



September 27, 2018

Mr. Alec Messina  
Director  
Illinois Environmental Protection Agency (IL-EPA)  
1021 North Grand Avenue East  
Post Office Box 19276  
Springfield, IL 62794-9276

Re: Sterigenics U.S., LLC Permit # 95120085

Dear Mr. Messina:

As requested in your September 25, 2018 letter, Sterigenics is providing the final results from the recent stack tests at our Willowbrook facilities to the Illinois EPA. Stack testing was conducted at the Sterigenics Willowbrook 1 and Willowbrook 2 facilities on September 20 and 21, 2018 to test the recent equipment upgrades that control the backvent process emissions. The two-day testing was conducted by a third-party, independent tester and witnessed by representatives from the IL-EPA, U.S. Environmental Protection Agency (EPA), Tri-State Fire Department and the Village of Willowbrook.

The final test results for the Willowbrook 1 and 2 facilities are summarized in the attached two tables. The test results show that all test measurements taken in the outlets of the two emissions control systems were below the detection limit of the stack testing measurement equipment. These tests were taken while the sterilization chamber back vents were exhausting to the emission controls. Using the determined quantification limit of the measurement equipment, control efficiencies were calculated to be 99.6061 and 99.5606 for the Willowbrook 1 and 2 facilities, respectively.

The final reports for these stack tests are underway and should be complete soon.

If you have any questions, please feel free to contact me.

Regards,

Kathleen Hoffman  
SVP, Global EH&S and Technical Services

**TABLE 1**  
**ETHYLENE OXIDE CONTROL EFFICIENCY – BACKVENT**  
**OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE**  
**OPERATED BY STERIGENICS, INC.**  
**IN WILLOWBROOK, ILLINOIS (PLANT 1)**  
**ON SEPTEMBER 21, 2018**

| <u>RUN NUMBER</u>                   | <u>INJECTION TIME</u> | <u>INLET ETO CONC. (PPM)<sup>1</sup></u> | <u>OUTLET ETO CONC. (PPM)<sup>2</sup></u> | <u>ETO CONTROL EFFICIENCY</u> |
|-------------------------------------|-----------------------|--|---|-------------------------------|
| 1 <sup>3</sup>                      | 914                   | 11.5                                     | <0.10 (ND <sup>4</sup> )                  | 99.1304                       |
| 1                                   | 915                   | 542                                      | <0.10 (ND)                                | 99.9815                       |
| 1                                   | 916                   | 38.9                                     | <0.10 (ND)                                | 99.7429                       |
| 1                                   | 917                   | 34.5                                     | <0.10 (ND)                                | 99.7101                       |
| 1                                   | 918                   | 27.6                                     | <0.10 (ND)                                | 99.6377                       |
| 1                                   | 919                   | 26.8                                     | <0.10 (ND)                                | 99.6269                       |
| 1                                   | 920                   | 27.0                                     | <0.10 (ND)                                | 99.6296                       |
| 1                                   | 921                   | 23.1                                     | <0.10 (ND)                                | 99.5671                       |
| 1                                   | 923                   | 25.4                                     | <0.10 (ND)                                | 99.6063                       |
| 1                                   | 924                   | 24.0                                     | <0.10 (ND)                                | 99.5833                       |
| 1                                   | 925                   | 23.7                                     | <0.10 (ND)                                | 99.5781                       |
| 1                                   | 926                   | 23.5                                     | <0.10 (ND)                                | 99.5745                       |
| 1                                   | 927                   | 23.2                                     | <0.10 (ND)                                | 99.5690                       |
| 2 <sup>5</sup>                      | 931                   | 24.0                                     | <0.10 (ND)                                | 99.5833                       |
