reported from insignificant boiler and generator sources. These sources are included to demonstrate that LANL has not exceeded Prevention of Significant Deterioration (PSD) applicability thresholds. In this report, actual emissions are listed along with the emission limits for ease in comparing and verifying compliance. No annual emission limits were exceeded during this reporting period.

Should you have any questions or comments regarding the information provided in this report, please contact Steve Story at (505) 665-2169.

Sincerely,

Michael Brandt, MS, MPH, DrPH, CIH
Acting Associate Director, ES&H

MTB/WWW

ADESH-12-022
LA-UR-12-20087

March 27, 2012

Enc. a/s

Cy: C. Beard, PADOPS, A102
H. Shen, DOE-LA-AO, E550
A. Gaona, DOE-LASO-EO, A316
A. Dorries, ENV-DO, K491
S. Jones, ENV-DO, K491
P. Gallagher, ENV-ES, J978
S. Story, ENV-ES, J978
W. Whetham, ENV-ES, J978
IRM-RM550, A150
ENV-ES Title V Emissions Report File
ENV-ES-12-0056
ADES&H File

Title V Semi-Annual Emission Report for Permit P100R1

July 1, 2011 – December 31, 2011

Identifying Information

Source Name: Los Alamos National Laboratory County: Los Alamos .

Source Address:
City: Los Alamos State: NM Zip Code: 87545

Responsible Official: Michael T. Brandt Ph No. (505) 667-4218 Fax No. (505) 665-3811
Technical Contact: Steven L. Story Ph No. (505) 665-2169 Fax No. (505) 665-8858
Principal Company Product or Business: National Security and Nuclear Weapons Research Primary SIC Code: 9711

Permit No. P100R1 {IDEA/Tempo ID No. 856} Permit Issued Date: August 7, 2009

Certification of Truth, Accuracy, and Completeness

I, Michael T. Brandt certify that, based on information and belief formed after reasonable inquiry, the statements and information in the attached semi-annual emission report are true, accurate, and complete.

Signature _____ Date: 3/27/12

Title: Acting Associate Director Environmental, Safety, and Health

New Mexico Environment Department
Air Quality Bureau
Compliance and Enforcement Section
1301 Siler Road Building B
Santa Fe, NM 87507
Phone (505) 476-4300 Fax (505) 476-4375

Version 07.03.08

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DTS	
TEMPO	

REPORTING SUBMITTAL FORM

NMED USE ONLY	
Staff	
Admin	

PLEASE NOTE: ® - Indicates required field

SECTION I - GENERAL COMPANY AND FACILITY INFORMATION

A. ® Company Name:			**D. ® Facility Name:** Los Alamos National Laboratory		
B.1 ® Company Address: P.O. Box 1663 MS J978			**E.1 ® Facility Address:** Same as Company		
B.2 ® City: Los Alamos	**B.3 ® State:** NM	**B.4 ® Zip:** 87545	**E.2 ® City:**	**E.3 ® State:**	**E.4 ® Zip:**
C.1 ® Company Environmental Contact: Pat Gallagher	**C.2 ® Title:** ES Group Leader		**F.1 ® Facility Contact:** Steve Story	**F.2 ® Title:** Air Compliance Team Leader	
C.3 ® Phone Number: 505-667-2278	**C.4 ® Fax Number:** 505-665-8858		**F.3 ® Phone Number:** 505-665-2169	**F.4 ® Fax Number:** 505-665-8858	
C.5 ® Email Address: patg@lanl.gov			**F.5 ® Email Address:** story@lanl.gov		
G. Responsible Official: (Title V only): Michael T. Brandt	**H. Title:** Acting Associate Director ES&H		**I. Phone Number:** 505-667-4218	**J. Fax Number:** 505-665-3811	

K. ® AI Number: 856	**L. Title V Permit Number:** P100R1	**M. Title V Permit Issue Date:** 8/7/2009	**N. NSR Permit Number:** 2195	**O. NSR Permit Issue Date:** Various

P. Reporting Period: From: 7/1/2011 To: 12/31/2011	**OR**	**Q. Proposed Test Date:**	**OR**	**R. Actual Test Date:**

SECTION II – TYPE OF SUBMITTAL (check one that applies)

