June 2023
Monthly Compliance Report

Solid Waste Permit No. 588
Bristol Integrated Solid Waste Management Facility
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INTRODUCTION

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) in accordance with item 8.iii in Appendix A of the Consent Decree between the City and VDEQ. This report provides updates regarding the progress towards completion of the items outlined in Appendix A of the Consent Decree between the City and VDEQ. The following sections outline progress during the month of June 2023 related to Solid Waste Permit (SWP) No. 588.

1.0 GAS COLLECTION

The following sections describe the steps the City, in collaboration with its consultants and contractors, has taken to improve the operation, monitoring, and performance of the facility's landfill gas collection and control system (GCCS).

1.1 SURFACE AND LEACHATE COLLECTION EMISSIONS

1.1.1 Surface Emissions

1.1.1.1 Quarterly SEM

The Second Quarter 2023 surface emissions monitoring event was conducted on May 30, 2023. Results from that monitoring event are documented in the May 2023 Monthly Compliance Report for the SWP No. 588 Landfill. No quarterly monitoring event was conducted in June. SCS will conduct the Third Quarterly Monitoring event for the SWP 588 landfill prior to September 30, 2023.

1.1.1.2 Weekly SEM

In addition to the standard regulatory quarterly surface emissions monitoring, SCS performed additional surface emissions monitoring on June 6, 2023; June 13, 2023; June 23, 2023; and June 29, 2023. These Weekly Surface Emissions Monitoring (SEM) Events were performed in accordance item 1.i in Appendix A of the Consent Decree between the City and VDEQ.

The monitoring in June generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The surface emission monitoring route included the entire waste footprint of the Permit No. 588 landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint.

SCS submitted letters to VDEQ outlining the results of the April monitoring events on June 14, 2023; June 21, 2023; June 28, 2023; and July 5, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the four monitoring events in May.

Table 1. Summary of June Surface Emissions Monitoring

Description	June 6, 2023	June 13, 2023	June 23, 2023	June 29, 2023
Number of Points Sampled	164	168	169	169
Number of Points in Serpentine Route	100	100	100	100
Number of Points at Surface Cover Penetrations	64	68	69	69
Number of Exceedances	3	4	2	4
Number of Serpentine Exceedances	0	0	0	0
Number of Pipe Penetration Exceedances	3	4	2	4

No serpentine exceedances were detected in June 2023. Furthermore, no serpentine exceedances have been detected since April 2023. Measurements indicate the additional soil placed in the vicinity of the April exceedances remain effective at reducing emissions at these locations.

Exceedances were detected at the pipe penetrations of seven vertical extraction wells. Four of these points were located at recently installed vertical wells 86, 95, 98, and 99. These four wells along with the majority of the newly installed vertical wells, were equipped with wellbore seals during June and subsequently recorded compliant readings. One of the three remaining exceedances, at vertical well 66, is likely a result of ongoing construction activity in the vicinity of that well. Modification or reinstallation of the existing wellbore seal at the well will likely return that well to compliance. For the remaining two exceedances, at the pipe penetration of vertical wells EW-38 and EW-52, additional soil and/or a well-bore skirt will be installed to remediate the exceedance. Corrective actions to address these exceedances are planned for the month of July 2023.

1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on June 2, 2023, and performed monitoring of the leachate, witness zone, and gradient control clean-outs at the northern and southern ends of the landfill. The results of that monitoring are included in Table 2. The monitoring data for the clean-outs at the southern end of the landfill are listed as LC01 – LC10. The monitoring data for the clean-outs at the northern end of the landfill are listed as NC01 – NC10. Table 2 also lists the cleanout pipe description based on site records and a review of correspondence.

Table 2. Leachate Cleanout Pipe Monitoring Results

Description	ID#	CH_4 (% by Vol)	CO_2 (% by Vol)	O_2 (% by Vol)	Balance Gas (% by Vol)	Initial Temp (°F)	Adj Temp (°F)	Initial Static Pressure (in H_2O)	Adj Static Pressure (in H_2O)	System Pressure (in H_2O)
Southern Cleanouts Gradient West	LC01	53.0	47.0	0.0	0.0	61.7	61.7	-15.6	-15.7	-16.4
Southern Cleanouts Gradient East	LC02	48.7	47.3	0.0	4.0	62.1	62.0	-15.8	-15.9	-16.5
Southern Cleanouts Leachate Center	LC03	9.8	7.3	16.9	66.0	74.8	75.2	-16.2	-16.2	-16.2
Southern Cleanouts Witness East	LC04	23.6	12.7	10.4	53.3	73.4	73.4	-16.3	-16.2	-15.9
Southern Cleanouts Leachate West	LC05	50.8	39.5	0.1	9.6	63.4	63.2	-15.5	-15.5	-16.2
Southern Cleanouts Gradient Center West	LC06	32.6	28.6	8.1	30.7	75.4	75.5	-16.5	-16.3	-16.5
Southern Cleanouts Leachate East	LC08	51.2	43.5	0.0	5.3	61.2	61.2	-15.5	-15.5	-16.3
Southern Cleanouts Gradient Center East	LC09	29.0	18.0	9.5	43.6	76.7	77.7	-16.2	-16.2	-14.4
Southern Cleanouts Leachate West	LC10	23.0	14.5	11.4	51.2	84.1	84.6	-15.8	-15.8	-15.0
Northern Cleanouts Leachate East	NC01	0.1	0.1	19.6	80.2	81.3	81.1	-5.1	-5.1	0.2
Northern Cleanouts Leachate Center	NC02	1.3	0.7	19.1	78.8	79.8	79.1	-4.7	-4.7	0.2
Northern Cleanouts Leachate West	NC03	1.0	0.5	19.2	79.3	78.7	78.4	-1.5	-1.5	0.1
Northern Cleanouts Witness East	NC04	0.0	0.0	19.6	80.4	78.3	78.4	-13.5	-13.5	0.4
Northern Cleanouts Witness Center	NC05	0.0	0.0	19.6	80.4	78.6	78.6	-13.6	-13.6	0.2
Northern Cleanouts Witness West	NC06	0.0	0.0	19.6	80.4	78.8	78.8	-13.5	-13.5	0.3
Northern Cleanouts Gradient East	NC07	22.5	8.1	5.1	64.3	78.9	79.0	-14.8	-14.8	0.4
Northern Cleanouts Gradient Center East	NC08	30.5	16.9	4.1	48.5	79.2	79.2	-14.8	-14.8	0.3
Northern Cleanouts Gradient Center West	NC09	31.7	17.9	3.2	47.2	79.4	79.4	-14.8	-14.8	0.2
Northern Cleanouts Gradient West	NC10	4.1	6.6	19.0	70.3	79.5	79.5	-13.6	-13.8	0.3

1.2 EXISTING GAS EXTRACTION SYSTEM PERFORMANCE

SCS and SCS-FS have been coordinating with the City to improve the performance of the existing gas system. Specific actions taken to maintain and improve the system are detailed in SCS-FS's summary report for the month of April.

1.3 REMOTE MONITORING SYSTEM

In the fall of 2022, SCS Remote Monitoring & Control (SCS-RMC) installed 25 industrial internet of things (IIoT) temperature sensors in the landfill gas well-heads. The purpose of the sensors is to record and transmit well-head gas temperatures via a cellular connection to a database managed by SCS-RMC.

The City is providing average temperatures recorded by the sensors to VDEQ on a daily basis via e-mail. In addition, SCS prepares a semi-monthly report with analysis of this data. The 1st semi-monthly report for June is included in Appendix C.

1.4 LARGE-DIAMETER DUAL-PHASE EXTRACTION WELLS

SCS completed design work on an expansion of the existing GCCS during the month of December 2022. The proposed expansion includes at least 5 large diameter dual-phase extraction wells. SCS submitted the design to VDEQ prior to December 31, 2022. The City commenced solicitation of contractor's bids for this project by advertising for bids and received one bid for the project from SCS Field Services Construction (SCS-CONS). On January 26, 2023, the City awarded the project to SCS-CONS.

During the month of June, work on the expansion of the GCCS focused on the construction of the deep well gas collection system and the 8" header connections to the existing system. Two wells were drilled during the first week of June, completing the project well schedule. The first five pumps were installed in June, satisfying item 1.iv of Appendix A of the Consent Decree between the Department and the City. The City and SCS-CONS are awaiting the delivery of additional pumps which will increase the number of operating dual extraction wells beyond the required minimum. The expanded GCCS was connected to these wells vacuum and began liquids extraction. An example of a stainless steel well is shown in Figure 1.

Figure 1. Stainless Steel Well Installation at the SWP No. 588 Landfill

1.5 VDEQ CONCURRENCE ON WELLS

As described in previous monthly compliance reports, the City engaged with VDEQ in discussions about the proposed approach for landfill GCCS improvements and expansions. Upon completion of the landfill gas collection system, SCS will submit updated as-built drawings depicting the completed system to VDEQ. The City intends to delay installation of interim or final cover systems until the City and VDEQ agree that the GCCS is sufficient.

2.0 SIDEWALL ODOR MITIGATION

The City has designed and is constructing a system to control fugitive emissions emanating from the quarry sidewalls. Specific aspects of the proposed design features are described in the following sections.

2.1 PERIMETER GAS COLLECTION SYSTEM

SCS's design of the GCCS expansion described in Section 1.4 included perimeter LFG wells. These wells are closer to the sidewall to intercept landfill gas that potentially could migrate to the quarry wall. These wells will supplement the sidewall odor mitigation system described in Section 2.2. The City completed bidding and contracting of construction for the perimeter LFG wells as part of the large diameter dual extraction well installation described in Section 1.4.

As described in the April 2023 Monthly Compliance Report for the SWP No. 588 Landfill, construction of the perimeter gas collection system was completed. SCS submitted a letter to VDEQ documenting completion of the Perimeter Gas Collection System on May 1, 2023. One of the perimeter gas collection system wells connected to lateral piping is shown in Figure 2.

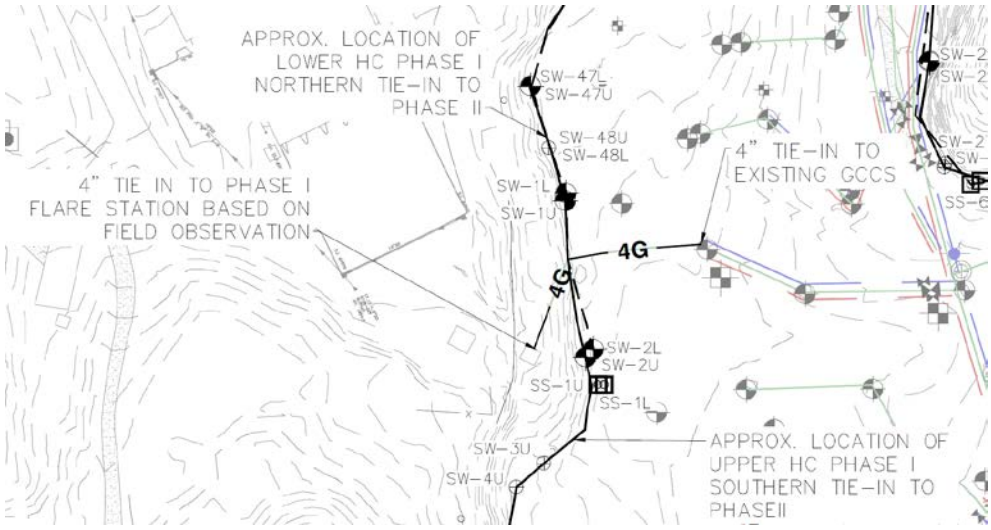
2.2 SIDEWALL ODOR MITIGATION SYSTEM

On behalf of the City and in an effort to capture emissions from the quarry sidewall, SCS designed a sidewall odor mitigation system (SOMS) during the month of October 2022. On October 20, 2022 SCS provided an overview of the proposed system to VDEQ staff. The design of this system was prepared and submitted to VDEQ on November 1, 2022. A project manual detailing the specifications of the system was developed concurrently with the design of the system.

2.3 PILOT SYSTEM CONSTRUCTION

SCS-CONS completed substantial construction of Phase 1 of the SOMS during the month of February 2023, SCS-FS began monitoring Phase 1 connected Horizontal Collector (HC) wellheads during the month of March, and SCS-FS continued weekly wellhead monitoring into the month of May 2023. Phase 1 is considered the pilot system portion of the SOMS. SCS submitted a design engineer certification to VDEQ on February 10, 2023 that documented the substantial completion of Phase 1 of the SOMS. Figure 3 shows the Phase 1 as-built, which includes the locations of the HC wellheads and HC sumps installed in Phase I, as well as the 4" header connection to the existing LFGCCS. The lower collector installed as part of Phase II was tied-in to the north end of the Phase I lower collector, and the upper collector installed as part of Phase II was tied-in to the south end of the Phase I upper collector.

Figure 2. SOMS Phase I As-Built[1]



Phase 1 was initially connected to an auxiliary flare located near the system. HC wellhead measurements of gas quality continued to be taken on a weekly basis during the month of June 2023. A summary of those measurements is shown in Table 3.

Table 3. Sidewall HC Wellhead Gas Quality Measurements

Device ID	Date	CH_4 (%)	CO_2 (%)	O_2 (%)
SW1L	6/5/2023	7.8	23.2	10.2
SW1U	6/5/2023	7.9	17.7	11.3
SW2L	6/5/2023	19.1	35.0	7.1
SW2U	6/5/2023	3.3	8.5	16.9
SW-1L	6/14/2023	5.9	19.4	11.5
SW-1U	6/14/2023	4.9	17.0	15.5
SW-2L	6/14/2023	19.2	38.1	6.1
SW-2U	6/14/2023	2.6	7.4	17.5
SW-1L	6/21/2023	7.4	20.6	10.7
SW-1L	6/21/2023	19.0	37.9	6.7
SW-1U	6/21/2023	7.9	23.0	11.6
SW-2U	6/21/2023	6.0	16.0	14.8
SW-1L	6/28/2023	13.28	27.63	6.96
SW-1U	6/28/2023	12.08	33.95	8.81
SW-2U	6/28/2023	10.54	29.96	9.97
SW-2L	6/28/2023	27.33	48.10	3.71

[1] Location data was collected using mapping grape global positioning system equipment.

Sidewall wellhead lower collector 1 (SW1L) is connected to the horizontal collector placed in waste inside the landfill liner close to the northern limit of Phase 1. Measurements of gas composition taken at SW1L indicate that methane levels are lower than typical for landfill gas, but that landfill gas continues to be captured by the system. Sidewall wellhead upper collector 1 (SW1U) is connected to the horizontal collector placed outside of the liner and waste.

Sidewall wellhead lower collector 2 (SW2L) is connected to the horizontal collector placed in waste inside the landfill liner close to the center of Phase 1. Measurements of gas composition taken at SW1L indicate that methane levels are lower than typical of landfill gas collection systems, but the presence of methane in addition to high carbon dioxide levels indicate that landfill gas is being captured by the system. Sidewall wellhead upper collector 2 (SW2U) is connected to the horizontal collector placed outside of the liner and waste and is close to the center of Phase 1. Measurements of gas composition taken at SW2U indicate that methane levels are low, but that landfill gas is being captured by the system.

Both the upper and lower collectors of Phase 1 of the system have been connected to the substantially completed Phase 2 of the system. Because construction of Phase 2 was ongoing during the month of June 2023, higher levels of ambient air were captured by the Phase 1 system through these connections.

Collection of landfill gas by both the upper and lower collectors indicates that the system is capturing fugitive emissions. Based on this data, Phase 2 was constructed utilizing the same general configuration. SCS-FS will continue to monitor Phase 1 of the system during the month of July 2023.

2.4 FULL SYSTEM CONSTRUCTION

SCS-CONS substantially completed construction of Phase 2 of the SOMS during the month of June 2023 as Phase 2 was connected to vacuum as of June 14, 2023. Liner and clay placement continued throughout the month of June and cover soil placement will continue into July. Figure 3 shows Phase 2 wellhead connections at HC wells SW-30U and SW-30L.

Figure 3. Phase 2 SOMS Wellhead Connections

On June 14, 2023, SCS-CONS completed installation of Phase 2 lower and upper horizontal collector wellheads and SCS-FS collected monitoring data at each connected wellhead. A summary of those

measurements is shown in Table 4. SCS submitted a certification letter to VDEQ documenting completion of the SOMS. A copy of that letter is included in Appendix G.

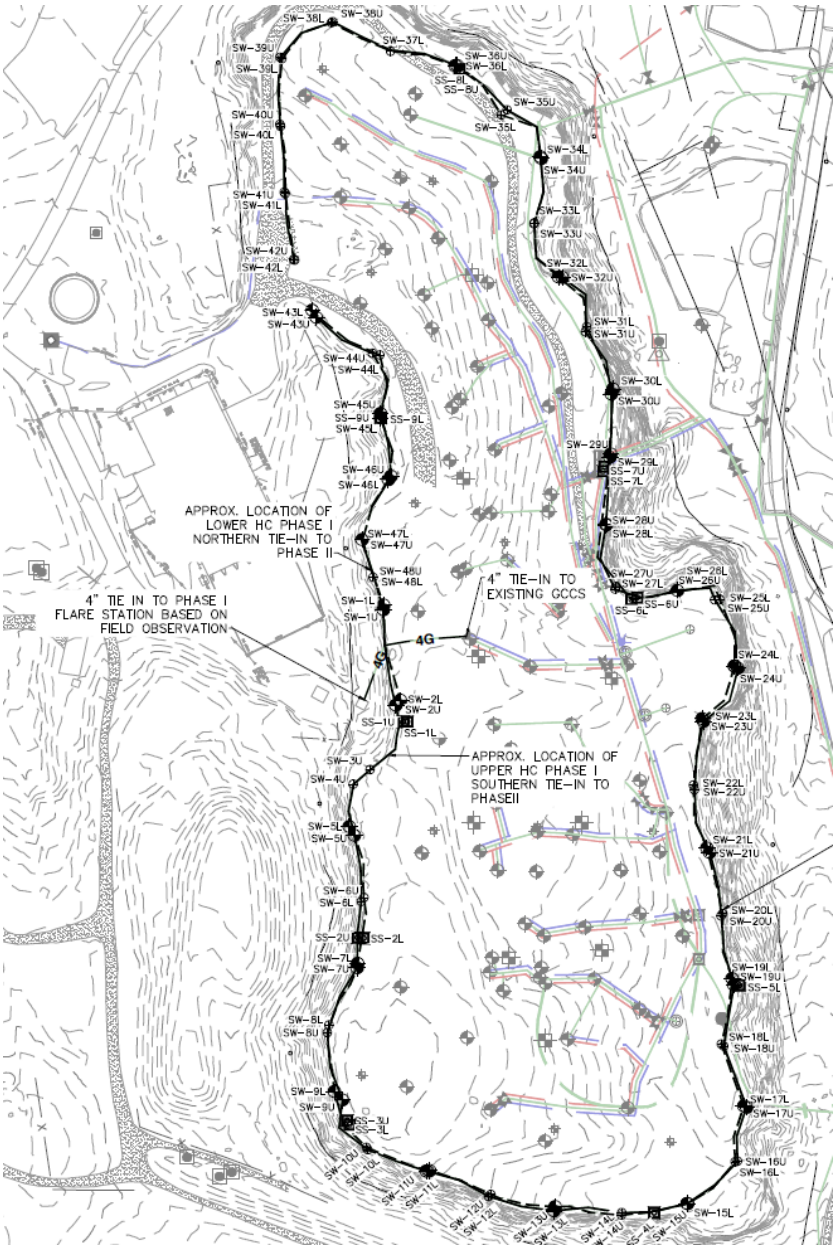
Table 4. Sidewall HC Wellhead Gas Quality Measurements – System Averages

Record Date	Average CH4 [%]	Average CO2 [%]	Average O2 [%]	Average Bal Gas [%]
6/14/2023	22.4	30.3	8.0	39.4
6/21/2023	14.1	23.6	10.9	51.4
6/28-29/2023	15.9	26.5	10.0	47.7

The sidewall system averages indicate lower methane content than typical landfill gas collection systems, but that fugitive emissions are being successfully collected based on the data. Measurements of gas composition taken during June indicated methane content ranging from trace amounts of methane to as high as 54 percent at select individual wellheads. The wide-ranged gas composition may indicate that some areas of the landfill may be experiencing higher landfill gas concentrations than areas where methane content is seemingly insignificant. Phase 2 lower and upper collectors construction progress, including HC wellhead riser and sump locations, is shown in the as-built depicted as Figure 4[2].

[2] During construction, redundant risers were put in place to accommodate supplemental wellhead installation in the future. Figure 5 shows all riser locations. The final submittal to VDEQ, Revised June 26, 2023, shows the locations of actual wellhead installation.

Figure 4. Phase 2 Sidewall Odor Mitigation System Progress As-Built[3]



At this time, not every SOMS horizontal collector riser has a wellhead installed, but HC risers may receive a wellhead at a future date as warranted by field conditions. An additional drawing showing the distinction between wellheads and risers is included in the certification letter included in Appendix G. Clay placement atop of the installed liner in the northern area of the landfill is shown in Figure 5.

[3] Location data was collected using mapping grape global positioning system equipment.

Figure 5. Phase 2 SOMS Lower and Upper Collector Construction

3.0 WASTE TEMPERATURE MONITORING

On behalf of the City, SCS designed a temperature monitoring system to collect temperature data throughout the waste mass. The steps taken by the City to implement this system are described in the following sections.

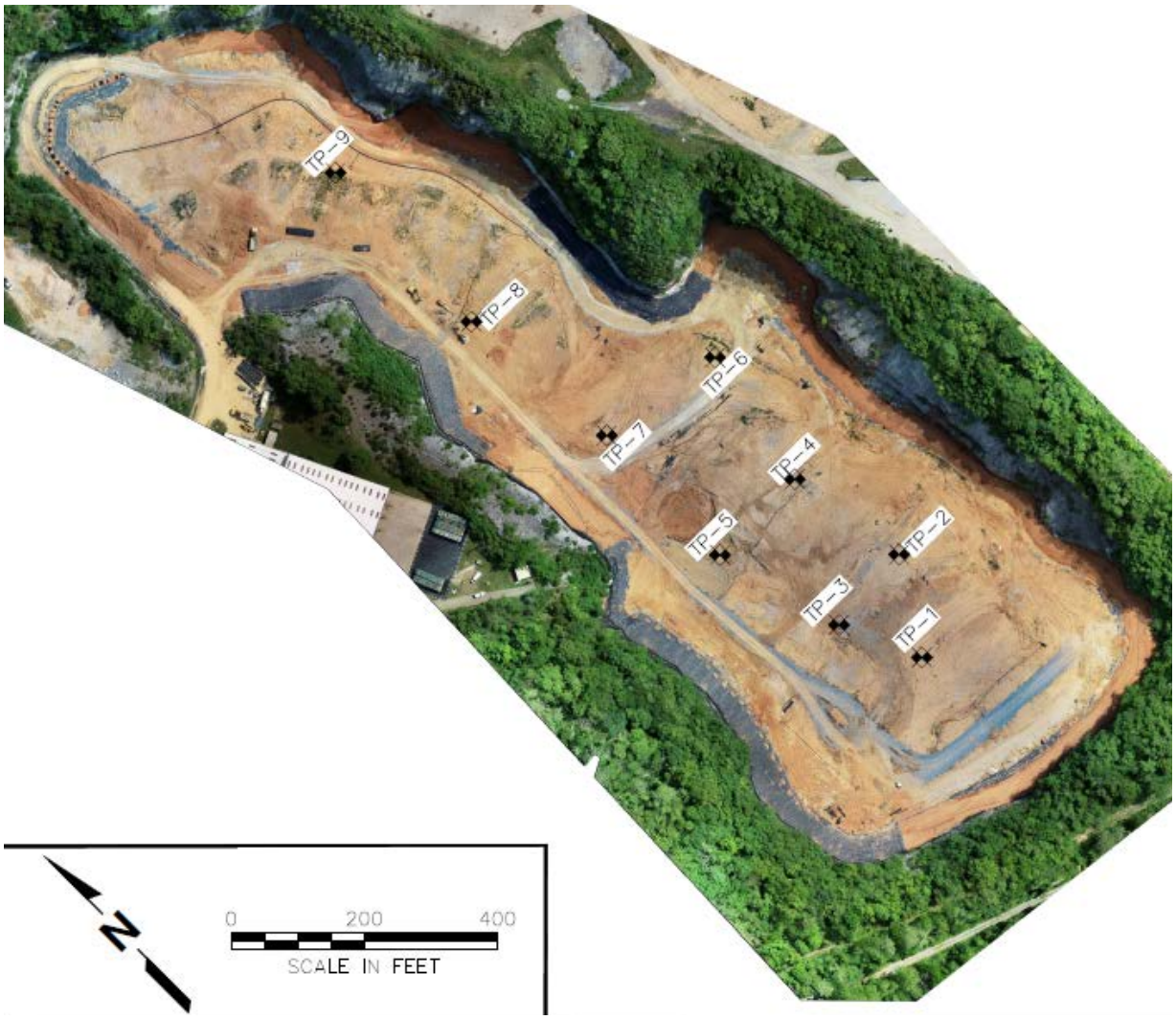
3.1 TEMPERATURE MONITORING SYSTEM DESIGN

The temperature monitoring system consists of 9 boreholes drilled into the waste mass. A steel casing was placed in each borehole and the hole was backfilled around the casing with aggregate. A series of temperature sensors was placed inside the steel casing. At the top of each borehole, an IIoT transmitter collects the data from the sensors and transmits it to a cloud-based RMC system. The City submitted design of the temperature monitoring system to VDEQ on November 30, 2022.

3.2 TEMPERATURE MONITORING SYSTEM INSTALLATION

Installation of the in-situ Landfill Temperature Monitoring System began in October of 2022 and installation of replacement sensors was completed in February of 2023. Details of construction progress can be found in the monthly compliance reports for the SWP No. 588 Landfill. The locations of the temperature probes are shown in Figure 6.

Figure 6. Temperature Monitoring Probe Locations



SCS began collecting temperature data daily on February 15, 2023. The temperature sensors continued to transmit temperature data from all 9 casings during the month of June. Average daily temperatures recorded by the sensors for the Month of June are included in Appendix D. Each week the average temperatures from a select day of that week are downloaded and compared to temperatures recorded during the previous week. Average daily temperatures recorded on select days during the month of June are shown in Appendix B. The average temperatures for the month recorded during the months of March through June are shown in Figures 7 through 15 on the following pages.

Figure 7 shows daily average temperatures in Temperature Probe 1 (TP-1) during the months of March through June. Based on the data, temperatures were consistent from March through May and saw some modest increases during the month of June at depths or 100 feet and below. TP-1 was originally drilled to a depth of 180 feet, but the contractor was unable to install the casing beyond a depth of 160 feet.

Figure 7. Average Temperatures within TP-1 During the Months of March through June

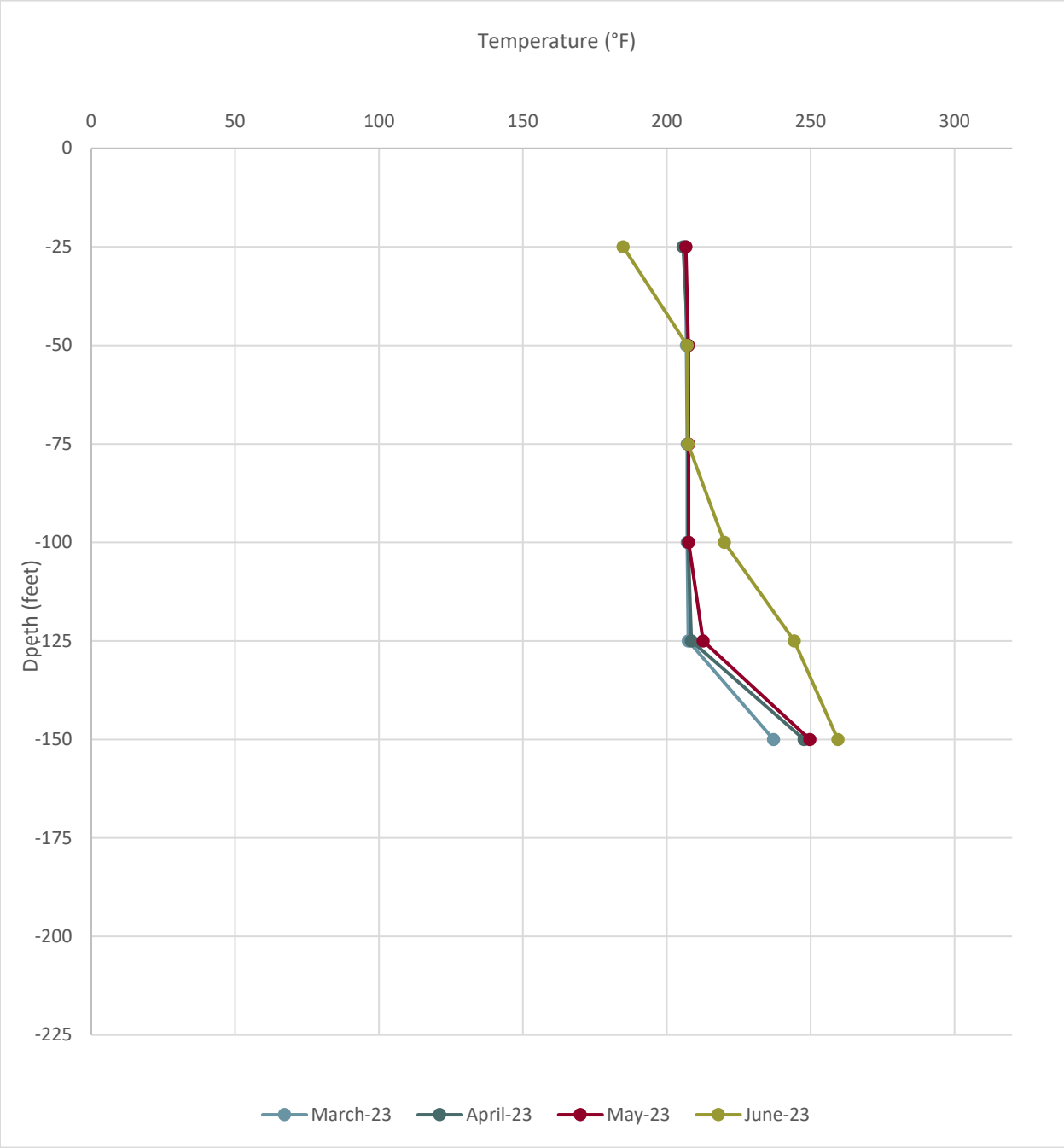


Figure 8 shows daily average temperatures in Temperature Probe 2 (TP-2) during the months of March through June. Based on the data, temperatures have been consistent during the last four months. TP-2 was originally drilled to a depth of 160 feet.

Figure 8. Average Temperatures within TP-2 During the Months of March through June

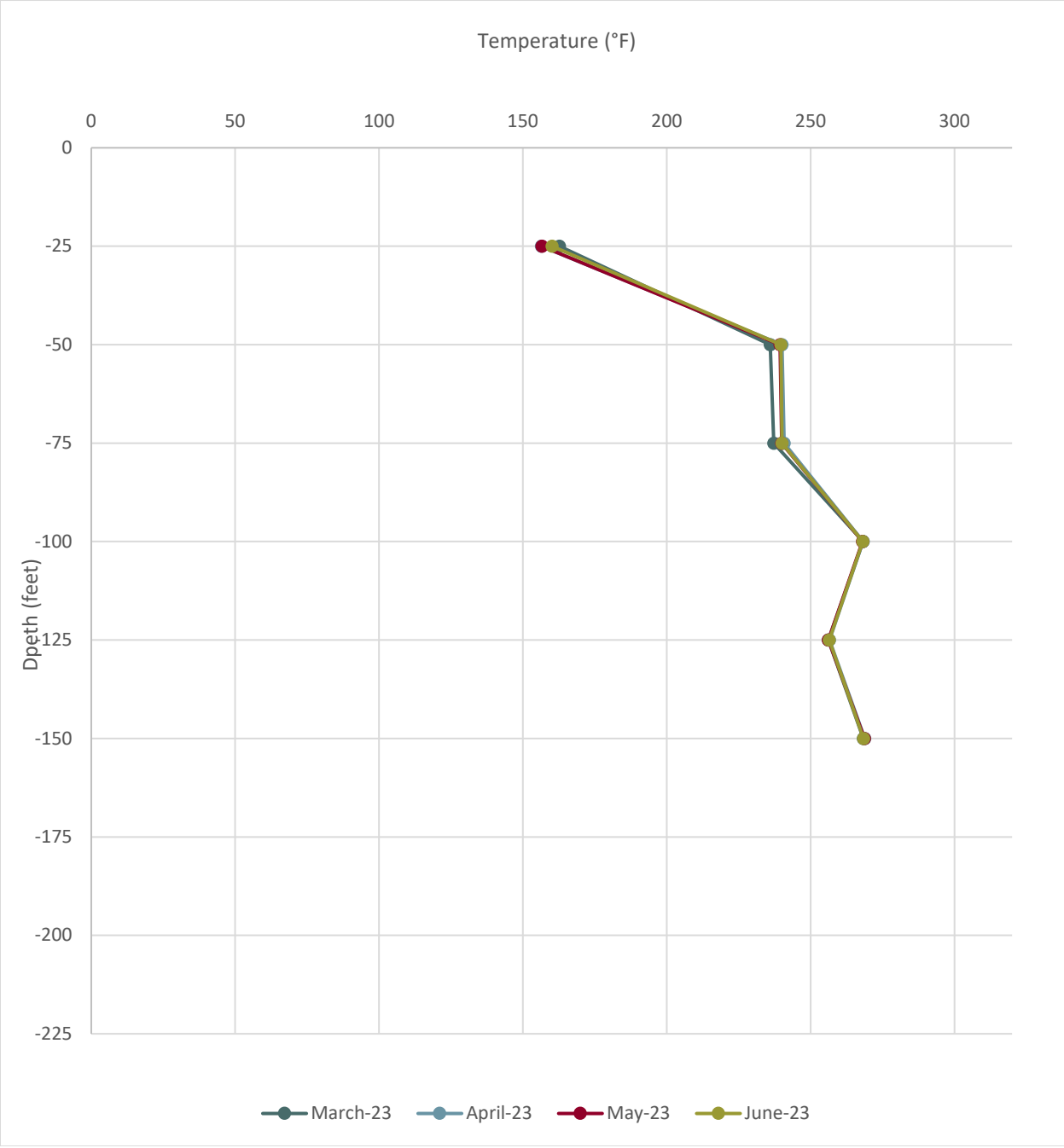


Figure 9 shows daily average temperatures in Temperature Probe 3 (TP-3) during the months of March through June. Based on the data, temperatures have been consistent during the last four months.

Figure 9. Average Temperatures within TP-3 During the Months of March through June

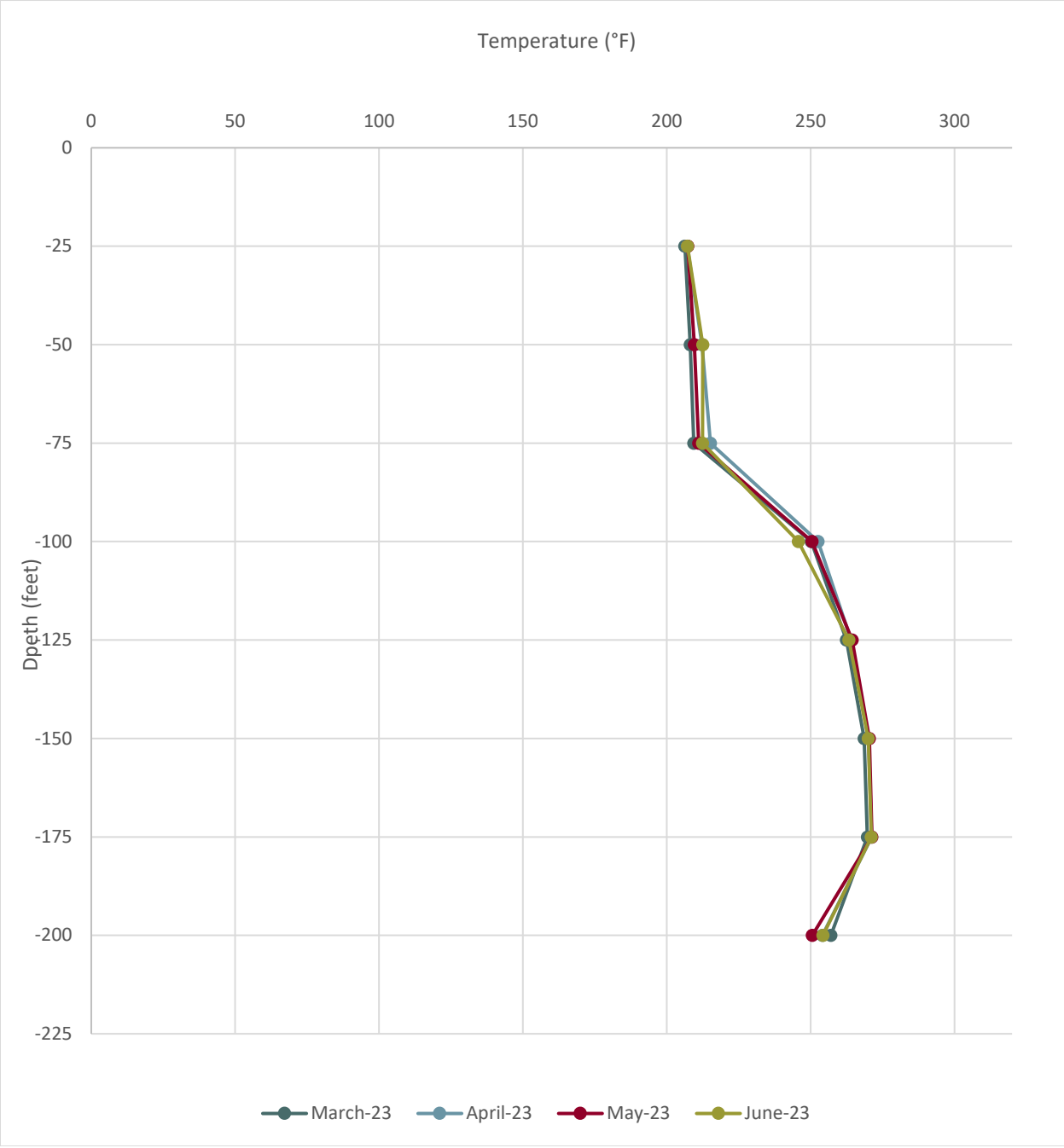


Figure 10 shows daily average temperatures in Temperature Probe 4 (TP-4) during the months of March through June. Based on the data, temperatures appeared to drop during the months of April and May, but returned to levels closer to baseline during the month of June.

