

SYNTHETIC MINOR APPLICATION EVALUATION REPORT
Lockheed Martin Space Systems Company
APPLICATION 23496, PLANT 55

BACKGROUND:

The Lockheed Martin Space Systems Company (Lockheed Martin) of the Lockheed Martin Corporation has chosen to apply for a revision to its Synthetic Minor Operating Permit (SMOP) to comply with the Title V permitting requirements of the Federal Clean Air Act. The Title V permitting requirements were implemented as a result of the 1990 revisions to the Federal Clean Air Act. The initial SMOP was issued on January 19, 1996 under Permit Application #13823. The SMOP was revised on November 1, 2010 under Permit Application #12514.

Lockheed Martin is a large aerospace corporation that is involved in the design and construction of missiles, satellites and space launch vehicles. Lockheed Martin has been at its Sunnyvale facility since 1954. The parent company of Lockheed Martin was formed in March 1995 with the merger of Lockheed Corporation and Martin Marietta Corporation. Subsequently, the facility name was changed from Lockheed Missiles and Space Company to Lockheed Martin Space Systems Company.

The majority of Lockheed Martin's emissions of organic compounds arise from cleaning, processing and coating operations associated with the cleaning, assembly, and testing of aerospace components. Lockheed Martin has combustion sources that emit NO_x, CO, POC, SO_x, particulates, and greenhouse gases.

It was determined in 1996 that Lockheed Martin had the potential to emit (PTE) greater than 100 tons per year of criteria pollutants and 25 tons per year of HAPS, if all sources were to operate at maximum capacity. Lockheed Martin applied for the SMOP to obtain federally enforceable permit conditions limiting its NO_x emissions to less than 62 tons per year, POC emissions to less than 50 tons per year, HAP emissions to less than 23 tons per year for any combination of HAPS and less than 9 tons per year for any individual HAP. Under Permit Application #12514, Lockheed Martin requested that the allowable POC emissions be less than 35 tons per year and the District make the NO_x emission limit of 62 tons per year a condition limit rather than limiting the amount of combustion of natural gas and solid fuel. A gasoline dispensing facility and emergency standby engines were also added to the SMOP.

Title V permitting requirements for greenhouse gases took effect on January 2, 2011. It was determined in December 2010 that Lockheed Martin had the PTE greater than 100,000 tons per year of greenhouse gases on a CO₂ equivalent basis (see Appendix A). With this application, Lockheed Martin is requesting a revision to its existing SMOP to include federally enforceable permit conditions limiting greenhouse gases emissions on a CO₂ equivalent basis to less than 90,000 tons per year.

SOURCES COVERED BY THIS APPLICATION:

The following permitted sources and significant exempt sources:

212	Emergency Standby Diesel Generator Set	
1300	Semiconductor Fab, Bldg. 113	
4107	Emergency Standby Diesel Generator Set	
4108	Emergency Standby Diesel Generator Set	
4109	Emergency Standby Diesel Generator Set	
4301	Diesel Engine, emergency standby	
4601	Diesel Engine, emergency standby	
4901	STEAM BOILER	[exempt]
5026	Standby Generator	
5028	Diesel Engine, emergency standby	
5029	Emergency Standby Diesel Engine	
5030	Emergency Engine Generator	
5199	Diesel Engine, emergency standby	
5201	WATER BOILER	[exempt]
5202	WATER BOILER	[exempt]
5203	WATER BOILER	[exempt]
5204	WATER BOILER	[exempt]
5210	Spray Booth with Associated Drying Ovens	
5216	Diesel Engine, emergency standby	
5301	WATER BOILER	[exempt]
5302	WATER BOILER	[exempt]
5336	Firetube Boiler	
5337	Diesel Engine, emergency standby	
5338	Diesel Engine, emergency standby	
5339	Natural Gas Fired Boiler, 400 BHP, 16.33 MMBTUhr	
5401	WATER BOILER	[exempt]
5402	WATER BOILER	[exempt]
5404	Emergency Standby Diesel Generator Set	
5610	Diesel Engine, emergency standby	
5615	Emergency Standby Generator	
5618	Emergency Standby Diesel Generator Set	
5620	Emergency Standby Diesel Generator Set	
5622	Emergency Standby Diesel Generator Set	
5623	Emergency Generator Set	
5624	Emergency Generator Set	
5625	Emergency Standby Diesel Generator Set	
5626	Natural Gas Fired Boiler for Bldg 156 Liquid Nitrogen Vapor	
5628	Natural Gas Fired Boiler, 35 mmbtu/hr	
5629	Natural Gas Fired Boiler, 35 mmbtu/hr	
5630	Emergency Standby Diesel Generator Set	
5631	Emergency Standby Diesel Generator Set	
5632	Emergency Standby Diesel Generator Set	
5701	Diesel Engine, emergency standby	
5702	Emergency Standby Diesel Engine	
5703	Natural Gas Fired Boiler	
5704	Cleaver-Brooks 350 HB Boiler	
5705	Cleaver-Brooks 350 HP Boiler	
5806	Emergency Standby Diesel Generator Set	
5807	Emergency Standby Diesel Generator Set	

5808	Emergency Standby Diesel Generator Set	
5904	WATER BOILER	[exempt]
5911	Heating System	
5918	Oven	[exempt]
5919	Boiler, Gas Fired	
5920	Diesel Engine, emergency standby	
5921	Diesel Engine, emergency standby	
5922	Emergency Engine Generator	
7101	WATER BOILER	[exempt]
7102	WATER BOILER	[exempt]
7103	WATER BOILER	[exempt]
7109	Diesel Engine, emergency standby	
7112	Diesel Engine, emergency standby	
7192	Boiler 400 Hp	
7193	Boiler 400 Hp	
7194	Boiler 400 Hp	
7201	Diesel Engine, emergency standby	
7432	Emergency Standby Diesel Engine	
7601	Diesel Engine, emergency standby	
7603	Emergency Standby Diesel Generator Set	
8101	WATER BOILER	[exempt]
8102	WATER BOILER	[exempt]
8220	WATER BOILER	[exempt]
8221	WATER BOILER	[exempt]
8222	WATER BOILER	[exempt]
8225	STEAM BOILER	[exempt]
8226	WATER BOILER	[exempt]
8279	Composite Fabrication, Curing and Cleaning	
8280	Emergency Standby Engine	
8602	Emergency Standby Diesel Generator Set	
8701	Emergency Standby Generator Engine	
9001	WATER BOILER	[exempt]
9002	WATER BOILER	[exempt]
9507	Emergency Diesel Generator Set	
9519	Emergency Standby Diesel Generator Set	
9520	Emergency Standby Diesel Generator Set	
9521	Emergency Standby Diesel Generator Set	

EMISSION LIMITS STRATEGY:

To obtain a synthetic minor permit, a facility must have federally enforceable limits that keep the PTE to no greater than 95 tons per year of any regulated pollutant, 9 tons per year of any single HAP, 23 tons per year of any combination of HAPs, and below 90,000 tons per year of greenhouse gases on a CO₂ equivalent basis.