A. ☐	**Title V Annual Compliance Certification**	**Permit Condition(s):**	**Description:**	
B. ☒	**Title V Semi-annual Monitoring Report**	**Permit Condition(s):** Condition 4.1	**Description:** Title V Semi-Annual Emissions Report July - December 2011	
C. ☐	**NSPS Requirement (40CFR60)**	**Regulation:**	**Section(s):**	**Description:**
D. ☐	**MACT Requirement (40CFR63)**	**Regulation:**	**Section(s):**	**Description:**
E. ☐	**NMAC Requirement (20.2.xx) or NESHAP Requirement (40CFR61)**	**Regulation:**	**Section(s):**	**Description:**
F. ☐	**Permit or Notice of Intent (NOI) Requirement**	**Permit No.☐: or NOI No.☐:**	**Condition(s):**	**Description:**
G. ☐	**Requirement of an Enforcement Action**	**NOV No. ☐: or SFO No. ☐: or CD No. ☐: or Other ☐:**	**Section(s):**	**Description:**

SECTION III – PERIODIC EMISSIONS TEST NOTIFICATIONS, TEST PROTOCOLS AND TEST REPORTS (if applicable)

T. ☐	A. Test Report ☐ CMT:____		B. Test Protocol ☐		C. Notification ☐ CMT:____						**Description: (Emission Units to be Tested)**
	D. Initial Compliance Test (EPA Methods) ☐		E. Periodic Test (EPA Methods) ☐		F. RATA Test ☐		G. Opacity Test ☐		H Portable Analyzer (Periodic Test) ☐		

SECTION IV - CERTIFICATION

After reasonable inquiry, I Michael T. Brandt **(name of reporting official) certify that the information in this submittal is true, accurate and complete.**

® Signature of Reporting Official:	**® Title:**	**® Date**	**® Responsible Official for Title V?**
	Acting Assoc. Director ES&H	3/27/12	☒ Yes ☐ No

Reviewed By: _____ Date Reviewed: 3/27/12

Enclosure

Title V Semi-Annual Emissions Report for Permit P100R1 **July 1, 2011 – December 31, 2011**

LA-UR-12-20087

Title V Semi-Annual Emissions Report for Permit P100R1
July 1, 2011 - December 31, 2011

Emission Reporting Requirements

4.0 Reporting

Conditions of 4.0 are pursuant to 20.2.70.302.E NMAC.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

4.3 The report required by Condition 4.1 shall be submitted within 90 days from the end of the reporting period. The semiannual report required by Condition 4.2 shall be submitted within 45 days from the end of the reporting period. The reporting periods are January 1st to June 30th and July 1st to December 31st. This condition is pursuant to 20.2.70.302.E.1 NMAC.

Specific Emissions Reports:

2.1 Asphalt Production

2.1.2 Emission Limits

Emission Unit	Allowable Emission Limits				
	NO_x	SO_2	PM	CO	VOC
TA-60-BDM	95.0 tpy	50.0 tpy	0.04 gr dscf 33.8 lbs/hr 95.0 tpy	95.0 tpy	95.0 tpy

Reporting Requirement

2.1.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Asphalt Plant TA-60-BDM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.1.2) (tons per year)
NOx	0.012	0.021	0.033	95.0
SO_2	0.001	0.002	0.003	50.0
PM	0.007	0.013	0.020	95.0
CO	0.43	0.74	1.17	95.0
VOC	0.002	0.003	0.005	95.0
HAPs	0.002	0.003	0.005	No Source Permit Limit

2.2 Beryllium Activities

2.2.2 Emission Limits

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Sigma Facility TA-3-66	10 gm/24 hr	Not Applicable
Beryllium Technology Facility TA-3-141	0.35 gm/24 hr 3.5 gm/yr	Not Applicable

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Target Fabrication Facility TA-35-213	1.8×10^{-04} gm/hr 0.36 gm/yr	Not Applicable
Plutonium Facility TA-55-PF4		
Machining Operation	0.12 gm/24 hr 2.99 gm/yr	0.12 gm/24 hr 2.99 gm/yr
Foundry Operation	3.49×10^{-5} gm/24 hr 8.73×10^{-3} gm/yr	3.49×10^{-5} gm/24 hr 8.73×10^{-3} gm/yr

Reporting Requirement

2.2.6 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.2 Beryllium Activities - continued

Comments:

Source	Pollutant	January - June Emissions	July - December Emissions	Annual Emissions	Permit Limits (Condition 2.2.2)
Beryllium Test Facility TA-3-141[1]	Beryllium (grams)	< 0.0033	< 0.0033	< 0.007	3.5 gm/yr
Target Fabrication Facility TA-35-213[2]	Beryllium (grams)	< 0.00944	< 0.009	< 0.018	0.36 gm/yr
Plutonium Facility TA-55-PF4 Machining Operation[3]	Beryllium (grams)	< 1.495	< 1.41	< 2.91	2.99 gm/yr
	Aluminum (grams)	< 1.495	< 1.41	< 2.91	2.99 gm/yr
Plutonium Facility TA-55-PF4 Foundry Operation[4]	Beryllium (grams)	0	0	0.00	8.73×10^{-4} gm/yr
	Aluminum (grams)	0	0	0.00	8.73×10^{-4} gm/yr
Beryllium Total[5] (tons) =		**< 1.66E-06**	**< 1.57E-06**	**< 3.23E-06**	
Aluminum Total (tons) =		**< 1.65E-06**	**< 1.55E-06**	**< 3.30E-06**	