Figure 10. Average Temperatures within TP-4 During the Months of March through June

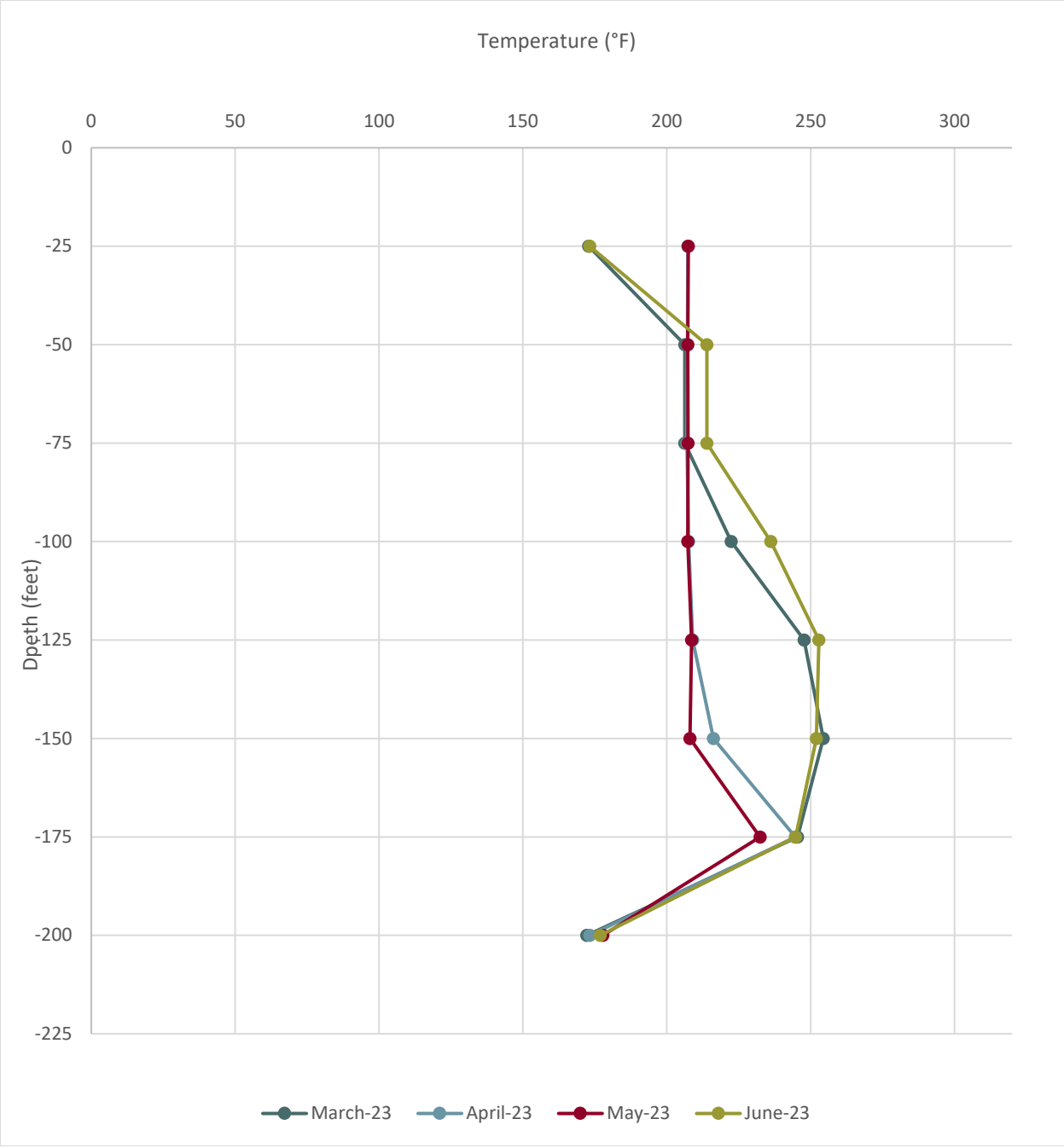


Figure 11 shows daily average temperatures in Temperature Probe 5 (TP-5) during the months of March through June. Based on the data, temperatures have been consistent during the last four months.

Figure 11. Average Temperatures within TP-5 During the Months of March through June

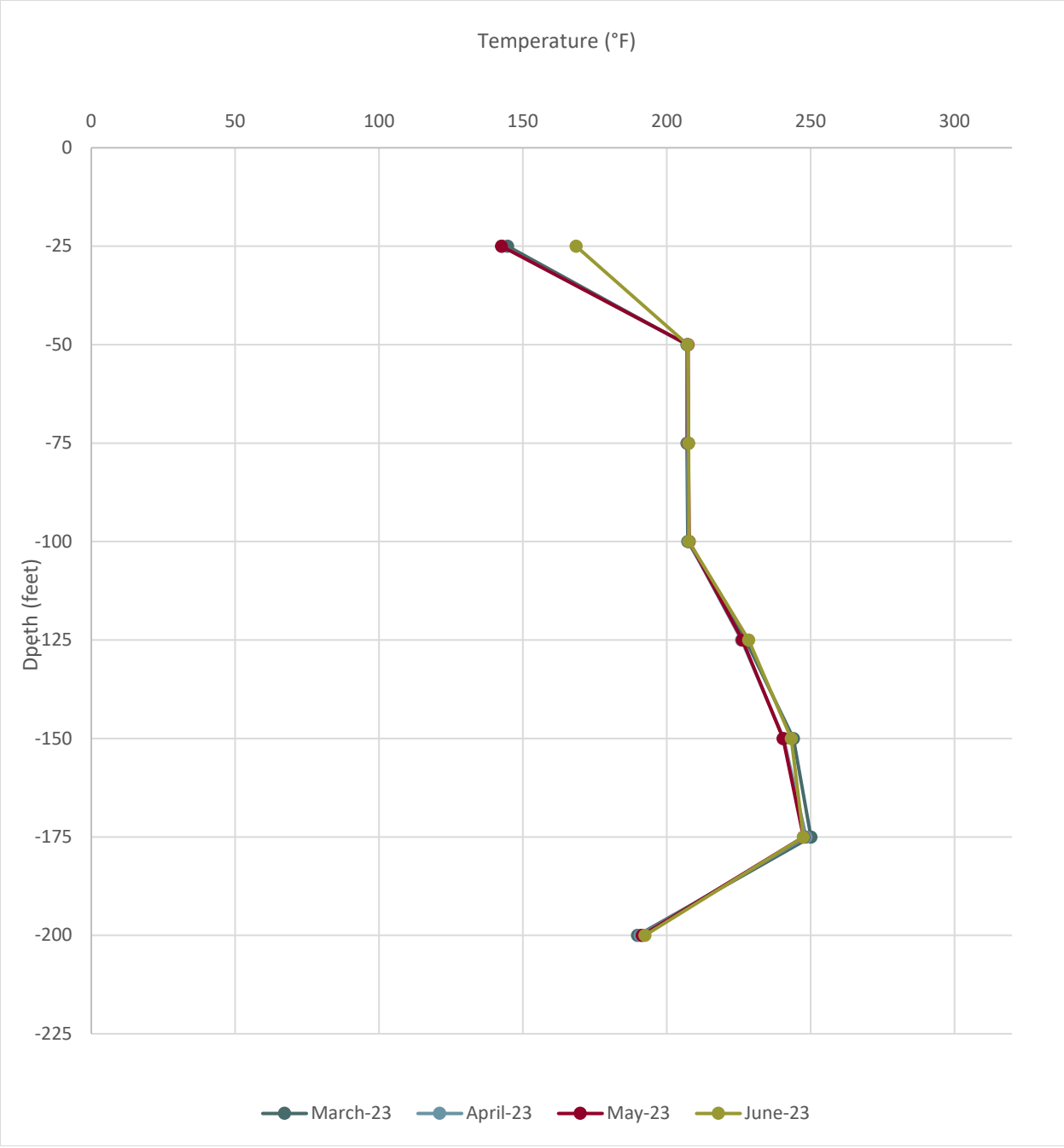


Figure 12 shows daily average temperatures in Temperature Probe 6 (TP-6) during the months of March through June. Based on the data, temperatures have been generally consistent during the last four months. A modest decrease at the 25-foot level has been observed. TP-6 was originally drilled to a depth of 208 feet and casing was installed to the full depth. During the installation of the installation of replacement sensors, a blockage within the casing prevented placement of sensors below the 125-foot depth.

Figure 12. Average Temperatures within TP-6 During the Months of March through June

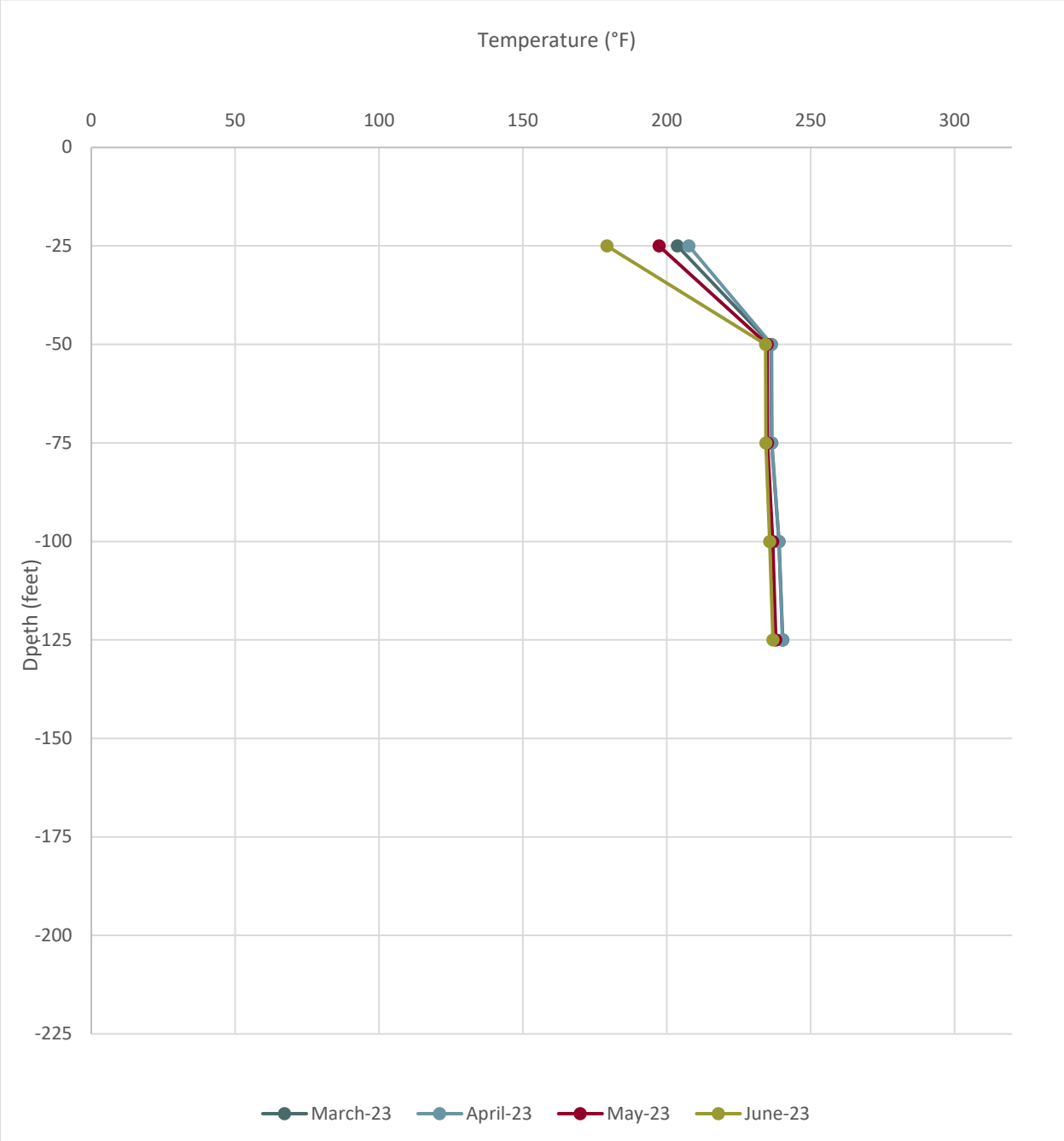


Figure 13 shows daily average temperatures in Temperature Probe 7 (TP-7) during the months of March through June. Based on the data, temperatures have been consistent during the last four months with a general downward trend.

Figure 13. Average Temperatures within TP-7 During the Months of March through June

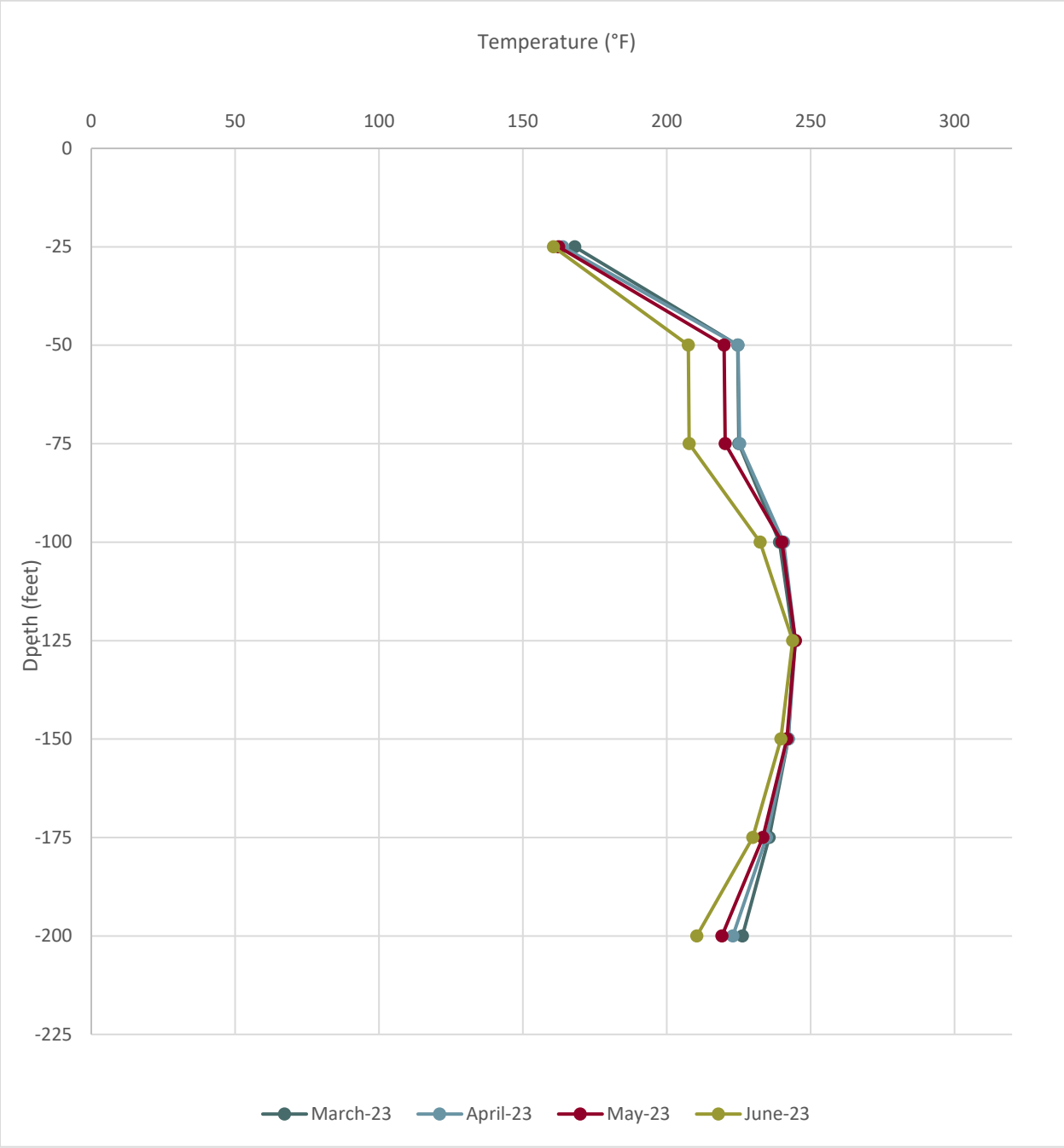


Figure 14 shows daily average temperatures in Temperature Probe 8 (TP-8) during the months of March through June. Based on the data, temperatures have slightly increased during the last four months.

Figure 14. Average Temperatures within TP-8 During the Months of March through June

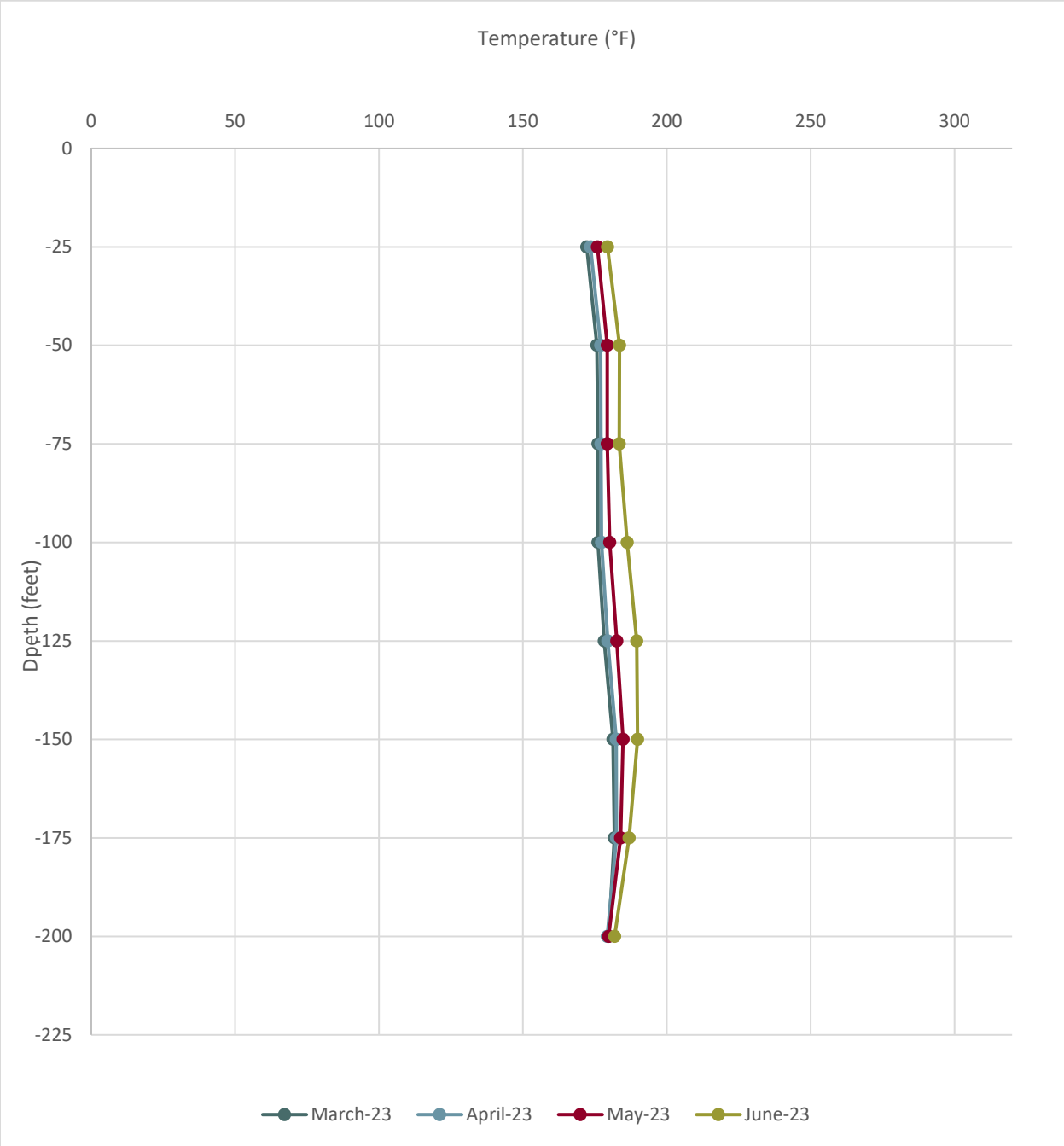
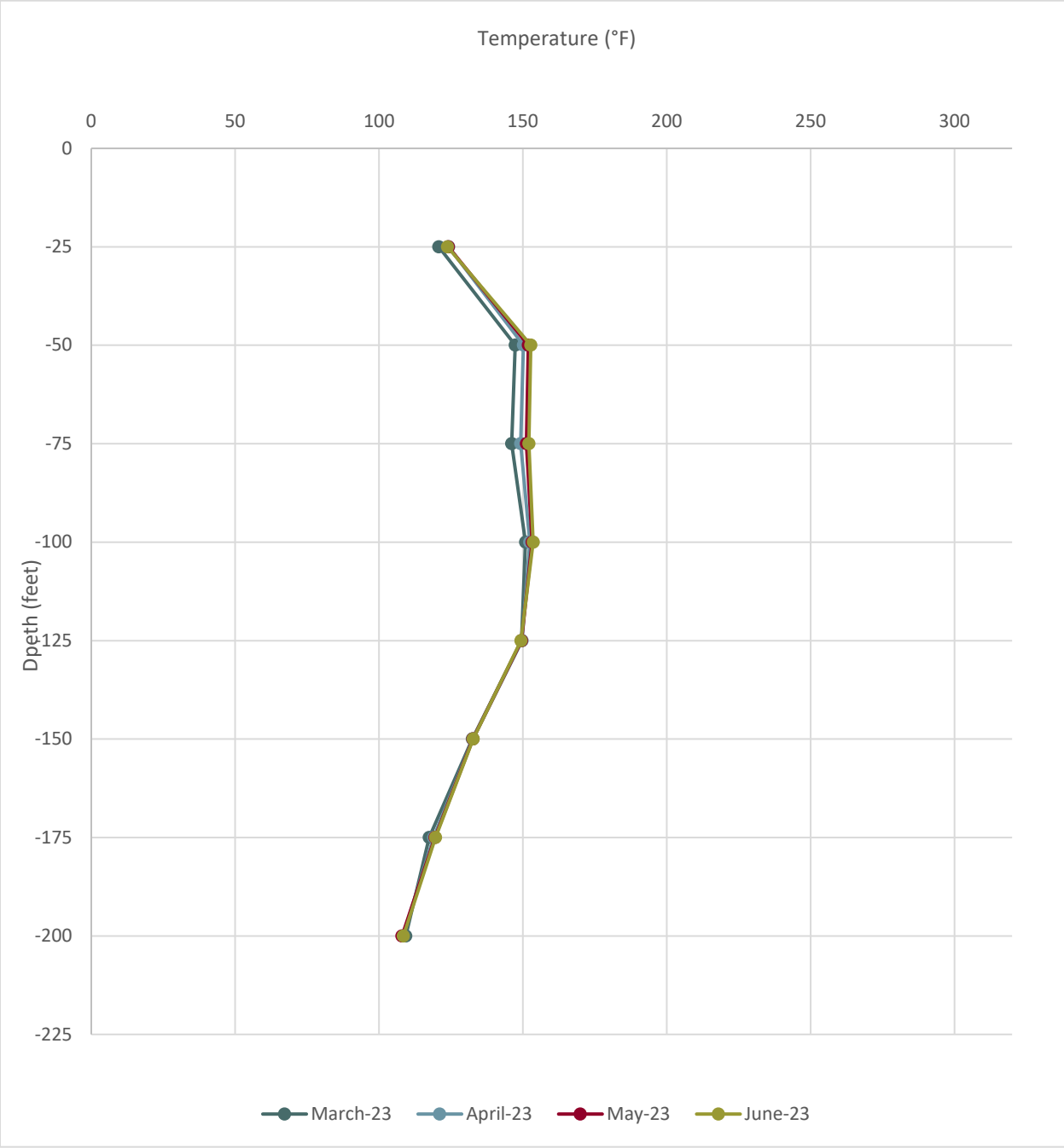


Figure 15 shows daily average temperatures in Temperature Probe 9 (TP-9) during the months of March through June. Based on the data, temperatures have been consistent during the last three months.

Figure 15. Average Temperatures within TP-9 During the Months of March through June



The data indicate that temperatures within the landfill are generally stable and are typical of those observe at elevated temperature landfills (ETLFs). During the months of May and June, there has been substantial construction at the landfill including deep dual extraction wells they may have impacted temperatures within the waste mass. While it is difficult to quantify the effect of the construction of addition wells, changes in wellhead temperature have been observed in existing wells adjacent to newly installed wells. These temperatures are substantially lower than those associated with landfill fires or other combustion processes, which can exceed 1000°F.

4.0 LEACHATE EXTRACTION AND MONITORING

The City has begun taking steps to improve the extraction of leachate from the waste mass and collect analytical data on leachate characteristics. The following sections detail steps taken to achieve these goals.

4.1 EXISTING SYSTEM OPTIMIZATION

During weekly gas extraction well monitoring, SCS also collected stroke counter data from the pumps installed in the GCCS extraction wells. Stroke counts were collected from 19 wells on May 30, 2023; June 5, 2023; June 12, 2023; June 19, 2023; and June 27, 2023. The data collected is summarized in Table 4. Cells marked with "*" represent dates when the pump was removed from the well for maintenance or had not yet been installed.

Table 5. Summary of Dual Extraction Well Pump Stroke Counter Data

Well	May 30, 2023	June 5, 2023	June 12, 2023	June 19, 2023	June 27, 2023
EW49	630900	637536	661580	672714	684163
EW50	961571	997815	1012360	1012371	1012380
EW51	*	*	1574	10871	10871
EW52	39412	42876	57777	61299	98207
EW53	2158667	2173146	2215357	2218369	2220807
EW54	317679	317684	341990	351992	358128
EW55	171553	174020	181043	181110	181110
EW57	300616	334105	396766	425173	425176
EW58	1994080	1994082	1994082	1994082	1994084
EW59	1878472	1878489	1910734	1973814	2117707
EW60	278402	292820	303613	307661	312565
EW61	234133	234895	236089	236125	237325
EW62	130883	136976	142231	144854	149889
EW63	*	*	*	*	*
EW64	117654	120357	122592	124863	132794
EW65	*	*	*	*	*
EW67	481717	502676	517746	533645	556044
EW68	2032232	2045329	2058910	2069944	2082975
EW94	292269	320203	320205	320206	363274

Based on this data and stroke counts taken on June 27, 2023, SCS can estimate the number of gallons of liquid pumped from each well. SCS assumed that each stroke correlates to approximately 0.3 gallons of liquid removed from the well. This data will then be used to repair or replace pumps or replace nonfunctional stroke counters. Estimates of the quantities of liquids removed between the reading dates are shown in Table 5.

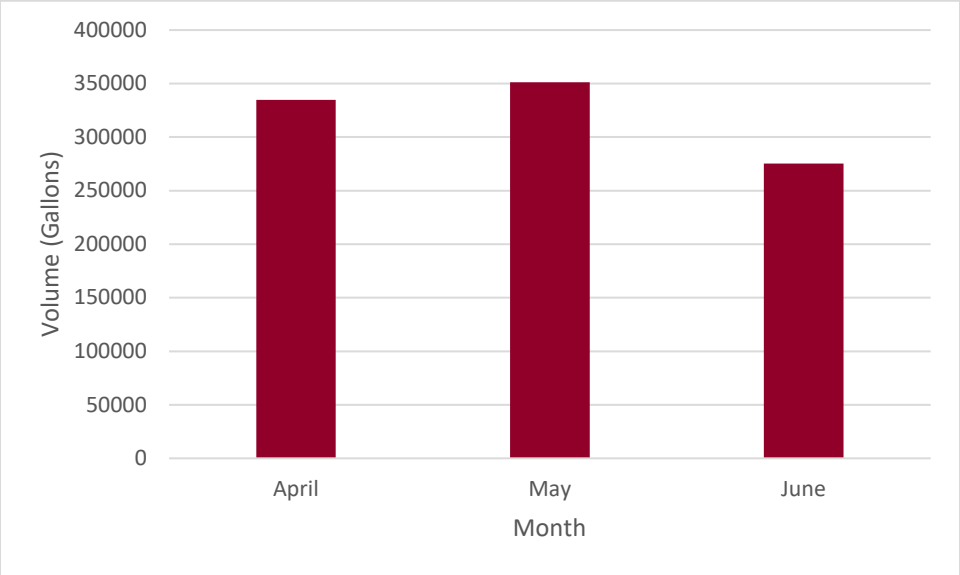
Table 6. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) May 22, 2023 to May 30, 2023	Liquids Removed (gal) May 30, 2023 to June 5, 2023	Liquids Removed (gal) June 5, 2023 to June 12, 2023	Liquids Removed (gal) June 12, 2023 to June 19, 2023	Liquids Removed (gal) June 19, 2023 to June 27, 2023
EW49	8469	1991	7213	3340	3434
EW50	3082	10873	4363	4	3
EW51	0	0	472	2789	0
EW52	10294	1039	4470	1056	11072
EW53	9179	4343	12663	903	731
EW54	3161	2	7291	3001	1841
EW55	2079	740	2107	20	0
EW57	5400	10047	18798	8522	1
EW58	3393	1	0	0	1
EW59	17328	5	9673	18924	43167
EW60	2941	4325	3237	1214	1471
EW61	413	229	358	11	360
EW62	2024	1828	1576	787	1511
EW63	0	0	0	0	0
EW64	5861	811	671	681	2379
EW65	0	0	0	0	0
EW67	301	6288	4521	4769	6719
EW68	22907	3929	4074	3310	3909
EW94	36980	8380	1	1	12920

SCS estimates that approximately 275,000 gallons of liquids were removed from the landfill gas collection and control system during the month of June. This is a decrease o when compared to the previous month. SCS-FS continues to implement an aggressive maintenance schedule for landfill gas liquids removal pumps. As shown in Table 6, the initial installation of pumps in Wells EW-68 and EW-94 contributed over 60,000 gallons to the total volume for the last week May. The volumes removed

during initial pump installation and subsequent drawn down of liquids in the gas well may be difficult to repeat on a monthly basis. The change in landfill gas liquids removal over the last three months is depicted in Figure 16.

Figure 16. Estimated Volume of Liquids Removed from Landfill Gas Wells



The City and SCS understand that operations of dewatering pumps are critical to address issues related to heat, odors, and the efficient operation of the GCCS. The landfill conditions present a challenging environment for pump operations. Pumps require servicing after relatively short intervals. During June pump maintenance occurred on June 1, 2023; June 7, 2023; June 8, 2023; June 15, 2023; June 20, 2023; June 21, 2023; and June 28, 2023.

Pumps that were determined to be inoperative were removed from their respective extraction wells and replaced with a clean, functioning pump. In June, EW-51, EW-52, EW-53, EW-57, EW-59, EW-60 and EW-68 had their pumps removed and replaced. The pump tri-tubing for EW-53 and EW-57 was found to be compromised and was repaired while those pumps were being maintained. The check valve for EW-60 was also replaced during June.

Five pumps were installed during the month of June. Two Jeneer float-less pumps were installed on June 15, 2023 into EW-71 and EW-72. Additionally, three PumpOne pneumatic pumps were installed into EW-33B, EW-74, and EW-75 at the end of the month. These pumps' performance will be tracked accordingly, and their gallons removed will be reflected in July and going forward.

EW-65 was disconnected from the airline used to power the pump for the month of June 2023 due to continued infrastructure relocation associated with the sidewall odor mitigation system and landfill GCCS expansion construction projects. The pump for EW-51 was reinstalled on June 6, 2023.

During the construction of the LFGCCS expansion outlined in Sections 1.4 and 2.1, multiple types of leachate extraction pumps will be installed. After installation, the City and SCS will evaluate the performance of those pumps. Based on that evaluation, the City will select the pump type that is most effective given the landfill conditions. SCS has developed a priority list for installations based on liquid levels that were collected during May 2023 and are continuing to install additional pumps based off this list where applicable.

4.2 SAMPLING AND ANALYSIS PLAN

On November 1, 2022, SCS submitted to VDEQ the Dual Phase Landfill Gas Extraction Well Leachate Monitoring Plan for the Bristol Integrated Solid Waste Management Facility Solid Waste Permit No. 588 Landfill and the plan was subsequently revised on December 1, 2022. Refer to the November 2022 and December 2022 Compliance Reports for the SWP No. 588 Landfill for additional information.

4.2.1 Sample Collection

On June 20 and 21, 2023, SCS collected leachate samples from three Dual Phase LFG-EWs (EW-59, EW-61 and EW-64). At the time of sample collection dissolved oxygen, oxidation-reduction potential, pH, specific conductance, temperature, and turbidity were measured and recorded. The sample collection log is included in Appendix F.

SCS' field staff was not able to collect samples from the other wells for the following reasons:

- Pumps were not running at the time of sample collection in the following wells: EW-49, EW-50, EW-51, EW-52, EW-60, EW-62, EW-63, EW-65, EW-67, EW-68, EW-71, EW-72, EW-74, and EW-75.
- No pump was installed in well EW-53.
- The airline was disconnected from wells EW-54, EW-55, EW-57, EW-58, and EW-94.

The samples were delivered to Enthalpy Analytical (Enthalpy) in Richmond, Virginia and Weck Laboratories, Inc (Weck) in City of Industry, California for analysis. The Enthalpy's Virginia Division of Consolidated Laboratory Services (VELAP) certifications are provided on the certificate of analysis (COA) included in Appendix F. The samples were analyzed for the parameters utilizing the analytical methods described in the Dual Phase Landfill Gas Extraction Well Leachate Monitoring Plan.

4.2.2 Quality Assurance and Quality Control

Field quality control (QC) involved the collection and analysis of trip blanks to verify that the sample collection and handling processes did not impair the quality of the samples. Trip blanks were prepared for volatile organic compound (VOC) analysis via Solid Waste (SW)-846 Method 8260D. In conjunction with the preparation of the groundwater sample collection bottle set, laboratory personnel filled each trip blank sample bottle with distilled/deionized water and transported them with the empty bottle kits to SCS. Field personnel handled the trip blanks like a sample; they remained un-opened, were transported in the sample cooler, and were returned to the laboratory for analyses. A trip blank is used to indicate potential contamination due to the potential migration of VOCs from the air at the site or in the sample shipping containers, through the septum or around the lid of the sampling vials and into the sample.

Laboratory quality assurance/quality control (QA/QC) involves the routine collection and analysis of method reagent blanks, matrix spike (MS) and matrix spike duplicate (MSD) samples, and laboratory control samples (LCS). A brief summary of each of these is presented below:

- Method Blank – The method blank is deionized water subjected to the same reagents and manipulations to which site samples are subjected. Positive results in the method

blanks may indicate either contamination of the chemical reagents or the glassware and implements used to store or prepare the sample and resulting solutions.

- MS/MSD – A MS is an aliquot of a field sample with a known concentration of target parameter added to it. An MSD is an intra-laboratory split sample spiked with a known concentration of target parameter. Spiking for each occurs prior to sample analysis. MS/MSD samples are collected for every batch of twenty or fewer samples. Matrix spike recoveries are used to indicate what effect the sample matrix may have on the reported concentration and/or the performance of the sample preparation and analysis.

- LCS – These samples consist of distilled/deionized water injected with the parameters of interest for single parameter methods and selected parameters for multi-parameter methods according to the appropriate analytical method. LCS samples are prepared and analyzed for each batch containing twenty or fewer samples. LCS recoveries are used to monitor analytical accuracy.

Surrogate recoveries are also measured as a part of laboratory QA/QC. Surrogates are organic compounds that are similar to the parameters of interest in chemical composition, extraction, and chromatography, but are not normally found in environmental samples. These compounds are inserted into blank, standards, samples, and spiked samples prior to analysis for organic parameters only. Percent recoveries are calculated for each surrogate. Spike recoveries at or below acceptance criteria indicate whether analytical results can be considered biased high or biased low.

Field and laboratory QA/QC also involves the routine collection and analysis of duplicate field samples. These samples are collected at a rate of one per sample event. A duplicate is a separate sample collected independently in such a manner that it equally represents the medium at a given time and location. Co-located samples provide intra-laboratory precision information for the entire measurement system, including sample collection, homogeneity, handling, shipping, storage, preparation, and analysis.

No method or trip blank detects were identified for the June 2023 monitoring event. The laboratory analysis report for the June 2023 monitoring event trip blank is included in **Appendix F**. The June 2023 monitoring event laboratory QA/QC reports, including the method blank results, are included in the COAs in **Appendix F**.

