

## **Appendix A**

### SCC Descriptions and Emission Factors

Appendix C  
 SCC List and Descriptions

SCC	SSC Level 1	SCC Level 2	SCC Level 3	SCC Level 4
10300501	External Combustion Boilers	Commercial/Institutional	Distillate Oil - Grades 1 and 2	Boiler
10300602	External Combustion Boilers	Commercial/Institutional	Natural Gas	<10 Million BTU/hr
10500205	External Combustion	Space Heater	Commercial/Institutional	Distillate Oil
10500206	External Combustion	Space Heater	Commercial/Institutional	Natural Gas
20100101	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine
20100102	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating
20100201	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine
20100202	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating
10101002	External Combustion Boilers	Electric Generation	Liquified Petroleum Gas (LPG)	Propane
10500210	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquified Petroleum Gas (LPG)

2501000090	Diesel/Oil Storage Tank Breathing Loss			
2501000120	Gasoline Storage Tank Breathing Loss			
2501995090	Diesel/Oil Storage Tank Working Loss			
2501995120	Gasoline Storage Tank Working Loss			
40100398	cold parts washers (only for cold washers that have emissions - not for washers that use detergents)			

30905144	Welding	E7018 Electrode
30905128	Welding	E6010 Electrode
30905355	Welding	E71T Electrode

Appendix C  
Emission Factors - SCC 10101002

Selected WebFIRE Factors  
6-Mar-18

FACTORID	SCC	SCCD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	GAS	POLLUTANT	POLLUTANTID	CONTROLCODE	CONTROLID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCES	Created	REVOKED	Dupcount		
3769	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	CO	630-08-0	Carbon monoxide	137					7.01E+00	Lb	1000 Gallons	Propane	Burned				Roy Huntley	-U	0	00:00.0		0		
3770	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	1.90E+01	Lb	1000 Gallons	Propane	Burned		1.5			EPA, 1995	-SE	0			0	
3771	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	5.06E-01	Lb	1000 Gallons	Propane	Burned		1.4	Derived from emission factor intended for natural gas-fired boilers. All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM. Condensable PM is the PM collected using EPA Method 202 (or equivalent). Filterable PM is the PM collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, March	-E	0	00:00.0		0		
3772	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM-FIL		PM, filterable	334					6.00E-01	Lb	1000 Gallons	Propane	Burned		1.5			EPA, 1995	-SE	0			0	
3774	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.59E-01	Lb	1000 Gallons	Propane	Burned					Roy Huntley	-U	0	00:00.0		0	
3775	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM10-PRI		PM10, primary	339	0	129	UNCONTROLLED	1	1.11E+00	Lb	1000 Gallons	Propane	Burned					Sum of PM10-FIL and PM-CON emission factors	This emission	-E	0	00:00.0		0
3777	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	1.59E-01	Lb	1000 Gallons	Propane	Burned					Roy Huntley	-U	0	00:00.0		0	
3778	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	PM25-PRI		PM2.5, primary	341	0	129	UNCONTROLLED	1	8.48E-01	Lb	1000 Gallons	Propane	Burned					Sum of PM25-FIL and PM-CON emission factors	This emission	-E	0	00:00.0		0
3779	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane			Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	Formula	Lb	1000 Gallons	Propane	Burned	9.5E-2*s	1.5	s in gr/100 lbs. Use 86 S(S) as std factor, where S is sulfur content of fuel in wt % sulfur.	EPA, 1995	-SE	0			0		
3781	10101002	58	External Combustion Boilers	Electric Generation	Liquefied Petroleum Gas (LPG)	Propane	VOC		Volatile organic compound	417	0	129	UNCONTROLLED	1	4.59E-01	Lb	1000 Gallons	Propane	Burned					Roy Huntley	-U	0	00:00.0		0	

Appendix C  
Emission Factors - SCC 10305001  
Selected Wastewater Factors  
6-Mar-18

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROLCODE	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCE	Created	REVOKED	Discount
7923	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	CD	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	5.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.	EPA, Septem	A	0		0	
9719	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	NOK		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	2.40E+01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Test results indicate that at least 95% by weight of NOx is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical boilers use 105 lb/1000 gallons at full load and normal (+15%) excess air.	EPA, Septem	D	0	00:00:00	0	
9727	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	2.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Does not include condensable PM. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, Septem	A	0		0	
9143	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	S02	975/7446	Sulfur dioxide	380	0	129	UNCONTROLLED	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.42E2*5	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	A	0		0
9147	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil		11/9/7446	Sulfur trioxide	382	0	129	UNCONTROLLED	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	5.7E0*5	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	C	0	00:00:00	0
9750	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	5.56E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.	EPA, Septem	A	0		0	
9710	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	2.75E-03	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Emissions data is available in lb/MWhr.	482588 Sour	U	0		0	
7929	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	50000	50-00-0	Formaldehyde	230	0	129	UNCONTROLLED	1	3.50E-2	6 lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Corrected in Supp A.	EPA, Septem	E	0		0	
9705	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	9163	7664-41-7	Acetone	87	0	129	UNCONTROLLED	1	6.00E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3		EPA, Septem	E	0	00:00:00	0	
9709	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440382	7440-38-2	Arsenic	93	0	129	UNCONTROLLED	1	4.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7920	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440417	7440-41-7	Beryllium	119	0	129	UNCONTROLLED	1	3.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7922	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440439	7440-43-9	Cadmium	130	0	129	UNCONTROLLED	1	3.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7926	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED	1	3.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7927	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440508	7440-50-8	Copper	156	0	129	UNCONTROLLED	1	6.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7928	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	206440	206-44-0	Fluoranthene	204	0	129	UNCONTROLLED	1	3.15E-06	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Emissions data is available in lb/MWhr.	482588 Sour	U	0		0	
7931	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7439921	7439-92-1	Lead	250	0	129	UNCONTROLLED	1	9.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
9713	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED	1	6.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
9714	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7439976	7439-97-6	Mercury	260	0	129	UNCONTROLLED	1	3.00E-06	lb	Million Btus	Heat	Input	1.3	Literature review.	EPA, Septem	E	0		0	
9715	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil		74-82-8	Methane	261	0	129	UNCONTROLLED	1	2.16E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.	EPA, Septem	A	0		0	
9717	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440000	7440-00-0	Nickel	296	0	129	UNCONTROLLED	1	3.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7924	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	16024-97-2		Nitrous oxide	300	0	129	UNCONTROLLED	1	2.60E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3		EPA, Septem	E	0	00:00:00	0	
9723	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	1.30E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Factor is for operation with all controls, or uncontrolled. No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil. 65% of the condensable PM is inorganic; 35% of the condensable PM is organic.	EPA, Septem	D	0	00:00:00	0	
9731	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.08E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3		EPA, Septem	D	0	00:00:00	0	
9734	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-PRY		PM10, primary	339	0	129	UNCONTROLLED	1	2.38E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3	Sum of PM2.5-FIL and PM-CON emission factors	This emission D	0	00:00:00	0	0	
9736	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM2.5-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	6.30E-01	lb	1000 Gallons	Distillate Oil	Burned	1.3		EPA, Septem	D	0	00:00:00	0	
9739	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM2.5-PRY		PM2.5, primary	341	0	129	UNCONTROLLED	1	2.13E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3	Sum of PM2.5-FIL and PM-CON emission factors	This emission D	0	00:00:00	0	0	
9741	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	246		Polycyclic organic matter (POM)	348	0	129	UNCONTROLLED	1	1.30E-03	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Particulate POM only. Corrected in Supp A.	EPA, Septem	E	0		0	
9742	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7732493	7732-49-3	Selenium	370	0	129	UNCONTROLLED	1	1.50E-05	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
9749	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil			Total non-methane organic compounds (TNMOC)	398	0	129	UNCONTROLLED	1	3.40E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.	EPA, Septem	A	0	00:00:00	0	
9752	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	7440-66-6		Zinc	419	0	129	UNCONTROLLED	1	4.00E-06	lb	Million Btus	Heat	Input	1.3		EPA, Septem	E	0	00:00:00	0	
7924	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	CD	630-08-0	Carbon monoxide	137	26	144	FLUE GAS RECIRCULATION	1	5.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.	EPA, Septem	A	0	00:00:00	0	
9720	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	NOK		Nitrogen oxides (NOx)	303	26	144	FLUE GAS RECIRCULATION	1	1.00E+01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Test results indicate that at least 95% by weight of NOx is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical boilers use 105 lb/1000 gallons at full load and normal (+15%) excess air.	EPA, Septem	D	0	00:00:00	0	
9724	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-CON		PM, condensable	330	26	144	FLUE GAS RECIRCULATION	1	1.30E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Factor is for operation with all controls, or uncontrolled. No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil. 65% of the condensable PM is inorganic; 35% of the condensable PM is organic.	EPA, Septem	D	0	00:00:00	0	
9728	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-FIL		PM, filterable	334	26	144	FLUE GAS RECIRCULATION	1	2.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	Does not include condensable PM. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, Septem	A	0	00:00:00	0	
9732	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-FIL		PM10, filterable	338	26	144	FLUE GAS RECIRCULATION	1	1.08E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3	Derived factor: 55% of PM-FIL factor. Assumes low-NOx burner and flue gas recirculation controls have no effect in PM10-FIL emissions.	EPA, Septem	D	0	00:00:00	0	
9735	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-PRY		PM10, primary	339	26	144	FLUE GAS RECIRCULATION	1	2.38E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3	Sum of PM10-FIL and PM-CON emission factors	This emission D	0	00:00:00	0		
9737	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM2.5-FIL		PM2.5, filterable	340	26	144	FLUE GAS RECIRCULATION	1	6.30E-01	lb	1000 Gallons	Distillate Oil	Burned	1.3	Derived factor: 42% of PM-FIL factor. Assumes low-NOx burner and flue gas recirculation controls have no effect in PM2.5-FIL emissions.	EPA, Septem	D	0	00:00:00	0	
9740	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM2.5-PRY		PM2.5, primary	341	26	144	FLUE GAS RECIRCULATION	1	2.13E+00	lb	1000 Gallons	Distillate Oil	Burned	1.3	Sum of PM2.5-FIL and PM-CON emission factors	This emission D	0	00:00:00	0		
9744	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	S02	975/7446	Sulfur dioxide	380	26	144	FLUE GAS RECIRCULATION	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.42E2*5	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	A	0	00:00:00	0
9748	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil		11/9/7446	Sulfur trioxide	382	26	144	FLUE GAS RECIRCULATION	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	5.7E0*5	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	A	0	00:00:00	0
7924	10305001	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	CD	630-08-0	Carbon monoxide	137	205	220	LOW NOX BURNERS	1	5.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.3	CO emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.	EPA, Septem	A	0	00:00:00	0	

9720	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	NOX		Nitrogen oxides (NOx)	303	205	220	LOW NOX BURNERS	1	1.00E+01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned		1.3	Test results indicate that at least 95% by weight of NOx is NO for all boiler types except residential furnaces, where about 75% is NO. For utility vertical boilers use 105 lb/1000 gallons at full load and normal (+15%) excess air.	EPA, Septem	D	0	00:00:0	0
9724	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-CO		PM, condensable	330	205	220	LOW NOX BURNERS	1	1.30E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned		1.3	Factor is for operation with all controls, or uncontrolled. No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil. 65% of the condensable PM is inorganic; 35% of the condensable PM is organic	EPA, Septem	D	0	00:00:0	0
9728	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM-FIL		PM, filterable	334	205	220	LOW NOX BURNERS	1	2.00E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned		1.3	Does not include condensable PM. Filterable PM is that particulate collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, Septem	A	0	00:00:0	0
9732	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-FIL		PM10, filterable	338	205	220	LOW NOX BURNERS	1	1.08E+00	lb	1000 Gallons	Distillate Oil	Burned		1.3	Derived factor: 55% of PM-FIL factor. Assumes low-NOx burner and flue gas recirculation controls have no effect in PM10-FIL emissions.	EPA, Septem	D	0	00:00:0	0
9735	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM10-PRI		PM10, primary	339	205	220	LOW NOX BURNERS	1	2.38E+00	lb	1000 Gallons	Distillate Oil	Burned			Sum of PM10-FIL and PM-CO emission factors	This emission	D	0	00:00:0	0
9737	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM25-FIL		PM2.5, filterable	340	205	220	LOW NOX BURNERS	1	8.30E-01	lb	1000 Gallons	Distillate Oil	Burned		1.3	Derived factor: 42% of PM-FIL factor. Assumes low-NOx burner and flue gas recirculation controls have no effect in PM25-FIL emissions.	EPA, Septem	D	0	00:00:0	0
9740	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	PM25-PRI		PM2.5, primary	341	205	220	LOW NOX BURNERS	1	2.13E+00	lb	1000 Gallons	Distillate Oil	Burned			Sum of PM25-FIL and PM-CO emission factors	This emission	D	0	00:00:0	0
9744	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	SO2	9/3/7446	Sulfur dioxide	380	205	220	LOW NOX BURNERS	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	1.42E2*	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	A	0	00:00:0	0
9748	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil		11/9/7446	Sulfur trioxide	382	205	220	LOW NOX BURNERS	1	Formula	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned	5.7E0*	1.3	To determine EF in lb/ton, multiply the EF provided by the weight percent sulfur (S).	EPA, Septem	A	0	00:00:0	0
9707	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	NH3	7664-41-7	Ammonia	87	139	198	SCR (SELECTIVE CATALYTIC RE	1	1.40E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned				Development	C	0	00:00:0	0
9706	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC RE	1	2.90E+00	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned				Development	C	0	00:00:0	0
26524	10300501	190	External Combustion Boilers	Commercial/Institutional	Distillate Oil	Grades 1 and 2 Oil		10024-97-2	Nitrous oxide	304				0	2.60E-01	lb	1000 Gallons	Distillate Oil (No. 1 & 2)	Burned		1.3		EPA, Septem	E	0	00:00:0	0

Appendix C  
Emission Factors - SCC 10300602  
Selected WeatIRE Factors  
6-Mar-18

Natural Gas Boilers 10 - 100 Mmbtu's

FACTORID	SCC	SCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEL_POLLUTA NT_CODE	CAS	POLLUTANT	POLLUTANT ID	CONTROL CODE	CONTROL ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO N	NOTES	REF_DESC	QUALITY	NUMSOURC ES	Created	REVOKED	Dupcount
9913	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Emission factor assumed to be the same as that for 1-02-006-02.	EPA_March	B	0	00.00.0	0	
9930	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	1.00E+02	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA_March	B	0	00.00.0	0	
9937	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA_March	B	0	00.00.0	0	
9948	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	SO2	9/5/7446	Sulfur dioxide	380	0	129	UNCONTROLLED	1	6.00E-01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Based on 100% conversion of fuel sulphur to SO2.	EPA_March	A	0	00.00.0	0	
9951	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	1.10E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA_March	B	0	00.00.0	0	
9954	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	5.50E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA_March	C	0	00.00.0	0	
9903	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	2.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA_March	B	0	00.00.0	0	
7937	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	7.50E-02	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA_March	B	0	00.00.0	0	
9927	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	91203	91-20-3	Naphthalene	291	0	129	UNCONTROLLED	1	6.10E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9950	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	108883	108-88-3	Toluene	397	0	129	UNCONTROLLED	1	3.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA_March	C	0	00.00.0	0	
9922	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	91576	91-57-6	2-Methyl Naphthalene	55	0	129	UNCONTROLLED	1	2.40E-05	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	D	0	00.00.0	0	
9923	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	56495	56-49-5	3-Methylcholanthrene	61	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9895	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	83329	83-32-9	Acenaphthene	69	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9896	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	208968	208-96-8	Acenaphthylene	70	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9897	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NH3	7664-41-7	Ammonia	87	0	129	UNCONTROLLED	1	4.90E-01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		Development	C	0	00.00.0	0	
9900	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	120127	120-12-7	Anthracene	91	0	129	UNCONTROLLED	1	<2.400E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9901	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440382	7440-38-2	Arsenic	93	0	129	UNCONTROLLED	1	2.00E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9902	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr		7440-39-3	Barium	96	0	129	UNCONTROLLED	1	4.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA_March	D	0	00.00.0	0	
9904	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	56553	56-55-3	Benzo (a) anthracene	102	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9905	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	50328	50-32-8	Benzo (a) pyrene	103	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9906	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	205992	205-99-2	Benzo (b) fluoranthene	104	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	
9907	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	191242	191-24-2	Benzo (g,h,i) perylene	106	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA_March	E	0	00.00.0	0	

9908	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	207089	207-08-9	Benzo (k) fluoranthene	107	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
9909	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440417	7440-41-7	Beryllium	119	0	129	UNCONTROLLED	1	<1.200E-5	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
9911	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440439	7440-43-9	Cadmium	130	0	129	UNCONTROLLED	1	1.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
9912	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	CO2	124-38-9	Carbon dioxide	136	0	129	UNCONTROLLED	1	1.20E+05	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Based on approximately 100% conversion of fuel carbon to CO2.	EPA	March	A	0	00:00:0	0
9917	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED	1	1.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
9918	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	218019	218-01-9	Chrysene	153	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
9919	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440484	7440-48-4	Cobalt	154	0	129	UNCONTROLLED	1	8.40E-05	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
9920	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	744050-8	7440-50-8	Copper	156	0	129	UNCONTROLLED	1	8.50E-04	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	C	0	00:00:0	0
9921	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	53703	53-70-3	Dibenz(a,h) anthracene	166	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7932	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	25321-22-2	25321-22-2	Dichlorobenzene, mixed isomers	169	0	129	UNCONTROLLED	1	1.20E-03	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7933	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	57976	57-97-6	Dimethylbenz(a)anthracene	181	0	129	UNCONTROLLED	1	<1.600E-5	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7934	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	74-84-0	74-84-0	Ethane	189	0	129	UNCONTROLLED	1	3.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7935	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	206440	206-44-0	Fluoranthene	204	0	129	UNCONTROLLED	1	3.00E-06	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7936	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	86737	86-73-7	Fluorene	205	0	129	UNCONTROLLED	1	2.80E-06	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7938	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	193395	193-39-5	Indeno(1,2,3-cd)pyrene	237	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
7939	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7439921	7439-92-1	Lead	250	0	129	UNCONTROLLED	1	5.00E-04	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
7940	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED	1	3.80E-04	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
7941	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7439976	7439-97-6	Mercury	260	0	129	UNCONTROLLED	1	2.60E-04	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0
7942	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	74-82-8	74-82-8	Methane	261	0	129	UNCONTROLLED	1	2.30E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4		EPA	March	B	0	00:00:0	0
9924	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7439-98-7	7439-98-7	Molybdenum	287	0	129	UNCONTROLLED	1	1.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned	1.4		EPA	March	D	0	00:00:0	0
9910	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	106-97-8	106-97-8	n-Butane	292	0	129	UNCONTROLLED	1	2.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4		EPA	March	E	0	00:00:0	0
9925	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	110543	110-54-3	n-Hexane	295	0	129	UNCONTROLLED	1	1.80E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00:0	0
9928	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7440020	7440-02-0	Nickel	296	0	129	UNCONTROLLED	1	2.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	C	0	00:00:0	0
9933	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	10024-97-2	10024-97-2	Nitrous oxide	304	0	129	UNCONTROLLED	1	2.20E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4		EPA	March	E	0	00:00:0	0
9936	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	109-66-9	109-66-9	n-Pentane	307	0	129	UNCONTROLLED	1	2.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned	1.4		EPA	March	E	0	00:00:0	0
9935	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	85018	85-01-8	Phenanthrene	325	0	129	UNCONTROLLED	1	1.70E-05	Lb	Million Cubic Feet	Natural Gas	Burned	1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00:0	0

9936	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	5.70E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, D	0	00.00.0	0
9939	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM-PRI		PM, primary	336	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, D	0	00.00.0	0
9940	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, B	0	00.00.0	0
9942	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM10-PRI		PM10, primary	339	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM10-FIL and PM-CON emission factors	This emission D	0	00.00.0	0
9943	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, B	0	00.00.0	0
9944	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	PM25-PRI		PM2.5, primary	341	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM25-FIL and PM-CON emission factors	This emission D	0	00.00.0	0
9945	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr		74-98-6	Propane	351	0	129	UNCONTROLLED	1	1.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, E	0	00.00.0	0
9946	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	129000	129-00-0	Pyrene	360	0	129	UNCONTROLLED	1	5.00E-06	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00.00.0	0
9947	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	7782492	7782-49-2	Selenium	370	0	129	UNCONTROLLED	1	<2.400E-5	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00.00.0	0
9952	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr		7440-61-2	Vanadium	413	0	129	UNCONTROLLED	1	2.30E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, D	0	00.00.0	0
9955	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr		7440-66-6	Zinc	419	0	129	UNCONTROLLED	1	2.90E-02	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, E	0	00.00.0	0
9916	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	26	144	FLUE GAS RECIRCULATION	8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, B	0	00.00.0	0	
9932	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	26	144	FLUE GAS RECIRCULATION	3.20E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, C	0	00.00.0	0	
9915	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	205	220	LOW NOX BURNER	1	8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, B	0	00.00.0	0
9916	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	205	220	LOW NOX BURNER	1	8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, B	0	00.00.0	0
9931	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	205	220	LOW NOX BURNER	1	5.00E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, D	0	00.00.0	0
9932	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	205	220	LOW NOX BURNER	1	3.20E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, C	0	00.00.0	0
9934	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr		10024-97-2	Nitrous oxide	304	205	220	LOW NOX BURNER	1	6.40E-01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, E	0	00.00.0	0
9898	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NH3	7664-41-7	Ammonia	87	139	198	SCR SELECTIVE CATALYTIC REDUCTION	1	9.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned				Development C	0	00.00.0	0
9898	10300602	195	External Combustion Boilers	Commercial/Institutional	Natural Gas	10-100 Million Btu/hr	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION	1	1.80E+01	Lb	Million Cubic Feet	Natural Gas	Burned				Development C	0	00.00.0	0



Appendix C  
Emission Factors - SCC 10300603  
Selected WebFIRE Factors  
6-Mar-18 Natural Gas Boiler <10 Million Btu/hr

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_CODE	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF DESC	QUALITY	NUMSOURCES	Created	REVOKED	Duplicate
9975	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr		630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, B	0	00:00.0	0	0	
10003	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	1.00E+02	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, B	0	00:00.0	0	0	
10008	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr		10024-97-2	Nitrous oxide	304	0	129	UNCONTROLLED	1	2.20E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, E	0	00:00.0	0	0	
10013	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensible and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensible PM.	EPA, March, B	0	00:00.0	0	0	
10025	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	SO2	9/5/7446	Sulfur dioxide	380	0	129	UNCONTROLLED	1	6.00E-01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Based on 100% conversion of fuel sulphur to SO2.	EPA, March, A	0	00:00.0	0	0	
10031	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	1.10E+01	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, B	0	00:00.0	0	0	
10034	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	5.50E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, C	0	00:00.0	0	0	
9964	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	2.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, B	0	00:00.0	0	0	
9990	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	7.50E-02	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, B	0	00:00.0	0	0	
10001	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	91203	91-20-3	Naphthalene	291	0	129	UNCONTROLLED	1	6.10E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
10029	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	108883	108-88-3	Toluene	397	0	129	UNCONTROLLED	1	3.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, C	0	00:00.0	0	0	
9996	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	91576	91-57-6	2-Methyl Naphthalene	55	0	129	UNCONTROLLED	1	2.40E-05	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, D	0	00:00.0	0	0	
9997	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	56495	56-49-5	3-Methylcholanthrene	61	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9956	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	83329	83-32-9	Acenaphthene	69	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9957	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	208968	208-96-8	Acenaphthylene	70	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9958	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	NH3	7664-41-7	Ammonia	87	0	129	UNCONTROLLED	1	4.90E-01	Lb	Million Cubic Feet	Natural Gas	Burned			Development	C	0	00:00.0	0	0	
9961	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	120127	120-12-7	Anthracene	91	0	129	UNCONTROLLED	1	<2.400E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9962	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	7440382	7440-38-2	Arsenic	93	0	129	UNCONTROLLED	1	2.00E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9963	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr		7440-39-3	Barium	96	0	129	UNCONTROLLED	1	4.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA, March, D	0	00:00.0	0	0	
9965	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	56553	56-55-3	Benzo (a) anthracene	102	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	
9966	10300603	196	External Com	Commercial/Institutional	Natural Gas	<10 Million Btu/hr	50328	50-32-8	Benzo (a) pyrene	103	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0	0	

9967	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	205992	205-99-2	Benzo (b) fluoranthene	104	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9968	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	191242	191-24-2	Benzo (g,h,i) perylene	106	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9969	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	207089	207-08-9	Benzo (k) fluoranthene	107	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9970	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7440417	7440-41-7	Beryllium	119	0	129	UNCONTROLLED	1	<1.200E-5	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9972	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7440439	7440-43-9	Cadmium	130	0	129	UNCONTROLLED	1	1.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9974	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	CO2	124-38-9	Carbon dioxide	136	0	129	UNCONTROLLED	1	1.20E+05	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Based on approximately 100% conversion of fuel carbon to CO2.	EPA	March	A	0	00:00.0	0
9980	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED	1	1.40E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9981	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	218019	218-01-9	Chrysene	153	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9982	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7440484	7440-48-4	Cobalt	154	0	129	UNCONTROLLED	1	8.40E-05	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9983	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7440-50-8	Copper	156	0	129	UNCONTROLLED	1	8.50E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA	March	C	0	00:00.0	0	
9984	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	53703	53-70-3	Dibenzo(a,h) anthracene	166	0	129	UNCONTROLLED	1	<1.200E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9985	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	25321-22-6	Dichlorobenzene, mixed isomers	169	0	129	UNCONTROLLED	1	1.20E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0	
9986	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	57976	57-97-6	Dimethylbenz(a)anth racene	181	0	129	UNCONTROLLED	1	<1.600E-5	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9987	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	74-84-0	Ethane	189	0	129	UNCONTROLLED	1	3.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA	March	E	0	00:00.0	0	
9988	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	206440	206-44-0	Fluoranthene	204	0	129	UNCONTROLLED	1	3.00E-06	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9989	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	86737	86-73-7	Fluorene	205	0	129	UNCONTROLLED	1	2.80E-06	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9991	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	193395	193-39-5	Indeno(1,2,3- cd)pyrene	237	0	129	UNCONTROLLED	1	<1.800E-6	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0
9992	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7439921	7439-92-1	Lead	250	0	129	UNCONTROLLED	1	5.00E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9993	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED	1	3.80E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9994	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7439976	7439-97-6	Mercury	260	0	129	UNCONTROLLED	1	2.60E-04	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA	March	D	0	00:00.0	0
9995	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	74-82-8	Methane	261	0	129	UNCONTROLLED	1	2.30E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA	March	B	0	00:00.0	0	
9998	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	7439-98-7	Molybdenum	287	0	129	UNCONTROLLED	1	1.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA	March	D	0	00:00.0	0	
9971	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	106-97-8	n-Butane	292	0	129	UNCONTROLLED	1	2.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4		EPA	March	E	0	00:00.0	0	
9999	10300603	196	External Com	Commercial/ nstitutional	Natural Gas	< 10 Million Btu/hr	110543	110-54-3	N-Hexane	295	0	129	UNCONTROLLED	1	1.80E+00	Lb	Million Cubic Feet	Natural Gas	Burned		1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA	March	E	0	00:00.0	0

10002	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	7440020	7440-02-0	Nickel	296	0	129	UNCONTROLLED	1	2.10E-03	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, C	0	00:00.0	0
10000	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr		109-66-0	N-Pentane	307	0	129	UNCONTROLLED	1	2.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, E	0	00:00.0	0
10010	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	85018	85-01-8	Phenanthrene	325	0	129	UNCONTROLLED	1	1.70E-05	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, D	0	00:00.0	0
10012	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM-CDN		PM, condensable	330	0	129	UNCONTROLLED	1	5.70E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, D	0	00:00.0	0
10016	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM-PRI		PM, primary	336	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, D	0	00:00.0	0
10017	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, B	0	00:00.0	0
10019	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM10-PRI		PM10, primary	339	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned				Sum of PM10-FIL and PM-CON emission factors	This emission D	0	00:00.0	0
10020	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	1.90E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, March, B	0	00:00.0	0
10021	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	PM25-PRI		PM2.5, primary	341	0	129	UNCONTROLLED	1	7.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned				Sum of PM25-FIL and PM-CON emission factors	This emission D	0	00:00.0	0
10022	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr		74-98-6	Propane	351	0	129	UNCONTROLLED	1	1.60E+00	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, E	0	00:00.0	0
10023	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	129000	129-00-0	Pyrene	360	0	129	UNCONTROLLED	1	5.00E-06	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act. HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0
10024	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	7782492	7782-49-2	Selenium	370	0	129	UNCONTROLLED	1	<2.400E-5	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.	EPA, March, E	0	00:00.0	0
10032	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr		7440-62-2	Vanadium	413	0	129	UNCONTROLLED	1	2.30E-03	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, D	0	00:00.0	0
10035	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr		7440-66-6	Zinc	419	0	129	UNCONTROLLED	1	2.90E-02	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, E	0	00:00.0	0
9979	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	26	144	FLUE GAS RECIRCULATION		8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, B	0	00:00.0	0
10007	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	26	144	FLUE GAS RECIRCULATION		3.20E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, C	0	00:00.0	0
9977	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	205	220	LOW NOX BURNER		8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, B	0	00:00.0	0
9979	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	CO	630-08-0	Carbon monoxide	137	205	220	LOW NOX BURNER		8.40E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, B	0	00:00.0	0
10006	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	205	220	LOW NOX BURNER		5.00E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, D	0	00:00.0	0
10007	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	NOX		Nitrogen oxides (NOx)	303	205	220	LOW NOX BURNER		3.20E+01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4	Expressed as NO2. For large and small wall-fired boilers with SNCR control, apply a 24% reduction to the appropriate NOx emission factor. For tangential-fired boilers with SNCR control apply a 13% reduction to the appropriate NOx emission factor.	EPA, March, C	0	00:00.0	0
10009	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr		10024-97-2	Nitrous oxide	304	205	220	LOW NOX BURNER		6.40E-01	Lb	Million Cubic Feet	Natural Gas	Burned			1.4		EPA, March, E	0	00:00.0	0
9960	10300603	196	External Com	Commercial/Institutional	Natural Gas	< 10 Million Btu/hr	NH3	7664-41-7	Ammonia	87	139	198	SCR (SELECTIVE C)		9.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned					Development, C	0	00:00.0	0

9959	10300603	196	External Com	Commercial/I nstitutional	Natural Gas	< 10 Million Btu/hr	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCA	1	1.80E+01	Lb	Million Cubic Feet	Natural Gas	Burned								Development	C	0	00.00.0		0
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Appendix C  
Emission Factors - SCC 10500205  
Selected WebFIRE Factors  
6-Mar-18

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANTID	CONTROL_CODE	CONTROLID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCES	Created	REVOKED	Dupcount
11238	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil			Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	Formula	Lb	1000 Gallons	Distillate Oil	Burned	1.436E+5		Multiply the emission factor provided by the weight percent sulfur content of the fuel to obtain emission factor in lb/activity units. 5=% Sulfur content.		A	0			0
11239	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	7.00E-01	Lb	1000 Gallons	Distillate Oil	Burned				U	0			0	
11230	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	NH3	7664-41-7	Ammonia	87	0	129	UNCONTROLLED	1	8.00E-01	Lb	1000 Gallons	Distillate Oil	Burned				Development	E	0	00:00.0		0
11233	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	1.30E+00	Lb	1000 Gallons	Distillate Oil	Burned		1.3	Factor is for operation with all controls, or uncontrolled. No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil. 65% of the condensable PM is inorganic; 35% of the condensable PM is organic	EPA, Septem	E	0	00:00.0		0
11234	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	2.46E+00	Lb	1000 Gallons	Distillate Oil	Burned				This factor w	U	0			0
11235	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	PM10-PRI		PM10, primary	339	0	129	UNCONTROLLED	1	3.76E+00	Lb	1000 Gallons	Distillate Oil	Burned			Sum of PM10-FIL and PM-CON emission factors	This emission	U	0	00:00.0		0
11236	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	6.15E-01	Lb	1000 Gallons	Distillate Oil	Burned		1.3	Derived factor: 25% of PM10-FIL factor based on factors for industrial boilers in AP-42, Table 1.3-6.	EPA, Septem	U	0	00:00.0		0
11237	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	PM25-PRI		PM2.5, primary	341	0	129	UNCONTROLLED	1	1.92E+00	Lb	1000 Gallons	Distillate Oil	Burned			Sum of PM25-FIL and PM-CON emission factors	This emission	U	0	00:00.0		0
11231	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION FOR NON SOX (SELECTIVE CATALYTIC REDUCTION)	1	2.90E+00	Lb	1000 Gallons	Distillate Oil	Burned				Development	C	0	00:00.0		0
11232	10500205	222	External Combustion Boilers	Space Heaters	Commercial/Institutional	Distillate Oil	NH3	7664-41-7	Ammonia	87	139	198	SELECTIVE NONCATALYTIC REDUCTION FOR NON SOX (SELECTIVE CATALYTIC REDUCTION)	1	1.40E+00	Lb	1000 Gallons	Distillate Oil	Burned				Development	C	0	00:00.0		0

Appendix C  
Emission Factors - SCC 10500206  
Selected Web/IRE Factors  
6-Mar-18

FACTORID	SCC	SCOD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCES	Created	REVOKED	Discount
11242	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	2.00E+01	lb	Million Cubic Feet	Natural Gas	Burned				This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0
11243	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas	NOX		Nitrogen oxides (NOx)	309	0	129	UNCONTROLLED	1	1.00E+02	lb	Million Cubic Feet	Natural Gas	Burned				This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0
11245	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	3.00E+00	lb	Million Cubic Feet	Natural Gas	Burned				This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0
11250	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas			Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	6.00E-01	lb	Million Cubic Feet	Natural Gas	Burned				This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0
11251	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	5.30E+00	lb	Million Cubic Feet	Natural Gas	Burned				This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0
11244	10500206	223	External Combustion Boilers	Space Heaters	Commercial/Institutional	Natural Gas	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	5.70E+00	lb	Million Cubic Feet	Natural Gas	Burned		1.4	All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM. Condensable PM is the PM collected using EPA Method 202 (or equivalent). Filterable PM is the PM collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, March, 1998, Section 1.4, Natural Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, Supplement D. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	E	0	00:00:0		0



Appendix C  
Emission Factors - SCC 10500210  
Selected WAPRIE Factors  
6-Mar-18

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO N	NOTES	REF_DESC	QUALITY	NUMSOURC ES	Created	REVOKED	Depurped
11257	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	2.00E+00	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	EPA, October 1992, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition, Supplement E, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0			0	
11258	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	1.45E+01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	EPA, October 1992, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition, Supplement E, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0			0	
11260	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	4.50E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	EPA, October 1992, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition, Supplement E, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0			0	
11266	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	5.50E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	EPA, October 1992, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fourth Edition, Supplement E, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0			0	
11265	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)			Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	Formula	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned	9.5E-2*		1.5	4 in gr/100 ft3. Use 86.5% as std factor, where 5 is sulfur content of fuel in wt%.	U	0			0
11259	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	5.26E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned	9.5E-2*	1.4	Derived from emission factor intended for natural gas-fired boilers. All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM. Condensable PM is the PM collected using EPA Method 202 (or equivalent). Filterable PM is the PM collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.	EPA, March, 1998, Section 1.4, Natural Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, Supplement D, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	E	0	00:00:0		0
11261	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	4.50E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	EPA, 1995, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0			0	
11262	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM10-PR		PM10, primary	339	0	129	UNCONTROLLED	1	9.76E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned			1.5	Sum of PM10-FIL and PM-CON emission factors. This emission factor was derived from other particulate matter emission factors. See Notes.	U	0	00:00:0		0
11263	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	4.50E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned		1.5	Use particle size distribution data for uncontrolled emissions for SCC 102020001 to derive PM2.5-FIL emission factor from PM10-FIL emission factor. All PM (total, condensable and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM10, PM2.5 or PM1 emissions. Total PM is the sum of the filterable PM and condensable PM.	EPA, October 1996, Section 1.5, Liquefied Petroleum Gas Combustion. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, Supplement E, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	U	0	00:00:0		0
11264	10500210	225	External Combustion Boilers	Space Heaters	Commercial/Institutional	Liquefied Petroleum Gas (LPG)	PM25-PR		PM2.5, primary	341	0	129	UNCONTROLLED	1	9.76E-01	lb	1000 Gallons	Liquefied Petroleum Gas (LPG)	Burned			1.5	Sum of PM25-FIL and PM-CON emission factors. This emission factor was derived from other particulate matter emission factors. See Notes.	U	0	00:00:0		0



Appendix C  
Emission Factors - SCC 20100101  
Selected Web/PRE Factors  
6-Mar-18

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO	AP42SECTIO_N	NOTES	REF_DESC	QUALITY	NUMSDURS	Created	REVOKED	Dupcount
11324	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION FOR NOX	1	2.90E+00	lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; EC/R Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00.00.0		0	
11325	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	NH3	7664-41-7	Ammonia	87	139	198	SCR (SELECTIVE CATALYTIC REDUCTION)	1	1.40E+00	lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; EC/R Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00.00.0		0	
11328	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	7440382	7440-38-2	Arsenic	93	0	129	UNCONTROLLED	1	<1.100E-5	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11331	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	5.50E-05	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0		0
11332	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	71432	71-43-2	Benzene	98	21	142	DIRECT FLAME AFTERBURNER	1	9.13E-05	lb	Million Btus	Heat	Input				F factor, Distillate Oil (calculated) = 9325 kcal/MMBtu, HHV = 19500 Btu/lb.	McDaniel, M.D. and J.A. Green, CABROT, Tustin, California. May 1990. In: Air Toxics Emissions Inventory Testing at Coolwater Generating Station Combustion Turbine No. 42. ESR 53804-2054. Prepared for Southern California Edison Company, Rosemead, California. For Inclusion in Air Toxics Hot Spots Inventory Required under AB-2588.	U	0			0
11334	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	7440417	7440-41-7	Beryllium	119	0	129	UNCONTROLLED	1	<3.100E-7	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11337	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	106990	106-99-0	1,3-Butadiene	25	0	129	UNCONTROLLED	1	<1.600E-5	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11339	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	7440439	7440-43-9	Cadmium	130	0	129	UNCONTROLLED	1	4.80E-06	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11342	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	CO2	124-38-9	Carbon dioxide	136	0	129	UNCONTROLLED	1	1.57E+02	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	A	0	00.00.0		0
11344	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	3.30E-03	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0		0
11346	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	CO	630-08-0	Carbon monoxide	137	28	145	STEAM OR WATER INJECTION	1	7.60E-02	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0		0
11348	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED	1	1.10E-05	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11352	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	2.80E-04	lb	Million Btus	Fuel	Input			3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	B	0	00.00.0		0



11382	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	PM25-PR1		PM2.5, primary	341	28	145	STEAM OR WATER INJECTION	1	1.11E-02	Lb	Million Btus	Fuel	Input						Sum of PM25-FIL and PM-CON emission factors	This emission factor was derived from other particulate matter emission factors. See Notes.	U	0	00.00.0		0
11383	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	40		Polycyclic aromatic hydrocarbons (PAH)	347	0	129	UNCONTROLLED	1	4.00E-05	Lb	Million Btus	Fuel	Input					3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0		0
11386	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	7782492	7782.49-2	Selenium	370	0	129	UNCONTROLLED	1	+2.500E-5	Lb	Million Btus	Fuel	Input					3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0		0
11389	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	SO2	9/5/7446	Sulfur dioxide	380	0	129	UNCONTROLLED	1	Formula	Lb	Million Btus	Fuel	Input	1.01E0*5				3.1	All sulfur in the fuel is assumed to be converted to SO2. 5-percent sulfur in the fuel. Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	B	0	00.00.0		0
11393	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	4.00E-03	Lb	Million Btus	Fuel	Input					3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0		0
11396	20100101	228	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Turbine	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	4.10E-04	Lb	Million Btus	Fuel	Input					3.1	Emission factors based on an average distillate oil heating value of 139 MMBtu/1000 gallons. To convert from (lb/MMBtu) to (lb/1000 gallons), multiply by 139.	EPA 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	E	0	00.00.0		0

Appendix C  
Emission Factors - SCC 20100102  
Selected WadRE Factors  
6-Mar-18

FACTORID	SCC	SCCD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANTID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO N	NOTES	REF_DESC	QUALITY	NUMDUWC ES	Created	REVOKED	Dupcount	
7955	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	50328	50-32-8	Benzo (a) pyrene	103	0	129	UNCONTROLLED	1	<4.290E-7	Lb	Million/Bus	Heat	Input			Based on F-factor of 9,190 dscf/MMBtu.	Source Emissions Survey of Diesel-Fired Generating Units, October 1990. (Confidential Report No. ERC-90)	U	0			0	
7956	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	1.30E+02	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3		EPA, 1995, Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			0	
7957	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	218019	218-01-9	Chrysene	153	0	129	UNCONTROLLED	1	1.20E-05	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7958	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	100414	100-41-4	Ethylbenzene	197	0	129	UNCONTROLLED	1	3.07E-03	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data are also available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7959	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	206440	206-44-0	Fluoranthene	204	0	129	UNCONTROLLED	1	1.31E-04	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7960	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	6.63E-02	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7961	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	1330207	1330-20-7	Isomers of xylene	246	0	129	UNCONTROLLED	1	6.84E-03	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7962	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	91203	91-20-3	Naphthalene	291	0	129	UNCONTROLLED	1	1.29E-02	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
7963	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	6.04E+02	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3		EPA, 1995, Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			0	
7965	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	1.40E+01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.4		EPA, 1996, Section 3.4, Large Stationary Diesel and all Stationary Dual-fuel Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0	00:00:0		0	
11398	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION FOR NOX	1	2.90E+00	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; EC/R Incorporated, Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00:00:0		0	
11399	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	NH3	7664-41-7	Ammonia	87	139	168	SCR (SELECTIVE CATALYTIC REDUCTION)	1	1.40E+00	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; EC/R Incorporated, Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00:00:0		0	
11400	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	1.29E-01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
11401	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	56553	56-55-3	Benzo (a) anthracene	102	0	129	UNCONTROLLED	1	1.52E-06	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned				Emissions data is available in lb/MMBtu.	AB2588 Source Test Report for Diesel-fired IC Engine and Diesel-fired Boiler. (Confidential Report No. ERC-93)	U	0			0
11403	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.40E+01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.4		EPA, 1996, Section 3.4, Large Stationary Diesel and all Stationary Dual-fuel Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0	00:00:0		0	
11405	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	PM2.5-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	1.40E+01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.4		EPA, 1996, Section 3.4, Large Stationary Diesel and all Stationary Dual-fuel Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0	00:00:0		0	

11406	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating			Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	3.97E+01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3		EPA, 1995. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			0
11407	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating	108883	108-88-3	Toluene	397	0	129	UNCONTROLLED	1	3.86E-02	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned			Emissions data is available in lb/MMBtu.	U	0			0	
11408	20100102	229	Internal Combustion Engines	Electric Generation	Distillate Oil (Diesel)	Reciprocating			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	4.93E+01	Lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3		EPA, 1995. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			0

Appendix C  
Emission Factors - SCC 20100201  
Selected Web/IRE Factors  
6-Mar-18

FACTORID	SCC	SCCD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NET_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_TID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO N	NOTES	REF_DESC	QUALITY	NUMSOURC ES	Created	REVOKED	Duplicate
11419	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	75070	75-07-0	Acetaldehyde	71	0	129	UNCONTROLLED	1	4.00E-05	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	C	0	00.00.0		0
11420	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	107028	107-02-8	Acrolein	79	0	129	UNCONTROLLED	1	6.40E-06	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	C	0	00.00.0		0
11422	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION FOR NOX	1	1.80E+01	Lb	Million Cubic Feet	Natural Gas	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; ECR Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00.00.0		0
11423	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	NH3	7664-41-7	Ammonia	87	129	198	SCR (SELECTIVE CATALYTIC REDUCTION)	1	9.10E+00	Lb	Million Cubic Feet	Natural Gas	Burned				Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; ECR Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00.00.0		0
11424	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	1.20E-05	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	A	0	00.00.0		0
11425	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	71432	71-43-2	Benzene	98	65	159	CATALYTIC REDUCTION	1	9.10E-07	Lb	Million Btus	Fuel	Input		3.1	SCONOX catalyst used. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	D	0	00.00.0		0
11426	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	106990	106-99-0	1,3-Butadiene	25	0	129	UNCONTROLLED	1	< 4.300E-7	Lb	Million Btus	Fuel	Input		3.1	Compound was not detected. Emission factor is based on one-half of the detection limit. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	D	0	00.00.0		0
11428	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	CO2	124-38-9	Carbon dioxide	136	0	129	UNCONTROLLED	1	1.10E+02	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	A	0	00.00.0		0
11430	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	8.20E-02	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	A	0	00.00.0		0
11433	2010201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	CO	630-08-0	Carbon monoxide	137	28	145	STEAM OR WATER INJECTION	1	3.00E-02	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000, Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency.	A	0	00.00.0		0

11435	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	CO	630-08-0	Carbon monoxide	137	149	206	PRE-COMBUSTION CHAMBER	1	1.50E-02	Lb	Million Btus	Fuel	Input			3.1	Control is use of lean-premix fuel. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0	0
11436	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	100414	100-41-4	Ethylbenzene	197	0	129	UNCONTROLLED	1	3.20E-05	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11437	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	7.30E-04	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	A	0	00.00.0	0
11439	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	50000	50-00-0	Formaldehyde	210	65	159	CATALYTIC REDUCTION	1	2.00E-05	Lb	Million Btus	Fuel	Input			3.1	SCONOX catalyst used. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0	0
11440	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	50000	50-00-0	Formaldehyde	210	112	175	AFTERBURNER	1	3.44E-04	Lb	Million Btus	Heat	Input				F-factor of natural gas = 8,472 dscf/MMBtu. HHV = 995 Btu/scf.	CARNOT, Tustin, California. January 1991. In: Air Toxics Emissions Inventory Testing at Coolwater Generating Station, Combustion Turbine No. 42. Prepared for Southern California Edison Company.	U	0	00.00.0	0
11441	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	1330207	1330-20-7	Isomers of xylene	246	0	129	UNCONTROLLED	1	6.40E-05	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11442	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	74-82-8	74-82-8	Methane	261	0	129	UNCONTROLLED	1	8.60E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11443	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	91203	91-20-3	Naphthalene	291	0	129	UNCONTROLLED	1	1.30E-06	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11445	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	3.20E-01	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	A	0	00.00.0	0
11448	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	NOX		Nitrogen oxides (NOx)	303	28	145	STEAM OR WATER INJECTION	1	1.30E-01	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	A	0	00.00.0	0
11450	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	NOX		Nitrogen oxides (NOx)	303	149	206	PRE-COMBUSTION CHAMBER	1	9.90E-02	Lb	Million Btus	Fuel	Input			3.1	Control is use of lean-premix fuel. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf), multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0	0

11451	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine		10024-97-2	Nitrous oxide	304	28	145	STEAM OR WATER INJECTION	1	3.00E-03	Lb	Million Btus	Fuel	Input			3.1	Based on limited source tests on a single turbine with water-steam injection. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	E	0	00.00.0	0
11453	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM-CON		PM, condensable	330	28	145	STEAM OR WATER INJECTION	1	4.70E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11454	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM-FIL		PM, filterable	334	28	145	STEAM OR WATER INJECTION	1	1.90E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11456	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM-PR		PM, primary	336	28	145	STEAM OR WATER INJECTION	1	6.60E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11458	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM10-FIL		PM10, filterable	338	28	145	STEAM OR WATER INJECTION	1	1.90E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, April, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0	00.00.0	0
11460	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM10-PR		PM10, primary	339	28	145	STEAM OR WATER INJECTION	1	6.60E-03	Lb	Million Btus	Fuel	Input				Sum of PM10-FIL and PM-CON emission factors	This emission factor was derived from other particulate matter emission factors. See Notes.	C	0	00.00.0	0
11461	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM25-FIL		PM2.5, filterable	340	28	145	STEAM OR WATER INJECTION	1	1.90E-03	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, April, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0	00.00.0	0
11462	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	PM25-PR		PM2.5, primary	341	28	145	STEAM OR WATER INJECTION	1	6.60E-03	Lb	Million Btus	Fuel	Input				Sum of PM25-FIL and PM-CON emission factors	This emission factor was derived from other particulate matter emission factors. See Notes.	C	0	00.00.0	0
11463	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	40		Polycyclic aromatic hydrocarbons (PAH)	347	0	129	UNCONTROLLED	1	2.20E-06	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00.00.0	0
11464	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	75569	75-56-9	Propylene oxide	357	0	129	UNCONTROLLED	1	< 2.90E-5	Lb	Million Btus	Fuel	Input			3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00.00.0	0
11465	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	S02	9/5/7446	Sulfur dioxide	380	0	129	UNCONTROLLED	1	Formula	Lb	Million Btus	Fuel	Input	9.4E-1*5		3.1	All sulfur in the fuel is assumed to be converted to SO2. S=percent sulfur in the fuel. Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (lb/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA, 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	B	0	00.00.0	0



