# ANNEX D7 THERMAL OXIDIZER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

## TABLE D7.1 THERMAL OXIDISER STACK EMISSION MONITORING RESULTS

| Parameters | Monitoring Results |
|---|---|
| $NO_2$ | 0.99 $gs^{-1}$ |
| CO | <0.01 $gs^{-1}$ |
| $SO_2$ | <0.01 $gs^{-1}$ |
| Benzene | 0.0011 $gs^{-1}$ |
| Vinyl chloride | <1.2 x $10^{-4}$ $gs^{-1}$ |
| Non-Methane Organic Carbons | 0.004 $gs^{-1}$ |
| Ammonia | 0.0664 $gs^{-1}$ |
| Exhaust gas velocity | 8.7 $ms^{-1}$ |

## TABLE D7.2 THERMAL OXIDISER STACK CONTINUOUS MONITORING RESULTS

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] |
|---|---|---|---|
| 1 May 25 | 900 | 1199 | 8.7 |
| 2 May 25 | 897 | 1199 | |
| 3 May 25 | 899 | 1199 | |
| 4 May 25 | 901 | 1156 | |
| 5 May 25 | 902 | 1157 | |
| 6 May 25 | 902 | 1157 | |
| 7 May 25 | 903 | 1177 | |
| 8 May 25 | 888 | 1196 | |
| 9 May 25 | 903 | 1201 | |
| 10 May 25 | 897 | 1195 | |
| 11 May 25 | 901 | 1185 | |
| 12 May 25 | 895 | 1172 | |
| 13 May 25 | 903 | 1184 | |
| 14 May 25 | 901 | 1199 | |
| 15 May 25 | Under Maintenance | | |
| 16 May 25 | 902 | 1203 | |
| 17 May 25 | 900 | 1197 | |
| 18 May 25 | 899 | 1204 | |
| 19 May 25 | Under Maintenance | | |
| 20 May 25 | 899 | 1210 | |
| 21 May 25 | 907 | 1213 | |
| 22 May 25 | Under Maintenance | | |
| 23 May 25 | 902 | 1208 | |
| 24 May 25 | 899 | 1199 | |
| 25 May 25 | 899 | 1194 | |
| 26 May 25 | 893 | 1152 | |
| 27 May 25 | Under Maintenance | | |
| 28 May 25 | 903 | 1205 | |
| 29 May 25 | 899 | 1200 | |
| 30 May 25 | 890 | 1192 | |
| 31 May 25 | 898 | 1195 | |
| **Average** | 899 | 1191 | - |
| **Min** | 888 | 1152 | - |
| **Max** | 907 | 1213 | - |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

## TABLE D7.3 LANDFILL GAS FLARE STACK EMISSION MONITORING RESULTS

| Parameters | Monitoring Results |
|---|---|
| $NO_2$ | $<0.02\ gs^{-1}$ |
| CO | $<0.01\ gs^{-1}$ |
| $SO_2$ | $<0.01\ gs^{-1}$ |
| Benzene | $2.04 \times 10^{-4}\ gs^{-1}$ |
| Vinyl chloride | $<9.3 \times 10^{-5}\ gs^{-1}$ |
| Non-Methane Organic Carbons | $<0.002\ gs^{-1}$ |
| Exhaust gas velocity | $9.0\ ms^{-1}$ |