4.2.3 Data Validation

To identify analytical data that may not represent valid results, data from the monitoring events were validated by the Laboratory and SCS in accordance with United States Environmental Protection Agency (EPA) guidance[4]. Data flagged with a "J" qualifier indicates the quantitation of the parameter is less than the laboratory's limit of quantitation but greater than the laboratory's limit of detection (LOD); thus, the concentration is considered estimated. Samples with parameter detections less than five times that of the trip blank, field blank, and/or method blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Samples with common laboratory contaminant

[4] United States Environmental Protection Agency. Guidance for Data Usability in Risk Assessment (Part A-14). April 1992.
United States Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. National Functional Guidelines for Inorganic Superfund Methods Data Review. January 2017.
United States Environmental Protection Agency. Office of Superfund Remediation and Technology Innovation. National Functional Guidelines for Organic Superfund Methods Data Review. January 2017.

parameter detections less than 10 times that of the trip blank, field blank, and/or method/laboratory blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Data with a "B" qualifier are considered not validated as the detection may be anomalous due to cross-contamination during sampling, transportation of samples, or laboratory analysis.

No leachate results were flagged with a "B" qualifier for the June 2023 monitoring event as no constituents were detected in the June 2023 method and trip blanks. The constituent detection flagged with a "J" qualifier is shown on Table 7.

4.2.4 Laboratory Analytical Results

Chemical characteristics of leachate samples collected from extraction wells EW-59, EW-61 and EW-64 are summarized in Table 7. The associated COA is included in Appendix F. Parameter results from June 2023 and previous monitoring events (November 2022 – May 2023) are presented on a table in Appendix F.

Table 7. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-59	EW-61	EW-64	LOD	LOQ
Parameter	June 2023 Concentration				
Ammonia as N (mg/L)	**2740**	**2370**	**2170**	146	200
Biological Oxygen Demand (mg/L)	**20000**	**27400**	**23100**	0.2	2
Chemical Oxygen Demand (mg/L)	---	**44800**	---	5000	5000
	41300	---	**55000**	10000	10000
Nitrate as N (mg/L)	ND	---	ND	1.1	5.1
	---	ND	---	1.2	5.2
Nitrite as N (mg/L)	**2 J**	ND	ND	1	5
Total Kjeldahl Nitrogen (mg/L)	**3080**	---	**2750**	100	250
	---	**2650**	---	200	500
Total Recoverable Phenolics (mg/L)	**39.1**	**45.6**	**80.6**	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)					
Anthracene	ND	---	ND	485	971
	---	ND	---	490	980
TOTAL METALS (mg/L)					
Arsenic	**0.26**	**0.5**	**0.14**	0.0025	0.005
Barium	**1.69**	---	**1.65**	0.005	0.025
	---	**3.01**	---	0.01	0.05
Cadmium	ND	ND	ND	0.0005	0.005
Chromium	**0.251**	**0.191**	**0.272**	0.002	0.005
Copper	**0.00154 J**	**0.00362 J**	**0.00269 J**	0.0015	0.005
Lead	ND	ND	**0.0069**	0.005	0.005
Mercury	ND	ND	ND	0.004	0.004
Nickel	**0.05978**	**0.05892**	**0.07161**	0.005	0.005
Selenium	ND	ND	ND	0.0043	0.005
Silver	ND	ND	ND	0.0003	0.005

Table 7. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-59	EW-61	EW-64	LOD	LOQ
Parameter	June 2023 Concentration				
TOTAL METAL (mg/L)					
Zinc	**0.0538**	**0.0253**	**0.945**	0.0125	0.025
VOLATILE ORGANIC COMPOUNDS (ug/L)					
2-Butanone (MEK)	**13800**	---	---	750	2500
	---	**20100**	**22600**	1500	5000
Acetone	**29600**	---	---	1750	2500
	---	**61800**	**50800**	3500	5000
Benzene	**2630**	---	---	8	20
	---	**1400**	**1590**	20	50
Ethylbenzene	**104**	---	---	8	20
	---	**98**	**116**	20	50
Tetrahydrofuran	**2100**	---	---	200	200
	---	**7320**	**6670**	500	500
Toluene	**165**	---	---	10	20
	---	**67**	**212**	25	50
Xylenes, Total	**177**	---	---	20	60
	---	**92 J**	**136 J**	50	150

--- = not available
J = Constituent was detected at a concentration above the laboratory's LOD but below the laboratory's LOQ. Concentration is estimated and not validated.
LOD = laboratory's Limit of Detection
LOQ = laboratory's Limit of Quantitation
mg/L = milligrams per liter
ND = Not Detected
ug/L = micrograms per liter

5.0 SETTLEMENT MONITORING AND MANAGEMENT

The City is taking steps to track and manage settlement occurring in the landfill. A summary of actions taken to quantify and manage settlement is included in the sections below.

5.1 SETTLEMENT MONITORING AND MANAGEMENT PLAN

On behalf of the City, SCS submitted a settlement monitoring and management plan to VDEQ on November 15, 2022. Refer to the November Monthly Compliance Report for the SWP No. 588 Landfill for additional information.

5.2 MONTHLY SURVEYS

5.2.1 Topographic Data Collection

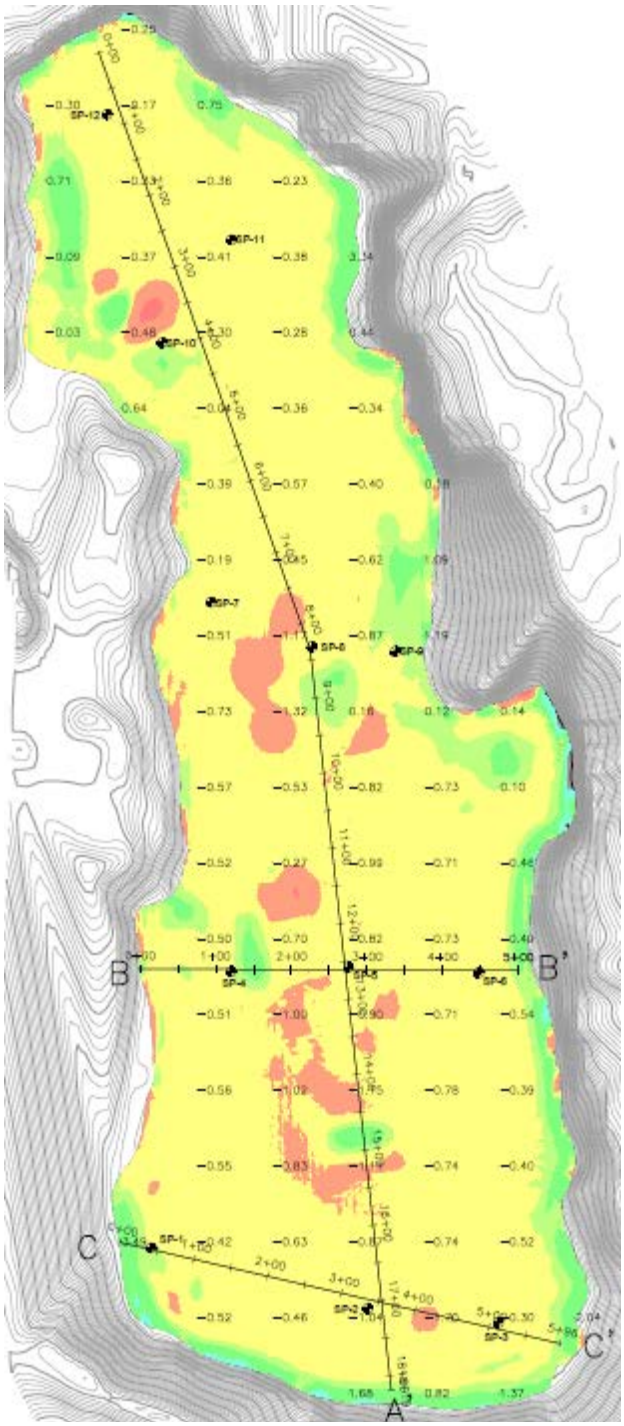
The City, through SCS, collected topographic data of the Solid Waste Permit No. 588 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On June 9, 2023 the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 2 in Appendix E.

The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on May 11, 2023. A drawing depicting the May 11, 2023 topography is included as Sheet 1 in Appendix E.

Based on a comparison of the topographic data collected on those two dates, settlement occurred that reduced the volume of waste in the landfill by approximately 14,700 cubic yards. During that same time period approximately 5,500 cubic yards of construction related fill were placed on the landfill. This fill was primarily soil placed as part of the sidewall odor mitigation system construction. This resulted in a net volume decrease of approximately 9,200 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 17. Areas in red indicate where elevations decreased and areas in green indicate areas where elevations have increased. Darker colors indicate greater changes in elevation. This drawing is also included as Sheet 3 in Appendix E.

Figure 17. 1-Month Elevation Change Color Map



The largest settlement occurred primarily in the southern end of the landfill where the waste settled by approximately 1 foot or more in some areas. Settlement in the southern end of the landfill appears to have slightly increased relative to last month. The southern end of the landfill is the location of the gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions. Settlement in the northern

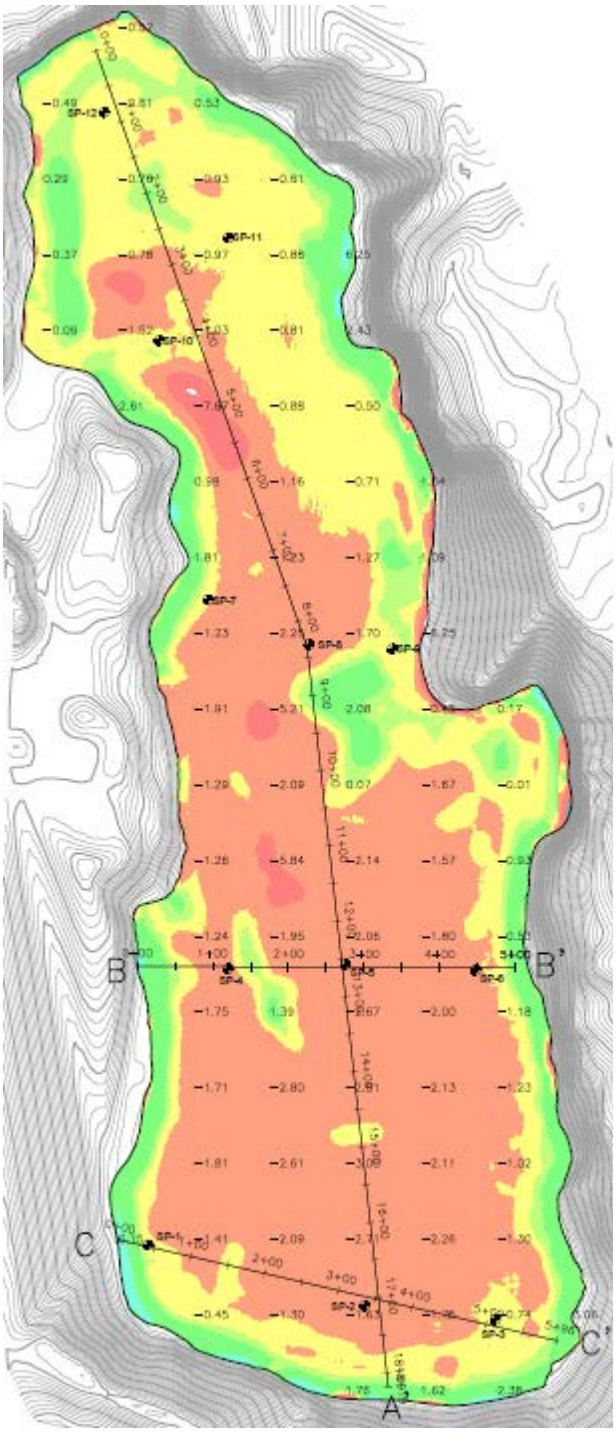
portion of the landfill was generally less substantial or was offset by soil placement associated with construction activities. These changes in elevation are more representative of typical settlement at municipal landfills. The perimeter of the landfill exhibited an increase in elevation, likely due to soil placement associated with construction of the Sidewall Odor Mitigation System. Some soil stockpile locations associated with the Sidewall Odor Mitigation System showed large elevation changes due to material removal from the stockpiles.

SCS calculated the waste footprint for purposes of analysis to be 752,610 square feet. Based on that area and the net volume change, the average elevation decrease was approximately 0.3 feet.

SCS also compared the topographic data collected in June to the topographic data collected on March 9, 2023. Based on a comparison of the topographic data collected on those two dates, settlement occurred that reduced the volume of waste in the landfill by approximately 36,800 cubic yards. During that same time period approximately 9,400 cubic yards of construction related fill were placed on the landfill. This fill was primarily soil placed as part of the sidewall odor mitigation system construction. This resulted in a net volume decrease of approximately 27,400 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 18. Areas in red indicate where elevations decreased and areas in green indicate areas where elevations have increased. Darker colors indicate greater changes in elevation. This drawing is also included as Sheet 4 in Appendix E.

Figure 18. 3-Month Elevation Change Color Map



The largest settlement occurred primarily in the southern end of the landfill where the waste settled by approximately 2 feet or more in some areas. The southern end of the landfill is the location of the gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions. Settlement in the northern portion of the landfill was generally less substantial or was offset by soil placement associated with construction

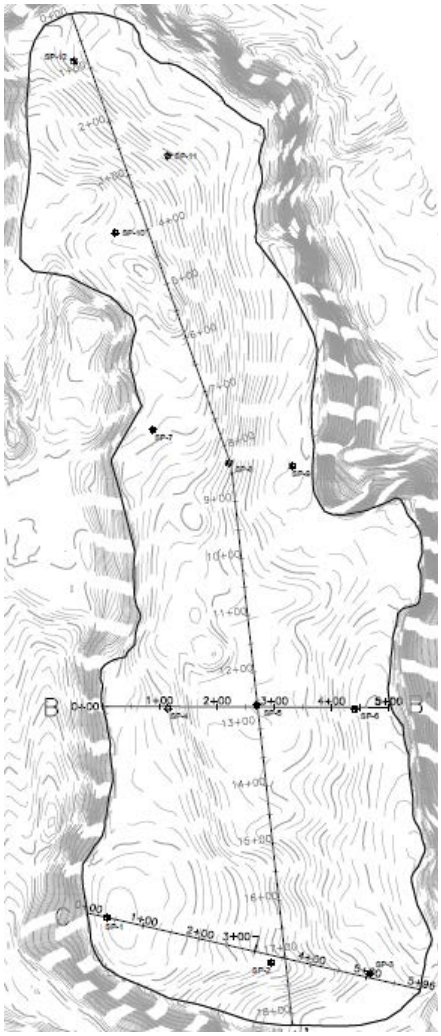
activities. Changes in elevation in these areas are more representative of typical settlement at municipal landfills. The eastern side of the landfill exhibited an increase in elevation, likely due to sediment deposition during storm events and waste relocation associated with construction of the Sidewall Odor Mitigation System. Increases in elevation along the western edge of the landfill are most likely due to installation of the Sidewall Odor Mitigation System. There were some large variations in elevation associated with soil stockpiling operations.

SCS will collect topographic data covering the landfill surface again in July using photogrammetric methods via UAV. This data will be compared to the data collected in June and April.

5.2.2 Settlement Plate Surveys

On November 7, 2022 SCS field services installed 12 settlement plates on the Solid Waste Permit No. 588 landfill. The construction and installation of the settlement plates generally conforms to the design outline in the Settlement Monitoring and Management Plan. The tops of the PVC pipes were spray painted orange to improve visibility. The settlement plate locations are depicted in Figure 19 and on Sheet 1 in Appendix E.

Figure 19. Settlement Plate Locations



The locations of the settlement plates were surveyed by the City's surveyor on November 14, 2022. The settlement plates were surveyed again on December 13, 2022; January 3, 2023; February 6, 2023; March 8, 2023; April 3, 2023; May 11, 2023; and June 5, 2023. The surveyed coordinates[5] and elevation changes of the settlement plates are shown in Table 8.

Table 8. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation on June 05, 2023	Elevation Change Since May 11, 2023	Strain[6] Since May 11, 2023	Elevation Change Since Installation	Strain Since Installation
SP-1	3,397,886.7	10,412,078.8	1,832.2	-0.2	-0.3%	-2.2	-3.4%
SP-2	3,397,808.0	10,412,365.0	1,806.0	-0.6	-0.4%	-4.6	-2.8%
SP-3	3,397,787.2	10,412,536.6	1,783.1	-0.1	-0.1%	-0.5	-0.8%
SP-4[7]	3,398,250.1	10,412,188.2	1,812.0	-0.7	-0.4%	-5.5	-3.5%
SP-5	3,398,256.1	10,412,338.9	1,797.0	-0.6	-0.2%	-3.7	-1.5%
SP-6	3,398,249.2	10,412,510.9	1,776.5	-0.2	-0.1%	-1.2	-0.9%
SP-7[8]	3,398,735.9	10,412,157.3	1,827.3	-0.2	-0.2%	-1.4	-1.2%
SP-8	3,398,679.0	10,412,290.7	1,804.4	-0.4	-0.2%	-2.9	-1.2%
SP-9	3,398,673.9	10,412,401.0	1,784.3	-0.2	-0.2%	-1.5	-1.5%
SP-10	3,399,080.4	10,412,092.2	1,839.2	-0.1	0.0%	-1.0	-0.4%
SP-11	3,399,216.3	10,412,183.6	1,815.8	-0.1	0.0%	-0.5	-0.2%
SP-12	3,399,382.0	10,412,019.6	1,810.3	-0.1	-0.1%	-0.3	-0.3%

Settlement Plates 2, 4, and 5 continue to demonstrate substantial elevation change. SCS believes that Settlement Plate 4 was disturbed by grading work on an adjacent roadway. The other 2 settlement plates (2 and 5) are located towards the center of the waste mass and in the southern end of the landfill. This area is where waste was most recently placed and is expected to show the most rapid settlement. This area is also the location of the gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions.

The change in elevation at Settlement Plates 10, 11, and 12 continues to be lower and more representative of typical settlement at municipal landfills. The change in elevation at Settlement Plates 1, 3, 6, 8, and 9 falls somewhere in between these two categories. Field observations indicate that Settlement Plate 7 may also have been damaged during construction operations.

The settlement plates will be surveyed again during the month of August. The elevations surveyed will be compared to the elevations surveyed the previous months.

[5] Settlement plate locations and coordinates are based on a local coordinate system.
[6] Strain is defined as the change in elevation divided by the estimated waste depth.
[7] Based on field observations SP-4 appears to have been disturbed during grading on an adjacent roadway.
[8] Based on field observations SP-7 appears to have been disturbed during grading on an adjacent stockpile.

6.0 INTERMEDIATE COVER AND EVOH COVER SYSTEM

The City is taking steps to provide intermediate and temporary cover of the wastes in the landfill. The sections below outline the steps taken by the City.

6.1 INTERMEDIATE COVER INSTALLATION

The City completed hauling and placement of a 12-inch thick intermediate cover across the entire landfill prior to October 10, 2022. The cover was placed in accordance with 9VAC20-81-140(B)(1)(d). SCS coordinated with the City to dig a series of test holes to verify cover thickness in select locations. Details of these verifications were discussed in the October 2022 Monthly Compliance Report for the SWP No. 588 Landfill.

6.2 EVOH COVER SYSTEM DESIGN

SCS submitted responses, including revised documents, on March 20, 2023 to comments received from VDEQ concerning the Interim EVOH Cover System Preliminary Design Plans. The submitted documents included a revised operations manual and settlement calculations for the proposed stormwater basin. On April 28, 2023, SCS submitted the EVOH Cover System Stormwater Management Plan to VDEQ for the No. 588 landfill. SCS received a comment letter dated May 16, 2023 concerning the stormwater management plan. SCS prepared a response letter with revised drawings, documents, and calculations. The response package was submitted to VDEQ on June 23, 2023.

SCS is preparing construction drawings for the EVOH Cover System, including revisions discussed in the response to comments letters. The construction drawings build upon the preliminary design plans and the stormwater management plan. Potential modifications to the stormwater management plan submitted to VDEQ on April 28, 2023 will be included in the construction drawing set along with applicable calculations. Other additions to the construction drawings include additional design cross sections, landfill gas management plans and details, access road design, and other items.

SCS continues to prepare specifications and contract documents for the construction of the EVOH Cover System.

6.3 EVOH COVER SYSTEM PROCUREMENT

Drawings used for the purposes of bidding, procurement and construction of the EVOH cover system will generally conform to the layout and details in the drawings described in section 6.2. SCS also prepared and submitted to VDEQ a specification for the EVOH geomembrane on January 30, 2023 based upon industry standards and discussions with material manufacturers. This specification and drawing set represent the first steps in the procurement process. SCS and the City have coordinated with potential suppliers to specify a product that is not currently anticipated to have long lead times. SCS has received a pro-forma data sheet from one manufacturer which is preparing a customized EVOH product for the No. 588 landfill.

6.4 EVOH COVER SYSTEM INSTALLATION

Installation of the EVOH cover system will begin after the installation of other infrastructure is complete.

7.0 STORMWATER MANAGEMENT

The City is taking steps to implement a stormwater management plan at the landfill. The sections below outline the steps taken by the City.

7.1 STORMWATER MANAGEMENT PLAN DEVELOPMENT

The stormwater management plan was submitted to VDEQ on April 28, 2023. The plan addresses the stormwater volume calculations, assumptions, design, and control measures. SCS received a comment letter dated May 16, 2023 concerning the stormwater management plan. SCS prepared a response letter with revised drawings, documents, and calculations. The response package was submitted to VDEQ on June 23, 2023.

The plan proposes a stormwater pumping system to convey stormwater collected atop the EVOH cover system to an existing discharge point permitted under VPDES permit VAR050053. The proposed system includes the construction of a collection basin in the southeast corner of the quarry and the installation of a nearby long-term stormwater pumping station. The stormwater will be conveyed by a force main pipe adjacent to the basin access road.

The plan proposes modifications to the existing stormwater basins west of the quarry to achieve discharge quantity targets. Modifications include increasing the basin depths and installing new outlet riser structures.

7.2 STORMWATER MANAGEMENT BASIN DESIGN AND CONSTRUCTION

The landfill surface will be regraded to form the SWM basin proposed in the stormwater management plan. The earthwork will be completed as the first stage of the interim EVOH cover system installation project. A revised landfill gas management plan is being prepared to facilitate the regrading of the landfill, which will affect existing landfill gas infrastructure.

A concrete pad is being designed for installation adjacent to the stormwater basin. The prefabricated stormwater pumping station will be installed atop the concrete pad, along with associated electrical panels. The pumping station will be equipped with a suction lift line to draw stormwater out of the basin.

Attention is being given to settlement concerns in the vicinity of the stormwater basin. Calculations provided to VDEQ on June 23, 2023 demonstrate the weight of the ponded water should not cause excessive settlement relative to ongoing settlement observed within the quarry.

7.3 STORMWATER MANAGEMENT PLAN IMPLEMENTATION

The stormwater management plan design drawings are being incorporated into the overall construction drawings for the interim EVOH cover system. The interim EVOH cover system installation and stormwater management features will be bid and constructed as one project to facilitate simultaneous progress and completion.

7.4 LONG-TERM STORMWATER CONTROL AND REMOVAL

The stormwater management plan is designed with resiliency and redundancy to promote long-term operation. Two stormwater pumps will be installed in parallel, with each pump capable of operating independently. The pumps may be operated in parallel in contingency scenarios. The City plans to install a backup generator for the stormwater pumping station to allow for continued operation in the event of a temporary power loss. The pumps have been selected to include additional capacity to allow for future settlement.

A variable frequency drive control system is planned for the stormwater pumping system. The water level will be gauged using a transducer cable or comparable monitoring system to allow for automation of the pumping system. Appropriate telemetry will be used to allow for remote monitoring of the pumping system.

The operations manual will be updated to discuss the long-term operation and maintenance of the pumping system and other stormwater management features. Periodic inspections of the stormwater management system will be completed. The regular inspections will include monitoring the rate of settlement. If excessive settlement occurs, repairs will be planned and conducted as necessary to maintain the stormwater management system and cover system integrity.

7.5 STORMWATER MONITORING

Stormwater monitoring will commence upon initial discharge of stormwater from the quarry stormwater pumping system. As stated in the stormwater management plan drawings, the stormwater shall be monitored in accordance with the facility's VPDES general permit for discharge of stormwater associated with industrial activity. Additional requirements include collecting an additional stormwater sample at the discharge of the quarry stormwater pumping system. The stormwater from the quarry basin will be sampled on a monthly basis prior to discharge to the upper stormwater ponds. The Operations Manual has been revised to include these additional requirements.

If the stormwater becomes contaminated or sampling indicates contamination above discharge limits, the stormwater will be diverted to the sanitary sewer system. The diversion to the sanitary sewer system will continue until the source of contamination is identified and resolved. The stormwater discharge pipe alignment was adjusted to pass adjacent to the existing sanitary sewer manhole. A tee with isolation valves will be used to direct the stormwater to the upper basins or the sanitary sewer manhole.

8.0 MISCELLANEOUS

8.1 CEASE WASTE ACCEPTANCE

The City ceased acceptance of offsite waste at the Solid Waste Permit No. 588 landfill prior to September 12, 2022.

8.2 LONG-TERM PLAN

SCS submitted the Monitoring, Maintenance, and Repair Plan to VDEQ for the SWP No. 588 landfill on December 30, 2022. Refer to the December 2022 Monthly Compliance Report for the SWP No.

588 Landfill for additional information. The City has taken steps to implement the plan that were detailed in the March 2023 Monthly Compliance Report for the SWP No. 588 Landfill.

8.3 MONTHLY COMPLIANCE REPORTS

As described in the introduction this report is intended to provide comprehensive updates regarding progress towards completion of each item described in Appendix A of the Consent Decree between the City and VDEQ,

8.4 COMMUNITY OUTREACH PROGRAM

The City's consultant leading community outreach, McGuireWoods Consulting, described the actions taken as part of their community outreach efforts. For the month of June, those actions include:

- **June – ongoing basis:** Twelve posts on the BristolVALandfill.org site and the existing City of Bristol Landfill Notifications and Information page covering several important updates including:
  - Progress updates during construction and completion of the Sidewall Odor Mitigation System (SOMS).
  - Progress updates during installation and completion of the gas well expansion project
  - Announcement of the start of air sampling and monitoring at the quarry landfill.
  - Shared news article related to the completion of the Sidewall Odor Mitigation System (SOMS).
  - Provided links to news articles chronicling construction updates and information on legal updates about the quarry landfill.
- **Published new "Ask the Experts"** resource on Bristolvalandfill.org, which leverages the expertise of Craig H. Benson, PHD, PE, DGE, BCEE, NAE and Robert B. Gardner, PE, BCEE to answer common questions asked about the quarry landfill and the recent and ongoing remediation efforts.
- **E-mail communication sent to the list of members of the public signed up through the Bristol, VA website, the BristolVALandfill.org website, or at the November 1 Open House to receive information via e-mail**
  - E-mails sent included weekly remediation progress update and links to website updates and latest news articles on the following days:
    - Friday, June 2nd
    - Wednesday, June 7th
    - Friday, June 9th
    - Friday, June 23rd
    - Friday, June 30th

Appendix A

Surface Emissions Monitoring Summary Letters

June 14, 2023
File No. 02218208.04

Mr. Jonathan Chapman
Enforcement Specialist
Virginia Department of Environmental Quality
SW Regional Office
355-A Deadmore Street
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – June 6, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on June 6, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route includes the entire waste footprint of the Permit No. 588 Landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint, including at the temperature probes and the newly installed and connected gas extraction wells. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	164
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	64
Number of Exceedances	3
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	3

Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120 days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive re-tests.

A summary of ongoing exceedance points is provided in Table 2.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	6/6/23 Event	6/6/23 Event Result	Comments
EW-89	4/27/2023	N/A	Passed	Subject to 1960(c)(4)(v)
EW-100	4/27/2023	N/A	Passed	Subject to 1960(c)(4)(v)
EW-66	5/25/2023	2nd 10-day retest	Failed	Subject to 1960(c)(4)(v)

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jonathan Hayes, City of Bristol
Jake Chandler, City of Bristol
Susan “Tracey” Blalock, VDEQ

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 6, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	1.5 PPM	OK			Start Serpentine Route
2	1.6 PPM	OK			
3	1.1 PPM	OK			
4	1.4 PPM	OK			
5	2.9 PPM	OK			
6	2.0 PPM	OK			
7	2.4 PPM	OK			
8	2.8 PPM	OK			
9	2.3 PPM	OK			
10	5.4 PPM	OK			
11	1.8 PPM	OK			
12	2.0 PPM	OK			
13	2.6 PPM	OK			
14	2.7 PPM	OK			
15	2.2 PPM	OK			
16	3.8 PPM	OK			
17	1.7 PPM	OK			
18	2.0 PPM	OK			
19	21.4 PPM	OK			
20	38.6 PPM	OK			
21	8.4 PPM	OK			
22	13.9 PPM	OK			
23	23.8 PPM	OK			
24	1.8 PPM	OK			
25	1.3 PPM	OK			
26	1.1 PPM	OK			
27	1.0 PPM	OK			
28	99.4 PPM	OK			
29	11.5 PPM	OK			
30	2.9 PPM	OK			
31	4.5 PPM	OK			
32	8.1 PPM	OK			
33	3.6 PPM	OK			
34	3.3 PPM	OK			
35	1.6 PPM	OK			
36	0.8 PPM	OK			
37	1.5 PPM	OK			
38	14.0 PPM	OK			
39	5.8 PPM	OK			
40	8.4 PPM	OK			
41	7.4 PPM	OK			
42	2.1 PPM	OK			

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 6, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	2.4 PPM	OK			
44	0.7 PPM	OK			
45	3.7 PPM	OK			
46	2.6 PPM	OK			
47	1.5 PPM	OK			
48	0.5 PPM	OK			
49	0.5 PPM	OK			
50	0.5 PPM	OK			
51	0.6 PPM	OK			
52	0.5 PPM	OK			
53	1.6 PPM	OK			
54	36.9 PPM	OK			
55	9.9 PPM	OK			
56	0.8 PPM	OK			
57	0.7 PPM	OK			
58	1.2 PPM	OK			
59	1.2 PPM	OK			
60	1.4 PPM	OK			
61	0.5 PPM	OK			
62	0.6 PPM	OK			
63	1.2 PPM	OK			
64	1.6 PPM	OK			
65	17.3 PPM	OK			
66	5.5 PPM	OK			
67	16.7 PPM	OK			
68	4.5 PPM	OK			
69	72.1 PPM	OK			
70	21.3 PPM	OK			
71	23.0 PPM	OK			
72	0.7 PPM	OK			
73	12.3 PPM	OK			
74	33.5 PPM	OK			
75	25.6 PPM	OK			
76	56.7 PPM	OK			
77	18.4 PPM	OK			
78	4.3 PPM	OK			
79	10.4 PPM	OK			
80	103.0 PPM	OK			
81	137.0 PPM	OK			
82	10.6 PPM	OK			
83	260.0 PPM	OK			
84	34.3 PPM	OK			

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 6, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	5.8 PPM	OK			
86	1.1 PPM	OK			
87	4.0 PPM	OK			
88	9.5 PPM	OK			
89	0.9 PPM	OK			
90	0.1 PPM	OK			
91	15.2 PPM	OK			
92	45.3 PPM	OK			
93	26.7 PPM	OK			
94	14.5 PPM	OK			
95	12.6 PPM	OK			
96	87.3 PPM	OK			
97	43.5 PPM	OK			
98	128.0 PPM	OK			
99	2.7 PPM	OK			
100	58.9 PPM	OK			End Serpentine Route
101	34.2 PPM	OK			EW-35
102	110.0 PPM	OK			EW-52
103	64.3 PPM	OK			TP-4
104	53.4 PPM	OK			EW-60
105	43.8 PPM	OK			EW-48
106	0.4 PPM	OK			TP-6
107	13.8 PPM	OK			EW-61
108	61.7 PPM	OK			EW-34
109	0.7 PPM	OK			EW-50
110	117.0 PPM	OK			EW-67
111	129.0 PPM	OK			EW-47
112	198.0 PPM	OK			EW-54
113	332.0 PPM	OK			EW-55
114	11.8 PPM	OK			TP-2
115	5927.0 PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	18.0 PPM	OK			EW-58
117	91.2 PPM	OK			EW-57
118	236.0 PPM	OK			TP-1
119	84.3 PPM	OK			EW-59
120	282.0 PPM	OK			EW-56
121	227.0 PPM	OK			EW-41
122	96.3 PPM	OK			EW-53
123	173.0 PPM	OK			EW-40
124	15.0 PPM	OK			TP-3
125	29.5 PPM	OK			EW-51

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 6, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	31.9 PPM	OK			EW-39
127	27.3 PPM	OK			TP-5
128	107.0 PPM	OK			EW-68
129	841.0 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	96.9 PPM	OK			TP-7
131	2.1 PPM	OK			EW-49
132	7.0 PPM	OK			EW-31R
133	1.6 PPM	OK			EW-65
134	1.4 PPM	OK			TP-8
135	1.0 PPM	OK			EW-64
136	0.1 PPM	OK			EW-30R
137	0.2 PPM	OK			EW-63
138	0.3 PPM	OK			EW-42
139	0.1 PPM	OK			TP-9
140	0.2 PPM	OK			EW-33R
141	0.1 PPM	OK			EW-62
142	0.0 PPM	OK			EW-29R
143	0.2 PPM	OK			EW-32R
144	102.0 PPM	OK			EW-69
145	5.7 PPM	OK			EW-32
146	0.6 PPM	OK			EW-70
147	353.0 PPM	OK			EW-73
148	0.0 PPM	OK			EW-76
149	4.2 PPM	OK			EW-78
150	26.3 PPM	OK			EW-82
151	18.4 PPM	OK			EW-85
152	0.7 PPM	OK			EW-88
153	0.5 PPM	OK			EW-89
154	40.4 PPM	OK			EW-93
155	14.1 PPM	OK			EW-94
156	25.7 PPM	OK			EW-98
157	0.6 PPM	OK			EW-100
158	39.4 PPM	OK			EW-99
159	3.2 PPM	OK			EW-95
160	4.2 PPM	OK			EW-90
162	2864.0 PPM	HIGH_ALRM	36.59932	-82.14824	EW-86
163	2.0 PPM	OK			EW-84
164	8.0 PPM	OK			EW-80

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 6, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments

Number of locations sampled:	164
Number of exceedance locations:	3

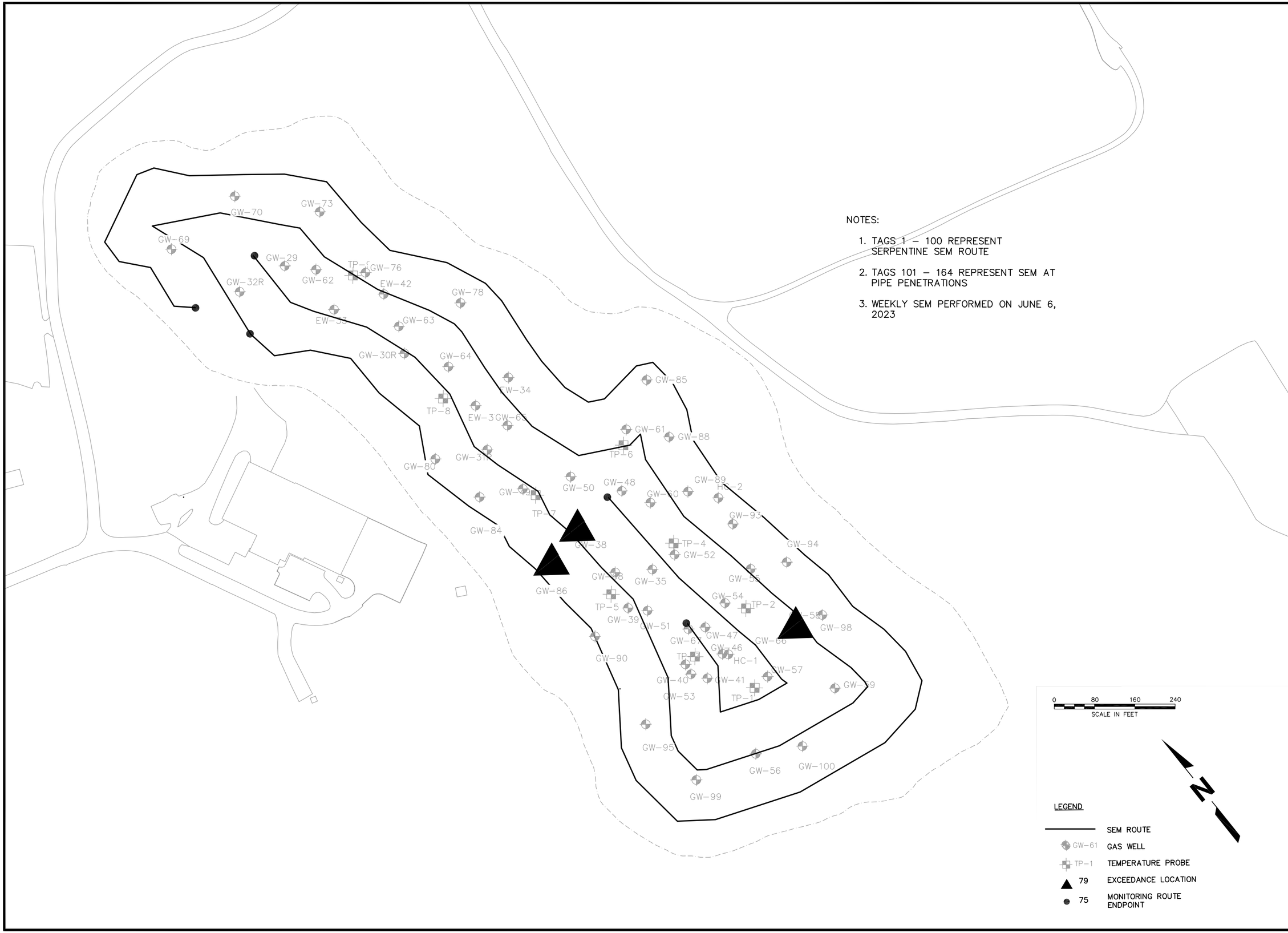
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 164 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 70˚F Wind: 0 S

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

6/6/2023	ZERO	0.0 PPM
6/6/2023	SPAN	464.0 PPM

Background Reading:

6/6/2023	Upwind	2.4 PPM
6/6/2023	Downwind	1.8 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 164 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JUNE 6, 2023

NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

PROJ. NO. 02218208.04
DSN. BY: LSN
CHK. BY: DBK
O/A RVW BY:
APP. BY:
DWN. BY: LSN

FILE: 02218208.04
DATE: 6/6/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

June 21, 2023
File No. 02218208.04

Mr. Jonathan Chapman
Enforcement Specialist
Virginia Department of Environmental Quality
SW Regional Office
355-A Deadmore Street
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – June 13, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on June 13, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route includes the entire waste footprint of the Permit No. 588 Landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint, including at the temperature probes and the newly installed and connected gas extraction wells. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	168
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	68
Number of Exceedances	4
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	4

Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive re-tests.