11467	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	108883	108-88-3	Toluene	397	0	129	UNCONTROLLED	1	1.30E-04	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (Bt/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	C	0	00:00:0	0
11469	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	1.10E-02	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (Bt/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	B	0	00:00:0	0
11472	20100201	235	Internal Combustion Engines	Electric Generation	Natural Gas	Turbine	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	2.10E-03	Lb	Million Btus	Fuel	Input		3.1	Emission factor based on an average natural gas heating value (HHV) of 1020 Btu/scf at 60 deg. F. To convert from (Bt/MMBtu) to (lb/10 <sup>6</sup> scf) multiply by 1020. Also, this emission factor may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to the average heating value of 1020 Btu/scf.	EPA. 2000. Section 3.1, Stationary Gas Turbines for Electricity Generation. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency.	D	0	00:00:0	0

Appendix C  
Emission Factors - SCC 20100201  
Selected WeatIRE Factors  
6-Mar-18

FACTORID	SCC	SCOD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANTID	CONTROL_CODE	CONTROLID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCES	Created	REVOKED	Dupcount
11474	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE NONCATALYTIC REDUCTION FOR NOx	1	1.80E+01	lb	Million Cubic Feet	Natural Gas	Burned			Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; ECR Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00:00.0		0	
11475	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	NH3	7664-41-7	Ammonia	87	139	158	SCR (SELECTIVE CATALYTIC REDUCTION)	1	9.10E+00	lb	Million Cubic Feet	Natural Gas	Burned			Development and Selection of Ammonia Emission Factors - Final Report. R. Battye, W. Battye, C. Overcash, and S. Fudge; ECR Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	00:00.0		0	
11476	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	3.99E+02	lb	Million Cubic Feet	Natural Gas	Burned		3.2	EPA, 1995. Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	A	0			0	
11477	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	NOx		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	2.84E+03	lb	Million Cubic Feet	Natural Gas	Burned		3.2	EPA, 1995. Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	A	0			0	
11478	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM-CON		PM, condensable	330	0	129	UNCONTROLLED	1	1.01E+01	lb	Million Cubic Feet	Natural Gas	Burned		3.2	No data were available for condensable PM emissions. The presented emission factor reflects emissions from 45LB engines. Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/106 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation: $lb/hp-hr = (lb/MMBtu) / (heat\ input\ MMBtu/hr) / (1/operating\ HP, 1/hp)$ .	D	0	00:00.0		0	
11479	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	1.00E+01	lb	Million Cubic Feet	Natural Gas	Burned			EPA. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Third Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina. Particulate emission factor is the average of emission factors listed for this process. This value should only be used in the absence of better information.	U	0			0	
11480	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED	1	1.00E+01	lb	Million Cubic Feet	Natural Gas	Burned			EPA. In: PM10 Emission Factor Listing Developed by Technology Transfer. EPA-450/4-89-022. U.S. Environmental Protection Agency.	U	0			0	
11481	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM10-PR1		PM10, primary	339	0	129	UNCONTROLLED	1	2.01E+01	lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM10-FIL and PM-CON emission factors	U	0	00:00.0		0	
11482	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTROLLED	1	1.00E+01	lb	Million Cubic Feet	Natural Gas	Burned			EPA. In: PM10 Emission Factor Listing Developed by Technology Transfer. EPA-450/4-89-022. U.S. Environmental Protection Agency.	U	0	00:00.0		0	
11483	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	PM25-PR1		PM2.5, primary	341	0	129	UNCONTROLLED	1	2.01E+01	lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM25-FIL and PM-CON emission factors	U	0	00:00.0		0	

11484	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating		Sulfur oxides (SOx)	381	0	129	UNCONTROLLED	1	6.00E-01	Lb	Million Cubic Feet	Natural Gas	Burned		3.2		EPA, 1995, Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0
11485	20100202	236	Internal Combustion Engines	Electric Generation	Natural Gas	Reciprocating	VOC	Volatile organic compounds (VOC)	417	0	129	UNCONTROLLED	1	1.16E+02	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	reported as TNMOC	EPA, 1995, Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	A	0			0

Appendix C  
Emission Factors - SCC 20300101  
Selected WASTE Factors  
6-Mar-18

FACTORID	SCC	SCCD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT CODE	CAS	POLLUTANT	POLLUTANT ID	CONTROL CODE	CONTROL D	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF DESC	QUALITY	NUMSOURCES	Created	REVISED	Duplicate
12281	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTROLLED	1	1.30E+02	lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3	The heating value for diesel fuel is 137,000 BTU/gallon. This was used to convert from lbs/MMBTU.	EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12290	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	NOx		Nitrogen oxides (NOx)	303	0	129	UNCONTROLLED	1	6.04E+02	lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3	The heating value for diesel fuel is 137,000 BTU/gallon. This was used to convert from lbs/MMBTU.	EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12292	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	PM-FIL		PM, filterable	334	0	129	UNCONTROLLED	1	4.25E+01	lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3	The heating value for diesel fuel is 137,000 BTU/gallon. This was used to convert from lbs/MMBTU.	EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12298	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating			Sulfur oxides (SOx)	383	0	129	UNCONTROLLED	1	3.97E+01	lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12300	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating			Total organic compounds (TOC)	399	0	129	UNCONTROLLED	1	4.93E+01	lb	1000 Gallons	Distillate Oil (Diesel)	Burned		3.3	Emission factor represents the sum of exhaust, evaporative, crankcase, and re-refining emissions. The heating value for diesel fuel is 137,000 BTU/gallon. This was used to convert from lbs/MMBTU.	EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12273	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	71432	71-43-2	Benzene	98	0	129	UNCONTROLLED	1	9.33E-04	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12286	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	50000	50-00-0	Formaldehyde	210	0	129	UNCONTROLLED	1	1.18E-03	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12289	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	91203	91-20-3	Naphthalene	293	0	129	UNCONTROLLED	1	8.48E-05	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	E	0			
12299	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	108881	108-88-3	Toluene	397	0	129	UNCONTROLLED	1	4.09E-04	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12265	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	83329	83-32-9	Acenaphthene	69	0	129	UNCONTROLLED	1	< 1.420E-6	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12266	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	208968	208-96-8	Acenaphthylene	70	0	129	UNCONTROLLED	1	< 5.960E-6	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12267	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	73070	73-07-0	Acetaldehyde	71	0	129	UNCONTROLLED	1	7.67E-04	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12268	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	107028	107-02-8	Acrolein	79	0	129	UNCONTROLLED	1	< 9.250E-5	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	E	0			
12269	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating			Aldehydes	82	0	129	UNCONTROLLED	1	7.00E-02	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0			
12272	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	120127	120-12-7	Anthracene	91	0	129	UNCONTROLLED	1	1.87E-06	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12274	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	56553	56-55-3	Benz(a)anthracene	103	0	129	UNCONTROLLED	1	1.68E-06	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			
12275	20300101	335	Internal Combustion Engines	Commercial/Institutional	Distillate Oil (Diesel)	Reciprocating	50328	50-32-8	Benz(a)pyrene	103	0	129	UNCONTROLLED	1	< 1.880E-7	lb	Million Btus	Heat	Input		3.3		EPA, October 1996. Section 3.3, Gasoline and Diesel Industrial Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	F	0			





Appendix C  
Emission Factors - SCC 20300201  
Selected Web/PRE Factors

FACTORID	SCC	SCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	HEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_D	CONTROL_CODE	CONTROL_D	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTIO	NOTES	REF_DESC	QUALITY	NUMSOURC	Created	REVOKED	Discount
12350	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	CO	630-08-0	Carbon monoxide	137	0	129	UNCONTRC	1	399	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	EPA. 1995. Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	A	0			0	
12357	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	NOX		Nitrogen oxides (NOx)	303	0	129	UNCONTRC	1	2840	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	EPA. 1995. Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	A	0			0	
12360	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM-FIL		PM filterable	334	0	129	UNCONTRC	1	10	Lb	Million Cubic Feet	Natural Gas	Burned			This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0	
12365	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating			Sulfur oxides (SOx)	381	0	129	UNCONTRC	1	0.6	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	EPA. 1995. Section 3.2, Heavy Duty Natural Gas Fired Pipeline Compressor Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0	
12366	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	VOC		Volatile organic compounds (VOC)	417	0	129	UNCONTRC	1	116	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	reported as TNMOC	A	0			0	
12356	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	7440020	7440-02-0	Nickel	296	0	129	UNCONTRC	1	0.07509	ng	Joules	Energy	Output			Lack of Supporting Documentation.	U	0			0	
12359	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM-CON		PM, condensable	330	0	129	UNCONTRC	1	10.11	Lb	Million Cubic Feet	Natural Gas	Burned		3.2	No data were available for condensable PM emissions. The presented emission factor reflects emissions from 45LB engines. Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/106 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation: lb/hp-hr = (lb/MMBtu)/heat input, MMBtu/hr x 1/operating HP, 1/hp).	EPA. July 2000. Section 3.2, Natural Gas-fired Reciprocating Engines. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	D	0	38018		0
12361	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM10-FIL		PM10, filterable	338	0	129	UNCONTRC	1	10	Lb	Million Cubic Feet	Natural Gas	Burned			This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003. These factors may have been (and may still be) in an AP-42 section, or they may have been added to that March 1990 document from other sources. Please check the latest AP42 to verify.	U	0			0	
12362	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM10-PR		PM10, primary	339	0	129	UNCONTRC	1	20.11	Lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM10-FIL and PM-CON emission factors	U	0	38018		0	
12363	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM25-FIL		PM2.5, filterable	340	0	129	UNCONTRC	1	10	Lb	Million Cubic Feet	Natural Gas	Burned			This emission factor was derived from other particulate matter emission factors. See Notes.	U	0	38018		0	
12364	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	PM25-PR		PM2.5, primary	341	0	129	UNCONTRC	1	20.11	Lb	Million Cubic Feet	Natural Gas	Burned			Sum of PM25-FIL and PM-CON emission factors	U	0	38018		0	
12348	20300201	362	Internal Combustion Engines	Commercial/Institutional	Natural Gas	Reciprocating	NH3	7664-41-7	Ammonia	87	107	172	SELECTIVE	1	18	Lb	Million Cubic Feet	Natural Gas	Burned			Development and Selection of Ammonia Emission Factors - Final Report, R. Batty, W. Batty, C. Overcash, and S. Fudge; EC/R Incorporated; Durham, NC. Report prepared for USEPA Office of Research and Development; August, 1994.	C	0	36770		0	





Appendix C  
Emission Factors - SCC 30905128  
Selected Web/PRE Factors  
24-Apr-18

FACTORID	SCC	SCCD	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTION	NOTES	REF_DESC	QUALITY	NUMSOURCES	Created	REVOKED	Duplicate	
21836	30905128	6909	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E6010 Electrode	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED		3.00E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	B	0				0
21837	30905128	6909	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E6010 Electrode	18540299	18540-29-9	Chromium (VI)	151	0	129	UNCONTROLLED		1.00E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	B	0				0
21838	30905128	6909	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E6010 Electrode	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED		9.91E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	B	0				0
21839	30905128	6909	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E6010 Electrode	7440020	7440-02-0	Nickel	296	0	129	UNCONTROLLED		4.00E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	B	0				0
21840	30905128	6909	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E6010 Electrode	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED		2.56E+01	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 229 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.	B	0				0

Appendix C  
Emission Factors - SCC 30905144  
Selected Welding Factors  
24-Apr-18

FACTORID	SCC	SCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI_POLLUTANT_CODE	CAS	POLLUTANT	POLLUTANT_ID	CONTROL_CODE	CONTROL_ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTI ON	NOTES	REF_DESC	QUALITY	NUMSOU	Created	REVOKED	Duplicate	
21852	30905144	6913	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E7018 Electrode	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED		6.00E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding, In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0				0
21853	30905144	6913	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E7018 Electrode	7440484	7440-48-4	Cobalt	154	0	129	UNCONTROLLED		<1.000E-3	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding, In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0				0
21854	30905144	6913	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E7018 Electrode	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED		1.03E+00	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding, In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0				0
21855	30905144	6913	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E7018 Electrode	7440020	7440-02-0	Nickel	296	0	129	UNCONTROLLED		2.00E-03	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding, In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0				0
21856	30905144	6913	Industrial Processes	Fabricated Metal Products	Shielded Metal Arc Welding (SMAW)	E7018 Electrode	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED		1.84E+01	lb	1000 Pounds	Electrode	Consumed		12.19	Current = 102 to 225 A; voltage = 21 to 34 V.	EPA, 1995, Section 12.19, Electric Arc Welding, In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	C	0				0

Appendix C  
Emission Factors - SCC 30905144  
Selected Web/PRE Factors  
24-Apr-18

FACTORID	SCC	SCCID	LEVEL1	LEVEL2	LEVEL3	LEVEL4	NEI POLLUTANT CODE	CAS	POLLUTANT	POLLUTANT ID	CONTROL CODE	CONTROL ID	CONTROL	Primary	FACTOR	UNIT	MEASURE	MATERIAL	ACTION	FORMULA	AP42SECTI ON	NOTES	REF DESC	QUALITY	NUMSOURCES	Created	REVOKED	Dupcount
21930	30905355	6937	Industrial Processes	Fabricated Metal Products	Flux Cored Arc Welding (FCAW)	E71T Electrode	7440473	7440-47-3	Chromium	149	0	129	UNCONTROLLED		2.00E-03	Lb	1000 Pounds	Electrode	Consumed		12.19	Includes E71T-1 and E71T-11.	EPA. 1995. Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 3: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0
21931	30905355	6937	Industrial Processes	Fabricated Metal Products	Flux Cored Arc Welding (FCAW)	E71T Electrode	7440484	7440-48-4	Cobalt	154	0	129	UNCONTROLLED		< 1.00E-3	Lb	1000 Pounds	Electrode	Consumed		12.19	Includes E71T-1 and E71T-11.	EPA. 1995. Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 3: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0
21932	30905355	6937	Industrial Processes	Fabricated Metal Products	Flux Cored Arc Welding (FCAW)	E71T Electrode	7439965	7439-96-5	Manganese	257	0	129	UNCONTROLLED		6.62E-01	Lb	1000 Pounds	Electrode	Consumed		12.19	Includes E71T-1 and E71T-11.	EPA. 1995. Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 3: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0
21933	30905355	6937	Industrial Processes	Fabricated Metal Products	Flux Cored Arc Welding (FCAW)	E71T Electrode	7440020	7440-02-0	Nickel	296	0	129	UNCONTROLLED		4.00E-03	Lb	1000 Pounds	Electrode	Consumed		12.19	Includes E71T-1 and E71T-11.	EPA. 1995. Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 3: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0
21934	30905355	6937	Industrial Processes	Fabricated Metal Products	Flux Cored Arc Welding (FCAW)	E71T Electrode	PM10-FIL		PM10, filterable	338	0	129	UNCONTROLLED		1.22E+01	Lb	1000 Pounds	Electrode	Consumed		12.19	Current = 450 to 550 A; voltage = 31 to 32 V. Type of shielding gas employed will influence emission factor. Includes E71T-1 and E71T-11.	EPA. 1995. Section 12.19, Electric Arc Welding. In: Compilation of Air Pollutant Emission Factors, Volume 3: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.	B	0			0

**Appendix B**  
Emission Source Calculation  
Sheets

**Diesel Generator Calculations**  
**AY**  
**Appendix B**  
**Diesel Generators (SCC# 20300101)**

**Convert KW to BTU/hr**

<b>Unit Size in Kilowatts</b>	60	<b>(Kw)</b>
<b>Conversion factor for KW to BTU/min</b>	56.92	
<b>Heat Input Capacity (1)</b>	1,726,578	<b>(btu/hr)</b>
<b>Heat Content of Fuel</b>	137,030	<b>(btu/gal)</b>
<b>Horsepower</b>	80	<b>(hp)</b>
<b>Maximum Fuel Firing Rate</b>	12.60	<b>(gal / hr)</b>

**Potential Hours of Operation** 8,760 **(hr / year)**

**Max Annual Fuel** 110,376 **(gal / year)**

**Actual Fuel Usage** 330 **(gal / year)**

**Actual Hour Usage** 26.15443817 **(hrs/ year since installed)**

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	7.17E+00	2.14E-02	100
Nitrogen oxides (NOx)	6.04E-01	3.33E+01	9.95E-02	25
PM, filterable	4.25E-02	2.35E+00	7.00E-03	100
Sulfur oxides (SOx)	3.97E-02	2.19E+00	6.54E-03	100
Total organic compounds (TOC)	4.93E-02	2.72E+00	8.12E-03	25
<b>Total Primary Pollutants</b>		<b>4.78E+01</b>	<b>1.43E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	7.06E-03	2.11E-05	10
Formaldehyde	1.18E-09	8.92E-03	2.66E-05	10
Naphthalene	8.48E-11	6.41E-04	1.91E-06	10
Toluene	4.09E-10	3.09E-03	9.23E-06	10
Acenaphthene	1.42E-12	1.07E-05	3.21E-08	10
Acenaphthylene	5.06E-12	3.83E-05	1.14E-07	10
Acetaldehyde	7.67E-10	5.80E-03	1.73E-05	10
Acrolein	9.25E-11	7.00E-04	2.09E-06	10
Aldehydes	7.00E-08	5.29E-01	1.58E-03	10
Anthracene	1.87E-12	1.41E-05	4.22E-08	10
Benzo (a) anthracene	1.68E-12	1.27E-05	3.79E-08	10
Benzo (a) pyrene	1.88E-13	1.42E-06	4.24E-09	10
Benzo (b) fluoranthene	9.91E-14	7.49E-07	2.24E-09	10
Benzo (g,h,i) perylene	4.89E-13	3.70E-06	1.10E-08	10
Benzo (k) fluoranthene	1.55E-13	1.17E-06	3.50E-09	10
1,3-Butadiene	3.91E-11	2.96E-04	8.83E-07	10
Chrysene	3.53E-13	2.67E-06	7.97E-09	10
Dibenzo(a,h) anthracene	5.83E-13	4.41E-06	1.32E-08	10
Fluoranthene	7.61E-12	5.75E-05	1.72E-07	10
Fluorene	2.92E-11	2.21E-04	6.59E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	2.84E-06	8.47E-09	10
Isomers of xylene	2.85E-10	2.16E-03	6.43E-06	10
Phenanthrene	2.94E-11	2.22E-04	6.64E-07	10
PM10, filterable	4.25E-02	2.35E+00	7.00E-03	10
PM2.5, filterable	4.25E-02	2.35E+00	7.00E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.27E-03	3.79E-06	10
Propylene	2.58E-09	1.95E-02	5.83E-05	10
Pyrene	4.78E-12	3.61E-05	1.08E-07	10
<b>Total HAPs</b>		<b>5.27E+00</b>	<b>1.57E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.25E+03	3.72E+00
<b>Total Greenhouse Gases</b>		<b>1.25E+03</b>	<b>3.72E+00</b>

**Notes:**

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.
- Actual Hour Usage was calculated by finding the difference between the installation date and the approx date the survey was conducted. When installation date is not available, Jan 1st of the "year made" year was used.

Natural Gas Emissions Boiler  
 AY  
 Appendix B  
 Army Emissions Calculations  
 Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	5,799,999	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	5,686.27	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	49,811,756.12	(scf / year)
Actual Fuel Usage	1,879,294.29	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	2.09E+00	7.89E-02	100
Nitrogen oxides (NOx)	1.02E-04	2.55E+00	9.60E-02	25
PM, filterable	1.90E-06	4.73E-02	1.79E-03	100
Sulfur dioxide	6.00E-07	1.49E-02	5.64E-04	100
Total organic compounds (TOC)	1.10E-05	2.74E-01	1.03E-02	25
Volatile organic compounds (VOC)	5.50E-06	1.37E-01	5.17E-03	25
<b>Total Primary Pollutants</b>		<b>5.11E+00</b>	<b>1.93E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	5.23E-05	1.97E-06	10
Formaldehyde	7.50E-08	1.87E-03	7.05E-05	10
Naphthalene	6.10E-10	1.52E-05	5.73E-07	10
Toluene	3.40E-09	8.47E-05	3.19E-06	10
2-Methyl Naphthalene	2.40E-11	5.98E-07	2.26E-08	10
3-Methylcholanthrene	1.80E-12	4.48E-08	1.69E-09	10
Acenaphthene	1.80E-12	4.48E-08	1.69E-09	10
Acenaphthylene	1.80E-12	4.48E-08	1.69E-09	10
Ammonia	4.90E-07	1.22E-02	4.60E-04	10
Anthracene	2.40E-12	5.98E-08	2.26E-09	10
Arsenic	2.00E-10	4.98E-06	1.88E-07	10
Barium	4.40E-09	1.10E-04	4.13E-06	10
Benzo (a) anthracene	1.80E-12	4.48E-08	1.69E-09	10
Benzo (a) pyrene	1.20E-12	2.99E-08	1.13E-09	10
Benzo (b) fluoranthene	1.80E-12	4.48E-08	1.69E-09	10
Benzo (g,h,i) perylene	1.20E-12	2.99E-08	1.13E-09	10
Benzo (k) fluoranthene	1.80E-12	4.48E-08	1.69E-09	10
Beryllium	1.20E-11	2.99E-07	1.13E-08	10
Cadmium	1.10E-09	2.74E-05	1.03E-06	10
Chromium	1.40E-09	3.49E-05	1.32E-06	10
Chrysene	1.80E-12	4.48E-08	1.69E-09	10
Cobalt	8.40E-11	2.09E-06	7.89E-08	10
Copper	8.50E-10	2.12E-05	7.99E-07	10
Dibenzo(a,h) anthracene	1.20E-12	2.99E-08	1.13E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	2.99E-05	1.13E-06	10
Dimethylbenz(a)anthracene	1.60E-11	3.98E-07	1.50E-08	10
Ethane	3.10E-06	7.72E-02	2.91E-03	10
Fluoranthene	3.00E-12	7.47E-08	2.82E-09	10
Fluorene	2.80E-12	6.97E-08	2.63E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	4.48E-08	1.69E-09	10
Lead	5.00E-10	1.25E-05	4.70E-07	10
Manganese	3.80E-10	9.46E-06	3.57E-07	10
Mercury	2.60E-10	6.48E-06	2.44E-07	10
Molybdenum	1.10E-09	2.74E-05	1.03E-06	10
n-Butane	2.10E-06	5.23E-02	1.97E-03	10
N-Hexane	1.80E-06	4.48E-02	1.69E-03	10
Nickel	2.10E-09	5.23E-05	1.97E-06	10
N-Pentane	2.60E-06	6.48E-02	2.44E-03	10
Phenanthrene	1.70E-11	4.23E-07	1.60E-08	10
PM, condensable	5.70E-06	1.42E-01	5.36E-03	10
PM, primary	7.60E-06	1.89E-01	7.14E-03	10
PM10, filterable	1.90E-06	4.73E-02	1.79E-03	10
PM10, primary	7.60E-06	1.89E-01	7.14E-03	10
PM2.5, filterable	1.90E-06	4.73E-02	1.79E-03	10
PM2.5, primary	7.60E-06	1.89E-01	7.14E-03	10
Propane	1.60E-06	3.98E-02	1.50E-03	10
Pyrene	5.00E-12	1.25E-07	4.70E-09	10
Selenium	2.40E-11	5.98E-07	2.26E-08	10
Vanadium	2.30E-09	5.73E-05	2.16E-06	10
Zinc	2.90E-08	7.22E-04	2.72E-05	10
<b>Total HAPs</b>		<b>1.10E+00</b>	<b>4.15E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	2.99E+03	1.13E+02
Methane	2.30E-06	5.73E-02	2.16E-03
<b>Total Greenhouse Gases</b>		<b>2.99E+03</b>	<b>1.13E+02</b>

Natural Gas Emissions Space Heater

AY

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	350000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	343.14	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	3,005,882.35	(scf /year)
Actual Fuel Usage	113,405.71	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	3.01E-02	1.13E-03	100
Nitrogen oxides (NOx)	1.00E-04	1.50E-01	5.67E-03	25
PM, filterable	3.00E-06	4.51E-03	1.70E-04	100
Sulfur dioxide	6.00E-07	9.02E-04	3.40E-05	100
VOCs	5.30E-06	7.97E-03	3.01E-04	25
<b>Total Primary Pollutants</b>		<b>1.94E-01</b>	<b>7.31E-03</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	8.57E-03	3.23E-04	100
PM10, filterable	3.00E-06	4.51E-03	1.70E-04	100
PM10, primary	8.70E-06	1.31E-02	4.93E-04	100
PM2.5, filterable	3.00E-06	4.51E-03	1.70E-04	100
PM2.5, primary	8.70E-06	1.31E-02	4.93E-04	100
<b>Total HAPs</b>		<b>2.29E-01</b>	<b>8.66E-03</b>	

Natural Gas Emissions Boiler BT  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	1,396,100	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	1,368.73	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	11,990,035.29	(scf / year)
Actual Fuel Usage	636,900.00	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	5.04E-01	2.67E-02	100
Nitrogen oxides (NOx)	1.02E-04	6.13E-01	3.25E-02	25
PM, filterable	1.90E-06	1.14E-02	6.05E-04	100
Sulfur dioxide	6.00E-07	3.60E-03	1.91E-04	100
Total organic compounds (TOC)	1.10E-05	6.59E-02	3.50E-03	25
Volatile organic compounds (VOC)	5.50E-06	3.30E-02	1.75E-03	25
<b>Total Primary Pollutants</b>		<b>1.23E+00</b>	<b>6.53E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.26E-05	6.69E-07	10
Formaldehyde	7.50E-08	4.50E-04	2.39E-05	10
Naphthalene	6.10E-10	3.66E-06	1.94E-07	10
Toluene	3.40E-09	2.04E-05	1.08E-06	10
2-Methyl Naphthalene	2.40E-11	1.44E-07	7.64E-09	10
3-Methylcholanthrene	1.80E-12	1.08E-08	5.73E-10	10
Acenaphthene	1.80E-12	1.08E-08	5.73E-10	10
Acenaphthylene	1.80E-12	1.08E-08	5.73E-10	10
Ammonia	4.90E-07	2.94E-03	1.56E-04	10
Anthracene	2.40E-12	1.44E-08	7.64E-10	10
Arsenic	2.00E-10	1.20E-06	6.37E-08	10
Barium	4.40E-09	2.64E-05	1.40E-06	10
Benzo (a) anthracene	1.80E-12	1.08E-08	5.73E-10	10
Benzo (a) pyrene	1.20E-12	7.19E-09	3.82E-10	10
Benzo (b) fluoranthene	1.80E-12	1.08E-08	5.73E-10	10
Benzo (g,h,i) perylene	1.20E-12	7.19E-09	3.82E-10	10
Benzo (k) fluoranthene	1.80E-12	1.08E-08	5.73E-10	10
Beryllium	1.20E-11	7.19E-08	3.82E-09	10
Cadmium	1.10E-09	6.59E-06	3.50E-07	10
Chromium	1.40E-09	8.39E-06	4.46E-07	10
Chrysene	1.80E-12	1.08E-08	5.73E-10	10
Cobalt	8.40E-11	5.04E-07	2.67E-08	10
Copper	8.50E-10	5.10E-06	2.71E-07	10
Dibenzo(a,h) anthracene	1.20E-12	7.19E-09	3.82E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	7.19E-06	3.82E-07	10
Dimethylbenz(a)anthracene	1.60E-11	9.59E-08	5.10E-09	10
Ethane	3.10E-06	1.86E-02	9.87E-04	10
Fluoranthene	3.00E-12	1.80E-08	9.55E-10	10
Fluorene	2.80E-12	1.68E-08	8.92E-10	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.08E-08	5.73E-10	10
Lead	5.00E-10	3.00E-06	1.59E-07	10
Manganese	3.80E-10	2.28E-06	1.21E-07	10
Mercury	2.60E-10	1.56E-06	8.28E-08	10
Molybdenum	1.10E-09	6.59E-06	3.50E-07	10
n-Butane	2.10E-06	1.26E-02	6.69E-04	10
N-Hexane	1.80E-06	1.08E-02	5.73E-04	10
Nickel	2.10E-09	1.26E-05	6.69E-07	10
N-Pentane	2.60E-06	1.56E-02	8.28E-04	10
Phenanthrene	1.70E-11	1.02E-07	5.41E-09	10
PM, condensable	5.70E-06	3.42E-02	1.82E-03	10
PM, primary	7.60E-06	4.56E-02	2.42E-03	10
PM10, filterable	1.90E-06	1.14E-02	6.05E-04	10
PM10, primary	7.60E-06	4.56E-02	2.42E-03	10
PM2.5, filterable	1.90E-06	1.14E-02	6.05E-04	10
PM2.5, primary	7.60E-06	4.56E-02	2.42E-03	10
Propane	1.60E-06	9.59E-03	5.10E-04	10
Pyrene	5.00E-12	3.00E-08	1.59E-09	10
Selenium	2.40E-11	1.44E-07	7.64E-09	10
Vanadium	2.30E-09	1.38E-05	7.32E-07	10
Zinc	2.90E-08	1.74E-04	9.24E-06	10
<b>Total HAPs</b>		<b>2.64E-01</b>	<b>1.40E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	7.19E+02	3.82E+01
Methane	2.30E-06	1.38E-02	7.32E-04
<b>Total Greenhouse Gases</b>		<b>7.19E+02</b>	<b>3.82E+01</b>



Natural Gas Emissions Space Heater

BN

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	435,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	426.47	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	3,735,882.35	(scf /year)
Actual Fuel Usage	Unknown: Tenant purchases fuel	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	3.74E-02	Unknown	100
Nitrogen oxides (NOx)	1.00E-04	1.87E-01	Unknown	25
PM, filterable	3.00E-06	5.60E-03	Unknown	100
Sulfur dioxide	6.00E-07	1.12E-03	Unknown	100
VOCs	5.30E-06	9.90E-03	Unknown	25
<b>Primary Pollutants Total</b>		<b>2.31E-01</b>	<b>Unknown</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.06E-02	Unknown	100
PM10, filterable	3.00E-06	5.60E-03	Unknown	100
PM10, primary	8.70E-06	1.63E-02	Unknown	100
PM2.5, filterable	3.00E-06	5.60E-03	Unknown	100
PM2.5, primary	8.70E-06	1.63E-02	Unknown	100
<b>Total HAPs</b>		<b>2.85E-01</b>	<b>Unknown</b>	

Propane Furnace

BN  
Appendix B  
Armory Emissions Calculations  
Propane (SCC 10500210)

Unit Size	66,000	(btu/hr)
Heat Content of Fuel	90,500.00	(btu/scf)
Maximum Fuel Firing Rate	0.73	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	6,388.51	(scf /year)
Actual Fuel Usage	Unknown: Tenant purchases fuel	(scf /year)
Sulfur Content of Fuel	0.0015	(%)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-03	6.39E-03	Unknown	100
Nitrogen oxides (NOx)	1.45E-02	4.63E-02	Unknown	25
PM, filterable	4.50E-04	1.44E-03	Unknown	100
Total organic compounds (TOC)	5.50E-04	1.76E-03	Unknown	25
Sulfur oxides (SOx)	1.43E-07	4.55E-07	Unknown	100
<b>Total Primary Pollutants</b>		<b>5.59E-02</b>	<b>Unknown</b>	
<b>HAPs</b>				
PM, condensable	5.26E-04	1.68E-03	Unknown	100
PM10, filterable	4.50E-04	1.44E-03	Unknown	100
PM10, primary	9.76E-04	3.12E-03	Unknown	100
PM2.5, filterable	4.50E-04	1.44E-03	Unknown	100
PM2.5, primary	9.76E-04	3.12E-03	Unknown	100
<b>Total HAPs</b>		<b>6.67E-02</b>	<b>Unknown</b>	

Natural Gas Emissions Boiler

CY

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	150,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	147.06	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	1,288,235.29	(scf /year)
Actual Fuel Usage	56,575.22	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	5.41E-02	2.38E-03	100
Nitrogen oxides (NOx)	1.02E-04	6.58E-02	2.89E-03	25
PM, filterable	1.90E-06	1.22E-03	5.37E-05	100
Sulfur dioxide	6.00E-07	3.86E-04	1.70E-05	100
Total organic compounds (TOC)	1.10E-05	7.09E-03	3.11E-04	25
Volatile organic compounds (VOC)	5.50E-06	3.54E-03	1.56E-04	25
<b>Total Primary Pollutants</b>		<b>1.22E-01</b>	<b>5.34E-03</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.35E-06	5.94E-08	10
Formaldehyde	7.50E-08	4.83E-05	2.12E-06	10
Naphthalene	6.10E-10	3.93E-07	1.73E-08	10
Toluene	3.40E-09	2.19E-06	9.62E-08	10
2-Methyl Naphthalene	2.40E-11	1.55E-08	6.79E-10	10
3-Methylcholanthrene	1.80E-12	1.16E-09	5.09E-11	10
Acenaphthene	1.80E-12	1.16E-09	5.09E-11	10
Acenaphthylene	1.80E-12	1.16E-09	5.09E-11	10
Ammonia	4.90E-07	3.16E-04	1.39E-05	10
Anthracene	2.40E-12	1.55E-09	6.79E-11	10
Arsenic	2.00E-10	1.29E-07	5.66E-09	10
Barium	4.40E-09	2.83E-06	1.24E-07	10
Benzo (a) anthracene	1.80E-12	1.16E-09	5.09E-11	10
Benzo (a) pyrene	1.20E-12	7.73E-10	3.39E-11	10
Benzo (b) fluoranthene	1.80E-12	1.16E-09	5.09E-11	10
Benzo (g,h,i) perylene	1.20E-12	7.73E-10	3.39E-11	10
Benzo (k) fluoranthene	1.80E-12	1.16E-09	5.09E-11	10
Beryllium	1.20E-11	7.73E-09	3.39E-10	10
Cadmium	1.10E-09	7.09E-07	3.11E-08	10
Chromium	1.40E-09	9.02E-07	3.96E-08	10
Chrysene	1.80E-12	1.16E-09	5.09E-11	10
Cobalt	8.40E-11	5.41E-08	2.38E-09	10
Copper	8.50E-10	5.48E-07	2.40E-08	10
Dibenzo(a,h) anthracene	1.20E-12	7.73E-10	3.39E-11	10
Dichlorobenzene, mixed isomers	1.20E-09	7.73E-07	3.39E-08	10
Dimethylbenz(a)anthracene	1.60E-11	1.03E-08	4.53E-10	10
Ethane	3.10E-06	2.00E-03	8.77E-05	10
Fluoranthene	3.00E-12	1.93E-09	8.49E-11	10
Fluorene	2.80E-12	1.80E-09	7.92E-11	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.16E-09	5.09E-11	10
Lead	5.00E-10	3.22E-07	1.41E-08	10
Manganese	3.80E-10	2.45E-07	1.07E-08	10
Mercury	2.60E-10	1.67E-07	7.35E-09	10
Molybdenum	1.10E-09	7.09E-07	3.11E-08	10
n-Butane	2.10E-06	1.35E-03	5.94E-05	10
N-Hexane	1.80E-06	1.16E-03	5.09E-05	10
Nickel	2.10E-09	1.35E-06	5.94E-08	10
N-Pentane	2.60E-06	1.67E-03	7.35E-05	10
Phenanthrene	1.70E-11	1.10E-08	4.81E-10	10
PM, condensable	5.70E-06	3.67E-03	1.61E-04	10
PM, primary	7.60E-06	4.90E-03	2.15E-04	10
PM10, filterable	1.90E-06	1.22E-03	5.37E-05	10
PM10, primary	7.60E-06	4.90E-03	2.15E-04	10
PM2.5, filterable	1.90E-06	1.22E-03	5.37E-05	10
PM2.5, primary	7.60E-06	4.90E-03	2.15E-04	10
Propane	1.60E-06	1.03E-03	4.53E-05	10
Pyrene	5.00E-12	3.22E-09	1.41E-10	10
Selenium	2.40E-11	1.55E-08	6.79E-10	10
Vanadium	2.30E-09	1.48E-06	6.51E-08	10
Zinc	2.90E-08	1.87E-05	8.20E-07	10
<b>Total HAPs</b>		<b>2.84E-02</b>	<b>1.25E-03</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	7.73E+01	3.39E+00
Methane	2.30E-06	1.48E-03	6.51E-05
<b>Total Greenhouse Gases</b>		<b>7.73E+01</b>	<b>3.39E+00</b>

**Natural Gas Emissions Space Heater**      **CY**  
**Appendix B**  
**Armory Emissions Calculations**  
**Space Heaters Heating Natural Gas (SCC 10500206)**

<b>Unit Size</b>	980,000	(btu/hr)
<b>Heat Content of Fuel</b>	1,020.00	(btu/scf)
<b>Maximum Fuel Firing Rate</b>	960.78	(scf / hour)
<b>Hours of Operation</b>	8,760.00	(hr / year)
<b>Max Annual Fuel</b>	8,416,470.59	(scf /year)
<b>Actual Fuel Usage</b>	369,624.78	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	8.42E-02	3.70E-03	100
Nitrogen oxides (NOx)	1.00E-04	4.21E-01	1.85E-02	25
PM, filterable	3.00E-06	1.26E-02	5.54E-04	100
Sulfur dioxide	6.00E-07	2.52E-03	1.11E-04	100
VOCs	5.30E-06	2.23E-02	9.80E-04	25
<b>Primary Pollutants Total</b>		<b>5.20E-01</b>	<b>2.28E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	2.40E-02	1.05E-03	100
PM10, filterable	3.00E-06	1.26E-02	5.54E-04	100
PM10, primary	8.70E-06	3.66E-02	1.61E-03	100
PM2.5, filterable	3.00E-06	1.26E-02	5.54E-04	100
PM2.5, primary	8.70E-06	3.66E-02	1.61E-03	100
<b>Total HAPs</b>		<b>6.43E-01</b>	<b>2.82E-02</b>	

## Oil Emissions Boiler

CY

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	3,668,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	26.20	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	229,512	(gal / year)
Actual Fuel Usage	8,448	(gal / year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	5.74E-01	2.11E-02	100
NOx	2.40E-02	2.75E+00	1.01E-01	25
PM, Filterable	2.00E-03	2.30E-01	8.45E-03	100
SOx	7.35E-02	8.43E+00	3.10E-01	100
TOC	5.56E-04	6.38E-02	2.35E-03	25
<b>Total Primary Pollutants</b>		<b>1.21E+01</b>	<b>4.44E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	3.16E-04	1.16E-05	10
Formaldehyde (2)	6.10E-05	7.00E-03	2.58E-04	10
Ammonia	8.00E-04	9.18E-02	3.38E-03	100
Arsenic (1)	4.00E-06	6.43E-05	4.73E-03	100
Beryllium (1)	3.00E-06	4.82E-05	3.55E-03	100
Cadmium (1)	3.00E-06	4.82E-05	3.55E-03	100
Chromium (1)	3.00E-06	4.82E-05	3.55E-03	100
Copper (1)	6.00E-06	9.64E-05	7.10E-03	100
Fluoranthene	3.15E-09	3.61E-07	1.33E-08	100
Lead (1)	9.00E-06	1.45E-04	1.06E-02	10
Manganese (1)	6.00E-06	9.64E-05	7.10E-03	100
Mercury (1)	3.00E-06	4.82E-05	3.55E-03	100
Nickel (1)	3.00E-06	4.82E-05	3.55E-03	100
PM, condensable	1.30E-03	1.49E-01	5.49E-03	100
PM10, filterable	1.08E-03	1.24E-01	4.56E-03	100
PM10, primary	1.08E-03	1.24E-01	4.56E-03	100
PM2.5, filterable	1.08E-03	1.24E-01	4.56E-03	100
PM2.5, primary	1.08E-03	1.24E-01	4.56E-03	100
Polycyclic organic matter (POM)	1.08E-03	1.24E-01	4.56E-03	100
Selenium (1)	1.50E-05	2.41E-04	1.77E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	3.90E-02	1.44E-03	100
Zinc (1)	4.00E-06	6.43E-05	1.69E-05	100
<b>Total HAPs</b>		<b>9.08E-01</b>	<b>9.84E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	2.48E-02	9.12E-04
<b>Total Greenhouse Gases</b>		<b>2.48E-02</b>	<b>9.12E-04</b>

Natural Gas Emissions Boiler CL  
Appendix B  
Armory Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	5,858,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	5,743.14	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	50,309,882.35	(scf /year)
Actual Fuel Usage	4,277,540.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	2.11E+00	1.80E-01	100
Nitrogen oxides (NOx)	1.02E-04	2.57E+00	2.19E-01	25
PM, filterable	1.90E-06	4.78E-02	4.06E-03	100
Sulfur dioxide	6.00E-07	1.51E-02	1.28E-03	100
Total organic compounds (TOC)	1.10E-05	2.77E-01	2.35E-02	25
Volatile organic compounds (VOC)	5.50E-06	1.38E-01	1.18E-02	25
<b>Total Primary Pollutants</b>		<b>4.75E+00</b>	<b>4.04E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	5.28E-05	4.49E-06	10
Formaldehyde	7.50E-08	1.89E-03	1.60E-04	10
Naphthalene	6.10E-10	1.53E-05	1.30E-06	10
Toluene	3.40E-09	8.55E-05	7.27E-06	10
2-Methyl Naphthalene	2.40E-11	6.04E-07	5.13E-08	10
3-Methylcholanthrene	1.80E-12	4.53E-08	3.85E-09	10
Acenaphthene	1.80E-12	4.53E-08	3.85E-09	10
Acenaphthylene	1.80E-12	4.53E-08	3.85E-09	10
Ammonia	4.90E-07	1.23E-02	1.05E-03	10
Anthracene	2.40E-12	6.04E-08	5.13E-09	10
Arsenic	2.00E-10	5.03E-06	4.28E-07	10
Barium	4.40E-09	1.11E-04	9.41E-06	10
Benzo (a) anthracene	1.80E-12	4.53E-08	3.85E-09	10
Benzo (a) pyrene	1.20E-12	3.02E-08	2.57E-09	10
Benzo (b) fluoranthene	1.80E-12	4.53E-08	3.85E-09	10
Benzo (g,h,i) perylene	1.20E-12	3.02E-08	2.57E-09	10
Benzo (k) fluoranthene	1.80E-12	4.53E-08	3.85E-09	10
Beryllium	1.20E-11	3.02E-07	2.57E-08	10
Cadmium	1.10E-09	2.77E-05	2.35E-06	10
Chromium	1.40E-09	3.52E-05	2.99E-06	10
Chrysene	1.80E-12	4.53E-08	3.85E-09	10
Cobalt	8.40E-11	2.11E-06	1.80E-07	10
Copper	8.50E-10	2.14E-05	1.82E-06	10
Dibenzo(a,h) anthracene	1.20E-12	3.02E-08	2.57E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	3.02E-05	2.57E-06	10
Dimethylbenz(a)anthracene	1.60E-11	4.02E-07	3.42E-08	10
Ethane	3.10E-06	7.80E-02	6.63E-03	10
Fluoranthene	3.00E-12	7.55E-08	6.42E-09	10
Fluorene	2.80E-12	7.04E-08	5.99E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	4.53E-08	3.85E-09	10
Lead	5.00E-10	1.26E-05	1.07E-06	10
Manganese	3.80E-10	9.56E-06	8.13E-07	10
Mercury	2.60E-10	6.54E-06	5.56E-07	10
Molybdenum	1.10E-09	2.77E-05	2.35E-06	10
n-Butane	2.10E-06	5.28E-02	4.49E-03	10
N-Hexane	1.80E-06	4.53E-02	3.85E-03	10
Nickel	2.10E-09	5.28E-05	4.49E-06	10
N-Pentane	2.60E-06	6.54E-02	5.56E-03	10
Phenanthrene	1.70E-11	4.28E-07	3.64E-08	10
PM, condensable	5.70E-06	1.43E-01	1.22E-02	10
PM, primary	7.60E-06	1.91E-01	1.63E-02	10
PM10, filterable	1.90E-06	4.78E-02	4.06E-03	10
PM10, primary	7.60E-06	1.91E-01	1.63E-02	10
PM2.5, filterable	1.90E-06	4.78E-02	4.06E-03	10
PM2.5, primary	7.60E-06	1.91E-01	1.63E-02	10
Propane	1.60E-06	4.02E-02	3.42E-03	10
Pyrene	5.00E-12	1.26E-07	1.07E-08	10
Selenium	2.40E-11	6.04E-07	5.13E-08	10
Vanadium	2.30E-09	5.79E-05	4.92E-06	10
Zinc	2.90E-08	7.29E-04	6.20E-05	10
<b>Total HAPs</b>		<b>1.11E+00</b>	<b>9.44E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	3.02E+03	2.57E+02
Methane	2.30E-06	5.79E-02	4.92E-03
<b>Total Greenhouse Gases</b>		<b>3.02E+03</b>	<b>2.57E+02</b>

## Oil Emissions Boiler

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## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	559,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	3.99	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	34,977	(gal /year)
Actual Fuel Usage	1,550	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year )
		PTE (Tons/Year )	Actual (Tons/Year )	
<b>Primary Pollutants</b>				
CO	5.00E-03	8.74E-02	3.88E-03	100
NOx	2.40E-02	4.20E-01	1.86E-02	25
PM, Filterable	2.00E-03	3.50E-02	1.55E-03	100
SOx	7.35E-02	1.29E+00	5.70E-02	100
TOC	5.56E-04	9.72E-03	4.31E-04	25
<b>Total Primary Pollutants</b>		<b>1.84E+00</b>	<b>8.14E-02</b>	
<b>HAPs</b>				
Benzene	2.75E-06	4.81E-05	2.13E-06	10
Formaldehyde (2)	6.10E-05	1.07E-03	4.73E-05	10
Ammonia	8.00E-04	1.40E-02	6.20E-04	100
Arsenic (1)	4.00E-06	9.79E-06	8.68E-04	100
Beryllium (1)	3.00E-06	7.35E-06	6.51E-04	100
Cadmium (1)	3.00E-06	7.35E-06	6.51E-04	100
Chromium (1)	3.00E-06	7.35E-06	6.51E-04	100
Copper (1)	6.00E-06	1.47E-05	1.30E-03	100
Fluoranthene	3.15E-09	5.51E-08	2.44E-09	100
Lead (1)	9.00E-06	2.20E-05	1.95E-03	10
Manganese (1)	6.00E-06	1.47E-05	1.30E-03	100
Mercury (1)	3.00E-06	7.35E-06	6.51E-04	100
Nickel (1)	3.00E-06	7.35E-06	6.51E-04	100
PM, condensable	1.30E-03	2.27E-02	1.01E-03	100
PM10, filterable	1.08E-03	1.89E-02	8.37E-04	100
PM10, primary	1.08E-03	1.89E-02	8.37E-04	100
PM2.5, filterable	1.08E-03	1.89E-02	8.37E-04	100
PM2.5, primary	1.08E-03	1.89E-02	8.37E-04	100
Polycyclic organic matter (POM)	1.08E-03	1.89E-02	8.37E-04	100
Selenium (1)	1.50E-05	3.67E-05	3.26E-03	100
Total non-methane organic compounds (TNMOC)	3.40E-04	5.95E-03	2.64E-04	100
Zinc (1)	4.00E-06	9.79E-06	3.10E-06	100
<b>Total HAPs</b>		<b>1.38E-01</b>	<b>1.81E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	3.78E-03	1.67E-04
<b>Total Greenhouse Gases</b>		<b>3.78E-03</b>	<b>1.67E-04</b>