Notes: [1] Emission values shown for the Beryllium Test Facility are from actual stack emission measurements which are submitted to NMED quarterly. [2] Emissions for the Target Fabrication Facility are from initial compliance testing of that source and calculated based on a conservative assumption of 8 hour work days. Log books were checked to verify that work days were much less than 8 hours. [3] Emissions for the Plutonium Facility are calculated based on permitted throughputs. Log books were checked to verify that throughputs were much less than permitted values. [4] The Plutonium Facility foundry operations did not operate in 2011. [5] The Sigma Facility listed in section 2.2 of the permit does not require reporting in the Semi-Annual Emissions Report.

2.3 Boilers and Heaters

2.3.2 Emission Limits

Source	Allowable Emission Limits				
All Boilers and Heaters[1]	NO_x (tpy)	CO (tpy)	PM or PM_{10} (tpy)	SO_2 (tpy)	VOC (tpy)
	80	80	50	50	50

[1] Excludes TA-3-22 Power Plant addressed in Condition 2.9

Reporting Requirement

2.3.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Boilers and Heaters	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.3.2) (tons per year)
NOx	15.01	12.60	27.61	80
SO_2	0.09	0.08	0.17	50
PM	1.20	1.00	2.20	50
PM-10	1.20	1.00	2.20	50
CO	12.11	10.23	22.34	80
VOCs	0.84	0.71	1.55	50
HAPs	0.29	0.24	0.53	No Source Limit

Note: The emissions shown in this table include **significant and** insignificant sources. This section does not include the TA-3-22 Power Plant boilers. These can be found under Section 2.9 of this report.

2.4 Carpenter Shops

2.4.2 Emission Limits

Source	Allowable Emission Limits
	PM_{10} (tpy)
TA-15-563	2.81
TA-3-38	3.07

Reporting Requirement

2.4.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Shop	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.4.2) (tons per year)
TA-3-38	PM_{10}	0.013	0.035	0.048	3.07
TA-15-563	PM_{10}	0.009	0.009	0.018	2.81

2.5 Chemical Usage

2.5.2 Emission Limits

2.5.3.1 The contribution of VOC and/or HAPs emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOC's
8 tons per year of individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.5.5.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Chemical Usage LANL-FW-CHEM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.5.3.1)
VOCs	3.4	3.0	6.4	Source limits refer to facility-wide limits.
HAPs	1.0	1.6	2.6	
Highest Individual HAP for the first 6 months of 2011 (Methanol)	0.16	0.20	0.36	
Highest Individual HAP for the second 6 months of 2011 (Hexane)	0.12	0.46	0.58	

2.6 Degreasers

2.6.2 Emission Limits

2.6.2.1 The contribution of VOC and/or HAP emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.6.6.3 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of **HAPs** shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Degreaser TA-55-DG-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.6.2.1) (tons per year)
VOCs	0.006	0.005	0.011	Source limits refer to facility-wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.006	0.005	0.011	

2.7 Internal Combustion Sources

2.7.2 Emission Limits

Source	Allowable Emission Limits											
	NO_x[1]		CO		VOC		SO_x[2]		TSP		PM_{10}	
	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
TA-33-G-1	40.3	18.1	33.7	15.2	0.7	0.3	5.5	2.5	1.4	0.6	1.4	0.6
TA-33-G-2	0.83	0.21	0.2	0.1	0.1	--[3]	--	--	--	--	--	--
TA-33-G-3	0.83	0.21	0.2	0.1	0.1	--	--	--	--	--	--	--
TA-33-G-4	9.33	2.33	5.7	1.4	0.75	0.2	0.62	0.16	--	--	--	--

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO_2.
2 Sulfur dioxide emissions include all oxides of sulfur expressed as SO_2
3 "- -" indicates the emission rate is less than 0.05 pph or 0.05 tpy and limits are not required for this permit.