Two of the four exceedance locations identified during this monitoring event were located at a newly installed landfill gas extraction well. These wells have been connected to vacuum but have not yet been equipped with supplemental emissions reducing components, such as liquids extraction pumps and wellbore seals. Those components will be added in the near future.

A summary of ongoing exceedance points is provided in Table 2.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	6/13/23 Event	6/13/23 Event Result	Comments
EW-89	4/27/23	N/A	Passed	Subject to 1960(c)(4)(v)
EW-100	4/27/23	N/A	Passed	Subject to 1960(c)(4)(v)
EW-66	5/25/2023	N/A	Failed	Subject to 1960(c)(4)(v)

EW-38	6/6/2023	10-day retest	Failed	Requires 2nd 10-day retest
EW-86	6/6/2023	10-day retest	Passed	Requires 30-day retest

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,

William J. Fabrie

Will J. Fabrie
Staff Professional
SCS Engineers

Lucas S. Nachman

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jonathan Hayes, City of Bristol
Jake Chandler, City of Bristol
Susan “Tracey” Blalock, VDEQ

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 13, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
1	1.2	PPM	OK			Start Serpentine Route
2	2.4	PPM	OK			
3	1.8	PPM	OK			
4	1.5	PPM	OK			
5	1.6	PPM	OK			
6	1.7	PPM	OK			
7	1.3	PPM	OK			
8	2.6	PPM	OK			
9	1.8	PPM	OK			
10	2	PPM	OK			
11	1.6	PPM	OK			
12	1.7	PPM	OK			
13	13.6	PPM	OK			
14	2.4	PPM	OK			
15	2.7	PPM	OK			
16	2.2	PPM	OK			
17	45.8	PPM	OK			
18	1.9	PPM	OK			
19	12.3	PPM	OK			
20	2.7	PPM	OK			
21	2	PPM	OK			
22	2.8	PPM	OK			
23	168	PPM	OK			
24	3.2	PPM	OK			
25	12.3	PPM	OK			
26	12.4	PPM	OK			
27	39.1	PPM	OK			
28	264	PPM	OK			
29	3.3	PPM	OK			
30	22.8	PPM	OK			
31	17.4	PPM	OK			
32	22.7	PPM	OK			
33	12.3	PPM	OK			
34	342	PPM	OK			
35	7.7	PPM	OK			
36	95.5	PPM	OK			
37	3.4	PPM	OK			
38	15.4	PPM	OK			
39	3.5	PPM	OK			
40	3.7	PPM	OK			
41	1	PPM	OK			
42	3.8	PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 13, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
43	4.9	PPM	OK			
44	2.5	PPM	OK			
45	2.2	PPM	OK			
46	12.5	PPM	OK			
47	3	PPM	OK			
48	1	PPM	OK			
49	2.1	PPM	OK			
50	1.7	PPM	OK			
51	0.6	PPM	OK			
52	0.6	PPM	OK			
53	2.2	PPM	OK			
54	0.5	PPM	OK			
55	0.4	PPM	OK			
56	0.4	PPM	OK			
57	0.5	PPM	OK			
58	1.4	PPM	OK			
59	0.5	PPM	OK			
60	1.9	PPM	OK			
61	0.7	PPM	OK			
62	1.7	PPM	OK			
63	2.5	PPM	OK			
64	3.4	PPM	OK			
65	17.5	PPM	OK			
66	15	PPM	OK			
67	53.5	PPM	OK			
68	2.8	PPM	OK			
69	1.2	PPM	OK			
70	6.4	PPM	OK			
71	42.6	PPM	OK			
72	4	PPM	OK			
73	5.4	PPM	OK			
74	267	PPM	OK			
75	5.2	PPM	OK			
76	93.4	PPM	OK			
77	405	PPM	OK			
78	314	PPM	OK			
79	75.3	PPM	OK			
80	58.4	PPM	OK			
81	88.9	PPM	OK			
82	59.9	PPM	OK			
83	21.8	PPM	OK			
84	9.1	PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 13, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
85	54.7	PPM	OK			
86	6	PPM	OK			
87	0.8	PPM	OK			
88	3.1	PPM	OK			
89	16.6	PPM	OK			
90	15.7	PPM	OK			
91	4.8	PPM	OK			
92	14.3	PPM	OK			
93	139	PPM	OK			
94	240	PPM	OK			
95	3.2	PPM	OK			
96	54	PPM	OK			
97	111	PPM	OK			
98	49.8	PPM	OK			
99	103	PPM	OK			
		PPM	OK			End Serpentine
100	5.9					Route
101	310	PPM	OK			EW-35
102	222	PPM	OK			EW-52
103	26.9	PPM	OK			TP-4
104	105	PPM	OK			EW-60
105	185	PPM	OK			EW-48
106	3.2	PPM	OK			TP-6
107	19.6	PPM	OK			EW-61
108	7	PPM	OK			EW-34
109	0.4	PPM	OK			EW-50
110	341	PPM	OK			EW-67
111	149	PPM	OK			EW-47
112	244	PPM	OK			EW-54
113	146	PPM	OK			EW-55
114	339	PPM	OK			TP-2
115	2264	PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	137	PPM	OK			EW-58
117	72.7	PPM	OK			EW-57
118	22.3	PPM	OK			TP-1
119	118	PPM	OK			EW-59
120	285	PPM	OK			EW-56
121	159	PPM	OK			EW-41
122	205	PPM	OK			EW-53
123	79.9	PPM	OK			EW-40
124	38.6	PPM	OK			TP-3
125	13.9	PPM	OK			EW-51

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 13, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
126	30.4	PPM	OK			EW-39
127	189	PPM	OK			TP-5
128	19.1	PPM	OK			EW-68
129	722	PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	41.3	PPM	OK			TP-7
131	1.5	PPM	OK			EW-49
132	2.9	PPM	OK			EW-31R
133	6.7	PPM	OK			EW-65
134	1.8	PPM	OK			EW-37
135	7.5	PPM	OK			TP-8
136	1.1	PPM	OK			EW-64
137	0.7	PPM	OK			EW-30R
138	0.6	PPM	OK			EW-63
139	0.6	PPM	OK			EW-42
140	0.6	PPM	OK			TP-9
141	1	PPM	OK			EW-33R
142	0.7	PPM	OK			EW-62
143	1.7	PPM	OK			EW-29R
144	0.1	PPM	OK			EW-74
145	1.6	PPM	OK			EW-32R
146	0.2	PPM	OK			EW-69
147	0.7	PPM	OK			EW-71
148	0.4	PPM	OK			EW-72
149	0	PPM	OK			EW-70
150	0	PPM	OK			EW-73
151	0.6	PPM	OK			EW-76
152	9	PPM	OK			EW-78
153	5.1	PPM	OK			EW-82
154	1.2	PPM	OK			EW-85
155	6.1	PPM	OK			EW-88
156	101	PPM	OK			EW-89
157	4.8	PPM	OK			EW-93
158	98.6	PPM	OK			EW-94
159	46.7	PPM	OK			EW-98
160	305	PPM	OK			EW-100
161	2947	PPM	HIGH_ALRM	36.59794	-82.14828	EW-99
162	1172	PPM	HIGH_ALRM	36.59794	-82.14828	EW-95
163	11.1	PPM	OK			EW-90
164	154	PPM	OK			EW-86
165	0.8	PPM	OK			EW-84
166	1.3	PPM	OK			EW-80
167	3.2	PPM	OK			EW-79

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 13, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
168	92.6	PPM	OK			EW-75

Number of locations sampled:	168
Number of exceedance locations:	4

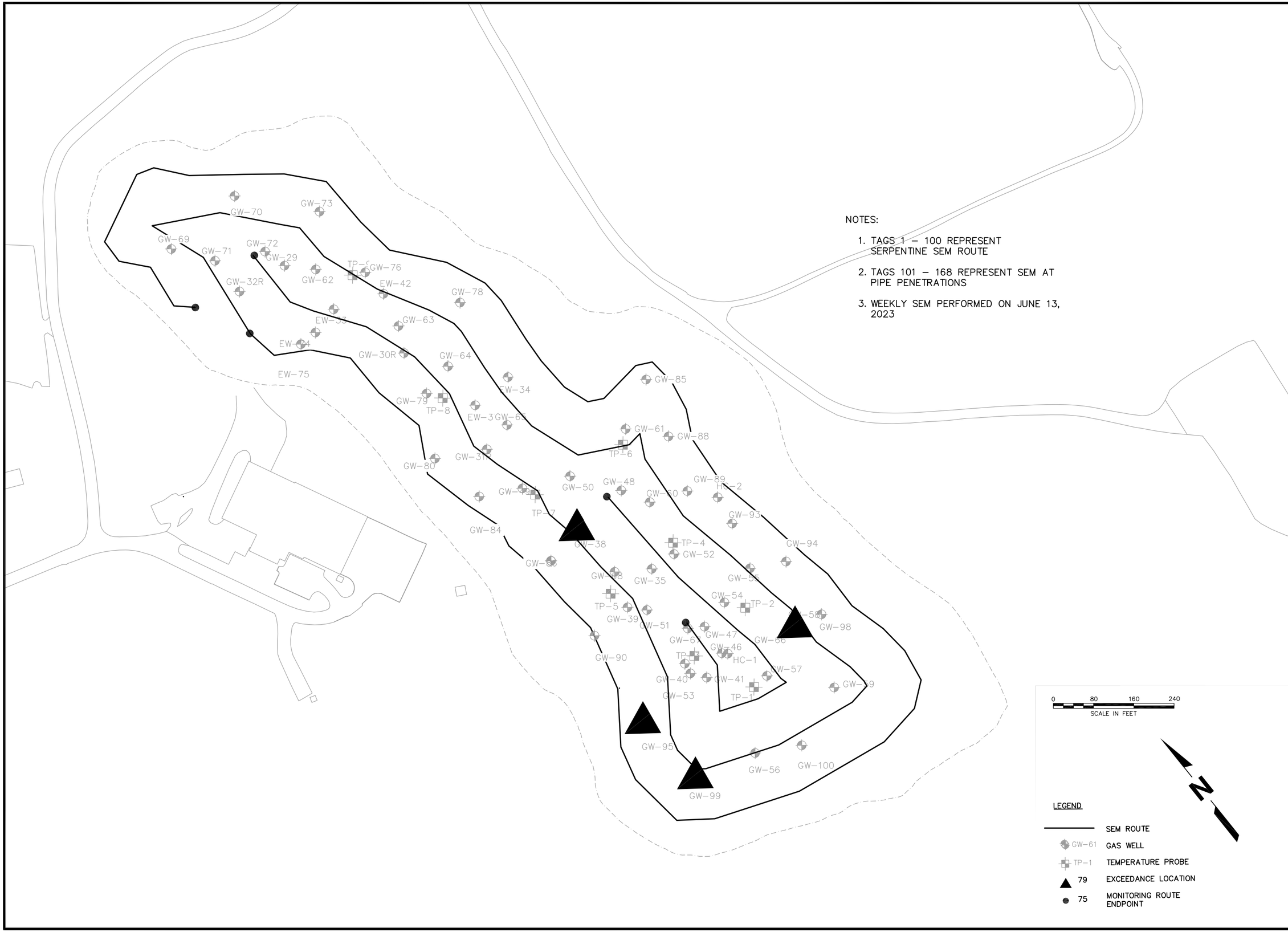
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 168 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 73°F Wind: 6 SW

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

6/13/2023	ZERO	0.1 PPM
6/13/2023	SPAN	500.0 PPM

Background Reading:

6/13/2023	Upwind	1.8 PPM
6/13/2023	Downwind	1.7 PPM



NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
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PROJ. NO.	DWN. BY:	O/A R/W BY:
02218208.04	LSN	
DSN. BY:	CHK. BY:	APP. BY:
LSN	DBK	

FILE: 02218208.04

DATE: 6/13/23

SCALE: AS SHOWN

DRAWING NO.
1 of **1**

June 28, 2023
File No. 02218208.04

Mr. Jonathan Chapman
Enforcement Specialist
Virginia Department of Environmental Quality
SW Regional Office
355-A Deadmore Street
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – June 23, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on June 23, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route includes the entire waste footprint of the Permit No. 588 Landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint, including at the temperature probes and the newly installed and connected gas extraction wells. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	169
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	69
Number of Exceedances	2
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	2

Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive re-tests.

A summary of ongoing exceedance points is provided in Table 2.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	6/23/23 Event	6/23/23 Event Result	Comments
EW-89	4/27/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-100	4/27/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-38	6/6/23	2nd 10-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-86	6/6/23	NA	Passed	Requires 30-day retest
EW-95	6/13/23	10-Day Retest	Passed	Requires 30-day retest
EW-99	6/13/23	10-Day Retest	Passed	Requires 30-Day Retest

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jonathan Hayes, City of Bristol
Jake Chandler, City of Bristol
Susan “Tracey” Blalock, VDEQ

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 23, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
1	3.9	PPM	OK			Start Serpentine Route
2	4.5	PPM	OK			
3	1.4	PPM	OK			
4	1.5	PPM	OK			
5	1.5	PPM	OK			
6	1.5	PPM	OK			
7	1.4	PPM	OK			
8	1.4	PPM	OK			
9	1.3	PPM	OK			
10	1.7	PPM	OK			
11	1.7	PPM	OK			
12	1.5	PPM	OK			
13	1.4	PPM	OK			
14	2.0	PPM	OK			
15	1.3	PPM	OK			
16	2.3	PPM	OK			
17	1.8	PPM	OK			
18	21.1	PPM	OK			
19	2.3	PPM	OK			
20	1.5	PPM	OK			
21	1.2	PPM	OK			
22	8.5	PPM	OK			
23	6.3	PPM	OK			
24	281.0	PPM	OK			
25	5.2	PPM	OK			
26	7.1	PPM	OK			
27	16.8	PPM	OK			
28	59.9	PPM	OK			
29	405.0	PPM	OK			
30	15.0	PPM	OK			
31	17.3	PPM	OK			
32	71.9	PPM	OK			
33	61.9	PPM	OK			
34	47.5	PPM	OK			
35	131.0	PPM	OK			
36	155.0	PPM	OK			
37	23.7	PPM	OK			
38	17.7	PPM	OK			
39	29.5	PPM	OK			
40	4.3	PPM	OK			
41	1.3	PPM	OK			
42	4.4	PPM	OK			

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 23, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
43	2.4	PPM	OK			
44	4.2	PPM	OK			
45	5.2	PPM	OK			
46	1.6	PPM	OK			
47	1.0	PPM	OK			
48	0.7	PPM	OK			
49	31.4	PPM	OK			
50	0.9	PPM	OK			
51	0.9	PPM	OK			
52	0.8	PPM	OK			
53	0.7	PPM	OK			
54	0.8	PPM	OK			
55	0.7	PPM	OK			
56	1.1	PPM	OK			
57	1.4	PPM	OK			
58	0.8	PPM	OK			
59	1.1	PPM	OK			
60	3.3	PPM	OK			
61	3.3	PPM	OK			
62	2.7	PPM	OK			
63	3.2	PPM	OK			
64	2.8	PPM	OK			
65	86.3	PPM	OK			
66	31.9	PPM	OK			
67	46.8	PPM	OK			
68	19.8	PPM	OK			
69	18.5	PPM	OK			
70	44.1	PPM	OK			
71	67.9	PPM	OK			
72	11.6	PPM	OK			
73	20.4	PPM	OK			
74	50.2	PPM	OK			
75	32.2	PPM	OK			
76	93.7	PPM	OK			
77	18.9	PPM	OK			
78	123.0	PPM	OK			
79	79.2	PPM	OK			
80	104.0	PPM	OK			
81	327.0	PPM	OK			
82	103.0	PPM	OK			
83	3.4	PPM	OK			
84	3.6	PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 23, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
85	7.0	PPM	OK			
86	5.2	PPM	OK			
87	2.2	PPM	OK			
88	1.1	PPM	OK			
89	1.5	PPM	OK			
90	0.6	PPM	OK			
91	11.6	PPM	OK			
92	132.0	PPM	OK			
93	60.9	PPM	OK			
94	23.9	PPM	OK			
95	26.3	PPM	OK			
96	13.7	PPM	OK			
97	34.1	PPM	OK			
98	42.2	PPM	OK			
99	17.9	PPM	OK			
100	44.5	PPM	OK			End Serpentine Route
101	262.0	PPM	OK			EW-35
102	229.0	PPM	OK			EW-52
103	55.9	PPM	OK			TP-4
104	23.2	PPM	OK			EW-60
105	116.0	PPM	OK			EW-48
106	115.0	PPM	OK			TP-6
107	67.9	PPM	OK			EW-61
108	59.2	PPM	OK			EW-34
109	2.4	PPM	OK			EW-50
110	20.3	PPM	OK			EW-67
111	133.0	PPM	OK			EW-47
112	168.0	PPM	OK			EW-54
113	420.0	PPM	OK			EW-55
114	8.8	PPM	OK			TP-2
115	11800.0	PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	41.4	PPM	OK			EW-58
117	55.0	PPM	OK			EW-57
118	35.4	PPM	OK			TP-1
119	230.0	PPM	OK			EW-59
120	273.0	PPM	OK			EW-56
121	321.0	PPM	OK			EW-41
122	291.0	PPM	OK			EW-53
123	99.0	PPM	OK			EW-40
124	11.8	PPM	OK			TP-3
125	11.0	PPM	OK			EW-51

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 23, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
126	74.1	PPM	OK			EW-39
127	381.0	PPM	OK			TP-5
128	3.2	PPM	OK			EW-68
129	1343.0	PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	19.2	PPM	OK			TP-7
131	0.9	PPM	OK			EW-49
132	17.1	PPM	OK			EW-31R
133	1.2	PPM	OK			EW-65
134	19.1	PPM	OK			EW-37
135	2.9	PPM	OK			TP-8
136	1.8	PPM	OK			EW-64
137	0.5	PPM	OK			EW-30R
138	0.4	PPM	OK			EW-63
139	1.2	PPM	OK			EW-42
140	13.0	PPM	OK			TP-9
141	0.3	PPM	OK			EW-33R
142	0.3	PPM	OK			EW-62
143	0.1	PPM	OK			EW-29R
144	2.2	PPM	OK			EW-74
145	0.1	PPM	OK			EW-32R
146	0.3	PPM	OK			EW-69
147	0.4	PPM	OK			EW-71
148	0.7	PPM	OK			EW-72
149	0.3	PPM	OK			EW-70
150	0.1	PPM	OK			EW-73
151	6.3	PPM	OK			EW-76
152	0.4	PPM	OK			EW-78
153	33.4	PPM	OK			EW-82
154	3.0	PPM	OK			EW-85
155	43.5	PPM	OK			EW-88
156	6.7	PPM	OK			EW-89
157	4.0	PPM	OK			EW-93
158	31.1	PPM	OK			EW-94
159	64.7	PPM	OK			EW-98
160	78.2	PPM	OK			EW-100
161	19.9	PPM	OK			EW-99
162	56.1	PPM	OK			EW-95
163	23.5	PPM	OK			EW-90
164	87.1	PPM	OK			EW-86
165	2.2	PPM	OK			EW-84
166	3.9	PPM	OK			EW-80
167	1.2	PPM	OK			EW-79

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 23, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
168	2.0	PPM	OK			EW-75
169	2.3	PPM	OK			EW-33B

Number of locations sampled:	169
Number of exceedance locations:	2

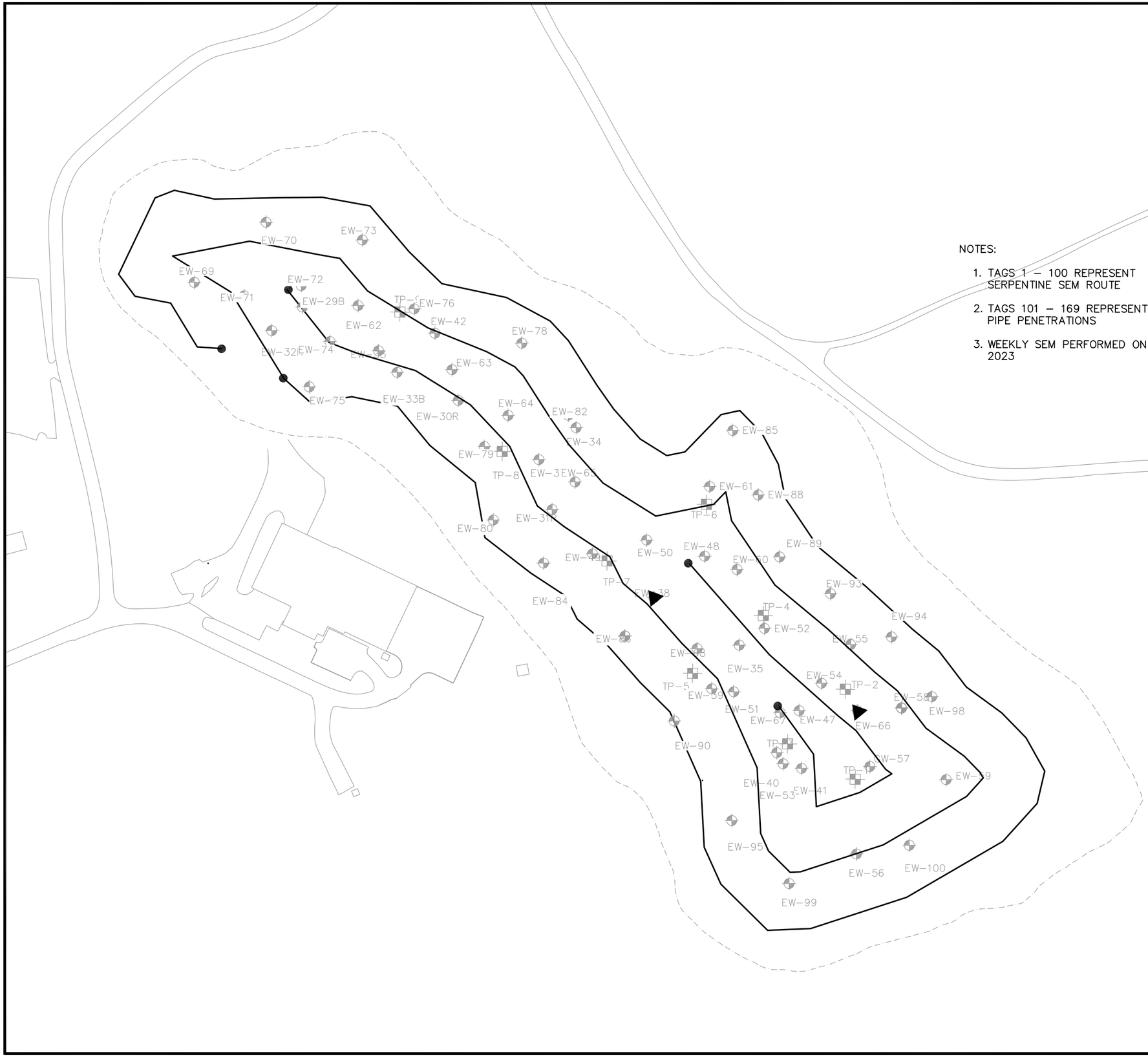
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 169 represent SEM at Pipe Penetrations
Weather Conditions: Cloudy, 75˚F Wind: 3 E

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

6/23/2023	ZERO	0.0 PPM
6/23/2023	SPAN	502.0 PPM

Background Reading:

6/23/2023	Upwind	1.7 PPM
6/23/2023	Downwind	2.8 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 169 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JUNE 23, 2023

1

NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

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LSN	DBK	

FILE: 02218208.04
DATE: 6/23/23
SCALE: AS SHOWN
DRAWING NO.

of 1

July 5, 2023
File No. 02218208.04

Mr. Jonathan Chapman
Enforcement Specialist
Virginia Department of Environmental Quality
SW Regional Office
355-A Deadmore Street
Abingdon, VA 24210

Subject: Weekly Surface Emissions Monitoring Event – June 29, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on June 29, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Appendix A.1.i of the Consent Decree between the Commonwealth of Virginia and the City of Bristol.

The monitoring generally conforms to the requirements of 40 CFR 63.1960(c) and (d), and 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route includes the entire waste footprint of the Permit No. 588 Landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint, including at the temperature probes and the newly installed and connected gas extraction wells. The approximate monitoring route and sampling locations are presented in the attached Drawing.

At the time of monitoring, all areas of the Permit No. 588 Landfill footprint are subject to regulatory monitoring based on the regulatory time schedule stipulated in 40 CFR 63.1960(b) and 40 CFR 60.36f(b). The Permit No. 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	169
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	69
Number of Exceedances	4
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	4

Remonitoring of Ongoing Exceedances

In accordance with 40 CFR 63.1960(c)(4)(ii) and 40 CFR 60.36f(c)(4)(ii), corrective actions and a remonitoring event are to be performed within 10 days of the initial exceedance. In accordance with 40 CFR 63.1960(c)(4)(iii) and 40 CFR 60.36f(c)(4)(iii) additional corrective actions and a second 10-day retest are to be performed if the initial 10-day retest indicates methane values greater than the regulatory threshold. The Facility performs corrective actions, as necessary, including wellhead vacuum adjustments, the installation of well-bore seals, and addition of soil cover prior to weekly monitoring events at locations that previously exhibited elevated methane concentrations.

In accordance with 40 CFR 63.1960(c)(4)(v) and 40 CFR 60.36f(c)(4)(v) a new well or collection device must be installed or an alternate remedy must be submitted within 120-days at locations that continue to exhibit methane concentrations above the regulatory threshold for two consecutive re-tests.

A summary of ongoing exceedance points is provided in Table 2.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	6/29/23 Event	6/29/23 Event Result	Comments
EW-89	4/27/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-100	4/27/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-86	6/6/23	N/A	Passed	Requires 30-Day Retest
EW-95	6/13/23	N/A	Passed	Requires 30-Day Retest
EW-99	6/13/23	N/A	Passed	Requires 30-Day Retest

If you have questions or require additional information, please contact either of the undersigned.

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jonathan Hayes, City of Bristol
Jake Chandler, City of Bristol
Susan “Tracey” Blalock, VDEQ

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 29, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
1	3.1	PPM	OK			Start Serpentine Route
2	27.4	PPM	OK			
3	3.1	PPM	OK			
4	2.4	PPM	OK			
5	2.5	PPM	OK			
6	2.5	PPM	OK			
7	3.2	PPM	OK			
8	2.2	PPM	OK			
9	2.1	PPM	OK			
10	2.1	PPM	OK			
11	2.7	PPM	OK			
12	2.6	PPM	OK			
13	2.5	PPM	OK			
14	2.4	PPM	OK			
15	32.4	PPM	OK			
16	8.2	PPM	OK			
17	13.7	PPM	OK			
18	22.3	PPM	OK			
19	2.1	PPM	OK			
20	1.9	PPM	OK			
21	2.8	PPM	OK			
22	2.2	PPM	OK			
23	10.7	PPM	OK			
24	3.5	PPM	OK			
25	13.6	PPM	OK			
26	5.5	PPM	OK			
27	4.8	PPM	OK			
28	83.4	PPM	OK			
29	72.5	PPM	OK			
30	93.0	PPM	OK			
31	65.8	PPM	OK			
32	26.5	PPM	OK			
33	5.7	PPM	OK			
34	46.2	PPM	OK			
35	7.8	PPM	OK			
36	7.7	PPM	OK			
37	12.5	PPM	OK			
38	6.3	PPM	OK			
39	10.7	PPM	OK			
40	12.1	PPM	OK			
41	7.5	PPM	OK			
42	150.0	PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 29, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
43	7.9	PPM	OK			
44	2.7	PPM	OK			
45	2.2	PPM	OK			
46	6.4	PPM	OK			
47	1.5	PPM	OK			
48	1.0	PPM	OK			
49	0.7	PPM	OK			
50	0.4	PPM	OK			
51	0.3	PPM	OK			
52	1.0	PPM	OK			
53	0.3	PPM	OK			
54	0.4	PPM	OK			
55	0.3	PPM	OK			
56	0.2	PPM	OK			
57	0.3	PPM	OK			
58	0.5	PPM	OK			
59	1.5	PPM	OK			
60	0.6	PPM	OK			
61	0.9	PPM	OK			
62	1.6	PPM	OK			
63	21.1	PPM	OK			
64	19.2	PPM	OK			
65	3.9	PPM	OK			
66	15.7	PPM	OK			
67	1.6	PPM	OK			
68	5.1	PPM	OK			
69	150.0	PPM	OK			
70	159.0	PPM	OK			
71	39.3	PPM	OK			
72	120.0	PPM	OK			
73	21.1	PPM	OK			
74	220.0	PPM	OK			
75	28.5	PPM	OK			
76	32.6	PPM	OK			
77	24.6	PPM	OK			
78	7.5	PPM	OK			
79	302.0	PPM	OK			
80	53.1	PPM	OK			
81	102.0	PPM	OK			
82	21.5	PPM	OK			
83	4.7	PPM	OK			
84	21.5	PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 29, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
85	0.6	PPM	OK			
86	3.6	PPM	OK			
87	6.7	PPM	OK			
88	5.0	PPM	OK			
89	1.2	PPM	OK			
90	0.6	PPM	OK			
91	22.8	PPM	OK			
92	2.5	PPM	OK			
93	162.0	PPM	OK			
94	158.0	PPM	OK			
95	89.8	PPM	OK			
96	95.8	PPM	OK			
97	3.4	PPM	OK			
98	213.0	PPM	OK			
99	3.4	PPM	OK			
100	4.4	PPM	OK			End Serpentine Route
101	130.0	PPM	OK			EW-35
102	671.0	PPM	HIGH_ALRM	36.59885	-82.14788	EW-52
103	9.3	PPM	OK			TP-4
104	278.0	PPM	OK			EW-60
105	275.0	PPM	OK			EW-48
106	24.6	PPM	OK			TP-6
107	25.1	PPM	OK			EW-61
108	6.6	PPM	OK			EW-34
109	3.0	PPM	OK			EW-50
110	307.0	PPM	OK			EW-67
111	236.0	PPM	OK			EW-47
112	365.0	PPM	OK			EW-54
113	250.0	PPM	OK			EW-55
114	125.0	PPM	OK			TP-2
115	2658.0	PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	139.0	PPM	OK			EW-58
117	17.3	PPM	OK			EW-57
118	2.2	PPM	OK			TP-1
119	171.0	PPM	OK			EW-59
120	372.0	PPM	OK			EW-56
121	12.5	PPM	OK			EW-41
122	430.0	PPM	OK			EW-53
123	140.0	PPM	OK			EW-40
124	72.3	PPM	OK			TP-3
125	6.2	PPM	OK			EW-51

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 29, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
126	46.4	PPM	OK			EW-39
127	28.6	PPM	OK			TP-5
128	9.0	PPM	OK			EW-68
129	2140.0	PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	269.0	PPM	OK			TP-7
131	2.4	PPM	OK			EW-49
132	44.5	PPM	OK			EW-31R
133	1.6	PPM	OK			EW-65
134	6.8	PPM	OK			EW-37
135	3.5	PPM	OK			TP-8
136	4.3	PPM	OK			EW-64
137	1.5	PPM	OK			EW-30R
138	1.0	PPM	OK			EW-63
139	2.1	PPM	OK			EW-42
140	7.5	PPM	OK			TP-9
141	0.0	PPM	OK			EW-33R
142	0.4	PPM	OK			EW-62
143	0.0	PPM	OK			EW-29R
144	0.5	PPM	OK			EW-74
145	0.4	PPM	OK			EW-32R
146	0.0	PPM	OK			EW-69
147	0.0	PPM	OK			EW-71
148	15.3	PPM	OK			EW-72
149	0.0	PPM	OK			EW-70
150	0.3	PPM	OK			EW-73
151	135.0	PPM	OK			EW-76
152	21.1	PPM	OK			EW-78
153	70.1	PPM	OK			EW-82
154	30.9	PPM	OK			EW-85
155	20.8	PPM	OK			EW-88
156	2.0	PPM	OK			EW-89
157	0.9	PPM	OK			EW-93
158	5.6	PPM	OK			EW-94
159	2116.0	PPM	HIGH_ALRM	36.59836	-82.14678	EW-98
160	48.5	PPM	OK			EW-100
161	68.8	PPM	OK			EW-99
162	10.8	PPM	OK			EW-95
163	12.0	PPM	OK			EW-90
164	149.0	PPM	OK			EW-86
165	3.2	PPM	OK			EW-84
166	3.5	PPM	OK			EW-80
167	1.1	PPM	OK			EW-79

S C S E N G I N E E R S

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JUNE 29, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration		Compliance	GPS Coordinates Lat.	Long.	Comments
168	1.2	PPM	OK			EW-33B
169	57.9	PPM	OK			EW-75

Number of locations sampled:	169
Number of exceedance locations:	4

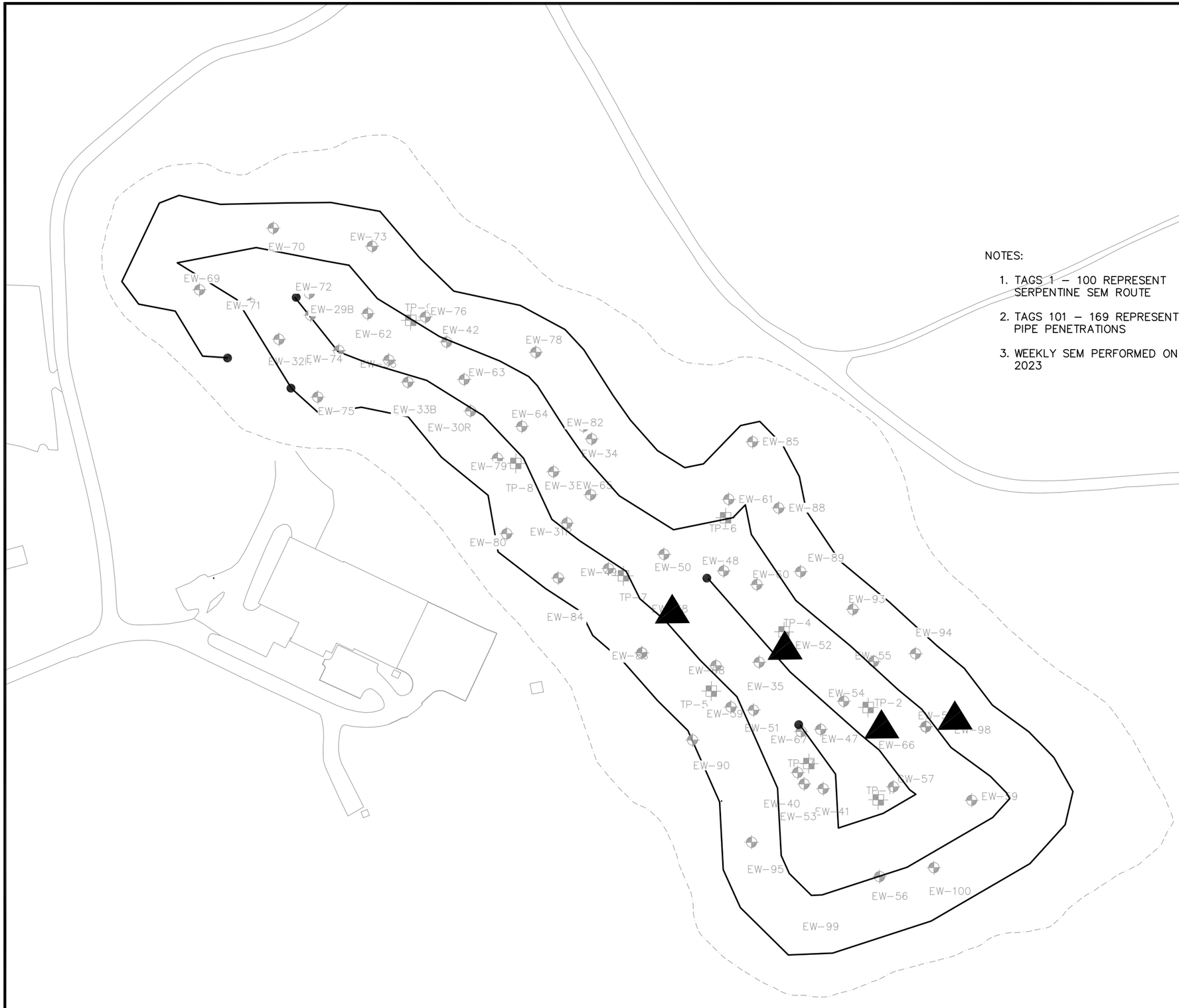
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 169 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 77˚F Wind: 5.5 E

Sampling Calibration: Methane - 500 ppm, Zero Air - 0.0 ppm

6/29/2023	ZERO	0.0 PPM
6/29/2023	SPAN	502.0 PPM

Background Reading:

6/29/2023	Upwind	3.1 PPM
6/29/2023	Downwind	13.9 PPM



1

NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

PROJ. NO.	DWN. BY:	C/A R/W BY:
02218208.04	LSN	
	CHK. BY:	APP. BY:
DSK. BY:	DBK	
LSN		

FILE: 02218208.04
DATE: 6/29/23
SCALE: AS SHOWN
DRAWING NO.