Natural Gas Emissions Boilers

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Appendix B

Army Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,679,600	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,627.06	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	23,013,035.29	(scf /year)
Actual Fuel Usage	782,663.32	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	9.67E-01	3.29E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.18E+00	4.00E-02	25
PM, filterable	1.90E-06	2.19E-02	7.44E-04	100
Sulfur dioxide	6.00E-07	6.90E-03	2.35E-04	100
Total organic compounds (TOC)	1.10E-05	1.27E-01	4.30E-03	25
Volatile organic compounds (VOC)	5.50E-06	6.33E-02	2.15E-03	25
<b>Total Primary Pollutants</b>		<b>2.36E+00</b>	<b>8.03E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.42E-05	8.22E-07	10
Formaldehyde	7.50E-08	8.63E-04	2.93E-05	10
Naphthalene	6.10E-10	7.02E-06	2.39E-07	10
Toluene	3.40E-09	3.91E-05	1.33E-06	10
2-Methyl Naphthalene	2.40E-11	2.76E-07	9.39E-09	10
3-Methylcholanthrene	1.80E-12	2.07E-08	7.04E-10	10
Acenaphthene	1.80E-12	2.07E-08	7.04E-10	10
Acenaphthylene	1.80E-12	2.07E-08	7.04E-10	10
Ammonia	4.90E-07	5.64E-03	1.92E-04	10
Anthracene	2.40E-12	2.76E-08	9.39E-10	10
Arsenic	2.00E-10	2.30E-06	7.83E-08	10
Barium	4.40E-09	5.06E-05	1.72E-06	10
Benzo (a) anthracene	1.80E-12	2.07E-08	7.04E-10	10
Benzo (a) pyrene	1.20E-12	1.38E-08	4.70E-10	10
Benzo (b) fluoranthene	1.80E-12	2.07E-08	7.04E-10	10
Benzo (g,h,i) perylene	1.20E-12	1.38E-08	4.70E-10	10
Benzo (k) fluoranthene	1.80E-12	2.07E-08	7.04E-10	10
Beryllium	1.20E-11	1.38E-07	4.70E-09	10
Cadmium	1.10E-09	1.27E-05	4.30E-07	10
Chromium	1.40E-09	1.61E-05	5.48E-07	10
Chrysene	1.80E-12	2.07E-08	7.04E-10	10
Cobalt	8.40E-11	9.67E-07	3.29E-08	10
Copper	8.50E-10	9.78E-06	3.33E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.38E-08	4.70E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	1.38E-05	4.70E-07	10
Dimethylbenz(a)anthracene	1.60E-11	1.84E-07	6.26E-09	10
Ethane	3.10E-06	3.57E-02	1.21E-03	10
Fluoranthene	3.00E-12	3.45E-08	1.17E-09	10
Fluorene	2.80E-12	3.22E-08	1.10E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.07E-08	7.04E-10	10
Lead	5.00E-10	5.75E-06	1.96E-07	10
Manganese	3.80E-10	4.37E-06	1.49E-07	10
Mercury	2.60E-10	2.99E-06	1.02E-07	10
Molybdenum	1.10E-09	1.27E-05	4.30E-07	10
n-Butane	2.10E-06	2.42E-02	8.22E-04	10
N-Hexane	1.80E-06	2.07E-02	7.04E-04	10
Nickel	2.10E-09	2.42E-05	8.22E-07	10
N-Pentane	2.60E-06	2.99E-02	1.02E-03	10
Phenanthrene	1.70E-11	1.96E-07	6.65E-09	10
PM, condensable	5.70E-06	6.56E-02	2.23E-03	10
PM, primary	7.60E-06	8.74E-02	2.97E-03	10
PM10, filterable	1.90E-06	2.19E-02	7.44E-04	10
PM10, primary	7.60E-06	8.74E-02	2.97E-03	10
PM2.5, filterable	1.90E-06	2.19E-02	7.44E-04	10
PM2.5, primary	7.60E-06	8.74E-02	2.97E-03	10
Propane	1.60E-06	1.84E-02	6.26E-04	10
Pyrene	5.00E-12	5.75E-08	1.96E-09	10
Selenium	2.40E-11	2.76E-07	9.39E-09	10
Vanadium	2.30E-09	2.65E-05	9.00E-07	10
Zinc	2.90E-08	3.34E-04	1.13E-05	10
<b>Total HAPs</b>		<b>5.08E-01</b>	<b>1.73E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.38E+03	4.70E+01
Methane	2.30E-06	2.65E-02	9.00E-04
<b>Total Greenhouse Gases</b>		<b>1.38E+03</b>	<b>4.70E+01</b>



Natural Gas Emissions Space Heater

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Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	690,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	676.47	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	5,925,882.35	(scf /year)
Actual Fuel Usage	201,536.68	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	5.93E-02	2.02E-03	100
Nitrogen oxides (NOx)	1.00E-04	2.96E-01	1.01E-02	25
PM, filterable	3.00E-06	8.89E-03	3.02E-04	100
Sulfur dioxide	6.00E-07	1.78E-03	6.05E-05	100
VOCs	5.30E-06	1.57E-02	5.34E-04	25
<b>Primary Pollutants Total</b>		<b>3.66E-01</b>	<b>1.25E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.69E-02	5.74E-04	100
PM10, filterable	3.00E-06	8.89E-03	3.02E-04	100
PM10, primary	8.70E-06	2.58E-02	8.77E-04	100
PM2.5, filterable	3.00E-06	8.89E-03	3.02E-04	100
PM2.5, primary	8.70E-06	2.58E-02	8.77E-04	100
<b>Total HAPs</b>		<b>4.52E-01</b>	<b>1.54E-02</b>	

## Oil Emissions Boiler

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## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	3,885,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	27.75	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	243,090	(gal /year)
Actual Fuel Usage	5,290	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	6.08E-01	1.32E-02	100
NOx	2.40E-02	2.92E+00	6.35E-02	25
PM, Filterable	2.00E-03	2.43E-01	5.29E-03	100
SOx	7.35E-02	8.93E+00	1.94E-01	100
TOC	5.56E-04	6.76E-02	1.47E-03	25
<b>Total Primary Pollutants</b>		<b>1.28E+01</b>	<b>2.78E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	3.34E-04	7.27E-06	10
Formaldehyde (2)	6.10E-05	7.41E-03	1.61E-04	10
Ammonia	8.00E-04	9.72E-02	2.12E-03	100
Arsenic (1)	4.00E-06	6.81E-05	2.96E-03	100
Beryllium (1)	3.00E-06	5.10E-05	2.22E-03	100
Cadmium (1)	3.00E-06	5.10E-05	2.22E-03	100
Chromium (1)	3.00E-06	5.10E-05	2.22E-03	100
Copper (1)	6.00E-06	1.02E-04	4.44E-03	100
Fluoranthene	3.15E-09	3.83E-07	8.33E-09	100
Lead (1)	9.00E-06	1.53E-04	6.67E-03	10
Manganese (1)	6.00E-06	1.02E-04	4.44E-03	100
Mercury (1)	3.00E-06	5.10E-05	2.22E-03	100
Nickel (1)	3.00E-06	5.10E-05	2.22E-03	100
PM, condensable	1.30E-03	1.58E-01	3.44E-03	100
PM10, filterable	1.08E-03	1.31E-01	2.86E-03	100
PM10, primary	1.08E-03	1.31E-01	2.86E-03	100
PM2.5, filterable	1.08E-03	1.31E-01	2.86E-03	100
PM2.5, primary	1.08E-03	1.31E-01	2.86E-03	100
Polycyclic organic matter (POM)	1.08E-03	1.31E-01	2.86E-03	100
Selenium (1)	1.50E-05	2.55E-04	1.11E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	4.13E-02	8.99E-04	100
Zinc (1)	4.00E-06	6.81E-05	1.06E-05	100
<b>Total HAPs</b>		<b>9.62E-01</b>	<b>6.17E-02</b>	

Greenhouse Gases			
Methane	2.16E-04	2.63E-02	5.71E-04
<b>Total Greenhouse Gases</b>		<b>2.63E-02</b>	<b>5.71E-04</b>

Oil Emissions Space Heater

**Appendix B**  
**Armory Emission Calculations**  
**Space Heaters Heating Oil (SCC 10500205)**

Unit Size	189,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	1.35	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	11,826	(gal /year)
Actual Fuel Usage	257	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	7.18E-02	4.25E-01	9.24E-03	100
VOCs	7.00E-04	4.14E-03	9.01E-05	25
<b>Total Primary Pollutants</b>		<b>4.29E-01</b>	<b>9.33E-03</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	4.73E-03	1.03E-04	100
PM, condensable	1.30E-03	7.69E-03	1.67E-04	100
PM10, filterable	2.46E-03	1.45E-02	3.17E-04	100
PM10, primary	3.76E-03	2.22E-02	4.84E-04	100
PM2.5, filterable	6.15E-04	3.64E-03	7.91E-05	100
PM2.5, primary	1.92E-03	1.13E-02	2.46E-04	100
<b>Total HAPs</b>		<b>4.93E-01</b>	<b>1.07E-02</b>	

Diesel Generator Calculations

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Appendix B  
Armory Emissions Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	750	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	7,111,857	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	1,006	(hp)
Maximum Fuel Firing Rate	51.9	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	454,644	(gal / year)
Actual Fuel Usage	1,220	(gal / year)
Actual Hour Usage	23.51259036	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	2.96E+01	7.93E-02	100
Nitrogen oxides (NOx)	6.04E-01	1.37E+02	3.69E-01	25
PM, filterable	4.25E-02	9.66E+00	2.59E-02	100
Sulfur oxides (SOx)	3.97E-02	9.02E+00	2.42E-02	100
Total organic compounds (TOC)	4.93E-02	1.12E+01	3.01E-02	25
<b>Total Primary Pollutants</b>		<b>1.97E+02</b>	<b>5.28E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	2.91E-02	7.80E-05	10
Formaldehyde	1.18E-09	3.68E-02	9.87E-05	10
Naphthalene	8.48E-11	2.64E-03	7.09E-06	10
Toluene	4.09E-10	1.27E-02	3.42E-05	10
Acenaphthene	1.42E-12	4.42E-05	1.19E-07	10
Acenaphthylene	5.06E-12	1.58E-04	4.23E-07	10
Acetaldehyde	7.67E-10	2.39E-02	6.41E-05	10
Acrolein	9.25E-11	2.88E-03	7.73E-06	10
Aldehydes	7.00E-08	2.18E+00	5.85E-03	10
Anthracene	1.87E-12	5.83E-05	1.56E-07	10
Benzo (a) anthracene	1.68E-12	5.23E-05	1.40E-07	10
Benzo (a) pyrene	1.88E-13	5.86E-06	1.57E-08	10
Benzo (b) fluoranthene	9.91E-14	3.09E-06	8.29E-09	10
Benzo (g,h,i) perylene	4.89E-13	1.52E-05	4.09E-08	10
Benzo (k) fluoranthene	1.55E-13	4.83E-06	1.30E-08	10
1,3-Butadiene	3.91E-11	1.22E-03	3.27E-06	10
Chrysene	3.53E-13	1.10E-05	2.95E-08	10
Dibenzo(a,h) anthracene	5.83E-13	1.82E-05	4.87E-08	10
Fluoranthene	7.61E-12	2.37E-04	6.36E-07	10
Fluorene	2.92E-11	9.10E-04	2.44E-06	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.17E-05	3.14E-08	10
Isomers of xylene	2.85E-10	8.88E-03	2.38E-05	10
Phenanthrene	2.94E-11	9.16E-04	2.46E-06	10
PM10, filterable	4.25E-02	9.66E+00	2.59E-02	10
PM2.5, filterable	4.25E-02	9.66E+00	2.59E-02	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	5.23E-03	1.40E-05	10
Propylene	2.58E-09	8.04E-02	2.16E-04	10
Pyrene	4.78E-12	1.49E-04	4.00E-07	10
<b>Total HAPs</b>		<b>2.17E+01</b>	<b>5.83E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	5.14E+03	1.38E+01
<b>Total Greenhouse Gases</b>		<b>5137.48</b>	<b>13.79</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Natural Gas Emissions Boiler

FX  
Appendix B  
Armory Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	17,670,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	17,323.53	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	151,754,117.65	(scf / year)
Actual Fuel Usage	12,448,156.24	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	6.37E+00	5.23E-01	100
Nitrogen oxides (NOx)	1.02E-04	7.75E+00	6.36E-01	25
PM, filterable	1.90E-06	1.44E-01	1.18E-02	100
Sulfur dioxide	6.00E-07	4.55E-02	3.73E-03	100
Total organic compounds (TOC)	1.10E-05	8.35E-01	6.85E-02	25
Volatile organic compounds (VOC)	5.50E-06	4.17E-01	3.42E-02	25
<b>Total Primary Pollutants</b>		<b>14.32</b>	<b>1.17</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.59E-04	1.31E-05	10
Formaldehyde	7.50E-08	5.69E-03	4.67E-04	10
Naphthalene	6.10E-10	4.63E-05	3.80E-06	10
Toluene	3.40E-09	2.58E-04	2.12E-05	10
2-Methyl Naphthalene	2.40E-11	1.82E-06	1.49E-07	10
3-Methylcholanthrene	1.80E-12	1.37E-07	1.12E-08	10
Acenaphthene	1.80E-12	1.37E-07	1.12E-08	10
Acenaphthylene	1.80E-12	1.37E-07	1.12E-08	10
Ammonia	4.90E-07	3.72E-02	3.05E-03	10
Anthracene	2.40E-12	1.82E-07	1.49E-08	10
Arsenic	2.00E-10	1.52E-05	1.24E-06	10
Barium	4.40E-09	3.34E-04	2.74E-05	10
Benzo (a) anthracene	1.80E-12	1.37E-07	1.12E-08	10
Benzo (a) pyrene	1.20E-12	9.11E-08	7.47E-09	10
Benzo (b) fluoranthene	1.80E-12	1.37E-07	1.12E-08	10
Benzo (g,h,i) perylene	1.20E-12	9.11E-08	7.47E-09	10
Benzo (k) fluoranthene	1.80E-12	1.37E-07	1.12E-08	10
Beryllium	1.20E-11	9.11E-07	7.47E-08	10
Cadmium	1.10E-09	8.35E-05	6.85E-06	10
Chromium	1.40E-09	1.06E-04	8.71E-06	10
Chrysene	1.80E-12	1.37E-07	1.12E-08	10
Cobalt	8.40E-11	6.37E-06	5.23E-07	10
Copper	8.50E-10	6.45E-05	5.29E-06	10
Dibenzo(a,h) anthracene	1.20E-12	9.11E-08	7.47E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	9.11E-05	7.47E-06	10
Dimethylbenz(a)anthracene	1.60E-11	1.21E-06	9.96E-08	10
Ethane	3.10E-06	2.35E-01	1.93E-02	10
Fluoranthene	3.00E-12	2.28E-07	1.87E-08	10
Fluorene	2.80E-12	2.12E-07	1.74E-08	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.37E-07	1.12E-08	10
Lead	5.00E-10	3.79E-05	3.11E-06	10
Manganese	3.80E-10	2.88E-05	2.37E-06	10
Mercury	2.60E-10	1.97E-05	1.62E-06	10
Molybdenum	1.10E-09	8.35E-05	6.85E-06	10
n-Butane	2.10E-06	1.59E-01	1.31E-02	10
N-Hexane	1.80E-06	1.37E-01	1.12E-02	10
Nickel	2.10E-09	1.59E-04	1.31E-05	10
N-Pentane	2.60E-06	1.97E-01	1.62E-02	10
Phenanthrene	1.70E-11	1.29E-06	1.06E-07	10
PM, condensable	5.70E-06	4.32E-01	3.55E-02	10
PM, primary	7.60E-06	5.77E-01	4.73E-02	10
PM10, filterable	1.90E-06	1.44E-01	1.18E-02	10
PM10, primary	7.60E-06	5.77E-01	4.73E-02	10
PM2.5, filterable	1.90E-06	1.44E-01	1.18E-02	10
PM2.5, primary	7.60E-06	5.77E-01	4.73E-02	10
Propane	1.60E-06	1.21E-01	9.96E-03	10
Pyrene	5.00E-12	3.79E-07	3.11E-08	10
Selenium	2.40E-11	1.82E-06	1.49E-07	10
Vanadium	2.30E-09	1.75E-04	1.43E-05	10
Zinc	2.90E-08	2.20E-03	1.80E-04	10
<b>Total HAPs</b>		<b>3.35E+00</b>	<b>2.75E-01</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	9.11E+03	7.47E+02
Methane	2.30E-06	1.75E-01	1.43E-02
<b>Total Greenhouse Gases</b>		<b>9.11E+03</b>	<b>7.47E+02</b>

Natural Gas Emissions Space Heater

FX

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	800,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	784.31	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	6,870,588.24	(scf /year)
Actual Fuel Usage	563,583.76	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	6.87E-02	5.64E-03	100
Nitrogen oxides (NOx)	1.00E-04	3.44E-01	2.82E-02	25
PM, filterable	3.00E-06	1.03E-02	8.45E-04	100
Sulfur dioxide	6.00E-07	2.06E-03	1.69E-04	100
VOCs	5.30E-06	1.82E-02	1.49E-03	25
<b>Primary Pollutants Total</b>		<b>4.25E-01</b>	<b>3.48E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.96E-02	1.61E-03	100
PM10, filterable	3.00E-06	1.03E-02	8.45E-04	100
PM10, primary	8.70E-06	2.99E-02	2.45E-03	100
PM2.5, filterable	3.00E-06	1.03E-02	8.45E-04	100
PM2.5, primary	8.70E-06	2.99E-02	2.45E-03	100
<b>Total HAPs</b>		<b>5.25E-01</b>	<b>4.30E-02</b>	

## Oil Emissions Boiler

FRN

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	3,150,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	22.50	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	197,100	(gal /year)
Actual Fuel Usage	5,671	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	4.93E-01	1.42E-02	100
NOx	2.40E-02	2.37E+00	6.81E-02	25
PM, Filterable	2.00E-03	1.97E-01	5.67E-03	100
SOx	7.35E-02	7.24E+00	2.08E-01	100
TOC	5.56E-04	5.48E-02	1.58E-03	25
<b>Total Primary Pollutants</b>		<b>1.04E+01</b>	<b>2.98E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	2.71E-04	7.80E-06	10
Formaldehyde (2)	6.10E-05	6.01E-03	1.73E-04	10
Ammonia	8.00E-04	7.88E-02	2.27E-03	100
Arsenic (1)	4.00E-06	5.52E-05	3.18E-03	100
Beryllium (1)	3.00E-06	4.14E-05	2.38E-03	100
Cadmium (1)	3.00E-06	4.14E-05	2.38E-03	100
Chromium (1)	3.00E-06	4.14E-05	2.38E-03	100
Copper (1)	6.00E-06	8.28E-05	4.76E-03	100
Fluoranthene	3.15E-09	3.10E-07	8.93E-09	100
Lead (1)	9.00E-06	1.24E-04	7.15E-03	10
Manganese (1)	6.00E-06	8.28E-05	4.76E-03	100
Mercury (1)	3.00E-06	4.14E-05	2.38E-03	100
Nickel (1)	3.00E-06	4.14E-05	2.38E-03	100
PM, condensable	1.30E-03	1.28E-01	3.69E-03	100
PM10, filterable	1.08E-03	1.06E-01	3.06E-03	100
PM10, primary	1.08E-03	1.06E-01	3.06E-03	100
PM2.5, filterable	1.08E-03	1.06E-01	3.06E-03	100
PM2.5, primary	1.08E-03	1.06E-01	3.06E-03	100
Polycyclic organic matter (POM)	1.08E-03	1.06E-01	3.06E-03	100
Selenium (1)	1.50E-05	2.07E-04	1.19E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	3.35E-02	9.64E-04	100
Zinc (1)	4.00E-06	5.52E-05	1.13E-05	100
<b>Total HAPs</b>		<b>7.80E-01</b>	<b>6.61E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	2.13E-02	6.13E-04
<b>Total Greenhouse Gases</b>		<b>2.13E-02</b>	<b>6.13E-04</b>

## Oil Emissions Boiler

FD

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	3,805,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	27.18	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	238,084	(gal /year)
Actual Fuel Usage	7,925	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	5.95E-01	1.98E-02	100
NOx	2.40E-02	2.86E+00	9.51E-02	25
PM, Filterable	2.00E-03	2.38E-01	7.92E-03	100
SOx	7.35E-02	8.75E+00	2.91E-01	100
TOC	5.56E-04	6.62E-02	2.20E-03	25
<b>Total Primary Pollutants</b>		<b>1.25E+01</b>	<b>4.16E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	3.27E-04	1.09E-05	10
Formaldehyde (2)	6.10E-05	7.26E-03	2.42E-04	10
Ammonia	8.00E-04	9.52E-02	3.17E-03	100
Arsenic (1)	4.00E-06	6.67E-05	4.44E-03	100
Beryllium (1)	3.00E-06	5.00E-05	3.33E-03	100
Cadmium (1)	3.00E-06	5.00E-05	3.33E-03	100
Chromium (1)	3.00E-06	5.00E-05	3.33E-03	100
Copper (1)	6.00E-06	1.00E-04	6.66E-03	100
Fluoranthene	3.15E-09	3.75E-07	1.25E-08	100
Lead (1)	9.00E-06	1.50E-04	9.99E-03	10
Manganese (1)	6.00E-06	1.00E-04	6.66E-03	100
Mercury (1)	3.00E-06	5.00E-05	3.33E-03	100
Nickel (1)	3.00E-06	5.00E-05	3.33E-03	100
PM, condensable	1.30E-03	1.55E-01	5.15E-03	100
PM10, filterable	1.08E-03	1.29E-01	4.28E-03	100
PM10, primary	1.08E-03	1.29E-01	4.28E-03	100
PM2.5, filterable	1.08E-03	1.29E-01	4.28E-03	100
PM2.5, primary	1.08E-03	1.29E-01	4.28E-03	100
Polycyclic organic matter (POM)	1.08E-03	1.29E-01	4.28E-03	100
Selenium (1)	1.50E-05	2.50E-04	1.66E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	4.05E-02	1.35E-03	100
Zinc (1)	4.00E-06	6.67E-05	1.58E-05	100
<b>Total HAPs</b>		<b>9.42E-01</b>	<b>9.24E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	2.57E-02	8.56E-04
<b>Total Greenhouse Gases</b>		<b>2.57E-02</b>	<b>8.56E-04</b>



## Oil Emissions Boilers

HN

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	2,415,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	17.25	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	151,110	(gal /year)
Actual Fuel Usage	6,285	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	3.78E-01	1.57E-02	100
NOx	2.40E-02	1.81E+00	7.54E-02	25
PM, Filterable	2.00E-03	1.51E-01	6.29E-03	100
SOx	7.35E-02	5.55E+00	2.31E-01	100
TOC	5.56E-04	4.20E-02	1.75E-03	25
<b>Total Primary Pollutants</b>		<b>7.94E+00</b>	<b>3.30E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	2.08E-04	8.64E-06	10
Formaldehyde (2)	6.10E-05	4.61E-03	1.92E-04	10
Ammonia	8.00E-04	6.04E-02	2.51E-03	100
Arsenic (1)	4.00E-06	4.23E-05	3.52E-03	100
Beryllium (1)	3.00E-06	3.17E-05	2.64E-03	100
Cadmium (1)	3.00E-06	3.17E-05	2.64E-03	100
Chromium (1)	3.00E-06	3.17E-05	2.64E-03	100
Copper (1)	6.00E-06	6.35E-05	5.28E-03	100
Fluoranthene	3.15E-09	2.38E-07	9.90E-09	100
Lead (1)	9.00E-06	9.52E-05	7.92E-03	10
Manganese (1)	6.00E-06	6.35E-05	5.28E-03	100
Mercury (1)	3.00E-06	3.17E-05	2.64E-03	100
Nickel (1)	3.00E-06	3.17E-05	2.64E-03	100
PM, condensable	1.30E-03	9.82E-02	4.09E-03	100
PM10, filterable	1.08E-03	8.16E-02	3.39E-03	100
PM10, primary	1.08E-03	8.16E-02	3.39E-03	100
PM2.5, filterable	1.08E-03	8.16E-02	3.39E-03	100
PM2.5, primary	1.08E-03	8.16E-02	3.39E-03	100
Polycyclic organic matter (POM)	1.08E-03	8.16E-02	3.39E-03	100
Selenium (1)	1.50E-05	1.59E-04	1.32E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	2.57E-02	1.07E-03	100
Zinc (1)	4.00E-06	4.23E-05	1.26E-05	100
<b>Total HAPs</b>		<b>5.98E-01</b>	<b>7.32E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	1.63E-02	6.79E-04
<b>Total Greenhouse Gases</b>		<b>1.63E-02</b>	<b>6.79E-04</b>

Oil Emissions Space Heater

HN

Appendix B

Armory Emission Calculations

Space Heaters Heating Oil (SCC 10500205)

Unit Size	189,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	1.35	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	11,826	(gal /year)
Actual Fuel Usage	492	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	7.18E-02	4.25E-01	1.77E-02	100
VOCs	7.00E-04	4.14E-03	1.72E-04	25
<b>Total Primary Pollutants</b>		<b>4.29E-01</b>	<b>1.78E-02</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	4.73E-03	1.97E-04	100
PM, condensable	1.30E-03	7.69E-03	3.20E-04	100
PM10, filterable	2.46E-03	1.45E-02	6.05E-04	100
PM10, primary	3.76E-03	2.22E-02	9.25E-04	100
PM2.5, filterable	6.15E-04	3.64E-03	1.51E-04	100
PM2.5, primary	1.92E-03	1.13E-02	4.71E-04	100
<b>Total HAPs</b>		<b>4.93E-01</b>	<b>2.05E-02</b>	

Natural Gas Emissions Boiler

HA

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,105,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,063.73	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	18,078,235.29	(scf / year)
Actual Fuel Usage	212,023.15	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	7.59E-01	8.90E-03	100
Nitrogen oxides (NOx)	1.02E-04	9.24E-01	1.08E-02	25
PM, filterable	1.90E-06	1.72E-02	2.01E-04	100
Sulfur dioxide	6.00E-07	5.42E-03	6.36E-05	100
Total organic compounds (TOC)	1.10E-05	9.94E-02	1.17E-03	25
Volatile organic compounds (VOC)	5.50E-06	4.97E-02	5.83E-04	25
<b>Total Primary Pollutants</b>		<b>1.71E+00</b>	<b>2.00E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.90E-05	2.23E-07	10
Formaldehyde	7.50E-08	6.78E-04	7.95E-06	10
Naphthalene	6.10E-10	5.51E-06	6.47E-08	10
Toluene	3.40E-09	3.07E-05	3.60E-07	10
2-Methyl Naphthalene	2.40E-11	2.17E-07	2.54E-09	10
3-Methylcholanthrene	1.80E-12	1.63E-08	1.91E-10	10
Acenaphthene	1.80E-12	1.63E-08	1.91E-10	10
Acenaphthylene	1.80E-12	1.63E-08	1.91E-10	10
Ammonia	4.90E-07	4.43E-03	5.19E-05	10
Anthracene	2.40E-12	2.17E-08	2.54E-10	10
Arsenic	2.00E-10	1.81E-06	2.12E-08	10
Barium	4.40E-09	3.98E-05	4.66E-07	10
Benzo (a) anthracene	1.80E-12	1.63E-08	1.91E-10	10
Benzo (a) pyrene	1.20E-12	1.08E-08	1.27E-10	10
Benzo (b) fluoranthene	1.80E-12	1.63E-08	1.91E-10	10
Benzo (g,h,i) perylene	1.20E-12	1.08E-08	1.27E-10	10
Benzo (k) fluoranthene	1.80E-12	1.63E-08	1.91E-10	10
Beryllium	1.20E-11	1.08E-07	1.27E-09	10
Cadmium	1.10E-09	9.94E-06	1.17E-07	10
Chromium	1.40E-09	1.27E-05	1.48E-07	10
Chrysene	1.80E-12	1.63E-08	1.91E-10	10
Cobalt	8.40E-11	7.59E-07	8.90E-09	10
Copper	8.50E-10	7.68E-06	9.01E-08	10
Dibenzo(a,h) anthracene	1.20E-12	1.08E-08	1.27E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	1.08E-05	1.27E-07	10
Dimethylbenz(a)anthracene	1.60E-11	1.45E-07	1.70E-09	10
Ethane	3.10E-06	2.80E-02	3.29E-04	10
Fluoranthene	3.00E-12	2.71E-08	3.18E-10	10
Fluorene	2.80E-12	2.53E-08	2.97E-10	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.63E-08	1.91E-10	10
Lead	5.00E-10	4.52E-06	5.30E-08	10
Manganese	3.80E-10	3.43E-06	4.03E-08	10
Mercury	2.60E-10	2.35E-06	2.76E-08	10
Molybdenum	1.10E-09	9.94E-06	1.17E-07	10
n-Butane	2.10E-06	1.90E-02	2.23E-04	10
N-Hexane	1.80E-06	1.63E-02	1.91E-04	10
Nickel	2.10E-09	1.90E-05	2.23E-07	10
N-Pentane	2.60E-06	2.35E-02	2.76E-04	10
Phenanthrene	1.70E-11	1.54E-07	1.80E-09	10
PM, condensable	5.70E-06	5.15E-02	6.04E-04	10
PM, primary	7.60E-06	6.87E-02	8.06E-04	10
PM10, filterable	1.90E-06	1.72E-02	2.01E-04	10
PM10, primary	7.60E-06	6.87E-02	8.06E-04	10
PM2.5, filterable	1.90E-06	1.72E-02	2.01E-04	10
PM2.5, primary	7.60E-06	6.87E-02	8.06E-04	10
Propane	1.60E-06	1.45E-02	1.70E-04	10
Pyrene	5.00E-12	4.52E-08	5.30E-10	10
Selenium	2.40E-11	2.17E-07	2.54E-09	10
Vanadium	2.30E-09	2.08E-05	2.44E-07	10
Zinc	2.90E-08	2.62E-04	3.07E-06	10
<b>Total HAPs</b>		<b>3.99E-01</b>	<b>4.68E-03</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.08E+03	1.27E+01
Methane	2.30E-06	2.08E-02	2.44E-04
<b>Total Greenhouse Gases</b>		<b>1.08E+03</b>	<b>1.27E+01</b>

Natural Gas Emissions Space Heater

HA

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	1,350,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	1,323.53	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	11,594,117.65	(scf /year)
Actual Fuel Usage	135,976.85	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.16E-01	1.36E-03	100
Nitrogen oxides (NOx)	1.00E-04	5.80E-01	6.80E-03	25
PM, filterable	3.00E-06	1.74E-02	2.04E-04	100
Sulfur dioxide	6.00E-07	3.48E-03	4.08E-05	100
VOCs	5.30E-06	3.07E-02	3.60E-04	25
<b>Primary Pollutants Total</b>		<b>7.17E-01</b>	<b>8.40E-03</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	3.30E-02	3.88E-04	100
PM10, filterable	3.00E-06	1.74E-02	2.04E-04	100
PM10, primary	8.70E-06	5.04E-02	5.91E-04	100
PM2.5, filterable	3.00E-06	1.74E-02	2.04E-04	100
PM2.5, primary	8.70E-06	5.04E-02	5.91E-04	100
<b>Total HAPs</b>		<b>8.85E-01</b>	<b>1.04E-02</b>	

Natural Gas Emissions Space Heater

HA

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

<b>Unit Size</b>	1,350,000	<b>(btu/hr)</b>
<b>Heat Content of Fuel</b>	1,020.00	<b>(btu/scf)</b>
<b>Maximum Fuel Firing Rate</b>	1,323.53	<b>(scf / hour)</b>
<b>Hours of Operation</b>	8,760.00	<b>(hr / year)</b>
<b>Max Annual Fuel</b>	11,594,117.65	<b>(scf /year)</b>
<b>Actual Fuel Usage</b>	135,976.85	<b>(scf /year)</b>

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.16E-01	1.36E-03	100
Nitrogen oxides (NOx)	1.00E-04	5.80E-01	6.80E-03	25
PM, filterable	3.00E-06	1.74E-02	2.04E-04	100
Sulfur dioxide	6.00E-07	3.48E-03	4.08E-05	100
VOCs	5.30E-06	3.07E-02	3.60E-04	25
<b>Primary Pollutants Total</b>		<b>7.17E-01</b>	<b>8.40E-03</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	3.30E-02	3.88E-04	100
PM10, filterable	3.00E-06	1.74E-02	2.04E-04	100
PM10, primary	8.70E-06	5.04E-02	5.91E-04	100
PM2.5, filterable	3.00E-06	1.74E-02	2.04E-04	100
PM2.5, primary	8.70E-06	5.04E-02	5.91E-04	100
<b>Total HAPs</b>		<b>8.85E-01</b>	<b>1.04E-02</b>	

Natural Gas Emissions Space Heater

JY  
Appendix B  
Armory Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	12000000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	11,764.71	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	103,058,823.53	(scf /year)
Actual Fuel Usage	10,907,433.60	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	4.33E+00	4.60E-01	100
Nitrogen oxides (NOx)	1.02E-04	5.27E+00	5.60E-01	25
PM, filterable	1.90E-06	1.00E-01	1.00E-02	100
Sulfur dioxide	6.00E-07	3.00E-02	0.00E+00	100
Total organic compounds (TOC)	1.10E-05	5.70E-01	6.00E-02	25
Volatile organic compounds (VOC)	5.50E-06	2.80E-01	3.00E-02	25
<b>Total Primary Pollutants</b>		<b>9.72E+00</b>	<b>1.03E+00</b>	
<b>HAPs</b>				
Benzene	2.10E-09	0.00E+00	0.00E+00	10
Formaldehyde	7.50E-08	0.00E+00	0.00E+00	10
Naphthalene	6.10E-10	0.00E+00	0.00E+00	10
Toluene	3.40E-09	0.00E+00	0.00E+00	10
2-Methyl Naphthalene	2.40E-11	1.24E-06	1.31E-07	10
3-Methylcholanthrene	1.80E-12	9.28E-08	9.82E-09	10
Acenaphthene	1.80E-12	9.28E-08	9.82E-09	10
Acenaphthylene	1.80E-12	9.28E-08	9.82E-09	10
Ammonia	4.90E-07	2.52E-02	2.67E-03	10
Anthracene	2.40E-12	1.24E-07	1.31E-08	10
Arsenic	2.00E-10	1.03E-05	1.09E-06	10
Barium	4.40E-09	2.27E-04	2.40E-05	10
Benzo (a) anthracene	1.80E-12	9.28E-08	9.82E-09	10
Benzo (a) pyrene	1.20E-12	6.18E-08	6.54E-09	10
Benzo (b) fluoranthene	1.80E-12	9.28E-08	9.82E-09	10
Benzo (g,h,i) perylene	1.20E-12	6.18E-08	6.54E-09	10
Benzo (k) fluoranthene	1.80E-12	9.28E-08	9.82E-09	10
Beryllium	1.20E-11	6.18E-07	6.54E-08	10
Cadmium	1.10E-09	5.67E-05	6.00E-06	10
Chromium	1.40E-09	7.21E-05	7.64E-06	10
Chrysene	1.80E-12	9.28E-08	9.82E-09	10
Cobalt	8.40E-11	4.33E-06	4.58E-07	10
Copper	8.50E-10	4.38E-05	4.64E-06	10
Dibenzo(a,h) anthracene	1.20E-12	6.18E-08	6.54E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	6.18E-05	6.54E-06	10
Dimethylbenz(a)anthracene	1.60E-11	8.24E-07	8.73E-08	10
Ethane	3.10E-06	1.60E-01	1.69E-02	10
Fluoranthene	3.00E-12	1.55E-07	1.64E-08	10
Fluorene	2.80E-12	1.44E-07	1.53E-08	10
Indeno(1,2,3-cd)pyrene	1.80E-12	9.28E-08	9.82E-09	10
Lead	5.00E-10	2.58E-05	2.73E-06	10
Manganese	3.80E-10	1.96E-05	2.07E-06	10
Mercury	2.60E-10	1.34E-05	1.42E-06	10
Molybdenum	1.10E-09	5.67E-05	6.00E-06	10
n-Butane	2.10E-06	1.08E-01	1.15E-02	10
N-Hexane	1.80E-06	9.28E-02	9.82E-03	10
Nickel	2.10E-09	1.08E-04	1.15E-05	10
N-Pentane	2.60E-06	1.34E-01	1.42E-02	10
Phenanthrene	1.70E-11	8.76E-07	9.27E-08	10
PM, condensable	5.70E-06	2.94E-01	3.11E-02	10
PM, primary	7.60E-06	3.92E-01	4.14E-02	10
PM10, filterable	1.90E-06	9.79E-02	1.04E-02	10
PM10, primary	7.60E-06	3.92E-01	4.14E-02	10
PM2.5, filterable	1.90E-06	9.79E-02	1.04E-02	10
PM2.5, primary	7.60E-06	3.92E-01	4.14E-02	10
Propane	1.60E-06	8.24E-02	8.73E-03	10
Pyrene	5.00E-12	2.58E-07	2.73E-08	10
Selenium	2.40E-11	1.24E-06	1.31E-07	10
Vanadium	2.30E-09	1.19E-04	1.25E-05	10
Zinc	2.90E-08	1.49E-03	1.58E-04	10
<b>Total HAPs</b>		<b>2.27E+00</b>	<b>2.40E-01</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	6.18E+03	6.54E+02
Methane	2.30E-06	1.19E-01	1.25E-02
<b>Total Greenhouse Gases</b>		<b>6.18E+03</b>	<b>6.54E+02</b>

Natural Gas Emissions Space Heater

JY

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	500,000 (btu/hr)
Heat Content of Fuel	1,020.00 (btu/scf)
Maximum Fuel Firing Rate	490.2 (scf / hour)
Hours of Operation	8,760.00 (hr / year)
Max Annual Fuel	4,294,117.65 (scf /year)
Actual Fuel Usage	454,476.40 (scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	4.00E-02	0.00E+00	100
Nitrogen oxides (NOx)	1.00E-04	2.10E-01	2.00E-02	25
PM, filterable	3.00E-06	1.00E-02	0.00E+00	100
Sulfur dioxide	6.00E-07	0.00E+00	0.00E+00	100
VOCs	5.30E-06	1.00E-02	0.00E+00	25
<b>Primary Pollutants Total</b>		<b>2.70E-01</b>	<b>3.00E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.00E-02	0.00E+00	100
PM10, filterable	3.00E-06	1.00E-02	0.00E+00	100
PM10, primary	8.70E-06	2.00E-02	0.00E+00	100
PM2.5, filterable	3.00E-06	1.00E-02	0.00E+00	100
PM2.5, primary	8.70E-06	2.00E-02	0.00E+00	100
<b>Total HAPs</b>		<b>3.30E-01</b>	<b>3.00E-02</b>	

Diesel Generator 1 Calculations

LT  
Appendix B  
Armory Emissions Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	500 (Kw)
Conversion factor for KW to BTU/min	56.92
Heat Input Capacity (1)	4,713,832 (btu/hr)
Heat Content of Fuel	137,030 (btu/gal)
Horsepower	671 (hp)
Maximum Fuel Firing Rate	34.4 (gal / hr)
Potential Hours of Operation	8,760 (hr / year)
Max Annual Fuel	301,344 (gal /year)
Actual Fuel Usage	423 (gal /year)
Actual Hour Usage	12.28712871 (hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	1.96E+01	2.75E-02	100
Nitrogen oxides (NOx)	6.04E-01	9.10E+01	1.28E-01	25
PM, filterable	4.25E-02	6.40E+00	8.98E-03	100
Sulfur oxides (SOx)	3.97E-02	5.98E+00	8.39E-03	100
Total organic compounds (TOC)	4.93E-02	7.43E+00	1.04E-02	25
<b>Total Primary Pollutants</b>		<b>1.30E+02</b>	<b>1.83E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.93E-02	2.70E-05	10
Formaldehyde	1.18E-09	2.44E-02	3.42E-05	10
Naphthalene	8.48E-11	1.75E-03	2.46E-06	10
Toluene	4.09E-10	8.44E-03	1.18E-05	10
Acenaphthene	1.42E-12	2.93E-05	4.11E-08	10
Acenaphthylene	5.06E-12	1.04E-04	1.47E-07	10
Acetaldehyde	7.67E-10	1.58E-02	2.22E-05	10
Acrolein	9.25E-11	1.91E-03	2.68E-06	10
Aldehydes	7.00E-08	1.91E-03	2.68E-06	10
Anthracene	1.87E-12	3.86E-05	5.42E-08	10
Benzo (a) anthracene	1.68E-12	3.47E-05	4.87E-08	10
Benzo (a) pyrene	1.88E-13	3.88E-06	5.44E-09	10
Benzo (b) fluoranthene	9.91E-14	2.05E-06	2.87E-09	10
Benzo (g,h,i) perylene	4.89E-13	1.01E-05	1.42E-08	10
Benzo (k) fluoranthene	1.55E-13	3.20E-06	4.49E-09	10
1,3-Butadiene	3.91E-11	8.07E-04	1.13E-06	10
Chrysene	3.53E-13	7.29E-06	1.02E-08	10
Dibenzo(a,h) anthracene	5.83E-13	1.20E-05	1.69E-08	10
Fluoranthene	7.61E-12	1.57E-04	2.20E-07	10
Fluorene	2.92E-11	6.03E-04	8.46E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	7.74E-06	1.09E-08	10
Isomers of xylene	2.85E-10	5.88E-03	8.25E-06	10
Phenanthrene	2.94E-11	6.07E-04	8.51E-07	10
PM10, filterable	4.25E-02	6.40E+00	8.98E-03	10
PM2.5, filterable	4.25E-02	6.40E+00	8.98E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	3.47E-03	4.87E-06	10
Propylene	2.58E-09	5.33E-02	7.47E-05	10
Pyrene	4.78E-12	9.87E-05	1.38E-07	10
<b>Total HAPs</b>		<b>1.29E+01</b>	<b>1.82E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	3.41E+03	4.78E+00
<b>Total Greenhouse Gases</b>		<b>3.41E+03</b>	<b>4.78E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.



Diesel Generator 2 Calculations

LT  
Appendix B  
Armory Emissions Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	400 (Kw)
Conversion factor for KW to BTU/min	56.92
Heat Input Capacity (1)	3,740,919 (btu/hr)
Heat Content of Fuel	137,030 (btu/gal)
Horsepower	536 (hp)
Maximum Fuel Firing Rate	27.3 (gal / hr)
Potential Hours of Operation	8,760 (hr / year)
Max Annual Fuel	239,148 (gal /year)
Actual Fuel Usage	320 (gal /year)
Actual Hour Usage	11.72246287 (hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	1.55E+01	2.08E-02	100
Nitrogen oxides (NOx)	6.04E-01	7.22E+01	9.66E-02	25
PM, filterable	4.25E-02	5.08E+00	6.80E-03	100
Sulfur oxides (SOx)	3.97E-02	4.75E+00	6.35E-03	100
Total organic compounds (TOC)	4.93E-02	5.89E+00	7.89E-03	25
<b>Total Primary Pollutants</b>		<b>1.03E+02</b>	<b>1.38E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.53E-02	2.05E-05	10
Formaldehyde	1.18E-09	1.93E-02	2.59E-05	10
Naphthalene	8.48E-11	1.39E-03	1.86E-06	10
Toluene	4.09E-10	6.70E-03	8.97E-06	10
Acenaphthene	1.42E-12	2.33E-05	3.11E-08	10
Acenaphthylene	5.06E-12	8.29E-05	1.11E-07	10
Acetaldehyde	7.67E-10	1.26E-02	1.68E-05	10
Acrolein	9.25E-11	1.52E-03	2.03E-06	10
Aldehydes	7.00E-08	1.15E+00	1.53E-03	10
Anthracene	1.87E-12	3.06E-05	4.10E-08	10
Benzo (a) anthracene	1.68E-12	2.75E-05	3.68E-08	10
Benzo (a) pyrene	1.88E-13	3.08E-06	4.12E-09	10
Benzo (b) fluoranthene	9.91E-14	1.62E-06	2.17E-09	10
Benzo (g,h,i) perylene	4.89E-13	8.01E-06	1.07E-08	10
Benzo (k) fluoranthene	1.55E-13	2.54E-06	3.40E-09	10
1,3-Butadiene	3.91E-11	6.41E-04	8.57E-07	10
Chrysene	3.53E-13	5.78E-06	7.74E-09	10
Dibenzo(a,h) anthracene	5.83E-13	9.55E-06	1.28E-08	10
Fluoranthene	7.61E-12	1.25E-04	1.67E-07	10
Fluorene	2.92E-11	4.78E-04	6.40E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	6.14E-06	8.22E-09	10
Isomers of xylene	2.85E-10	4.67E-03	6.25E-06	10
Phenanthrene	2.94E-11	4.82E-04	6.45E-07	10
PM10, filterable	4.25E-02	5.08E+00	6.80E-03	10
PM2.5, filterable	4.25E-02	5.08E+00	6.80E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	2.75E-03	3.68E-06	10
Propylene	2.58E-09	4.23E-02	5.66E-05	10
Pyrene	4.78E-12	7.83E-05	1.05E-07	10
<b>Total HAPs</b>		<b>1.14E+01</b>	<b>1.53E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	2.70E+03	3.62E+00
<b>Total Greenhouse Gases</b>		<b>2.70E+03</b>	<b>3.62E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Natural Gas Emissions Boiler

LT  
Appendix B  
Armory Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size 23,275,000 (btu/hr)  
Heat Content of Fuel 1,020.00 (btu/scf)  
Maximum Fuel Firing Rate 21,999.02 (scf / hour)  
Hours of Operation 8,760.00 (hr / year)  
Max Annual Fuel 192,711,411.76 (scf /year)  
Actual Fuel Usage 16,042,744.00 (scf /year)  
Sulfur Content %

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	8.09E+00	6.70E-01	100
Nitrogen oxides (NOx)	1.02E-04	9.85E+00	8.20E-01	25
PM, filterable	1.90E-06	1.80E-01	2.00E-02	100
Sulfur dioxide	6.00E-07	6.00E-02	0.00E+00	100
Total organic compounds (TOC)	1.10E-05	1.06E+00	9.00E-02	25
Volatile organic compounds (VOC)	5.50E-06	5.30E-01	4.00E-02	25
<b>Total Primary Pollutants</b>		<b>1.82E+01</b>	<b>1.51E+00</b>	
<b>HAPs</b>				
Benzene	2.10E-09	0.00E+00	0.00E+00	10
Formaldehyde	7.50E-08	1.00E-02	0.00E+00	10
Naphthalene	6.10E-10	0.00E+00	0.00E+00	10
Toluene	3.40E-09	0.00E+00	0.00E+00	10
2-Methyl Naphthalene	2.40E-11	2.31E-06	1.93E-07	10
3-Methylcholanthrene	1.80E-12	1.73E-07	1.44E-08	10
Acenaphthene	1.80E-12	1.73E-07	1.44E-08	10
Acenaphthylene	1.80E-12	1.73E-07	1.44E-08	10
Ammonia	4.90E-07	4.72E-02	3.93E-03	10
Anthracene	2.40E-12	2.31E-07	1.93E-08	10
Arsenic	2.00E-10	1.93E-05	1.60E-06	10
Barium	4.40E-09	4.24E-04	3.53E-05	10
Benzo (a) anthracene	1.80E-12	1.73E-07	1.44E-08	10
Benzo (a) pyrene	1.20E-12	1.16E-07	9.63E-09	10
Benzo (b) fluoranthene	1.80E-12	1.73E-07	1.44E-08	10
Benzo (g,h,i) perylene	1.20E-12	1.16E-07	9.63E-09	10
Benzo (k) fluoranthene	1.80E-12	1.73E-07	1.44E-08	10
Beryllium	1.20E-11	1.16E-06	9.63E-08	10
Cadmium	1.10E-09	1.06E-04	8.82E-06	10
Chromium	1.40E-09	1.35E-04	1.12E-05	10
Chrysene	1.80E-12	1.73E-07	1.44E-08	10
Cobalt	8.40E-11	8.09E-06	6.74E-07	10
Copper	8.50E-10	8.19E-05	6.82E-06	10
Dibenzo(a,h) anthracene	1.20E-12	1.16E-07	9.63E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	1.16E-04	9.63E-06	10
Dimethylbenz(a)anthracene	1.60E-11	1.54E-06	1.28E-07	10
Ethane	3.10E-06	2.99E-01	2.49E-02	10
Fluoranthene	3.00E-12	2.89E-07	2.41E-08	10
Fluorene	2.80E-12	2.70E-07	2.25E-08	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.73E-07	1.44E-08	10
Lead	5.00E-10	4.82E-05	4.01E-06	10
Manganese	3.80E-10	3.66E-05	3.05E-06	10
Mercury	2.60E-10	2.51E-05	2.09E-06	10
Molybdenum	1.10E-09	1.06E-04	8.82E-06	10
n-Butane	2.10E-06	2.02E-01	1.68E-02	10
N-Hexane	1.80E-06	1.73E-01	1.44E-02	10
Nickel	2.10E-09	2.02E-04	1.68E-05	10
N-Pentane	2.60E-06	2.51E-01	2.09E-02	10
Phenanthrene	1.70E-11	1.64E-06	1.36E-07	10
PM, condensable	5.70E-06	5.49E-01	4.57E-02	10
PM, primary	7.60E-06	7.32E-01	6.10E-02	10
PM10, filterable	1.90E-06	1.83E-01	1.52E-02	10
PM10, primary	7.60E-06	7.32E-01	6.10E-02	10
PM2.5, filterable	1.90E-06	1.83E-01	1.52E-02	10
PM2.5, primary	7.60E-06	7.32E-01	6.10E-02	10
Propane	1.60E-06	1.54E-01	1.28E-02	10
Pyrene	5.00E-12	4.82E-07	4.01E-08	10
Selenium	2.40E-11	2.31E-06	1.93E-07	10
Vanadium	2.30E-09	2.22E-04	1.84E-05	10
Zinc	2.90E-08	2.79E-03	2.33E-04	10
<b>Total HAPs</b>		<b>4.25E+00</b>	<b>3.53E-01</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.16E+04	9.63E+02
Methane	2.30E-06	2.22E-01	1.84E-02
<b>Total Greenhouse Gases</b>		<b>1.16E+04</b>	<b>9.63E+02</b>