Reporting Requirement

2.7.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Generator TA-33-G-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	4.91	0.04	4.95	18.1
SO_x	0.73	0.01	0.74	2.5
TSP	0.16	0.001	0.17	0.6
PM_{10}	0.16	0.001	0.17	0.6
CO	4.00	0.03	4.03	15.2
VOC	0.09	0.001	0.09	0.3
HAPs	0.001	0.000	0.001	No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Generator TA-33-G-2	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.001	0.003	0.004	0.21
SO_X	0.000	0.000	0.000	Not Required
TSP	0.000	0.000	0.000	Not Required
PM_{10}	0.000	0.000	0.000	Not Required
CO	0.000	0.001	0.001	0.1
VOC	0.000	0.000	0.000	Not Required
HAPs	2.03E-07	9.73E-07	1.18E-06	No Source Limit

Note: This generator only ran for 1.5 hours during the first six months of 2011 and 8.7 hours during the second six months of 2011.

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.000	0.002	0.002	0.21
SO_X	0.000	0.000	0.000	Not Required
TSP	0.000	0.000	0.000	Not Required
PM_{10}	0.000	0.000	0.000	Not Required
CO	0.000	0.000	0.000	0.1
VOC	0.000	0.000	0.000	Not Required
HAPs	0.00E+00	5.00E-07	5.00E-07	No Source Limit

Note: This generator rdid not run for the first 6 months of 2011, and only operated for 3.7 hours during the second six months of 2011.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.057	0.014	0.071	2.33
SO_X	0.004	0.001	0.005	0.16
TSP	0.004	0.001	0.005	Not Required
PM_{10}	0.004	0.001	0.005	Not Required
CO	0.012	0.003	0.015	1.4
VOC	0.004	0.001	0.005	0.2
HAPs	1.83E-05	4.56E-06	2.29E-05	No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	2.61	3.58	6.19	No Source Specific Emission Limits for Standby Generators
SOx	0.08	0.10	0.18	
TSP	0.11	0.14	0.25	
PM_{10}	0.11	0.14	0.25	
CO	0.61	0.84	1.45	
VOC	0.11	0.14	0.25	
HAPs	0.001	0.001	0.002	

Note: Standby Generators are insignificant sources.

2.8 Data Disintegrator

2.8.2 Emission Limits

Source	Allowable Emission Limits			
TA-52-11	TSP (pph)	TSP (tpy)	PM10 (pph)	PM10 (tpy)
	2.3	9.9	2.3	9.9

PM10 and TSP emissions limits shown in above Table are after controls.

Reporting Requirement

2.8.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Data Disintegrator TA-52-11	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.8.2) (tons per year)
TSP	0.03	0.03	0.06	9.9
PM10	0.03	0.03	0.06	9.9

2.9 Power Plant at Technical Area 3 (TA-3-22)

2.9.2 Emission Limits

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22-1 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-2 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-3 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
Boilers Individually (tpy)	35.9		N/A		N/A		N/A		N/A		N/A	
Boilers Combined[1] (tpy)	60.2		41.3		7.9		8.4		8.2		5.6	

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22 CT-1 (lb/hr)	23.8		170.9		1.4		1.6		1.6		1.0	
TA-3-22 CT-1 (tpy)[1,2]	33.2		19.8		1.9		2.3		2.3		-	
TA-3-22 CT-1 (ppm)	25 ppmv @ 15% O_2		N/A		N/A		N/A		N/A		N/A	

[1] Annual emission limits are 12-month rolling totals. This is pursuant to NSR Permit 2195B-M1R2, Table 2.1, Note 7.

[2] "-" notation implies emission rates less than or equal to 0.5 tpy.

* N/A means not applicable.

Reporting Requirement

2.9.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on February 9, 2012, Tracking Number SBR20120003.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.9 Power Plant at Technical Area 3 (TA-3-22) - Continued

Comments:

Boilers TA-3-22-1, TA-3-22-2, TA-3-22-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	7.22	5.82	13.04	60.2
SO_2	0.26	0.06	0.32	7.9
TSP	0.97	0.76	1.73	8.4
PM_{10}	0.96	0.76	1.72	8.2
CO	4.95	4.01	8.96	41.3
VOC	0.67	0.55	1.22	5.6
HAPs	0.23	0.19	0.42	No Source Limit

Boiler	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
TA-3-22-1	NOx	3.19	3.21	6.40	35.9
TA-3-22-2	NOx	3.84	2.18	6.02	35.9
TA-3-22-3	NOx	0.19	0.42	0.61	35.9

Combustion Turbine TA-3-22 CT-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	0.50	1.27	1.76	33.2
SO_2	0.04	0.09	0.13	1.9
TSP	0.07	0.17	0.24	2.3
PM_{10}	0.07	0.17	0.24	2.3
CO	0.10	0.26	0.36	19.8
VOC	0.02	0.06	0.08	No TPY Limit
HAPs	0.01	0.03	0.04	No Source Limit

2.10 Open Burning

2.10.2 Emission Limits

2.10.2.1 The contribution of HAP emissions from open burning shall not cause the exceedance of the corresponding facility-wide limit listed below:

8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.10.5.1 Reports shall be submitted in accordance with conditions 4.1.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:
No open burning activities took place in 2011.