Appendix B

In-Waste Temperatures on Select Days in June

Appendix B Figures

Figure *B*- 1. Average Temperatures Recorded by TP-1 on June 7, 2023

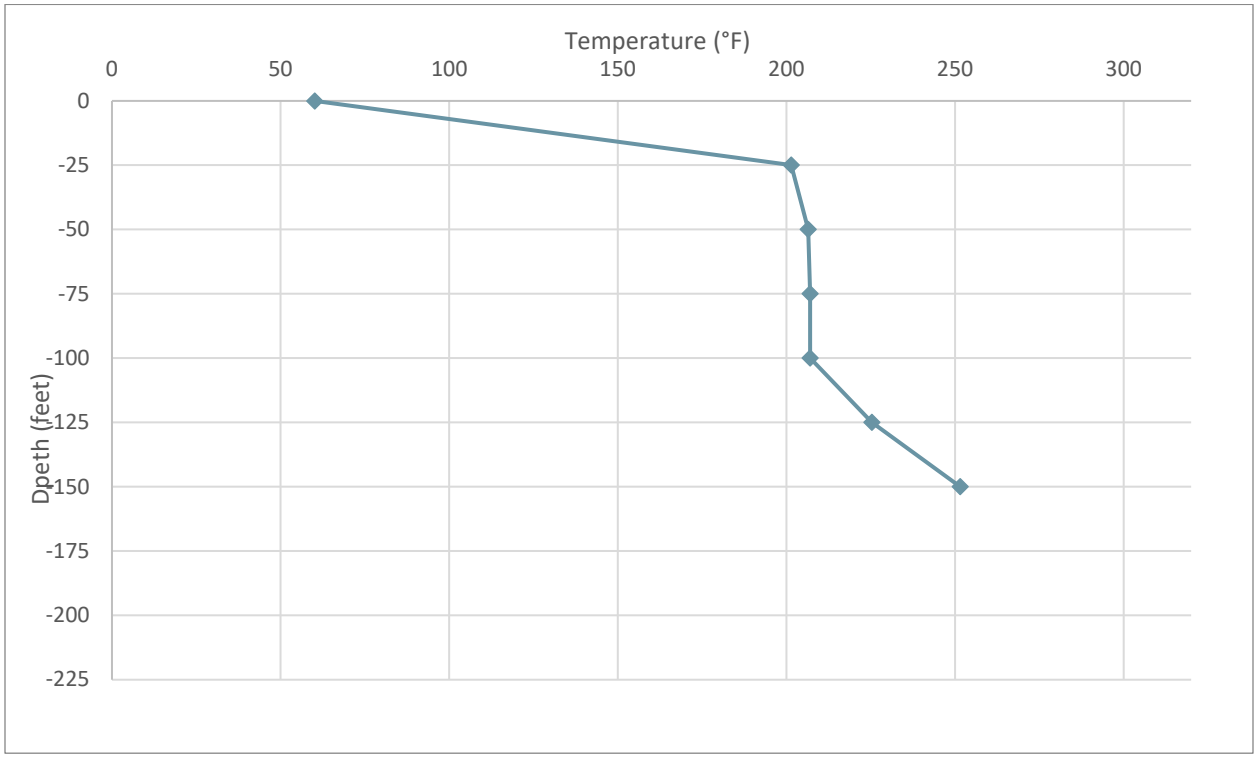


Figure B- 2. Average Temperatures Recorded by TP-1 on June 14, 2023

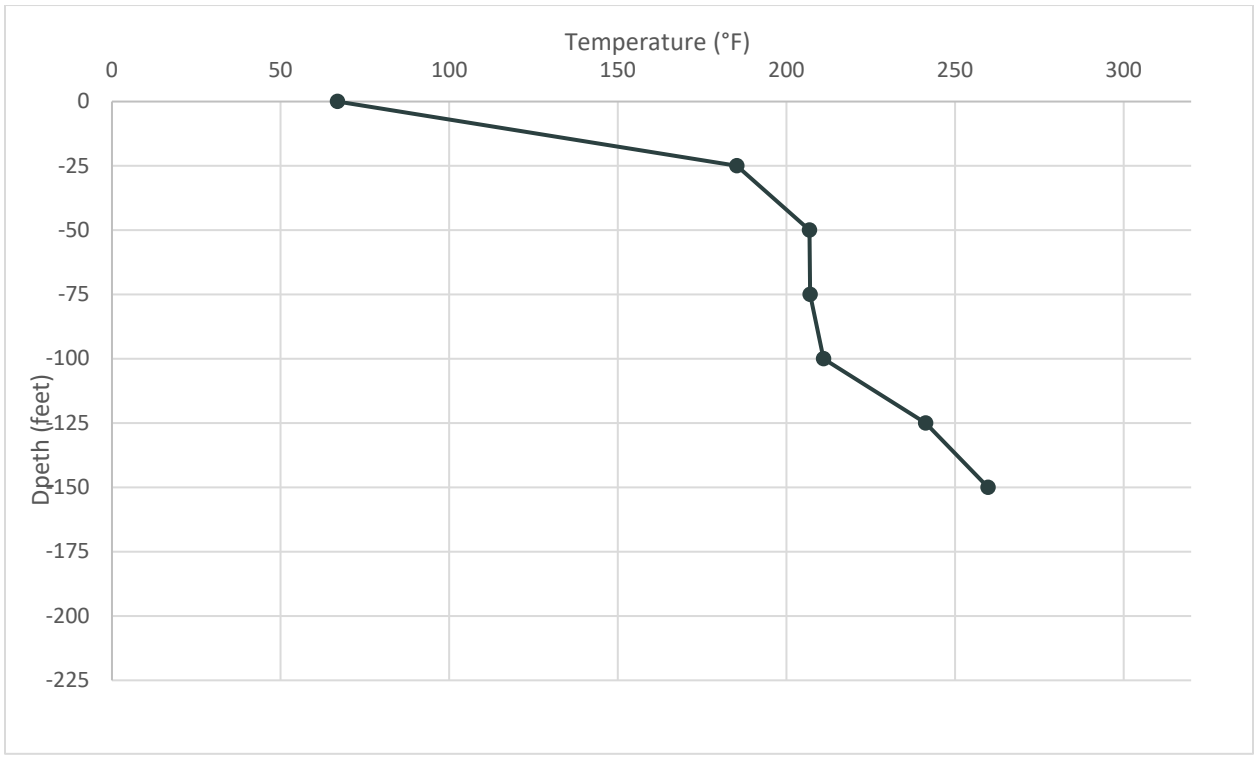


Figure B- 3. Average Temperatures Recorded by TP-1 on June 21, 2023

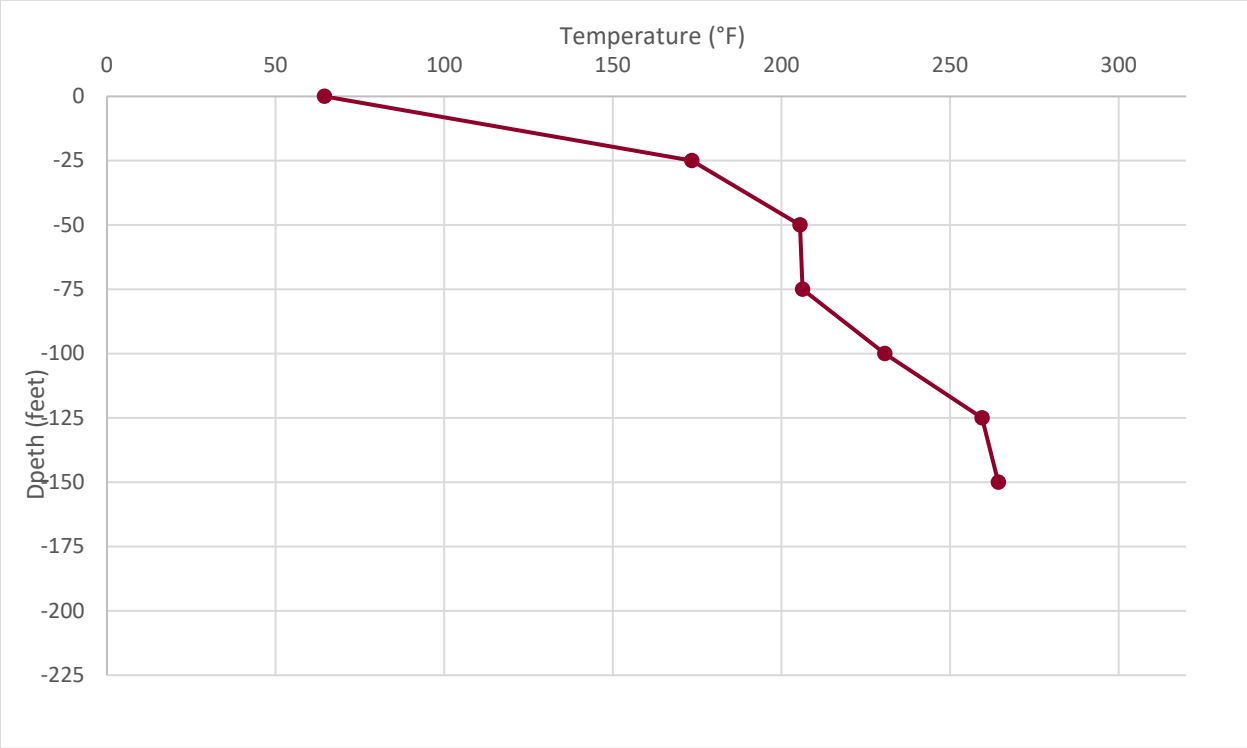


Figure B- 4. Average Temperatures Recorded by TP-1 on June 28, 2023

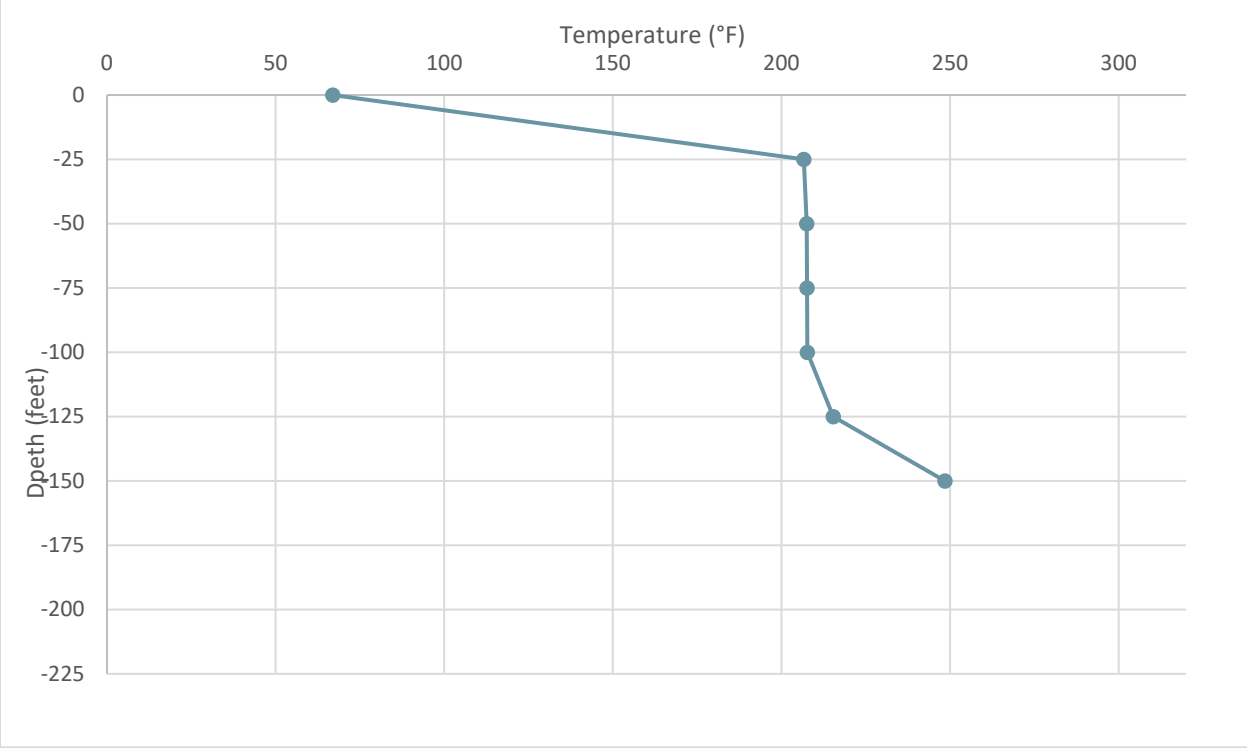


Figure B- 5. Average Temperatures Recorded by TP-2 on June 7, 2023

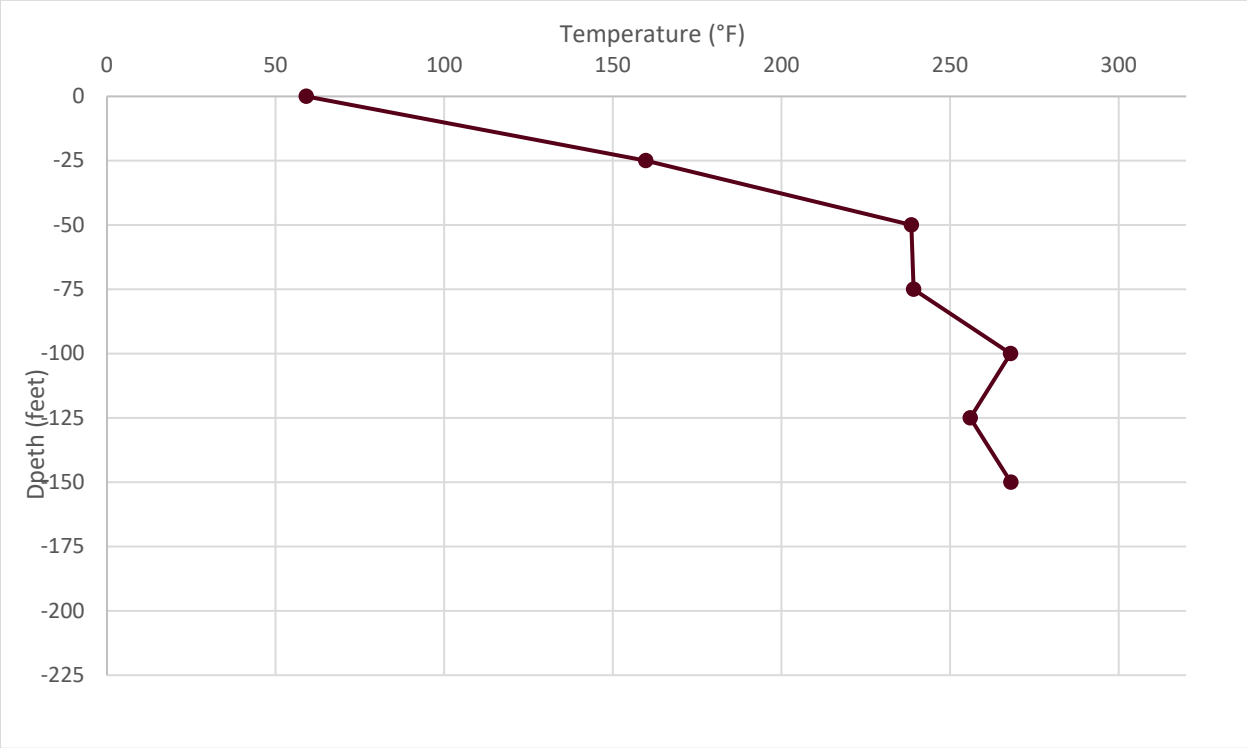


Figure B- 6. Average Temperatures Recorded by TP-2 on June 14, 2023

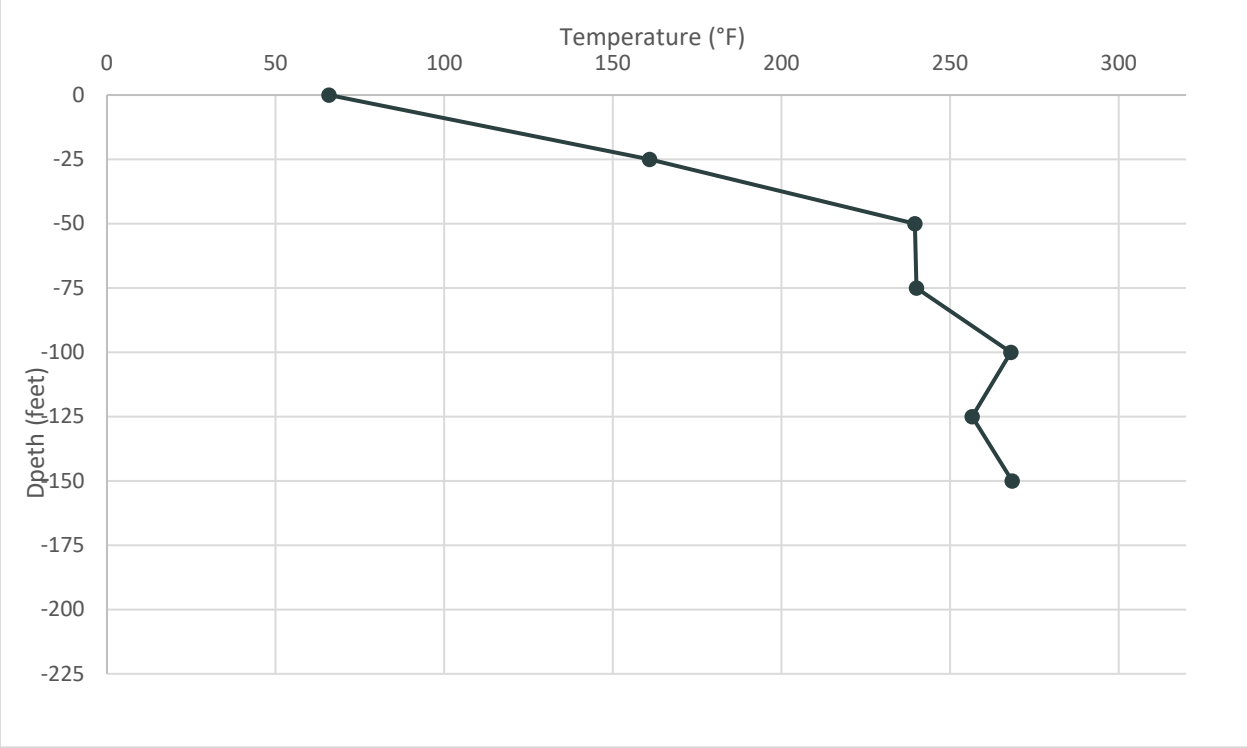


Figure B- 7. Average Temperatures Recorded by TP-2 on June 21, 2023

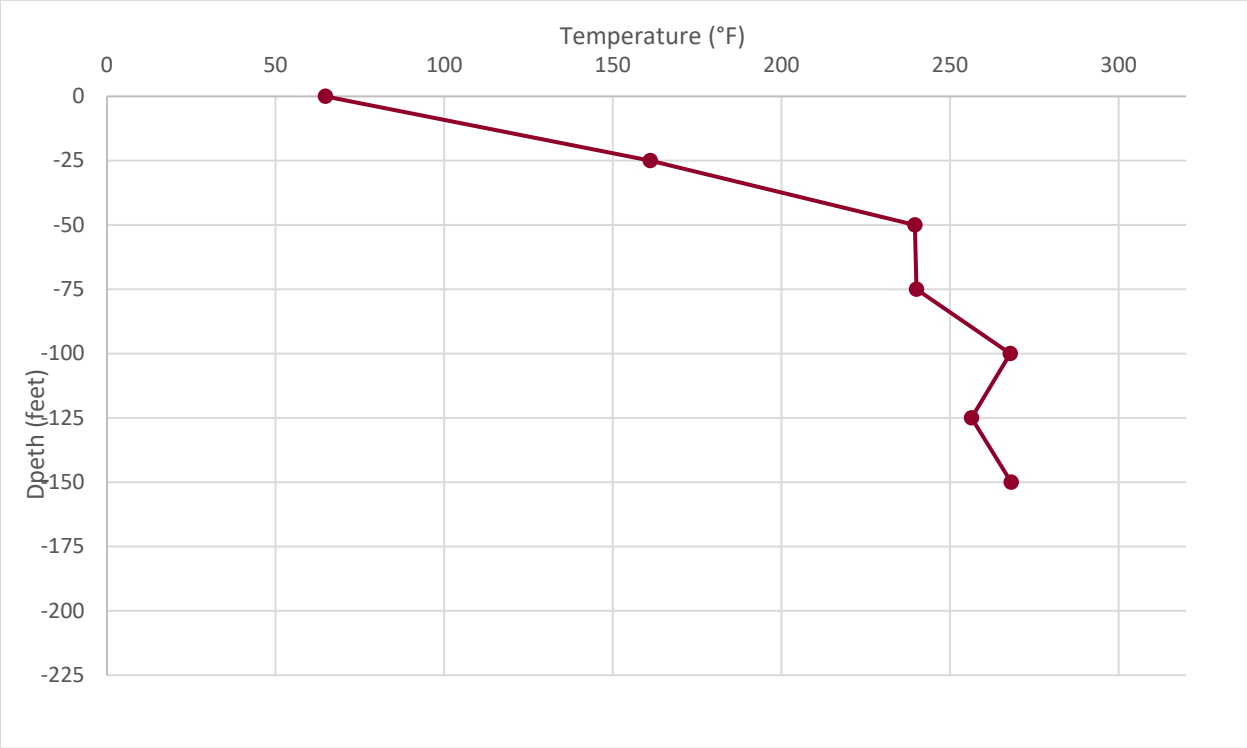


Figure B- 8. Average Temperatures Recorded by TP-2 on June 28, 2023

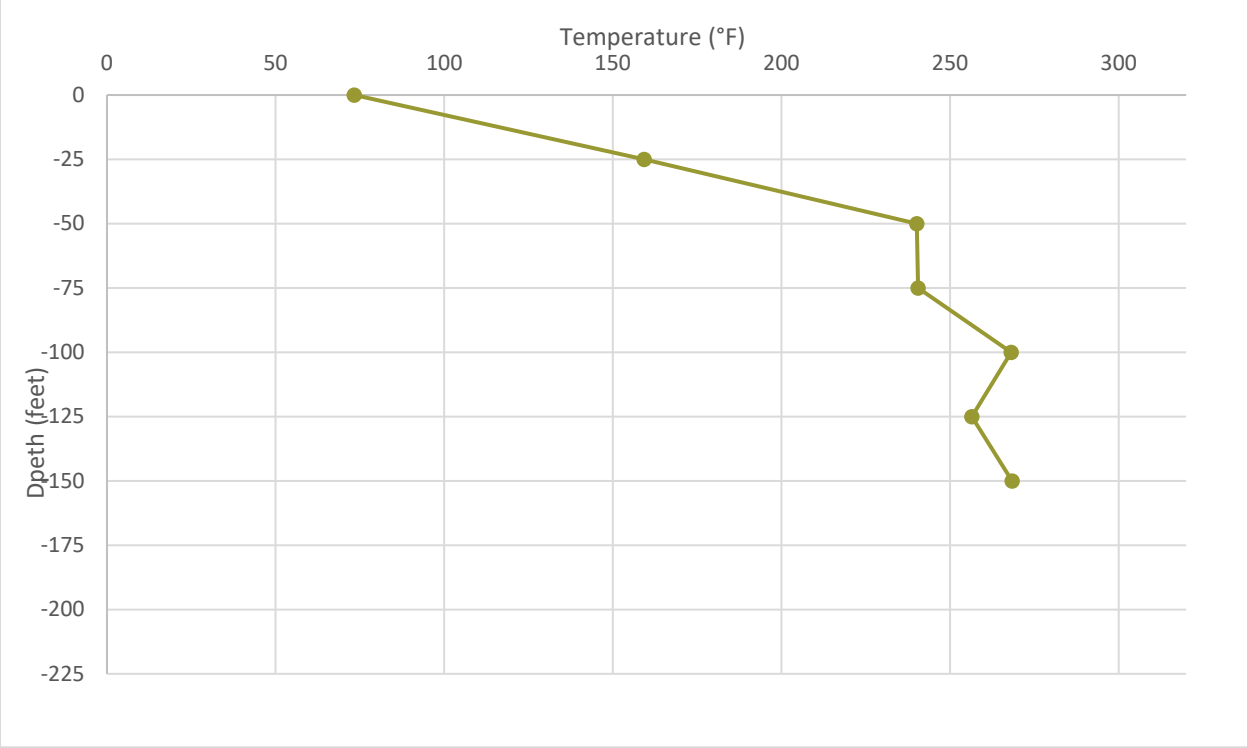


Figure B- 9. Average Temperatures Recorded by TP-3 on June 7, 2023

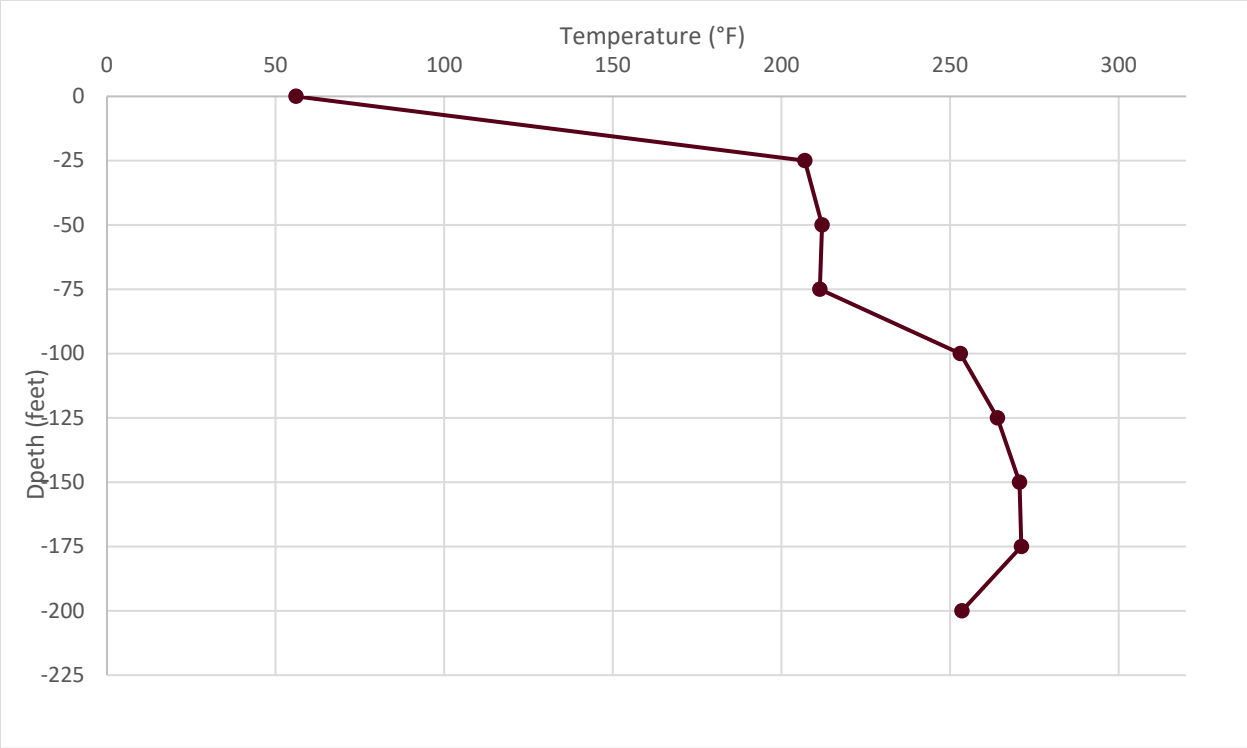


Figure B- 10. Average Temperatures Recorded by TP-3 on June 14, 2023

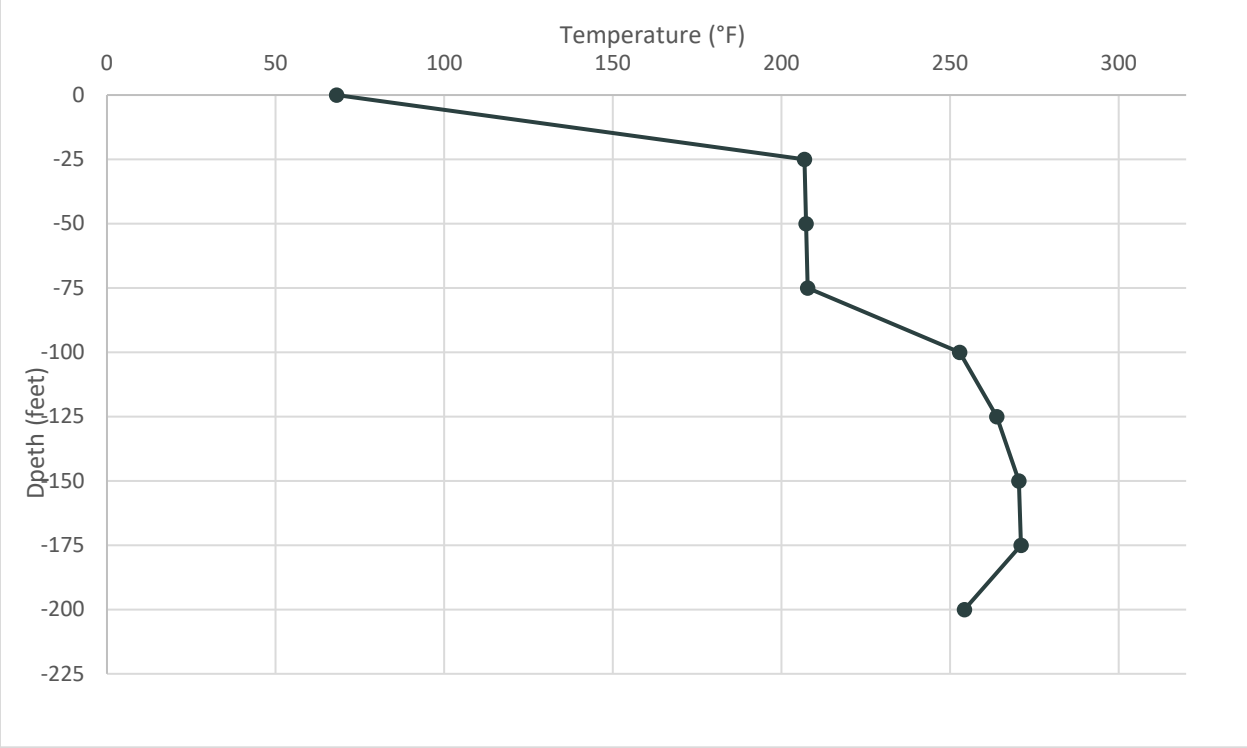


Figure B- 11. Average Temperatures Recorded by TP-3 on June 21, 2023

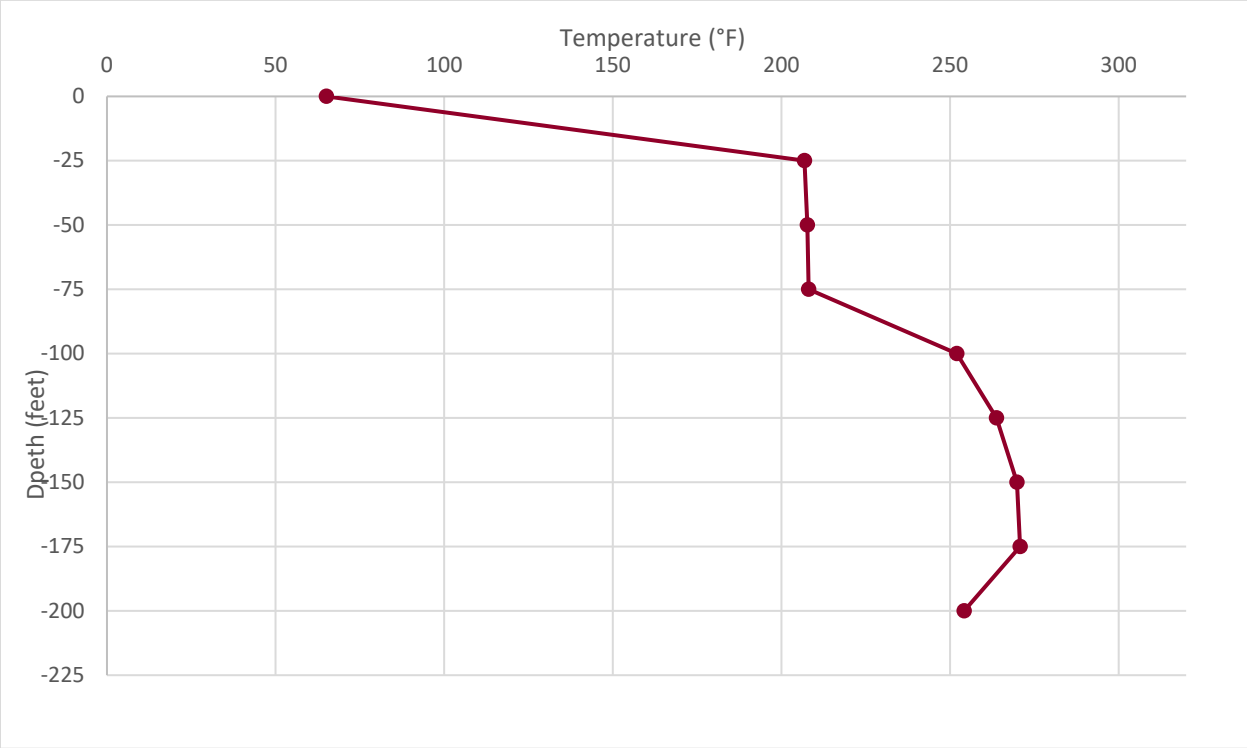


Figure B- 12. Average Temperatures Recorded by TP-3 on June 28, 2023

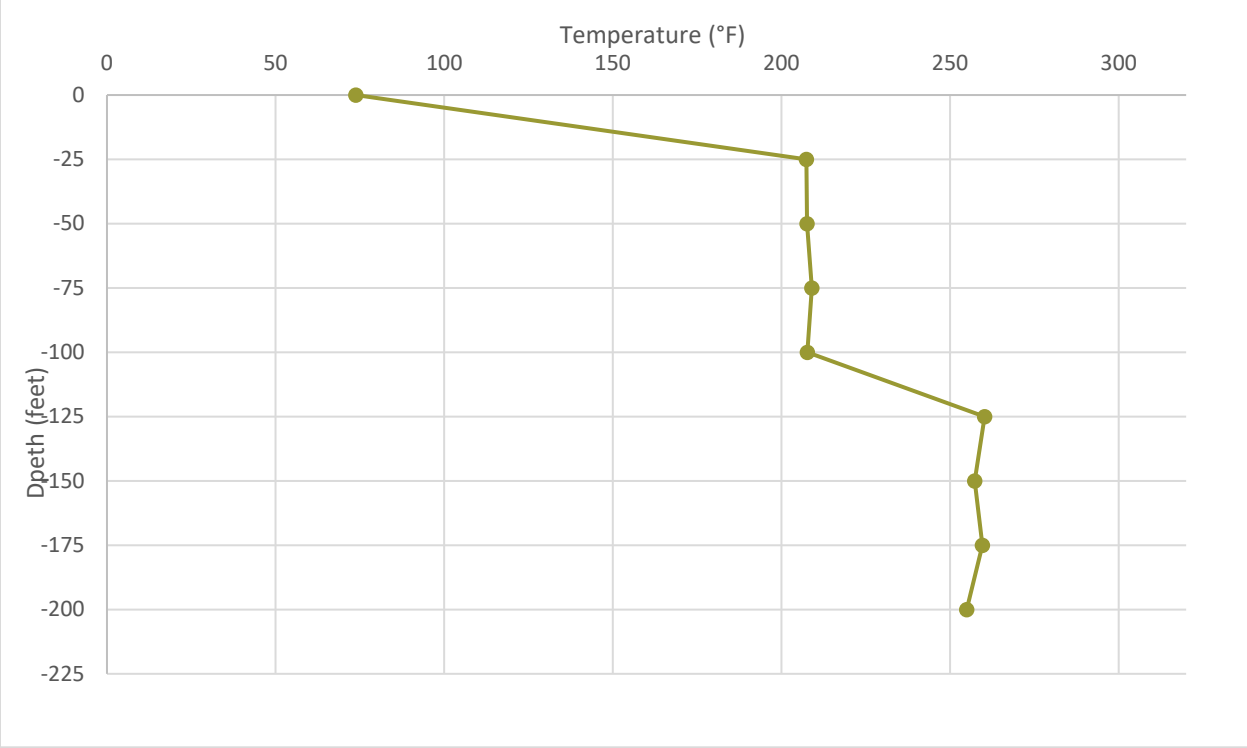


Figure B- 13. Average Temperatures Recorded by TP-4 on June 7, 2023

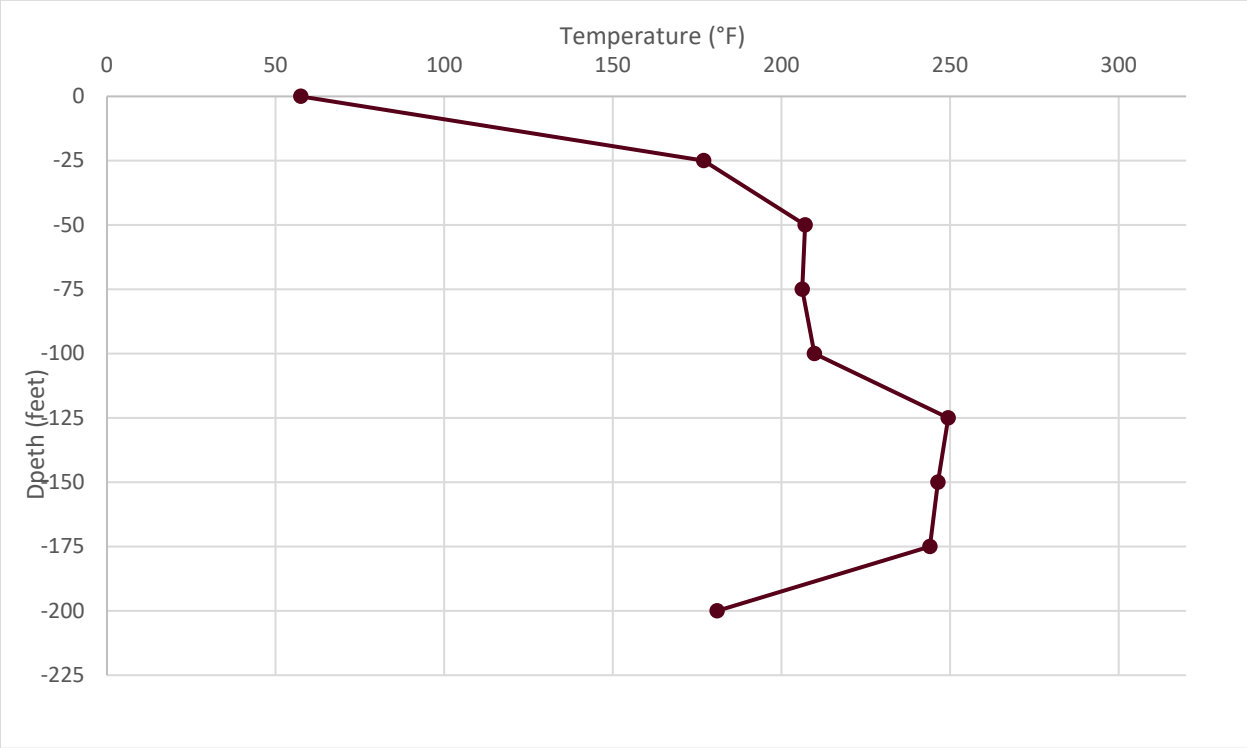


Figure B- 14. Average Temperatures Recorded by TP-4 on June 14, 2023

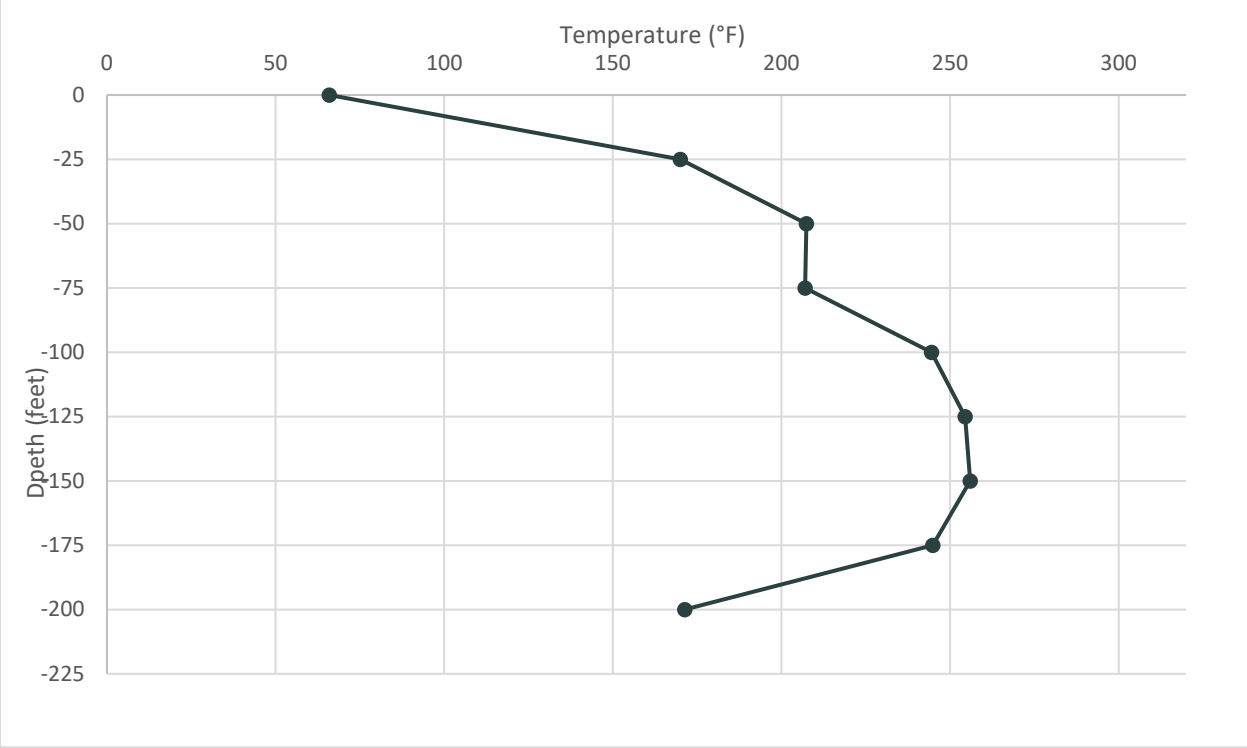


Figure B- 15. Average Temperatures Recorded by TP-4 on June 21, 2023

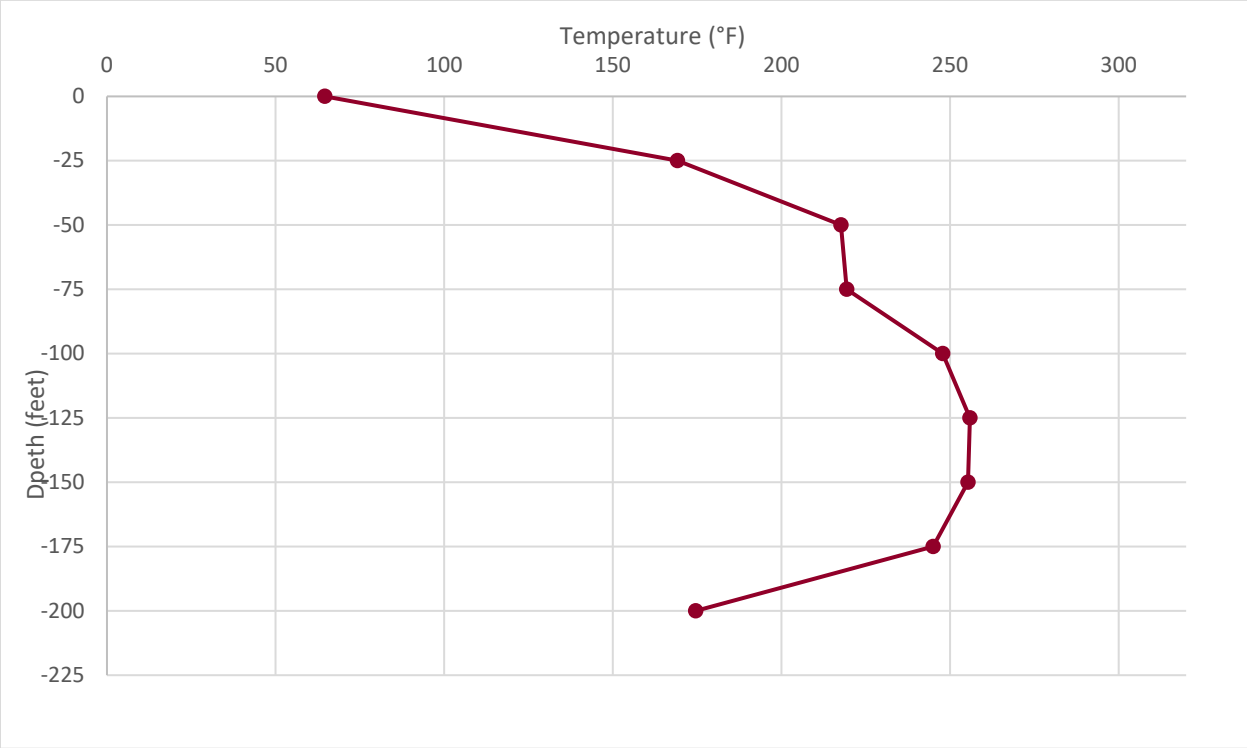


Figure B- 16. Average Temperatures Recorded by TP-4 on June 28, 2023

