Sterigenics - Santa Teresa Facility
2020 Annual EO + PO Emissions

EO

PO

Emission Source (Unit)/Control (Unit)
2020 Usage (lb)
1,089,769

14,811

Notes:
Calculations based on the following sterilant usage mass balance:
95% From vacuum pumps to scrubber
1% From backvents to catalytic oxidizer
4% From aeration to catalytic oxidizer
PO emissions are based on same mass balance as used for EO and control efficiencies observed for EO performance testi

EO Performance Test Efficiencies
Scrubber
Catalytic Oxidizer from Backvent
Catalytic Oxidizer from Aeration

Abator Test date
Scrubber Test date

Vacuum Pumps (S1-S14)/Scrubber (CD2)			Backvents (BV1-BV14)/Catalytic Oxidizer	
Uncontrolled (lb)	Controlled (lb)	Controlled (tons)	Uncontrolled (lb)	Controlled (lb)
1035281	476.23	0.2381	10898	2.02
			Total Oxidizer EO Emissions (lbs)	
			Total Oxidizer EO Emissions (tons)	
Uncontrolled (lb)	Controlled (lb)	Controlled (tons)	Uncontrolled (lb)	Controlled (lb)
14070	6.47	0.0032	148	0.03
			Total Oxidizer PO Emissions (lbs)	
			Total Oxidizer PO Emissions (tons)	

ng

99.9540%
99.9815%
99.9792%

11/5/2020
12/12/2012

r (CD 3)	Aeration Rooms (AR8 +AR9)/Catalytic Oxidizer (CD 3)		
Controlled (tons)	Uncontrolled (lb)	Controlled (lb)	(Controlled Tons)
0.00101	43591	9.1	0.0045
	11.08		
	0.0055		
Controlled (tons)	Uncontrolled (lb)	Controlled (lb)	(Controlled Tons)
0.00001	592	0.1	0.0001
	0.15		
	0.00008		

2020 ST Facility Natural Gas B

Jan
1,441,150

Month

Jan
Feb
March
April
May
June
July
August
September
October
November
December

Annual Total:

Natural Gas Usage/Distributi

Unit
Catalytic Oxidizer Burner (CD 3)
Boiler #1 - Outside Boiler (B1)
Boiler #2 - Inside Boiler (B2)

Notes:

Assumptions:

Boiler 1
Boiler 2

ill Data

Feb
1,391,281

KWH

1441150
1391281
1321597
1143136
1056086
948994
914426
914696
992886
1138612
1358017
1570399

14191280

on

Rating (BTU/HR)
3,765,000
9,000,000
8,165,000

Only pipeline quality, commercial natural gas is utilized at the ST site
Boiler #1 is listed in AEIR as B1 or EQPT-11. Boiler #2 is listed as B2 or EQPT-12. There is no third boiler at the site.
Units using natural gas at the ST site are not metered individually. Usage is metered only for the site as a whole.
Due to relative usage considerations and observations at other locations, assume gas usage allocation between catalytic
Gas usage split between boilers based on BTU Rating is: Boiler 1 = 52.4%, Boiler 2 = 47.6%, as calculated below:

0.52432275
0.47567725

Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,321,597	1,143,136	1,056,086	948,994	914,426	914,696	992,886	1,138,612	1,358,017	1,570,399

Therms	MMSCF
49186	4.68251
47484	4.52048
45106	4.29406
39015	3.71422
36044	3.43138
32389	3.08342
31209	2.97110
31218	2.97198
33887	3.22603
38860	3.69952
46349	4.41240
53597	5.10246
484344	**46.1096**

KWH	Therms	MMSCF
8514768	290606	27.6657
2974492	101519	9.6646
2702020	92219	8.7793

oxidizer (full-time usage) and gas boilers (on demand usage) to be approximately 60% catalytic oxidizer- 40% boilers

Natural Gas Combustion Emissions

Emission Source	AEIR ID (Designation)	Max BTU/Hour Rating
Donaldson Abator (Catalytic Oxidizer) Burner	CONT-8 (CD 3)	3,765,000
Boiler #1 - Outside Boiler	EQPT-11 (B1)	9,000,000
Boiler #2 - Inside Boiler	EQPT-13 (B2)	8,165,000
Boiler 1 and Boiler 2 Combined (Note 6)	EQPT-11 (B1)	Less than 18

Emission Factors:		
Emission Source		Unit Model Number
Donaldson Abator (Catalytic Oxidizer) Burner (Note 1)		--
Boiler #1 - Outside Boiler (Note 2)		FLX-700-900-150ST
Boiler #2 - Inside Boiler (Note 3)		CBLE-700-200-150ST

Notes:

1. Emission factors in lb/ft3 are taken from US EPA's AP-42 database for Natural Gas fired burners less than 10
2. Emission factors for NOx and CO represent manufacturer guaranteed limits per boiler specification sheet. Er
3. Emission factors represent manufacturer guaranteed limits per boiler specification sheet.
4. Orange cells are for EFs from AP-42. Green cells are for EFs from manufacturer/specification sheet
5. Only pipeline quality, commercial natural gas is used as fuel at the site. Supplemental natural parameters er
6. There are two boilers at site, Boiler #1 -Outside Boiler and Boiler #2 - Inside Boiler, permitted together as Ur 11 /B1. Therefore, emissions for EQPT-13/B2 and EQPT-14/B3 will be set to zero in the database. There is no th

		Annual Emissions (lbs)				
Natural Gas Heating Value (BTU/SCF)	Annual Gas Consumption (MMSCF)	Particulate Material - PM_{10}	Sulfur Dioxide - SO2	Nitrogen Oxides - NO_x	Volatile Organic Compounds - VOC	Carbon Monoxide - CO
1000	27.6657	210.260	16.599	2766.573	152.162	2323.921
1000	9.6646	73.451	5.799	703.790	53.155	357.045
1000	8.7793	87.793	14.837	639.321	140.468	1297.354
	18.4438	161.243	20.636	1343.111	193.623	1654.399

PM10			SO2			
ppm	lb/ft3	lb/MMBtu	ppm	lb/ft3	lb/MMBtu	ppm
--	0.0000076	0.0076	--	0.0000006	0.0006	--
--	0.0000076	0.0076	--	0.0000006	0.0006	60
--	--	0.01	1	--	0.0017	60

0 MMBtu/hr (uncontrolled). Available online at: https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf. A
nission factors for the remaining pollutants are taken from US EPA's AP-42 database for Natural Gas fired burner

ıtered in AEIR are based on data from natural gas transportation contract provided by natural gas supplier.
ıit Bx. Based on how the AEIR unit descriptions are set, emissions for both boilers are to be reported collectively
ıird boiler or EQPT-14/B3 at the site.

Annual Emissions (tons)				
Particulate Material - PM_{10}	Sulfur Dioxide - SO2	Nitrogen Oxides - NO_x	Volatile Organic Compounds - VOC	Carbon Monoxide - CO
0.1051	0.0083	1.3833	0.0761	1.1620
0.0367	0.0029	0.3519	0.0266	0.1785
0.0439	0.0074	0.3197	0.0702	0.6487
0.0806	0.0103	0.6716	0.0968	0.8272

NOx		VOC			CO		
lb/ft3	lb/MMBtu	ppm	lb/ft3	lb/MMBtu	ppm	lb/ft3	lb/MMBtu
0.0001	0.100	--	0.0000055	0.0055	--	0.000084	0.084
--	0.073	--	0.0000055	0.0055	50	--	0.036943719
--	0.073	--	--	0.016	200	--	0.147774877

ccessed: November 2020.
·s less than 100 MMBtu/hr.

under EQPT-