2.11 Facility Wide Emission Limits

2.11.1 Emission Limits

Total Allowable Criteria Pollutant and HAP Emission Limits

Pollutant	Emission Limit (tons per year)
Nitrogen Oxides (NO_x)	245
Carbon Monoxide (CO)	225
Volatile Organic Compounds (VOCs)	200
Sulfur Dioxide (SO_2)	150
Particulate Matter (PM)	120
Hazardous Air Pollutants (HAPs)	24 combined / 8 individual

Reporting Requirement

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	2011 Annual Emissions (tons)	Facility Wide Permit Limits (Condition 2.11.1) (tons per year)
Nitrogen Oxides	30.3	23.3	53.7	245
Sulfur Dioxide	1.2	0.3	1.5	150
Particulate Matter	2.6	2.2	4.8	120
Carbon Monoxide	22.2	16.1	38.3	225
Volatile Organic Compounds	5.2	4.5	9.7	200
Hazardous Air Pollutants	1.6	2.1	3.7	24 combined
Highest Individual HAP (Hexane)	0.12	0.46	0.58	8 individual

Los Alamos
NATIONAL LABORATORY
EST. 1943

Associate Directorate for ESH&Q
P.O. Box 1663, MS K491
Los Alamos, New Mexico 87545
505-667-4218/Fax 505-665-3811

Date: September 22, 2011
Refer To: ESH&Q-11: 036

Compliance Reporting Manager
Compliance & Enforcement Section
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, NM 87507

SUBJECT: TITLE V SEMI-ANNUAL EMISSIONS REPORT FOR PERMIT P100R1 JANUARY 1, 2011 – JUNE 30, 2011, AI NO. 856 – LOS ALAMOS NATIONAL LABORATORY (LANL)

Dear Compliance Reporting Manager:

Enclosed is Los Alamos National Laboratory's (LANL) Semi-Annual Emissions report for the period January 1, 2011 through June 30, 2011. This report is required by permit condition 4.1 and is submitted within 90 days from the end of the reporting period as required by permit condition 4.3.

The semi-annual emissions report includes actual emissions from permitted sources included in section 2.0 of LANL's Operating Permit. Emissions are also reported from insignificant boiler and generator sources. These sources are included to demonstrate that LANL has not exceeded Prevention of Significant Deterioration (PSD) applicability thresholds. In this report, actual emissions are listed along with the emission limits for ease in comparing and verifying compliance. No annual emission limits were exceeded during this reporting period.

Should you have any questions or comments regarding the information provided in this report, please contact Steve Story at (505) 665-2169.

Sincerely,

J. Chris Cantwell
Associate Director, ESH&Q

JCC/WWW/tav

ESH&Q-11: 036 *September 22, 2011*
LA-UR:11-05306

Cy:

I.E. Richardson, III, DIR, w/att., A100
C. Beard, PADOPS, w/att., A102
H. Shen, DOE-LASO-EO, w/att., A316
D. Hjeresen, ENV-DO, w/att., K404
P. Gallagher, ENV-ES, w/att., J978
D. Janecky, ENV-ES, w/att., J978
S. Story, ENV-ES, w/att., J978
W. Whetham, ENV-ES, w/att., J978
IRM-RM550, w/att., A150
ENV-ES Title V Emissions Report File, w/att.
ADESH&Q File, w/att., K491

Title V Operating Permit
Semi-Annual Emission Report

January 1, 2011 – June 30, 2011

Identifying Information

Source Name: Los Alamos National Laboratory County: Los Alamos .

Source Address:
City: Los Alamos State: NM Zip Code: 87545

Responsible Official: J. Chris Cantwell Ph No. (505) 667-4218 Fax No. (505) 665-3811
Technical Contact: Steven L. Story Ph No. (505) 665-2169 Fax No. (505) 665-8858
Principal Company Product or Business: National Security and Nuclear Weapons Research Primary SIC Code: 9711

Permit No. P100R1 {IDEA/Tempo ID No. 856} Permit Issued Date: August 7, 2009

Certification of Truth, Accuracy, and Completeness

I, J. Chris Cantwell certify that, based on information and belief formed after reasonable inquiry, the statements and information in the attached semi-annual emission report are true, accurate, and complete.