Lockheed Martin previously agreed to accept permit conditions limiting POC emissions to no more than 35 tons per year and NO_x emissions to no more than 62 tons per year. Additionally, total HAPs were conditioned to no more than 23 tons per year and emissions of any single HAP were conditioned to no more than 9 tons per year. With this application, permit conditions limiting greenhouse gases to no more than 90,000 tons per year on a CO₂ equivalent basis will be included.

The majority of Lockheed Martin's emissions of greenhouse gases arise from the combustion of fuels in stationary sources. A small amount of emissions of greenhouse gases are from the use of perfluorocompounds (e.g., CHF₃, CF₄, and SF₆) in a semiconductor fab area.

The combustion sources and semiconductor fab area will be limited to emitting 90,000 tons per year of greenhouse gases on a CO₂ equivalent basis.

Greenhouse gases emissions from combustion sources and semiconductor fab areas shall be calculated as follows:

Emissions from combustion sources shall be calculated using the following basis:

- (a) The following emission factors from 40 CFR part 98:
 - i. For diesel fuel type,
CO₂ emission factor: 73.96 kg/MMBtu
CH₄ emission factor: 0.003 kg/MMBtu
N₂O emission factor: 0.0006 kg/MMBtu
 - ii. For natural gas fuel type,
CO₂ emission factor: 53.02 kg/MMBtu
CH₄ emission factor: 0.001 kg/MMBtu
N₂O emission factor: 0.0001 kg/MMBtu
- (b) Default high heat value of 0.138 MMBtu per gallon for diesel fuel from 40 CFR part 98
- (c) The following Global Warming Potentials (GWPs) from 40 CFR part 98:
CO₂ GWP: 1
CH₄ GWP: 21
N₂O GWP: 310
- (d) Fuel supplied or actual fuel usage, run time and/or energy produced

Simplified, emissions from combustion sources shall be calculated using the following basis:

- (a) The following emission factors from 40 CFR part 98:
 - i. For diesel fuel type,
CO₂e emission factor: 163.6 lb/MMBtu or 22.58 lb/gallon, which is derived as follows:
 $((73.96 \text{ kg/MMBtu} * 1) + (0.003 \text{ kg/MMBtu} * 21) + (0.0006 \text{ kg/MMBtu} * 310)) * 2.2046 \text{ lbs/kg} = 163.6 \text{ lb/MMBtu}$
 $= 163.6 \text{ lb/MMBtu} * 0.138 \text{ MMBtu/gallon} = 22.58 \text{ lb/gallon}$
 - ii. For natural gas fuel type,
CO₂e emission factor: 117.0 lb/MMBtu, which is derived as follows:
 $((53.02 \text{ kg/MMBtu} * 1) + (0.001 \text{ kg/MMBtu} * 21) + (0.0001 \text{ kg/MMBtu} * 310)) * 2.2046 \text{ lbs/kg} = 117.0 \text{ lb/MMBtu}$
- (b) Fuel supplied or actual fuel usage, run time and/or energy produced

If other fuel types besides diesel and natural gas are used, the Permit Holder shall use the emission factors for the fuel types in question from 40 CFR part 98.

A couple of examples are provided to better illustrate a conservative approach to calculating emissions:

If fuel usage and engine load are not measured but run time is recorded, the Permit Holder shall assume an engine operated at full load and maximum fuel use rate its entire run time.

As suggested by Kraig L. Kurucz of Lockheed Martin, emissions from semiconductor fab areas shall be calculated using the following basis:

- (1) Assumption that any fluorinated greenhouse gases (e.g., CHF₃, CF₄, and SF₆) used are 100 percent emitted into the atmosphere
- (2) Global Warming Potentials (GWPs) from 40 CFR part 98
- (3) Actual usage of each fluorinated greenhouse gas used

If actual usages of fluorinated greenhouse gases are not measured, the Permit Holder shall use procurement records of fluorinated greenhouse gases and assume the entire amounts in the procurement records are used when they are introduced to the fab area.

Restated, Lockheed Martin, at its option, may calculate combustion emissions at the source level, group similar sources together, or calculate emissions using a combination of the above.

Records of fuel usage shall be maintained on a monthly basis. Natural gas usage for the entire facility shall be based on the utility meter used for billing purposes. Natural gas for the entire facility is supplied through a main gas meter, which simplifies facility-wide monthly natural gas readings.

Records of fluorinated greenhouse gases usage shall be maintained on a monthly basis.

EMISSION CALCULATIONS

The emissions calculation approaches for CO₂, CH₄, and N₂O from combustion sources and semiconductor fab area are described above. The emissions for each greenhouse gas will be converted to the emissions on a CO₂ equivalent basis using its respective GWP from 40 CFR part 98.

Lockheed Martin will determine stationary sources diesel usage using either a fuel meter or hour meter and manufacturer's rated fuel use on all diesel fuel combustion sources. Lockheed Martin will use its facility-wide gas meter to measure throughput of natural gas used by boilers and other natural gas fired equipment. Lockheed Martin will determine usage of each fluorinated greenhouse gas in its semiconductor fab area using either actual usage data or procurement records of each fluorinated greenhouse gas.

Estimated facility-wide diesel usage in permitted and exempt-permit stationary sources for the period of March 2010 through February 2011, based on maximum fuel use rates and hour-meter run-time records, was 30,000 gallons. Estimated facility-wide natural gas usage in permitted and exempt-permit stationary sources for the period of March 2010 through February 2011, based on utility meter data, was 520,000 MMBtu. Estimated fluorinated greenhouse gas usage in permitted semiconductor fab area for the period of March 2010 through February 2011, based on procurement records of CHF₃, was 0.0045 metric ton of CHF₃; no other fluorinated greenhouse gases were used in the period of March 2010 through February 2011. Therefore, estimated emissions of greenhouse gases on a CO₂ equivalent basis are as follows:

Table 1. Emissions of greenhouse gases from diesel fuel use

Pollutant	Emission Factor (kg/MMBtu)	GWP	GHG Emissions (tons/yr)	CO ₂ e Emissions (tons/yr)
CO ₂	73.96	1	337.52	338
CH ₄	0.003	21	0.014	0
N ₂ O	0.0006	310	0.003	1
Total				339