## TABLE D7.4 LANDFILL GAS FLARE STACK CONTINUOUS MONITORING RESULTS

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [a] | Operation Status |
|---|---|---|---|---|
| **Flare 1 – F601** | | | | |
| 1 May 25 | 899 | 1123 | | In Operation |
| 2 May 25 | 905 | 1130 | | In Operation |
| 3 May 25 | 888 | 1116 | | In Operation |
| 4 May 25 | 915 | 1144 | | In Operation |
| 5 May 25 | 880 | 1109 | | In Operation |
| 6 May 25 | 912 | 1135 | | In Operation |
| 7 May 25 | 895 | 1129 | | In Operation |
| 8 May 25 | 881 | 1106 | | In Operation |
| 9 May 25 | 902 | 1128 | | In Operation |
| 10 May 25 | 879 | 1113 | | In Operation |
| 11 May 25 | 890 | 1131 | | In Operation |
| 12 May 25 | 902 | 1127 | | In Operation |
| 13 May 25 | 894 | 1118 | | In Operation |
| 14 May 25 | 918 | 1144 | | In Operation |
| 15 May 25 | 902 | 1140 | | In Operation |
| 16 May 25 | 907 | 1143 | 9.0 | In Operation |
| 17 May 25 | 911 | 1151 | | In Operation |
| 18 May 25 | 899 | 1141 | | In Operation |
| 19 May 25 | 881 | 1116 | | In Operation |
| 20 May 25 | 915 | 1153 | | In Operation |
| 21 May 25 | 871 | 1101 | | In Operation |
| 22 May 25 | 872 | 1103 | | In Operation |
| 23 May 25 | 882 | 1120 | | In Operation |
| 24 May 25 | 881 | 1115 | | In Operation |
| 25 May 25 | 891 | 1120 | | In Operation |
| 26 May 25 | 884 | 1126 | | In Operation |
| 27 May 25 | 884 | 1114 | | In Operation |
| 28 May 25 | 891 | 1118 | | In Operation |
| 29 May 25 | 898 | 1126 | | In Operation |
| 30 May 25 | 900 | 1123 | | In Operation |
| 31 May 25 | 893 | 1118 | | In Operation |
| **Average** | 894 | 1125 | - | |
| **Min** | 871 | 1101 | - | |
| **Max** | 918 | 1153 | - | |

| Date | Gas Combustion Temperature (°C) | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [a] | Operation Status |
|---|---|---|---|---|
| **Flare 2 – F602** | | | | |
| 1 May 25 | 935 | 1165 | | In Operation |
| 2 May 25 | 926 | 1165 | | In Operation |
| 3 May 25 | 919 | 1142 | | In Operation |
| 4 May 25 | 916 | 1154 | | In Operation |
| 5 May 25 | 915 | 1153 | | In Operation |
| 6 May 25 | 889 | 1112 | | In Operation |
| 7 May 25 | 927 | 1161 | | In Operation |
| 8 May 25 | 893 | 1126 | | In Operation |
| 9 May 25 | 917 | 1155 | | In Operation |
| 10 May 25 | 932 | 1161 | | In Operation |
| 11 May 25 | 901 | 1137 | | In Operation |
| 12 May 25 | 904 | 1137 | | In Operation |
| 13 May 25 | 892 | 1119 | | In Operation |
| 14 May 25 | 901 | 1133 | | In Operation |
| 15 May 25 | 915 | 1154 | | In Operation |
| 16 May 25 | 909 | 1144 | 9.0 | In Operation |
| 17 May 25 | 907 | 1148 | | In Operation |
| 18 May 25 | 905 | 1147 | | In Operation |
| 19 May 25 | 910 | 1137 | | In Operation |
| 20 May 25 | 917 | 1155 | | In Operation |
| 21 May 25 | 887 | 1113 | | In Operation |
| 22 May 25 | 921 | 1162 | | In Operation |
| 23 May 25 | 922 | 1161 | | In Operation |
| 24 May 25 | 918 | 1158 | | In Operation |
| 25 May 25 | 894 | 1124 | | In Operation |
| 26 May 25 | 933 | 1169 | | In Operation |
| 27 May 25 | 903 | 1134 | | In Operation |
| 28 May 25 | 902 | 1129 | | In Operation |
| 29 May 25 | 886 | 1121 | | In Operation |
| 30 May 25 | 913 | 1154 | | In Operation |
| 31 May 25 | 907 | 1137 | | In Operation |
| **Average** | 910 | 1144 | - | |
| **Min** | 886 | 1112 | - | |
| **Max** | 935 | 1169 | - | |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

## TABLE D7.5 LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

| Parameters | Monitoring Results |
|---|---|
| $NO_2$ | 0.023 $gs^{-1}$ |
| CO | 0.721 $gs^{-1}$ |
| $SO_2$ | <0.001 $gs^{-1}$ |
| Benzene | 1.17 x $10^{-4}$ $gs^{-1}$ |
| Vinyl chloride | 7.2 x $10^{-6}$ $gs^{-1}$ |
| Non-Methane Organic Carbons | 0.0038 $gs^{-1}$ |
| Exhaust gas velocity | 6.7 $ms^{-1}$ |