Natural Gas Emissions Space Heater

LT

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	13572400 (btu/hr)
Heat Content of Fuel	1020 (btu/scf)
Maximum Fuel Firing Rate	13306.27 (scf / hour)
Hours of Operation	8760 (hr / year)
Max Annual Fuel	116562964.7 (scf /year)
Actual Fuel Usage	5990289.411 (scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.17E+00	1.00E-01	100
Nitrogen oxides (NOx)	1.00E-04	5.83E+00	4.90E-01	25
PM, filterable	3.00E-06	1.70E-01	1.00E-02	100
Sulfur dioxide	6.00E-07	3.00E-02	0.00E+00	100
VOCs	5.30E-06	3.10E-01	3.00E-02	25
<b>Primary Pollutants Total</b>		<b>7.20E+00</b>	<b>6.00E-01</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	3.30E-01	3.00E-02	100
PM10, filterable	3.00E-06	1.70E-01	1.00E-02	100
PM10, primary	8.70E-06	5.10E-01	4.00E-02	100
PM2.5, filterable	3.00E-06	1.70E-01	1.00E-02	100
PM2.5, primary	8.70E-06	5.10E-01	4.00E-02	100
<b>Total HAPs</b>		<b>8.90E+00</b>	<b>7.40E-01</b>	

Diesel Generator 1 Calculations

LV  
Appendix B  
Armory Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	60	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	2,644,679	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	80	(hp)
Maximum Fuel Firing Rate	19.30	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	169,068	(gal /year)
Actual Fuel Usage	677	(gal /year)
Actual Hour Usage	35.06	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	1.10E+01	4.40E-02	100
Nitrogen oxides (NOx)	6.04E-01	5.11E+01	2.04E-01	25
PM, filterable	4.25E-02	3.59E+00	1.44E-02	100
Sulfur oxides (SOx)	3.97E-02	3.36E+00	1.34E-02	100
Total organic compounds (TOC)	4.93E-02	4.17E+00	1.67E-02	25
<b>Total Primary Pollutants</b>		<b>7.32E+01</b>	<b>2.93E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.08E-02	4.33E-05	10
Formaldehyde	1.18E-09	1.37E-02	5.47E-05	10
Naphthalene	8.48E-11	9.82E-04	3.93E-06	10
Toluene	4.09E-10	4.74E-03	1.90E-05	10
Acenaphthene	1.42E-12	1.64E-05	6.58E-08	10
Acenaphthylene	5.06E-12	5.86E-05	2.35E-07	10
Acetaldehyde	7.67E-10	8.88E-03	3.56E-05	10
Acrolein	9.25E-11	1.07E-03	4.29E-06	10
Aldehydes	7.00E-08	8.11E-01	3.25E-03	10
Anthracene	1.87E-12	2.17E-05	8.67E-08	10
Benzo (a) anthracene	1.68E-12	1.95E-05	7.79E-08	10
Benzo (a) pyrene	1.88E-13	2.18E-06	8.72E-09	10
Benzo (b) fluoranthene	9.91E-14	1.15E-06	4.59E-09	10
Benzo (g,h,i) perylene	4.89E-13	5.66E-06	2.27E-08	10
Benzo (k) fluoranthene	1.55E-13	1.80E-06	7.19E-09	10
1,3-Butadiene	3.91E-11	4.53E-04	1.81E-06	10
Chrysene	3.53E-13	4.09E-06	1.64E-08	10
Dibenzo(a,h) anthracene	5.83E-13	6.75E-06	2.70E-08	10
Fluoranthene	7.61E-12	8.82E-05	3.53E-07	10
Fluorene	2.92E-11	3.38E-04	1.35E-06	10
Indeno(1,2,3-cd)pyrene	3.75E-13	4.34E-06	1.74E-08	10
Isomers of xylene	2.85E-10	3.30E-03	1.32E-05	10
Phenanthrene	2.94E-11	3.41E-04	1.36E-06	10
PM10, filterable	4.25E-02	3.59E+00	1.44E-02	10
PM2.5, filterable	4.25E-02	3.59E+00	1.44E-02	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.95E-03	7.79E-06	10
Propylene	2.58E-09	2.99E-02	1.20E-04	10
Pyrene	4.78E-12	5.54E-05	2.22E-07	10
<b>Total HAPs</b>		<b>8.07E+00</b>	<b>3.23E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.91E+03	7.65E+00
<b>Total Greenhouse Gases</b>		<b>1910.47</b>	<b>7.65</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Diesel Generator 2 Calculations

LV  
Appendix B  
Armory Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	230	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	2,452,837	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	308	(hp)
Maximum Fuel Firing Rate	17.90	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	156,804	(gal / year)
Actual Fuel Usage	Unknown: Machine Damaged	(gal / year)
Actual Hour Usage	Unknown: Machine Damaged	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	1.30E-01	1.02E+01	Unknown	100
Nitrogen oxides (NOx)	6.04E-01	4.74E+01	Unknown	25
PM, filterable	4.25E-02	3.33E+00	Unknown	100
Sulfur oxides (SOx)	3.97E-02	3.11E+00	Unknown	100
Total organic compounds (TOC)	4.93E-02	3.87E+00	Unknown	25
<b>Total Primary Pollutants</b>		<b>6.79E+01</b>	<b>Unknown</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.00E-02	Unknown	10
Formaldehyde	1.18E-09	1.27E-02	Unknown	10
Naphthalene	8.48E-11	9.11E-04	Unknown	10
Toluene	4.09E-10	4.39E-03	Unknown	10
Acenaphthene	1.42E-12	1.53E-05	Unknown	10
Acenaphthylene	5.06E-12	5.44E-05	Unknown	10
Acetaldehyde	7.67E-10	8.24E-03	Unknown	10
Acrolein	9.25E-11	9.94E-04	Unknown	10
Aldehydes	7.00E-08	7.52E-01	Unknown	10
Anthracene	1.87E-12	2.01E-05	Unknown	10
Benzo (a) anthracene	1.68E-12	1.80E-05	Unknown	10
Benzo (a) pyrene	1.88E-13	2.02E-06	Unknown	10
Benzo (b) fluoranthene	9.91E-14	1.06E-06	Unknown	10
Benzo (g,h,i) perylene	4.89E-13	5.25E-06	Unknown	10
Benzo (k) fluoranthene	1.55E-13	1.67E-06	Unknown	10
1,3-Butadiene	3.91E-11	4.20E-04	Unknown	10
Chrysene	3.53E-13	3.79E-06	Unknown	10
Dibenzo(a,h) anthracene	5.83E-13	6.26E-06	Unknown	10
Fluoranthene	7.61E-12	8.18E-05	Unknown	10
Fluorene	2.92E-11	3.14E-04	Unknown	10
Indeno(1,2,3-cd)pyrene	3.75E-13	4.03E-06	Unknown	10
Isomers of xylene	2.85E-10	3.06E-03	Unknown	10
Phenanthrene	2.94E-11	3.16E-04	Unknown	10
PM10, filterable	4.25E-02	3.33E+00	Unknown	10
PM2.5, filterable	4.25E-02	3.33E+00	Unknown	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.80E-03	Unknown	10
Propylene	2.58E-09	2.77E-02	Unknown	10
Pyrene	4.78E-12	5.14E-05	Unknown	10
<b>Total HAPs</b>		<b>7.49E+00</b>	<b>Unknown</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.77E+03	Unknown
<b>Total Greenhouse Gases</b>		<b>1771.89</b>	<b>Unknown</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Diesel Generator 3 Calculations

LV  
Appendix B  
Army Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	180	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	1,849,905	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	241	(hp)
Maximum Fuel Firing Rate	13.50	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	118,260	(gal / year)
Actual Fuel Usage	207	(gal / year)
Actual Hour Usage	15	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	7.69E+00	1.35E-02	100
Nitrogen oxides (NOx)	6.04E-01	3.57E+01	6.25E-02	25
PM, filterable	4.25E-02	2.51E+00	4.40E-03	100
Sulfur oxides (SOx)	3.97E-02	2.35E+00	4.11E-03	100
Total organic compounds (TOC)	4.93E-02	2.92E+00	5.10E-03	25
<b>Total Primary Pollutants</b>		<b>5.12E+01</b>	<b>8.96E-02</b>	
<b>HAPs</b>				
Benzene	9.33E-10	7.56E-03	1.32E-05	10
Formaldehyde	1.18E-09	9.56E-03	1.67E-05	10
Naphthalene	8.48E-11	6.87E-04	1.20E-06	10
Toluene	4.09E-10	3.31E-03	5.80E-06	10
Acenaphthene	1.42E-12	1.15E-05	2.01E-08	10
Acenaphthylene	5.06E-12	4.10E-05	7.18E-08	10
Acetaldehyde	7.67E-10	6.21E-03	1.09E-05	10
Acrolein	9.25E-11	7.49E-04	1.31E-06	10
Aldehydes	7.00E-08	5.67E-01	9.93E-04	10
Anthracene	1.87E-12	1.52E-05	2.65E-08	10
Benzo (a) anthracene	1.68E-12	1.36E-05	2.38E-08	10
Benzo (a) pyrene	1.88E-13	1.52E-06	2.67E-09	10
Benzo (b) fluoranthene	9.91E-14	8.03E-07	1.41E-09	10
Benzo (g,h,i) perylene	4.89E-13	3.96E-06	6.94E-09	10
Benzo (k) fluoranthene	1.55E-13	1.26E-06	2.20E-09	10
1,3-Butadiene	3.91E-11	3.17E-04	5.55E-07	10
Chrysene	3.53E-13	2.86E-06	5.01E-09	10
Dibenzo(a,h) anthracene	5.83E-13	4.72E-06	8.27E-09	10
Fluoranthene	7.61E-12	6.17E-05	1.08E-07	10
Fluorene	2.92E-11	2.37E-04	4.14E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	3.04E-06	5.32E-09	10
Isomers of xylene	2.85E-10	2.31E-03	4.04E-06	10
Phenanthrene	2.94E-11	2.38E-04	4.17E-07	10
PM10, filterable	4.25E-02	2.51E+00	4.40E-03	10
PM2.5, filterable	4.25E-02	2.51E+00	4.40E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.36E-03	2.38E-06	10
Propylene	2.58E-09	2.09E-02	3.66E-05	10
Pyrene	4.78E-12	3.87E-05	6.78E-08	10
<b>Total HAPs</b>		<b>5.65E+00</b>	<b>9.89E-03</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.34E+03	2.34E+00
<b>Total Greenhouse Gases</b>		<b>1.34E+03</b>	<b>2.34E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Diesel Heater Emissions

LV  
Appendix B

Armory Emission Calculations  
Mobile Diesel Heaters (SCC 10500205)

Unit Size	345884.7	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Maximum Fuel Firing Rate	2.52	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	22,112	(gal /year)
Actual Fuel Usage	8,760	(gal /year)
Sulfur Content of Fuel	0.0015	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	2.15E-04	2.38E-03	9.43E-04	100
VOCs	7.00E-04	7.74E-03	3.07E-03	25
<b>Total Primary Pollutants</b>		<b>1.01E-02</b>	<b>4.01E-03</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	8.84E-03	3.50E-03	100
PM, condensable	1.30E-03	1.44E-02	5.69E-03	100
PM10, filterable	2.46E-03	2.72E-02	1.08E-02	100
PM10, primary	3.76E-03	4.16E-02	1.65E-02	100
PM2.5, filterable	6.15E-04	6.80E-03	2.69E-03	100
PM2.5, primary	1.92E-03	2.12E-02	8.39E-03	100
<b>Total HAPs</b>		<b>1.30E-01</b>	<b>5.15E-02</b>	

Natural Gas Emissions Boiler

LV  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	13,829,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	13,557.84	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	118,766,705.88	(scf / year)
Actual Fuel Usage	4,226,601.16	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	4.99E+00	1.78E-01	100
Nitrogen oxides (NOx)	1.02E-04	6.07E+00	2.16E-01	25
PM, filterable	1.90E-06	1.13E-01	4.02E-03	100
Sulfur dioxide	6.00E-07	3.56E-02	1.27E-03	100
Total organic compounds (TOC)	1.10E-05	6.53E-01	2.32E-02	25
Volatile organic compounds (VOC)	5.50E-06	3.27E-01	1.16E-02	25
<b>Total Primary Pollutants</b>		<b>1.12E+01</b>	<b>3.99E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.25E-04	4.44E-06	10
Formaldehyde	7.50E-08	4.45E-03	1.58E-04	10
Naphthalene	6.10E-10	3.62E-05	1.29E-06	10
Toluene	3.40E-09	2.02E-04	7.19E-06	10
2-Methyl Naphthalene	2.40E-11	1.43E-06	5.07E-08	10
3-Methylcholanthrene	1.80E-12	1.07E-07	3.80E-09	10
Acenaphthene	1.80E-12	1.07E-07	3.80E-09	10
Acenaphthylene	1.80E-12	1.07E-07	3.80E-09	10
Ammonia	4.90E-07	2.91E-02	1.04E-03	10
Anthracene	2.40E-12	1.43E-07	5.07E-09	10
Arsenic	2.00E-10	1.19E-05	4.23E-07	10
Barium	4.40E-09	2.61E-04	9.30E-06	10
Benzo (a) anthracene	1.80E-12	1.07E-07	3.80E-09	10
Benzo (a) pyrene	1.20E-12	7.13E-08	2.54E-09	10
Benzo (b) fluoranthene	1.80E-12	1.07E-07	3.80E-09	10
Benzo (g,h,i) perylene	1.20E-12	7.13E-08	2.54E-09	10
Benzo (k) fluoranthene	1.80E-12	1.07E-07	3.80E-09	10
Beryllium	1.20E-11	7.13E-07	2.54E-08	10
Cadmium	1.10E-09	6.53E-05	2.32E-06	10
Chromium	1.40E-09	8.31E-05	2.96E-06	10
Chrysene	1.80E-12	1.07E-07	3.80E-09	10
Cobalt	8.40E-11	4.99E-06	1.78E-07	10
Copper	8.50E-10	5.05E-05	1.80E-06	10
Dibenzo(a,h) anthracene	1.20E-12	7.13E-08	2.54E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	7.13E-05	2.54E-06	10
Dimethylbenz(a)anthracene	1.60E-11	9.50E-07	3.38E-08	10
Ethane	3.10E-06	1.84E-01	6.55E-03	10
Fluoranthene	3.00E-12	1.78E-07	6.34E-09	10
Fluorene	2.80E-12	1.66E-07	5.92E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	1.07E-07	3.80E-09	10
Lead	5.00E-10	2.97E-05	1.06E-06	10
Manganese	3.80E-10	2.26E-05	8.03E-07	10
Mercury	2.60E-10	1.54E-05	5.49E-07	10
Molybdenum	1.10E-09	6.53E-05	2.32E-06	10
n-Butane	2.10E-06	1.25E-01	4.44E-03	10
N-Hexane	1.80E-06	1.07E-01	3.80E-03	10
Nickel	2.10E-09	1.25E-04	4.44E-06	10
N-Pentane	2.60E-06	1.54E-01	5.49E-03	10
Phenanthrene	1.70E-11	1.01E-06	3.59E-08	10
PM, condensable	5.70E-06	3.38E-01	1.20E-02	10
PM, primary	7.60E-06	4.51E-01	1.61E-02	10
PM10, filterable	1.90E-06	1.13E-01	4.02E-03	10
PM10, primary	7.60E-06	4.51E-01	1.61E-02	10
PM2.5, filterable	1.90E-06	1.13E-01	4.02E-03	10
PM2.5, primary	7.60E-06	4.51E-01	1.61E-02	10
Propane	1.60E-06	9.50E-02	3.38E-03	10
Pyrene	5.00E-12	2.97E-07	1.06E-08	10
Selenium	2.40E-11	1.43E-06	5.07E-08	10
Vanadium	2.30E-09	1.37E-04	4.86E-06	10
Zinc	2.90E-08	1.72E-03	6.13E-05	10
<b>Total HAPs</b>		<b>2.62E+00</b>	<b>9.32E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	7.13E+03	2.54E+02
Methane	2.30E-06	1.37E-01	4.86E-03
<b>Total Greenhouse Gases</b>		<b>7.13E+03</b>	<b>2.54E+02</b>



Natural Gas Emissions Space Heaters

LV

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

<b>Unit Size</b>	4523000	<b>(btu/hr)</b>
<b>Heat Content of Fuel</b>	1,020.00	<b>(btu/scf)</b>
<b>Maximum Fuel Firing Rate</b>	4,434.31	<b>(scf / hour)</b>
<b>Hours of Operation</b>	8,760.00	<b>(hr / year)</b>
<b>Max Annual Fuel</b>	38,844,588.24	<b>(scf /year)</b>
<b>Actual Fuel Usage</b>	1,483,418.11	<b>(scf /year)</b>

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	3.88E-01	1.48E-02	100
Nitrogen oxides (NOx)	1.00E-04	1.94E+00	7.42E-02	25
PM, filterable	3.00E-06	5.83E-02	2.23E-03	100
Sulfur dioxide	6.00E-07	1.17E-02	4.45E-04	100
VOCs	5.30E-06	1.03E-01	3.93E-03	25
<b>Primary Pollutants Total</b>		<b>2.40E+00</b>	<b>9.17E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.11E-01	4.23E-03	100
PM10, filterable	3.00E-06	5.83E-02	2.23E-03	100
PM10, primary	8.70E-06	1.69E-01	6.45E-03	100
PM2.5, filterable	3.00E-06	5.83E-02	2.23E-03	100
PM2.5, primary	8.70E-06	1.69E-01	6.45E-03	100
<b>Total HAPs</b>		<b>2.97E+00</b>	<b>1.13E-01</b>	

Oil Emissions Space Heater

LV

Appendix B

Armory Emission Calculations

Space Heaters Heating Oil (SCC 10500205)

Unit Size	406,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	2.90	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	25,404	(gal /year)
Actual Fuel Usage	1,412	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	7.18E-02	9.12E-01	5.07E-02	100
VOCs	7.00E-04	8.89E-03	4.94E-04	25
<b>Total Primary Pollutants</b>		<b>9.21E-01</b>	<b>5.12E-02</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	1.02E-02	5.65E-04	100
PM, condensable	1.30E-03	1.65E-02	9.18E-04	100
PM10, filterable	2.46E-03	3.12E-02	1.74E-03	100
PM10, primary	3.76E-03	4.78E-02	2.65E-03	100
PM2.5, filterable	6.15E-04	7.81E-03	4.34E-04	100
PM2.5, primary	1.92E-03	2.43E-02	1.35E-03	100
<b>Total HAPs</b>		<b>1.06E+00</b>	<b>5.88E-02</b>	

Natural Gas Emissions Space Heater

LI

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	2,350,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,303.92	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	20,182,352.94	(scf /year)
Actual Fuel Usage	1,200,519.58	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	2.02E-01	1.20E-02	100
Nitrogen oxides (NOx)	1.00E-04	1.01E+00	6.00E-02	25
PM, filterable	3.00E-06	3.03E-02	1.80E-03	100
Sulfur dioxide	6.00E-07	6.05E-03	3.60E-04	100
VOCs	5.30E-06	5.35E-02	3.18E-03	25
<b>Primary Pollutants Total</b>		<b>1.25E+00</b>	<b>7.42E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	5.75E-02	3.42E-03	100
PM10, filterable	3.00E-06	3.03E-02	1.80E-03	100
PM10, primary	8.70E-06	8.78E-02	5.22E-03	100
PM2.5, filterable	3.00E-06	3.03E-02	1.80E-03	100
PM2.5, primary	8.70E-06	8.78E-02	5.22E-03	100
<b>Total HAPs</b>		<b>1.54E+00</b>	<b>9.17E-02</b>	

## Appendix B

## Armory Emissions Calculations

## Boilers and Heaters &lt;10 Million BTU/hr (SCC 10300602)

Unit Size	4,620,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	4,529.41	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	39,677,647.06	(scf /year)
Actual Fuel Usage	2,360,170.42	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.67E+00	9.91E-02	100
Nitrogen oxides (NOx)	1.00E-04	1.98E+00	1.18E-01	25
PM, filterable	1.90E-06	3.77E-02	2.24E-03	100
Total organic compounds (TOC)	1.10E-05	2.18E-01	1.30E-02	25
Sulfur dioxide	6.00E-07	1.19E-02	7.08E-04	100
<b>Total Primary Pollutants</b>		<b>3.92E+00</b>	<b>2.33E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	4.17E-05	2.48E-06	10
Naphthalene	6.10E-10	1.21E-05	7.20E-07	10
Toluene	3.40E-09	6.75E-05	4.01E-06	10
Acenaphthene	1.80E-12	3.57E-08	2.12E-09	10
Acenaphthylene	1.80E-12	3.57E-08	2.12E-09	10
Ammonia	4.90E-07	9.72E-03	5.78E-04	10
Anthracene	2.40E-12	4.76E-08	2.83E-09	10
Arsenic	2.00E-10	3.97E-06	2.36E-07	10
Barium	4.40E-09	8.73E-05	5.19E-06	10
Benzo (a) anthracene	1.80E-12	3.57E-08	2.12E-09	10
Benzo (a) pyrene	1.20E-12	2.38E-08	1.42E-09	10
Benzo (b) fluoranthene	1.80E-12	3.57E-08	2.12E-09	10
Benzo (g,h,i) perylene	1.20E-12	2.38E-08	1.42E-09	10
Benzo (k) fluoranthene	1.80E-12	3.57E-08	2.12E-09	10
Beryllium	1.20E-11	2.38E-07	1.42E-08	10
n-Butane	2.10E-06	4.17E-02	2.48E-03	10
Cadmium	1.10E-09	2.18E-05	1.30E-06	10
Chromium	1.40E-09	2.78E-05	1.65E-06	10
Chrysene	1.80E-12	3.57E-08	2.12E-09	10
Cobalt	8.40E-11	1.67E-06	9.91E-08	10
Copper	8.50E-10	1.69E-05	1.00E-06	10
Dibenzo(a,h) anthracene	1.20E-12	2.38E-08	1.42E-09	10
2-Methyl Naphthalene	2.40E-11	4.76E-07	2.83E-08	10
3-Methylcholanthrene	1.80E-12	3.57E-08	2.12E-09	10
Molybdenum	1.10E-09	2.18E-05	1.30E-06	10
N-Hexane	1.80E-06	3.57E-02	2.12E-03	10
N-Pentane	2.60E-06	5.16E-02	3.07E-03	10
Nickel	2.10E-09	4.17E-05	2.48E-06	10
Phenanthrene	1.70E-11	3.37E-07	2.01E-08	10
PM, condensable	5.70E-06	1.13E-01	6.73E-03	10
PM, primary	7.60E-06	1.51E-01	8.97E-03	10
PM10, filterable	1.90E-06	3.77E-02	2.24E-03	10
PM10, primary	7.60E-06	1.51E-01	8.97E-03	10
PM2.5, filterable	1.90E-06	3.77E-02	2.24E-03	10
PM2.5, primary	7.60E-06	1.51E-01	8.97E-03	10
Propane	1.60E-06	3.17E-02	1.89E-03	10
Pyrene	5.00E-12	9.92E-08	5.90E-09	10
Selenium	2.40E-11	4.76E-07	2.83E-08	10
Vanadium	2.30E-09	4.56E-05	2.71E-06	10
<b>Total HAPs</b>		<b>8.12E-01</b>	<b>4.83E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	2.38E+03	1.42E+02
Nitrous oxide	2.20E-06	4.36E-02	2.60E-03
<b>Total Greenhouse Gases</b>		<b>2.38E+03</b>	<b>1.42E+02</b>

Natural Gas Emissions Boiler

MN

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300602)

Unit Size	3,000,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,941.18	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	25,764,705.88	(scf / year)
Actual Fuel Usage	3,708,490.00	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.08E+00	1.56E-01	100
Nitrogen oxides (NOx)	1.00E-04	1.29E+00	1.85E-01	25
PM, filterable	1.90E-06	2.45E-02	3.52E-03	100
Total organic compounds (TOC)	1.10E-05	1.42E-01	2.04E-02	25
Sulfur dioxide	6.00E-07	7.73E-03	1.11E-03	100
<b>Total Primary Pollutants</b>		<b>2.54E+00</b>	<b>3.66E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.71E-05	3.89E-06	10
Naphthalene	6.10E-10	7.86E-06	1.13E-06	10
Toluene	3.40E-09	4.38E-05	6.30E-06	10
Acenaphthene	1.80E-12	2.32E-08	3.34E-09	10
Acenaphthylene	1.80E-12	2.32E-08	3.34E-09	10
Ammonia	4.90E-07	6.31E-03	9.09E-04	10
Anthracene	2.40E-12	3.09E-08	4.45E-09	10
Arsenic	2.00E-10	2.58E-06	3.71E-07	10
Barium	4.40E-09	5.67E-05	8.16E-06	10
Benzo (a) anthracene	1.80E-12	2.32E-08	3.34E-09	10
Benzo (a) pyrene	1.20E-12	1.55E-08	2.23E-09	10
Benzo (b) fluoranthene	1.80E-12	2.32E-08	3.34E-09	10
Benzo (g,h,i) perylene	1.20E-12	1.55E-08	2.23E-09	10
Benzo (k) fluoranthene	1.80E-12	2.32E-08	3.34E-09	10
Beryllium	1.20E-11	1.55E-07	2.23E-08	10
n-Butane	2.10E-06	2.71E-02	3.89E-03	10
Cadmium	1.10E-09	1.42E-05	2.04E-06	10
Chromium	1.40E-09	1.80E-05	2.60E-06	10
Chrysene	1.80E-12	2.32E-08	3.34E-09	10
Cobalt	8.40E-11	1.08E-06	1.56E-07	10
Copper	8.50E-10	1.10E-05	1.58E-06	10
Dibenzo(a,h) anthracene	1.20E-12	1.55E-08	2.23E-09	10
2-Methyl Naphthalene	2.40E-11	3.09E-07	4.45E-08	10
3-Methylcholanthrene	1.80E-12	2.32E-08	3.34E-09	10
Molybdenum	1.10E-09	1.42E-05	2.04E-06	10
N-Hexane	1.80E-06	2.32E-02	3.34E-03	10
N-Pentane	2.60E-06	3.35E-02	4.82E-03	10
Nickel	2.10E-09	2.71E-05	3.89E-06	10
Phenanthrene	1.70E-11	2.19E-07	3.15E-08	10
PM, condensable	5.70E-06	7.34E-02	1.06E-02	10
PM, primary	7.60E-06	9.79E-02	1.41E-02	10
PM10, filterable	1.90E-06	2.45E-02	3.52E-03	10
PM10, primary	7.60E-06	9.79E-02	1.41E-02	10
PM2.5, filterable	1.90E-06	2.45E-02	3.52E-03	10
PM2.5, primary	7.60E-06	9.79E-02	1.41E-02	10
Propane	1.60E-06	2.06E-02	2.97E-03	10
Pyrene	5.00E-12	6.44E-08	9.27E-09	10
Selenium	2.40E-11	3.09E-07	4.45E-08	10
Vanadium	2.30E-09	2.96E-05	4.26E-06	10
<b>Total HAPs</b>		<b>5.27E-01</b>	<b>7.59E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.55E+03	2.23E+02
Nitrous oxide	2.20E-06	2.83E-02	4.08E-03
<b>Total Greenhouse Gases</b>		<b>1.55E+03</b>	<b>2.23E+02</b>

Natural Gas Emissions Boiler

MY

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	5,600,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	5,490.20	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	48,094,117.65	(scf / year)
Actual Fuel Usage	751,950.00	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	2.02E+00	3.16E-02	100
Nitrogen oxides (NOx)	1.02E-04	2.46E+00	3.84E-02	25
PM, filterable	1.90E-06	4.57E-02	7.14E-04	100
Sulfur dioxide	6.00E-07	1.44E-02	2.26E-04	100
Total organic compounds (TOC)	1.10E-05	2.65E-01	4.14E-03	25
Volatile organic compounds (VOC)	5.50E-06	1.32E-01	2.07E-03	25
<b>Total Primary Pollutants</b>		<b>4.54E+00</b>	<b>7.09E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	5.05E-05	7.90E-07	10
Formaldehyde	7.50E-08	1.80E-03	2.82E-05	10
Naphthalene	6.10E-10	1.47E-05	2.29E-07	10
Toluene	3.40E-09	8.18E-05	1.28E-06	10
2-Methyl Naphthalene	2.40E-11	5.77E-07	9.02E-09	10
3-Methylcholanthrene	1.80E-12	4.33E-08	6.77E-10	10
Acenaphthene	1.80E-12	4.33E-08	6.77E-10	10
Acenaphthylene	1.80E-12	4.33E-08	6.77E-10	10
Ammonia	4.90E-07	1.18E-02	1.84E-04	10
Anthracene	2.40E-12	5.77E-08	9.02E-10	10
Arsenic	2.00E-10	4.81E-06	7.52E-08	10
Barium	4.40E-09	1.06E-04	1.65E-06	10
Benzo (a) anthracene	1.80E-12	4.33E-08	6.77E-10	10
Benzo (a) pyrene	1.20E-12	2.89E-08	4.51E-10	10
Benzo (b) fluoranthene	1.80E-12	4.33E-08	6.77E-10	10
Benzo (g,h,i) perylene	1.20E-12	2.89E-08	4.51E-10	10
Benzo (k) fluoranthene	1.80E-12	4.33E-08	6.77E-10	10
Beryllium	1.20E-11	2.89E-07	4.51E-09	10
Cadmium	1.10E-09	2.65E-05	4.14E-07	10
Chromium	1.40E-09	3.37E-05	5.26E-07	10
Chrysene	1.80E-12	4.33E-08	6.77E-10	10
Cobalt	8.40E-11	2.02E-06	3.16E-08	10
Copper	8.50E-10	2.04E-05	3.20E-07	10
Dibenzo(a,h) anthracene	1.20E-12	2.89E-08	4.51E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	2.89E-05	4.51E-07	10
Dimethylbenz(a)anthracene	1.60E-11	3.85E-07	6.02E-09	10
Ethane	3.10E-06	7.45E-02	1.17E-03	10
Fluoranthene	3.00E-12	7.21E-08	1.13E-09	10
Fluorene	2.80E-12	6.73E-08	1.05E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	4.33E-08	6.77E-10	10
Lead	5.00E-10	1.20E-05	1.88E-07	10
Manganese	3.80E-10	9.14E-06	1.43E-07	10
Mercury	2.60E-10	6.25E-06	9.78E-08	10
Molybdenum	1.10E-09	2.65E-05	4.14E-07	10
n-Butane	2.10E-06	5.05E-02	7.90E-04	10
N-Hexane	1.80E-06	4.33E-02	6.77E-04	10
Nickel	2.10E-09	5.05E-05	7.90E-07	10
N-Pentane	2.60E-06	6.25E-02	9.78E-04	10
Phenanthrene	1.70E-11	4.09E-07	6.39E-09	10
PM, condensable	5.70E-06	1.37E-01	2.14E-03	10
PM, primary	7.60E-06	1.83E-01	2.86E-03	10
PM10, filterable	1.90E-06	4.57E-02	7.14E-04	10
PM10, primary	7.60E-06	1.83E-01	2.86E-03	10
PM2.5, filterable	1.90E-06	4.57E-02	7.14E-04	10
PM2.5, primary	7.60E-06	1.83E-01	2.86E-03	10
Propane	1.60E-06	3.85E-02	6.02E-04	10
Pyrene	5.00E-12	1.20E-07	1.88E-09	10
Selenium	2.40E-11	5.77E-07	9.02E-09	10
Vanadium	2.30E-09	5.53E-05	8.65E-07	10
Zinc	2.90E-08	6.97E-04	1.09E-05	10
<b>Total HAPs</b>		<b>1.06E+00</b>	<b>1.66E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	2.89E+03	4.51E+01
Methane	2.30E-06	5.53E-02	8.65E-04
<b>Total Greenhouse Gases</b>		<b>2.89E+03</b>	<b>4.51E+01</b>

Natural Gas Emissions Space Heater

NK

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	625,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	612.75	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	5,367,647.06	(scf /year)
Actual Fuel Usage	133,505.96	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	5.37E-02	1.34E-03	100
Nitrogen oxides (NOx)	1.00E-04	2.68E-01	6.68E-03	25
PM, filterable	3.00E-06	8.05E-03	2.00E-04	100
Sulfur dioxide	6.00E-07	1.61E-03	4.01E-05	100
VOCs	5.30E-06	1.42E-02	3.54E-04	25
<b>Primary Pollutants Total</b>		<b>3.32E-01</b>	<b>8.25E-03</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.53E-02	3.80E-04	100
PM10, filterable	3.00E-06	8.05E-03	2.00E-04	100
PM10, primary	8.70E-06	2.33E-02	5.81E-04	100
PM2.5, filterable	3.00E-06	8.05E-03	2.00E-04	100
PM2.5, primary	8.70E-06	2.33E-02	5.81E-04	100
<b>Total HAPs</b>		<b>4.10E-01</b>	<b>1.02E-02</b>	

Natural Gas Emissions Boiler      NK  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	5,204,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	5,101.96	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	44,693,176.47	(scf / year)
Actual Fuel Usage	1,111,624.04	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.88E+00	4.67E-02	100
Nitrogen oxides (NOx)	1.02E-04	2.28E+00	5.68E-02	25
PM, filterable	1.90E-06	4.25E-02	1.06E-03	100
Sulfur dioxide	6.00E-07	1.34E-02	3.33E-04	100
Total organic compounds (TOC)	1.10E-05	2.46E-01	6.11E-03	25
Volatile organic compounds (VOC)	5.50E-06	1.23E-01	3.06E-03	25
<b>Total Primary Pollutants</b>		<b>4.22E+00</b>	<b>1.05E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	4.69E-05	1.17E-06	10
Formaldehyde	7.50E-08	1.68E-03	4.17E-05	10
Naphthalene	6.10E-10	1.36E-05	3.39E-07	10
Toluene	3.40E-09	7.60E-05	1.89E-06	10
2-Methyl Naphthalene	2.40E-11	5.36E-07	1.33E-08	10
3-Methylcholanthrene	1.80E-12	4.02E-08	1.00E-09	10
Acenaphthene	1.80E-12	4.02E-08	1.00E-09	10
Acenaphthylene	1.80E-12	4.02E-08	1.00E-09	10
Ammonia	4.90E-07	1.09E-02	2.72E-04	10
Anthracene	2.40E-12	5.36E-08	1.33E-09	10
Arsenic	2.00E-10	4.47E-06	1.11E-07	10
Barium	4.40E-09	9.83E-05	2.45E-06	10
Benzo (a) anthracene	1.80E-12	4.02E-08	1.00E-09	10
Benzo (a) pyrene	1.20E-12	2.68E-08	6.67E-10	10
Benzo (b) fluoranthene	1.80E-12	4.02E-08	1.00E-09	10
Benzo (g,h,i) perylene	1.20E-12	2.68E-08	6.67E-10	10
Benzo (k) fluoranthene	1.80E-12	4.02E-08	1.00E-09	10
Beryllium	1.20E-11	2.68E-07	6.67E-09	10
Cadmium	1.10E-09	2.46E-05	6.11E-07	10
Chromium	1.40E-09	3.13E-05	7.78E-07	10
Chrysene	1.80E-12	4.02E-08	1.00E-09	10
Cobalt	8.40E-11	1.88E-06	4.67E-08	10
Copper	8.50E-10	1.90E-05	4.72E-07	10
Dibenzo(a,h) anthracene	1.20E-12	2.68E-08	6.67E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	2.68E-05	6.67E-07	10
Dimethylbenz(a)anthracene	1.60E-11	3.58E-07	8.89E-09	10
Ethane	3.10E-06	6.93E-02	1.72E-03	10
Fluoranthene	3.00E-12	6.70E-08	1.67E-09	10
Fluorene	2.80E-12	6.26E-08	1.56E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	4.02E-08	1.00E-09	10
Lead	5.00E-10	1.12E-05	2.78E-07	10
Manganese	3.80E-10	8.49E-06	2.11E-07	10
Mercury	2.60E-10	5.81E-06	1.45E-07	10
Molybdenum	1.10E-09	2.46E-05	6.11E-07	10
n-Butane	2.10E-06	4.69E-02	1.17E-03	10
N-Hexane	1.80E-06	4.02E-02	1.00E-03	10
Nickel	2.10E-09	4.69E-05	1.17E-06	10
N-Pentane	2.60E-06	5.81E-02	1.45E-03	10
Phenanthrene	1.70E-11	3.80E-07	9.45E-09	10
PM, condensable	5.70E-06	1.27E-01	3.17E-03	10
PM, primary	7.60E-06	1.70E-01	4.22E-03	10
PM10, filterable	1.90E-06	4.25E-02	1.06E-03	10
PM10, primary	7.60E-06	1.70E-01	4.22E-03	10
PM2.5, filterable	1.90E-06	4.25E-02	1.06E-03	10
PM2.5, primary	7.60E-06	1.70E-01	4.22E-03	10
Propane	1.60E-06	3.58E-02	8.89E-04	10
Pyrene	5.00E-12	1.12E-07	2.78E-09	10
Selenium	2.40E-11	5.36E-07	1.33E-08	10
Vanadium	2.30E-09	5.14E-05	1.28E-06	10
Zinc	2.90E-08	6.48E-04	1.61E-05	10
<b>Total HAPs</b>		<b>9.86E-01</b>	<b>2.45E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	2.68E+03	6.67E+01
Methane	2.30E-06	5.14E-02	1.28E-03
<b>Total Greenhouse Gases</b>		<b>2.68E+03</b>	<b>6.67E+01</b>



## Oil Emissions Boiler

OU

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	2,702,980	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	19.31	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	169,129	(gal /year)
Actual Fuel Usage	8,965	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	4.23E-01	2.24E-02	100
NOx	2.40E-02	2.03E+00	1.08E-01	25
PM, Filterable	2.00E-03	1.69E-01	8.97E-03	100
SOx	7.35E-02	6.22E+00	3.29E-01	100
TOC	5.56E-04	4.70E-02	2.49E-03	25
<b>Total Primary Pollutants</b>		<b>8.88E+00</b>	<b>4.71E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	2.33E-04	1.23E-05	10
Formaldehyde (2)	6.10E-05	5.16E-03	2.73E-04	10
Ammonia	8.00E-04	6.77E-02	3.59E-03	100
Arsenic (1)	4.00E-06	4.74E-05	5.02E-03	100
Beryllium (1)	3.00E-06	3.55E-05	3.77E-03	100
Cadmium (1)	3.00E-06	3.55E-05	3.77E-03	100
Chromium (1)	3.00E-06	3.55E-05	3.77E-03	100
Copper (1)	6.00E-06	7.10E-05	7.53E-03	100
Fluoranthene	FALSE	0.00E+00	0.00E+00	100
Lead (1)	9.00E-06	1.07E-04	1.13E-02	10
Manganese (1)	6.00E-06	7.10E-05	7.53E-03	100
Mercury (1)	3.00E-06	3.55E-05	3.77E-03	100
Nickel (1)	3.00E-06	3.55E-05	3.77E-03	100
PM, condensable	1.30E-03	1.10E-01	5.83E-03	100
PM10, filterable	1.08E-03	9.13E-02	4.84E-03	100
PM10, primary	1.08E-03	9.13E-02	4.84E-03	100
PM2.5, filterable	1.08E-03	9.13E-02	4.84E-03	100
PM2.5, primary	1.08E-03	9.13E-02	4.84E-03	100
Polycyclic organic matter (POM)	1.08E-03	9.13E-02	4.84E-03	100
Selenium (1)	1.50E-05	1.78E-04	1.88E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	2.88E-02	1.52E-03	100
Zinc (1)	4.00E-06	4.74E-05	1.79E-05	100
<b>Total HAPs</b>		<b>6.69E-01</b>	<b>1.04E-01</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	1.83E-02	9.68E-04
<b>Total Greenhouse Gases</b>		<b>1.83E-02</b>	<b>9.68E-04</b>

Natural Gas Emissions Boiler

PY

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	3,651,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	3,579.41	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	31,355,647.06	(scf /year)
Actual Fuel Usage	1,984,480.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.32E+00	8.33E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.60E+00	1.01E-01	25
PM, filterable	1.90E-06	2.98E-02	1.89E-03	100
Sulfur dioxide	6.00E-07	9.41E-03	5.95E-04	100
Total organic compounds (TOC)	1.10E-05	1.72E-01	1.09E-02	25
Volatile organic compounds (VOC)	5.50E-06	8.62E-02	5.46E-03	25
<b>Total Primary Pollutants</b>		<b>2.96E+00</b>	<b>1.87E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	3.29E-05	2.08E-06	10
Formaldehyde	7.50E-08	1.18E-03	7.44E-05	10
Naphthalene	6.10E-10	9.56E-06	6.05E-07	10
Toluene	3.40E-09	5.33E-05	3.37E-06	10
2-Methyl Naphthalene	2.40E-11	3.76E-07	2.38E-08	10
3-Methylcholanthrene	1.80E-12	2.82E-08	1.79E-09	10
Acenaphthene	1.80E-12	2.82E-08	1.79E-09	10
Acenaphthylene	1.80E-12	2.82E-08	1.79E-09	10
Ammonia	4.90E-07	7.68E-03	4.86E-04	10
Anthracene	2.40E-12	3.76E-08	2.38E-09	10
Arsenic	2.00E-10	3.14E-06	1.98E-07	10
Barium	4.40E-09	6.90E-05	4.37E-06	10
Benzo (a) anthracene	1.80E-12	2.82E-08	1.79E-09	10
Benzo (a) pyrene	1.20E-12	1.88E-08	1.19E-09	10
Benzo (b) fluoranthene	1.80E-12	2.82E-08	1.79E-09	10
Benzo (g,h,i) perylene	1.20E-12	1.88E-08	1.19E-09	10
Benzo (k) fluoranthene	1.80E-12	2.82E-08	1.79E-09	10
Beryllium	1.20E-11	1.88E-07	1.19E-08	10
Cadmium	1.10E-09	1.72E-05	1.09E-06	10
Chromium	1.40E-09	2.19E-05	1.39E-06	10
Chrysene	1.80E-12	2.82E-08	1.79E-09	10
Cobalt	8.40E-11	1.32E-06	8.33E-08	10
Copper	8.50E-10	1.33E-05	8.43E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.88E-08	1.19E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	1.88E-05	1.19E-06	10
Dimethylbenz(a)anthracene	1.60E-11	2.51E-07	1.59E-08	10
Ethane	3.10E-06	4.86E-02	3.08E-03	10
Fluoranthene	3.00E-12	4.70E-08	2.98E-09	10
Fluorene	2.80E-12	4.39E-08	2.78E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.82E-08	1.79E-09	10
Lead	5.00E-10	7.84E-06	4.96E-07	10
Manganese	3.80E-10	5.96E-06	3.77E-07	10
Mercury	2.60E-10	4.08E-06	2.58E-07	10
Molybdenum	1.10E-09	1.72E-05	1.09E-06	10
n-Butane	2.10E-06	3.29E-02	2.08E-03	10
N-Hexane	1.80E-06	2.82E-02	1.79E-03	10
Nickel	2.10E-09	3.29E-05	2.08E-06	10
N-Pentane	2.60E-06	4.08E-02	2.58E-03	10
Phenanthrene	1.70E-11	2.67E-07	1.69E-08	10
PM, condensable	5.70E-06	8.94E-02	5.66E-03	10
PM, primary	7.60E-06	1.19E-01	7.54E-03	10
PM10, filterable	1.90E-06	2.98E-02	1.89E-03	10
PM10, primary	7.60E-06	1.19E-01	7.54E-03	10
PM2.5, filterable	1.90E-06	2.98E-02	1.89E-03	10
PM2.5, primary	7.60E-06	1.19E-01	7.54E-03	10
Propane	1.60E-06	2.51E-02	1.59E-03	10
Pyrene	5.00E-12	7.84E-08	4.96E-09	10
Selenium	2.40E-11	3.76E-07	2.38E-08	10
Vanadium	2.30E-09	3.61E-05	2.28E-06	10
Zinc	2.90E-08	4.55E-04	2.88E-05	10
<b>Total HAPs</b>		<b>6.92E-01</b>	<b>4.38E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.88E+03	1.19E+02
Methane	2.30E-06	3.61E-02	2.28E-03
<b>Total Greenhouse Gases</b>		<b>1.88E+03</b>	<b>1.19E+02</b>

Diesel Generator Calculations          PN  
Appendix B  
Armory Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	50	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	685,150	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	67	(hp)
Maximum Fuel Firing Rate	5	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	43,800	(gal /year)
Actual Fuel Usage	63	(gal /year)
Actual Hour Usage	12.61441266	(Hrs/ yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	1.30E-01	2.85E+00	4.10E-03	100
Nitrogen oxides (NOx)	6.04E-01	1.32E+01	1.90E-02	25
PM, filterable	4.25E-02	9.31E-01	1.34E-03	100
Sulfur oxides (SOx)	3.97E-02	8.69E-01	1.25E-03	100
Total organic compounds (TOC)	4.93E-02	1.08E+00	1.55E-03	25
<b>Total Primary Pollutants</b>		<b>1.90E+01</b>	<b>2.73E-02</b>	
<b>HAPs</b>				
Benzene	9.33E-10	2.80E-03	4.03E-06	10
Formaldehyde	1.18E-09	3.54E-03	5.10E-06	10
Naphthalene	8.48E-11	2.54E-04	3.66E-07	10
Toluene	4.09E-10	1.23E-03	1.77E-06	10
Acenaphthene	1.42E-12	4.26E-06	6.14E-09	10
Acenaphthylene	5.06E-12	1.52E-05	2.19E-08	10
Acetaldehyde	7.67E-10	2.30E-03	3.31E-06	10
Acrolein	9.25E-11	2.78E-04	4.00E-07	10
Aldehydes	7.00E-08	2.10E-01	3.02E-04	10
Anthracene	1.87E-12	5.61E-06	8.08E-09	10
Benzo (a) anthracene	1.68E-12	5.04E-06	7.26E-09	10
Benzo (a) pyrene	1.88E-13	5.64E-07	8.12E-10	10
Benzo (b) fluoranthene	9.91E-14	2.97E-07	4.28E-10	10
Benzo (g,h,i) perylene	4.89E-13	1.47E-06	2.11E-09	10
Benzo (k) fluoranthene	1.55E-13	4.65E-07	6.70E-10	10
1,3-Butadiene	3.91E-11	1.17E-04	1.69E-07	10
Chrysene	3.53E-13	1.06E-06	1.53E-09	10
Dibenzo(a,h) anthracene	5.83E-13	1.75E-06	2.52E-09	10
Fluoranthene	7.61E-12	2.28E-05	3.29E-08	10
Fluorene	2.92E-11	8.76E-05	1.26E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.13E-06	1.62E-09	10
Isomers of xylene	2.85E-10	8.55E-04	1.23E-06	10
Phenanthrene	2.94E-11	8.82E-05	1.27E-07	10
PM10, filterable	4.25E-02	9.31E-01	1.34E-03	10
PM2.5, filterable	4.25E-02	9.31E-01	1.34E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	5.04E-04	7.26E-07	10
Propylene	2.58E-09	7.74E-03	1.11E-05	10
Pyrene	4.78E-12	1.43E-05	2.07E-08	10
<b>Total HAPs</b>		<b>2.09E+00</b>	<b>3.01E-03</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	4.95E+02	7.13E-01
<b>Total Greenhouse Gases</b>		<b>4.95E+02</b>	<b>7.13E-01</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Oil Emissions Space Heater

PN

Appendix B

Armory Emission Calculations

Space Heaters Heating Oil (SCC 10500205)

Unit Size	490,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	3.50	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	30,660	(gal /year)
Actual Fuel Usage	1,650	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	7.18E-02	1.10E+00	5.92E-02	100
VOCs	7.00E-04	1.07E-02	5.78E-04	25
<b>Total Primary Pollutants</b>		<b>1.11E+00</b>	<b>5.98E-02</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	1.23E-02	6.60E-04	100
PM, condensable	1.30E-03	1.99E-02	1.07E-03	100
PM10, filterable	2.46E-03	3.77E-02	2.03E-03	100
PM10, primary	3.76E-03	5.76E-02	3.10E-03	100
PM2.5, filterable	6.15E-04	9.43E-03	5.07E-04	100
PM2.5, primary	1.92E-03	2.94E-02	1.58E-03	100
<b>Total HAPs</b>		<b>1.28E+00</b>	<b>6.88E-02</b>	