Notes:

30,000 gallons x 0.138 MMBtu/gallon = 4,140 MMBtu

1 kg = 2.2046 lbs

Table 2. Emissions of greenhouse gases from natural gas fuel use

Pollutant	Emission Factor (kg/MMBtu)	GWP	GHG Emissions (tons/yr)	CO ₂ e Emissions (tons/yr)
CO ₂	53.02	1	30,391	30,391
CH ₄	0.001	21	0.573	12
N ₂ O	0.0001	310	0.057	18
Total				30,421

Note:

1 kg = 2.2046 lbs

Table 3. Emissions of greenhouse gases from fluorinated greenhouse gases use

Pollutant	Emission Factor (%)	GWP	GHG Emissions (tons/yr)	CO ₂ e Emissions (tons/yr)
CHF ₃	100	11,700	0.005	58
Total				58

Note:

1 kg = 2.2046 lbs

Table 4. Total emissions of greenhouse gases from diesel and natural gas fuel use

Pollutant Source	CO ₂ e Emissions (tons/yr)
Diesel Fuel	339
Natural Gas Fuel	30,421
Fluorinated Greenhouse Gases	58
Total	30,817

Table 4 shows that estimated total emissions of greenhouse gases on a CO₂ equivalent basis at Lockheed Martin for the period of March 2010 through February 2011 are less than 90,000 tons per year.

STATEMENT OF COMPLIANCE:

This facility is in compliance with the necessary requirements in Regulation 2, Rule 6 to retain a synthetic minor operating permit. Lockheed Martin has voluntarily accepted federally enforceable permit conditions including emission limits that will keep Lockheed Martin's PTE no more than 62 tons per year of any regulated air pollutant except that POC shall be no more than 35 tons per year, 9 tons per year of any hazardous air pollutant, 23 tons per year of any combination of hazardous air pollutants, and 90,000 tons per year of greenhouse gases on a CO₂ equivalent basis.

This application is subject to the requirements in Regulation 3, Section 333. Because the application was received by the District in June 2011, the fees were calculated in accordance with Fee Schedule P in Regulation 3 amended in July 2010. The fees are a Synthetic Minor Filing Fee of \$558 plus a Synthetic Minor Revision Fee of \$391 for each of the following ten sources which will be added to or modified in the list of sources in Synthetic Minor Permit Condition Number 24784:

1300	Semiconductor Fab, Bldg. 113	(under Application 24034)
4109	Emergency Standby Diesel Generator Set	(under Application 19638)
5630	Emergency Standby Diesel Generator Set	(under Application 23109)
5631	Emergency Standby Diesel Generator Set	(under Application 23109)
5632	Emergency Standby Diesel Generator Set	(under Application 23109)
5922	Emergency Engine Generator	(under Application 23568)
8602	Emergency Standby Diesel Generator Set	(under Application 22638)
9519	Emergency Standby Diesel Generator Set	(under Application 23109)
9520	Emergency Standby Diesel Generator Set	(under Application 23109)
9521	Emergency Standby Diesel Generator Set	(under Application 23109)

For all of ten sources described above, Synthetic Minor Revision Fees are applicable because Lockheed Martin was never charged these fees under the respective applications above.

Therefore, the total fee for this application is as follows:
 $\$558 + 10 \times \$391 = \$4,468$

CONDITIONS:

Lockheed Martin is currently subject to Synthetic Minor Permit Condition Number 24784. The permit condition will be revised to include federally enforceable permit conditions limiting on greenhouse gases emissions on a CO₂ equivalent basis to less than 90,000 tons per year. In addition, the list of sources in the permit condition will be updated to reflect the list of sources existing at the facility on the date of issuance of the revised permit condition.

Condition 24784:

(Application 12514: Revision of Synthetic Minor Operating Permit. Decrease facility-wide POC limit from 50 to 35 tpy. Limit facility-wide NO_x emissions to 62 tpy versus limiting the amount of fuel fired. Include GDF and emergency standby engines in the Synthetic Minor Operating Permit.)

[\(Application 23496: Revision of Synthetic Minor Operating Permit. Limit facility-wide greenhouse gases emissions on a CO₂ equivalent basis to 90,000 tpy.\)](#)

Conditions presented in this revised Synthetic Operating Permit shall become effective 60 days from the facility's receipt of the finalized version of this permit.

Lockheed Martin Space Systems Co., Plant #55, has a synthetic minor operating permit. This operating permit covers all sources existing at this facility on the date of issuance. The sources are listed below.

10	Vehicle Gasoline Dispensing	
206	Wipe Cleaning Operation	
211	Brush-Applied Coating Operation	
212	Diesel Engine, Cummins model 6CT8.3/G, emergency standby abated by A-212 Catalyzed diesel particulate filter	
322	Wipe Cleaning Operation	
323	Wipe Cleaning Operation Bldg 103/E-3	
324	Wipe Cleaning Operation Bldg 103/J-12	
325	Wipe Cleaning Operation Bldg 103/K-6	
328	Wipe Cleaning Operation Bldg 103/C-12	
335	Wipe Cleaning Operation	
336	Wipe cleaning Operation	
338	Solvent Wipe Cleaning	
406	Wipe Cleaning Operation Bldg 150/C-8	
407	Mobile Freon Storage Tank/Hydrostatic Test (Bldg 104)	[exempt]
408	B/104 Thin Film Lab with Associated Curing Oven	
510	Solvent Cold Cleaner	
701	Diesel Engine, Komatsu model 06110T, emergency standby	
1001	Wipe Cleaning Operation Bldg 076/E-7	
1300	Semiconductor Fab, Bldg. 113 abated by A-1304 Acid Fume Scrubber	
1310	Bead blast operation (bldg 113) abated by A-1310 Cyclone and Baghouse	[exempt]
3001	Wipe Cleaning Operation - Bldg. 130	
3902	Sandblast Operation	
4107	Diesel Engine	
4108	Diesel Engine	
4109	Emergency Standby Diesel Generator Set	
4301	Diesel Engine, John Deere model 4239DF001, emergency standby	
4601	Diesel Engine, Cummins model VTA28G2, emergency standby	
4901	STEAM BOILER	[exempt]
5024	Wipe Cleaning Operation - Bldg 182	
5026	Standby Generator abated by A-5026 Diesel Particulate Filter	
5028	Diesel Engine, John Deere model 6059TF001, emergency standby	
5029	Emergency Standby Diesel Engine	
5030	Emergency Engine Generator	
5104	FUME HOOD	
5125	Wipe Cleaning Operation Bldg 151/A2-7	
5126	Solvent Wipe Cleaning-Bldg 151/B-6	
5127	Solvent Wipe Cleaning-Bldg 141/C-5	
5128	Wipe Cleaning Operation Bldg 151/C-13	
5129	Wipe Cleaning Operation Bldg 151A/X-8	
5130	Solvent Wipe Cleaning-Bldg 151/G-11	
5131	Wipe Cleaning Operation Bldg 151/K-2	
5139	Paint Spray Booth	
5144	Peelcoat Cleaning/Coating Operation	
5147	Spray booth	
5149	Paint Spray Booth B/151	