Signature J C Cantwell Date: 9/26/2011

Title: Associate Director Environmental, Safety, Health, and Quality

Enclosure

Los Alamos National Laboratory's Title V Operating Permit Emissions Report for the period **January 1, 2011 – June 30, 2011**

Title V Semi-Annual Emissions Report for Permit P100R1
January 1, 2011 - June 30, 2011

Emission Reporting Requirements

4.0 Reporting

Conditions of 4.0 are pursuant to 20.2.70.302.E NMAC.

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

4.3 The report required by Condition 4.1 shall be submitted within 90 days from the end of the reporting period. The semiannual report required by Condition 4.2 shall be submitted within 45 days from the end of the reporting period. The reporting periods are January 1st to June 30th and July 1st to December 31st. This condition is pursuant to 20.2.70.302.E.1 NMAC.

Specific Emissions Reports:

2.1 Asphalt Production

2.1.2 Emission Limits

Emission Unit	Allowable Emission Limits				
	NO_x	SO_2	PM	CO	VOC
TA-60-BDM	95.0 tpy	50.0 tpy	0.04 gr/dscf 33.8 lbs/hr 95.0 tpy	95.0 tpy	95.0 tpy

Reporting Requirement

2.1.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1 Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Asphalt Plant TA-60-BDM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.1.2) (tons per year)
NOx	0.012			95.0
SO_2	0.001			50.0
PM	0.007			95.0
CO	0.426			95.0
VOC	0.002			95.0
HAPs	0.002			No Source Permit Limit

2.2 Beryllium Activities

2.2.2 Emission Limits

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Sigma Facility TA-3-66	10 gm/24 hr	Not Applicable
Beryllium Technology Facility TA-3-141	0.35 gm/24 hr 3.5 gm/yr	Not Applicable

Source	Allowable Emission Limits	
	Beryllium	Aluminum
Target Fabrication Facility TA-35-213	1.8×10^{-01} gm/hr 0.36 gm/yr	Not Applicable
Plutonium Facility TA-55-PF4		
Machining Operation	0.12 gm/24 hr 2.99 gm/yr	0.12 gm/24 hr 2.99 gm/yr
Foundry Operation	3.49×10^{-5} gm/24 hr 8.73×10^{-3} gm/yr	3.49×10^{-5} gm/24 hr 8.73×10^{-3} gm/yr

Reporting Requirement

2.2.6 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.2 Beryllium Activities - continued

Comments:

Source	Pollutant	January - June Emissions	July - December Emissions	Annual Emissions	Permit Limits (Condition 2.2.2)
Beryllium Test Facility TA-3-141[1]	Beryllium (grams)	< 0.0033			3.5 gm/yr
Target Fabrication Facility TA-35-213[2]	Beryllium (grams)	< 0.00944			0.36 gm/yr
Plutonium Facility TA-55-PF4 Machining Operation[3]	Beryllium (grams)	< 1.495			2.99 gm/yr
	Aluminum (grams)	< 1.495			2.99 gm/yr
Plutonium Facility TA-55-PF4 Foundry Operation[4]	Beryllium (grams)	0			8.73×10^{-4} gm/yr
	Aluminum (grams)	0			8.73×10^{-4} gm/yr
Beryllium Total[5] (tons) =		**< 1.66E-06**			
Aluminum Total (tons) =		**< 1.65E-06**			

Notes: [1] Emission values shown for the Beryllium Test Facility are from actual stack emission measurements which are submitted to NMED quarterly. [2] Emissions for the Target Fabrication Facility are from initial compliance testing of that source and calculated based on a conservative assumption of 8 hour work days. Log books were checked to verify that work days were much less than 8 hours. [3] Emissions for the Plutonium Facility are calculated based on permitted throughputs. Log books were checked to verify that throughputs were much less than permitted values. [4] The Plutonium Facility foundry operations did not operate in the first 6 months of 2011. [5] The Sigma Facility listed in section 2.2 of the permit does not require reporting in the Semi-Annual Emissions Report.

2.3 Boilers and Heaters

2.3.2 Emission Limits

Source	Allowable Emission Limits				
All Boilers and Heaters[1]	NO_x (tpy)	CO (tpy)	PM or PM_{10} (tpy)	SO_2 (tpy)	VOC (tpy)
	80	80	50	50	50

[1] Excludes TA-3-22 Power Plant addressed in Condition 2.9

Reporting Requirement

2.3.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.(1)

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Boilers and Heaters	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.3.2) (tons per year)
NOx	15.01			80
SO_2	0.09			50
PM	1.20			50
PM-10	1.20			50
CO	12.11			80
VOCs	0.84			50
HAPs	0.29			No Source Limit

Note: The emissions shown in this table include significant and insignificant sources. This section does not include the TA-3-22 Power Plant boilers. These can be found under Section 2.9 of this report.