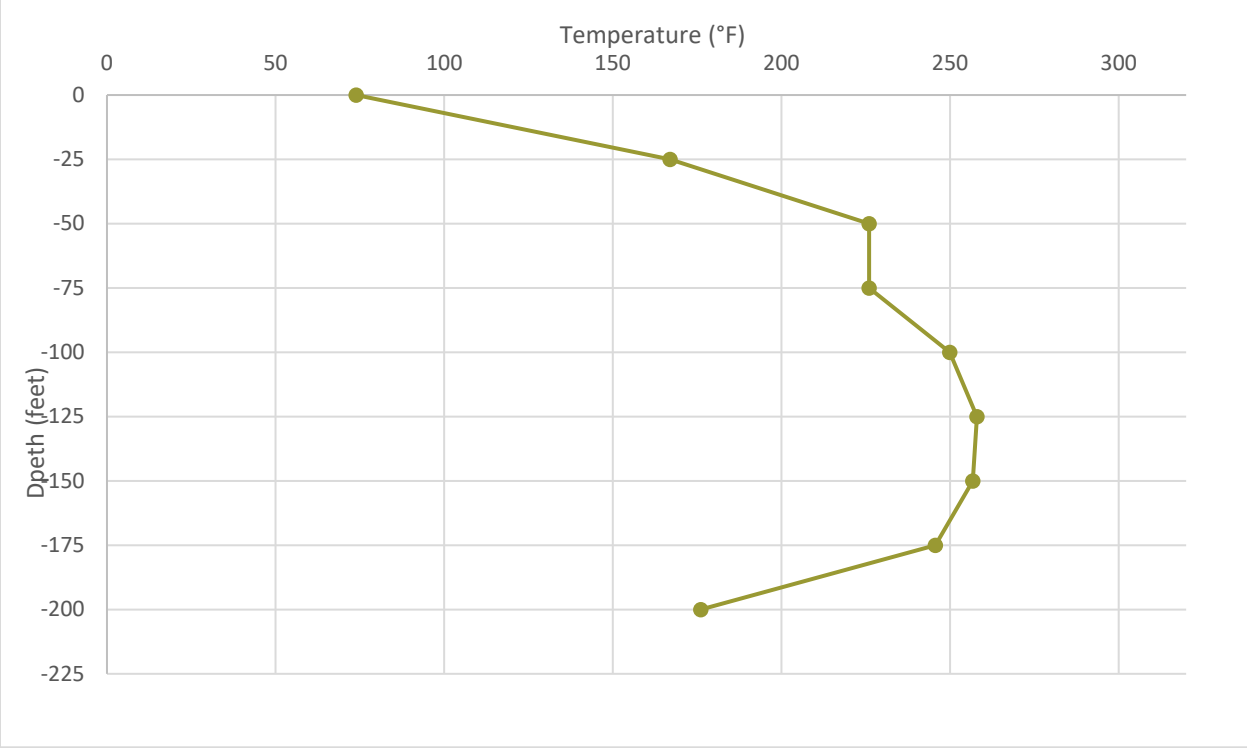


Figure B- 17. Average Temperatures Recorded by TP-5 on June 7, 2023

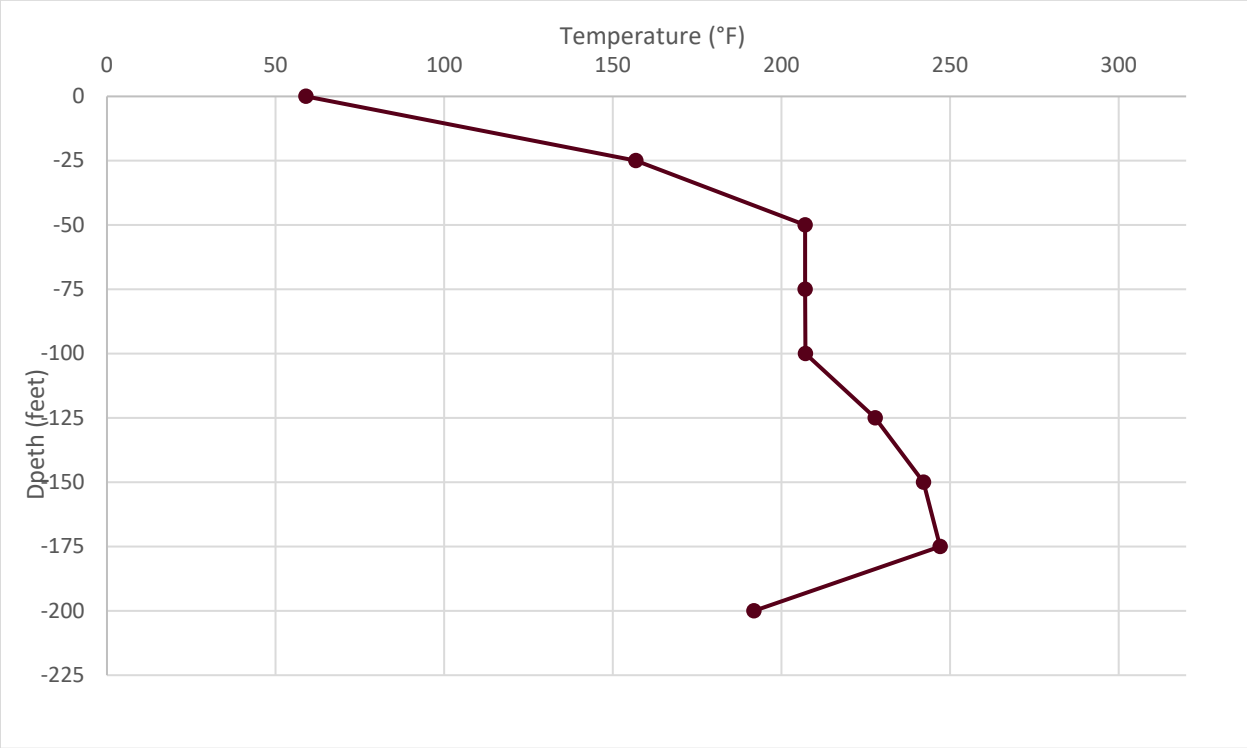


Figure B- 18. Average Temperatures Recorded by TP-5 on June 14, 2023

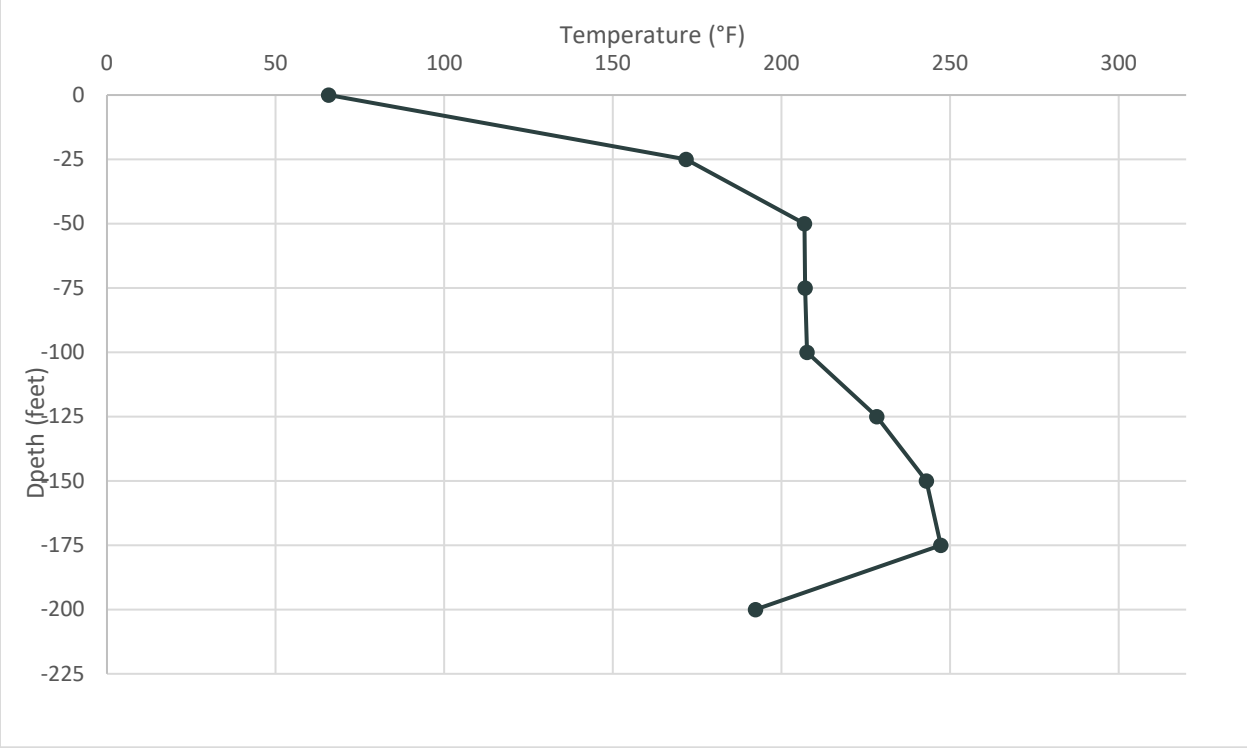


Figure B- 19. Average Temperatures Recorded by TP-5 on June 21, 2023

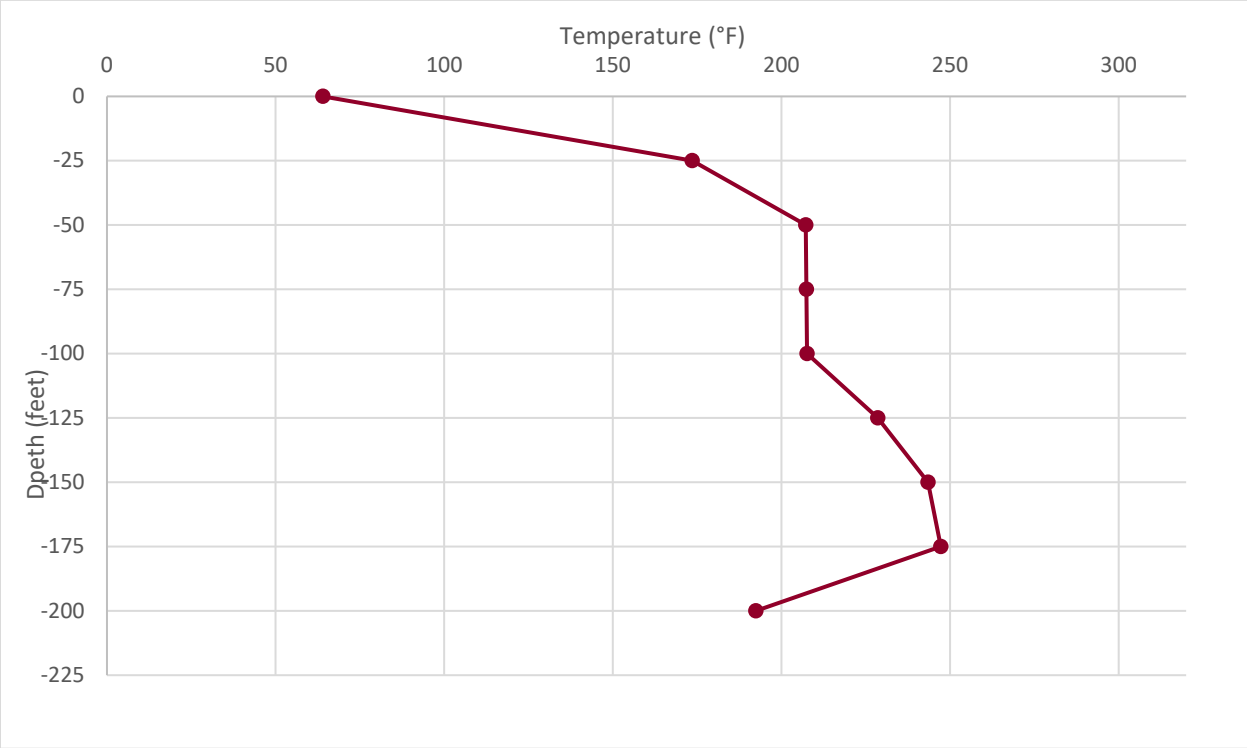


Figure B- 20. Average Temperatures Recorded by TP-5 on June 28, 2023

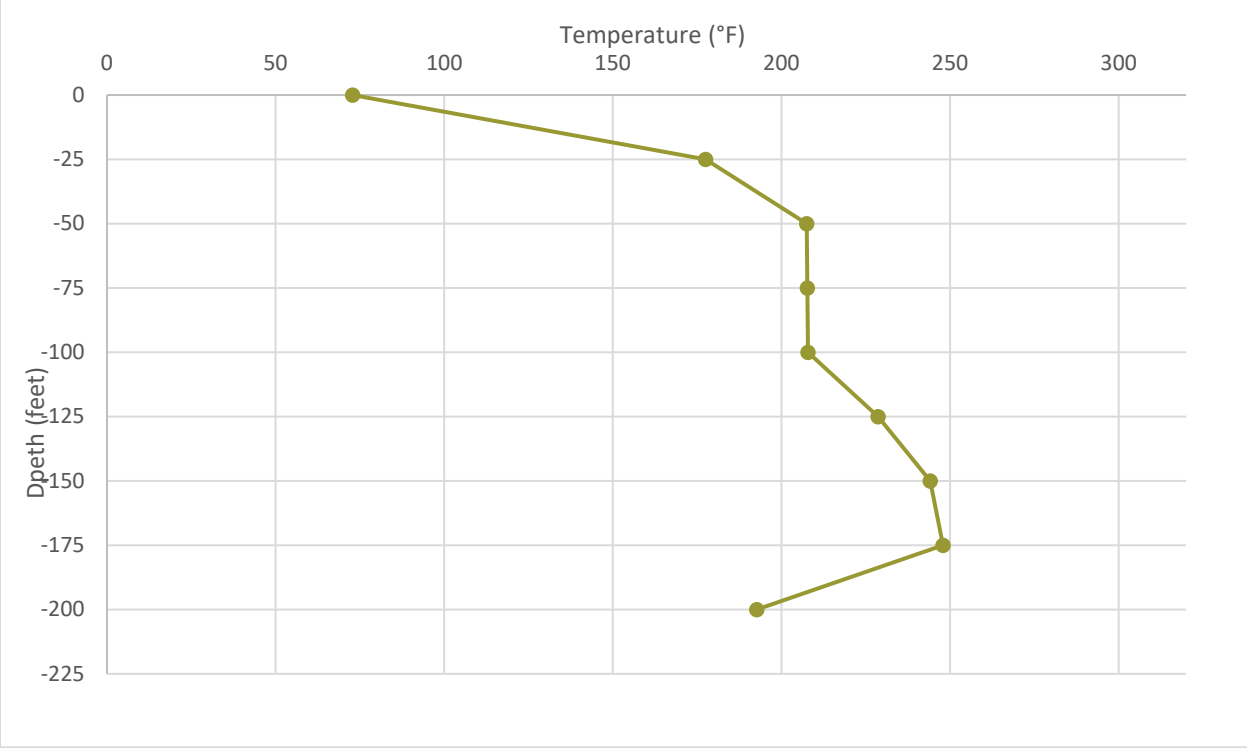


Figure B- 21. Average Temperatures Recorded by TP-6 on June 7, 2023

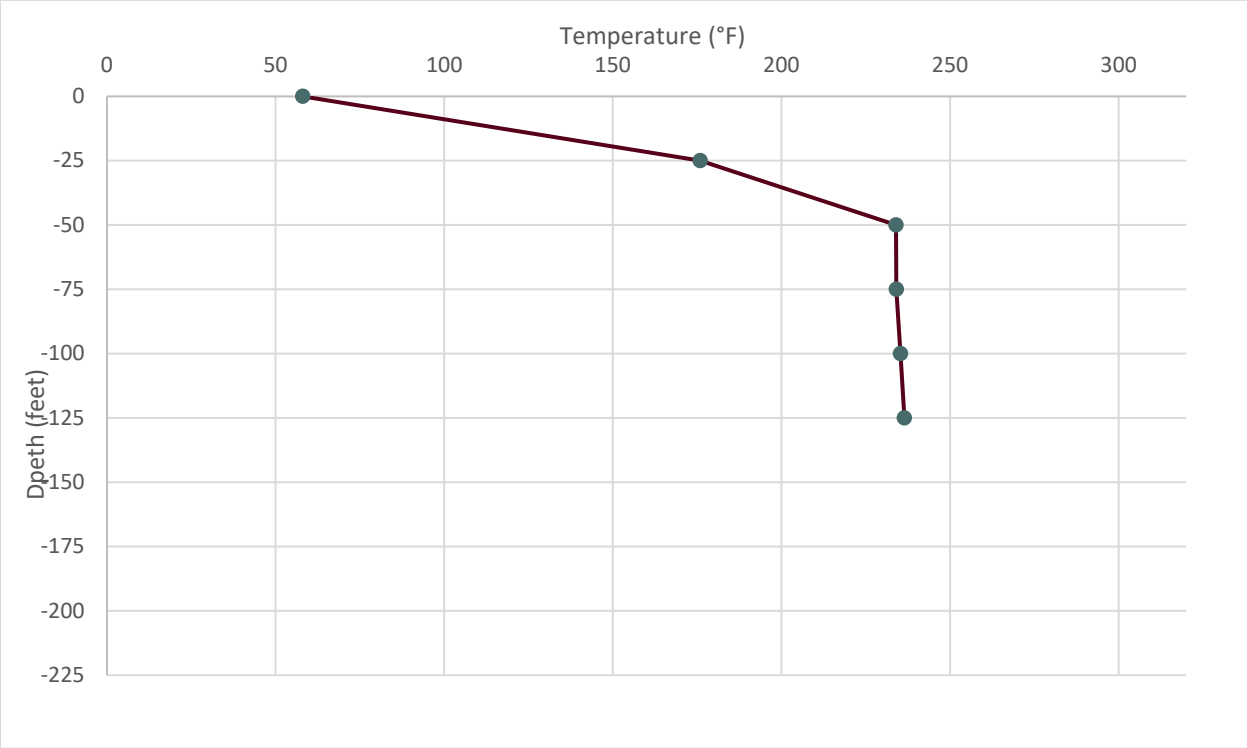


Figure B- 22. Average Temperatures Recorded by TP-6 on June 14, 2023

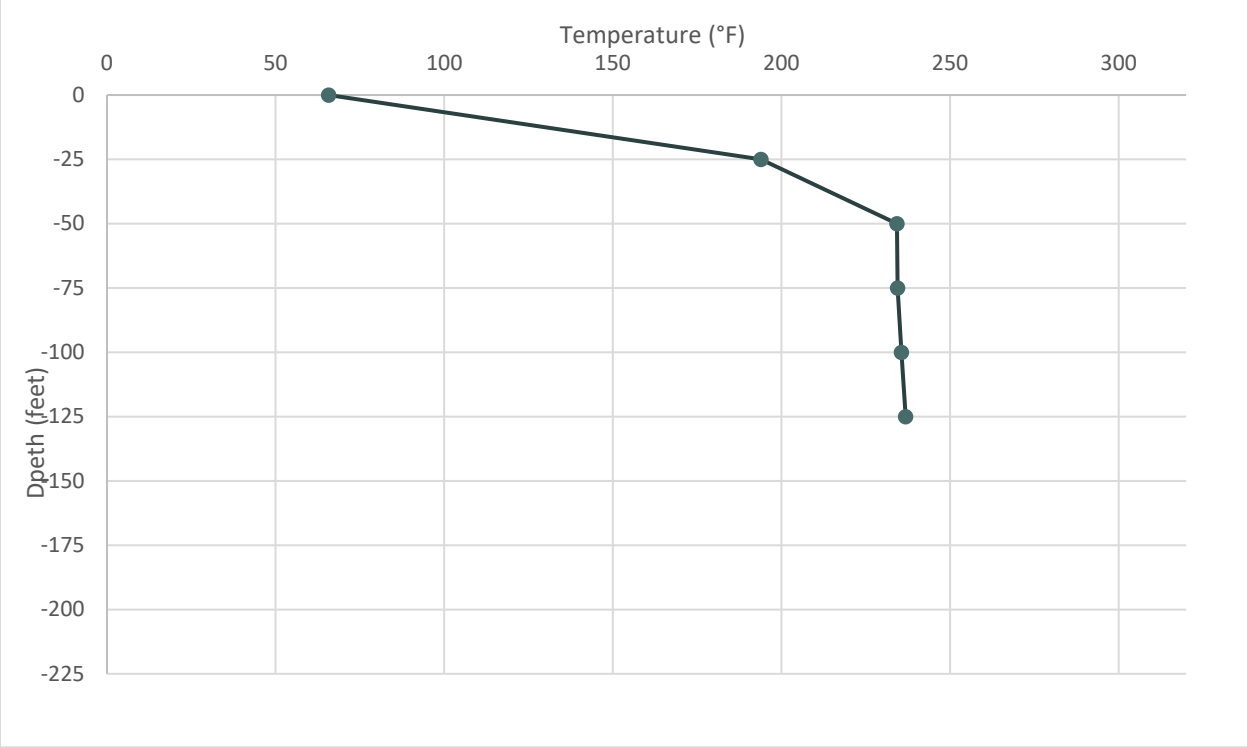


Figure B- 23. Average Temperatures Recorded by TP-6 on June 21, 2023

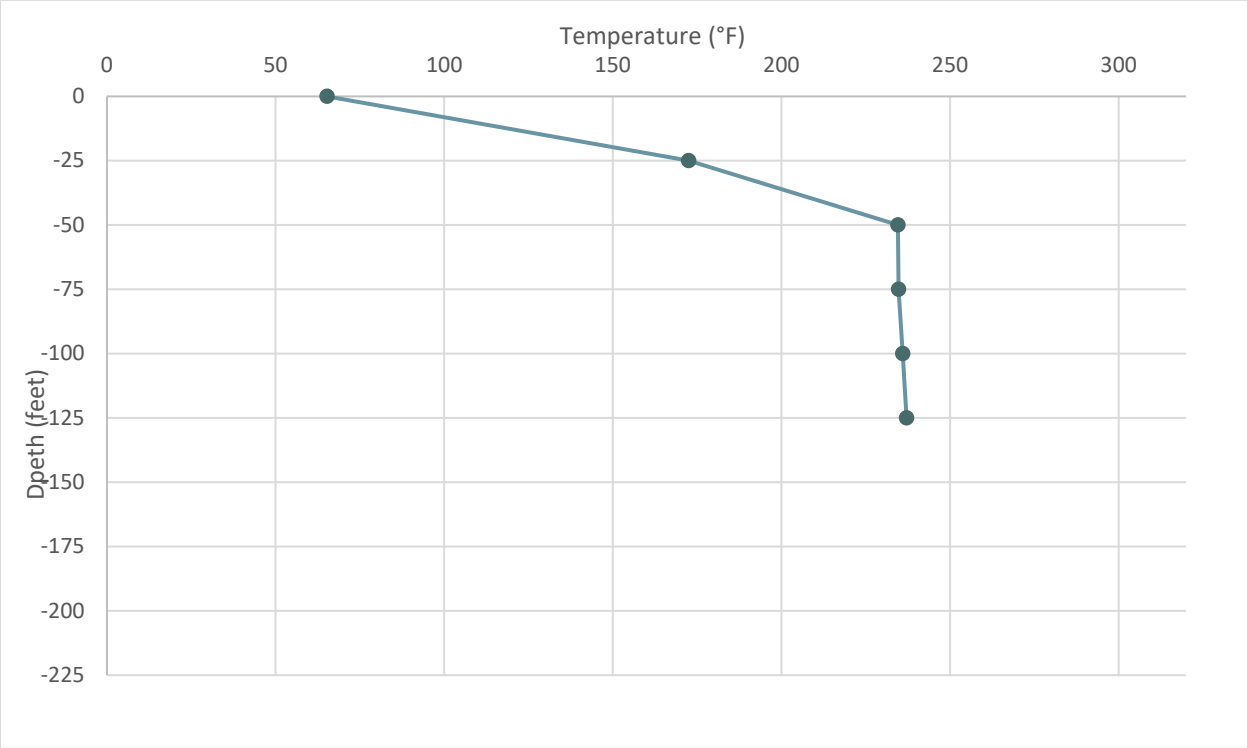


Figure B- 24. Average Temperatures Recorded by TP-6 on June 28, 2023

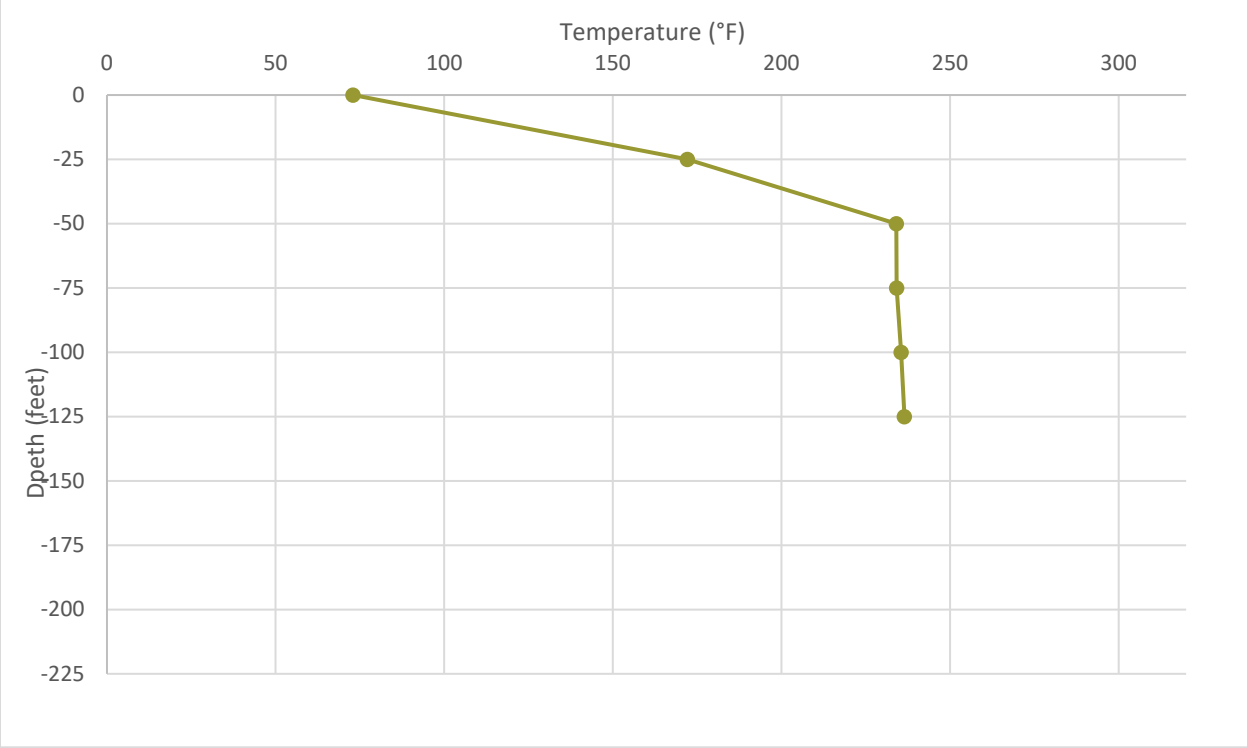


Figure B- 25. Average Temperatures Recorded by TP-7 on June 7, 2023

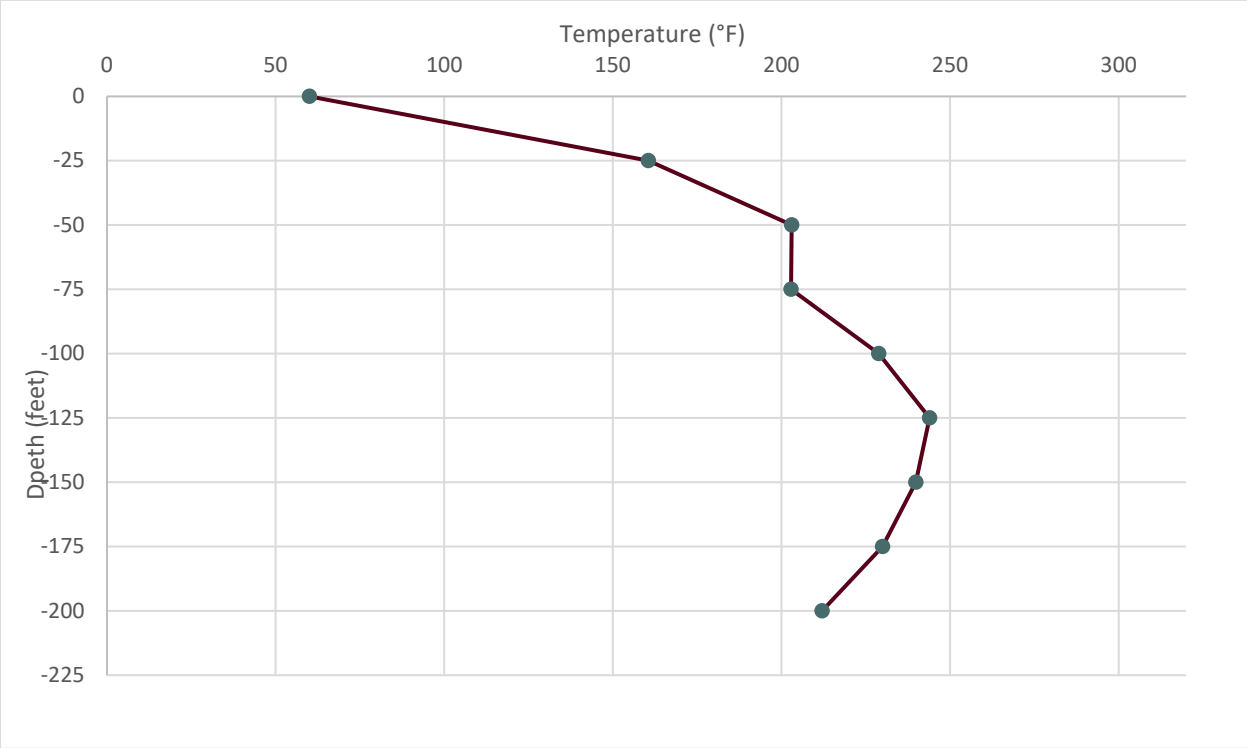


Figure B- 26. Average Temperatures Recorded by TP-7 on June 14, 2023

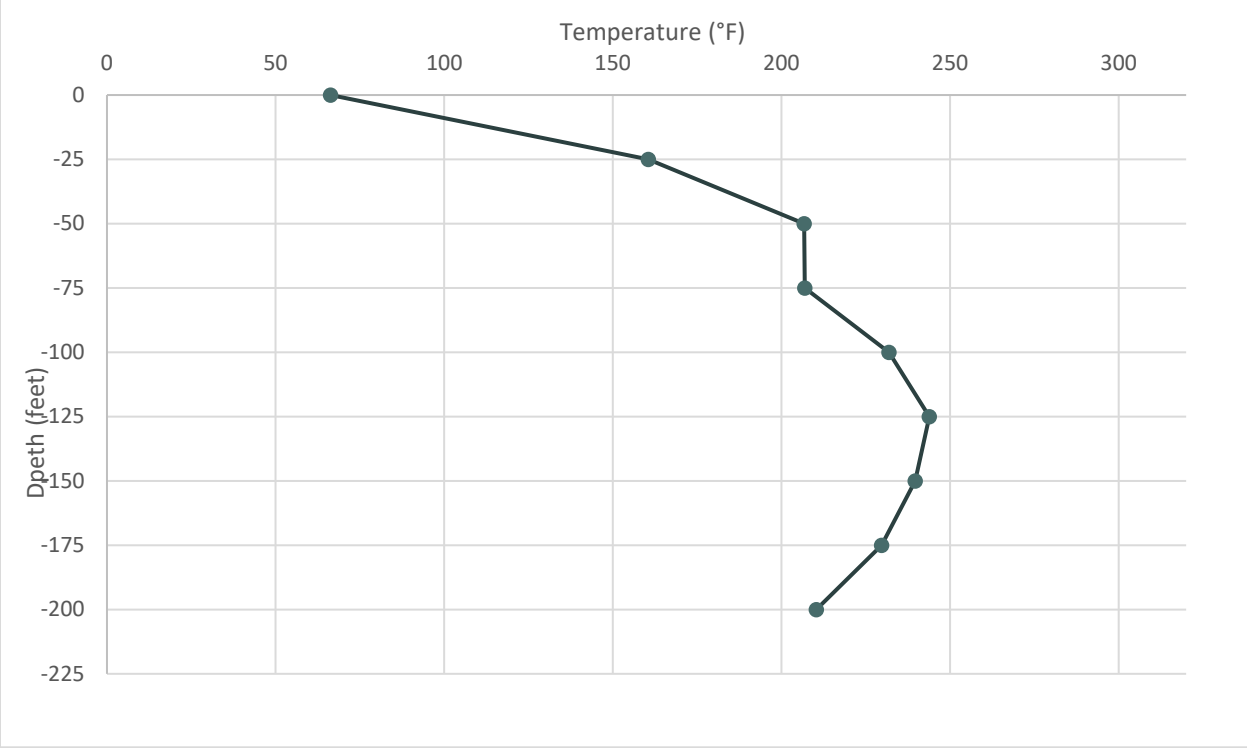


Figure B- 27. Average Temperatures Recorded by TP-7 on June 21, 2023

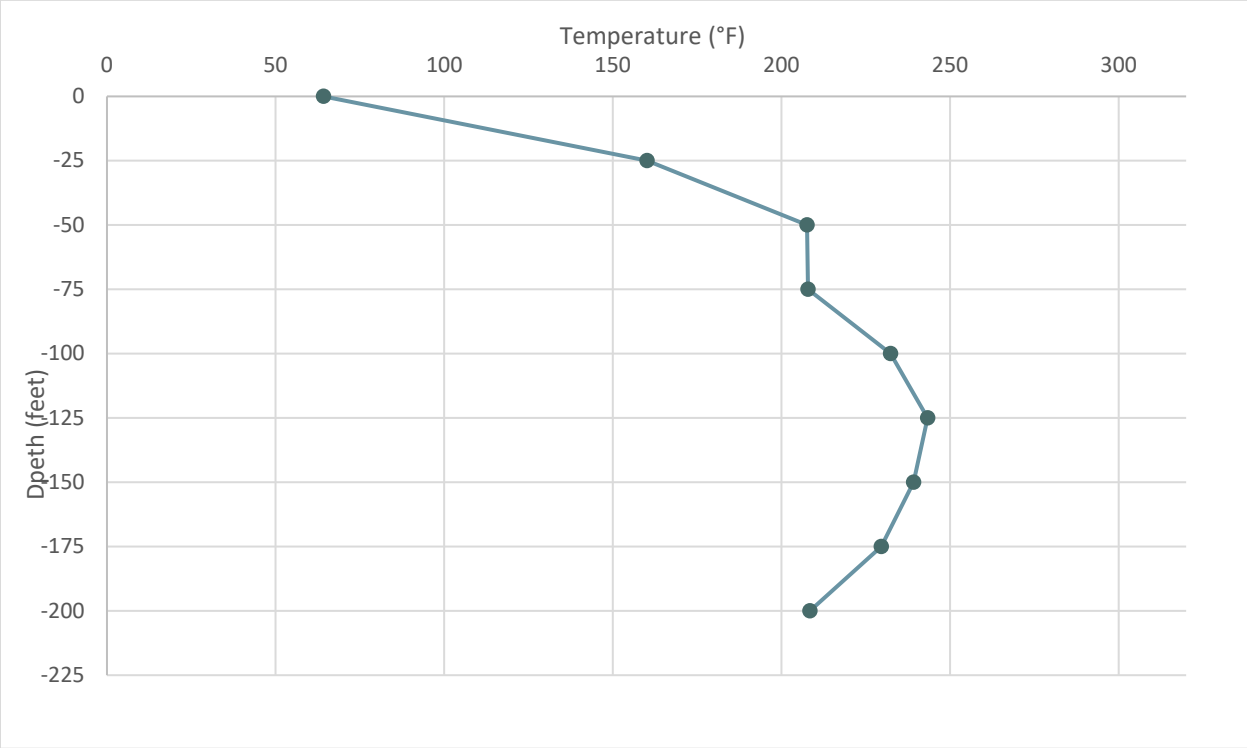


Figure B- 28. Average Temperatures Recorded by TP-7 on June 28, 2023

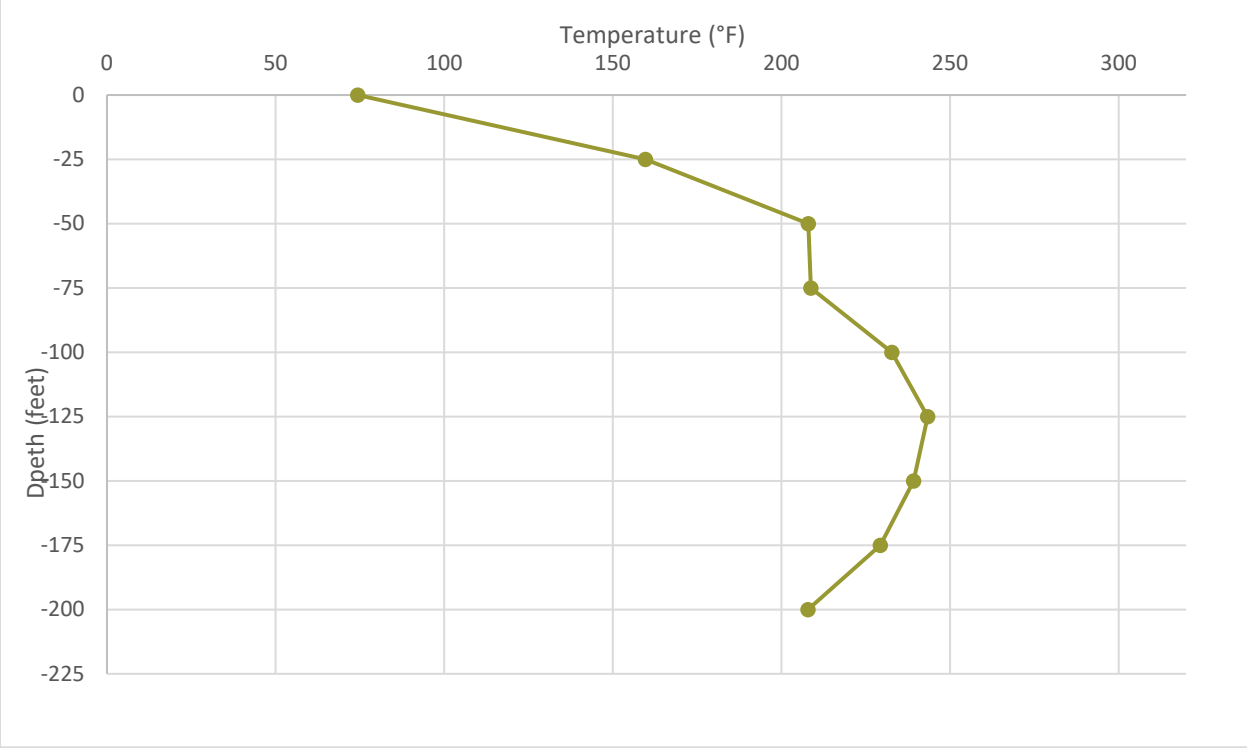


Figure B- 29. Average Temperatures Recorded by TP-8 on June 7, 2023

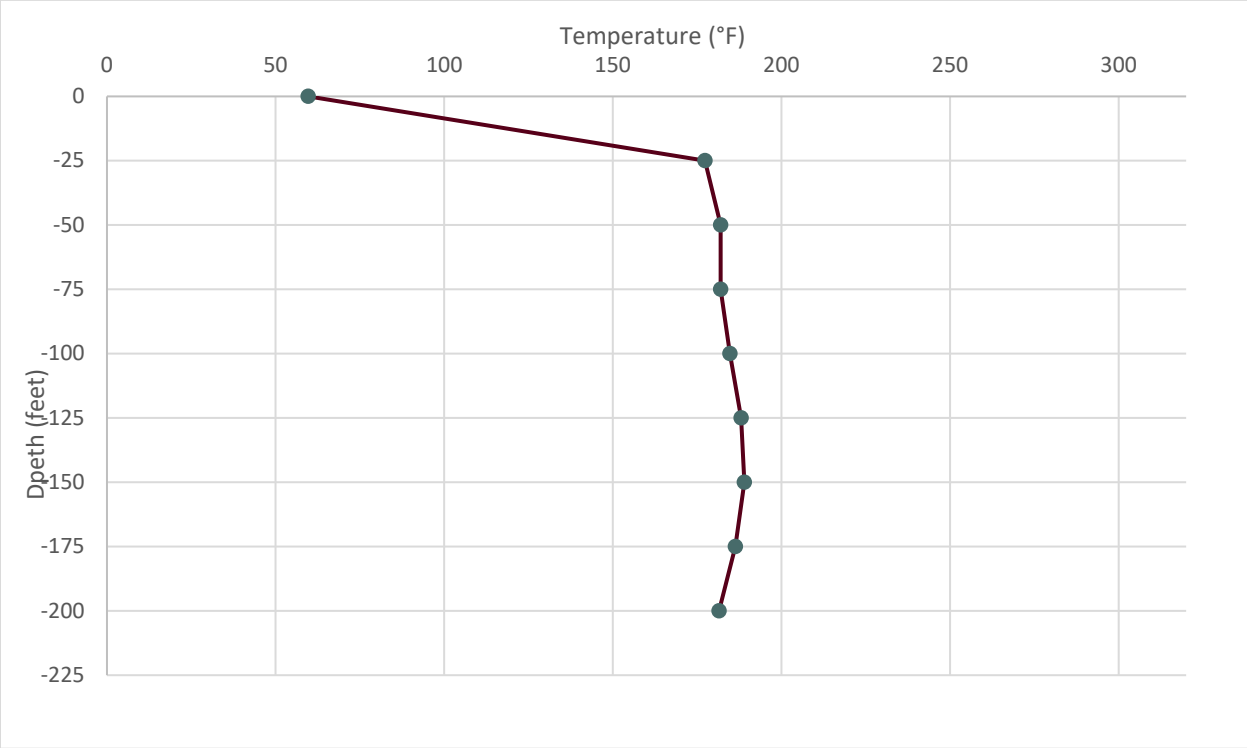


Figure B- 30. Average Temperatures Recorded by TP-8 on June 14, 2023

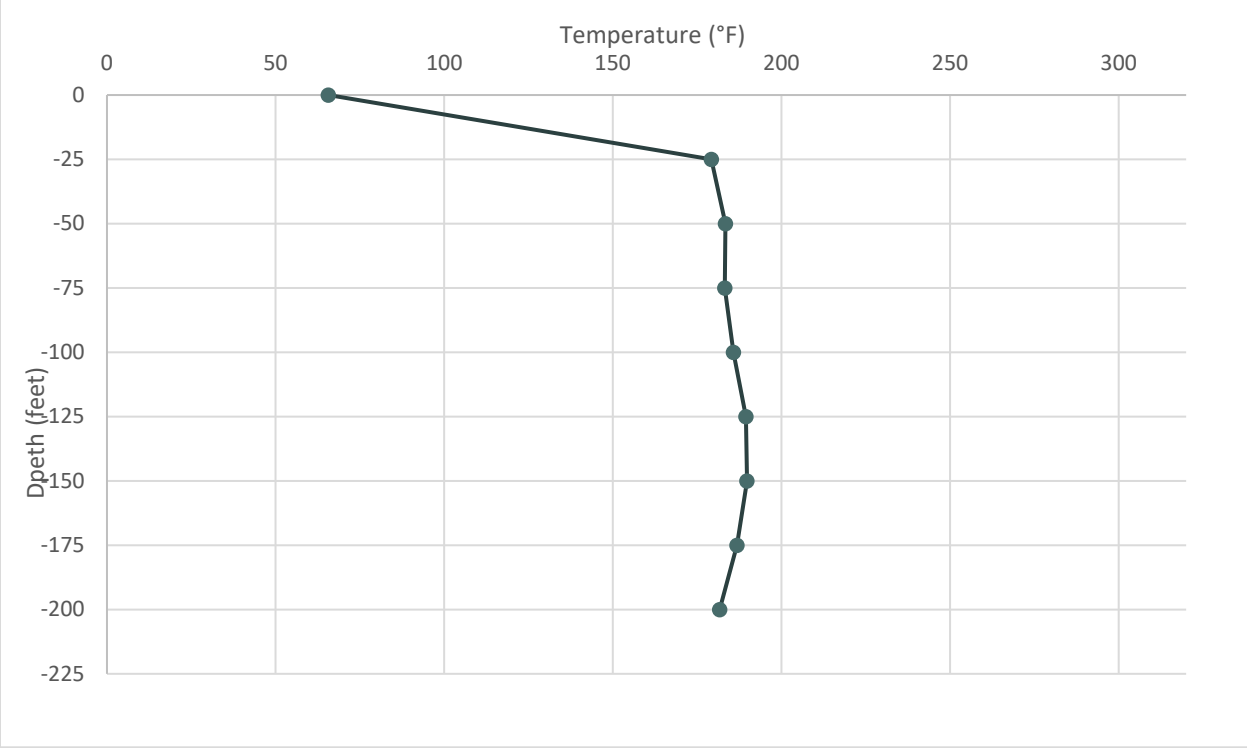


Figure B- 31. Average Temperatures Recorded by TP-8 on June 21, 2023

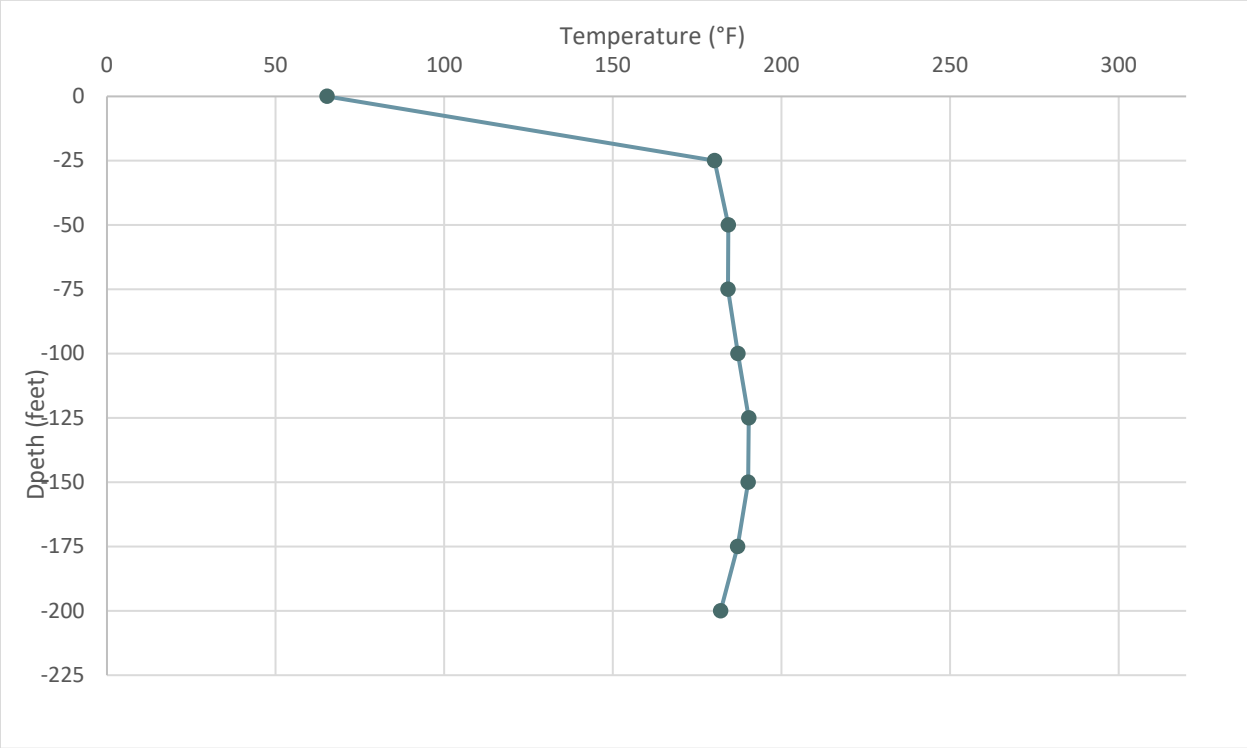


Figure B- 32. Average Temperatures Recorded by TP-8 on June 28, 2023