5150	Paint Spray Booth B/151	
5153	Cold Cleaner	
5162	Glove Box Sandblast Unit abated by A-5162 Baghouse	
5189	Wipe Cleaning Operation	
5190	Cold Cleaner	
5191	Cold Cleaner	
5192	Cold Cleaner	
5197	Solvent Wipe Cleaning	
5199	Diesel Engine, Cummins model NT855G, emergency standby	
5200	Wave Solder	
5201	WATER BOILER	[exempt]
5202	WATER BOILER	[exempt]
5203	WATER BOILER	[exempt]
5204	WATER BOILER	[exempt]
5205	PAINT SPRAY BOOTH	[exempt]
5207	Wipe Cleaning Operation Bldg 152/E-14	
5208	Wipe Cleaning Operation Bldg 152/E-20	
5209	Wipe Cleaning Operation Bldg 152	
5210	Spray Booth with Associated Drying Ovens	
5211	Touchup Coating	
5212	SOLVENT WIPE CLEANING	
5216	Diesel Engine, Cummins model NT855G, emergency standby	
5301	WATER BOILER	[exempt]
5302	WATER BOILER	[exempt]
5307	Wipe Cleaning Operation Bldg 153/C-8	
5308	Wipe Cleaning Operation Bldg 153/D-2 & E-3	
5315	Conformal coating of circuit boards with associated drying	
5319	Ventilation Hood (Bldg. 153)	
5322	Coating Operation	
5323	Paint Booth (M175542) B/153, J6	
5326	Primer Spray Booth Portable Filtration Table abated by A-5326 Carbon Filters	
5327	Wipe Cleaning Operation	
5329	Wipe Cleaning	
5330	Touchup Coating Operation	
5332	Wipe Cleaning Operation	
5333	Wipe Cleaning	
5334	Wave Solder	
5336	Firetube Boiler	
5337	Diesel Engine, John Deere model 6076AF010, emergency standby	
5338	Diesel Engine, John Deere model 6076AF010, emergency standby	
5339	Natural Gas Fired Boiler, 400 BHP, 16.33 MMBtu/hr	
5401	WATER BOILER	[exempt]
5402	WATER BOILER	[exempt]
5404	Emergency Standby Diesel Generator Set	
5501	WATERFALL PAINT BOOTH	
5502	WOOD CUTTING MACHINES AND FLOOR SWEEP Abated by A-5501 Dust Collector	[exempt]
5503	Wipe Cleaning Operation Bldg 155	
5602	Touch-up/Repair Operation, Col. G-9	
5603	Wipe Cleaning Operation	
5604	Wipe Cleaning	
5608	Emergency Standby Generator Engine	
5609	Emergency Standby Generator Engine	
5610	Diesel Engine, Cummins model NTA855G3, emergency standby	
5611	Emergency Standby Generator Engine	
5615	Emergency Standby Generator	

5618	Diesel Engine	
5620	Emergency Standby Diesel Generator Set	
5622	Emergency Standby Diesel Generator Set	
5623	Emergency Generator Set	
5624	Emergency Generator Set	
5625	Emergency Standby Diesel Generator Set	
5626	Natural Gas Fired Boiler for Bldg 156 Liquid Nitrogen Vaporizer	
5628	Natural Gas Fired Boiler, 60 MMBtu/hr	
5629	Natural Gas Fired Boiler, 60 MMBtu/hr	
5630	Emergency Standby Diesel Generator Set	
5631	Emergency Standby Diesel Generator Set	
5632	Emergency Standby Diesel Generator Set	
5701	Diesel Engine, Detroit Diesel model 12V92T, emergency standby	
5702	Emergency Standby Diesel Engine	
5703	Natural Gas Fired Boiler	
5704	Cleaver-Brooks 350 HP Boiler	
5705	Cleaver-Brooks 350 HP Boiler	
5802	Wipe Cleaning Operation	
5803	Diesel Engine, Cummins model NT855G, emergency standby	
5804	Diesel Engine, Caterpillar model 3412, emergency standby	
5805	Diesel Engine, Caterpillar model 3412, emergency standby	
5806	Emergency Engine Generator	
5807	Emergency Engine Generator	
5808	Emergency Engine Generator	
5904	WATER BOILER	[exempt]
5905	Wipe Cleaning Operation Bldg 153A	
5906	Wipe Cleaning Operation Bldg 159/DX-1	
5907	Wipe Cleaning Operation	
5908	Wipe Cleaning Operation	
5911	Heating System	
5912	Spray Booth	
5913	Manual Surface Coating	
5914	Wipe Cleaning Operation	
5915	Fiberglass Layup	
5916	Resin Mixing/Kitting Hood	
5917	Trim Area abated by A-5917 Dust Control System	[exempt]
5918	Oven	[exempt]
5919	Boiler, Gas Fired	
5920	Diesel Engine, Caterpillar model 3508 STD, emergency standby	
5921	Diesel Engine, Cummins model KTA-50-G1, emergency standby	
5922	Emergency Engine Generator	
7023	Wipe Cleaning Operation Bldg 170/A-7	
7025	Wipe Cleaning Operation Bldg 170/B-4	
7026	Wipe Cleaning Operation Bldg 170/D-8	
7027	Wipe Cleaning Operation Bldg 170/F-7 & F-8	
7035	Adhesive Application Area, Col. C-8	
7036	Batch Silicone Mixer	[exempt]
7037	Batch Silicone Mixer	[exempt]
7101	WATER BOILER	[exempt]
7102	WATER BOILER	[exempt]
7103	WATER BOILER	[exempt]
7109	Diesel Engine, Caterpillar model 3406, emergency standby	
7112	Diesel Engine, Caterpillar model 3508 STD, emergency standby	
7162	Process Tanks 37 and 43 abated by A-7162 Washer 7	[exempt]
7163	Process Tanks 27 and 29 abated by A-7163 Washer 6	[exempt]
7164	Process Tanks 8 and 10 abated by A-7164 Washer 3	[exempt]