Natural Gas Emissions Boiler RE  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,800,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,745.10	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	24,047,058.82	(scf /year)
Actual Fuel Usage	897,429.27	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.01E+00	3.77E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.23E+00	4.59E-02	25
PM, filterable	1.90E-06	2.28E-02	8.53E-04	100
Sulfur dioxide	6.00E-07	7.21E-03	2.69E-04	100
Total organic compounds (TOC)	1.10E-05	1.32E-01	4.94E-03	25
Volatile organic compounds (VOC)	5.50E-06	6.61E-02	2.47E-03	25
<b>Total Primary Pollutants</b>		<b>2.27E+00</b>	<b>8.47E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.52E-05	9.42E-07	10
Formaldehyde	7.50E-08	9.02E-04	3.37E-05	10
Naphthalene	6.10E-10	7.33E-06	2.74E-07	10
Toluene	3.40E-09	4.09E-05	1.53E-06	10
2-Methyl Naphthalene	2.40E-11	2.89E-07	1.08E-08	10
3-Methylcholanthrene	1.80E-12	2.16E-08	8.08E-10	10
Acenaphthene	1.80E-12	2.16E-08	8.08E-10	10
Acenaphthylene	1.80E-12	2.16E-08	8.08E-10	10
Ammonia	4.90E-07	5.89E-03	2.20E-04	10
Anthracene	2.40E-12	2.89E-08	1.08E-09	10
Arsenic	2.00E-10	2.40E-06	8.97E-08	10
Barium	4.40E-09	5.29E-05	1.97E-06	10
Benzo (a) anthracene	1.80E-12	2.16E-08	8.08E-10	10
Benzo (a) pyrene	1.20E-12	1.44E-08	5.38E-10	10
Benzo (b) fluoranthene	1.80E-12	2.16E-08	8.08E-10	10
Benzo (g,h,i) perylene	1.20E-12	1.44E-08	5.38E-10	10
Benzo (k) fluoranthene	1.80E-12	2.16E-08	8.08E-10	10
Beryllium	1.20E-11	1.44E-07	5.38E-09	10
Cadmium	1.10E-09	1.32E-05	4.94E-07	10
Chromium	1.40E-09	1.68E-05	6.28E-07	10
Chrysene	1.80E-12	2.16E-08	8.08E-10	10
Cobalt	8.40E-11	1.01E-06	3.77E-08	10
Copper	8.50E-10	1.02E-05	3.81E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.44E-08	5.38E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	1.44E-05	5.38E-07	10
Dimethylbenz(a)anthracene	1.60E-11	1.92E-07	7.18E-09	10
Ethane	3.10E-06	3.73E-02	1.39E-03	10
Fluoranthene	3.00E-12	3.61E-08	1.35E-09	10
Fluorene	2.80E-12	3.37E-08	1.26E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.16E-08	8.08E-10	10
Lead	5.00E-10	6.01E-06	2.24E-07	10
Manganese	3.80E-10	4.57E-06	1.71E-07	10
Mercury	2.60E-10	3.13E-06	1.17E-07	10
Molybdenum	1.10E-09	1.32E-05	4.94E-07	10
n-Butane	2.10E-06	2.52E-02	9.42E-04	10
N-Hexane	1.80E-06	2.16E-02	8.08E-04	10
Nickel	2.10E-09	2.52E-05	9.42E-07	10
N-Pentane	2.60E-06	3.13E-02	1.17E-03	10
Phenanthrene	1.70E-11	2.04E-07	7.63E-09	10
PM, condensable	5.70E-06	6.85E-02	2.56E-03	10
PM, primary	7.60E-06	9.14E-02	3.41E-03	10
PM10, filterable	1.90E-06	2.28E-02	8.53E-04	10
PM10, primary	7.60E-06	9.14E-02	3.41E-03	10
PM2.5, filterable	1.90E-06	2.28E-02	8.53E-04	10
PM2.5, primary	7.60E-06	9.14E-02	3.41E-03	10
Propane	1.60E-06	1.92E-02	7.18E-04	10
Pyrene	5.00E-12	6.01E-08	2.24E-09	10
Selenium	2.40E-11	2.89E-07	1.08E-08	10
Vanadium	2.30E-09	2.77E-05	1.03E-06	10
Zinc	2.90E-08	3.49E-04	1.30E-05	10
<b>Total HAPs</b>		<b>5.30E-01</b>	<b>1.98E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.44E+03	5.38E+01
Methane	2.30E-06	2.77E-02	1.03E-03
<b>Total Greenhouse Gases</b>		<b>1.44E+03</b>	<b>5.38E+01</b>

Natural Gas Emissions Space Heater

RE

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	1,314,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	1,288.24	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	11,284,941.18	(scf /year)
Actual Fuel Usage	421,150.73	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.13E-01	4.21E-03	100
Nitrogen oxides (NOx)	1.00E-04	5.64E-01	2.11E-02	25
PM, filterable	3.00E-06	1.69E-02	6.32E-04	100
Sulfur dioxide	6.00E-07	3.39E-03	1.26E-04	100
VOCs	5.30E-06	2.99E-02	1.12E-03	25
<b>Primary Pollutants Total</b>		<b>6.97E-01</b>	<b>2.60E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	3.22E-02	1.20E-03	100
PM10, filterable	3.00E-06	1.69E-02	6.32E-04	100
PM10, primary	8.70E-06	4.91E-02	1.83E-03	100
PM2.5, filterable	3.00E-06	1.69E-02	6.32E-04	100
PM2.5, primary	8.70E-06	4.91E-02	1.83E-03	100
<b>Total HAPs</b>		<b>8.62E-01</b>	<b>3.22E-02</b>	

Diesel Generator 1 Calculations

ST  
Appendix B  
Army Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts		(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	2,661,123	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	0	(hp)
Maximum Fuel Firing Rate	19.42	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	170,119	(gal /year)
Actual Fuel Usage	1,361	(gal /year)
Actual Hour Usage	70.09486349	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	1.11E+01	8.85E-02	100
Nitrogen oxides (NOx)	6.04E-01	5.14E+01	4.11E-01	25
PM, filterable	4.25E-02	3.62E+00	2.89E-02	100
Sulfur oxides (SOx)	3.97E-02	3.38E+00	2.70E-02	100
Total organic compounds (TOC)	4.93E-02	4.19E+00	3.36E-02	25
<b>Total Primary Pollutants</b>		<b>7.36E+01</b>	<b>5.89E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.09E-02	8.70E-05	10
Formaldehyde	1.18E-09	1.38E-02	1.10E-04	10
Naphthalene	8.48E-11	9.88E-04	7.91E-06	10
Toluene	4.09E-10	4.77E-03	3.81E-05	10
Acenaphthene	1.42E-12	1.66E-05	1.32E-07	10
Acenaphthylene	5.06E-12	5.90E-05	4.72E-07	10
Acetaldehyde	7.67E-10	8.94E-03	7.15E-05	10
Acrolein	9.25E-11	1.08E-03	8.63E-06	10
Aldehydes	7.00E-08	8.16E-01	6.53E-03	10
Anthracene	1.87E-12	2.18E-05	1.74E-07	10
Benzo (a) anthracene	1.68E-12	1.96E-05	1.57E-07	10
Benzo (a) pyrene	1.88E-13	2.19E-06	1.75E-08	10
Benzo (b) fluoranthene	9.91E-14	1.16E-06	9.24E-09	10
Benzo (g,h,i) perylene	4.89E-13	5.70E-06	4.56E-08	10
Benzo (k) fluoranthene	1.55E-13	1.81E-06	1.45E-08	10
1,3-Butadiene	3.91E-11	4.56E-04	3.65E-06	10
Chrysene	3.53E-13	4.11E-06	3.29E-08	10
Dibenzo(a,h) anthracene	5.83E-13	6.80E-06	5.44E-08	10
Fluoranthene	7.61E-12	8.87E-05	7.10E-07	10
Fluorene	2.92E-11	3.40E-04	2.72E-06	10
Indeno(1,2,3-cd)pyrene	3.75E-13	4.37E-06	3.50E-08	10
Isomers of xylene	2.85E-10	3.32E-03	2.66E-05	10
Phenanthrene	2.94E-11	3.43E-04	2.74E-06	10
PM10, filterable	4.25E-02	3.62E+00	2.89E-02	10
PM2.5, filterable	4.25E-02	3.62E+00	2.89E-02	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.96E-03	1.57E-05	10
Propylene	2.58E-09	3.01E-02	2.41E-04	10
Pyrene	4.78E-12	5.57E-05	4.46E-07	10
<b>Total HAPs</b>		<b>8.12E+00</b>	<b>6.50E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.92E+03	1.54E+01
<b>Total Greenhouse Gases</b>		<b>1.92E+03</b>	<b>1.54E+01</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.
- Actual Hour Usage was calculated by finding the difference between the installation date and the approx date the survey was conducted. When Installation date is not available, Jan 1st of the "year made" year was used.

Diesel Generator 2 Calculations

ST  
Appendix B  
Armory Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts		(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	2,661,123	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	0	(hp)
Maximum Fuel Firing Rate	19.42	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	170,119	(gal /year)
Actual Fuel Usage	1,361	(gal /year)
Actual Hour Usage	70.09486349	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	1.11E+01	8.85E-02	100
Nitrogen oxides (NOx)	6.04E-01	5.14E+01	4.11E-01	25
PM, filterable	4.25E-02	3.62E+00	2.89E-02	100
Sulfur oxides (SOx)	3.97E-02	3.38E+00	2.70E-02	100
Total organic compounds (TOC)	4.93E-02	4.19E+00	3.36E-02	25
<b>Total Primary Pollutants</b>		<b>7.36E+01</b>	<b>5.89E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	1.09E-02	8.70E-05	10
Formaldehyde	1.18E-09	1.38E-02	1.10E-04	10
Naphthalene	8.48E-11	9.88E-04	7.91E-06	10
Toluene	4.09E-10	4.77E-03	3.81E-05	10
Acenaphthene	1.42E-12	1.66E-05	1.32E-07	10
Acenaphthylene	5.06E-12	5.90E-05	4.72E-07	10
Acetaldehyde	7.67E-10	8.94E-03	7.15E-05	10
Acrolein	9.25E-11	1.08E-03	8.63E-06	10
Aldehydes	7.00E-08	8.16E-01	6.53E-03	10
Anthracene	1.87E-12	2.18E-05	1.74E-07	10
Benzo (a) anthracene	1.68E-12	1.96E-05	1.57E-07	10
Benzo (a) pyrene	1.88E-13	2.19E-06	1.75E-08	10
Benzo (b) fluoranthene	9.91E-14	1.16E-06	9.24E-09	10
Benzo (g,h,i) perylene	4.89E-13	5.70E-06	4.56E-08	10
Benzo (k) fluoranthene	1.55E-13	1.81E-06	1.45E-08	10
1,3-Butadiene	3.91E-11	4.56E-04	3.65E-06	10
Chrysene	3.53E-13	4.11E-06	3.29E-08	10
Dibenzo(a,h) anthracene	5.83E-13	6.80E-06	5.44E-08	10
Fluoranthene	7.61E-12	8.87E-05	7.10E-07	10
Fluorene	2.92E-11	3.40E-04	2.72E-06	10
Indeno(1,2,3-cd)pyrene	3.75E-13	4.37E-06	3.50E-08	10
Isomers of xylene	2.85E-10	3.32E-03	2.66E-05	10
Phenanthrene	2.94E-11	3.43E-04	2.74E-06	10
PM10, filterable	4.25E-02	3.62E+00	2.89E-02	10
PM2.5, filterable	4.25E-02	3.62E+00	2.89E-02	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	1.96E-03	1.57E-05	10
Propylene	2.58E-09	3.01E-02	2.41E-04	10
Pyrene	4.78E-12	5.57E-05	4.46E-07	10
<b>Total HAPs</b>		<b>8.12E+00</b>	<b>6.50E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	1.92E+03	1.54E+01
<b>Total Greenhouse Gases</b>		<b>1922.35</b>	<b>15.38</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.
- Actual Hour Usage was calculated by finding the difference between the installation date and the approx date the survey was conducted. When Installation date is not available, Jan 1st of the "year made" year was used.



ST  
Appendix B  
Army Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts		(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	8,865,841	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	0	(hp)
Maximum Fuel Firing Rate	64.70	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	566,772	(gal /year)
Actual Fuel Usage	0	(gal /year)
Actual Hour Usage	0	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	3.68E+01	0.00E+00	100
Nitrogen oxides (NOx)	6.04E-01	1.71E+02	0.00E+00	25
PM, filterable	4.25E-02	1.20E+01	0.00E+00	100
Sulfur oxides (SOx)	3.97E-02	1.13E+01	0.00E+00	100
Total organic compounds (TOC)	4.93E-02	1.40E+01	0.00E+00	25
<b>Total Primary Pollutants</b>		<b>2.45E+02</b>	<b>0.00E+00</b>	
<b>HAPs</b>				
Benzene	9.33E-10	3.62E-02	0.00E+00	10
Formaldehyde	1.18E-09	4.58E-02	0.00E+00	10
Naphthalene	8.48E-11	3.29E-03	0.00E+00	10
Toluene	4.09E-10	1.59E-02	0.00E+00	10
Acenaphthene	1.42E-12	5.51E-05	0.00E+00	10
Acenaphthylene	5.06E-12	1.96E-04	0.00E+00	10
Acetaldehyde	7.67E-10	2.98E-02	0.00E+00	10
Acrolein	9.25E-11	3.59E-03	0.00E+00	10
Aldehydes	7.00E-08	2.72E+00	0.00E+00	10
Anthracene	1.87E-12	7.26E-05	0.00E+00	10
Benzo (a) anthracene	1.68E-12	6.52E-05	0.00E+00	10
Benzo (a) pyrene	1.88E-13	7.30E-06	0.00E+00	10
Benzo (b) fluoranthene	9.91E-14	3.85E-06	0.00E+00	10
Benzo (g,h,i) perylene	4.89E-13	1.90E-05	0.00E+00	10
Benzo (k) fluoranthene	1.55E-13	6.02E-06	0.00E+00	10
1,3-Butadiene	3.91E-11	1.52E-03	0.00E+00	10
Chrysene	3.53E-13	1.37E-05	0.00E+00	10
Dibenzo(a,h) anthracene	5.83E-13	2.26E-05	0.00E+00	10
Fluoranthene	7.61E-12	2.96E-04	0.00E+00	10
Fluorene	2.92E-11	1.13E-03	0.00E+00	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.46E-05	0.00E+00	10
Isomers of xylene	2.85E-10	1.11E-02	0.00E+00	10
Phenanthrene	2.94E-11	1.14E-03	0.00E+00	10
PM10, filterable	4.25E-02	1.20E+01	0.00E+00	10
PM2.5, filterable	4.25E-02	1.20E+01	0.00E+00	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	6.52E-03	0.00E+00	10
Propylene	2.58E-09	1.00E-01	0.00E+00	10
Pyrene	4.78E-12	1.86E-04	0.00E+00	10
<b>Total HAPs</b>		<b>2.71E+01</b>	<b>0.00E+00</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	6.40E+03	0.00E+00
<b>Total Greenhouse Gases</b>		<b>6.40E+03</b>	<b>0.00E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.
- Actual Hour Usage was calculated by finding the difference between the installation date and the approx date the survey was conducted. When Installation date is not available, Jan 1st of the "year made" year was used.

Diesel Generator 4 Calculations

ST  
Appendix B  
Armory Emission Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts		(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	8,865,841	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	0	(hp)
Maximum Fuel Firing Rate	64.70	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	566,772	(gal / year)
Actual Fuel Usage	0	(gal / year)
Actual Hour Usage	0	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	3.68E+01	0.00E+00	100
Nitrogen oxides (NOx)	6.04E-01	1.71E+02	0.00E+00	25
PM, filterable	4.25E-02	1.20E+01	0.00E+00	100
Sulfur oxides (SOx)	3.97E-02	1.13E+01	0.00E+00	100
Total organic compounds (TOC)	4.93E-02	1.40E+01	0.00E+00	25
<b>Total Primary Pollutants</b>		<b>2.45E+02</b>	<b>0.00E+00</b>	
<b>HAPs</b>				
Benzene	9.33E-10	3.62E-02	0.00E+00	10
Formaldehyde	1.18E-09	4.58E-02	0.00E+00	10
Napthalene	8.48E-11	3.29E-03	0.00E+00	10
Toluene	4.09E-10	1.59E-02	0.00E+00	10
Acenaphthene	1.42E-12	5.51E-05	0.00E+00	10
Acenaphthylene	5.06E-12	1.96E-04	0.00E+00	10
Acetaldehyde	7.67E-10	2.98E-02	0.00E+00	10
Acrolein	9.25E-11	3.59E-03	0.00E+00	10
Aldehydes	7.00E-08	2.72E+00	0.00E+00	10
Anthracene	1.87E-12	7.26E-05	0.00E+00	10
Benzo (a) anthracene	1.68E-12	6.52E-05	0.00E+00	10
Benzo (a) pyrene	1.88E-13	7.30E-06	0.00E+00	10
Benzo (b) fluoranthene	9.91E-14	3.85E-06	0.00E+00	10
Benzo (g,h,i) perylene	4.89E-13	1.90E-05	0.00E+00	10
Benzo (k) fluoranthene	1.55E-13	6.02E-06	0.00E+00	10
1,3-Butadiene	3.91E-11	1.52E-03	0.00E+00	10
Chrysene	3.53E-13	1.37E-05	0.00E+00	10
Dibenzo(a,h) anthracene	5.83E-13	2.26E-05	0.00E+00	10
Fluoranthene	7.61E-12	2.96E-04	0.00E+00	10
Fluorene	2.92E-11	1.13E-03	0.00E+00	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.46E-05	0.00E+00	10
Isomers of xylene	2.85E-10	1.11E-02	0.00E+00	10
Phenanthrene	2.94E-11	1.14E-03	0.00E+00	10
PM10, filterable	4.25E-02	1.20E+01	0.00E+00	10
PM2.5, filterable	4.25E-02	1.20E+01	0.00E+00	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	6.52E-03	0.00E+00	10
Propylene	2.58E-09	1.00E-01	0.00E+00	10
Pyrene	4.78E-12	1.86E-04	0.00E+00	10
<b>Total HAPs</b>		<b>2.71E+01</b>	<b>0.00E+00</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	6.40E+03	0.00E+00
<b>Total Greenhouse Gases</b>		<b>6.40E+03</b>	<b>0.00E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.
- Actual Hour Usage was calculated by finding the difference between the installation date and the approx date the survey was conducted. When Installation date is not available, Jan 1st of the "year made" year was used.

Firing Range Emissions

ST  
Appendix B  
Armory Emissions Calculations  
Sea Girt NGTC Range Emissions

Munitions		
DODIC	Description	Amount (1) (rounds/year)
DWGX	.40 S&W	7,500
A363	9mm Ball Cartridge	900
A475	.45 Cal. Ball Cartridge	600
<b>Total Rounds</b>		<b>9,000</b>

Pollutant	A363 Emissions		A475 Emissions		Emission Totals (tons/year)
	Emission Factors (lb/round)	Actual Emissions (tons/year)	Emission Factors (lb/round)	Actual Emissions (tons/year)	
<b>Primary Pollutants</b>					
CO	3.10E-04	1.40E-04	2.60E-04	1.05E-03	1.19E-03
Lead	6.80E-06	3.06E-06	1.20E-05	4.86E-05	5.17E-05
NOX	1.50E-05	6.75E-06	8.10E-06	3.28E-05	3.96E-05
PM-2.5	2.00E-05	9.00E-06	3.10E-05	1.26E-04	1.35E-04
PM-10	2.40E-05	1.08E-05	3.70E-05	1.50E-04	1.61E-04
SO2	8.20E-08	3.69E-08	NA	NA	3.69E-08
TSP	2.10E-05	9.45E-06	3.20E-05	1.30E-04	1.39E-04
<b>HAPs</b>					
Acenaphthene	3.60E-11	1.62E-11	2.20E-11	8.91E-11	1.05E-10
Acenaphthylene	2.40E-10	1.08E-10	NA	NA	1.08E-10
Acetonitrile	4.50E-08	2.03E-08	1.60E-08	6.48E-08	8.51E-08
Acetaldehyde	NA	NA	NA	NA	0.00E+00
Acrolein	8.10E-09	3.65E-09	NA	NA	3.65E-09
Acrylonitrile	2.20E-08	9.90E-09	9.10E-09	3.69E-08	4.68E-08
Aluminum	7.00E-08	3.15E-08	1.40E-07	5.67E-07	5.99E-07
Ammonia	2.10E-06	9.45E-07	NA	NA	9.45E-07
Anthracene	3.90E-11	1.76E-11	NA	NA	1.76E-11
Antimony	2.00E-06	9.00E-07	2.90E-06	1.17E-05	1.26E-05
Arsenic	4.50E-09	2.03E-09	5.20E-09	2.11E-08	2.31E-08
Barium	1.70E-06	7.65E-07	1.50E-06	6.08E-06	6.84E-06
Benzene	NA	NA	1.30E-07	5.27E-07	5.27E-07
Benzo(a)anthracene	2.30E-10	1.04E-10	1.10E-10	4.46E-10	5.49E-10
Benzo(b)fluoranthene	2.50E-10	1.13E-10	1.40E-10	5.67E-10	6.80E-10
Benzo(k)fluoranthene	1.60E-10	7.20E-11	9.20E-11	3.73E-10	4.45E-10
Benzo(g,h,i)perylene	6.70E-10	3.02E-10	1.60E-10	6.48E-10	9.50E-10
Benzo(a)pyrene	2.30E-10	1.04E-10	NA	NA	1.04E-10
Benzo(e)pyrene	2.70E-10	1.22E-10	1.10E-10	4.46E-10	5.67E-10
1,3-Butadiene	1.20E-09	5.40E-10	2.50E-09	1.01E-08	1.07E-08
Carbon Disulfide	1.60E-09	7.20E-10	6.50E-09	2.63E-08	2.70E-08
Chrysene	2.40E-10	1.08E-10	1.40E-10	5.67E-10	6.75E-10
Chloromethane	NA	NA	4.30E-10	1.74E-09	1.74E-09
Copper	9.80E-07	4.41E-07	1.50E-06	6.08E-06	6.52E-06
Dibenz(a,h)anthracene	3.00E-11	1.35E-11	1.60E-11	6.48E-11	7.83E-11
Dichlorodifluoromethane	1.70E-10	7.65E-11	NA	NA	7.65E-11
1,2-Dichloroethane	2.80E-09	1.26E-09	2.30E-09	9.32E-09	1.06E-08
Total dioxin/furan compounds	NA	NA	2.90E-15	1.17E-14	1.17E-14
Dibenz(a,h)anthracene	3.00E-11	1.35E-11	NA	NA	1.35E-11
Dichlorodifluoromethane	1.70E-10	7.65E-11	NA	NA	7.65E-11
1,2-Dichloroethane	2.80E-09	1.26E-09	NA	NA	1.26E-09
Ethylbenzene	1.50E-09	6.75E-10	1.30E-09	5.27E-09	5.94E-09
Ethylene	5.20E-07	2.34E-07	3.90E-07	1.58E-06	1.81E-06
Fluoranthene	NA	NA	2.60E-10	4.16E-18	4.16E-18
Fluorene	1.10E-10	4.95E-11	9.80E-11	3.97E-10	4.46E-10
Formaldehyde	5.20E-08	2.34E-08	2.50E-08	1.01E-07	1.25E-07
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	8.50E-16	3.44E-15	3.44E-15
Hexane	4.90E-07	2.21E-07	6.30E-08	2.55E-07	4.76E-07
Hydrogen cyanide	1.80E-06	8.10E-07	1.00E-06	4.05E-06	4.86E-06
Indeno(1,2,3-cd)pyrene	3.00E-10	1.35E-10	1.20E-10	4.86E-10	6.21E-10
Lead	6.80E-06	3.06E-06	1.20E-05	0.0000486	5.17E-05
Methylene Chloride	NA	NA	5.00E-08	2.03E-07	2.03E-07
Naphthalene	4.50E-09	2.03E-09	NA	NA	2.03E-09
Nitric Acid	1.90E-07	8.55E-08	NA	NA	8.55E-08
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	NA	NA	2.10E-15	8.51E-15	8.51E-15
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.00E+00
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.00E+00
Phenanthrene	2.40E-10	1.08E-10	1.60E-10	6.48E-10	7.56E-10
Propionaldehyde	NA	NA	NA	NA	0.00E+00
Propylene	1.50E-07	6.75E-08	1.20E-07	4.86E-07	5.54E-07
Pyrene	1.00E-09	4.50E-10	3.90E-10	1.58E-09	2.03E-09
Styrene	2.10E-09	9.45E-10	3.20E-09	1.30E-08	1.39E-08
Sulfuric Acid	6.40E-08	2.88E-08	NA	NA	2.88E-08
2,3,7,8-Tetrachlorodibenzofurane	NA	NA	NA	NA	0.00E+00
Toluene	3.10E-08	1.40E-08	2.50E-08	1.01E-07	1.15E-07
1,1,1-Trichloroethane	1.90E-10	8.55E-11	NA	NA	8.55E-11
1,2,4-Trimethylbenzene	8.50E-10	3.83E-10	3.10E-09	1.26E-08	1.29E-08
m-Xylene, p-Xylene	4.50E-09	2.03E-09	3.30E-09	1.34E-08	1.54E-08
o-Xylene	3.00E-09	1.35E-09	1.70E-09	6.89E-09	8.24E-09
Zinc	NA	NA	2.40E-07	9.72E-07	9.72E-07
<b>Total HAPs (tons/year)(5)</b>	<b>4.05E-03</b>	<b>7.68E-06</b>	<b>2.01E-05</b>	<b>8.15E-05</b>	<b>8.92E-05</b>

Greenhouse Gases					
Carbon dioxide	2.00E-04	9.00E-05	2.20E-04	8.91E-04	9.81E-04
Methane	1.40E-06	1.26E-03	7.80E-07	3.16E-06	1.26E-03
<b>Total Greenhouse Gases</b>	<b>2.01E-04</b>	<b>1.35E-03</b>	<b>2.21E-04</b>	<b>8.94E-04</b>	<b>2.24E-03</b>

Notes:

- Amount of rounds fired based on CY2016. Includes NIANRG and State and Federal Law Enforcement Agencies.
- Emission factors are not available for DODIC DWGX (.40 S&W). Emissions factors for DODIC A475 were used for these munitions.
- HAP - Hazardous Air Pollutant
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- Emission factors based on USEPA AP42 Section 15 Draft Ordinance Detonation Jan. 2007.

Natural Gas Emissions Boiler

ST

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	11,854,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	11,621.57	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	101,804,941.18	(scf / year)
Actual Fuel Usage	11,328,661.06	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	4.28E+00	4.76E-01	100
Nitrogen oxides (NOx)	1.02E-04	5.20E+00	5.79E-01	25
PM, filterable	1.90E-06	9.67E-02	1.08E-02	100
Sulfur dioxide	6.00E-07	3.05E-02	3.40E-03	100
Total organic compounds (TOC)	1.10E-05	5.60E-01	6.23E-02	25
Volatile organic compounds (VOC)	5.50E-06	2.80E-01	3.12E-02	25
<b>Total Primary Pollutants</b>		<b>9.61E+00</b>	<b>1.07E+00</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.07E-04	1.19E-05	10
Formaldehyde	7.50E-08	3.82E-03	4.25E-04	10
Naphthalene	6.10E-10	3.11E-05	3.46E-06	10
Toluene	3.40E-09	1.73E-04	1.93E-05	10
2-Methyl Naphthalene	2.40E-11	1.19E-06	1.36E-07	10
3-Methylcholanthrene	1.80E-12	8.94E-08	1.02E-08	10
Acenaphthene	1.80E-12	8.94E-08	1.02E-08	10
Acenaphthylene	1.80E-12	8.94E-08	1.02E-08	10
Ammonia	4.90E-07	2.43E-02	2.78E-03	10
Anthracene	2.40E-12	1.19E-07	1.36E-08	10
Arsenic	2.00E-10	9.94E-06	1.13E-06	10
Barium	4.40E-09	2.19E-04	2.49E-05	10
Benzo (a) anthracene	1.80E-12	8.94E-08	1.02E-08	10
Benzo (a) pyrene	1.20E-12	5.96E-08	6.80E-09	10
Benzo (b) fluoranthene	1.80E-12	8.94E-08	1.02E-08	10
Benzo (g,h,i) perylene	1.20E-12	5.96E-08	6.80E-09	10
Benzo (k) fluoranthene	1.80E-12	8.94E-08	1.02E-08	10
Beryllium	1.20E-11	5.96E-07	6.80E-08	10
Cadmium	1.10E-09	5.47E-05	6.23E-06	10
Chromium	1.40E-09	6.96E-05	7.93E-06	10
Chrysene	1.80E-12	8.94E-08	1.02E-08	10
Cobalt	8.40E-11	4.17E-06	4.76E-07	10
Copper	8.50E-10	4.22E-05	4.81E-06	10
Dibenzo(a,h) anthracene	1.20E-12	5.96E-08	6.80E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	5.96E-05	6.80E-06	10
Dimethylbenz(a)anthracene	1.60E-11	7.95E-07	9.06E-08	10
Ethane	3.10E-06	1.54E-01	1.76E-02	10
Fluoranthene	3.00E-12	1.49E-07	1.70E-08	10
Fluorene	2.80E-12	1.39E-07	1.59E-08	10
Indeno(1,2,3-cd)pyrene	1.80E-12	8.94E-08	1.02E-08	10
Lead	5.00E-10	2.48E-05	2.83E-06	10
Manganese	3.80E-10	1.89E-05	2.15E-06	10
Mercury	2.60E-10	1.29E-05	1.47E-06	10
Molybdenum	1.10E-09	5.47E-05	6.23E-06	10
n-Butane	2.10E-06	1.04E-01	1.19E-02	10
N-Hexane	1.80E-06	8.94E-02	1.02E-02	10
Nickel	2.10E-09	1.04E-04	1.19E-05	10
N-Pentane	2.60E-06	1.29E-01	1.47E-02	10
Phenanthrene	1.70E-11	8.45E-07	9.63E-08	10
PM, condensable	5.70E-06	2.83E-01	3.23E-02	10
PM, primary	7.60E-06	3.78E-01	4.30E-02	10
PM10, filterable	1.90E-06	9.44E-02	1.08E-02	10
PM10, primary	7.60E-06	3.78E-01	4.30E-02	10
PM2.5, filterable	1.90E-06	9.44E-02	1.08E-02	10
PM2.5, primary	7.60E-06	3.78E-01	4.30E-02	10
Propane	1.60E-06	7.95E-02	9.06E-03	10
Pyrene	5.00E-12	2.48E-07	2.83E-08	10
Selenium	2.40E-11	1.19E-06	1.36E-07	10
Vanadium	2.30E-09	1.14E-04	1.30E-05	10
Zinc	2.90E-08	1.44E-03	1.64E-04	10
<b>Total HAPs</b>		<b>2.19E+00</b>	<b>2.50E-01</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	5.96E+03	6.80E+02
Methane	2.30E-06	1.14E-01	1.30E-02
<b>Total Greenhouse Gases</b>		<b>5.96E+03</b>	<b>6.80E+02</b>

Natural Gas Emissions Space Heater

ST

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	4,842,500	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	4,747.55	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	41,588,529.41	(scf /year)
Actual Fuel Usage	3,761,698.94	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	4.16E-01	3.76E-02	100
Nitrogen oxides (NOx)	1.00E-04	2.08E+00	1.88E-01	25
PM, filterable	3.00E-06	6.24E-02	5.64E-03	100
Sulfur dioxide	6.00E-07	1.25E-02	1.13E-03	100
VOCs	5.30E-06	1.10E-01	9.97E-03	25
<b>Primary Pollutants Total</b>		<b>2.57E+00</b>	<b>2.32E-01</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.19E-01	1.07E-02	10
PM10, filterable	3.00E-06	6.24E-02	5.64E-03	10
PM10, primary	8.70E-06	1.81E-01	1.64E-02	10
PM2.5, filterable	3.00E-06	6.24E-02	5.64E-03	10
PM2.5, primary	8.70E-06	1.81E-01	1.64E-02	10
<b>Total HAPs</b>		<b>3.18E+00</b>	<b>2.87E-01</b>	

Natural Gas Generator 1

ST  
**Appendix B**  
**Armory Emissions Calculations**  
**Generators: Natural Gas (SCC 10300602)**

<b>Unit Size</b>	550,000	<b>(btu/hr)</b>
<b>Heat Content of Fuel</b>	1,020.00	<b>(btu/scf)</b>
<b>Maximum Fuel Firing Rate</b>	539.22	<b>(scf / hour)</b>
<b>Hours of Operation</b>	17.93	<b>(hr / year)</b>
<b>Max Annual Fuel</b>	4,723,529.41	<b>(scf /year)</b>
<b>Actual Fuel Usage</b>	9,668.14	<b>(scf /year)</b>

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	3.99E-04	9.42E-01	1.93E-03	100
Nitrogen oxides (NOx)	2.84E-03	6.71E+00	1.37E-02	25
PM, filterable	1.00E-05	2.36E-02	4.83E-05	100
Sulfur dioxide	6.00E-07	1.42E-03	2.90E-06	100
VOCs	1.16E-04	2.74E-01	5.61E-04	25
<b>Total Primary Pollutants</b>		<b>7.95E+00</b>	<b>1.63E-02</b>	
<b>HAPs</b>				
Nickel	2.10E-09	4.96E-06	1.02E-08	100
PM, condensable	1.01E-05	2.39E-02	4.89E-05	100
PM10, filterable	1.00E-05	2.36E-02	4.83E-05	100
PM10, primary	2.01E-05	4.75E-02	9.72E-05	100
PM2.5, filterable	1.00E-05	2.36E-02	4.83E-05	100
PM2.5, primary	2.01E-05	4.75E-02	9.72E-05	100
<b>Total HAPs</b>		<b>8.11E+00</b>	<b>1.66E-02</b>	

Natural Gas Generator 2

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Appendix B

Armory Emissions Calculations

Generators: Natural Gas (SCC 10300602)

Unit Size	260,100	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	255.00	(scf / hour)
Hours of Operation	37.24	(hr / year)
Max Annual Fuel	2,233,800.00	(scf /year)
Actual Fuel Usage	9,496.20	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	3.99E-04	4.46E-01	1.89E-03	100
Nitrogen oxides (NOx)	2.84E-03	3.17E+00	1.35E-02	25
PM, filterable	1.00E-05	1.12E-02	4.75E-05	100
Sulfur dioxide	6.00E-07	6.70E-04	2.85E-06	100
VOCs	1.16E-04	1.30E-01	5.51E-04	25
<b>Total Primary Pollutants</b>		<b>3.76E+00</b>	<b>1.60E-02</b>	
<b>HAPs</b>				
Nickel	2.10E-09	2.35E-06	9.97E-09	100
PM, condensable	1.01E-05	1.13E-02	4.80E-05	100
PM10, filterable	1.00E-05	1.12E-02	4.75E-05	100
PM10, primary	2.01E-05	2.25E-02	9.55E-05	100
PM2.5, filterable	1.00E-05	1.12E-02	4.75E-05	100
PM2.5, primary	2.01E-05	2.25E-02	9.55E-05	100
<b>Total HAPs</b>		<b>3.84E+00</b>	<b>1.63E-02</b>	

Diesel Generator 1 Calculations

SS

Appendix B

Armory Emissions Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	80	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	835,883	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	107	(hp)
Maximum Fuel Firing Rate	6.10	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	53,436	(gal /year)
Actual Fuel Usage	996	(gal /year)
Actual Hour Usage	163.2911392	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	3.47E+00	6.47E-02	100
Nitrogen oxides (NOx)	6.04E-01	1.61E+01	3.01E-01	25
PM, filterable	4.25E-02	1.14E+00	2.12E-02	100
Sulfur oxides (SOx)	3.97E-02	1.06E+00	1.98E-02	100
Total organic compounds (TOC)	4.93E-02	1.32E+00	2.46E-02	25
<b>Total Primary Pollutants</b>		<b>2.31E+01</b>	<b>4.31E-01</b>	
<b>HAPs</b>				
Benzene	9.33E-10	3.42E-03	6.37E-05	10
Formaldehyde	1.18E-09	4.32E-03	8.05E-05	10
Naphthalene	8.48E-11	3.10E-04	5.79E-06	10
Toluene	4.09E-10	1.50E-03	2.79E-05	10
Acenaphthene	1.42E-12	5.20E-06	9.69E-08	10
Acenaphthylene	5.06E-12	1.85E-05	3.45E-07	10
Acetaldehyde	7.67E-10	2.81E-03	5.23E-05	10
Acrolein	9.25E-11	3.39E-04	6.31E-06	10
Aldehydes	7.00E-08	2.56E-01	4.78E-03	10
Anthracene	1.87E-12	6.85E-06	1.28E-07	10
Benzo (a) anthracene	1.68E-12	6.15E-06	1.15E-07	10
Benzo (a) pyrene	1.88E-13	6.88E-07	1.28E-08	10
Benzo (b) fluoranthene	9.91E-14	3.63E-07	6.76E-09	10
Benzo (g,h,i) perylene	4.89E-13	1.79E-06	3.34E-08	10
Benzo (k) fluoranthene	1.55E-13	5.67E-07	1.06E-08	10
1,3-Butadiene	3.91E-11	1.43E-04	2.67E-06	10
Chrysene	3.53E-13	1.29E-06	2.41E-08	10
Dibenzo(a,h) anthracene	5.83E-13	2.13E-06	3.98E-08	10
Fluoranthene	7.61E-12	2.79E-05	5.19E-07	10
Fluorene	2.92E-11	1.07E-04	1.99E-06	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.37E-06	2.56E-08	10
Isomers of xylene	2.85E-10	1.04E-03	1.95E-05	10
Phenanthrene	2.94E-11	1.08E-04	2.01E-06	10
PM10, filterable	4.25E-02	1.14E+00	2.12E-02	10
PM2.5, filterable	4.25E-02	1.14E+00	2.12E-02	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	6.15E-04	1.15E-05	10
Propylene	2.58E-09	9.45E-03	1.76E-04	10
Pyrene	4.78E-12	1.75E-05	3.26E-07	10
<b>Total HAPs</b>		<b>2.55E+00</b>	<b>4.76E-02</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	6.04E+02	1.13E+01
<b>Total Greenhouse Gases</b>		<b>6.04E+02</b>	<b>1.13E+01</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.



Unit Size	7,075,100	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	6,936.37	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	60,762,623.53	(scf /year)
Actual Fuel Usage	2,284,606.78	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	2.55E+00	9.60E-02	100
Nitrogen oxides (NOx)	1.02E-04	3.10E+00	1.17E-01	25
PM, filterable	1.90E-06	5.77E-02	2.17E-03	100
Sulfur dioxide	6.00E-07	1.82E-02	6.85E-04	100
Total organic compounds (TOC)	1.10E-05	3.34E-01	1.26E-02	25
Volatile organic compounds (VOC)	5.50E-06	1.67E-01	6.28E-03	25
<b>Total Primary Pollutants</b>		<b>5.73E+00</b>	<b>2.16E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	6.38E-05	2.40E-06	10
Formaldehyde	7.50E-08	2.28E-03	8.57E-05	10
Naphthalene	6.10E-10	1.85E-05	6.97E-07	10
Toluene	3.40E-09	1.03E-04	3.88E-06	10
2-Methyl Naphthalene	2.40E-11	7.29E-07	2.74E-08	10
3-Methylcholanthrene	1.80E-12	5.47E-08	2.06E-09	10
Acenaphthene	1.80E-12	5.47E-08	2.06E-09	10
Acenaphthylene	1.80E-12	5.47E-08	2.06E-09	10
Ammonia	4.90E-07	1.49E-02	5.60E-04	10
Anthracene	2.40E-12	7.29E-08	2.74E-09	10
Arsenic	2.00E-10	6.08E-06	2.28E-07	10
Barium	4.40E-09	1.34E-04	5.03E-06	10
Benzo (a) anthracene	1.80E-12	5.47E-08	2.06E-09	10
Benzo (a) pyrene	1.20E-12	3.65E-08	1.37E-09	10
Benzo (b) fluoranthene	1.80E-12	5.47E-08	2.06E-09	10
Benzo (g,h,i) perylene	1.20E-12	3.65E-08	1.37E-09	10
Benzo (k) fluoranthene	1.80E-12	5.47E-08	2.06E-09	10
Beryllium	1.20E-11	3.65E-07	1.37E-08	10
Cadmium	1.10E-09	3.34E-05	1.26E-06	10
Chromium	1.40E-09	4.25E-05	1.60E-06	10
Chrysene	1.80E-12	5.47E-08	2.06E-09	10
Cobalt	8.40E-11	2.55E-06	9.60E-08	10
Copper	8.50E-10	2.58E-05	9.71E-07	10
Dibenzo(a,h) anthracene	1.20E-12	3.65E-08	1.37E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	3.65E-05	1.37E-06	10
Dimethylbenz(a)anthracene	1.60E-11	4.86E-07	1.83E-08	10
Ethane	3.10E-06	9.42E-02	3.54E-03	10
Fluoranthene	3.00E-12	9.11E-08	3.43E-09	10
Fluorene	2.80E-12	8.51E-08	3.20E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	5.47E-08	2.06E-09	10
Lead	5.00E-10	1.52E-05	5.71E-07	10
Manganese	3.80E-10	1.15E-05	4.34E-07	10
Mercury	2.60E-10	7.90E-06	2.97E-07	10
Molybdenum	1.10E-09	3.34E-05	1.26E-06	10
n-Butane	2.10E-06	6.38E-02	2.40E-03	10
N-Hexane	1.80E-06	5.47E-02	2.06E-03	10
Nickel	2.10E-09	6.38E-05	2.40E-06	10
N-Pentane	2.60E-06	7.90E-02	2.97E-03	10
Phenanthrene	1.70E-11	5.16E-07	1.94E-08	10
PM, condensable	5.70E-06	1.73E-01	6.51E-03	10
PM, primary	7.60E-06	2.31E-01	8.68E-03	10
PM10, filterable	1.90E-06	5.77E-02	2.17E-03	10
PM10, primary	7.60E-06	2.31E-01	8.68E-03	10
PM2.5, filterable	1.90E-06	5.77E-02	2.17E-03	10
PM2.5, primary	7.60E-06	2.31E-01	8.68E-03	10
Propane	1.60E-06	4.86E-02	1.83E-03	10
Pyrene	5.00E-12	1.52E-07	5.71E-09	10
Selenium	2.40E-11	7.29E-07	2.74E-08	10
Vanadium	2.30E-09	6.99E-05	2.63E-06	10
Zinc	2.90E-08	8.81E-04	3.31E-05	10
<b>Total HAPs</b>		<b>1.34E+00</b>	<b>5.04E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	3.65E+03	1.37E+02
Methane	2.30E-06	6.99E-02	2.63E-03
<b>Total Greenhouse Gases</b>		<b>3.65E+03</b>	<b>1.37E+02</b>

Natural Gas Emissions Space Heater

SS

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	400,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	392.16	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	3,435,294.12	(scf /year)
Actual Fuel Usage	129,163.22	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	3.44E-02	1.29E-03	100
Nitrogen oxides (NOx)	1.00E-04	1.72E-01	6.46E-03	25
PM, filterable	3.00E-06	5.15E-03	1.94E-04	100
Sulfur dioxide	6.00E-07	1.03E-03	3.87E-05	100
VOCs	5.30E-06	9.10E-03	3.42E-04	25
<b>Primary Pollutants Total</b>		<b>2.12E-01</b>	<b>7.98E-03</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	9.79E-03	3.68E-04	100
PM10, filterable	3.00E-06	5.15E-03	1.94E-04	100
PM10, primary	8.70E-06	1.49E-02	5.62E-04	100
PM2.5, filterable	3.00E-06	5.15E-03	1.94E-04	100
PM2.5, primary	8.70E-06	1.49E-02	5.62E-04	100
<b>Total HAPs</b>		<b>2.62E-01</b>	<b>9.86E-03</b>	

## Oil Boiler Emissions

SS

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	588,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	4.20	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	36,792	(gal /year)
Actual Fuel Usage	499	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	9.20E-02	1.25E-03	100
NOx	2.40E-02	4.42E-01	5.99E-03	25
PM, Filterable	2.00E-03	3.68E-02	4.99E-04	100
SOx	7.35E-02	1.35E+00	1.83E-02	100
TOC	5.56E-04	1.02E-02	1.39E-04	25
<b>Total Primary Pollutants</b>		<b>1.93E+00</b>	<b>2.62E-02</b>	
<b>HAPs</b>				
Benzene	2.75E-06	5.06E-05	6.87E-07	10
Formaldehyde (2)	6.10E-05	1.12E-03	1.52E-05	10
Ammonia	8.00E-04	1.47E-02	2.00E-04	100
Arsenic (1)	4.00E-06	1.03E-05	2.80E-04	100
Beryllium (1)	3.00E-06	7.73E-06	2.10E-04	100
Cadmium (1)	3.00E-06	7.73E-06	2.10E-04	100
Chromium (1)	3.00E-06	7.73E-06	2.10E-04	100
Copper (1)	6.00E-06	1.55E-05	4.19E-04	100
Fluoranthene	3.15E-09	5.79E-08	7.86E-10	100
Lead (1)	9.00E-06	2.32E-05	6.29E-04	10
Manganese (1)	6.00E-06	1.55E-05	4.19E-04	100
Mercury (1)	3.00E-06	7.73E-06	2.10E-04	100
Nickel (1)	3.00E-06	7.73E-06	2.10E-04	100
PM, condensable	1.30E-03	2.39E-02	3.25E-04	100
PM10, filterable	1.08E-03	1.99E-02	2.70E-04	100
PM10, primary	1.08E-03	1.99E-02	2.70E-04	100
PM2.5, filterable	1.08E-03	1.99E-02	2.70E-04	100
PM2.5, primary	1.08E-03	1.99E-02	2.70E-04	100
Polycyclic organic matter (POM)	1.08E-03	1.99E-02	2.70E-04	100
Selenium (1)	1.50E-05	3.86E-05	1.05E-03	100
Total non-methane organic compounds (TNMOC)	3.40E-04	6.25E-03	8.49E-05	100
Zinc (1)	4.00E-06	1.03E-05	9.99E-07	100
<b>Total HAPs</b>		<b>1.46E-01</b>	<b>5.82E-03</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	3.97E-03	5.39E-05
<b>Total Greenhouse Gases</b>		<b>3.97E-03</b>	<b>5.39E-05</b>

Natural Gas Emissions Boiler                      TK  
Appendix B  
Armory Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	29,042,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	28,472.55	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	249,419,529.41	(scf / year)
Actual Fuel Usage	7,782,765.73	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.05E+01	3.27E-01	100
Nitrogen oxides (NOx)	1.02E-04	1.27E+01	3.98E-01	25
PM, filterable	1.90E-06	2.37E-01	7.39E-03	100
Sulfur dioxide	6.00E-07	7.48E-02	2.33E-03	100
Total organic compounds (TOC)	1.10E-05	1.37E+00	4.28E-02	25
Volatile organic compounds (VOC)	5.50E-06	6.86E-01	2.14E-02	25
<b>Total Primary Pollutants</b>		<b>2.35E+01</b>	<b>7.34E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.62E-04	8.17E-06	10
Formaldehyde	7.50E-08	9.35E-03	2.92E-04	11
Naphthalene	6.10E-10	7.61E-05	2.37E-06	10
Toluene	3.40E-09	4.24E-04	1.32E-05	10
2-Methyl Naphthalene	2.40E-11	2.99E-06	9.34E-08	10
3-Methylcholanthrene	1.80E-12	2.24E-07	7.00E-09	10
Acenaphthene	1.80E-12	2.24E-07	7.00E-09	10
Acenaphthylene	1.80E-12	2.24E-07	7.00E-09	10
Ammonia	4.90E-07	6.11E-02	1.91E-03	10
Anthracene	2.40E-12	2.99E-07	9.34E-09	10
Arsenic	2.00E-10	2.49E-05	7.78E-07	10
Barium	4.40E-09	5.49E-04	1.71E-05	10
Benzo (a) anthracene	1.80E-12	2.24E-07	7.00E-09	10
Benzo (a) pyrene	1.20E-12	1.50E-07	4.67E-09	10
Benzo (b) fluoranthene	1.80E-12	2.24E-07	7.00E-09	10
Benzo (g,h,i) perylene	1.20E-12	1.50E-07	4.67E-09	10
Benzo (k) fluoranthene	1.80E-12	2.24E-07	7.00E-09	10
Beryllium	1.20E-11	1.50E-06	4.67E-08	10
Cadmium	1.10E-09	1.37E-04	4.28E-06	10
Chromium	1.40E-09	1.75E-04	5.45E-06	10
Chrysene	1.80E-12	2.24E-07	7.00E-09	10
Cobalt	8.40E-11	1.05E-05	3.27E-07	10
Copper	8.50E-10	1.06E-04	3.31E-06	10
Dibenzo(a,h) anthracene	1.20E-12	1.50E-07	4.67E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	1.50E-04	4.67E-06	10
Dimethylbenz(a)anthracene	1.60E-11	2.00E-06	6.23E-08	10
Ethane	3.10E-06	3.87E-01	1.21E-02	10
Fluoranthene	3.00E-12	3.74E-07	1.17E-08	10
Fluorene	2.80E-12	3.49E-07	1.09E-08	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.24E-07	7.00E-09	10
Lead	5.00E-10	6.24E-05	1.95E-06	10
Manganese	3.80E-10	4.74E-05	1.48E-06	10
Mercury	2.60E-10	3.24E-05	1.01E-06	10
Molybdenum	1.10E-09	1.37E-04	4.28E-06	10
n-Butane	2.10E-06	2.62E-01	8.17E-03	10
N-Hexane	1.80E-06	2.24E-01	7.00E-03	10
Nickel	2.10E-09	2.62E-04	8.17E-06	10
N-Pentane	2.60E-06	3.24E-01	1.01E-02	10
Phenanthrene	1.70E-11	2.12E-06	6.62E-08	10
PM, condensable	5.70E-06	7.11E-01	2.22E-02	10
PM, primary	7.60E-06	9.48E-01	2.96E-02	10
PM10, filterable	1.90E-06	2.37E-01	7.39E-03	10
PM10, primary	7.60E-06	9.48E-01	2.96E-02	10
PM2.5, filterable	1.90E-06	2.37E-01	7.39E-03	10
PM2.5, primary	7.60E-06	9.48E-01	2.96E-02	10
Propane	1.60E-06	2.00E-01	6.23E-03	10
Pyrene	5.00E-12	6.24E-07	1.95E-08	10
Selenium	2.40E-11	2.99E-06	9.34E-08	10
Vanadium	2.30E-09	2.87E-04	8.95E-06	10
Zinc	2.90E-08	3.62E-03	1.13E-04	10
<b>Total HAPs</b>		<b>5.50E+00</b>	<b>1.72E-01</b>	