2.4 Carpenter Shops

2.4.2 Emission Limits

Source	Allowable Emission Limits
	PM_{10} (tpy)
TA-15-563	2.81
TA-3-38	3.07

Reporting Requirement

2.4.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

(1) Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Shop	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.4.2) (tons per year)
TA-3-38	PM_{10}	0.013			3.07
TA-15-563	PM_{10}	0.009			2.81

2.5 Chemical Usage

2.5.2 Emission Limits

2.5.3.1 The contribution of VOC and/or HAPs emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.5.5.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Chemical Usage LANL-FW-CHEM	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.5.3.1)
VOCs	3.4			Source limits refer to facility-wide limits.
HAPs	1.0			
Highest Individual HAP for the first 6 months of 2011 (Methanol)	0.16			

2.6 Degreasers

2.6.2 Emission Limits

2.6.2.1 The contribution of VOC and/or HAP emissions from chemical usage shall not cause the exceedence of the corresponding facility-wide limit listed below:

200 tons per year of facility-wide VOCs
8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.6.6.3 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Degreaser TA-55-DG-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.6.2.1) (tons per year)
VOCs	0.006			Source limits refer to facility-wide limits. (See Facility Emissions Table on Page 1)
HAPs	0.006			

2.7 Internal Combustion Sources

2.7.2 Emission Limits

Source	Allowable Emission Limits											
	NO_x[1]		CO		VOC		SO_x[2]		TSP		PM_{10}	
	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy	pph	tpy
TA-33-G-1	40.3	18.1	33.7	15.2	0.7	0.3	5.5	2.5	1.4	0.6	1.4	0.6
TA-33-G-2	0.83	0.21	0.2	0.1	0.1	--[3]	--	--	--	--	--	--
TA-33-G-3	0.83	0.21	0.2	0.1	0.1	--	--	--	--	--	--	--
TA-33-G-4	9.33	2.33	5.7	1.4	0.75	0.2	0.62	0.16	--	--	--	--

1 Nitrogen dioxide emissions include all oxides of nitrogen expressed as NO_2.
2 Sulfur dioxide emissions include all oxides of sulfur expressed as SO_2
3 "--" indicates the emission rate is less than 0.05 pph or 0.05 tpy and limits are not required for this permit.

Reporting Requirement

2.7.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Generator TA-33-G-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	4.905			18.1
SO_x	0.727			2.5
TSP	0.164			0.6
PM_{10}	0.164			0.6
CO	3.997			15.2
VOC	0.091			0.3
HAPs	1.06E-03			No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Generator TA-33-G-2	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.001			0.21
SO_X	0.000			Not Required
TSP	0.000			Not Required
PM_{10}	0.000			Not Required
CO	0.000			0.1
VOC	0.000			Not Required
HAPs	2.03E-07			No Source Limit

Note: This generator only ran for 1.5 hours during the first six months of 2011.

Generator TA-33-G-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.000			0.21
SO_X	0.000			Not Required
TSP	0.000			Not Required
PM_{10}	0.000			Not Required
CO	0.000			0.1
VOC	0.000			Not Required
HAPs	0.00E+00			No Source Limit

Note: This generator rdid not run for the first 6 months of 2011.

Generator TA-33-G-4	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.7.2) (tons per year)
NOx	0.057			2.33
SO_X	0.004			0.16
TSP	0.004			Not Required
PM_{10}	0.004			Not Required
CO	0.012			1.4
VOC	0.004			0.2
HAPs	1.83E-05			No Source Limit

Continued on the next page.

2.7 Internal Combustion Sources - continued

Comments:

Stationary Standby Generators	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits
NOx	2.29			No Source Specific Emission Limits for Standby Generators
SOx	0.08			
TSP	0.10			
PM_{10}	0.10			
CO	0.54			
VOC	0.10			
HAPs	0.001			

Note: Standby Generators are insignificant sources.

2.8 Data Disintegrator

2.8.2 Emission Limits

Source	Allowable Emission Limits			
TA-52-11	TSP (pph)	TSP (tpy)	PM10 (pph)	PM10 (tpy)
	2.3	9.9	2.3	9.9

PM10 and TSP emissions limits shown in above Table are after controls.