7165	Process Tank 52 abated by A-7165 Washer 1	[exempt]
7166	Process Tanks, 39, 48 and 41 abated by A-7166 Scrubber 4	[exempt]
7167	Process Tank 31 abated by A-7167 Scrubber 3	[exempt]
7168	Process Tanks 4 and 6 abated by A-7168 Scrubber 1	[exempt]
7189	Wipe Cleaning Operation	
7192	Boiler 400 Hp	
7193	Boiler 400 Hp	
7194	Boiler 400 Hp	
7196	Paint Booth with Electric Oven #2	
7197	Paint Booth	
7198	Paint Booth	
7199	Paint Booth with Electric Oven #1	
7201	Diesel Engine, John Deere model 6076TF001, emergency standby	
7427	Printing Press	
7428	Printing Press	
7432	Emergency Standby Diesel Engine	
7601	Diesel Engine, Komatsu model 06110TA, emergency standby	
7603	Emergency Engine Generator	
8101	WATER BOILER	[exempt]
8102	WATER BOILER	[exempt]
8104	Wipe Cleaning Operation Bldg 181/B-6	
8107	Paint Area with Curing Oven	
8108	Wipe Cleaning Operation	
8112	Wipe Cleaning Operation	
8204	Spray Booth for Adhesive Coating Prep,(Acetone Wipe Cleaning)	
8216	Paint Booth with Dryer	
8218	Paint Booth with Dryer	
8220	WATER BOILER	[exempt]
8221	WATER BOILER	[exempt]
8222	WATER BOILER	[exempt]
8223	PAINT SPRAY BOOTH	
8225	STEAM BOILER	[exempt]
8226	WATER BOILER	[exempt]
8227	MACHINE SHOP abated by A-8215 Dust Collector	[exempt]
8234	Paint Booth	[exempt]
8237	Wipe Cleaning Operation Bldg 182/F-16	
8238	Wipe Cleaning Operation Bldg 182/F-23	
8239	Wipe Cleaning Operation Bldg 182/H-12	
8240	Wipe Cleaning Operation Bldg 182/H-15	
8241	Wipe Cleaning Operation Bldg 182/H-27	
8242	Wipe Cleaning Operation Bldg 182/J-23	
8255	Cold Cleaner	
8261	Bead Blast Operation abated by A-8261 Dust Collector for Blast Cabinet	[exempt]
8262	Silicone Adhesive Application with Curing Oven	
8264	Paint Spray Booth, Col. F-29	
8265	Wipe Cleaning Operation	
8266	Batch Silicone Mixer	[exempt]
8267	Batch Silicone Mixer	[exempt]
8268	Paint Touch-Up Operation	
8278	Sealant Application	
8279	Composite Fabrication, Curing and Cleaning	
8280	Emergency Standby Engine	
8302	Wipe Cleaning Operation	
8601	Diesel Engine, Allis Chalmers Model 670T, emergency standby	
8602	Emergency Standby Diesel Generator Set	
8701	Emergency Standby Generator Engine	

8801	Coating Operation	
9001	WATER BOILER	[exempt]
9002	WATER BOILER	[exempt]
9502	Spray Booth	
9504	Wipe Cleaning - Bldg 195B/Rm 144	
9505	Emergency Standby Generator Engine	
9506	Emergency Standby Generator Engine	
9507	Emergency Diesel Generator Set	
9519	Emergency Standby Diesel Generator Set	
9520	Emergency Standby Diesel Generator Set	
9521	Emergency Standby Diesel Generator Set	
15100	Solvent Cleaning	
30004	Wipe Cleaning	
30012	Enclosed Coating Line	
30016	Adhesive and Primer Application	
30017	Paint Spray Booth - Coating	
30024	Coating and Adhesive Booth	
30026	Paint Booth 2B/159	
30028	Solvent Cleaning Operation B/151	
32100	Fugitive Sources	[exempt]
32101	Fugitive Sources	[exempt]

Permit conditions that are part of this operating permit but do not contribute to establishing the synthetic minor limits are attached. Lockheed Martin Space Systems Co. must comply with all conditions. The following conditions do not negate the applicability of any District, state, or federal requirements.

Synthetic Minor Conditions:

- 1) The owner/operator shall not emit more than 9 tons per any consecutive twelve-month period of any single hazardous air pollutant (HAP) from all sources combined.
(basis: Regulation 2-6-423.2)
- 2) The owner/operator shall not emit more than 23 tons per any consecutive twelve-month period of any combination of HAPs from all sources combined.
(basis: Regulation 2-6-423.2)
- 3) The owner/operator shall not emit more than 35 tons per any consecutive twelve-month period of Precursor Organic Compounds from all sources combined on a facility-wide basis.
(basis: Regulation 2-6-423.2)
- 4) The owner/operator shall not emit more than 62 tons per any consecutive twelve-month period of Oxides of Nitrogen as NO2 from all sources combined on a facility-wide basis.
(basis: Regulation 2-6-423.2)
- 5) The owner/operator shall not emit more than 90,000 tons per any consecutive twelve-month period of greenhouse gases on a CO2 equivalent basis from all sources combined on a facility-wide basis.

| [\(basis: Regulation 2-6-423.2\)](#)

| Conditions [56-910](#)

Demonstration of Compliance for NOx and POC for Combustion Sources:

| [56\)](#) The owner/operator shall calculate NOx and POC emissions from combustion sources as follows:

Emissions shall be calculated using one or more of the following methods:

- (1) continuous emission monitor systems (CEMs),
- (2) source test data,
- (3) for boilers, portable analyzer test data. The portable analyzer must be operated and maintained as required by Appendix A "Portable Analyzer Protocol and Specifications" in the District's Regulation 9, Rule 7 "Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters"
- (4) (a) manufacturer's emissions data, or emission factors from AP-42, or the California Air Resources Board (CARB) [including CARB's Off-road Certification Database, CARB's "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000 (The Risk Reduction Plan)", the amendment and clarification to the Guidance, March 2002, and CARB's "California's Emissions Inventory For Off-Road Large Compression-Ignited (CI) Engines (> 25HP), January 2000" (The OFFROAD Model)],

plus

- (b) fuel supplied or actual fuel usage, run time and/or energy produced.

If emissions information is not available for a propane-fired engine, the Permit Holder may assume emissions are the same as for a natural gas fired engine.

The Permit Holder may use the NOx and POC emission factors for "commercial boilers" in Table 1.5-1 of AP-42 for propane boilers and for all other propane or LPG fired sources at the facility except internal combustion engines.