<b>Greenhouse Gases</b>			
Carbon dioxide	1.20E-01	1.50E+04	4.67E+02
Methane	2.30E-06	2.87E-01	8.95E-03
<b>Total Greenhouse Gases</b>		<b>1.50E+04</b>	<b>4.67E+02</b>

Natural Gas Emissions Space Heater

TK

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	2,200,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,156.86	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	18,894,117.65	(scf /year)
Actual Fuel Usage	564,024.27	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.89E-01	5.64E-03	100
Nitrogen oxides (NOx)	1.00E-04	9.45E-01	2.82E-02	25
PM, filterable	3.00E-06	2.83E-02	8.46E-04	100
Sulfur dioxide	6.00E-07	5.67E-03	1.69E-04	100
VOCs	5.30E-06	5.01E-02	1.49E-03	25
<b>Primary Pollutants Total</b>		<b>1.17E+00</b>	<b>3.49E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	5.38E-02	1.61E-03	100
PM10, filterable	3.00E-06	2.83E-02	8.46E-04	100
PM10, primary	8.70E-06	8.22E-02	2.45E-03	100
PM2.5, filterable	3.00E-06	2.83E-02	8.46E-04	100
PM2.5, primary	8.70E-06	8.22E-02	2.45E-03	100
<b>Total HAPs</b>		<b>1.44E+00</b>	<b>4.31E-02</b>	

Natural Gas Emissions Boiler

TR

Appendix B

Army Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	1,287,100	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	1,261.86	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	11,053,917.65	(scf / year)
Actual Fuel Usage	334,917.35	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	4.64E-01	1.41E-02	100
Nitrogen oxides (NOx)	1.02E-04	5.65E-01	1.71E-02	25
PM, filterable	1.90E-06	1.05E-02	3.18E-04	100
Sulfur dioxide	6.00E-07	3.32E-03	1.00E-04	100
Total organic compounds (TOC)	1.10E-05	6.08E-02	1.84E-03	25
Volatile organic compounds (VOC)	5.50E-06	3.04E-02	9.21E-04	25
<b>Total Primary Pollutants</b>		<b>1.04</b>	<b>0.03</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.16E-05	3.52E-07	10
Formaldehyde	7.50E-08	4.15E-04	1.26E-05	10
Naphthalene	6.10E-10	3.37E-06	1.02E-07	10
Toluene	3.40E-09	1.88E-05	5.69E-07	10
2-Methyl Naphthalene	2.40E-11	1.33E-07	4.02E-09	10
3-Methylcholanthrene	1.80E-12	9.95E-09	3.01E-10	10
Acenaphthene	1.80E-12	9.95E-09	3.01E-10	10
Acenaphthylene	1.80E-12	9.95E-09	3.01E-10	10
Ammonia	4.90E-07	2.71E-03	8.21E-05	10
Anthracene	2.40E-12	1.33E-08	4.02E-10	10
Arsenic	2.00E-10	1.11E-06	3.35E-08	10
Barium	4.40E-09	2.43E-05	7.37E-07	10
Benzo (a) anthracene	1.80E-12	9.95E-09	3.01E-10	10
Benzo (a) pyrene	1.20E-12	6.63E-09	2.01E-10	10
Benzo (b) fluoranthene	1.80E-12	9.95E-09	3.01E-10	10
Benzo (g,h,i) perylene	1.20E-12	6.63E-09	2.01E-10	10
Benzo (k) fluoranthene	1.80E-12	9.95E-09	3.01E-10	10
Beryllium	1.20E-11	6.63E-08	2.01E-09	10
Cadmium	1.10E-09	6.08E-06	1.84E-07	10
Chromium	1.40E-09	7.74E-06	2.34E-07	10
Chrysene	1.80E-12	9.95E-09	3.01E-10	10
Cobalt	8.40E-11	4.64E-07	1.41E-08	10
Copper	8.50E-10	4.70E-06	1.42E-07	10
Dibenzo(a,h) anthracene	1.20E-12	6.63E-09	2.01E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	6.63E-06	2.01E-07	10
Dimethylbenz(a)anthracene	1.60E-11	8.84E-08	2.68E-09	10
Ethane	3.10E-06	1.71E-02	5.19E-04	10
Fluoranthene	3.00E-12	1.66E-08	5.02E-10	10
Fluorene	2.80E-12	1.55E-08	4.69E-10	10
Indeno(1,2,3-cd)pyrene	1.80E-12	9.95E-09	3.01E-10	10
Lead	5.00E-10	2.76E-06	8.37E-08	10
Manganese	3.80E-10	2.10E-06	6.36E-08	10
Mercury	2.60E-10	1.44E-06	4.35E-08	10
Molybdenum	1.10E-09	6.08E-06	1.84E-07	10
n-Butane	2.10E-06	1.16E-02	3.52E-04	10
N-Hexane	1.80E-06	9.95E-03	3.01E-04	10
Nickel	2.10E-09	1.16E-05	3.52E-07	10
N-Pentane	2.60E-06	1.44E-02	4.35E-04	10
Phenanthrene	1.70E-11	9.40E-08	2.85E-09	10
PM, condensable	5.70E-06	3.15E-02	9.55E-04	10
PM, primary	7.60E-06	4.20E-02	1.27E-03	10
PM10, filterable	1.90E-06	1.05E-02	3.18E-04	10
PM10, primary	7.60E-06	4.20E-02	1.27E-03	10
PM2.5, filterable	1.90E-06	1.05E-02	3.18E-04	10
PM2.5, primary	7.60E-06	4.20E-02	1.27E-03	10
Propane	1.60E-06	8.84E-03	2.68E-04	10
Pyrene	5.00E-12	2.76E-08	8.37E-10	10
Selenium	2.40E-11	1.33E-07	4.02E-09	10
Vanadium	2.30E-09	1.27E-05	3.85E-07	10
Zinc	2.90E-08	1.60E-04	4.86E-06	10
<b>Total HAPs</b>		<b>2.44E-01</b>	<b>7.39E-03</b>	

<b>Greenhouse Gases</b>			
Carbon dioxide	1.20E-01	6.63E+02	2.01E+01
Methane	2.30E-06	1.27E-02	3.85E-04
<b>Total Greenhouse Gases</b>		<b>6.63E+02</b>	<b>2.01E+01</b>

Natural Gas Emissions Space Heater

TR

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	1,595,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	1,563.73	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	13,698,235.29	(scf /year)
Actual Fuel Usage	259,682.65	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	1.37E-01	2.60E-03	100
Nitrogen oxides (NOx)	1.00E-04	6.85E-01	1.30E-02	25
PM, filterable	3.00E-06	2.05E-02	3.90E-04	100
Sulfur dioxide	6.00E-07	4.11E-03	7.79E-05	100
VOCs	5.30E-06	3.63E-02	6.88E-04	25
<b>Primary Pollutants Total</b>		<b>8.47E-01</b>	<b>1.60E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	3.90E-02	7.40E-04	100
PM10, filterable	3.00E-06	2.05E-02	3.90E-04	100
PM10, primary	8.70E-06	5.96E-02	1.13E-03	100
PM2.5, filterable	3.00E-06	2.05E-02	3.90E-04	100
PM2.5, primary	8.70E-06	5.96E-02	1.13E-03	100
<b>Total HAPs</b>		<b>1.05E+00</b>	<b>1.98E-02</b>	

Natural Gas Emissions Boiler TU  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,655,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,602.94	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	22,801,764.71	(scf /year)
Actual Fuel Usage	257,000.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	9.58E-01	1.08E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.17E+00	1.31E-02	25
PM, filterable	1.90E-06	2.17E-02	2.44E-04	100
Sulfur dioxide	6.00E-07	6.84E-03	7.71E-05	100
Total organic compounds (TOC)	1.10E-05	1.25E-01	1.41E-03	25
Volatile organic compounds (VOC)	5.50E-06	6.27E-02	7.07E-04	25
<b>Total Primary Pollutants</b>		<b>2.15E+00</b>	<b>2.42E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.39E-05	2.70E-07	10
Formaldehyde	7.50E-08	8.55E-04	9.64E-06	10
Naphthalene	6.10E-10	6.95E-06	7.84E-08	10
Toluene	3.40E-09	3.88E-05	4.37E-07	10
2-Methyl Naphthalene	2.40E-11	2.74E-07	3.08E-09	10
3-Methylcholanthrene	1.80E-12	2.05E-08	2.31E-10	10
Acenaphthene	1.80E-12	2.05E-08	2.31E-10	10
Acenaphthylene	1.80E-12	2.05E-08	2.31E-10	10
Ammonia	4.90E-07	5.59E-03	6.30E-05	10
Anthracene	2.40E-12	2.74E-08	3.08E-10	10
Arsenic	2.00E-10	2.28E-06	2.57E-08	10
Barium	4.40E-09	5.02E-05	5.65E-07	10
Benzo (a) anthracene	1.80E-12	2.05E-08	2.31E-10	10
Benzo (a) pyrene	1.20E-12	1.37E-08	1.54E-10	10
Benzo (b) fluoranthene	1.80E-12	2.05E-08	2.31E-10	10
Benzo (g,h,i) perylene	1.20E-12	1.37E-08	1.54E-10	10
Benzo (k) fluoranthene	1.80E-12	2.05E-08	2.31E-10	10
Beryllium	1.20E-11	1.37E-07	1.54E-09	10
Cadmium	1.10E-09	1.25E-05	1.41E-07	10
Chromium	1.40E-09	1.60E-05	1.80E-07	10
Chrysene	1.80E-12	2.05E-08	2.31E-10	10
Cobalt	8.40E-11	9.58E-07	1.08E-08	10
Copper	8.50E-10	9.69E-06	1.09E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.37E-08	1.54E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	1.37E-05	1.54E-07	10
Dimethylbenz(a)anthracene	1.60E-11	1.82E-07	2.06E-09	10
Ethane	3.10E-06	3.53E-02	3.98E-04	10
Fluoranthene	3.00E-12	3.42E-08	3.86E-10	10
Fluorene	2.80E-12	3.19E-08	3.60E-10	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.05E-08	2.31E-10	10
Lead	5.00E-10	5.70E-06	6.43E-08	10
Manganese	3.80E-10	4.33E-06	4.88E-08	10
Mercury	2.60E-10	2.96E-06	3.34E-08	10
Molybdenum	1.10E-09	1.25E-05	1.41E-07	10
n-Butane	2.10E-06	2.39E-02	2.70E-04	10
N-Hexane	1.80E-06	2.05E-02	2.31E-04	10
Nickel	2.10E-09	2.39E-05	2.70E-07	10
N-Pentane	2.60E-06	2.96E-02	3.34E-04	10
Phenanthrene	1.70E-11	1.94E-07	2.18E-09	10
PM, condensable	5.70E-06	6.50E-02	7.32E-04	10
PM, primary	7.60E-06	8.66E-02	9.77E-04	10
PM10, filterable	1.90E-06	2.17E-02	2.44E-04	10
PM10, primary	7.60E-06	8.66E-02	9.77E-04	10
PM2.5, filterable	1.90E-06	2.17E-02	2.44E-04	10
PM2.5, primary	7.60E-06	8.66E-02	9.77E-04	10
Propane	1.60E-06	1.82E-02	2.06E-04	10
Pyrene	5.00E-12	5.70E-08	6.43E-10	10
Selenium	2.40E-11	2.74E-07	3.08E-09	10
Vanadium	2.30E-09	2.62E-05	2.96E-07	10
Zinc	2.90E-08	3.31E-04	3.73E-06	10
<b>Total HAPs</b>		<b>5.03E-01</b>	<b>5.67E-03</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.37E+03	1.54E+01
Methane	2.30E-06	2.62E-02	2.96E-04
<b>Total Greenhouse Gases</b>		<b>1.37E+03</b>	<b>1.54E+01</b>



Natural Gas Emissions Boiler

VD

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	4,644,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	4,552.94	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	39,883,764.71	(scf /year)
Actual Fuel Usage	1,427,284.23	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.68E+00	5.99E-02	100
Nitrogen oxides (NOx)	1.02E-04	2.04E+00	7.29E-02	25
PM, filterable	1.90E-06	3.79E-02	1.36E-03	100
Sulfur dioxide	6.00E-07	1.20E-02	4.28E-04	100
Total organic compounds (TOC)	1.10E-05	2.19E-01	7.85E-03	25
Volatile organic compounds (VOC)	5.50E-06	1.10E-01	3.93E-03	25
<b>Total Primary Pollutants</b>		<b>3.76E+00</b>	<b>1.35E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	4.19E-05	1.50E-06	10
Formaldehyde	7.50E-08	1.50E-03	5.35E-05	10
Naphthalene	6.10E-10	1.22E-05	4.35E-07	10
Toluene	3.40E-09	6.78E-05	2.43E-06	10
2-Methyl Naphthalene	2.40E-11	4.79E-07	1.71E-08	10
3-Methylcholanthrene	1.80E-12	3.59E-08	1.28E-09	10
Acenaphthene	1.80E-12	3.59E-08	1.28E-09	10
Acenaphthylene	1.80E-12	3.59E-08	1.28E-09	10
Ammonia	4.90E-07	9.77E-03	3.50E-04	10
Anthracene	2.40E-12	4.79E-08	1.71E-09	10
Arsenic	2.00E-10	3.99E-06	1.43E-07	10
Barium	4.40E-09	8.77E-05	3.14E-06	10
Benzo (a) anthracene	1.80E-12	3.59E-08	1.28E-09	10
Benzo (a) pyrene	1.20E-12	2.39E-08	8.56E-10	10
Benzo (b) fluoranthene	1.80E-12	3.59E-08	1.28E-09	10
Benzo (g,h,i) perylene	1.20E-12	2.39E-08	8.56E-10	10
Benzo (k) fluoranthene	1.80E-12	3.59E-08	1.28E-09	10
Beryllium	1.20E-11	2.39E-07	8.56E-09	10
Cadmium	1.10E-09	2.19E-05	7.85E-07	10
Chromium	1.40E-09	2.79E-05	9.99E-07	10
Chrysene	1.80E-12	3.59E-08	1.28E-09	10
Cobalt	8.40E-11	1.68E-06	5.99E-08	10
Copper	8.50E-10	1.70E-05	6.07E-07	10
Dibenzo(a,h) anthracene	1.20E-12	2.39E-08	8.56E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	2.39E-05	8.56E-07	10
Dimethylbenz(a)anthracene	1.60E-11	3.19E-07	1.14E-08	10
Ethane	3.10E-06	6.18E-02	2.21E-03	10
Fluoranthene	3.00E-12	5.98E-08	2.14E-09	10
Fluorene	2.80E-12	5.58E-08	2.00E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	3.59E-08	1.28E-09	10
Lead	5.00E-10	9.97E-06	3.57E-07	10
Manganese	3.80E-10	7.58E-06	2.71E-07	10
Mercury	2.60E-10	5.18E-06	1.86E-07	10
Molybdenum	1.10E-09	2.19E-05	7.85E-07	10
n-Butane	2.10E-06	4.19E-02	1.50E-03	10
N-Hexane	1.80E-06	3.59E-02	1.28E-03	10
Nickel	2.10E-09	4.19E-05	1.50E-06	10
N-Pentane	2.60E-06	5.18E-02	1.86E-03	10
Phenanthrene	1.70E-11	3.39E-07	1.21E-08	10
PM, condensable	5.70E-06	1.14E-01	4.07E-03	10
PM, primary	7.60E-06	1.52E-01	5.42E-03	10
PM10, filterable	1.90E-06	3.79E-02	1.36E-03	10
PM10, primary	7.60E-06	1.52E-01	5.42E-03	10
PM2.5, filterable	1.90E-06	3.79E-02	1.36E-03	10
PM2.5, primary	7.60E-06	1.52E-01	5.42E-03	10
Propane	1.60E-06	3.19E-02	1.14E-03	10
Pyrene	5.00E-12	9.97E-08	3.57E-09	10
Selenium	2.40E-11	4.79E-07	1.71E-08	10
Vanadium	2.30E-09	4.59E-05	1.64E-06	10
Zinc	2.90E-08	5.78E-04	2.07E-05	10
<b>Total HAPs</b>		<b>8.80E-01</b>	<b>3.15E-02</b>	

<b>Greenhouse Gases</b>			
Carbon dioxide	1.20E-01	2.39E+03	8.56E+01
Methane	2.30E-06	4.59E-02	1.64E-03
<b>Total Greenhouse Gases</b>		<b>2.39E+03</b>	<b>8.56E+01</b>

## Oil Emissions Boiler

VD

## Appendix B

## Armory Emission Calculations

## Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	1,153,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	8.24	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	72,145	(gal /year)
Actual Fuel Usage	4,169	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	1.80E-01	1.04E-02	100
NOx	2.40E-02	8.66E-01	5.00E-02	25
PM, Filterable	2.00E-03	7.21E-02	4.17E-03	100
SOx	7.35E-02	2.65E+00	1.53E-01	100
TOC	5.56E-04	2.01E-02	1.16E-03	25
<b>Total Primary Pollutants</b>		<b>3.79E+00</b>	<b>2.19E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	9.92E-05	5.73E-06	10
Formaldehyde (2)	6.10E-05	2.20E-03	1.27E-04	10
Ammonia	8.00E-04	2.89E-02	1.67E-03	100
Arsenic (1)	4.00E-06	2.02E-05	2.33E-03	100
Beryllium (1)	3.00E-06	1.52E-05	1.75E-03	100
Cadmium (1)	3.00E-06	1.52E-05	1.75E-03	100
Chromium (1)	3.00E-06	1.52E-05	1.75E-03	100
Copper (1)	6.00E-06	3.03E-05	3.50E-03	100
Fluoranthene	3.15E-09	1.14E-07	6.57E-09	100
Lead (1)	9.00E-06	4.55E-05	5.25E-03	10
Manganese (1)	6.00E-06	3.03E-05	3.50E-03	100
Mercury (1)	3.00E-06	1.52E-05	1.75E-03	100
Nickel (1)	3.00E-06	1.52E-05	1.75E-03	100
PM, condensable	1.30E-03	4.69E-02	2.71E-03	100
PM10, filterable	1.08E-03	3.90E-02	2.25E-03	100
PM10, primary	1.08E-03	3.90E-02	2.25E-03	100
PM2.5, filterable	1.08E-03	3.90E-02	2.25E-03	100
PM2.5, primary	1.08E-03	3.90E-02	2.25E-03	100
Polycyclic organic matter (POM)	1.08E-03	3.90E-02	2.25E-03	100
Selenium (1)	1.50E-05	7.58E-05	8.75E-03	100
Total non-methane organic compounds (TNMOC)	3.40E-04	1.23E-02	7.09E-04	100
Zinc (1)	4.00E-06	2.02E-05	8.34E-06	100
<b>Total HAPs</b>		<b>2.85E-01</b>	<b>4.86E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	7.79E-03	4.50E-04
<b>Total Greenhouse Gases</b>		<b>7.79E-03</b>	<b>4.50E-04</b>

Oil Emissions Boiler

WT

Appendix B

Armory Emission Calculations

Boilers and Heaters <10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	2,619,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	18.71	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	163,875	(gal /year)
Actual Fuel Usage	13,065	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	4.10E-01	3.27E-02	100
NOx	2.40E-02	1.97E+00	1.57E-01	25
PM, Filterable	2.00E-03	1.64E-01	1.31E-02	100
SOx	7.35E-02	6.02E+00	4.80E-01	100
TOC	5.56E-04	4.56E-02	3.63E-03	25
<b>Total Primary Pollutants</b>		<b>8.61E+00</b>	<b>6.86E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	2.25E-04	1.80E-05	10
Formaldehyde (2)	6.10E-05	5.00E-03	3.98E-04	10
Ammonia	8.00E-04	6.55E-02	5.23E-03	100
Arsenic (1)	4.00E-06	4.59E-05	7.32E-03	100
Beryllium (1)	3.00E-06	3.44E-05	5.49E-03	100
Cadmium (1)	3.00E-06	3.44E-05	5.49E-03	100
Chromium (1)	3.00E-06	3.44E-05	5.49E-03	100
Copper (1)	6.00E-06	6.88E-05	1.10E-02	100
Fluoranthene	3.15E-09	2.58E-07	2.06E-08	100
Lead (1)	9.00E-06	1.03E-04	1.65E-02	10
Manganese (1)	6.00E-06	6.88E-05	1.10E-02	100
Mercury (1)	3.00E-06	3.44E-05	5.49E-03	100
Nickel (1)	3.00E-06	3.44E-05	5.49E-03	100
PM, condensable	1.30E-03	1.07E-01	8.49E-03	100
PM10, filterable	1.08E-03	8.85E-02	7.06E-03	100
PM10, primary	1.08E-03	8.85E-02	7.06E-03	100
PM2.5, filterable	1.08E-03	8.85E-02	7.06E-03	100
PM2.5, primary	1.08E-03	8.85E-02	7.06E-03	100
Polycyclic organic matter (POM)	1.08E-03	8.85E-02	7.06E-03	100
Selenium (1)	1.50E-05	1.72E-04	2.74E-02	100
Total non-methane organic compounds (TNMOC)	3.40E-04	2.79E-02	2.22E-03	100
Zinc (1)	4.00E-06	4.59E-05	2.61E-05	100
<b>Total HAPs</b>		<b>6.48E-01</b>	<b>1.52E-01</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	1.77E-02	1.41E-03
<b>Total Greenhouse Gases</b>		<b>1.77E-02</b>	<b>1.41E-03</b>

Diesel Generator 1 Calculations      WO  
Appendix B  
Army Emissions Calculations  
Diesel Generators (SCC# 20300101)

Convert KW to BTU/hr

Unit Size in Kilowatts	76	(Kw)
Conversion factor for KW to BTU/min	56.92	
Heat Input Capacity (1)	876,992	(btu/hr)
Heat Content of Fuel	137,030	(btu/gal)
Horsepower	102	(hp)
Maximum Fuel Firing Rate	6.4	(gal / hr)
Potential Hours of Operation	8,760	(hr / year)
Max Annual Fuel	56,064	(gal /year)
Actual Fuel Usage	170	(gal /year)
Actual Hour Usage	27	(hrs/yr since installed)

Pollutant	Emission Factor (4) (lb/hp-hr)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
Carbon monoxide	1.30E-01	3.64E+00	1.10E-02	100
Nitrogen oxides (NOx)	6.04E-01	1.69E+01	5.12E-02	25
PM, filterable	4.25E-02	1.19E+00	3.60E-03	100
Sulfur oxides (SOx)	3.97E-02	1.11E+00	3.37E-03	100
Total organic compounds (TOC)	4.93E-02	1.38E+00	4.18E-03	25
<b>Total Primary Pollutants</b>		<b>2.43E+01</b>	<b>7.34E-02</b>	
<b>HAPs</b>				
Benzene	9.33E-10	3.58E-03	1.08E-05	10
Formaldehyde	1.18E-09	4.53E-03	1.37E-05	10
Naphthalene	8.48E-11	3.26E-04	9.86E-07	10
Toluene	4.09E-10	1.57E-03	4.75E-06	10
Acenaphthene	1.42E-12	5.45E-06	1.65E-08	10
Acenaphthylene	5.06E-12	1.94E-05	5.88E-08	10
Acetaldehyde	7.67E-10	2.95E-03	8.91E-06	10
Acrolein	9.25E-11	3.55E-04	1.08E-06	10
Aldehydes	7.00E-08	2.69E-01	8.14E-04	10
Anthracene	1.87E-12	7.18E-06	2.17E-08	10
Benzo (a) anthracene	1.68E-12	6.45E-06	1.95E-08	10
Benzo (a) pyrene	1.88E-13	7.22E-07	2.18E-09	10
Benzo (b) fluoranthene	9.91E-14	3.81E-07	1.15E-09	10
Benzo (g,h,i) perylene	4.89E-13	1.88E-06	5.68E-09	10
Benzo (k) fluoranthene	1.55E-13	5.95E-07	1.80E-09	10
1,3-Butadiene	3.91E-11	1.50E-04	4.54E-07	10
Chrysene	3.53E-13	1.36E-06	4.10E-09	10
Dibenzo(a,h) anthracene	5.83E-13	2.24E-06	6.78E-09	10
Fluoranthene	7.61E-12	2.92E-05	8.84E-08	10
Fluorene	2.92E-11	1.12E-04	3.39E-07	10
Indeno(1,2,3-cd)pyrene	3.75E-13	1.44E-06	4.36E-09	10
Isomers of xylene	2.85E-10	1.09E-03	3.31E-06	10
Phenanthrene	2.94E-11	1.13E-04	3.42E-07	10
PM10, filterable	4.25E-02	1.19E+00	3.60E-03	100
PM2.5, filterable	4.25E-02	1.19E+00	3.60E-03	10
Polycyclic aromatic hydrocarbons (PAH)	1.68E-10	6.45E-04	1.95E-06	10
Propylene	2.58E-09	9.91E-03	3.00E-05	10
Pyrene	4.78E-12	1.84E-05	5.56E-08	10
<b>Total HAPs</b>		<b>2.68E+00</b>	<b>8.10E-03</b>	

Greenhouse Gases			
Carbon dioxide	2.26E+01	6.34E+02	1.92E+00
<b>Total Greenhouse Gases</b>		<b>6.34E+02</b>	<b>1.92E+00</b>

Notes:

- Unit Size is the total of all heat input capacity of all sources and includes all sources that burn diesel.
- HAP - Hazardous Air Pollutant, AP-42
- Total HAPs cannot exceed 10 tpy (NJAC 7:27-8.1, "Major Facility" definition).
- In order to simplify calculations, unless otherwise noted emission factors are taken from SCC 2-02-001-02 and 2-03-001-01 (ICE Diesel, Commercial/Industrial). Other emission factors are used, as noted, when emission factors don't exist for the referenced SCC or the other emission factor isn't as conservative as the referenced factor.
- VOC pollution was calculated using the TOC factor.
- Emission factor is in lbs/MMBtu/hr heat input. The actual emission cannot be calculated based on this unit. However, as the PTE is more than the actual emissions, this is not a concern.

Natural Gas Emissions Boiler

WO

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	12,097,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	11,859.80	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	103,891,882.35	(scf / year)
Actual Fuel Usage	7,087,001.70	(scf / year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	4.36E+00	2.98E-01	100
Nitrogen oxides (NOx)	1.02E-04	5.31E+00	3.62E-01	25
PM, filterable	1.90E-06	9.87E-02	6.73E-03	100
Sulfur dioxide	6.00E-07	3.12E-02	2.13E-03	100
Total organic compounds (TOC)	1.10E-05	5.71E-01	3.90E-02	25
Volatile organic compounds (VOC)	5.50E-06	2.86E-01	1.95E-02	25
<b>Total Primary Pollutants</b>		<b>9.80E+00</b>	<b>6.69E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	1.09E-04	7.44E-06	10
Formaldehyde	7.50E-08	3.90E-03	2.66E-04	10
Naphthalene	6.10E-10	3.17E-05	2.16E-06	10
Toluene	3.40E-09	1.77E-04	1.20E-05	10
2-Methyl Naphthalene	2.40E-11	1.25E-06	8.50E-08	10
3-Methylcholanthrene	1.80E-12	9.35E-08	6.38E-09	10
Acenaphthene	1.80E-12	9.35E-08	6.38E-09	10
Acenaphthylene	1.80E-12	9.35E-08	6.38E-09	10
Ammonia	4.90E-07	2.55E-02	1.74E-03	10
Anthracene	2.40E-12	1.25E-07	8.50E-09	10
Arsenic	2.00E-10	1.04E-05	7.09E-07	10
Barium	4.40E-09	2.29E-04	1.56E-05	10
Benzo (a) anthracene	1.80E-12	9.35E-08	6.38E-09	10
Benzo (a) pyrene	1.20E-12	6.23E-08	4.25E-09	10
Benzo (b) fluoranthene	1.80E-12	9.35E-08	6.38E-09	10
Benzo (g,h,i) perylene	1.20E-12	6.23E-08	4.25E-09	10
Benzo (k) fluoranthene	1.80E-12	9.35E-08	6.38E-09	10
Beryllium	1.20E-11	6.23E-07	4.25E-08	10
Cadmium	1.10E-09	5.71E-05	3.90E-06	10
Chromium	1.40E-09	7.27E-05	4.96E-06	10
Chrysene	1.80E-12	9.35E-08	6.38E-09	10
Cobalt	8.40E-11	4.36E-06	2.98E-07	10
Copper	8.50E-10	4.42E-05	3.01E-06	10
Dibenzo(a,h) anthracene	1.20E-12	6.23E-08	4.25E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	6.23E-05	4.25E-06	10
Dimethylbenz(a)anthracene	1.60E-11	8.31E-07	5.67E-08	10
Ethane	3.10E-06	1.61E-01	1.10E-02	10
Fluoranthene	3.00E-12	1.56E-07	1.06E-08	10
Fluorene	2.80E-12	1.45E-07	9.92E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	9.35E-08	6.38E-09	10
Lead	5.00E-10	2.60E-05	1.77E-06	10
Manganese	3.80E-10	1.97E-05	1.35E-06	10
Mercury	2.60E-10	1.35E-05	9.21E-07	10
Molybdenum	1.10E-09	5.71E-05	3.90E-06	10
n-Butane	2.10E-06	1.09E-01	7.44E-03	10
N-Hexane	1.80E-06	9.35E-02	6.38E-03	10
Nickel	2.10E-09	1.09E-04	7.44E-06	10
N-Pentane	2.60E-06	1.35E-01	9.21E-03	10
Phenanthrene	1.70E-11	8.83E-07	6.02E-08	10
PM, condensable	5.70E-06	2.96E-01	2.02E-02	10
PM, primary	7.60E-06	3.95E-01	2.69E-02	10
PM10, filterable	1.90E-06	9.87E-02	6.73E-03	10
PM10, primary	7.60E-06	3.95E-01	2.69E-02	10
PM2.5, filterable	1.90E-06	9.87E-02	6.73E-03	10
PM2.5, primary	7.60E-06	3.95E-01	2.69E-02	10
Propane	1.60E-06	8.31E-02	5.67E-03	10
Pyrene	5.00E-12	2.60E-07	1.77E-08	10
Selenium	2.40E-11	1.25E-06	8.50E-08	10
Vanadium	2.30E-09	1.19E-04	8.15E-06	10
Zinc	2.90E-08	1.51E-03	1.03E-04	10
<b>Total HAPs</b>		<b>2.29E+00</b>	<b>1.56E-01</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	6.23E+03	4.25E+02
Methane	2.30E-06	1.19E-01	8.15E-03
<b>Total Greenhouse Gases</b>		<b>6.23E+03</b>	<b>4.25E+02</b>

Natural Gas Emission Space Heater

WO

Appendix B

Armory Emissions Calculations

Space Heaters Heating Natural Gas (SCC 10500206)

Unit Size	800,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	784.31	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	6,870,588.24	(scf /year)
Actual Fuel Usage	468,678.30	(scf /year)

Pollutant	Emission Factor (4) (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	2.00E-05	6.87E-02	4.69E-03	100
Nitrogen oxides (NOx)	1.00E-04	3.44E-01	2.34E-02	25
PM, filterable	3.00E-06	1.03E-02	7.03E-04	100
Sulfur dioxide	6.00E-07	2.06E-03	1.41E-04	100
VOCs	5.30E-06	1.82E-02	1.24E-03	25
<b>Primary Pollutants Total</b>		<b>4.25E-01</b>	<b>2.90E-02</b>	
<b>HAPs</b>				
PM, condensable	5.70E-06	1.96E-02	1.34E-03	100
PM10, filterable	3.00E-06	1.03E-02	7.03E-04	100
PM10, primary	8.70E-06	2.99E-02	2.04E-03	100
PM2.5, filterable	3.00E-06	1.03E-02	7.03E-04	100
PM2.5, primary	8.70E-06	2.99E-02	2.04E-03	100
<b>Total HAPs</b>		<b>5.25E-01</b>	<b>3.58E-02</b>	

Natural Gas Emissions Boiler

WD

Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,909,999	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,852.94	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	24,991,756.12	(scf /year)
Actual Fuel Usage	1,775,500.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.05E+00	7.46E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.28E+00	9.07E-02	25
PM, filterable	1.90E-06	2.37E-02	1.69E-03	100
Sulfur dioxide	6.00E-07	7.50E-03	5.33E-04	100
Total organic compounds (TOC)	1.10E-05	1.37E-01	9.77E-03	25
Volatile organic compounds (VOC)	5.50E-06	6.87E-02	4.88E-03	25
<b>Total Primary Pollutants</b>		<b>2.36E+00</b>	<b>1.68E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.62E-05	1.86E-06	10
Formaldehyde	7.50E-08	9.37E-04	6.66E-05	10
Naphthalene	6.10E-10	7.62E-06	5.42E-07	10
Toluene	3.40E-09	4.25E-05	3.02E-06	10
2-Methyl Naphthalene	2.40E-11	3.00E-07	2.13E-08	10
3-Methylcholanthrene	1.80E-12	2.25E-08	1.60E-09	10
Acenaphthene	1.80E-12	2.25E-08	1.60E-09	10
Acenaphthylene	1.80E-12	2.25E-08	1.60E-09	10
Ammonia	4.90E-07	6.12E-03	4.35E-04	10
Anthracene	2.40E-12	3.00E-08	2.13E-09	10
Arsenic	2.00E-10	2.50E-06	1.78E-07	10
Barium	4.40E-09	5.50E-05	3.91E-06	10
Benzo (a) anthracene	1.80E-12	2.25E-08	1.60E-09	10
Benzo (a) pyrene	1.20E-12	1.50E-08	1.07E-09	10
Benzo (b) fluoranthene	1.80E-12	2.25E-08	1.60E-09	10
Benzo (g,h,i) perylene	1.20E-12	1.50E-08	1.07E-09	10
Benzo (k) fluoranthene	1.80E-12	2.25E-08	1.60E-09	10
Beryllium	1.20E-11	1.50E-07	1.07E-08	10
Cadmium	1.10E-09	1.37E-05	9.77E-07	10
Chromium	1.40E-09	1.75E-05	1.24E-06	10
Chrysene	1.80E-12	2.25E-08	1.60E-09	10
Cobalt	8.40E-11	1.05E-06	7.46E-08	10
Copper	8.50E-10	1.06E-05	7.55E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.50E-08	1.07E-09	10
Dichlorobenzene, mixed isomers	1.20E-09	1.50E-05	1.07E-06	10
Dimethylbenz(a)anthracene	1.60E-11	2.00E-07	1.42E-08	10
Ethane	3.10E-06	3.87E-02	2.75E-03	10
Fluoranthene	3.00E-12	3.75E-08	2.66E-09	10
Fluorene	2.80E-12	3.50E-08	2.49E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.25E-08	1.60E-09	10
Lead	5.00E-10	6.25E-06	4.44E-07	10
Manganese	3.80E-10	4.75E-06	3.37E-07	10
Mercury	2.60E-10	3.25E-06	2.31E-07	10
Molybdenum	1.10E-09	1.37E-05	9.77E-07	10
n-Butane	2.10E-06	2.62E-02	1.86E-03	10
N-Hexane	1.80E-06	2.25E-02	1.60E-03	10
Nickel	2.10E-09	2.62E-05	1.86E-06	10
N-Pentane	2.60E-06	3.25E-02	2.31E-03	10
Phenanthrene	1.70E-11	2.12E-07	1.51E-08	10
PM, condensable	5.70E-06	7.12E-02	5.06E-03	10
PM, primary	7.60E-06	9.50E-02	6.75E-03	10
PM10, filterable	1.90E-06	2.37E-02	1.69E-03	10
PM10, primary	7.60E-06	9.50E-02	6.75E-03	10
PM2.5, filterable	1.90E-06	2.37E-02	1.69E-03	10
PM2.5, primary	7.60E-06	9.50E-02	6.75E-03	10
Propane	1.60E-06	2.00E-02	1.42E-03	10
Pyrene	5.00E-12	6.25E-08	4.44E-09	10
Selenium	2.40E-11	3.00E-07	2.13E-08	10
Vanadium	2.30E-09	2.87E-05	2.04E-06	10
Zinc	2.90E-08	3.62E-04	2.57E-05	10
<b>Total HAPs</b>		<b>5.51E-01</b>	<b>3.92E-02</b>	

Greenhouse Gases			
Carbon dioxide	1.20E-01	1.50E+03	1.07E+02
Methane	2.30E-06	2.87E-02	2.04E-03
<b>Total Greenhouse Gases</b>		<b>1.50E+03</b>	<b>1.07E+02</b>

Oil Emissions Boiler

WD

Appendix B

Armory Emission Calculations

Boilers and Heaters <10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	1,999,999	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	14.29	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	125,143	(gal /year)
Actual Fuel Usage	2,877	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Summary			
	Emission Factor (lb/gal)	PTE (Tons/Year)	Actual (Tons/Year)	NJ State Limits (Tons/Year)
<b>Primary Pollutants</b>				
CO	5.00E-03	3.13E-01	7.19E-03	100
NOx	2.40E-02	1.50E+00	3.45E-02	25
PM, Filterable	2.00E-03	1.25E-01	2.88E-03	100
SOx	7.35E-02	4.60E+00	1.06E-01	100
TOC	5.56E-04	3.48E-02	8.00E-04	25
<b>Total Primary Pollutants</b>		<b>6.57E+00</b>	<b>1.51E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	1.72E-04	3.96E-06	10
Formaldehyde (2)	6.10E-05	3.82E-03	8.77E-05	10
Ammonia	8.00E-04	5.01E-02	1.15E-03	100
Arsenic (1)	4.00E-06	3.50E-05	1.61E-03	100
Beryllium (1)	3.00E-06	2.63E-05	1.21E-03	100
Cadmium (1)	3.00E-06	2.63E-05	1.21E-03	100
Chromium (1)	3.00E-06	2.63E-05	1.21E-03	100
Copper (1)	6.00E-06	5.26E-05	2.42E-03	100
Fluoranthene	3.15E-09	1.97E-07	4.53E-09	100
Lead (1)	9.00E-06	7.88E-05	3.63E-03	10
Manganese (1)	6.00E-06	5.26E-05	2.42E-03	100
Mercury (1)	3.00E-06	2.63E-05	1.21E-03	100
Nickel (1)	3.00E-06	2.63E-05	1.21E-03	100
PM, condensable	1.30E-03	8.13E-02	1.87E-03	100
PM10, filterable	1.08E-03	6.76E-02	1.55E-03	100
PM10, primary	1.08E-03	6.76E-02	1.55E-03	100
PM2.5, filterable	1.08E-03	6.76E-02	1.55E-03	100
PM2.5, primary	1.08E-03	6.76E-02	1.55E-03	100
Polycyclic organic matter (POM)	1.08E-03	6.76E-02	1.55E-03	100
Selenium (1)	1.50E-05	1.31E-04	6.04E-03	100
Total non-methane organic compounds (TNMOC)	3.40E-04	2.13E-02	4.89E-04	100
Zinc (1)	4.00E-06	3.50E-05	5.75E-06	100
<b>Total HAPs</b>		<b>4.95E-01</b>	<b>3.35E-02</b>	

Greenhouse Gases			
Methane	2.16E-04	1.35E-02	3.11E-04
<b>Total Greenhouse Gases</b>		<b>1.35E-02</b>	<b>3.11E-04</b>



Natural Gas Emissios Boiler

WE  
Appendix B

Armory Emissions Calculations

Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	3,934,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	3,856.86	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	33,786,117.65	(scf /year)
Actual Fuel Usage	1,122,500.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.42E+00	4.71E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.73E+00	5.74E-02	25
PM, filterable	1.90E-06	3.21E-02	1.07E-03	100
Sulfur dioxide	6.00E-07	1.01E-02	3.37E-04	100
Total organic compounds (TOC)	1.10E-05	1.86E-01	6.17E-03	25
Volatile organic compounds (VOC)	5.50E-06	9.29E-02	3.09E-03	25
<b>Total Primary Pollutants</b>		<b>3.19E+00</b>	<b>1.06E-01</b>	
<b>HAPs</b>				
Benzene	2.10E-09	3.55E-05	1.18E-06	10
Formaldehyde	7.50E-08	1.27E-03	4.21E-05	10
Naphthalene	6.10E-10	1.03E-05	3.42E-07	10
Toluene	3.40E-09	5.74E-05	1.91E-06	10
2-Methyl Naphthalene	2.40E-11	4.05E-07	1.35E-08	10
3-Methylcholanthrene	1.80E-12	3.04E-08	1.01E-09	10
Acenaphthene	1.80E-12	3.04E-08	1.01E-09	10
Acenaphthylene	1.80E-12	3.04E-08	1.01E-09	10
Ammonia	4.90E-07	8.28E-03	2.75E-04	10
Anthracene	2.40E-12	4.05E-08	1.35E-09	10
Arsenic	2.00E-10	3.38E-06	1.12E-07	10
Barium	4.40E-09	7.43E-05	2.47E-06	10
Benzo (a) anthracene	1.80E-12	3.04E-08	1.01E-09	10
Benzo (a) pyrene	1.20E-12	2.03E-08	6.74E-10	10
Benzo (b) fluoranthene	1.80E-12	3.04E-08	1.01E-09	10
Benzo (g,h,i) perylene	1.20E-12	2.03E-08	6.74E-10	10
Benzo (k) fluoranthene	1.80E-12	3.04E-08	1.01E-09	10
Beryllium	1.20E-11	2.03E-07	6.74E-09	10
Cadmium	1.10E-09	1.86E-05	6.17E-07	10
Chromium	1.40E-09	2.37E-05	7.86E-07	10
Chrysene	1.80E-12	3.04E-08	1.01E-09	10
Cobalt	8.40E-11	1.42E-06	4.71E-08	10
Copper	8.50E-10	1.44E-05	4.77E-07	10
Dibenzo(a,h) anthracene	1.20E-12	2.03E-08	6.74E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	2.03E-05	6.74E-07	10
Dimethylbenz(a)anthracene	1.60E-11	2.70E-07	8.98E-09	10
Ethane	3.10E-06	5.24E-02	1.74E-03	10
Fluoranthene	3.00E-12	5.07E-08	1.68E-09	10
Fluorene	2.80E-12	4.73E-08	1.57E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	3.04E-08	1.01E-09	10
Lead	5.00E-10	8.45E-06	2.81E-07	10
Manganese	3.80E-10	6.42E-06	2.13E-07	10
Mercury	2.60E-10	4.39E-06	1.46E-07	10
Molybdenum	1.10E-09	1.86E-05	6.17E-07	10
n-Butane	2.10E-06	3.55E-02	1.18E-03	10
N-Hexane	1.80E-06	3.04E-02	1.01E-03	10
Nickel	2.10E-09	3.55E-05	1.18E-06	10
N-Pentane	2.60E-06	4.39E-02	1.46E-03	10
Phenanthrene	1.70E-11	2.87E-07	9.54E-09	10
PM, condensable	5.70E-06	9.63E-02	3.20E-03	10
PM, primary	7.60E-06	1.28E-01	4.27E-03	10
PM10, filterable	1.90E-06	3.21E-02	1.07E-03	10
PM10, primary	7.60E-06	1.28E-01	4.27E-03	10
PM2.5, filterable	1.90E-06	3.21E-02	1.07E-03	10
PM2.5, primary	7.60E-06	1.28E-01	4.27E-03	10
Propane	1.60E-06	2.70E-02	8.98E-04	10
Pyrene	5.00E-12	8.45E-08	2.81E-09	10
Selenium	2.40E-11	4.05E-07	1.35E-08	10
Vanadium	2.30E-09	3.89E-05	1.29E-06	10
Zinc	2.90E-08	4.90E-04	1.63E-05	10
<b>Total HAPs</b>		<b>7.45E-01</b>	<b>2.48E-02</b>	

<b>Greenhouse Gases</b>			
Carbon dioxide	1.20E-01	2.03E+03	6.74E+01
Methane	2.30E-06	3.89E-02	1.29E-03
<b>Total Greenhouse Gases</b>		<b>2.03E+03</b>	<b>6.74E+01</b>

Natural Gas Emissions Boiler WY  
Appendix B  
Army Emissions Calculations  
Boilers and Heaters <10 Million BTU/hr (SCC 10300603)

Unit Size	2,875,000	(btu/hr)
Heat Content of Fuel	1,020.00	(btu/scf)
Maximum Fuel Firing Rate	2,818.63	(scf / hour)
Hours of Operation	8,760.00	(hr / year)
Max Annual Fuel	24,691,176.47	(scf /year)
Actual Fuel Usage	997,410.00	(scf /year)

Pollutant	Emission Factor (lb/scf)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
Carbon monoxide	8.40E-05	1.04E+00	4.19E-02	100
Nitrogen oxides (NOx)	1.02E-04	1.26E+00	5.10E-02	25
PM, filterable	1.90E-06	2.35E-02	9.48E-04	100
Sulfur dioxide	6.00E-07	7.41E-03	2.99E-04	100
Total organic compounds (TOC)	1.10E-05	1.36E-01	5.49E-03	25
Volatile organic compounds (VOC)	5.50E-06	6.79E-02	2.74E-03	25
<b>Total Primary Pollutants</b>		<b>2.33E+00</b>	<b>9.41E-02</b>	
<b>HAPs</b>				
Benzene	2.10E-09	2.59E-05	1.05E-06	10
Formaldehyde	7.50E-08	9.26E-04	3.74E-05	10
Naphthalene	6.10E-10	7.53E-06	3.04E-07	10
Toluene	3.40E-09	4.20E-05	1.70E-06	10
2-Methyl Naphthalene	2.40E-11	2.96E-07	1.20E-08	10
3-Methylcholanthrene	1.80E-12	2.22E-08	8.98E-10	10
Acenaphthene	1.80E-12	2.22E-08	8.98E-10	10
Acenaphthylene	1.80E-12	2.22E-08	8.98E-10	10
Ammonia	4.90E-07	6.05E-03	2.44E-04	10
Anthracene	2.40E-12	2.96E-08	1.20E-09	10
Arsenic	2.00E-10	2.47E-06	9.97E-08	10
Barium	4.40E-09	5.43E-05	2.19E-06	10
Benzo (a) anthracene	1.80E-12	2.22E-08	8.98E-10	10
Benzo (a) pyrene	1.20E-12	1.48E-08	5.98E-10	10
Benzo (b) fluoranthene	1.80E-12	2.22E-08	8.98E-10	10
Benzo (g,h,i) perylene	1.20E-12	1.48E-08	5.98E-10	10
Benzo (k) fluoranthene	1.80E-12	2.22E-08	8.98E-10	10
Beryllium	1.20E-11	1.48E-07	5.98E-09	10
Cadmium	1.10E-09	1.36E-05	5.49E-07	10
Chromium	1.40E-09	1.73E-05	6.98E-07	10
Chrysene	1.80E-12	2.22E-08	8.98E-10	10
Cobalt	8.40E-11	1.04E-06	4.19E-08	10
Copper	8.50E-10	1.05E-05	4.24E-07	10
Dibenzo(a,h) anthracene	1.20E-12	1.48E-08	5.98E-10	10
Dichlorobenzene, mixed isomers	1.20E-09	1.48E-05	5.98E-07	10
Dimethylbenz(a)anthracene	1.60E-11	1.98E-07	7.98E-09	10
Ethane	3.10E-06	3.83E-02	1.55E-03	10
Fluoranthene	3.00E-12	3.70E-08	1.50E-09	10
Fluorene	2.80E-12	3.46E-08	1.40E-09	10
Indeno(1,2,3-cd)pyrene	1.80E-12	2.22E-08	8.98E-10	10
Lead	5.00E-10	6.17E-06	2.49E-07	10
Manganese	3.80E-10	4.69E-06	1.90E-07	10
Mercury	2.60E-10	3.21E-06	1.30E-07	10
Molybdenum	1.10E-09	1.36E-05	5.49E-07	10
n-Butane	2.10E-06	2.59E-02	1.05E-03	10
N-Hexane	1.80E-06	2.22E-02	8.98E-04	10
Nickel	2.10E-09	2.59E-05	1.05E-06	10
N-Pentane	2.60E-06	3.21E-02	1.30E-03	10
Phenanthrene	1.70E-11	2.10E-07	8.48E-09	10
PM, condensable	5.70E-06	7.04E-02	2.84E-03	10
PM, primary	7.60E-06	9.38E-02	3.79E-03	10
PM10, filterable	1.90E-06	2.35E-02	9.48E-04	10
PM10, primary	7.60E-06	9.38E-02	3.79E-03	10
PM2.5, filterable	1.90E-06	2.35E-02	9.48E-04	10
PM2.5, primary	7.60E-06	9.38E-02	3.79E-03	10
Propane	1.60E-06	1.98E-02	7.98E-04	10
Pyrene	5.00E-12	6.17E-08	2.49E-09	10
Selenium	2.40E-11	2.96E-07	1.20E-08	10
Vanadium	2.30E-09	2.84E-05	1.15E-06	10
Zinc	2.90E-08	3.58E-04	1.45E-05	10
<b>Total HAPs</b>		<b>5.45E-01</b>	<b>2.20E-02</b>	

