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LON C HILL REDEVELOPMENT PROJECT
LON C. HILL, LP

SIEMENS SCC6-5000F
Annual Average Emission Rates per Unit

		Scenario 1			Scenario 2			Scenario 3		
		CASE 3	CASE 3	CASE 40	CASE 6	CASE 6	CASE 41	CASE 10	CASE 10	CASE 11
SITE CONDITIONS										
Ambient Temperature	ºF	45.0	45.0	45.0	60.0	60.0	60.0	75.0	75.0	75.0
Relative Humidity	%	45.0	45.0	45.0	70.0	70.0	70.0	70.0	70.0	70.0
Site Pressure	psia	14.656	14.656	14.656	14.656	14.656	14.656	14.656	14.656	14.656
FACILITY CONDITIONS										
		WITHOUT SU/SD	WITH SU/SD		WITHOUT SU/SD	WITH SU/SD		WITHOUT SU/SD	WITH SU/SD	
Annual Hours of Operation	hr/yr	4,385	3,813	4,375	4,385	3,813	4,375	4,385	3,813	4,375
Plant Mode		2x1	2x1	2X1	2x1	2x1	2X1	2x1	2x1	2x1
GT Fuel Type		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
GT Model		SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F
GT Load		Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit	Base	Base	Base
GT Evap. Cooler Status	On/Off	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
GT Fuel Flow Rate	lb/hr	97,287	97,287	97,287	97,922	97,922	97,922	98,784	98,784	98,772
GT Heat Input (LHV)	MMBtu/hr	2,039	2,039	2,039	2,053	2,053	2,053	2,071	2,071	2,070
GT Heat Input (HHV)	MMBtu/hr	2,262	2,262	2,262	2,277	2,277	2,277	2,297	2,297	2,296
DB Status		OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
DB Fuel Type		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
DB Fuel Flow Rate	lb/hr	-	-	11,594	-	-	10,956	-	-	10,009
DB Heat Input (LHV)	MMBtu/hr	-	-	243	-	-	230	-	-	210
DB Heat Input (HHV)	MMBtu/hr	-	-	270	-	-	255	-	-	233
GT+DB Heat Input (HHV)	MMBtu/hr	2,262	2,262	2,531	2,277	2,277	2,531	2,297	2,297	2,529
FUEL ANALYSIS										
Fuel Heat Content (LHV)	Btu/lb	20,961	20,961	20,961	20,961	20,961	20,961	20,961	20,961	20,961
Fuel Heat Content (HHV)	Btu/lb	23,250	23,250	23,250	23,250	23,250	23,250	23,250	23,250	23,250
HHV/LHV Ratio		1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Fuel Molecular Weight	lb/lbmole	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Fuel Heat Content (LHV)	Btu/scf	926	926	926	926	926	926	926	926	926
Fuel Heat Content (HHV)	Btu/scf	1,027	1,027	1,027	1,027	1,027	1,027	1,027	1,027	1,027
Total Sulfur in Fuel, S	grains/100scf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
HRSG STACK EXHAUST GAS										
Exhaust Gas Temperature	ºF	200	200	187	200	200	192	204	204	196
Exhaust Gas Flow Rate	lb/hr	4,399,506	4,399,506	4,411,100	4,473,279	4,473,279	4,484,235	4,530,005	4,530,005	4,540,014
Exhaust Gas Flow Rate	MMlbmole/yr	678	590	680	692	601	693	703	611	704
Exhaust Oxygen, O2	vol%	12.4	12.4	11.4	12.3	12.3	11.4	12.2	12.2	11.4
Exhaust Carbon Dioxide, CO2	vol%	3.9	3.9	4.4	3.9	3.9	4.3	3.9	3.9	4.2
Exhaust Water, H2O	vol%	8.1	8.1	8.9	8.7	8.7	9.5	9.7	9.7	10.4
Exhaust Nitrogen, N2	vol%	74.8	74.8	74.4	74.2	74.2	73.9	73.5	73.5	73.2
Exhaust Argon, Ar	vol%	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Total	vol%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
MW (GT Exhaust Gases)	lb/lbmole	28.4	28.4	28.4	28.4	28.4	28.3	28.3	28.3	28.2