The Permit Holder may use the NOx and POC emission factors for "small boilers" in Tables 1.4-1 and 1.4-2, respectively, of AP-42 for natural gas fired boilers and for all other natural gas fired sources at the facility except internal combustion engines.

If an engine drives a generator and the generator output is measured, the Permit Holder may assume that it takes 1.34 horsepower-hours to produce 1 kW-hr of electricity. Emissions shall be estimated using accepted methodology that is appropriate to the emitting sources.

(basis: Regulation 2-6-423.2)

| [67\)](#) The owner/operator shall use the facility-wide gas meter to measure throughput of natural gas used by boilers and natural gas fired equipment.

(basis: Regulation 2-6-423.2)

| [78\)](#) The owner/operator shall install either a fuel meter or hour meter on all diesel fuel combustion sources that are subject to air permits.

(basis: Regulation 2-6-423.2)

| [89](#)) The owner/operator shall maintain monthly logs and rolling 12-month total logs of the usage of diesel fuel, propane, natural gas and other liquid fuel when the fuel usage is used in an emission calculation.
(basis: Regulation 2-6-423.2)

| [910](#)) The owner/operator shall calculate NO_x and POC from all combustion sources combined on a rolling 12-month basis.
(basis: Regulation 2-6-423.2)

| Condition [4011](#)
Demonstration of Compliance for POC and HAP for Solvent Evaporating Sources:

| [4011](#)) The owner/operator shall maintain District approved coating and solvent usage logs that list the mass emissions of Precursor Organic Compounds (POC) and HAPs from all solvent evaporating sources. The emissions of POC compounds shall be grouped in one of two categories: coating operations and solvent usage operations. Any material which cannot be categorized as a coating operation shall be categorized as a solvent usage operation.

- a. Records of the quantity of POC and HAP containing materials distributed through the central warehouse system shall be summarized on a monthly basis.
- b. Materials containing POCs and HAPs purchased directly for special projects shall be recorded on an event basis and summarized monthly.
- c. The quantities of materials used and the chemical composition information from the associated Material Safety Data Sheets (MSDS) shall be used to calculate emissions of POCs and HAPs.
- d. The emission factor for POCs and HAPs shall be one (1) pound of POC per pound of POC content and one (1) pound of HAP per pound of HAP content, respectively.
- e. The quantities of materials collected for recycle, multiplied by the corresponding POC and HAP content of the material, shall be subtracted from the amount of material distributed to calculate the net consumption of POC and HAP containing materials.
- f. The year-to-date totals shall be derived each month by summing the totals for the previous twelve month period.
(basis: Regulation 2-6-423.2)

| Condition [4412](#)
Demonstration of Compliance for POC and HAP ~~from~~for Fuel Dispensing Source

| [4412](#)) The owner/operator shall do all of the following for the Fuel Dispensing Source listed above:

- a. Maintain records of Material Safety Data Sheets (MSDS) or other product information identifying the POC content and individual HAP contents for each of the fuel or fuel mixtures, as appropriate, dispensed at the sources.
- b. Keep a log of the quantity of the amount of each type of fuel dispensed (or received) at the source, summarized on a monthly basis.

- c. Calculate monthly emissions of POC (as gasoline) and combined HAP (as benzene) from each source, assuming that emissions of gasoline vapors occurring during the loading, breathing, refueling and spillage are 1.52 pounds of gasoline per 1,000 gallons dispensed (or received) and 7.50 pounds of benzene per million gallons dispensed (or received).
- d. Calculate POC and combined HAP (as benzene) emissions on a rolling 12-month basis for the source.
(basis: Regulation 2-6-423.2)

Conditions 13-20

Demonstration of Compliance for Greenhouse Gases for Combustion Sources and Semiconductor Fab Area Source:

- 13) The owner/operator shall calculate greenhouse gases emissions from combustion sources as follows:

Emissions shall be calculated using the following basis:

(1) The following emission factors from 40 CFR part 98:

a) For diesel fuel type,

CO₂e emission factor: 163.6 lb/MMBtu or 22.58 lb/gallon

b) For natural gas fuel type,

CO₂e emission factor: 117.0 lb/MMBtu

(2) Fuel supplied or actual fuel usage, run time and/or energy produced

If other fuel types besides diesel and natural gas are used, the Permit Holder shall use the emission factors for the fuel types in question from 40 CFR part 98.

If fuel usage and engine load are not measured but run time is recorded, the Permit Holder shall assume an engine operated at full load and maximum fuel use rate its entire run time.

(basis: Regulation 2-6-423.2)

- 14) The owner/operator shall calculate greenhouse gases emissions from semiconductor fab area source as follows:

Emissions shall be calculated using the following basis:

(1) Assumption that any fluorinated greenhouse gases (e.g., CHF₃, CF₄, and SF₆) used are 100 percent emitted into the atmosphere

(2) Global Warming Potentials (GWPs) from 40 CFR part 98

(3) Actual usage of each fluorinated greenhouse gas used

If actual usages of fluorinated greenhouse gases are not measured, the Permit Holder shall use procurement records of fluorinated greenhouse gases and assume the entire amounts in the procurement records are used when they are introduced to the fab area.

- 15) The owner/operator shall use the facility-wide gas meter to measure throughput of natural gas used by boilers and natural gas fired equipment.

(basis: Regulation 2-6-423.2)

- 16) The owner/operator shall install either a fuel meter or hour meter on all diesel fuel combustion sources that are subject to air permits.

(basis: Regulation 2-6-423.2)

- 17) The owner/operator shall maintain monthly logs and rolling 12-month total logs of the usage of diesel fuel, natural gas and other liquid fuel when the fuel usage is used in an emission calculation.
(basis: Regulation 2-6-423.2)
- 18) The owner/operator shall maintain monthly logs and rolling 12-month total logs of the usage of each fluorinated greenhouse gas used in semiconductor fab area source. Alternatively, the owner/operator shall maintain procurement records of each fluorinated greenhouse gas used in semiconductor fab area source.
(basis: Regulation 2-6-423.2)
- 19) The owner/operator shall calculate greenhouse gases on a CO2 equivalent basis from all combustion sources combined on a rolling 12-month basis.
(basis: Regulation 2-6-423.2)
- 20) The owner/operator shall calculate greenhouse gases on a CO2 equivalent basis from semiconductor fab area source on a rolling 12-month basis.
(basis: Regulation 2-6-423.2)

Conditions 4221-22

Monthly and Annual Emissions and Non-Compliance Reporting

- 4221) The owner/operator shall calculate and maintain records on a monthly basis of the quantities of NOx, POC ~~and~~, HAP, and greenhouse gases (on a CO2 equivalent basis) emitted into the atmosphere as required for sources identified in the SMOP. Within 30 days of the end of each month, the NOx, POC ~~and~~, HAP, and greenhouse gases (on a CO2 equivalent basis) emissions must be totaled for the last consecutive 12-month period to ensure compliance with parts 1 - 45. The owner/operator shall keep all the information required to calculate NOx, POC ~~and~~, HAP, and and greenhouse gases (on a CO2 equivalent basis) emissions for at least five years, and shall make those records available for review during normal business hours by the District's representatives.
(basis: Regulation 2-6-423.2)
- 4322) The Owner/Operator shall prepare an annual emissions report. The report shall contain the following items for the year ending June 30:
- Monthly report on each HAP and total combined HAP emissions for the rolling 12-month period.
 - Monthly report on total POC emissions for the rolling 12-month period.
 - Monthly report on NOx emissions for the rolling 12-month period.
 - Monthly report on total greenhouse gases (on a CO2 equivalent basis) emissions for the rolling 12-month period.