<b>Greenhouse Gases</b>			
Carbon dioxide	1.20E-01	1.48E+03	5.98E+01
Methane	2.30E-06	2.84E-02	1.15E-03
<b>Total Greenhouse Gases</b>		<b>1.48E+03</b>	<b>5.98E+01</b>

## Oil Emissions Boiler

WN

## Appendix B

## Armory Emission Calculations

Boilers and Heaters &lt;10 Mmbtu/hr Heating Oil (SCC 10300501)

Unit Size	8,540,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	61.00	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	534,360	(gal /year)
Actual Fuel Usage	2,617	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
CO	5.00E-03	1.34E+00	6.54E-03	100
NOx	2.40E-02	6.41E+00	3.14E-02	25
PM, Filterable	2.00E-03	5.34E-01	2.62E-03	100
SOx	7.35E-02	1.96E+01	9.62E-02	100
TOC	5.56E-04	1.49E-01	7.27E-04	25
<b>Total Primary Pollutants</b>		<b>2.81E+01</b>	<b>1.37E-01</b>	
<b>HAPs</b>				
Benzene	2.75E-06	7.35E-04	3.60E-06	10
Formaldehyde (2)	6.10E-05	1.63E-02	7.98E-05	10
Ammonia	8.00E-04	2.14E-01	1.05E-03	100
Arsenic (1)	4.00E-06	1.50E-04	1.47E-03	100
Beryllium (1)	3.00E-06	1.12E-04	1.10E-03	100
Cadmium (1)	3.00E-06	1.12E-04	1.10E-03	100
Chromium (1)	3.00E-06	1.12E-04	1.10E-03	100
Copper (1)	6.00E-06	2.24E-04	2.20E-03	100
Fluoranthene	3.15E-09	8.42E-07	4.12E-09	100
Lead (1)	9.00E-06	3.37E-04	3.30E-03	10
Manganese (1)	6.00E-06	2.24E-04	2.20E-03	100
Mercury (1)	3.00E-06	1.12E-04	1.10E-03	100
Nickel (1)	3.00E-06	1.12E-04	1.10E-03	100
PM, condensable	1.30E-03	3.47E-01	1.70E-03	100
PM10, filterable	1.08E-03	2.89E-01	1.41E-03	100
PM10, primary	1.08E-03	2.89E-01	1.41E-03	100
PM2.5, filterable	1.08E-03	2.89E-01	1.41E-03	100
PM2.5, primary	1.08E-03	2.89E-01	1.41E-03	100
Polycyclic organic matter (POM)	1.08E-03	2.89E-01	1.41E-03	100
Selenium (1)	1.50E-05	5.61E-04	5.50E-03	100
Total non-methane organic compounds (TNMOC)	3.40E-04	9.08E-02	4.45E-04	100
Zinc (1)	4.00E-06	1.50E-04	5.23E-06	100
<b>Total HAPs</b>		<b>2.11E+00</b>	<b>3.05E-02</b>	

<b>Greenhouse Gases</b>			
Methane	2.16E-04	5.77E-02	2.83E-04
<b>Total Greenhouse Gases</b>		<b>5.77E-02</b>	<b>2.83E-04</b>

Oil Emissions Space Heater

WN

Appendix B

Armory Emission Calculations

Space Heaters Heating Oil (SCC 10500205)

Unit Size	1,250,000	(btu/hr)
Heat Content of Fuel	140,000	(btu/gal)
Maximum Fuel Firing Rate	8.93	(gal / hour)
Hours of Operation	8,760	(hr / year)
Max Annual Fuel	78,214	(gal /year)
Actual Fuel Usage	383	(gal /year)
Sulfur Content of Fuel	0.50	(%)

Pollutant	Emission Factor (lb/gal)	Emission Summary		NJ State Limits (Tons/Year)
		PTE (Tons/Year)	Actual (Tons/Year)	
<b>Primary Pollutants</b>				
SOx	7.18E-02	2.81E+00	1.38E-02	100
VOCs	7.00E-04	2.74E-02	1.34E-04	25
<b>Total Primary Pollutants</b>		<b>2.84E+00</b>	<b>1.39E-02</b>	
<b>HAPs</b>				
Ammonia	8.00E-04	3.13E-02	1.53E-04	100
PM, condensable	1.30E-03	5.08E-02	2.49E-04	100
PM10, filterable	2.46E-03	9.62E-02	4.71E-04	100
PM10, primary	3.76E-03	1.47E-01	7.20E-04	100
PM2.5, filterable	6.15E-04	2.41E-02	1.18E-04	100
PM2.5, primary	1.92E-03	7.49E-02	3.67E-04	100
<b>Total HAPs</b>		<b>3.26E+00</b>	<b>1.60E-02</b>	

## **Appendix C**

### Scanned Floor Plan Data Collection Sheets

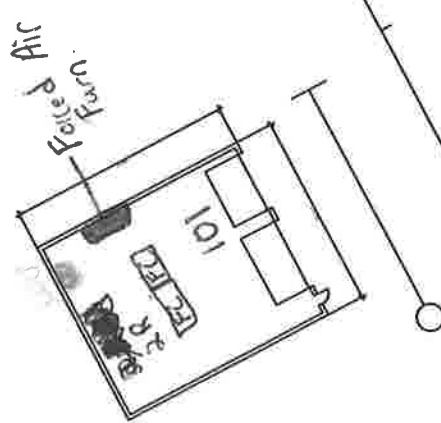
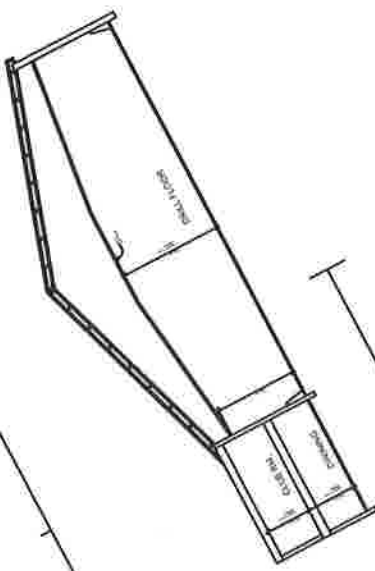
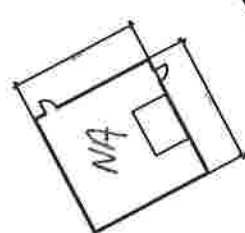


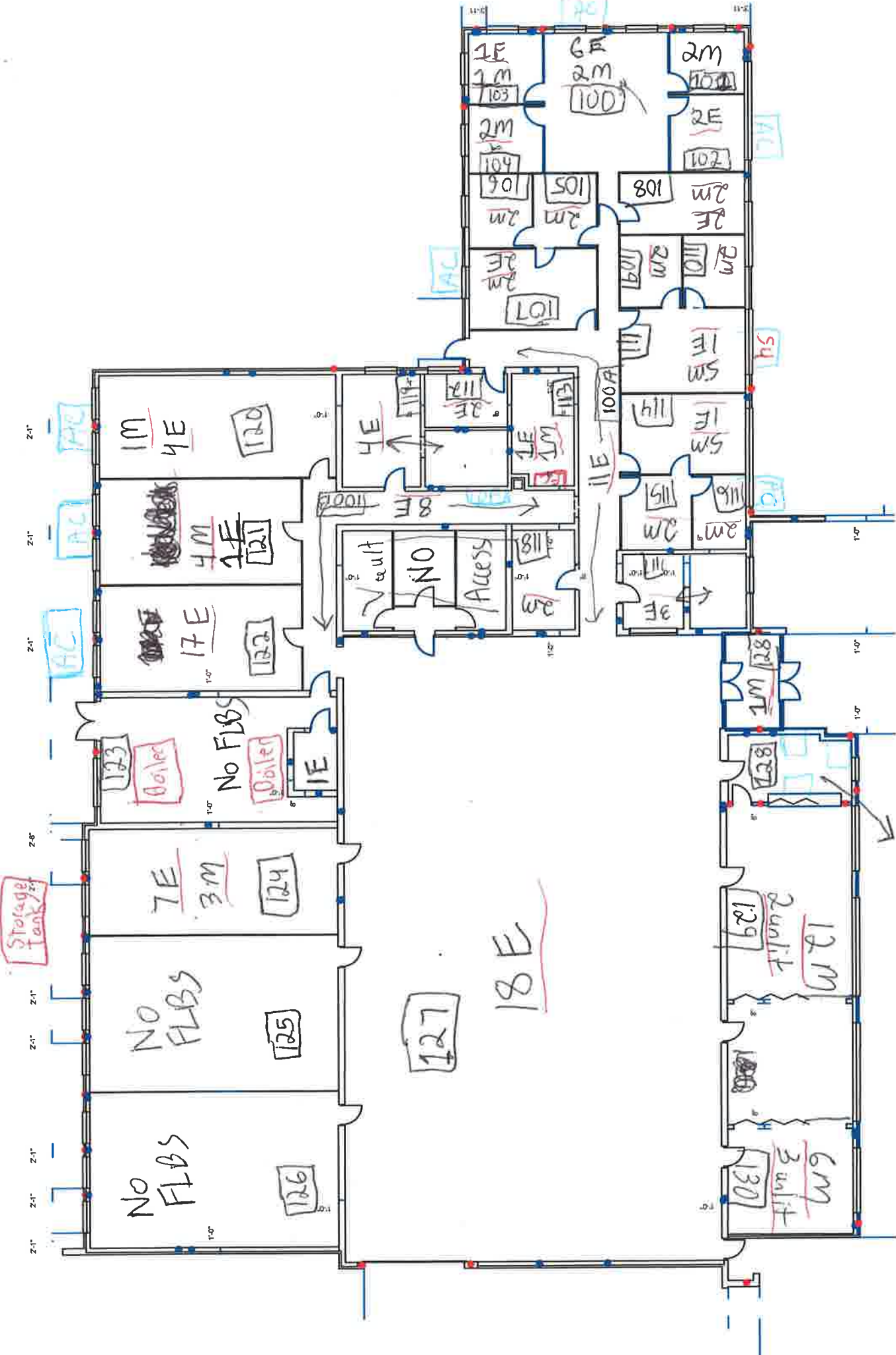
PERWICK  
ARCHITECTS  
51  
PERWICK ASSOCIATES  
646 Ocean Heights Avenue  
Lanewood, NJ 08224  
P. 609-453-0722  
F. 609-653-1637  
www.perwickarchitects.com

FMS Floor Plan

EXISTING  
CONDITIONS

Atlantic City Army  
Private Club & Golf Course





GROUND FLOOR PLAN  
 SCALE: 18" = 1'-0"

u: Split Unit

# Cape May Armory First Floor

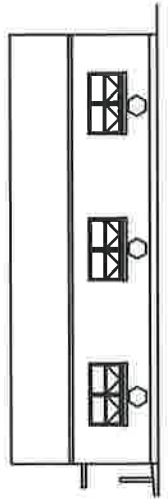
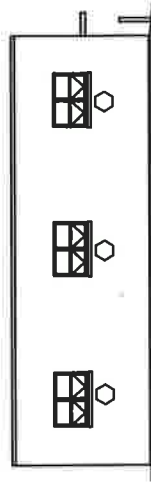
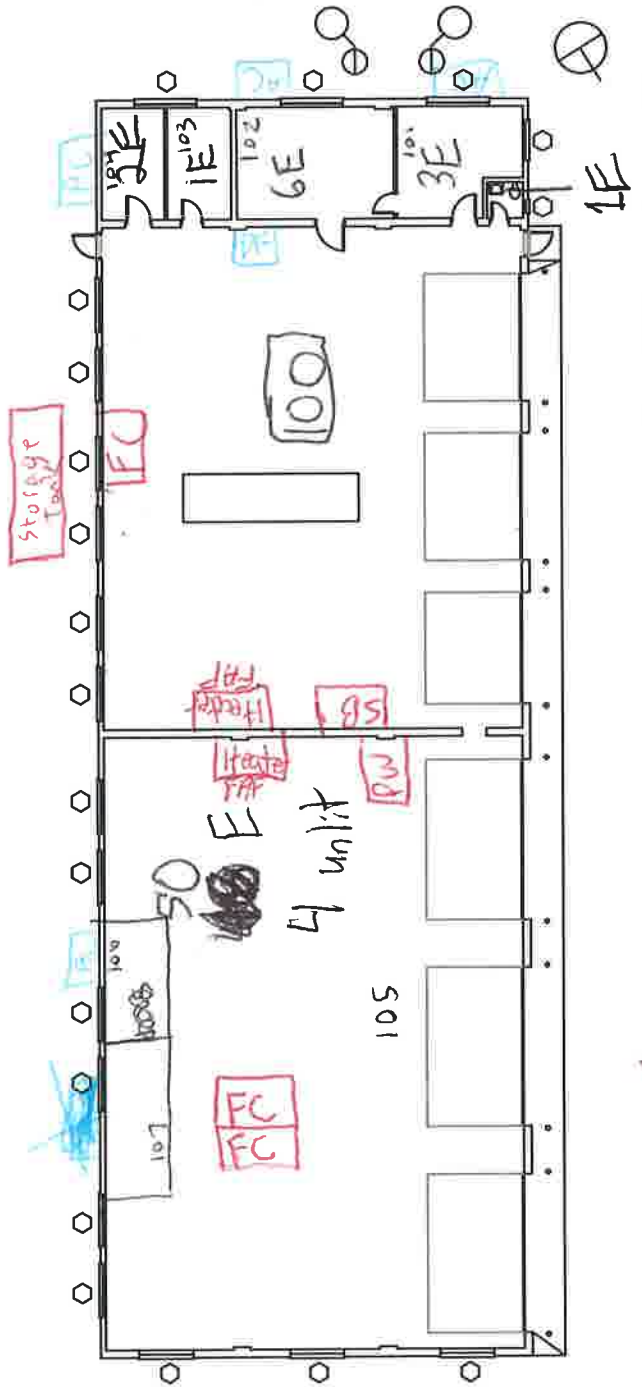
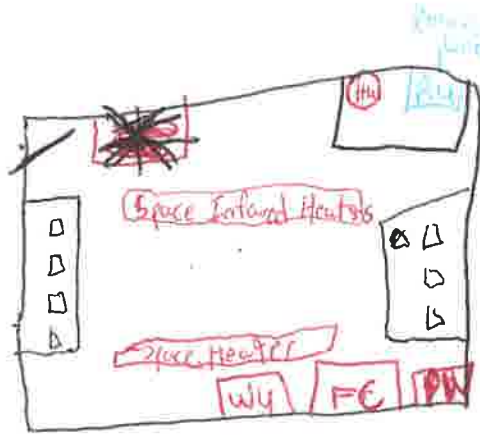
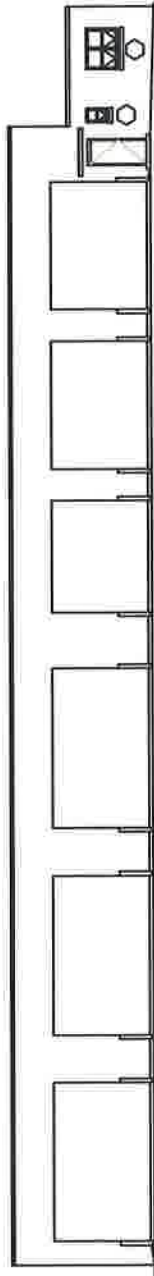
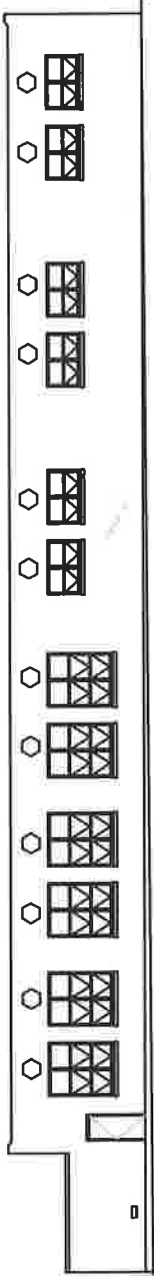
9E  
 2 Split Unit  
 1 100 measuring



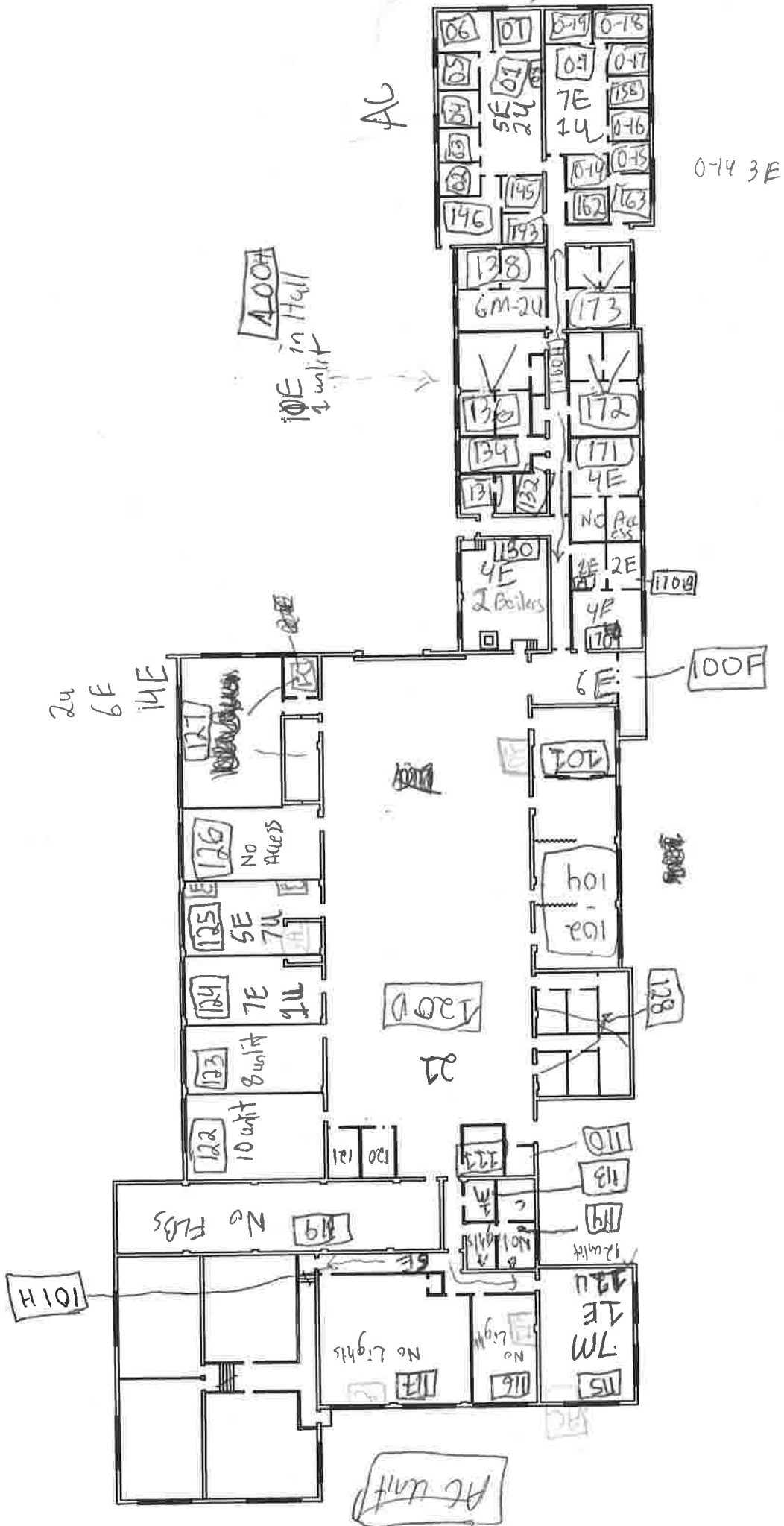
# Cape May FMS Floor Plan

DF: Parking Function  
 SB: Sand Blaster  
 FC: Flamm. Cabinet  
 PW: Parts Washer

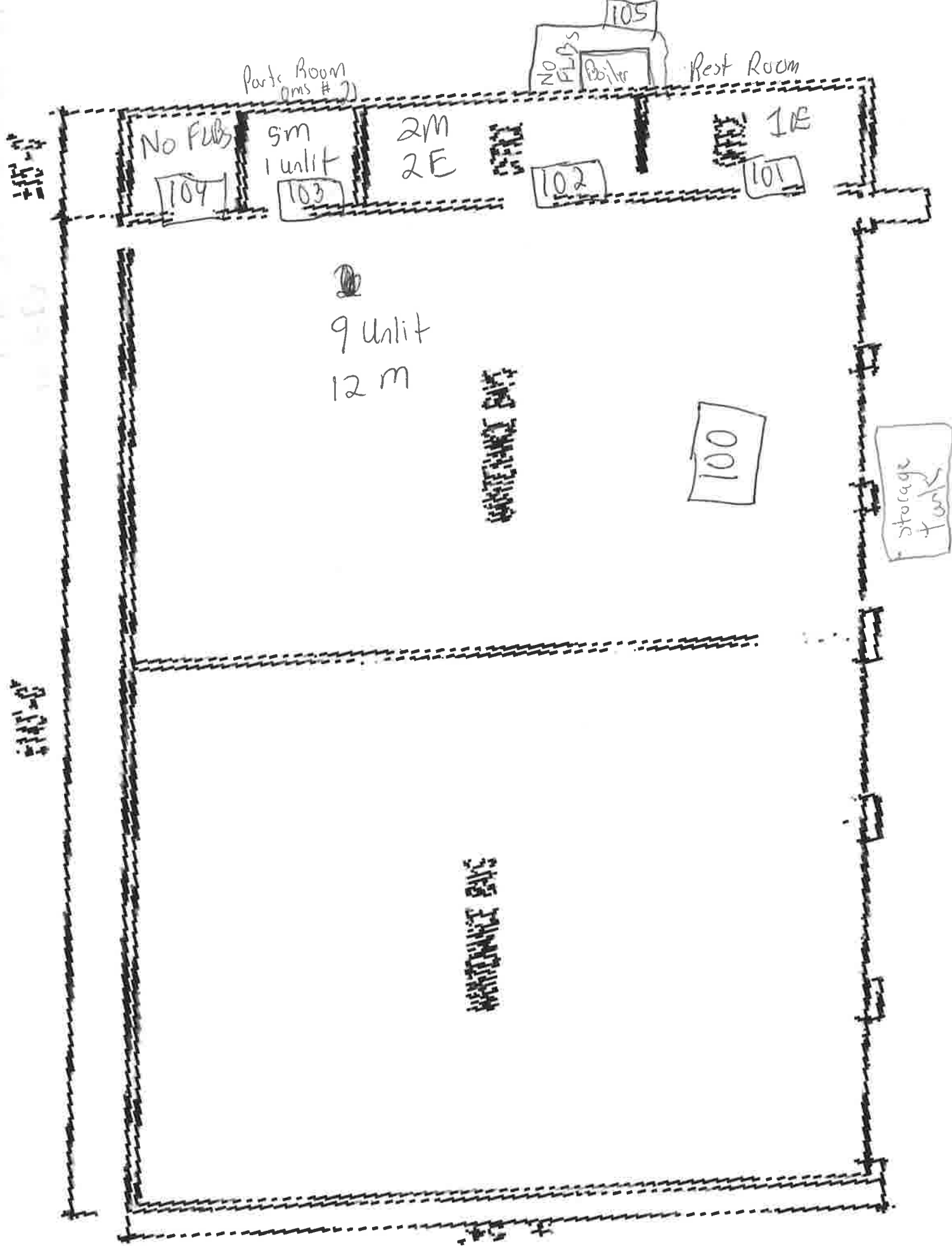
HW: Hot Water Heater  
 WU: Welding Unit



# Cherry Hill Armory Floor Plan

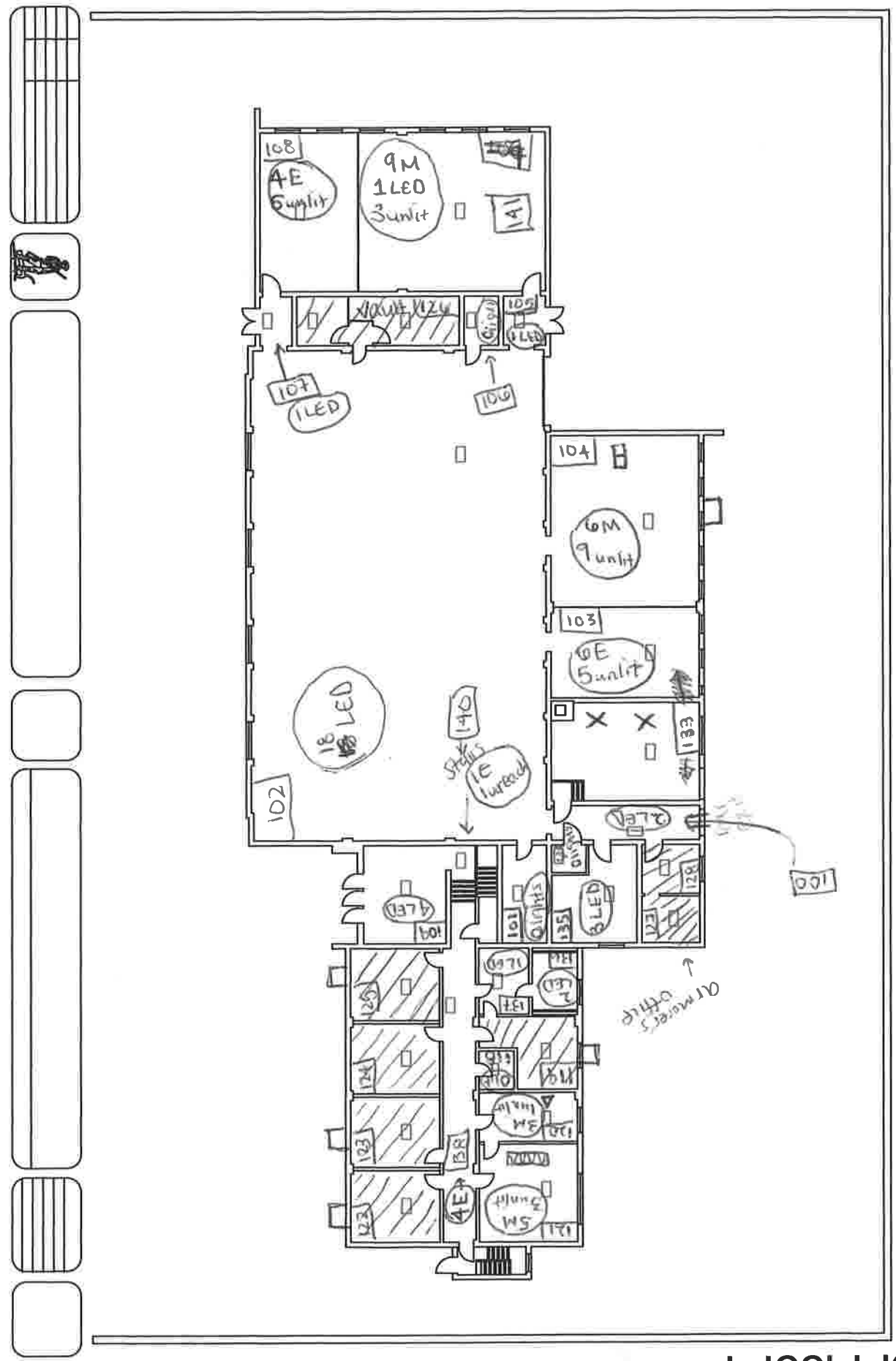


# Cherry Hill FMS Floor Plan



# Dover Floor 1

- X boiler
- Refrig Δ ice machine
- Freezer



# Dover OMS

water cooler

forced air furnace

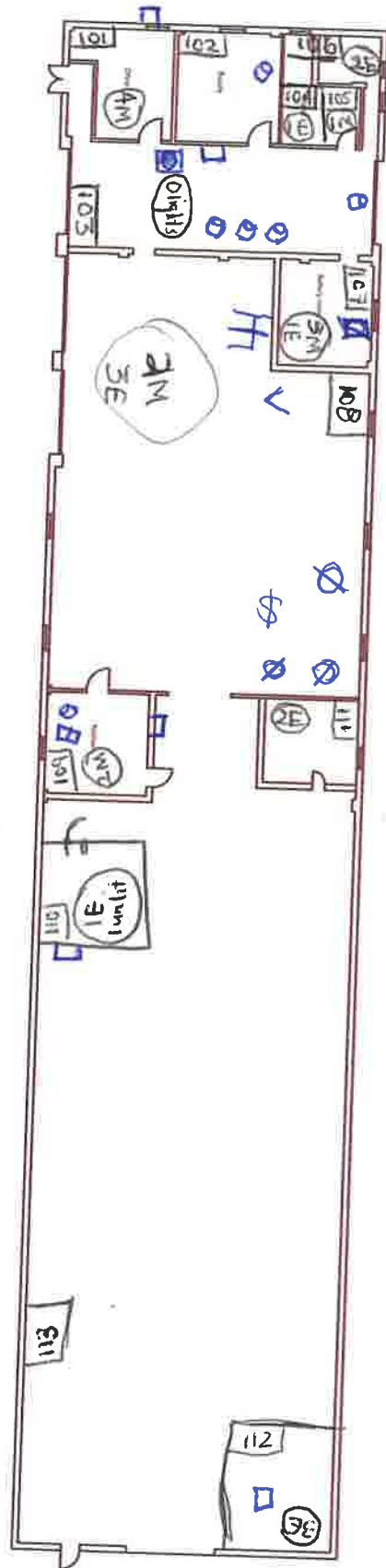
Watercooler

Flame cabinet

Recharging ret. system

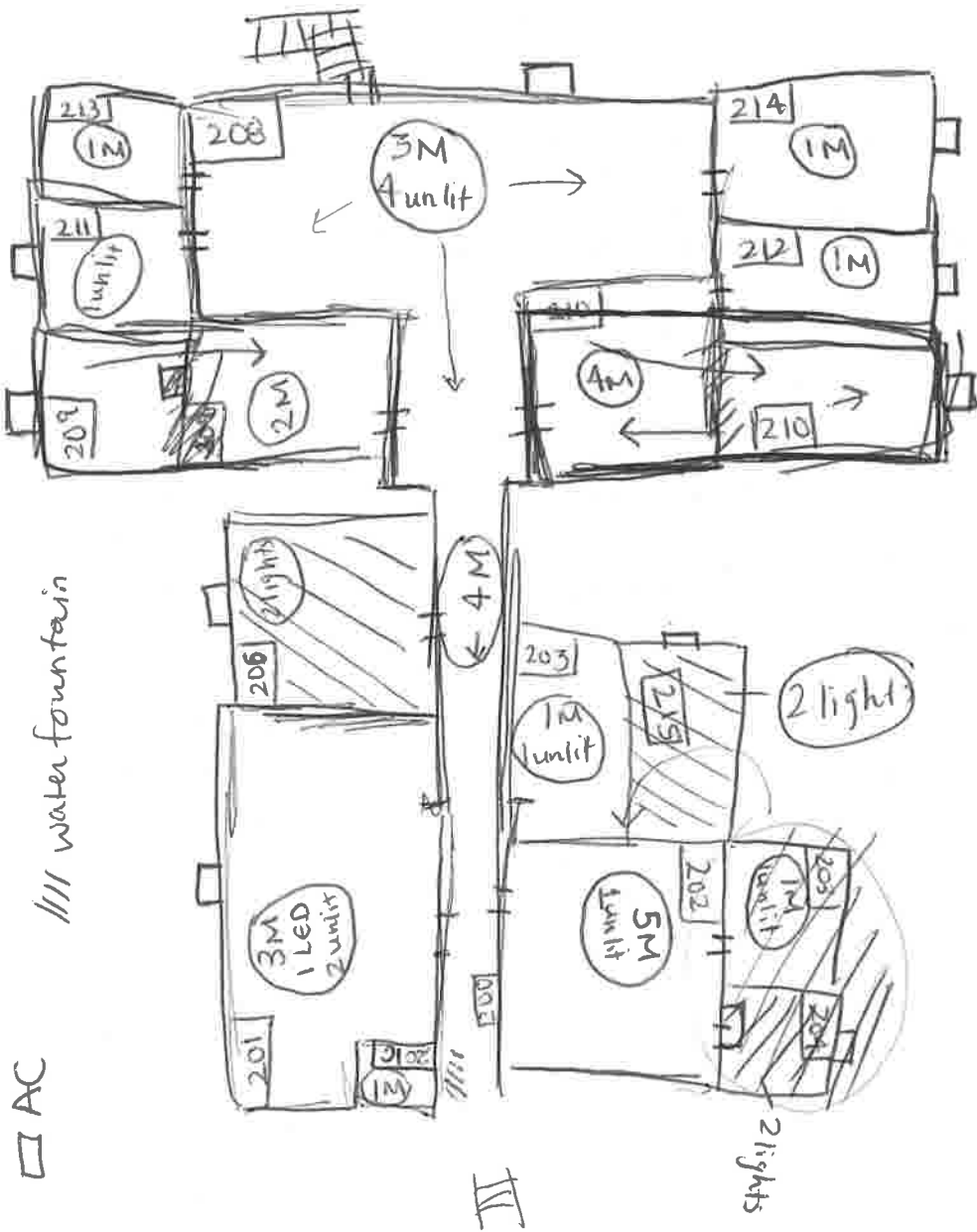
recovery unit

parts washer



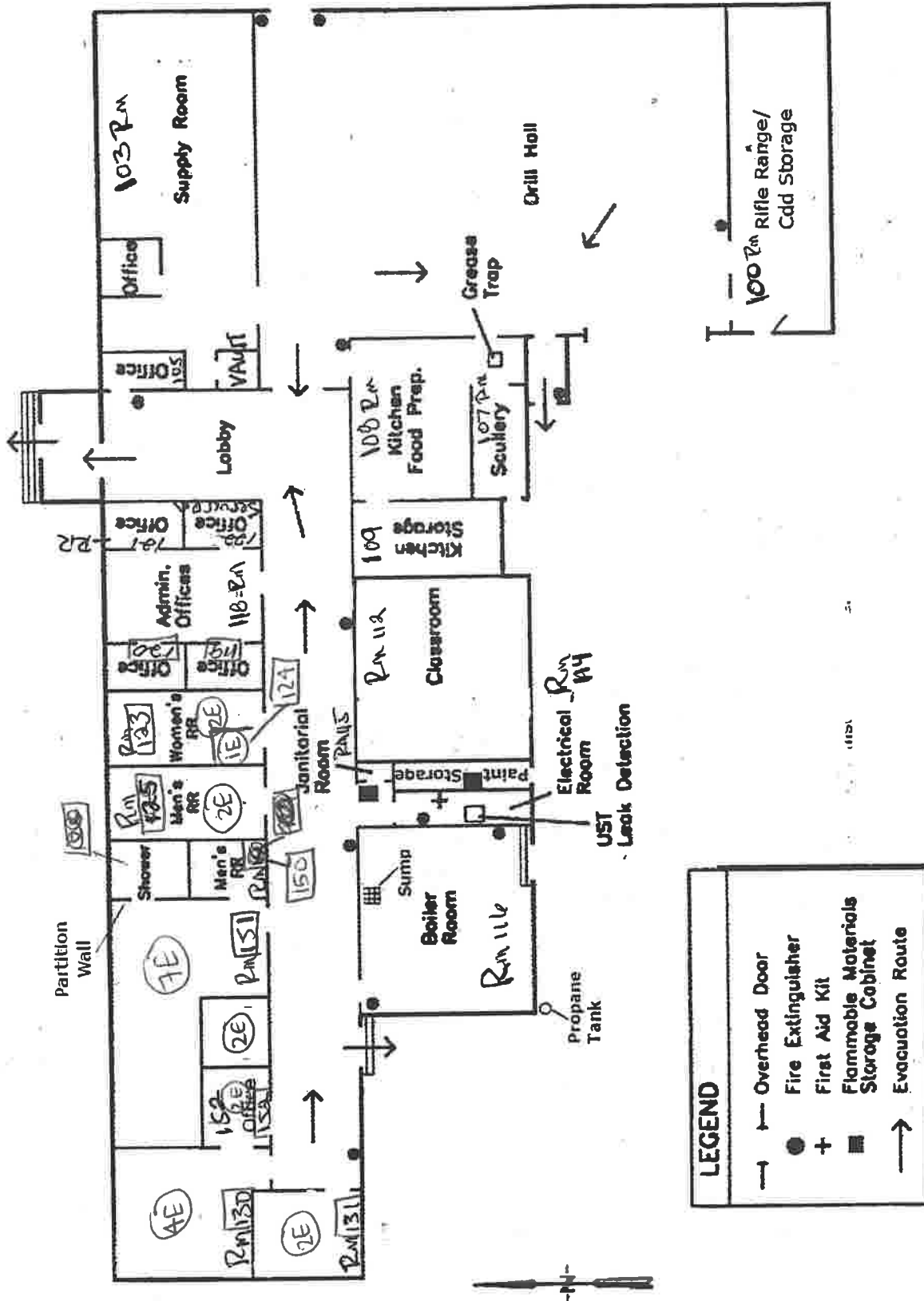
# Dover Floor 2

☐ AC  
 /// water fountain





# Evacuation Map - Armory





Franklin First Floor

met storage  
above  
prng



transfer  
mem

0-2-11-11  
□ = AC



INSTALL NEW HANDRAILS

REPAIR SURFACE W/ OF EXISTING  
LANDING AND STAIRS

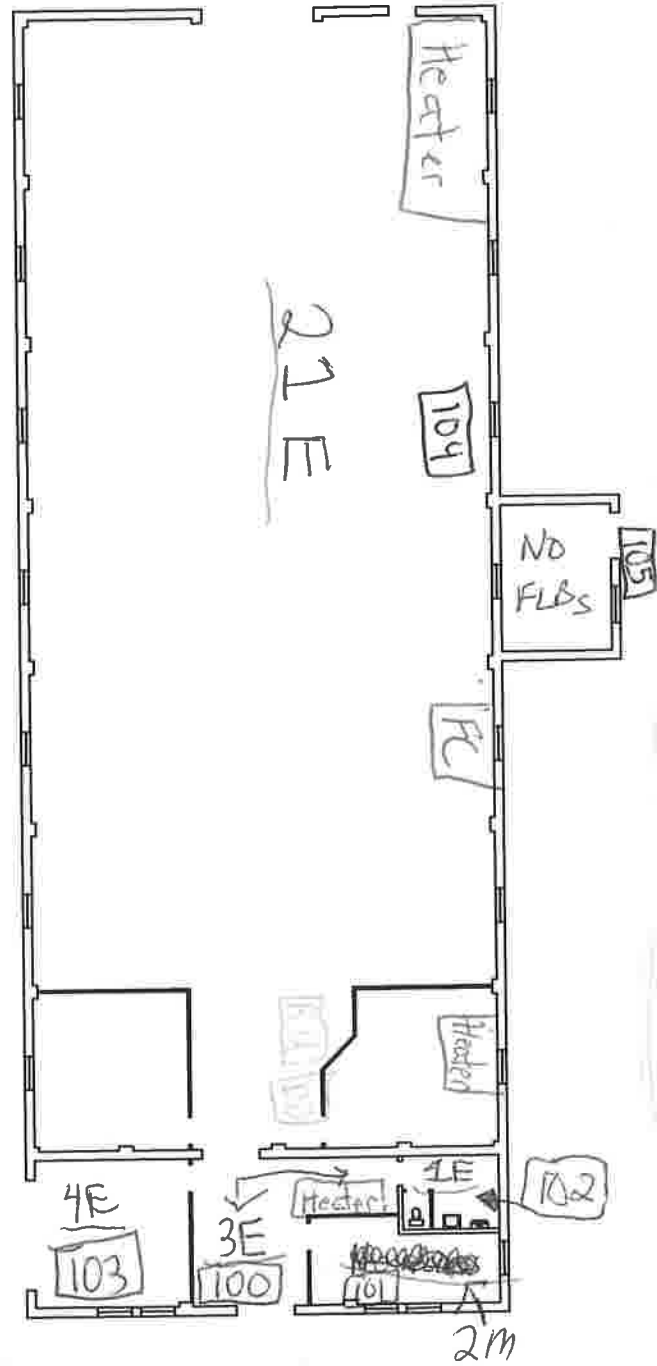
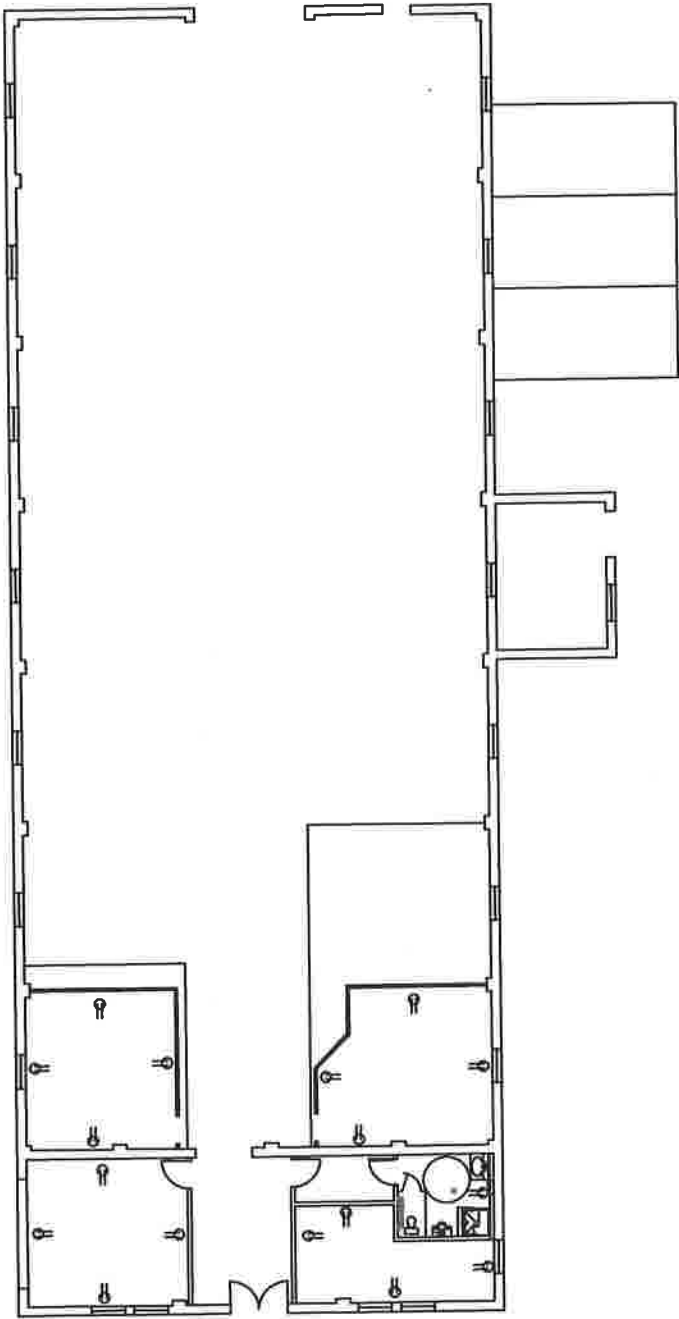






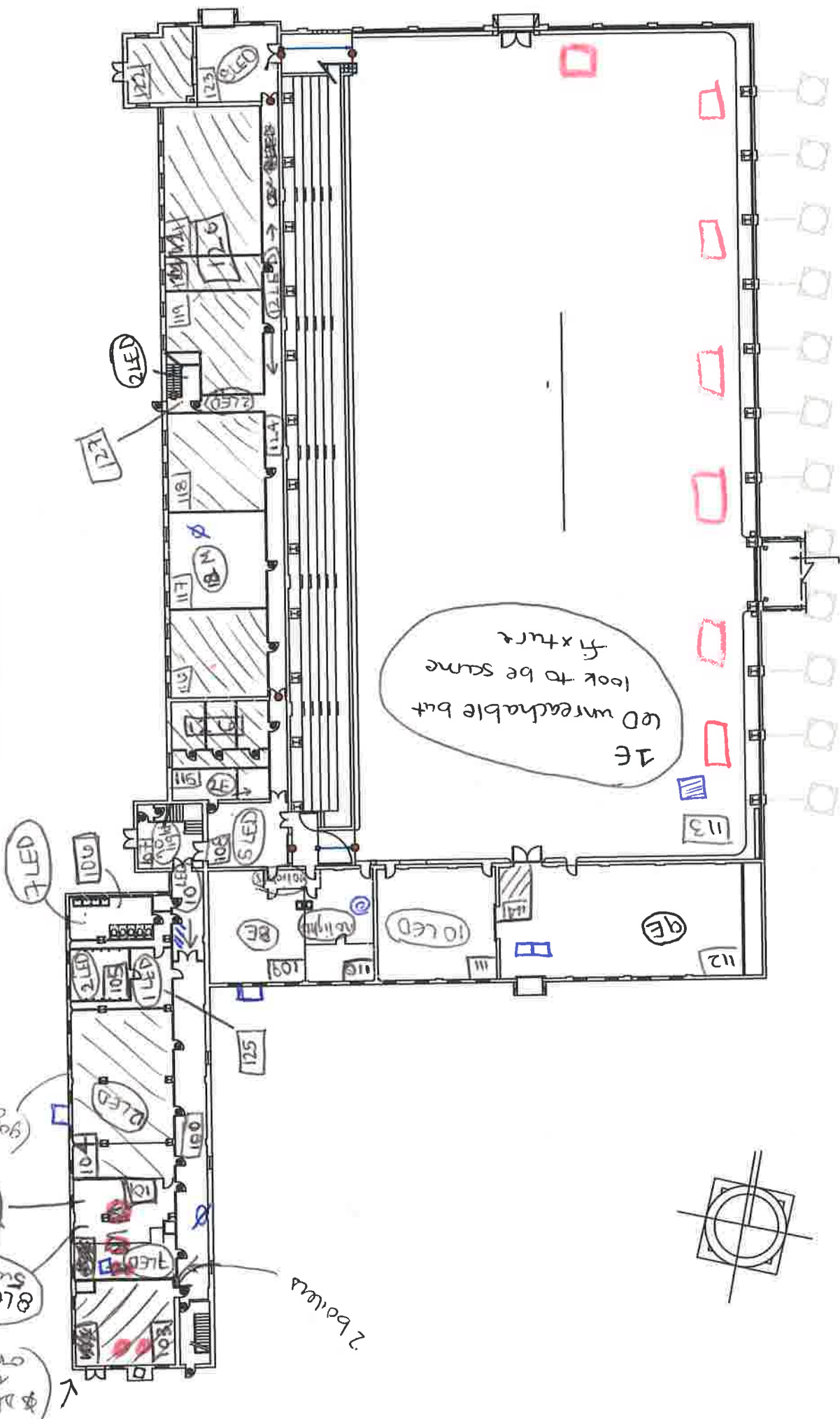


# Hammonton OMS Floor Plan



Ry: Rating unit  
DD: Drink Dispenser  
FL: Flamm. Cabinet

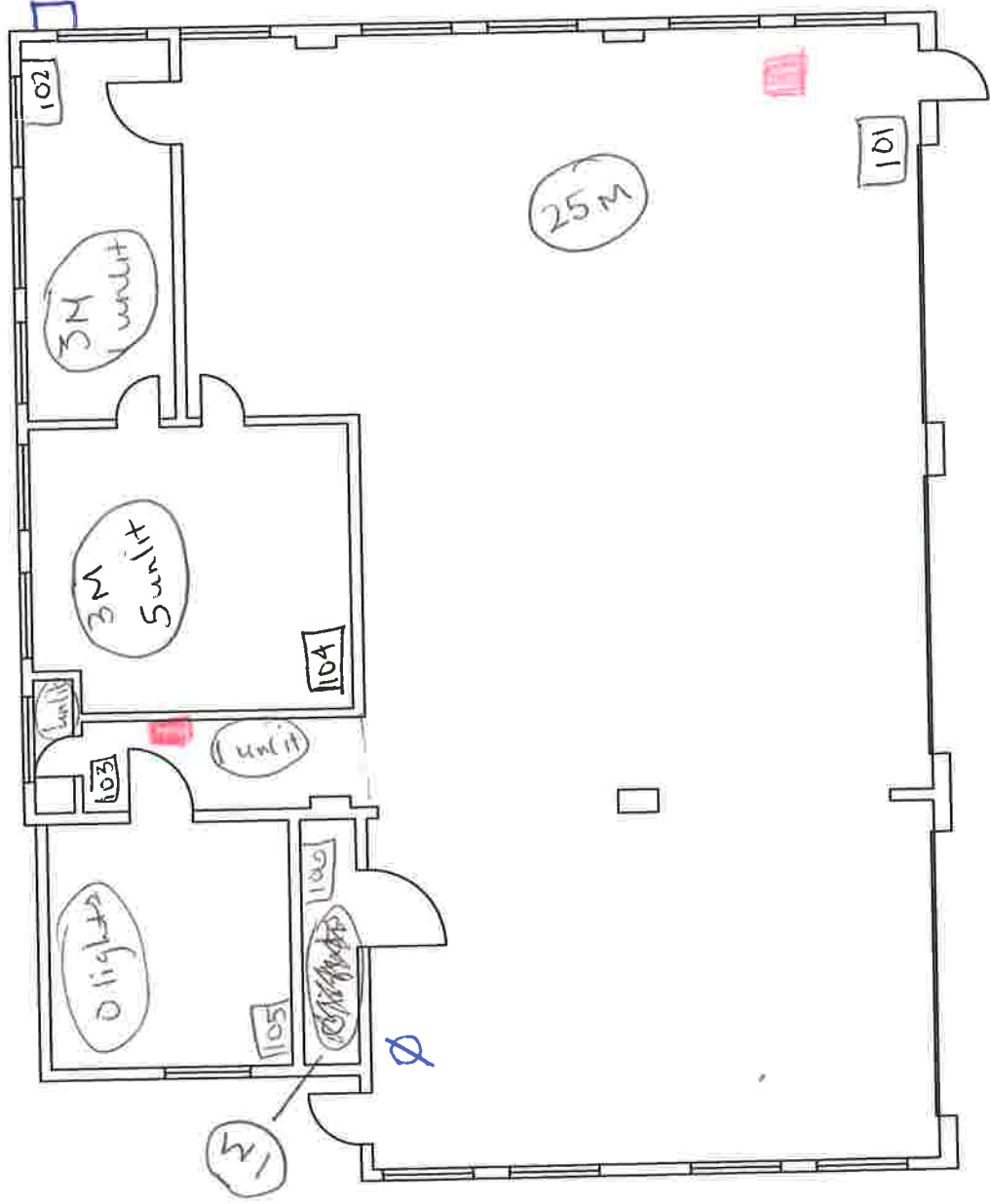
- ☐ boiler
- ⊗ Flame Cabinet
- ⊗ Refrigerator
- ⊗ water fountain
- ⊗ dehumidifier
- ⊗ heater
- ⊗ refrigerator