## TABLE D7.6 LANDFILL GAS GENERATOR STACK CONTINUOUS MONITORING RESULTS

| Date | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [a] | Operation Status |
|---|---|---|---|
| **ENGA** | | | |
| 1 May 25 | 874 | 6.7 | In Operation |
| 2 May 25 | 861 | | In Operation |
| 3 May 25 | 862 | | In Operation |
| 4 May 25 | 862 | | In Operation |
| 5 May 25 | 863 | | In Operation |
| 6 May 25 | 863 | | In Operation |
| 7 May 25 | 867 | | In Operation |
| 8 May 25 | 874 | | In Operation |
| 9 May 25 | 889 | | In Operation |
| 10 May 25 | - | | Under Maintenance |
| 11 May 25 | - | | Under Maintenance |
| 12 May 25 | - | | Under Maintenance |
| 13 May 25 | 884 | | In Operation |
| 14 May 25 | - | | Under Maintenance |
| 15 May 25 | - | | Under Maintenance |
| 16 May 25 | - | | Under Maintenance |
| 17 May 25 | - | | Under Maintenance |
| 18 May 25 | - | | Under Maintenance |
| 19 May 25 | - | | Under Maintenance |
| 20 May 25 | - | | Under Maintenance |
| 21 May 25 | 866 | | In Operation |
| 22 May 25 | - | | Under Maintenance |
| 23 May 25 | - | | Under Maintenance |
| 24 May 25 | 860 | | In Operation |
| 25 May 25 | - | | Under Maintenance |
| 26 May 25 | - | | Under Maintenance |
| 27 May 25 | - | | Under Maintenance |
| 28 May 25 | - | | Under Maintenance |
| 29 May 25 | - | | Under Maintenance |
| 30 May 25 | - | | Under Maintenance |
| 31 May 25 | - | | |
| **Average** | 869 | - | |
| **Min** | 860 | - | |
| **Max** | 889 | - | |

| Date | Exhaust Temperature (K) | Exhaust Gas Velocity ($ms^{-1}$) [(a)] | Operation Status |
|---|---|---|---|
| **ENGB** | | | |
| 1 May 25 | - | 6.7 | Under Maintenance |
| 2 May 25 | - | | Under Maintenance |
| 3 May 25 | - | | Under Maintenance |
| 4 May 25 | - | | Under Maintenance |
| 5 May 25 | - | | Under Maintenance |
| 6 May 25 | - | | Under Maintenance |
| 7 May 25 | 889 | | In Operation |
| 8 May 25 | 881 | | In Operation |
| 9 May 25 | 879 | | In Operation |
| 10 May 25 | 875 | | In Operation |
| 11 May 25 | 874 | | In Operation |
| 12 May 25 | 873 | | In Operation |
| 13 May 25 | 874 | | In Operation |
| 14 May 25 | 876 | | In Operation |
| 15 May 25 | 877 | | In Operation |
| 16 May 25 | 878 | | In Operation |
| 17 May 25 | 877 | | In Operation |
| 18 May 25 | 871 | | In Operation |
| 19 May 25 | 879 | | In Operation |
| 20 May 25 | 879 | | In Operation |
| 21 May 25 | 880 | | In Operation |
| 22 May 25 | 877 | | In Operation |
| 23 May 25 | 878 | | In Operation |
| 24 May 25 | 871 | | In Operation |
| 25 May 25 | 853 | | In Operation |
| 26 May 25 | 854 | | In Operation |
| 27 May 25 | 870 | | In Operation |
| 28 May 25 | 876 | | In Operation |
| 29 May 25 | 876 | | In Operation |
| 30 May 25 | 873 | | In Operation |
| 31 May 25 | 877 | | In Operation |
| **Average** | 875 | - | |
| **Min** | 853 | - | |
| **Max** | 889 | - | |

**Notes:**

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.