This report shall be submitted to the Director of Compliance and Enforcement by August 31 of each year.

(basis: Regulation 2-6-423.2)

Signed by Kevin Oei _____
Kevin Oei
Air Quality Engineer I

April 30, 2012
Date

Appendix A
Lockheed Martin's Greenhouse Gases PTE

Table A1 shows that, even without accounting for CH₄ and N₂O and emissions from fab area source, Lockheed Martin had the PTE greater than 100,000 tons per year of greenhouse gases on a CO₂ basis. The calculations in the table assume maximum firing rate and annual hours of operation for each combustion source at the facility.

Table A1. Lockheed Martin's CO₂ PTE

Source Number	Source Description	Maximum Firing Rate	Units	Fuel Type	Maximum Annual Hours of Operation	CO ₂ Emission Factor	Units	CO ₂ Emissions ton/yr
212	Diesel Engine, emergency standby	0.0151	thou gal/hr	Diesel	500	22,300	lb/thou gal	84.18
701	Diesel Engine, emergency standby	0.0194	thou gal/hr	Diesel	500	22,300	lb/thou gal	108.16
1313	Diesel Engine, emergency standby	0.0194	thou gal/hr	Diesel	500	22,300	lb/thou gal	108.16
4107	Emergency Standby Diesel Generator Set	0.0081	thou gal/hr	Diesel	500	22,300	lb/thou gal	45.16
4108	Emergency Standby Diesel Generator Set	0.012	thou gal/hr	Diesel	500	22,300	lb/thou gal	66.90
4109	Emergency Standby Diesel Generator Set	0.0107	thou gal/hr	Diesel	500	22,300	lb/thou gal	59.65
4301	Diesel Engine, emergency standby	0.0039	thou gal/hr	Diesel	500	22,300	lb/thou gal	21.74
4601	Diesel Engine, emergency standby	0.0654	thou gal/hr	Diesel	500	22,300	lb/thou gal	364.61
4901	STEAM BOILER	2.9886	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	1,608.11
5026	Standby Generator	0.0389	thou gal/hr	Diesel	500	22,300	lb/thou gal	216.87
5028	Diesel Engine, emergency standby	0.0097	thou gal/hr	Diesel	500	22,300	lb/thou gal	54.08
5029	Emergency Standby Diesel Engine	0.0162	thou gal/hr	Diesel	500	22,300	lb/thou gal	90.32
5030	Emergency Engine Generator	0.038	thou gal/hr	Diesel	500	22,300	lb/thou gal	211.85
5199	Diesel Engine, emergency standby	0.0194	thou gal/hr	Diesel	500	22,300	lb/thou gal	108.16
5201	WATER BOILER	5.978	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.66
5202	WATER BOILER	5.978	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.66
5203	WATER BOILER	5.976	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,215.58
5204	WATER BOILER	5.976	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,215.58
5210	Spray Booth with Associated Drying Ovens	1.5238	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	819.93
5216	Diesel Engine,	0.0291	thou	Diesel	500	22,300	lb/thou	162.23

Source Number	Source Description	Maximum Firing Rate	Units	Fuel Type	Maximum Annual Hours of Operation	CO ₂ Emission Factor	Units	CO ₂ Emissions ton/yr
	emergency standby		gal/hr				gal	
5301	WATER BOILER	7.9695	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	4,288.25
5302	WATER BOILER	7.9695	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	4,288.25
5336	Firetube Boiler	13.619	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	7,328.15
5337	Diesel Engine, emergency standby	0.0175	thou gal/hr	Diesel	500	22,300	lb/thou gal	97.56
5338	Diesel Engine, emergency standby	0.0145	thou gal/hr	Diesel	500	22,300	lb/thou gal	80.84
5339	Natural Gas Fired Boiler, 400 BHP, 16.33 MMBTU/hr	16.33	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	8,368.47
5401	WATER BOILER	4.981	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	2,680.19
5402	WATER BOILER	4.981	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	2,680.19
5404	Emergency Standby Diesel Generator Set	0.0097	thou gal/hr	Diesel	500	22,300	lb/thou gal	54.08
5608	Emergency Standby Generator Engine	3.3	thou cf/hr	Natural Gas	500	117	lb/MM BTU	101.35
5609	Emergency Standby Generator Engine	3.3	thou cf/hr	Natural Gas	500	117	lb/MM BTU	101.35
5610	Diesel Engine, emergency standby	0.0389	thou gal/hr	Diesel	500	22,300	lb/thou gal	216.87
5611	Emergency Standby Generator Engine	0.55	thou gal/hr	Diesel	500	22,300	lb/thou gal	3,066.25
5615	Emergency Standby Generator	0.039	thou gal/hr	Diesel	500	22,300	lb/thou gal	217.43
5616	Emergency Standby Generator	2.4762	thou cf/hr	Natural Gas	500	117	lb/MM BTU	76.05
5617	Emergency Standby Generator	9.1429	thou cf/hr	Natural Gas	500	117	lb/MM BTU	280.80
5618	Emergency Standby Generator	0.0706	thou gal/hr	Diesel	500	22,300	lb/thou gal	393.60
5620	Emergency Standby Generator	0.017	thou gal/hr	Diesel	500	22,300	lb/thou gal	94.78
5622	Emergency Standby Generator	0.077	thou gal/hr	Diesel	500	22,300	lb/thou gal	429.28
5623	Emergency Generator Set	0.0194	thou gal/hr	Diesel	500	22,300	lb/thou gal	108.16
5624	Emergency Generator Set	0.0194	thou gal/hr	Diesel	500	22,300	lb/thou gal	108.16
5625	Emergency Standby Generator	0.0166	thou gal/hr	Diesel	500	22,300	lb/thou gal	92.55
5626	Natural Gas Fired Boiler for Bldg 156 Liquid Nitrogen Vapor	18,000	MM BTU/yr	Natural Gas	N/A	117	lb/MM BTU	1,053.00
5628	Natural Gas Fired Boiler for Bldg 156	35	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	17,936.10