Reporting Requirement

2.8.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[1]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[1] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Data Disintegrator TA-52-11	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limits (Condition 2.8.2) (tons per year)
TSP	0.03			9.9
PM10	0.03			9.9

2.9 Power Plant at Technical Area 3 (TA-3-22)

2.9.2 Emission Limits

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22-1 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-2 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
TA-3-22-3 (lb/hr)	10.2	11.3	7.0	6.5	1.1	9.6	1.3	4.3	1.3	3.0	1.0	0.3
Boilers Individually (tpy)	35.9		N/A		N/A		N/A		N/A		N/A	
Boilers Combined[1] (tpy)	60.2		41.3		7.9		8.4		8.2		5.6	

Source	Allowable Emission Limits											
	NOx		CO		SOx		TSP		PM_{10}		VOC	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
TA-3-22 CT-1 (lb/hr)	23.8		170.9		1.4		1.6		1.6		1.0	
TA-3-22 CT-1 (tpy)[1,2]	33.2		19.8		1.9		2.3		2.3		-	
TA-3-22 CT-1 (ppm)	25 ppmv @ 15% O_2		N/A		N/A		N/A		N/A		N/A	

[1] Annual emission limits are 12-month rolling totals. This is pursuant to NSR Permit 2195B-M1R2, Table 2.1, Note 7.

[2] "-" notation implies emission rates less than or equal to 0.5 tpy.

* N/A means not applicable.

Reporting Requirement

2.9.6.1 Reports shall be submitted in accordance with conditions 4.1 and 4.2.[(1)]

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

[(1)] Condition 4.2 refers to submitting a Semi-Annual Monitoring report which LANL submitted on August 12, 2011.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments: Continued on the next page

2.9 Power Plant at Technical Area 3 (TA-3-22) - Continued

Comments:

Boilers TA-3-22-1, TA-3-22-2, TA-3-22-3	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	7.22			60.2
SO_2	0.26			7.9
TSP	0.97			8.4
PM_{10}	0.96			8.2
CO	4.95			41.3
VOC	0.67			5.6
HAPs	0.23			No Source Limit

Boiler	Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
TA-3-22-1	NOx	3.19			35.9
TA-3-22-2	NOx	3.84			35.9
TA-3-22-3	NOx	0.19			35.9

Combustion Turbine TA-3-22 CT-1	January - June Emissions (tons)	July - December Emissions (tons)	Annual Emissions (tons)	Permit Limit (Condition 2.9.2) (tons per year)
NOx	0.50			33.2
SO_2	0.04			1.9
TSP	0.07			2.3
PM_{10}	0.07			2.3
CO	0.10			19.8
VOC	0.02			No TPY Limit
HAPs	0.01			No Source Limit

2.10 Open Burning

2.10.2 Emission Limits

2.10.2.1 The contribution of HAP emissions from open burning shall not cause the exceedance of the corresponding facility-wide limit listed below:

8 tons per year of an individual facility-wide HAP
24 tons per year of total facility-wide HAPs

Reporting Requirement

2.10.5.1 Reports shall be submitted in accordance with conditions 4.1.

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:
No open burning activities took place in the first 6 months of 2011.

2.11 Facility Wide Emission Limits

2.11.1 Emission Limits

Total Allowable Criteria Pollutant and HAP Emission Limits

Pollutant	Emission Limit (tons per year)
Nitrogen Oxides (NO_x)	245
Carbon Monoxide (CO)	225
Volatile Organic Compounds (VOCs)	200
Sulfur Dioxide (SO_2)	150
Particulate Matter (PM)	120
Hazardous Air Pollutants (HAPs)	24 combined / 8 individual

Reporting Requirement

4.1

Reports of actual emissions from permitted sources in Section 2.0 shall be submitted on a 6 month basis. Reports shall not include emissions from insignificant activities. Emission estimates of criteria pollutants NOx, CO, SO_2, PM and VOCs shall not include fugitive emissions. Emission estimates of HAPs shall include fugitive emissions. The reports shall include a comparison of actual emissions that occurred during the reporting period with the facility-wide allowable emission limits specified in Section 2.11 of this permit.

Has this reporting requirement been met during this reporting period with a separate reporting submittal? Answer Yes or No below.

☐ **Yes** **Date report submitted:** **Tracking Number:**

☒ **No** **Provide comments and identify any supporting documentation as an attachment.**

Comments:

Pollutant	January - June Emissions (tons)	July - December Emissions (tons)	2009 Annual Emissions (tons)	Facility Wide Permit Limits (Condition 2.11.1) (tons per year)
Nitrogen Oxides	30.0			245
Sulfur Dioxide	1.2			150
Particulate Matter	2.6			120
Carbon Monoxide	22.1			225
Volatile Organic Compounds	5.1			200
Hazardous Air Pollutants	1.6			24 combined
Highest Individual HAP (Methanol)	0.16			8 individual


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