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		Scenario 1			Scenario 2			Scenario 3		
		CASE 3	CASE 3	CASE 40	CASE 6	CASE 6	CASE 41	CASE 10	CASE 10	CASE 11
STACK EXHAUST EMISSION RATES										
NOx	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NOx (as NO2)	lb/hr	17.1	17.1	19.1	17.2	17.2	19.1	17.3	17.3	19.1
NOx (as NO2)	tpy	37.5	32.6	41.8	37.7	32.8	41.8	37.9	33.0	41.8
CO	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO	lb/hr	10.4	10.4	11.6	10.5	10.5	11.6	10.6	10.6	11.6
CO	tpy	22.8	19.8	25.4	23.0	20.0	25.4	23.2	20.2	25.4
VOC	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
VOC (non-methane, non-ethane)	ppmvd	2.5	2.5	2.8	2.5	2.5	2.8	2.5	2.5	2.8
VOC (as CH4)	tpy	12.6	11.0	14.1	12.7	11.0	14.1	12.8	11.1	14.1
Total Sulfur in Fuel, S	grains/100scf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SO2	tpy	2.8	2.4	3.1	2.8	2.4	3.1	2.8	2.4	3.1
Particulates (Back and Front)	lb/hr	9.9	9.9	12.7	10.0	10.0	12.7	10.1	10.1	12.5
Particulates	tpy	21.7	18.9	27.8	21.9	19.1	27.8	22.1	19.3	27.3
SO3 Oxidation	%	10	10	10	10	10	10	10	10	10
SO3	tpy	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4
Conversion SO3 to H2SO4	%	100	100	100	100	100	100	100	100	100
H2SO4 (Sulfuric Acid Mist)	tpy	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5
NH3	ppmvd @ 15% O_2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
NH3	ppmvd	8.8	8.8	9.9	8.8	8.8	9.8	8.8	8.8	9.7
NH3	tpy	46.9	40.7	52.3	47.1	41.0	52.2	47.6	41.4	52.3
Formaldehyde, HCOH	ppbvd @ 15% O_2	91.0	91.0	91.0	91.0	91.0	91.0	91.0	91.0	91.0
Formaldehyde, HCOH	ppmvd	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Formaldehyde, HCOH	tpy	1.1	1.0	1.3	1.2	1.0	1.3	1.2	1.0	1.3

US EPA ARCHIVE DOCUMENT

LON C HILL REDEVELOPMENT PROJECT
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SIEMENS SCC6-5000F
Annual Average Emission Rates per Unit

