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"Your Regulatory Compliance Expert"

May 16, 2017

Ms. Laura Hartman
Manager, Environmental Health and Safety
STERIGENICS, INC.
2015 Spring Road, Suite 650
Oak Brook, Illinois 60523

Subject: **RESULTS OF ETHYLENE OXIDE SOURCE TESTING PERFORMED AT THE STERIGENICS FACILITY IN LOS ANGELES, CALIFORNIA**

Dear Ms. Hartman:

Please find attached a presentation of the results of the ethylene oxide source testing and leak testing performed at your 49th Street and 50th Street facilities in Los Angeles, CA by ECSi, on Tuesday, May 16, 2017. These test results are to be kept with all records pertaining to SCAQMD-required testing of the EtO gas-sterilization system, and are to be made available upon request by the SCAQMD. A copy of all raw test data, complete with sample chromatograms and calibration data, will be maintained in our files, and will be made available upon request.

The test results indicate that you continue to operate the EtO sterilization and emission-control systems at both facilities in compliance with SCAQMD Rule 1405. I will follow up with you in approximately five months to let you know when your next semi-annual leak test is due, and in approximately eleven months to let you know when your next annual source test/leak test is due.

If you have any questions or comments regarding this submittal, please contact me at (949)400-9145. We thank you for the opportunity to serve your needs.

Respectfully Submitted:

Daniel P. Kremer
ECSi

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TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (49TH ST ABATOR)
OPERATED BY STERIGENICS, INC.
IN LOS ANGELES, CALIFORNIA
ON MAY 16, 2017

CYCLE PHASE	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
Backvent(3)	944	137	0.01	99.9927
Backvent	945	25.3	0.01	99.9605
Backvent	946	16.5	0.01	99.9394
Backvent	947	15.1	0.01	99.9338
Backvent	948	14.5	0.01	99.9310
Backvent	949	14.8	0.01	99.9324
Backvent	950	14.2	0.01	99.9296
Backvent	952	14.1	0.01	99.9291
Backvent	953	13.9	0.01	99.9281
Backvent	954	12.9	0.01	99.9225
Backvent	955	13.5	0.01	99.9259
Backvent	956	13.1	0.01	99.9237
Backvent	958	13.4	0.01	99.9254
TIME-WEIGHTED AVERAGE:		**24.48**	**0.0100**	**99.9365**
		SCAQMD REQUIRED CONTROL EFFICIENCY:		**99.0**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - The backvent phase test run started at 9:43, ended at 9:58.
(4) - The average Abator catalyst bed temperature during the backvent phase test run was 286 degrees F.

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (49TH ST ABATOR)
OPERATED BY STERIGENICS, INC.
IN LOS ANGELES, CALIFORNIA
ON MAY 16, 2017

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	833	12.7	0.01	99.9213
1	838	12.3	0.01	99.9187
1	843	12.2	0.01	99.9180
1	848	13.3	0.01	99.9248
1	853	13.8	0.01	99.9275
1	858	14.0	0.01	99.9286
1	903	12.7	0.01	99.9213
1	908	12.1	0.01	99.9174
1	913	11.9	0.01	99.9160
1	918	11.8	0.01	99.9153
1	923	12.0	0.01	99.9167
1	928	11.8	0.01	99.9153
2(4)	1003	11.7	0.01	99.9145
2	1008	11.2	0.01	99.9107
2	1013	11.3	0.01	99.9115
2	1018	11.3	0.01	99.9115
2	1023	11.2	0.01	99.9107
2	1028	11.2	0.01	99.9107
2	1033	11.2	0.01	99.9107
2	1038	12.4	0.01	99.9194
2	1043	13.0	0.01	99.9231
2	1048	13.4	0.01	99.9254
2	1053	12.2	0.01	99.9180
2	1058	12.5	0.01	99.9200
3(5)	1103	10.2	0.01	99.9020
3	1108	9.53	0.01	99.8951
3	1113	9.89	0.01	99.8989
3	1118	9.96	0.01	99.8996
3	1123	9.81	0.01	99.8981
3	1128	9.80	0.01	99.8980
3	1133	9.50	0.01	99.8947
3	1138	9.41	0.01	99.8937
3	1143	9.77	0.01	99.8976
3	1148	9.22	0.01	99.8915
3	1153	10.0	0.01	99.9000
3	1158	9.69	0.01	99.8968
TIME-WEIGHTED AVERAGE:		**11.39**	**0.0100**	**99.9109**
		SCAQMD REQUIRED CONTROL EFFICIENCY:		**99.0%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 8:30, ended at 9:30.
(4) - Aeration Phase Test Run #2 started at 10:00, ended at 11:00.
(5) - Aeration Phase Test Run #3 started at 11:00, ended at 12:00.
(4) - The average catalyst bed temperature recorded during the test was 286 degrees F.