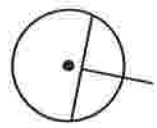
Morristown Floor 1



# Morristown OMS



found  
fire  
water  
Ø flame-cabinet

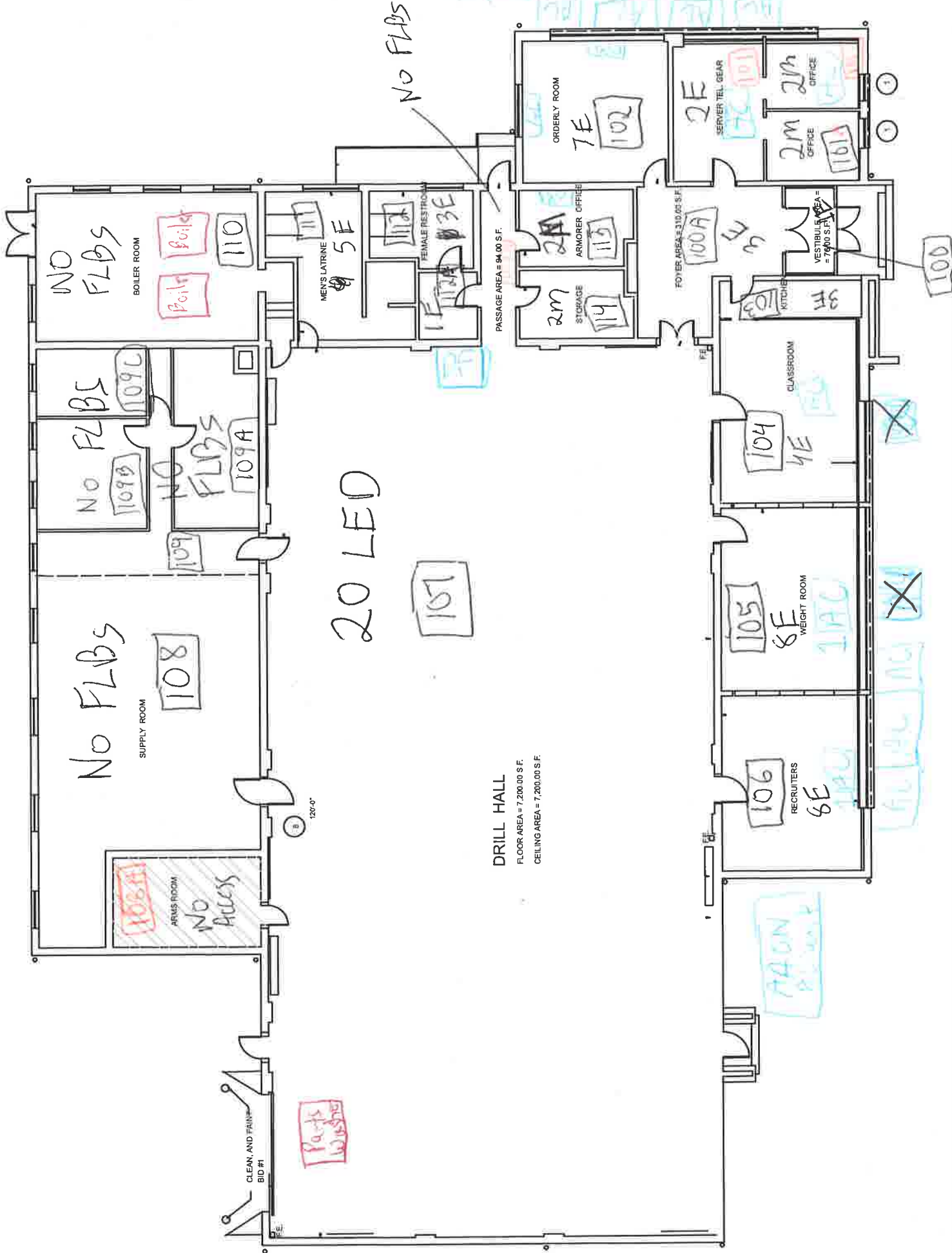


FLOOR PLAN

SCALE: 1/8" = 1'-0"



# Mount Holly Armory Floor Plan



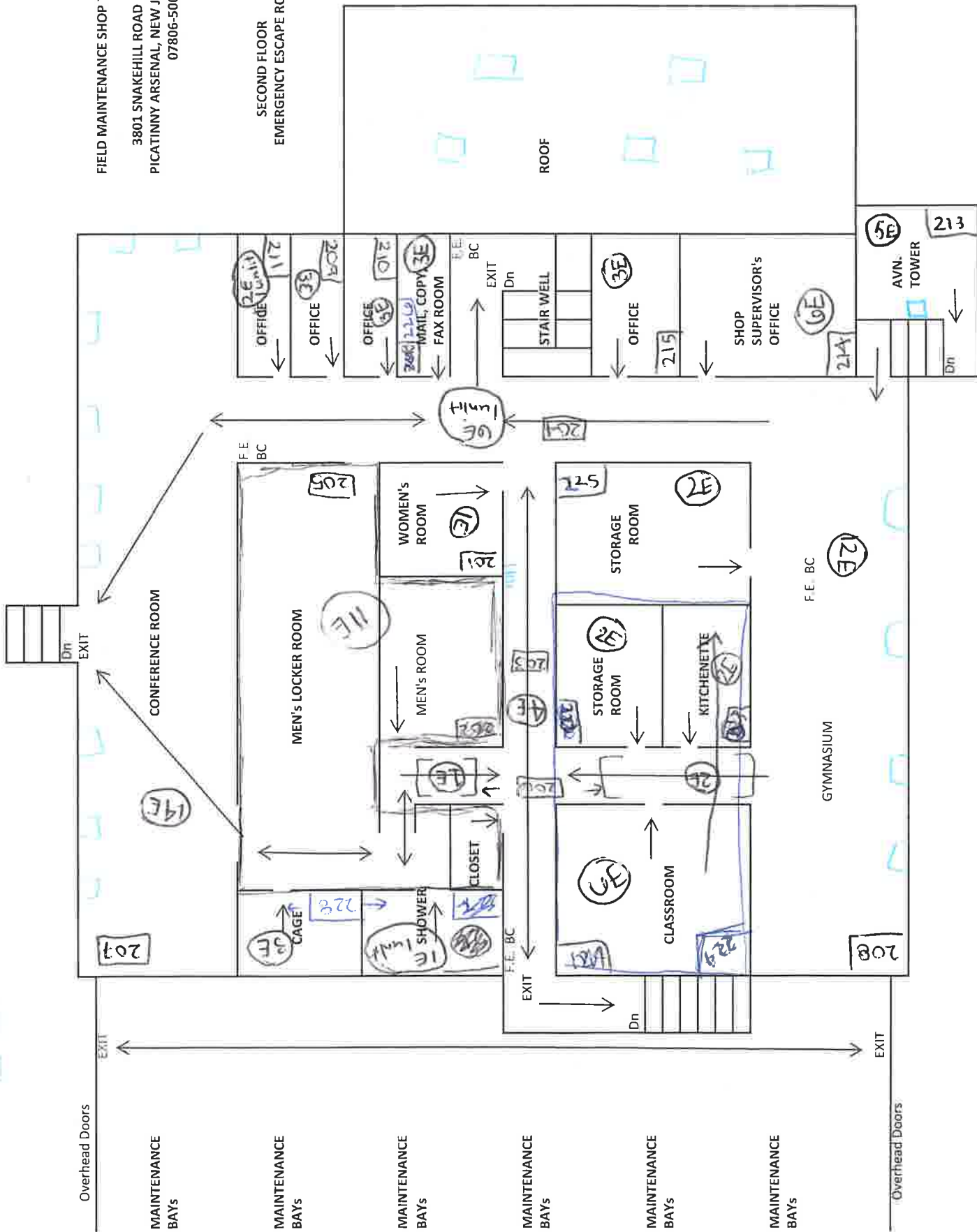


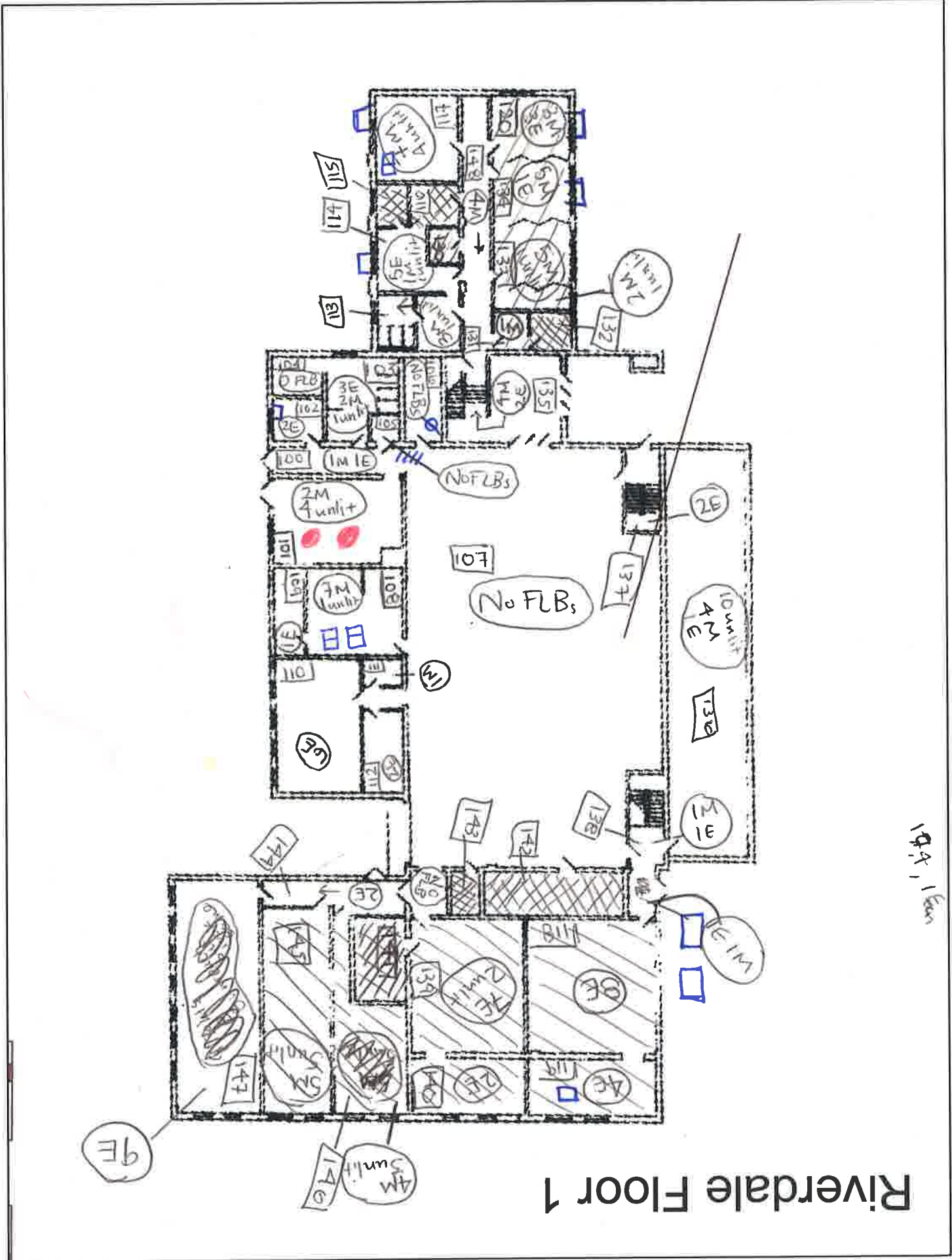
FIELD MAINTENANCE SHOP 7

3801 SNAKEHILL ROAD  
PICATINNY ARSENAL, NEW JERSEY  
07806-5000

SECOND FLOOR  
EMERGENCY ESCAPE ROUTES

ROOF



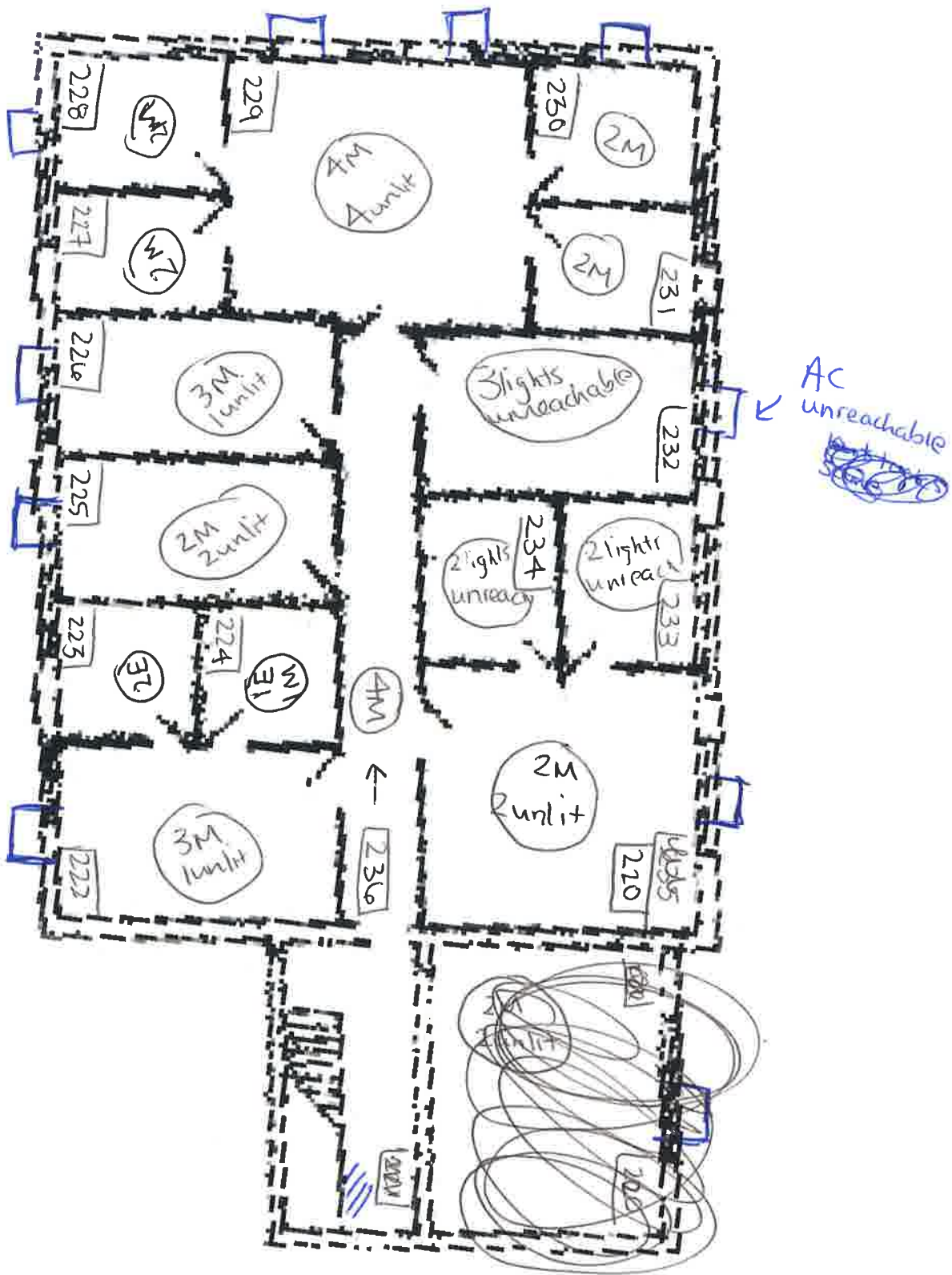


Riverdale Floor 1

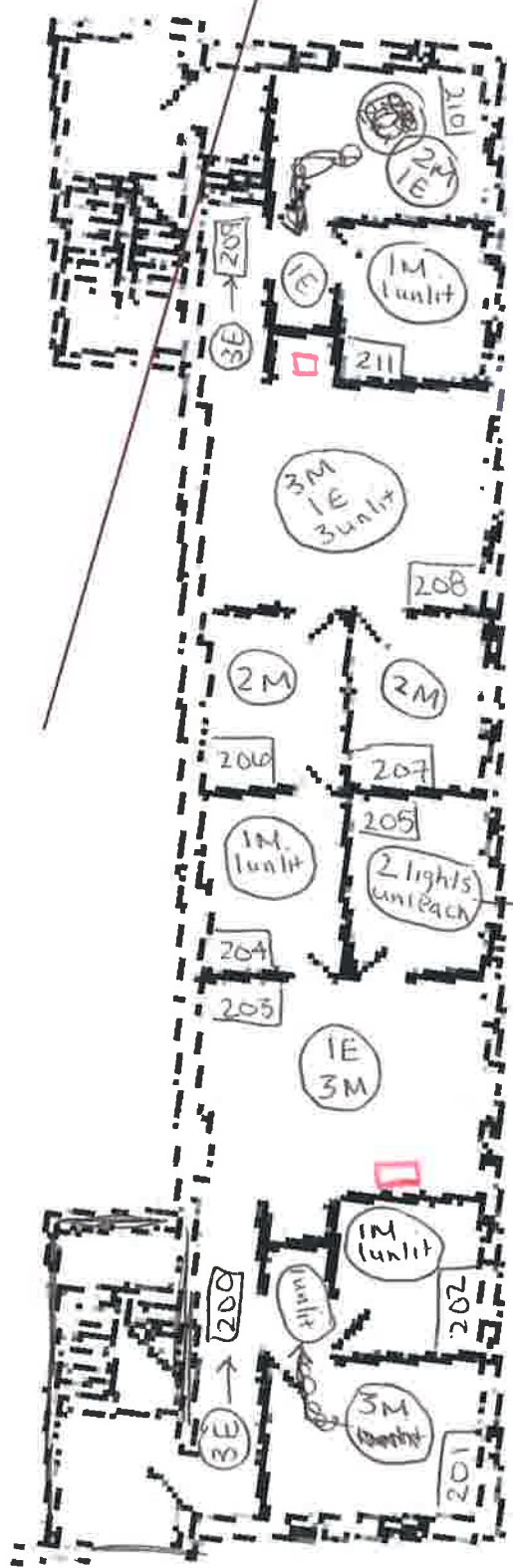
194, 195



# Riverdale Floor 2a



# Riverdale Floor 2b



□ forced air furnace

look like M



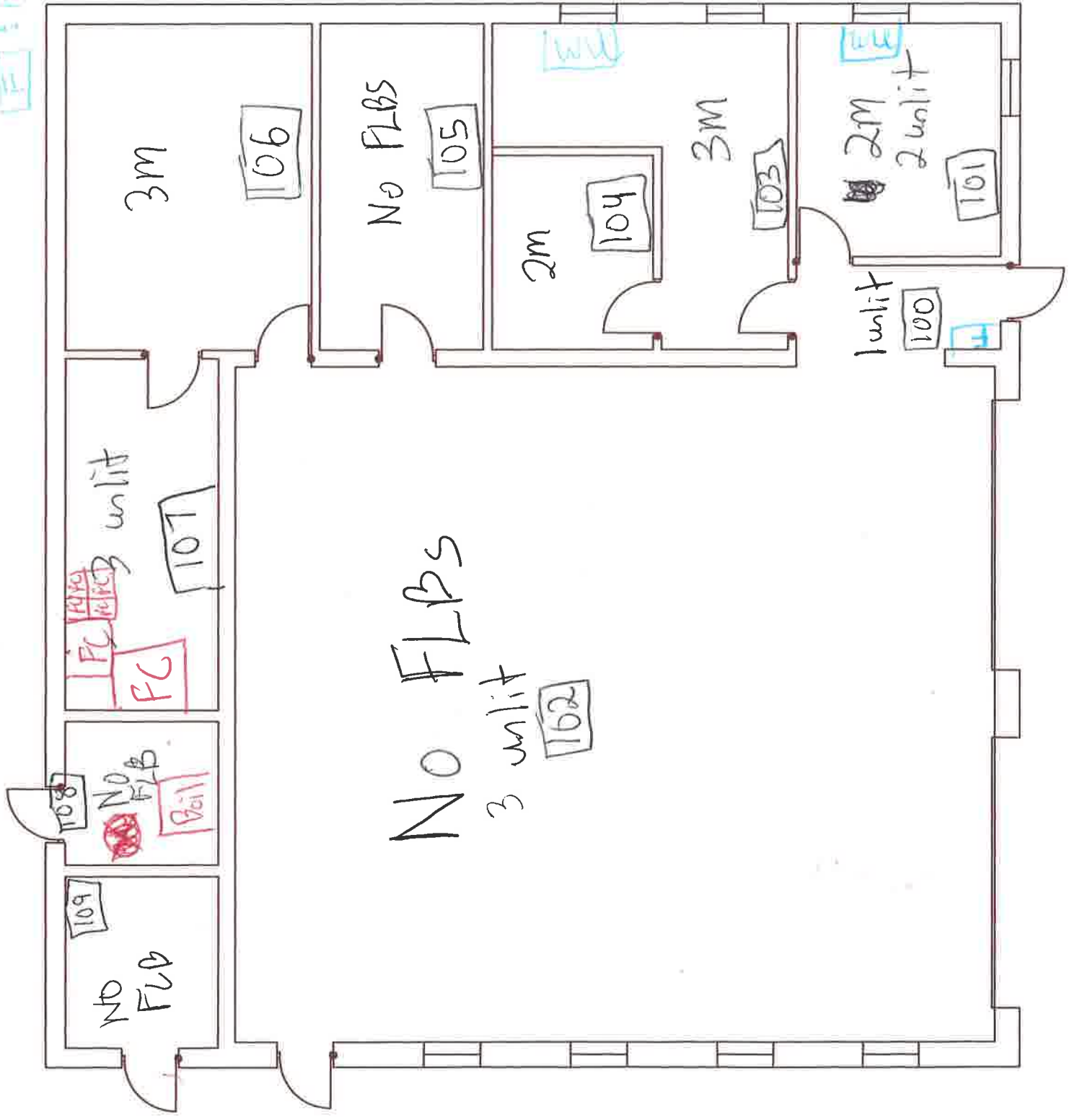
**RIVERDALE (MVS) Floor Plan**

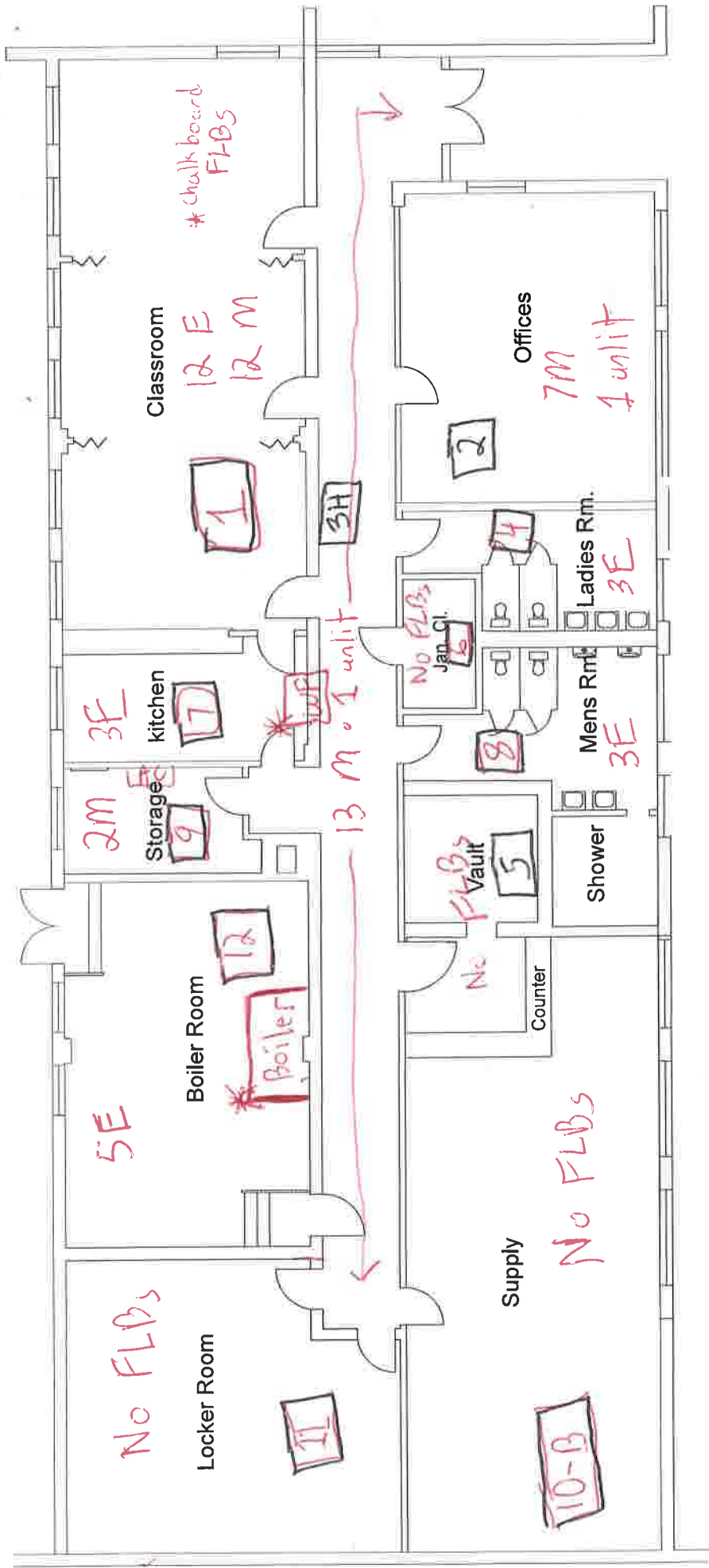




# Toms River OMS Floor Plan

W/L  
F  
F





3 AC units on Roof

Carriers

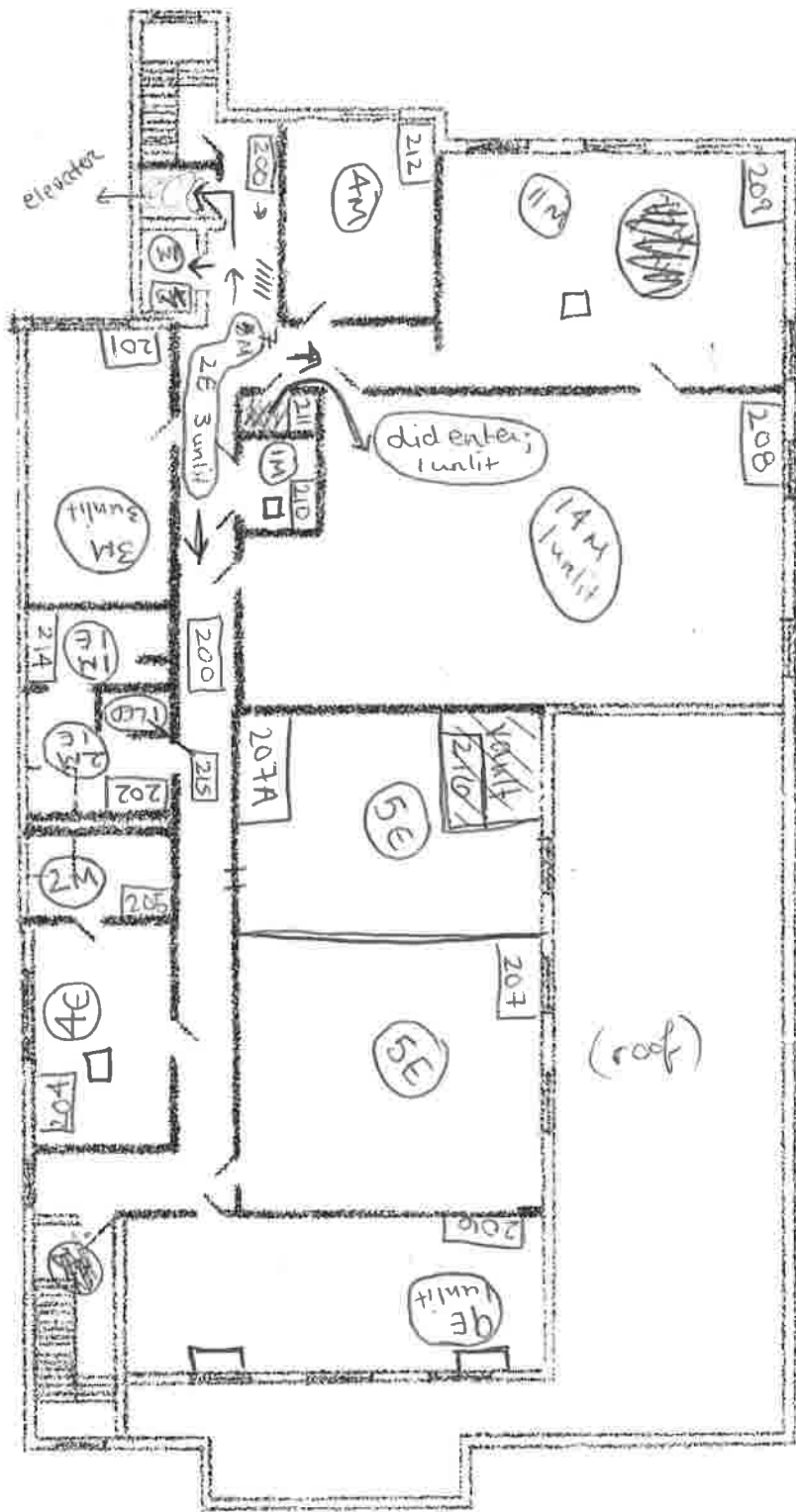
# TUCKERTON ARMORY FLOOR PLAN





06/27/17

# Washington Floor 2



\* 9 air conditioners on roof; pics on camera

2ND FLOOR PLAN

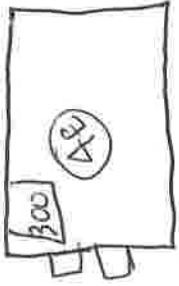


4411 20

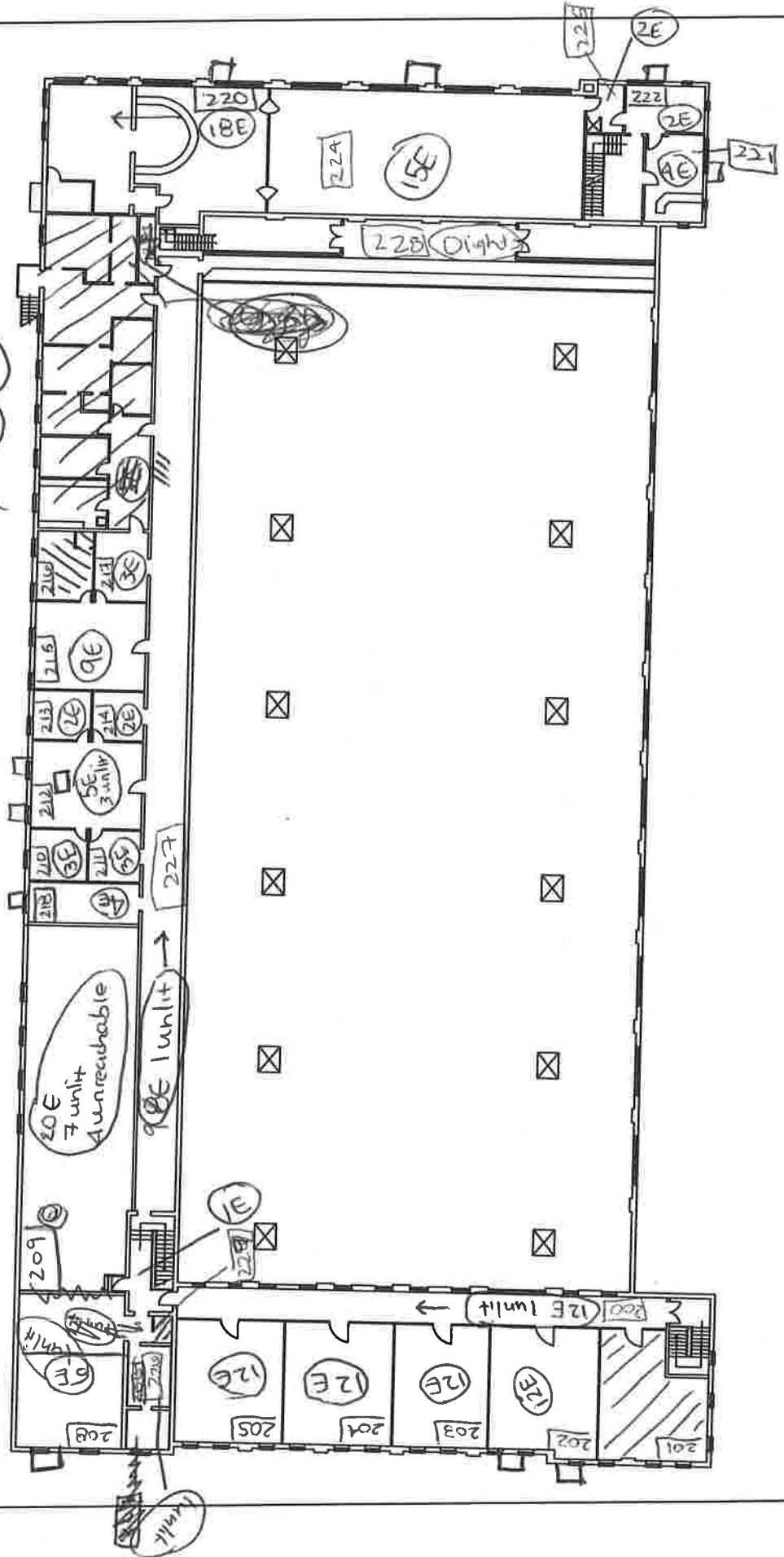
# Westfield Floor 2

[1 ac on roof]

(Tower)



225



20E 7 unit Unreachable

90E 1 unit

12E 1 unit


1 unit






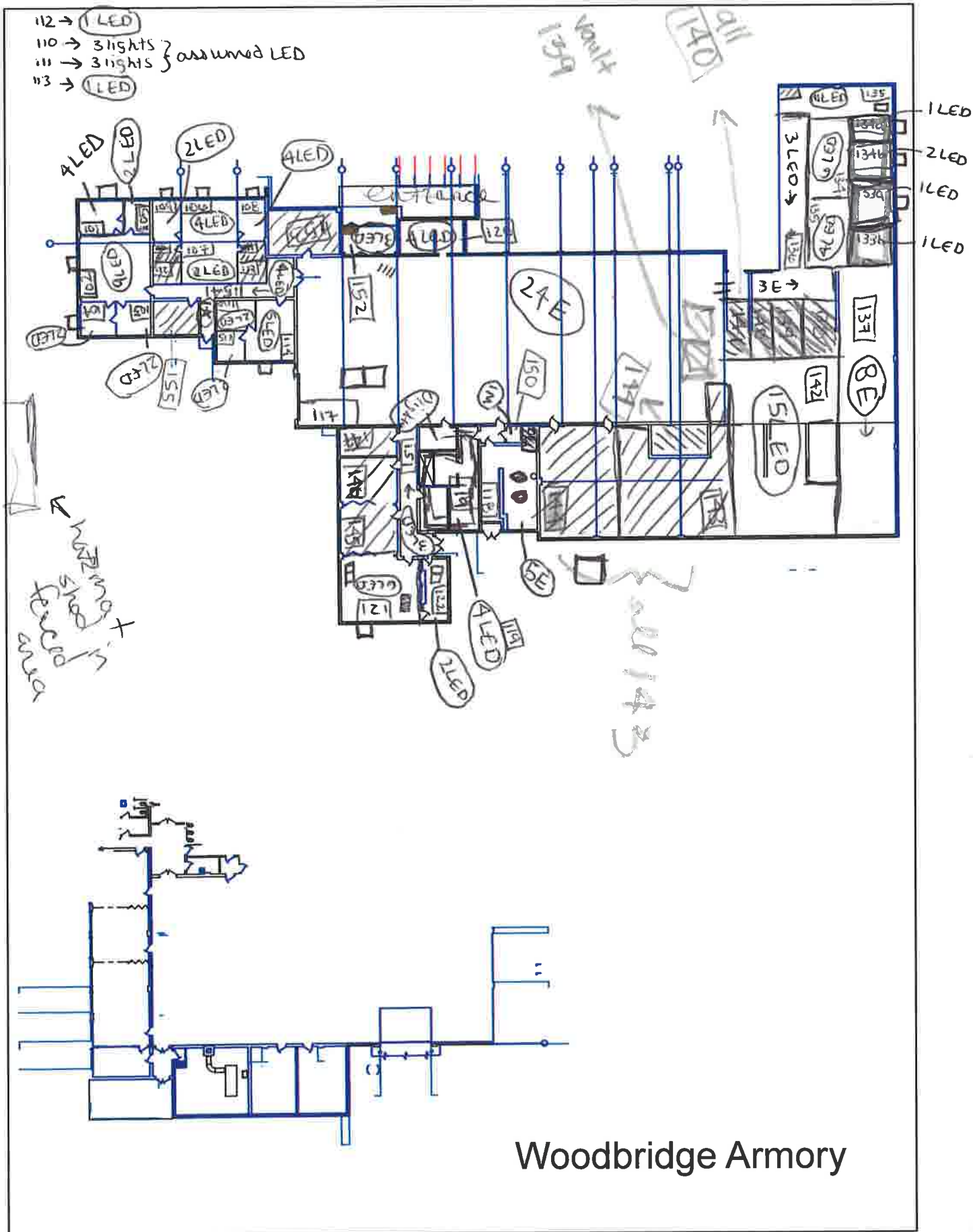
- 112 → 1 LED
- 110 → 3 lights } assumed LED
- 111 → 3 lights }
- 113 → 1 LED

security = 

air cond = 

water fountain = 

boiler = 

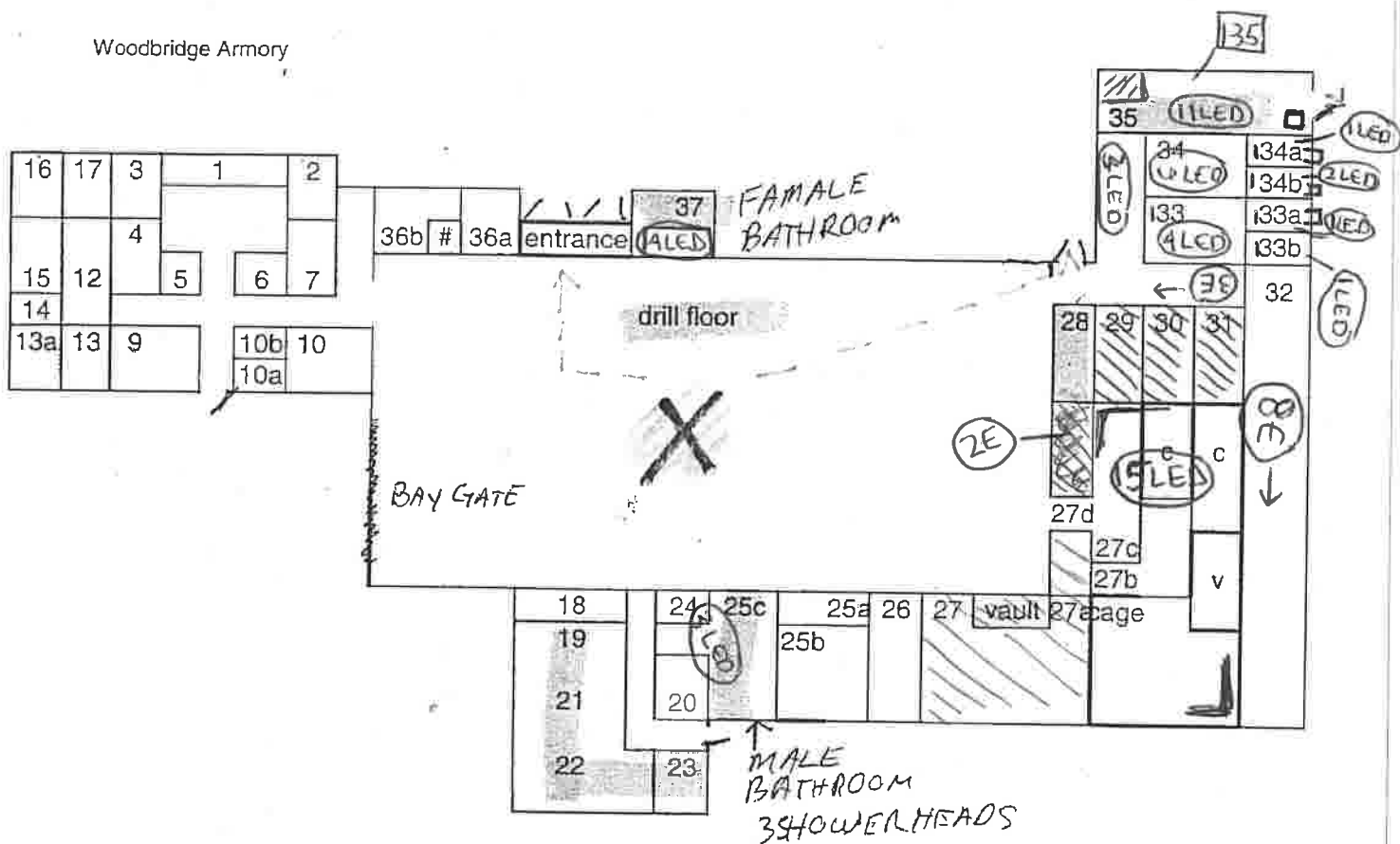


Woodbridge Armory



# WOODBIDGE ARMORY FLOOR PLAN

## FIRE & ESCAPE PLAN

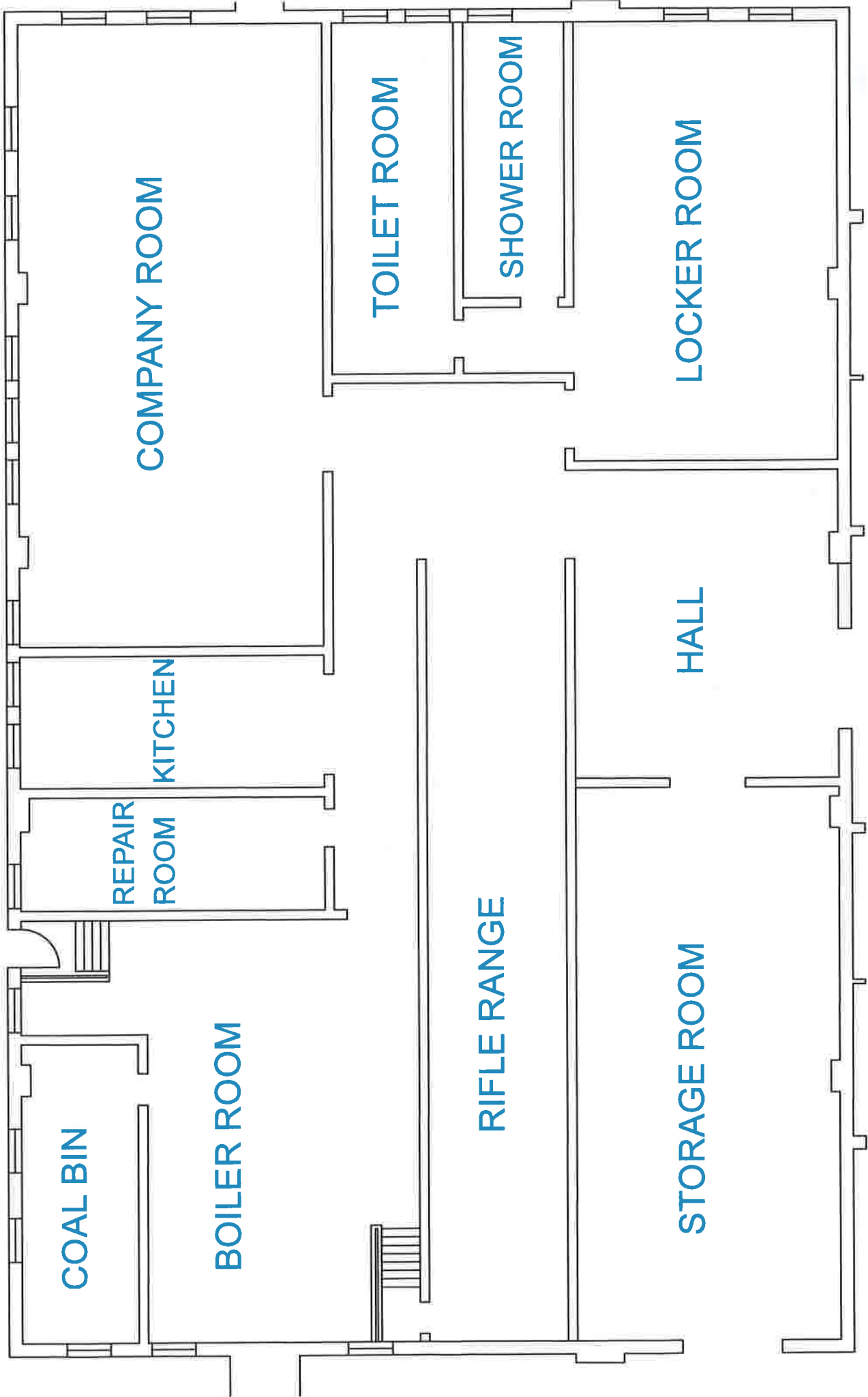


X = You are in this area. If possible, exit this way





# Woodbury E1 Floor Plan







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