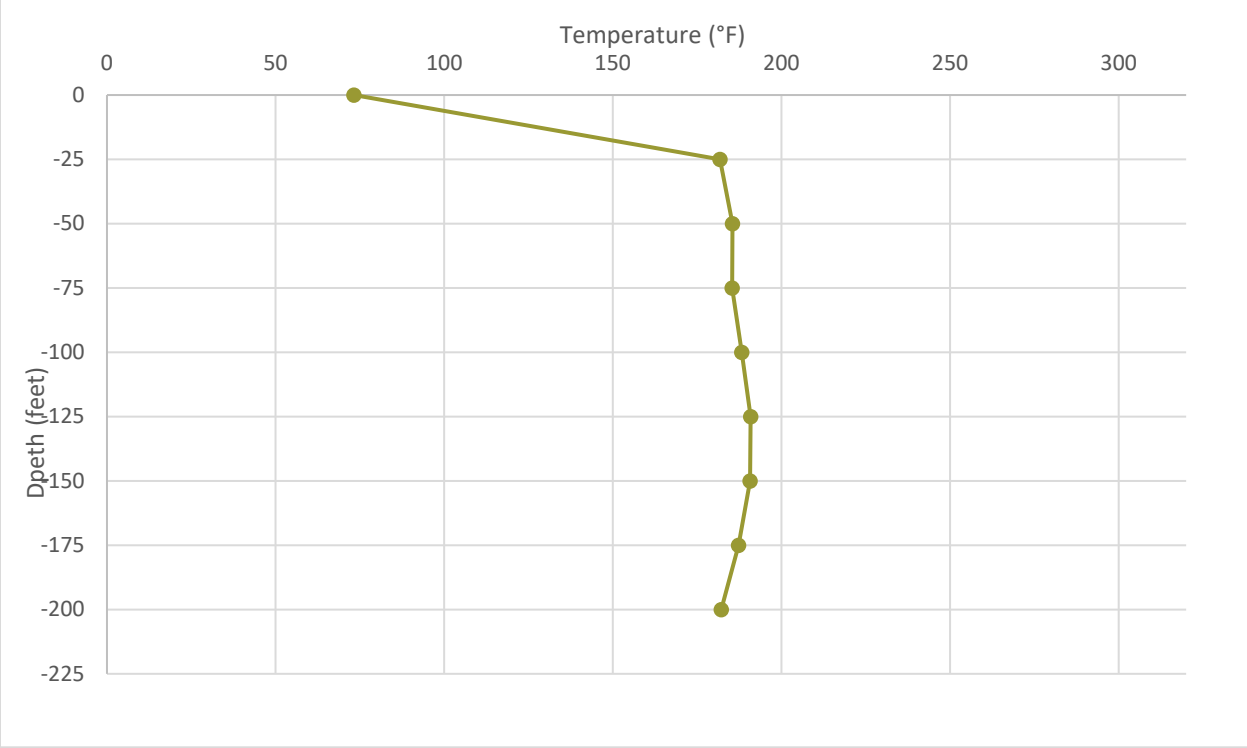


Figure B- 33. Average Temperatures Recorded by TP-9 on June 7, 2023

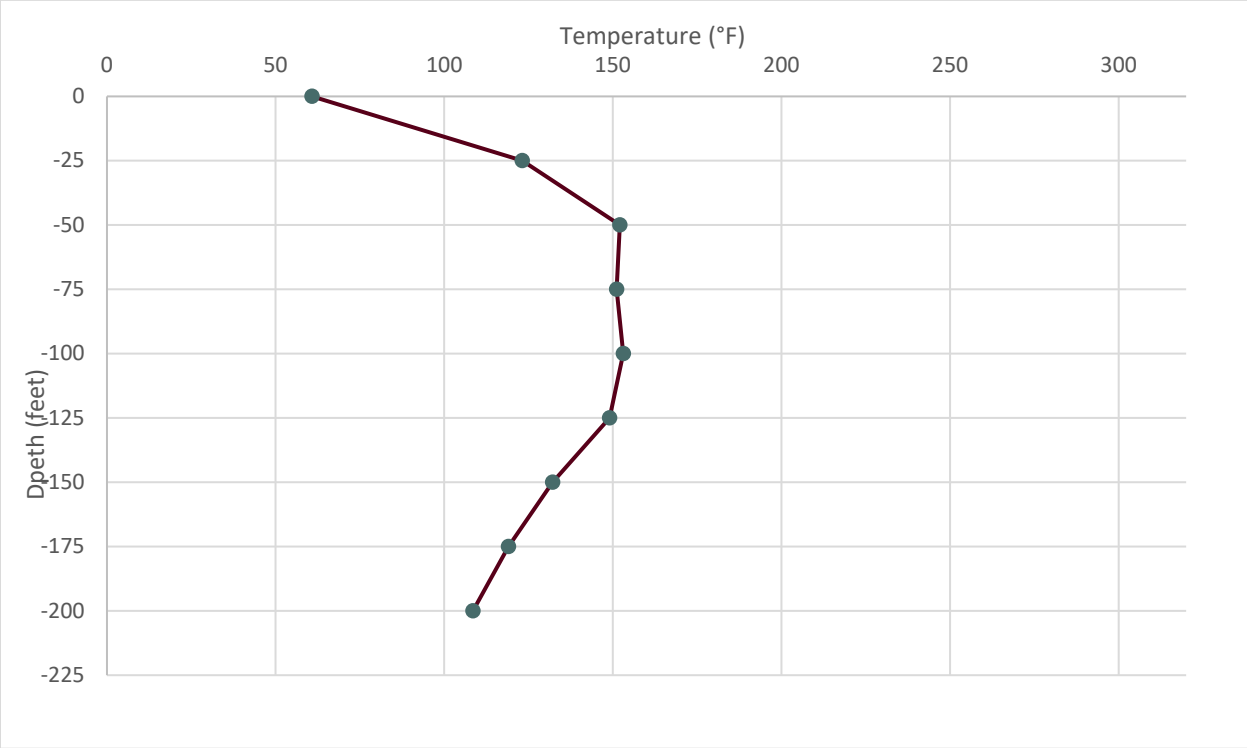


Figure B- 34. Average Temperatures Recorded by TP-9 on June 14, 2023

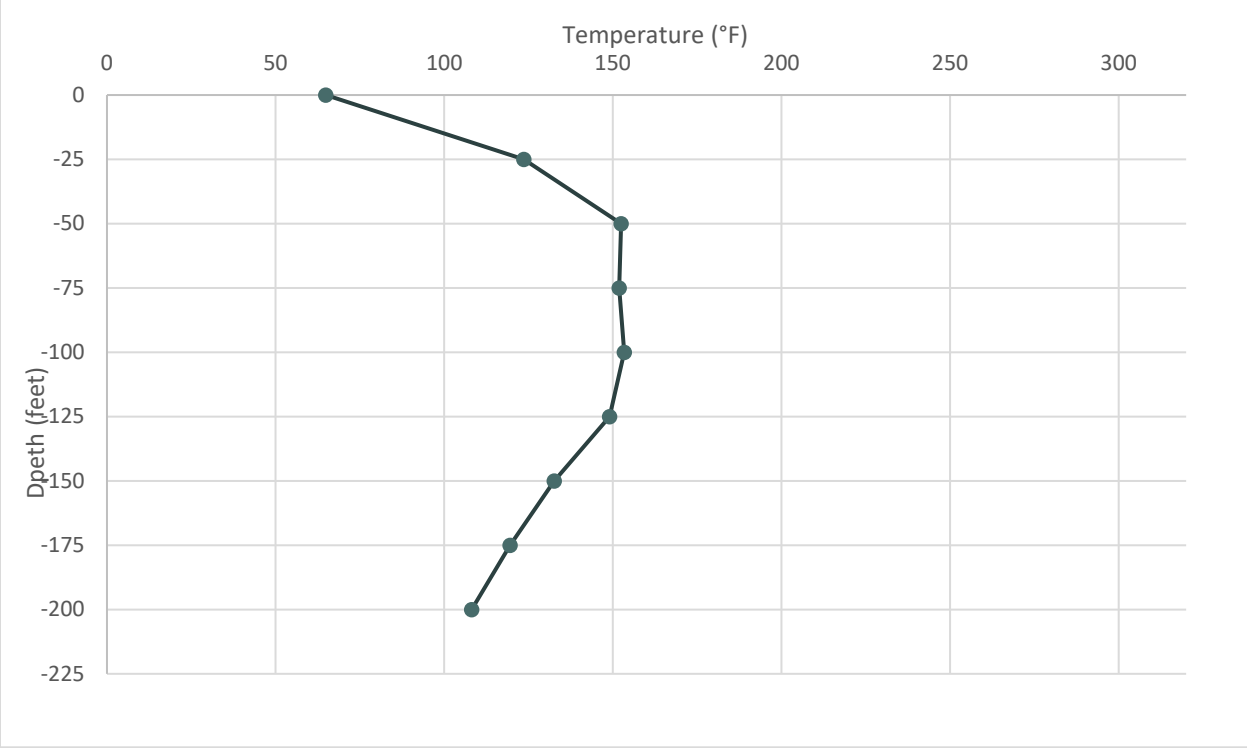


Figure B- 35. Average Temperatures Recorded by TP-9 on June 21, 2023

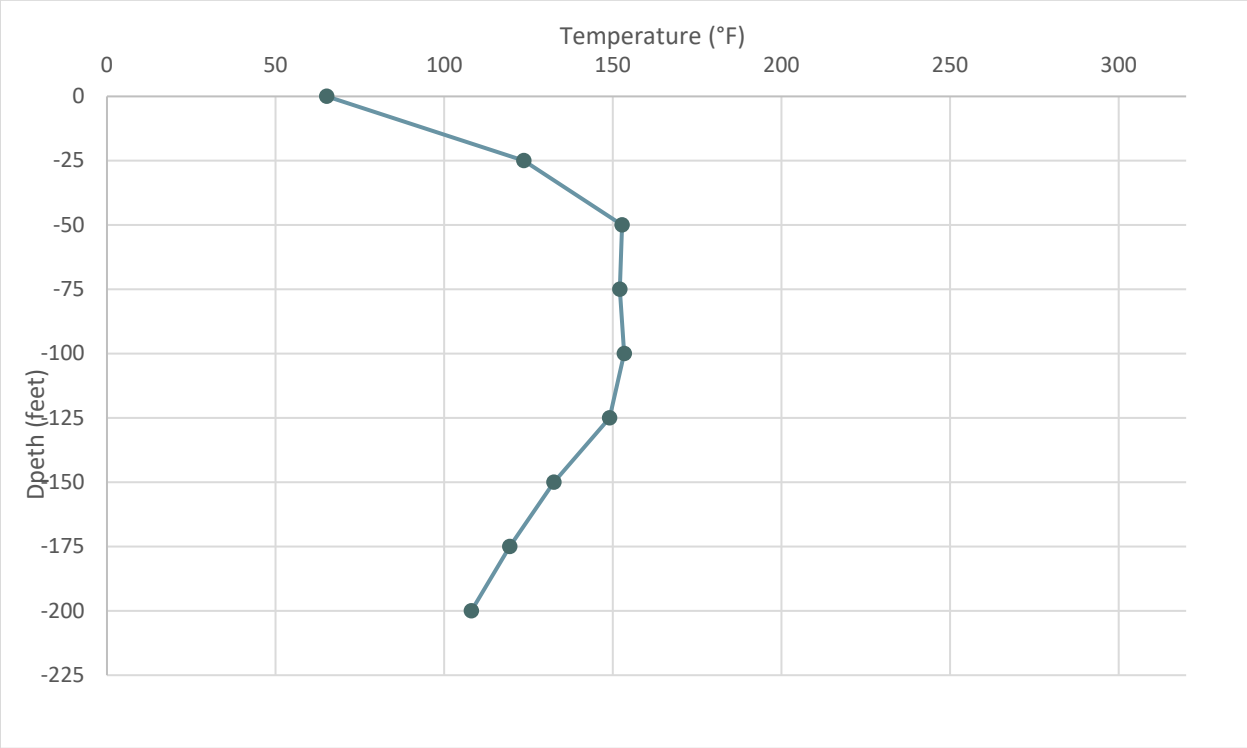
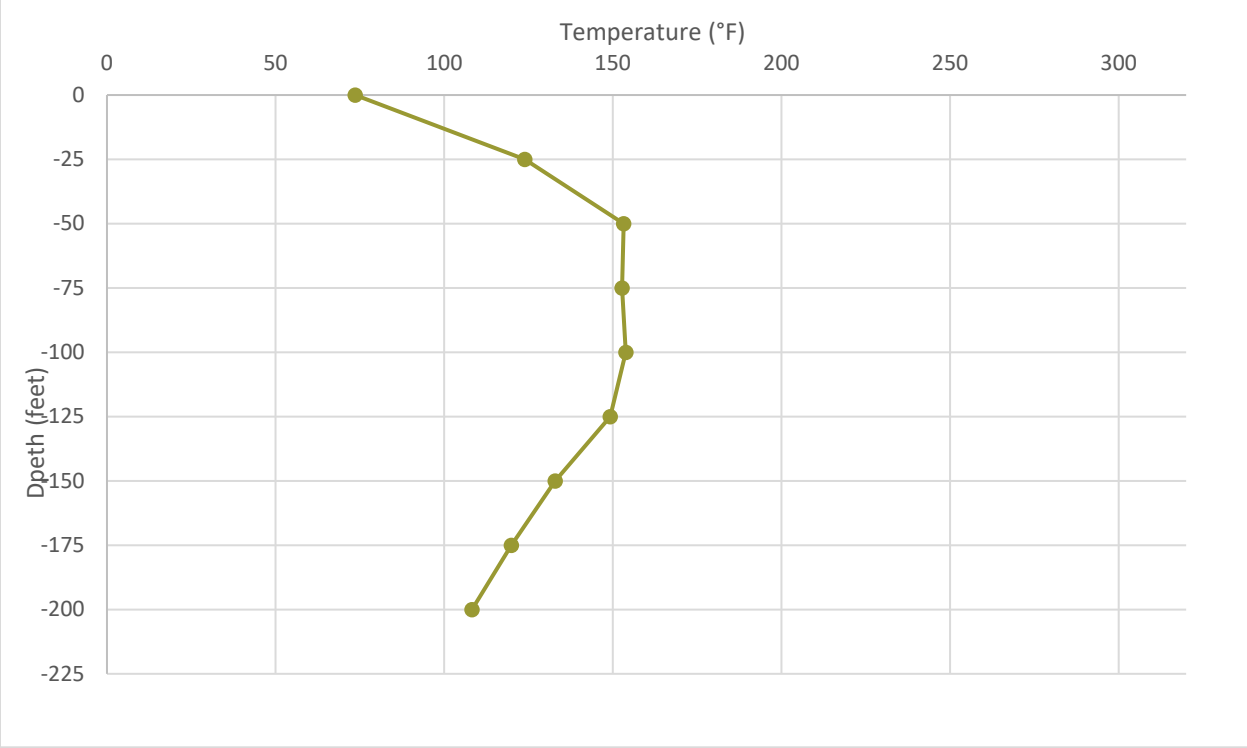


Figure B- 36. Average Temperatures Recorded by TP-9 on June 28, 2023



Appendix C

Semi-Monthly Temperature Update Memo

July 10, 2023
File No. 02218208.04

MEMORANDUM

TO: Kristin Hall, EPA Region III
Tracy Blalock, VDEQ-SWRO

FROM: D. Brandon King, SCS Engineers
Quinn Bernier, SCS Engineers

SUBJECT: Semi-Monthly Status Update – June 1st through June 15th, 2023
Bristol Integrated Waste Management Facility, Bristol, Virginia

SCS is submitting this semi-monthly status update to satisfy the conditions of compliance provision #2 of the Environmental Protection Agency (EPA) Region III letter, *Approval of Higher Operating Temperature Values for Landfill Gas Wells and Submission of Gas Treatment Alternatives at the Bristol Virginia Integrated Solid Waste Management Facility*, dated 8/23/21. Accordingly, this memo is a summary of temperature monitoring activities as well as work accomplished during the semi-monthly monitoring period of 6/1/23 through 6/15/23.

TEMPERATURE MONITORING

Automated Wellhead Temperature Measurements

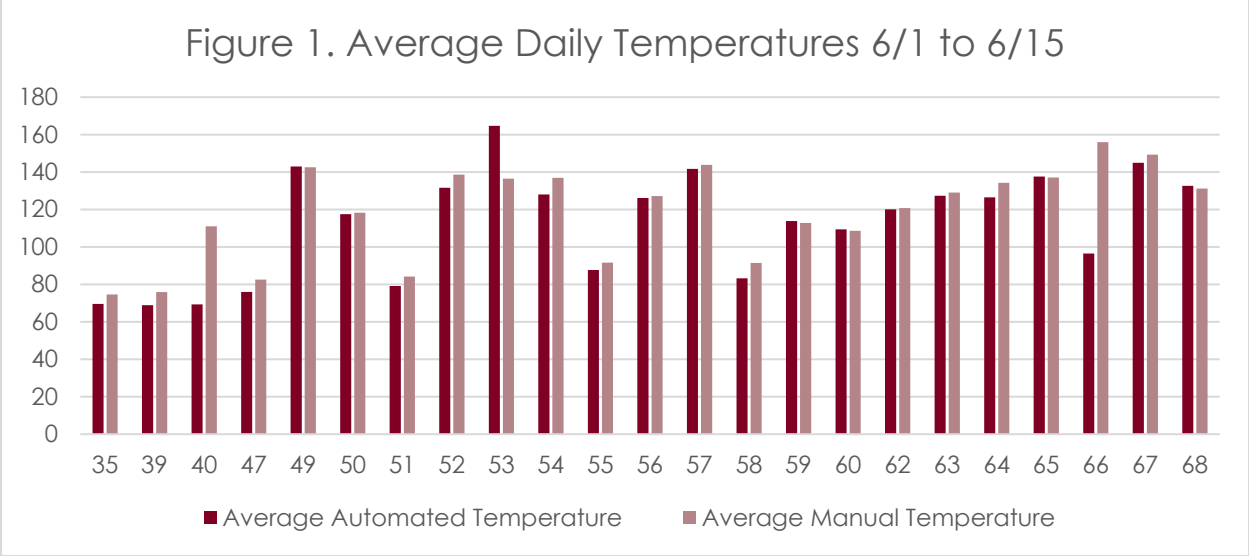
Twenty-five (25) individual landfill gas (LFG) wellheads in the Permit #588 Landfill have automated temperature sensors installed. VDEQ and USEPA have been receiving Daily Gas Well Temperature Reports with data from these automated temperature sensors since 12/1/22.