Source Number	Source Description	Maximum Firing Rate	Units	Fuel Type	Maximum Annual Hours of Operation	CO ₂ Emission Factor	Units	CO ₂ Emissions ton/yr
	Liquid Nitrogen Vapor							
5629	Natural Gas Fired Boiler for Bldg 156 Liquid Nitrogen Vapor	35	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	17,936.10
5630	Emergency Standby Diesel Generator Set	0.0067	thou gal/hr	Diesel	500	22,300	lb/thou gal	37.35
5631	Emergency Standby Diesel Generator Set	0.0144	thou gal/hr	Diesel	500	22,300	lb/thou gal	80.28
5632	Emergency Standby Diesel Generator Set	0.0144	thou gal/hr	Diesel	500	22,300	lb/thou gal	80.28
5701	Diesel Engine, emergency standby	0.0485	thou gal/hr	Diesel	500	22,300	lb/thou gal	270.39
5702	Emergency Standby Diesel Engine	0.0034	thou gal/hr	Diesel	500	22,300	lb/thou gal	18.96
5703	Natural Gas Fired Boiler	14.3	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	7,328.18
5704	Cleaver-Brooks 350 HB Boiler	14.3	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	7,328.18
5705	Cleaver-Brooks 350 HB Boiler	14.3	MM BTU/hr	Natural Gas	8760	117	lb/MM BTU	7,328.18
5803	Diesel Engine, emergency standby	0.0309	thou gal/hr	Diesel	500	22,300	lb/thou gal	172.27
5804	Diesel Engine, emergency standby	0.056	thou gal/hr	Diesel	500	22,300	lb/thou gal	312.20
5805	Diesel Engine, emergency standby	0.056	thou gal/hr	Diesel	500	22,300	lb/thou gal	312.20
5806	Emergency Standby Diesel Generator Set	0.023	thou gal/hr	Diesel	500	22,300	lb/thou gal	128.23
5807	Emergency Standby Diesel Generator Set	0.0366	thou gal/hr	Diesel	500	22,300	lb/thou gal	204.05
5808	Emergency Standby Diesel Generator Set	0.0366	thou gal/hr	Diesel	500	22,300	lb/thou gal	204.05
5904	WATER BOILER	2.3905	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	1,286.29
5911	Heating System	18.0952	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	9,736.72
5918	Oven	2.8571	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	1,537.36
5919	Boiler, Gas Fired	23.9048	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	12,862.77
5920	Diesel Engine, emergency standby	0.0727	thou gal/hr	Diesel	500	22,300	lb/thou gal	405.30
5921	Diesel Engine, emergency standby	0.0891	thou gal/hr	Diesel	500	22,300	lb/thou gal	496.73
7101	WATER BOILER	5.9771	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.18
7102	WATER BOILER	5.9771	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.18
7103	WATER BOILER	5.9771	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.18

Source Number	Source Description	Maximum Firing Rate	Units	Fuel Type	Maximum Annual Hours of Operation	CO ₂ Emission Factor	Units	CO ₂ Emissions ton/yr
7109	Diesel Engine, emergency standby	0.034	thou gal/hr	Diesel	500	22,300	lb/thou gal	189.55
7112	Diesel Engine, emergency standby	0.0796	thou gal/hr	Diesel	500	22,300	lb/thou gal	443.77
7192	Boiler 400 Hp	15.9524	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	8,583.72
7193	Boiler 400 Hp	15.9524	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	8,583.72
7194	Boiler 400 Hp	15.9524	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	8,583.72
7201	Diesel Engine, emergency standby	0.0121	thou gal/hr	Diesel	500	22,300	lb/thou gal	67.46
7432	Emergency Standby Diesel Engine	0.0106	thou gal/hr	Diesel	500	22,300	lb/thou gal	59.10
7601	Diesel Engine, emergency standby	0.0242	thou gal/hr	Diesel	500	22,300	lb/thou gal	134.92
7603	Emergency Standby Diesel Generator Set	0.019	thou gal/hr	Diesel	500	22,300	lb/thou gal	105.93
8101	WATER BOILER	8	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	4,304.66
8102	WATER BOILER	5.978	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	3,216.66
8220	WATER BOILER	3.985	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	2,144.26
8221	WATER BOILER	3.985	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	2,144.26
8222	WATER BOILER	3.1429	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	1,691.14
8225	STEAM BOILER	0.9429	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	507.36
8226	WATER BOILER	3.985	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	2,144.26
8279	Composite Fabrication, Curing and Cleaning	0.7619	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	409.97
8280	Emergency Standby Engine	0.0046	thou gal/hr	Diesel	500	22,300	lb/thou gal	25.65
8601	Diesel Engine, emergency standby	0.0097	thou gal/hr	Diesel	500	22,300	lb/thou gal	54.08
8602	Emergency Standby Diesel Generator Set	0.0118	thou gal/hr	Diesel	500	22,300	lb/thou gal	65.79
8701	Emergency Standby Generator Engine	1.5	thou cf/hr	Natural Gas	500	117	lb/MM BTU	46.07
9001	WATER BOILER	1.64	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	884.07
9002	WATER BOILER	1.6438	thou cf/hr	Natural Gas	8760	117	lb/MM BTU	884.50
9505	Emergency Standby Generator Engine	0.0265	thou gal/hr	Diesel	500	22,300	lb/thou gal	147.74
9506	Emergency Standby Generator Engine	3.3	thou cf/hr	Natural Gas	500	117	lb/MM BTU	101.35
9507	Emergency Diesel	0.0042	thou	Diesel	500	22,300	lb/thou	23.42

Source Number	Source Description	Maximum Firing Rate	Units	Fuel Type	Maximum Annual Hours of Operation	CO ₂ Emission Factor	Units	CO ₂ Emissions ton/yr
	Generator Set		gal/hr				gal	
9519	Emergency Standby Diesel Generator Set	0.0079	thou gal/hr	Diesel	500	22,300	lb/thou gal	44.04
9520	Emergency Standby Diesel Generator Set	0.0144	thou gal/hr	Diesel	500	22,300	lb/thou gal	80.28
9521	Emergency Standby Diesel Generator Set	0.0067	thou gal/hr	Diesel	500	22,300	lb/thou gal	37.35

PTE: 189,617.64