		Scenario 4 - 45°F			Scenario 4 - 60°F		
		CASE 3	CASE 3	CASE 40	CASE 6	CASE 6	CASE 41
SITE CONDITIONS							
Ambient Temperature	ºF	45.0	45.0	45.0	60.0	60.0	60.0
Relative Humidity	%	45.0	45.0	45.0	70.0	70.0	70.0
Site Pressure	psia	14.656	14.656	14.656	14.656	14.656	14.656
FACILITY CONDITIONS							
		WITHOUT SU/SD	WITH SU/SD		WITHOUT SU/SD	WITH SU/SD	
Annual Hours of Operation	hr/yr	2,949	2,613	2,188	1,437	1,200	2,188
Plant Mode		2x1	2x1	2X1	2x1	2x1	2X1
GT Fuel Type		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
GT Model		SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F	SCC6-5000F
GT Load		Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit	Shaft Limit
GT Evap. Cooler Status	On/Off	OFF	OFF	OFF	OFF	OFF	OFF
GT Fuel Flow Rate	lb/hr	97,287	97,287	97,287	97,922	97,922	97,922
GT Heat Input (LHV)	MMBtu/hr	2,039	2,039	2,039	2,053	2,053	2,053
GT Heat Input (HHV)	MMBtu/hr	2,262	2,262	2,262	2,277	2,277	2,277
DB Status		OFF	OFF	ON	OFF	OFF	ON
DB Fuel Type		Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
DB Fuel Flow Rate	lb/hr	-	-	11,594	-	-	10,956
DB Heat Input (LHV)	MMBtu/hr	-	-	243	-	-	230
DB Heat Input (HHV)	MMBtu/hr	-	-	270	-	-	255
GT+DB Heat Input (HHV)	MMBtu/hr	2,262	2,262	2,531	2,277	2,277	2,531
FUEL ANALYSIS							
Fuel Heat Content (LHV)	Btu/lb	20,961	20,961	20,961	20,961	20,961	20,961
Fuel Heat Content (HHV)	Btu/lb	23,250	23,250	23,250	23,250	23,250	23,250
HHV/LHV Ratio		1.1	1.1	1.1	1.1	1.1	1.1
Fuel Molecular Weight	lb/lbmole	16.8	16.8	16.8	16.8	16.8	16.8
Fuel Heat Content (LHV)	Btu/scf	926	926	926	926	926	926
Fuel Heat Content (HHV)	Btu/scf	1,027	1,027	1,027	1,027	1,027	1,027
Total Sulfur in Fuel, S	grains/100scf	0.2	0.2	0.2	0.2	0.2	0.2
HRSG STACK EXHAUST GAS							
Exhaust Gas Temperature	ºF	200	200	187	200	200	192
Exhaust Gas Flow Rate	lb/hr	4,399,506	4,399,506	4,411,100	4,473,279	4,473,279	4,484,235
Exhaust Gas Flow Rate	MMlbmole/yr	456	404	340	227	189	346
Exhaust Oxygen, O2	vol%	12.4	12.4	11.4	12.3	12.3	11.4
Exhaust Carbon Dioxide, CO2	vol%	3.9	3.9	4.4	3.9	3.9	4.3
Exhaust Water, H2O	vol%	8.1	8.1	8.9	8.7	8.7	9.5
Exhaust Nitrogen, N2	vol%	74.8	74.8	74.4	74.2	74.2	73.9
Exhaust Argon, Ar	vol%	0.9	0.9	0.9	0.9	0.9	0.9
Total	vol%	100.0	100.0	100.0	100.0	100.0	100.0
MW (GT Exhaust Gases)	lb/lbmole	28.4	28.4	28.4	28.4	28.4	28.3

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Annual Average Emission Rates per Unit

		Scenario 4 - 45°F			Scenario 4 - 60°F		
		CASE 3	CASE 3	CASE 40	CASE 6	CASE 6	CASE 41
STACK EXHAUST EMISSION RATES							
NOx	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0
NOx (as NO2)	lb/hr	17.1	17.1	19.1	17.2	17.2	19.1
NOx (as NO2)	tpy	25.2	22.3	20.9	12.4	10.3	20.9
CO	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0
CO	lb/hr	10.4	10.4	11.6	10.5	10.5	11.6
CO	tpy	15.3	13.6	12.7	7.5	6.3	12.7
VOC	ppmvd @ 15% O_2	2.0	2.0	2.0	2.0	2.0	2.0
VOC (non-methane, non-ethane)	ppmvd	2.5	2.5	2.8	2.5	2.5	2.8
VOC (as CH4)	tpy	8.5	7.5	7.0	4.2	3.5	7.0
Total Sulfur in Fuel, S	grains/100scf	0.2	0.2	0.2	0.2	0.2	0.2
SO2	tpy	1.9	1.6	1.5	0.9	0.8	1.5
Particulates (Back and Front)	lb/hr	9.9	9.9	12.7	10.0	10.0	12.7
Particulates	tpy	14.6	12.9	13.9	7.2	6.0	13.9
SO3 Oxidation	%	10	10	10	10	10	10
SO3	tpy	0.2	0.2	0.2	0.1	0.1	0.2
Conversion SO3 to H2SO4	%	100	100	100	100	100	100
H2SO4 (Sulfuric Acid Mist)	tpy	0.3	0.3	0.2	0.1	0.1	0.2
NH3	ppmvd @ 15% O_2	7.0	7.0	7.0	7.0	7.0	7.0
NH3	ppmvd	8.8	8.8	9.9	8.8	8.8	9.8
NH3	tpy	31.5	27.9	26.1	15.4	12.9	26.1
Formaldehyde, HCOH	ppbvd @ 15% O_2	91.0	91.0	91.0	91.0	91.0	91.0
Formaldehyde, HCOH	ppmvd	0.1	0.1	0.1	0.1	0.1	0.1
Formaldehyde, HCOH	tpy	0.8	0.7	0.6	0.4	0.32	0.6