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TABLE 3
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (50TH ST ABATOR)
OPERATED BY STERIGENICS, INC.
IN LOS ANGELES, CALIFORNIA
ON MAY 16, 2017

CYCLE PHASE	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
Backvent(3)	1309	10.4	0.01	99.9038
Backvent	1310	40.3	0.01	99.9752
Backvent	1311	36.0	0.01	99.9722
Backvent	1312	27.9	0.01	99.9642
Backvent	1313	51.1	0.01	99.9804
Backvent	1314	22.4	0.01	99.9554
Backvent	1315	18.7	0.01	99.9465
Backvent	1317	15.0	0.01	99.9333
Backvent	1318	14.4	0.01	99.9306
Backvent	1319	14.3	0.01	99.9301
Backvent	1320	13.9	0.01	99.9281
Backvent	1322	13.5	0.01	99.9259
Backvent	1323	13.7	0.01	99.9270
TIME-WEIGHTED AVERAGE:		**22.43**	**0.0100**	**99.9441**
		SCAQMD REQUIRED CONTROL EFFICIENCY:		**99.0**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - The backvent phase test run started at 13:08, ended at 13:23.
(4) - The average Abator catalyst bed temperature during the backvent phase test run was 289 degrees F.

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TABLE 4
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (50TH ST ABATOR)
OPERATED BY STERIGENICS, INC.
IN LOS ANGELES, CALIFORNIA
ON MAY 16, 2017

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1208	10.7	0.01	99.9065
1	1213	10.9	0.01	99.9083
1	1218	10.8	0.01	99.9074
1	1223	10.5	0.01	99.9048
1	1228	10.5	0.01	99.9048
1	1233	11.2	0.01	99.9107
1	1238	10.8	0.01	99.9074
1	1243	10.8	0.01	99.9074
1	1248	11.3	0.01	99.9115
1	1253	11.2	0.01	99.9107
1	1258	11.2	0.01	99.9107
1	1303	10.8	0.01	99.9074
2(4)	1328	12.6	0.01	99.9206
2	1333	12.8	0.01	99.9219
2	1338	13.4	0.01	99.9254
2	1343	12.7	0.01	99.9213
2	1348	12.5	0.01	99.9200
2	1353	11.7	0.01	99.9145
2	1358	11.0	0.01	99.9091
2	1403	12.1	0.01	99.9174
2	1408	11.7	0.01	99.9145
2	1413	11.6	0.01	99.9138
2	1418	11.3	0.01	99.9115
2	1423	11.2	0.01	99.9107
3(5)	1428	11.3	0.01	99.9115
3	1433	11.1	0.01	99.9099
3	1438	10.8	0.01	99.9074
3	1443	10.9	0.01	99.9083
3	1448	10.6	0.01	99.9057
3	1453	10.7	0.01	99.9065
3	1458	10.7	0.01	99.9065
3	1503	10.6	0.01	99.9057
3	1508	10.2	0.01	99.9020
3	1513	10.1	0.01	99.9010
3	1518	10.4	0.01	99.9038
3	1523	10.2	0.01	99.9020
TIME-WEIGHTED AVERAGE:		**11.19**	**0.0100**	**99.9102**
		SCAQMD REQUIRED CONTROL EFFICIENCY:		**99.0%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 12:05, ended at 13:05.
(4) - Aeration Phase Test Run #2 started at 13:25, ended at 14:25.
(5) - Aeration Phase Test Run #3 started at 14:25, ended at 15:25.
(4) - The average catalyst bed temperature recorded during the test was 288 degrees F.

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TABLE 5
ETHYLENE OXIDE LEAK TESTING
OF A GAS STERILIZATION SYSTEM (6 STERILIZERS)
OPERATED BY STERIGENICS, INC. (50TH ST PLANT)
IN LOS ANGELES, CALIFORNIA
ON MAY 15, 2017

COMPONENT GROUP TESTED	LEAKING COMPONENTS FOUND	CONCENTRATION
Supply Tanks / Load Station	None	<1.0 ppm (1)
Sterilizer Inlet / Inbleed Valve	None	<1.0 ppm
Door Seal	None	<1.0 ppm
Sterilizer Outlet / Chamber Drain	None	<1.0 ppm
Vacuum Pump / Floor Drain	None	<1.0 ppm
Emission Control Device Inlet	None	<1.0 ppm

