Table B-2: Combustion Turbine Emissions
Wolf 1 CHP Data Center
Newark, Delaware

Unit Type		Gas Turbine	
Equipment Model		LM2500 DLE	
Manufacturer		GE	
Rated Capacity		23.2	MW
Exhaust Flow per CT	*Summer*	489,421	lb/hr
	Winter	556,863	lb/hr
Heat Input Rate per CT, H_{in}	*Summer*	213.1	MMBtu/hr (LHV)
	Winter	**220.3**	MMBtu/hr (LHV)
Exhaust Flow Rate per CT, Q	*Summer*	109,583	dscfm
	Winter	113,286	dscfm
Heat Input (6) LM2500	*Winter case x 8760 hrs/yr*	11,578,968	MMBTU/year

Unit Emissions		
Pollutant	***LM2500 DLE***	
	GE CT @ 50% load and greater	
	Emission Factor	Units
NOx[+]	2.0	ppmv d
	0.0073	lb/MMBTU
CO[+]	0.75	ppmv d
	0.0017	lb/MMBTU
VOC[++]	0.0021	lb/MMBTU
SO_2[++]	0.00141	lb/MMBTU
PM_{10}[++]	0.0066	lb/MMBTU
$PM_{2.5}$[++]	0.0066	lb/MMBTU
PM_{Total}[++]	0.0066	lb/MMBTU
H_2SO_4[1]	0.0011	lb/MMBTU
Ammonia[*]	7	ppmv d
	0.0096	lb/MMBTU
Green House Gases		
CO_2[++]	110	lb/MMBTU
CH_4[2++]	0.0086	lb/MMBTU
N_2O++	0.003	lb/MMBTU
Calculated Hourly Emissions Potential to Emit - PER UNIT		
NO_x	1.6	lb/hr
CO	0.37	lb/hr
VOC	0.46	lb/hr
SO_2	0.31	lb/hr
PM_{10}	1.45	lb/hr
$PM_{2.5}$	1.5	lb/hr
PM_{Total}	1.5	lb/hr
H_2SO_4	0.234	lb/hr
Ammonia	2.11	lb/hr
Green House Gases		
CO_2	24,233	lb/hr
CH_4	1.9	lb/hr
N_2O	0.7	lb/hr
Gross Annual Potential to Emit - PER UNIT		
NO_x	7.0	tons/year
CO	1.6	tons/year
VOC	2.0	tons/year
SO_2	1.4	tons/year
PM_{10}	6.4	tons/year
$PM_{2.5}$	6.4	tons/year
PM_{Total}	6.4	tons/year
H_2SO_4	1.0	tons/year
Ammonia	9.3	tons/year
Green House Gases		
CO_2	106,141	tons/year
CH_4	8.3	tons/year
N_2O	2.9	tons/year

Actual Emissions for 6 CTs at 50% load or greater	
Hourly Actual Emissions (lb/hr)	
NO_x	9.63
CO	2.20
VOC	2.78
SO_2	1.86
PM_{10}	8.72
$PM_{2.5}$	8.72
PM_{Total}	8.72
H_2SO_4	1.41
Ammonia	12.67
Greenhouse Gases	
CO_2	145,398
CH_4	11.37
N_2O	3.97
Hourly Actual Emissions (tons/year)	
NO_x	42.17
CO	9.63
VOC	12.16
SO_2	8.16
PM_{10}	38.21
$PM_{2.5}$	38.21
PM_{Total}	38.21
H_2SO_4	6.16
Ammonia	55.51
Greenhouse Gases	
CO_2	636,843
CH_4	49.79
N_2O	17.37

Emission Factor Source:

[1] H_2SO_4 calculated assuming a conservative estimate of 0.5 grains of Sulfur per 100 standard cubic foot (scf); natural gas heating value of 1027BTU/scf; 50% of Sulfur becomes SO_3 and 100% of SO_3 becomes H_2SO_4.

[2] CH_4 assumes all VOC is methane.

[*] Emission factor based on BACT/LAER assessment

[+] Emission Factors obtained via the manufacturer

[++] Emission Factors obtained via Table 3.1-2A of the EPA AP-42, Compilation of Air Pollutant Emission Factors Document Table.

Sulfur content of Natural Gas = 0.5 grains / 100 scf or approximately 0.0015%