| 2                                   | 932                   | 22.5                                     | <0.10 (ND)                                | 99.5556                       |
| 2                                   | 933                   | 42.3                                     | <0.10 (ND)                                | 99.7636                       |
| 2                                   | 934                   | 31.3                                     | <0.10 (ND)                                | 99.6805                       |
| 2                                   | 935                   | 28.8                                     | <0.10 (ND)                                | 99.6528                       |
| 2                                   | 936                   | 28.7                                     | <0.10 (ND)                                | 99.6516                       |
| 2                                   | 937                   | 28.5                                     | <0.10 (ND)                                | 99.6491                       |
| 2                                   | 939                   | 26.7                                     | <0.10 (ND)                                | 99.6255                       |
| 2                                   | 940                   | 26.8                                     | <0.10 (ND)                                | 99.6269                       |
| 2                                   | 941                   | 26.4                                     | <0.10 (ND)                                | 99.6212                       |
| 2                                   | 942                   | 26.9                                     | <0.10 (ND)                                | 99.6283                       |
| 2                                   | 943                   | 25.0                                     | <0.10 (ND)                                | 99.6000                       |
| 2                                   | 944                   | 25.2                                     | <0.10 (ND)                                | 99.6032                       |
| 3 <sup>6</sup>                      | 953                   | 23.1                                     | <0.10 (ND)                                | 99.5671                       |
| 3                                   | 954                   | 22.8                                     | <0.10 (ND)                                | 99.5614                       |
| 3                                   | 955                   | 27.8                                     | <0.10 (ND)                                | 99.6403                       |
| 3                                   | 956                   | 26.0                                     | <0.10 (ND)                                | 99.6154                       |
| 3                                   | 957                   | 23.8                                     | <0.10 (ND)                                | 99.5798                       |
| 3                                   | 958                   | 23.0                                     | <0.10 (ND)                                | 99.5652                       |
| 3                                   | 1000                  | 22.3                                     | <0.10 (ND)                                | 99.5516                       |
| 3                                   | 1001                  | 22.8                                     | <0.10 (ND)                                | 99.5614                       |
| 3                                   | 1002                  | 22.8                                     | <0.10 (ND)                                | 99.5614                       |
| 3                                   | 1003                  | 23.4                                     | <0.10 (ND)                                | 99.5726                       |
| 3                                   | 1004                  | 21.7                                     | <0.10 (ND)                                | 99.5392                       |
| 3                                   | 1006                  | <u>21.7</u>                              | <u>&lt;0.10 (ND)</u>                      | 99.5392                       |
| <b>TIME-WEIGHTED AVERAGE:</b>       |                       | <b>39.36</b>                             | <b>0.1000</b>                             | <b>99.6061</b>                |
| <b>REQUIRED CONTROL EFFICIENCY:</b> |                       |  |   | <b>99%</b>                    |