Notes:
(1) - PPM = parts per million by volume

TABLE 6
ETHYLENE OXIDE LEAK TESTING
OF A GAS STERILIZATION SYSTEM (8 STERILIZERS)
OPERATED BY STERIGENICS, INC. (49TH ST PLANT)
IN LOS ANGELES, CALIFORNIA
ON MAY 15, 2017

COMPONENT GROUP TESTED	LEAKING COMPONENTS FOUND	CONCENTRATION
Supply Tanks / Load Station	None	<1.0 ppm (1)
Sterilizer Inlet / Inbleed Valve	None	<1.0 ppm
Door Seal	None	<1.0 ppm
Sterilizer Outlet / Chamber Drain	None	<1.0 ppm
Vacuum Pump / Floor Drain	None	<1.0 ppm
Emission Control Device Inlet	None	<1.0 ppm

Notes:
(1) - PPM = parts per million by volume

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Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - 49th Street Plant - Los Angeles, California
5/16/17 - Backvent Phase Emissions

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
0.175	0.4183	202	0.01
0.175	0.4183	202	0.01
0.175	0.4183	202	0.01
0.175	0.4183	202	0.01
0.175	0.4183	202	0.01
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
0.175	0.4183	201	0.01
Average =			
0.175	0.4183	201.4	**0.0100**
	=	661	degR

mw =	28.51	
stack area =	7.07	
press =	29.70	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.3	ft/sec
Flow =	**10203**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000075**	**lbs/min**
EtO Mass Flow =	**0.000453**	**lbs/hr**

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Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - 49th Street Plant - Los Angeles, California
5/16/17 - Aeration Emissions

DeltaP	SqRtDeltaP	Stack Temp (F)	ppm EtO
Run#1			
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
Run#2			
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	201	0.01
0.17	0.4123	202	0.01
0.17	0.4123	202	0.01
Run#3			
0.17	0.4123	202	0.01
0.17	0.4123	202	0.01
0.17	0.4123	202	0.01
0.17	0.4123	202	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
0.17	0.4123	203	0.01
Average =			
0.17	0.4123	201.6	0.0100
	=	662	degR

mw =	28.51	
stack area =	7.07	
press =	29.70	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	30.8	ft/sec
Flow =	**10055**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000115**	**lbs/min**
EtO Mass Flow =	**0.000690**	**lbs/hr**

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Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - 50th Street Plant - Los Angeles, California
5/16/17 - Backvent Phase Emissions

DeltaP	SqRtDeltaP	Temp (F)	ppm EtO
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
0.175	0.4183	193	0.01
Average =			
0.175	0.4183	192.7	**0.0100**
	=	653	degR

mw =	28.51	
stack area =	7.07	
press =	29.70	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.1	ft/sec
Flow =	**10271**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000076**	**lbs/min**
EtO Mass Flow =	**0.000456**	**lbs/hr**

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Ethylene Oxide Mass Emissions Data and Calculations

Sterigenics, Inc. - 50th Street Plant - Los Angeles, California
5/16/17 - Aeration Emissions

DeltaP	SqRtDeltaP	Stack Temp (F)	ppm EtO
Run#1			
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	191	0.01
0.175	0.4183	191	0.01
0.175	0.4183	188	0.01
0.175	0.4183	189	0.01
0.175	0.4183	192	0.01
0.175	0.4183	192	0.01
0.175	0.4183	193	0.01
Run#2			
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	193	0.01
0.175	0.4183	195	0.01
0.175	0.4183	194	0.01
0.175	0.4183	196	0.01
0.175	0.4183	197	0.01
0.175	0.4183	195	0.01
0.175	0.4183	195	0.01
Run#3			
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	194	0.01
0.175	0.4183	195	0.01
0.175	0.4183	195	0.01
0.175	0.4183	196	0.01
0.175	0.4183	196	0.01
0.175	0.4183	196	0.01
0.175	0.4183	196	0.01
0.175	0.4183	195	0.01
0.175	0.4183	195	0.01
Average =			
0.175	0.4183	193.7	0.0100
	=	654	degR

mw =	28.51	
stack area =	7.07	
press =	29.70	
Tstd =	528	
Pstd =	29.92	
Cp =	0.99	
Kp =	85.49	
Velocity =	31.1	ft/sec
Flow =	**10263**	**dscfm**
MWeto =	44.05	
MolVol =	385.32	
ppmv/ft3 =	1000000	
EtO Mass Flow =	**0.0000117**	**lbs/min**
EtO Mass Flow =	**0.000704**	**lbs/hr**