<sup>1</sup> PPM = parts per million by volume

<sup>2</sup> 0.10 ppm is the quantification limit for the detector used at the outlet

<sup>3</sup> Backvent Phase Test Run #1 started at 9:13, ended at 9:28.

<sup>4</sup> ND = Below Detection Limit

<sup>5</sup> Backvent Phase Test Run #2 started at 9:30, ended at 9:45.

<sup>6</sup> Backvent Phase Test Run #3 started at 9:52, ended at 10:07.

**TABLE 1**  
**ETHYLENE OXIDE CONTROL EFFICIENCY – BACKVENT**  
**OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE**  
**OPERATED BY STERIGENICS, INC.**  
**IN WILLOWBROOK, ILLINOIS (PLANT 2)**  
**ON SEPTEMBER 20, 2018**

| <u>RUN NUMBER</u>             | <u>INJECTION TIME</u> | <u>INLET ETO CONC. (PPM)<sup>1</sup></u> | <u>OUTLET ETO CONC. (PPM)<sup>2</sup></u> | <u>ETO CONTROL EFFICIENCY</u>           |
|-------------------------------|-----------------------|--|---|---|
| 1 <sup>3</sup>                | 1539                  | 7.94                                     | <0.10 (ND <sup>4</sup> )                  | 98.7406                                 |
| 1                             | 1540                  | 8.41                                     | <0.10 (ND)                                | 98.8109                                 |
| 1                             | 1541                  | 213                                      | <0.10 (ND)                                | 99.9531                                 |
| 1                             | 1542                  | 30.4                                     | <0.10 (ND)                                | 99.6711                                 |
| 1                             | 1544                  | 22.3                                     | <0.10 (ND)                                | 99.5516                                 |
| 1                             | 1545                  | 22.2                                     | <0.10 (ND)                                | 99.5495                                 |
| 1                             | 1546                  | 21.8                                     | <0.10 (ND)                                | 99.5413                                 |
| 1                             | 1547                  | 19.7                                     | <0.10 (ND)                                | 99.4924                                 |
| 1                             | 1548                  | 18.8                                     | <0.10 (ND)                                | 99.4681                                 |
| 1                             | 1549                  | 20.3                                     | <0.10 (ND)                                | 99.5074                                 |
| 1                             | 1550                  | 19.3                                     | <0.10 (ND)                                | 99.4819                                 |
| 1                             | 1552                  | 19.8                                     | <0.10 (ND)                                | 99.4949                                 |
| 2 <sup>5</sup>                | 1617                  | 13.0                                     | <0.10 (ND)                                | 99.2308                                 |
| 2                             | 1618                  | 545                                      | <0.10 (ND)                                | 99.9817                                 |
| 2                             | 1619                  | 50.0                                     | <0.10 (ND)                                | 99.8000                                 |
| 2                             | 1620                  | 22.0                                     | <0.10 (ND)                                | 99.5455                                 |
| 2                             | 1621                  | 22.8                                     | <0.10 (ND)                                | 99.5614                                 |
| 2                             | 1622                  | 19.7                                     | <0.10 (ND)                                | 99.4924                                 |
| 2                             | 1623                  | 20.0                                     | <0.10 (ND)                                | 99.5000                                 |
| 2                             | 1625                  | 20.5                                     | <0.10 (ND)                                | 99.5122                                 |
| 2                             | 1626                  | 19.8                                     | <0.10 (ND)                                | 99.4949                                 |
| 2                             | 1627                  | 19.5                                     | <0.10 (ND)                                | 99.4872                                 |
| 2                             | 1628                  | 21.3                                     | <0.10 (ND)                                | 99.5305                                 |
| 2                             | 1629                  | 19.4                                     | <0.10 (ND)                                | 99.4845                                 |
| 2                             | 1630                  | 19.7                                     | <0.10 (ND)                                | 99.4924                                 |
| 3 <sup>6</sup>                | 1651                  | 20.6                                     | <0.10 (ND)                                | 99.5146                                 |
| 3                             | 1652                  | 246                                      | <0.10 (ND)                                | 99.9593                                 |
| 3                             | 1653                  | 40.1                                     | <0.10 (ND)                                | 99.7506                                 |
| 3                             | 1654                  | 34.2                                     | <0.10 (ND)                                | 99.7076                                 |
| 3                             | 1655                  | 30.8                                     | <0.10 (ND)                                | 99.6753                                 |
| 3                             | 1657                  | 31.6                                     | <0.10 (ND)                                | 99.6835                                 |
| 3                             | 1658                  | 33.1                                     | <0.10 (ND)                                | 99.6979                                 |
| 3                             | 1659                  | 31.5                                     | <0.10 (ND)                                | 99.6825                                 |
| 3                             | 1700                  | 31.8                                     | <0.10 (ND)                                | 99.6855                                 |
| 3                             | 1701                  | 29.4                                     | <0.10 (ND)                                | 99.6599                                 |
| 3                             | 1703                  | 31.5                                     | <0.10 (ND)                                | 99.6825                                 |
| 3                             | 1704                  | <u>30.1</u>                              | <u>&lt;0.10 (ND)</u>                      | <u>99.6678</u>                          |
| <b>TIME-WEIGHTED AVERAGE:</b> |                       | <b>49.39</b>                             | <b>0.1000</b>                             | <b>99.5606</b>                          |
|                               |                       |  |   | <b>REQUIRED CONTROL EFFICIENCY: 99%</b> |

<sup>1</sup> PPM = parts per million by volume

<sup>2</sup> 0.10 ppm is the quantification limit for the detector used at the outlet.

<sup>3</sup> Backvent Phase Test Run #1 started at 15:38, ended at 15:53.

<sup>4</sup> ND = Below Detection Limit

<sup>5</sup> Backvent Phase Test Run #2 started at 16:16, ended at 16:31.

<sup>6</sup> Backvent Phase Test Run #3 started at 16:50, ended at 17:05.