The 25 wellheads have 2-inch automated sensors. SCS believes that the 2-inch sensors measure temperature with more accuracy than the 1-inch sensors that were used in the majority of the 25 wells prior to March 1, 2023, but we are still comparing with manual temperature to assess the validity of this assertion.

SCS reviewed the automated hourly temperature measurements from 6/1/23 to 6/15/23, and identified the following trends:

- **Temperatures over 145°F:** Temperatures over the NESHAP AAAA compliance threshold of 145°F were recorded at nine wells during this monitoring period. Although temperatures fluctuate throughout the wellfield, SCS is continuing to see higher temperatures at certain wells during these monitoring periods. Temperatures greater than 145°F appear to be most consistent at EW-52, 53, 54 and 55. The highest temperatures were measured at EW-51 and EW-53 (greater than 190° at times). SCS believes that the general increase in wellfield temperatures suggests that, with the increase of pneumatic pump operations and increased liquids removal, the collection system is being successfully dewatered. Liquids removal in combination with the addition of new LFG collection infrastructure from the recent GCCS expansion is likely providing more pathways for extraction of the warmer landfill gas; thus the increased average temperatures.

- **Low temperatures at certain wells:** Average temperatures between 50°F and 80°F have been most consistent at eight wells. This generally correlated with low LFG flow rates measured during monthly wellfield monitoring events. These low temperatures are likely close to ambient because little to no LFG is passing through the wellhead where the sensors are placed.

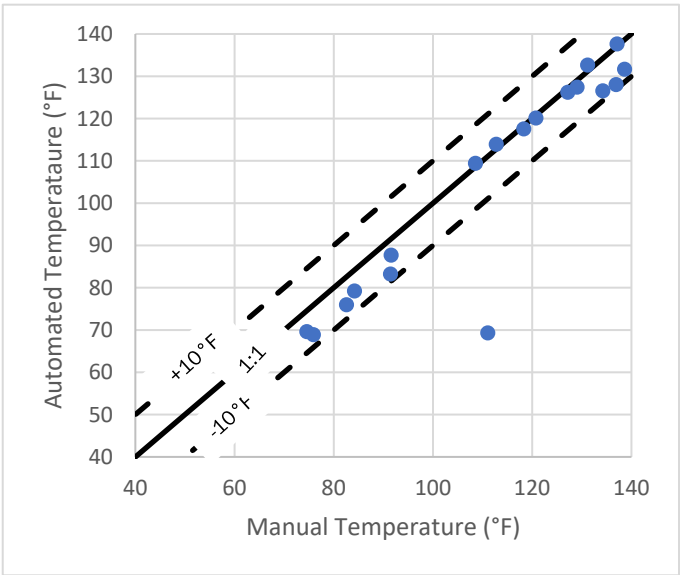


Manual Daily Temperature Monitoring

Manual temperature measurements are being made daily by field staff with a GEM5000 or equivalent LFG analyzer. The manual measurements are used to verify the automated wellhead temperature sensors and to provide temperature data for the 13 wellheads without automated sensors.

During this monitoring period, the average automated temperatures and the average manual temperatures generally correlated ±10°F. As shown in Figure 2, EW-40 is the only clear outlier, with automated temperature measurements trending lower than manual measurements. SCS recommends inspecting the probe at EW-40 for proper function, however the cause may simply be that LFG flow is minimal at this device. During wellfield monitoring events in June, the flow recorded by a GEM5000 was less than 5 scfm.

Figure 2. Manual vs. Automated Temperature Comparison



The automated temperature sensor at EW-32R continues to erroneously record 0°F. This data was removed from the dataset used to produce Figure 1 and 2 until the issue can be resolved. SCS is investigating what we suspect is an issue with signal. The average manual temperature for EW-32R was 121.4°F during this monitoring period.

In general, the continued correlation of manual and automated temperature measurements supports SCS' belief that the 2-inch automated sensors are measuring temperatures accurately. All daily temperatures recorded manually are provided in **Attachment A**.

Monthly Regulatory Wellhead Temperature Measurements

Routine monthly temperature monitoring for purposes of complying with 40 CFR 60.36f(a)(5) was conducted 6/5/23, with follow-up monitoring on several days after. Additionally, SCS monitors the Permit #588 Landfill on a weekly basis. During this monitoring period, temperature exceedances were resolved at EW-34, EW-37, EW-61, and EW-94. An HOV request was submitted for EW-37 to VDEQ on 5/17/23. The approval for that HOV request is currently pending. See Table 1 for the statuses of all exceedances recorded during this monitoring period.

Table 1. June Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 6/15/23
EW-34	5/30/23	6/8/23 131.2°F	9 days	Resolved, within 15-day timeline
EW-37	4/4/23	6/15/23 94.6°F	72 days	Resolved, within 120-day timeline
EW-53	6/5/23	6/15/23 161.5°F	10 days	Ongoing, within 15-day timeline
EW-61	6/12/23	6/15/23 130.8°F	3 days	Resolved, within 15-day timeline
EW-84	4/27/23	6/15/23 180.0°F	49 days	Ongoing, within 60-day timeline
EW-86	4/27/23	6/15/23 153.2°F	49 days	Ongoing, within 60-day timeline
EW-89	5/30/23	6/15/23 154.3°F	16 days	Ongoing, within 60-day timeline
EW-90	4/27/23	6/15/23 166.3°F	49 days	Ongoing, within 60-day timeline
EW-94	5/26/23	6/1/23 87.6°F	6 days	Resolved, within 15-day timeline
EW-94	6/12/23	6/15/23 84.8°F	3 days	Resolved, within 15-day timeline
EW-100	4/27/23	6/15/23 158.3°	49 days	Ongoing, within 60-day timeline

Work Accomplished During Monitoring Period

LFG Sampling

SCS collected LFG samples from wells with temperature exceedances lasting more than 7 days using 1.5-L Summa canisters on 6/1/23 and 6/12/23 to fulfill the requirement in 40 CFR 63.1961(a)(5). The samples were sent to Enthalpy Analytical for lab analysis of carbon monoxide (CO) and hydrogen

(H_2) content. Lab results are summarized in Table 2. Full laboratory analytical data is included in **Attachment B** for further detail.

Table 2. LFG Wellhead Sampling Summary

Sample Date		6/1/2023	6/12/23
34	CO (ppmv)	1260	--
	H2 (Vol. %)	20.8	--
53	CO (ppmv)	--	671
	H2 (Vol. %)	--	13.1
84	CO (ppmv)	390	400
	H2 (Vol. %)	8.71	8.84
86	CO (ppmv)	126	106
	H2 (Vol. %)	2.29	2.01
89	CO (ppmv)	939	963
	H2 (Vol. %)	37.6	38.2
90	CO (ppmv)	125	110
	H2 (Vol. %)	2.47	2.16
100	CO (ppmv)	ND	ND
	H2 (Vol. %)	4.20	3.81
Blower Inlet	CO (ppmv)	--	ND
	H2 (Vol. %)	--	1.25

The presence of hydrogen in all the samples collected during this monitoring period indicates that combustion reactions are unlikely. The carbon monoxide measurements were greater than 100 ppmv in all but EW-100, which was non-detect.

During this monitoring period, a voluntary LFG sample was collected at the blower inlet. This shows the collective value for carbon monoxide and hydrogen of the overall gas quality. During this initial sampling, carbon monoxide was found to be non-detect and hydrogen was found to be 1.25% of the total volume of gas.

Construction Activities

All 16 of the 304 stainless steel (SS) LFG wells have been completed as of 6/15/23. During this monitoring period, EW-75, EW-87, and EW-97 were drilled. This concludes LFG well drilling installation activities in the Permit #588 Landfill. The LFG System contractor, SCS Field Services (SCS-FS), equipped SS LFG wells EW-71 and EW-72 with Jeneer pumps and connected the wells to the LFG Collection and Dewatering Systems. In addition, the LFG System contractor equipped SS LFG wells EW-33B, EW-74, and EW-75 with QED pumps and connected those wells to the LFG Collection and Dewatering Systems. This satisfies the conditions of connecting five dual phase extraction wells to vacuum and the existing dewatering system prior to the Consent Order deadline of 6/30/23.

SCS-FS connected the sidewall odor mitigation system (SOMS) collectors to vacuum during this period. The SOMS collectors were opened to applied vacuum from the existing LFG Collection System and initial monitoring and tuning of the collectors occurred on 6/14/23. This satisfies the conditions of the Consent Order deadline to have an active sidewall order mitigation system operational and under applied vacuum prior to 6/14/23.

The liner subcontractor, Chesapeake Containment, finished the final lower liner section along the eastern section of the SOMS at the beginning of this period. SCS-FS completed upper collector and soil placement over the lower liner in this area. Chesapeake installed the upper liner over the remaining perimeter areas of the SOMS during this period, primarily the northern, eastern, and southern sections of the SOMS prior to the system undergoing vacuum on 6/14/23. SCS-FS continued placing soil on the northwest, northern, and northeastern, and southwest side of the SOMS during this reporting period. SCS-FS will continue soil placement activities over the upper liner of the SOMS during the second half of June. SCS-FS began installation of safety grates and well bore seals on the 34 new LFG extraction wells at the end of this reporting period.

Weekly SEM

SCS is continuing weekly surface emissions monitoring (SEM) per the Plan of Action Report dated 7/6/22. Three exceedances of the 500-ppmv threshold were recorded during the weekly SEM event held on 6/6/23, and four exceedances were recorded during the weekly event conducted on 6/13/23. All exceedances during this monitoring period were located at pipe penetrations within the landfill.

The ongoing construction of new wells and the sidewall odor mitigation system, in addition to connection of the new LFG collection infrastructure, is likely contributing to the exceedances located at pipe penetrations in June. As SCS' dewatering efforts continue to advance, landfill gas collection will increase, and pipe penetration exceedances should decrease. In addition, SCS is continuing to connect these new wells to permanent vacuum as well as installing well bore skirts and placing additional cover where necessary.

LFG System O&M

The City's O&M contractor conducted initial June LFG wellfield monitoring on 6/1/23 and 6/5/23, including 18 new CPVC wells and the pilot SOMS during this monitoring period. Samples were collected at seven wells during this period. The O&M contractor performed initial monitoring and tuning of the SOMS collectors on 6/14/23. The vacuum set point was increased at the blower/flare station to provide more vacuum to the SOMS when it was connected to vacuum. The O&M contractor monitored, tuned, and balanced the LFG wellfield to account for the vacuum set point adjustment.

Routine well and pump maintenance continued during this monitoring period. The O&M contractor replaced pumps in EW-51, EW-53, EW-57, EW-59, and EW-68. Tritubing was replaced in EW-53 and EW-57. Repaired wellheads in EW-51 and EW-57. Spare pumps were cleaned and rebuilt on 6/1/23, 6/7/23, and 6/8/23. In addition, wires were adjusted in temperature probe TP-8 to account for settlement.

Please contact SCS or City personnel if you have any questions or require additional information.

cc: Randall Eads, City of Bristol
Jon Hayes, City of Bristol
Jeff Hurst, VDEQ-SWRO
Tom Lock, SCS Field Services
David Cochran, City of Bristol
Erin Willard, EPA Region III
Stacy Bowers, VDEQ-SWRO
Robert E. Dick, P.E., SCS Engineers

Attachment A

City of Bristol Daily LFG Well Temperature Readings

Month	June	June	June	June	June	June	June	June	June	June	June	June	June	June	June
Day	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Well Number															
35	85	88	87	85	85	67	59	71	84	54	56	75	72	74	77
39	85	90	91	88	88	64	59	70	81	56	60	79	76	73	79
40	90	94	93	90	85	62	59	71	88	156	154	171	161	153	139
46 Well Decomissioned															
47	93	97	98	90	94	73	66	78	90	62	62	82	79	84	91
29	120	124	118	117	120	116	115	114	120	98	82	95	99	97	98
30R	121	119	120	118	110	112	114	116	114	127	128	129	129	127	127
31R	174	172	172	172	166	160	156	153	149	140	126	110	116	110	129
32 Well Decommissioned	91	93	93	92	90	91	90	98	99						
33	124	126	126	124	125	122	120	121	120	122	122	122	123	122	123
34	96	98	98	98	90	88	80	82	88	102	104	140	91	89	94
36 Well Decommissioned															
37										194	195	193	190	184	97
38	99	95	94	96	92	90	88	86	87	64	66	82	86	104	103
41	94	96	95	94	96	95	90	93	90	58	57	80	83	79	87
42	120	122	120	121	122	121	120	119	120	122	122	116	117	116	117
48	92	94	93	94	95	95	90	90	92	55	56	78	79	77	85
32R	122	122	122	121	122	122	126	128	123	122	119	119	120	119	114
49	142	143	143	142	143	142	145	144	145	140	141	143	143	140	142
50	120	121	120	122	121	119	119	120	118	116	116	116	117	115	115
51	86	89	89	88	88	66	60	72	85	54	57	149	106	83	91
52	132	131	130	132	172	138	142	135	132	175	119	190	118	115	119
53	181	180	180	176	157	176	146	155	160	77	87	87	88	95	102
54	130	128	129	128	131	144	128	127	131	162	130	170	143	140	133
55	103	104	102	103	151	72	72	77	85	67	69	88	98	88	95
56	130	133	131	132	134	131	126	131	130	117	122	118	123	123	127
57	127	148	145	146	162	169	143	138	160	127	120	169	154	124	126
58	101	102	102	101	98	82	76	80	90	98	86	76	77	98	105
59	111	111	111	111	117	124	110	111	112	110	110	113	111	112	118
60	110	111	111	110	111	107	107	109	109	105	106	110	109	107	107
61	126	128	127	126	122	110	124	121	124	122	121	133	122	123	128
62	120	121	121	120	122	120	119	121	122	120	121	121	122	123	119
63	130	131	131	132	131	128	125	130	129	127	127	129	130	129	127
64	131	132	132	132	131	126	125	130	126	140	140	145	142	140	142
65	138	139	137	138	139	137	124	138	139	138	137	139	139	138	137
66	118	111	116	118	107	94	88	108	118	110	114	83	891	78	86
67	137	126	125	126	182	153	155	179	151	135	120	137	181	167	166
68	129	127	128	129	142	136	134	134	132	130	129	134	130	127	127

Attachment B

Laboratory Analytical Reports

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	June 2, 2023 11:30
	4330 Lewis Road, Suite 1	Date Issued:	June 9, 2023 15:56
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 06/02/2023 11:30. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

TNI Accredited
VELAP ID 460021

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

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	4330 Lewis Road, Suite 1	Date Issued:	June 9, 2023 15:56
	Harrisburg, PA 17111	Project Number:	07223016.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
84	23F0137-01	Air	06/01/2023 10:38	06/02/2023 11:30
86	23F0137-02	Air	06/01/2023 10:47	06/02/2023 11:30
90	23F0137-03	Air	06/01/2023 10:57	06/02/2023 11:30
100	23F0137-04	Air	06/01/2023 11:07	06/02/2023 11:30
89	23F0137-05	Air	06/01/2023 11:23	06/02/2023 11:30
34	23F0137-06	Air	06/01/2023 11:44	06/02/2023 11:30

ENTHALPY ANALYTICAL

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 2, 2023 11:30 June 9, 2023 15:56
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 84

Sample ID: 23F0137-01

Sample Matrix: Air

Sampled: 6/1/2023 10:38

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00214::00277

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.0

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	390	90.0	90.0		9	1	6/5/23 11:03	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	12.0	0.45	0.45		9	1	6/5/23 11:03	MER
Carbon dioxide, as received	48.3	0.45	0.45		9	1	6/5/23 11:03	MER
Oxygen (O2), as received	0.79	0.45	0.45		9	1	6/5/23 11:03	MER
Hydrogen (H2), as received	8.71	0.54	0.54		27	1	6/5/23 17:00	MER
Nitrogen (N2), as received	24.3	9.00	9.00		9	1	6/5/23 11:03	MER
Carbon Monoxide, as received	0.04	0.009	0.009		9	1	6/5/23 11:03	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	191000	10500	26200		610000	34000	84000	52500	1	6/6/23 15:39	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	90.0	80-120	6/6/23 15:39

ENTHALPY ANALYTICAL

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 2, 2023 11:30 June 9, 2023 15:56
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 86

Sample ID: 23F0137-02

Sample Matrix: Air

Sampled: 6/1/2023 10:47

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00207::00300

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 4.6

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	126	90.0	90.0		9	1	6/5/23 11:54	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	33.3	0.45	0.45		9	1	6/5/23 11:54	MER
Carbon dioxide, as received	48.3	0.45	0.45		9	1	6/5/23 11:54	MER
Oxygen (O2), as received	0.97	0.45	0.45		9	1	6/5/23 11:54	MER
Hydrogen (H2), as received	2.29	0.18	0.18		9	1	6/5/23 11:54	MER
Nitrogen (N2), as received	9.49	9.00	9.00		9	1	6/5/23 11:54	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	6/5/23 11:54	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	113000	2330	5830		360000	7500	19000	11700	1	6/6/23 17:10	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	94.8	80-120	6/6/23 17:10

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ANALYTICAL RESULTS

Project Location:

Field Sample #: 90

Sample ID: 23F0137-03

Sample Matrix: Air

Sampled: 6/1/2023 10:57

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00026::1151

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 4.4

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	125	90.0	90.0		9	1	6/5/23 13:20	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	36.3	0.45	0.45		9	1	6/5/23 13:20	MER
Carbon dioxide, as received	53.0	0.45	0.45		9	1	6/5/23 13:20	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/5/23 13:20	MER
Hydrogen (H2), as received	2.47	0.18	0.18		9	1	6/5/23 13:20	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/5/23 13:20	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	6/5/23 13:20	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	207000	4670	11700		660000	15000	37000	23300	1	6/6/23 18:43	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	92.6	80-120	6/6/23 18:43

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Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 100

Sample ID: 23F0137-04

Sample Matrix: Air

Sampled: 6/1/2023 11:07

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00009::10039

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.0

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	6/5/23 16:12	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	41.2	0.45	0.45		9	1	6/5/23 16:12	MER
Carbon dioxide, as received	48.2	0.45	0.45		9	1	6/5/23 16:12	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/5/23 16:12	MER
Hydrogen (H2), as received	4.20	0.18	0.18		9	1	6/5/23 16:12	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/5/23 16:12	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	6/5/23 16:12	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	40900	778	1940		130000	2500	6200	3890	1	6/6/23 20:15	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	95.4	80-120	6/6/23 20:15

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Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 89

Sample ID: 23F0137-05

Sample Matrix: Air

Sampled: 6/1/2023 11:23

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00110::12785

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.6

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	939	90.0	90.0		9	1	6/6/23 11:57	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	0.66	0.45	0.45		9	1	6/6/23 11:57	MER
Carbon dioxide, as received	67.6	0.90	0.90		18	1	6/6/23 14:37	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/6/23 11:57	MER
Hydrogen (H2), as received	37.6	3.24	3.24		162	1	6/6/23 15:03	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/6/23 11:57	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	6/6/23 11:57	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	434000	7000	17500		1400000	22000	56000	35000	1	6/7/23 14:31	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	92.0	80-120	6/7/23 14:31

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ANALYTICAL RESULTS

Project Location:

Field Sample #: 34

Sample ID: 23F0137-06

Sample Matrix: Air

Sampled: 6/1/2023 11:44

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00155::12850

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 11.8

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	1260	90.0	90.0		9	1	6/6/23 12:55	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	0.70	0.45	0.45		9	1	6/6/23 12:55	MER
Carbon dioxide, as received	76.6	0.90	0.90		18	1	6/6/23 15:18	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/6/23 12:55	MER
Hydrogen (H2), as received	20.8	2.16	2.16		108	1	6/6/23 15:40	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/6/23 12:55	MER
Carbon Monoxide, as received	0.13	0.009	0.009		9	1	6/6/23 12:55	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	46400000	5040000	12600000		150000000	16000000	40000000	25200000	1	6/8/23 20:07	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	116	80-120	6/8/23 20:07

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Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23F0137-01	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0127	AG00026
23F0137-02	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0127	AG00026
23F0137-03	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0127	AG00026
23F0137-04	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0127	AG00026
23F0137-05	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0190	AG00026
23F0137-06	1.00 mL / 1.00 mL	ALT-145	BGF0135	SGF0190	AG00026
23F0137-01	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0127	AG00026
23F0137-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0127	AG00026
23F0137-02	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0127	AG00026
23F0137-03	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0127	AG00026
23F0137-04	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0127	AG00026
23F0137-05	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026
23F0137-05RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026
23F0137-05RE2	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026
23F0137-06	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026
23F0137-06RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026
23F0137-06RE2	1.00 mL / 1.00 mL	EPA 3C	BGF0135	SGF0190	AG00026

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**No Prep VOC Air**	
23F0137-01	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0178	AE30194
23F0137-02	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0178	AE30194
23F0137-03	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0178	AE30194
23F0137-04	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0178	AE30194
23F0137-05	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0233	AE30194
23F0137-06	400 mL / 400 mL	EPA TO-15	BGF0010	SGF0296	AE30194

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0010 - No Prep VOC Air										
Blank (BGF0010-BLK1)				Prepared & Analyzed: 06/01/2023						
Benzene	<	0.50	ppbv							
Surr: 4-Bromofluorobenzene (Surr)	*4.53*		ppbv	*5.00*		*90.6*	*80-120*			
LCS (BGF0010-BS1)				Prepared & Analyzed: 06/01/2023						
1,1,1-Trichloroethane	4.49	0.5	ppbv	5.00		89.8	70-130			
1,1,2,2-Tetrachloroethane	4.68	0.5	ppbv	5.00		93.6	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane	3.89	0.5	ppbv	5.00		77.8	70-130			
1,1,2-Trichloroethane	4.69	0.5	ppbv	5.00		93.8	70-130			
1,1-Dichloroethane	4.27	0.5	ppbv	5.00		85.4	70-130			
1,1-Dichloroethylene	4.40	0.5	ppbv	5.00		88.0	70-130			
1,2,4-Trimethylbenzene	4.70	0.5	ppbv	5.00		94.0	70-130			
1,2-Dibromoethane (EDB)	4.46	0.5	ppbv	5.00		89.2	70-130			
1,2-Dichlorobenzene	4.60	0.5	ppbv	5.00		92.0	70-130			
1,2-Dichloroethane	4.61	0.5	ppbv	5.00		92.2	70-130			
1,2-Dichloropropane	4.76	0.5	ppbv	5.00		95.2	70-130			
1,2-Dichlorotetrafluoroethane	4.50	0.5	ppbv	5.00		90.0	70-130			
1,3,5-Trimethylbenzene	4.58	0.5	ppbv	5.00		91.6	70-130			
1,3-Butadiene	4.70	0.5	ppbv	5.00		94.0	70-130			
1,3-Dichlorobenzene	4.47	0.5	ppbv	5.00		89.4	70-130			
1,4-Dichlorobenzene	4.48	0.5	ppbv	5.00		89.6	70-130			
1,4-Dioxane	4.86	0.5	ppbv	5.00		97.2	70-130			
2-Butanone (MEK)	4.34	0.5	ppbv	5.00		86.8	70-130			
4-Methyl-2-pentanone (MIBK)	4.91	0.5	ppbv	5.00		98.2	70-130			
Allyl chloride	4.34	0.5	ppbv	5.00		86.8	70-130			
Benzene	4.58	0.5	ppbv	5.00		91.6	70-130			
Benzyl Chloride	3.65	0.5	ppbv	5.00		73.0	70-130			
Bromodichloromethane	4.12	0.5	ppbv	5.00		82.4	70-130			
Bromoform	0.38	0.5	ppbv	5.00		7.60	70-130			L
Bromomethane	5.02	0.5	ppbv	5.00		100	70-130			
Carbon Disulfide	3.64	0.5	ppbv	5.00		72.8	70-130			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0010 - No Prep VOC Air										
LCS (BGF0010-BS1)				Prepared & Analyzed: 06/01/2023						
Carbon Tetrachloride	4.36	0.5	ppbv	5.00		87.2	70-130			
Chlorobenzene	4.35	0.5	ppbv	5.00		87.0	70-130			
Chloroethane	4.62	0.5	ppbv	5.00		92.4	70-130			
Chloroform	4.34	0.5	ppbv	5.00		86.8	70-130			
Chloromethane	4.89	0.5	ppbv	5.00		97.8	70-130			
cis-1,2-Dichloroethylene	4.30	0.5	ppbv	5.00		86.0	70-130			
cis-1,3-Dichloropropene	4.82	0.5	ppbv	5.00		96.4	70-130			
Cyclohexane	4.72	0.5	ppbv	5.00		94.4	70-130			
Dichlorodifluoromethane	4.42	0.5	ppbv	5.00		88.4	70-130			
Ethyl acetate	4.37	0.5	ppbv	5.00		87.4	70-130			
Ethylbenzene	4.60	0.5	ppbv	5.00		92.0	70-130			
Heptane	5.08	0.5	ppbv	5.00		102	70-130			
Hexane	4.70	0.5	ppbv	5.00		94.0	70-130			
m+p-Xylenes	9.03	1	ppbv	10.0		90.3	70-130			
Methylene chloride	4.54	1	ppbv	5.00		90.8	70-130			
Methyl-t-butyl ether (MTBE)	4.36	0.5	ppbv	5.00		87.2	70-130			
Naphthalene	3.66	0.5	ppbv	5.00		73.2	60-140			
o-Xylene	4.52	0.5	ppbv	5.00		90.4	70-130			
Propylene	4.87	1	ppbv	5.00		97.4	70-130			
Styrene	4.56	0.5	ppbv	5.00		91.2	70-130			
Tetrachloroethylene (PCE)	4.10	0.5	ppbv	5.00		82.0	70-130			
Tetrahydrofuran	5.20	0.5	ppbv	5.00		104	70-130			
Toluene	4.67	0.5	ppbv	5.00		93.4	70-130			
trans-1,2-Dichloroethylene	3.69	0.5	ppbv	5.00		73.8	70-130			
trans-1,3-Dichloropropene	4.34	0.5	ppbv	5.00		86.8	70-130			
Trichloroethylene	4.64	0.5	ppbv	5.00		92.8	70-130			
Trichlorofluoromethane	4.75	0.5	ppbv	5.00		95.0	70-130			
Vinyl acetate	4.58	0.5	ppbv	5.00		91.6	70-130			
Vinyl bromide	4.47	0.5	ppbv	5.00		89.4	70-130			
Vinyl chloride	4.70	0.5	ppbv	5.00		94.0	70-130			
Surr: 4-Bromofluorobenzene (Surr)	*5.02*		ppbv	*5.00*		*100*	*70-130*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0010 - No Prep VOC Air										
LCS Dup (BGF0010-BSD1)					Prepared & Analyzed: 06/01/2023					
1,1,1-Trichloroethane	4.50	0.5	ppbv	5.00		90.0	70-130	0.222	25	
1,1,2,2-Tetrachloroethane	4.78	0.5	ppbv	5.00		95.6	70-130	2.11	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	3.75	0.5	ppbv	5.00		75.0	70-130	3.66	25	
1,1,2-Trichloroethane	4.67	0.5	ppbv	5.00		93.4	70-130	0.427	25	
1,1-Dichloroethane	4.26	0.5	ppbv	5.00		85.2	70-130	0.234	25	
1,1-Dichloroethylene	4.35	0.5	ppbv	5.00		87.0	70-130	1.14	25	
1,2,4-Trimethylbenzene	4.81	0.5	ppbv	5.00		96.2	70-130	2.31	25	
1,2-Dibromoethane (EDB)	4.59	0.5	ppbv	5.00		91.8	70-130	2.87	25	
1,2-Dichlorobenzene	4.68	0.5	ppbv	5.00		93.6	70-130	1.72	25	
1,2-Dichloroethane	4.62	0.5	ppbv	5.00		92.4	70-130	0.217	25	
1,2-Dichloropropane	4.81	0.5	ppbv	5.00		96.2	70-130	1.04	25	
1,2-Dichlorotetrafluoroethane	4.50	0.5	ppbv	5.00		90.0	70-130	0.00	25	
1,3,5-Trimethylbenzene	4.68	0.5	ppbv	5.00		93.6	70-130	2.16	25	
1,3-Butadiene	4.52	0.5	ppbv	5.00		90.4	70-130	3.90	25	
1,3-Dichlorobenzene	4.59	0.5	ppbv	5.00		91.8	70-130	2.65	25	
1,4-Dichlorobenzene	4.62	0.5	ppbv	5.00		92.4	70-130	3.08	25	
1,4-Dioxane	4.84	0.5	ppbv	5.00		96.8	70-130	0.412	25	
2-Butanone (MEK)	4.28	0.5	ppbv	5.00		85.6	70-130	1.39	25	
4-Methyl-2-pentanone (MIBK)	4.92	0.5	ppbv	5.00		98.4	70-130	0.203	25	
Allyl chloride	4.11	0.5	ppbv	5.00		82.2	70-130	5.44	25	
Benzene	4.62	0.5	ppbv	5.00		92.4	70-130	0.870	25	
Benzyl Chloride	3.78	0.5	ppbv	5.00		75.6	70-130	3.50	25	
Bromodichloromethane	4.13	0.5	ppbv	5.00		82.6	70-130	0.242	25	
Bromoform	0.39	0.5	ppbv	5.00		7.80	70-130	2.60	25	L
Bromomethane	4.94	0.5	ppbv	5.00		98.8	70-130	1.61	25	
Carbon Disulfide	3.49	0.5	ppbv	5.00		69.8	70-130	4.21	25	L
Carbon Tetrachloride	4.41	0.5	ppbv	5.00		88.2	70-130	1.14	25	
Chlorobenzene	4.46	0.5	ppbv	5.00		89.2	70-130	2.50	25	
Chloroethane	4.56	0.5	ppbv	5.00		91.2	70-130	1.31	25	
Chloroform	4.33	0.5	ppbv	5.00		86.6	70-130	0.231	25	
Chloromethane	4.86	0.5	ppbv	5.00		97.2	70-130	0.615	25	
cis-1,2-Dichloroethylene	4.31	0.5	ppbv	5.00		86.2	70-130	0.232	25	
cis-1,3-Dichloropropene	4.90	0.5	ppbv	5.00		98.0	70-130	1.65	25	

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 2, 2023 11:30 June 9, 2023 15:56
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0010 - No Prep VOC Air										
LCS Dup (BGF0010-BSD1)				Prepared & Analyzed: 06/01/2023						
Cyclohexane	4.75	0.5	ppbv	5.00		95.0	70-130	0.634	25	
Dichlorodifluoromethane	4.38	0.5	ppbv	5.00		87.6	70-130	0.909	25	
Ethyl acetate	4.33	0.5	ppbv	5.00		86.6	70-130	0.920	25	
Ethylbenzene	4.69	0.5	ppbv	5.00		93.8	70-130	1.94	25	
Heptane	5.12	0.5	ppbv	5.00		102	70-130	0.784	25	
Hexane	4.71	0.5	ppbv	5.00		94.2	70-130	0.213	25	
m+p-Xylenes	9.25	1	ppbv	10.0		92.5	70-130	2.41	25	
Methylene chloride	4.38	1	ppbv	5.00		87.6	70-130	3.59	25	
Methyl-t-butyl ether (MTBE)	4.37	0.5	ppbv	5.00		87.4	70-130	0.229	25	
Naphthalene	3.74	0.5	ppbv	5.00		74.8	60-140	2.16	25	
o-Xylene	4.67	0.5	ppbv	5.00		93.4	70-130	3.26	25	
Propylene	4.84	1	ppbv	5.00		96.8	70-130	0.618	25	
Styrene	4.64	0.5	ppbv	5.00		92.8	70-130	1.74	25	
Tetrachloroethylene (PCE)	4.21	0.5	ppbv	5.00		84.2	70-130	2.65	25	
Tetrahydrofuran	5.19	0.5	ppbv	5.00		104	70-130	0.192	25	
Toluene	4.73	0.5	ppbv	5.00		94.6	70-130	1.28	25	
trans-1,2-Dichloroethylene	3.67	0.5	ppbv	5.00		73.4	70-130	0.543	25	
trans-1,3-Dichloropropene	4.35	0.5	ppbv	5.00		87.0	70-130	0.230	25	
Trichloroethylene	4.66	0.5	ppbv	5.00		93.2	70-130	0.430	25	
Trichlorofluoromethane	4.71	0.5	ppbv	5.00		94.2	70-130	0.846	25	
Vinyl acetate	4.52	0.5	ppbv	5.00		90.4	70-130	1.32	25	
Vinyl bromide	4.50	0.5	ppbv	5.00		90.0	70-130	0.669	25	
Vinyl chloride	4.71	0.5	ppbv	5.00		94.2	70-130	0.213	25	
Surr: 4-Bromofluorobenzene (Surr)	*5.07*		ppbv	*5.00*		*101*	*70-130*			

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Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0135 - No Prep VOC GC Air										
Blank (BGF0135-BLK1)					Prepared & Analyzed: 06/05/2023					
Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							
LCS (BGF0135-BS1)					Prepared & Analyzed: 06/05/2023					
Methane	4650	500	ppmv	5000		93.0	0-200			
Methane	4650	0.05	ppmv	5000		93.0	80-120			
Carbon dioxide	5820	500	ppmv	5000		116	0-200			
Carbon dioxide	5820	0.05	ppmv	5000		116	80-120			
Oxygen (O2)	5170	500	ppmv	5000		103	0-200			
Oxygen (O2)	5170	0.05	ppmv	5000		103	80-120			
Nitrogen (N2)	5500	2000	ppmv	5000		110	0-200			
Hydrogen (H2)	5860	200	ppmv	5100		115	0-200			
Nitrogen (N2)	5500	1	ppmv	5000		110	80-120			
Hydrogen (H2)	5860	0.02	ppmv	5100		115	80-120			
Carbon Monoxide	4870	0.001	ppmv	5000		97.3	80-120			
Carbon Monoxide	4870	10	ppmv	5000		97.3	0-200			
Duplicate (BGF0135-DUP1)				**Source: 23F0137-01**	Prepared & Analyzed: 06/05/2023					
Methane	12.0	0.45	Vol%		12.0			0.0616	5	
Methane	120000	4500	ppmv		120000			0.0616	25	
Carbon dioxide	485000	4500	ppmv		483000			0.225	25	
Carbon dioxide	48.5	0.45	Vol%		48.3			0.225	5	
Oxygen (O2)	7800	4500	ppmv		7880			1.09	25	
Oxygen (O2)	0.78	0.45	Vol%		0.79			1.09	5	
Hydrogen (H2)	90500	1800	ppmv		91000			0.552	25	
Nitrogen (N2)	244000	18000	ppmv		243000			0.247	25	
Nitrogen (N2)	24.4	9.00	Vol%		24.3			0.247	5	
Carbon Monoxide	402	90.0	ppmv		390			2.98	25	
Carbon Monoxide	0.04	0.009	Vol%		0.04			2.98	5	

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Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0135 - No Prep VOC GC Air										
Duplicate (BGF0135-DUP2)				**Source: 23F0137-02**	Prepared & Analyzed: 06/05/2023					
Methane	330000	4500	ppmv		333000			0.933	25	
Methane	33.0	0.45	Vol%		33.3			0.933	5	
Carbon dioxide	475000	4500	ppmv		483000			1.68	25	
Carbon dioxide	47.5	0.45	Vol%		48.3			1.68	5	
Oxygen (O2)	0.96	0.45	Vol%		0.97			0.845	5	
Oxygen (O2)	9620	4500	ppmv		9700			0.845	25	
Hydrogen (H2)	23000	1800	ppmv		22900			0.347	25	
Hydrogen (H2)	2.30	0.18	Vol%		2.29			0.347	5	
Nitrogen (N2)	9.39	9.00	Vol%		9.49			1.07	5	
Nitrogen (N2)	93900	18000	ppmv		94900			1.07	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			3.92	5	
Carbon Monoxide	122	90.0	ppmv		126			3.92	25	
Duplicate (BGF0135-DUP3)				**Source: 23F0137-03**	Prepared & Analyzed: 06/05/2023					
Methane	362000	4500	ppmv		363000			0.0810	25	
Methane	36.2	0.45	Vol%		36.3			0.0810	5	
Carbon dioxide	52.9	0.45	Vol%		53.0			0.225	5	
Carbon dioxide	529000	4500	ppmv		530000			0.225	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Hydrogen (H2)	24500	1800	ppmv		24700			0.982	25	
Hydrogen (H2)	2.45	0.18	Vol%		2.47			0.982	5	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	125	90.0	ppmv		125			0.360	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			0.360	5	
Duplicate (BGF0135-DUP4)				**Source: 23F0137-04**	Prepared & Analyzed: 06/05/2023					
Methane	412000	4500	ppmv		412000			0.134	25	
Methane	41.2	0.45	Vol%		41.2			0.134	5	
Carbon dioxide	478000	4500	ppmv		482000			0.837	25	
Carbon dioxide	47.8	0.45	Vol%		48.2			0.837	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	

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Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0135 - No Prep VOC GC Air										
Duplicate (BGF0135-DUP4)			**Source: 23F0137-04**		Prepared & Analyzed: 06/05/2023					
Hydrogen (H2)	41800	1800	ppmv		42000			0.490	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Hydrogen (H2)	4.18	0.18	Vol%		4.20			0.490	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGF0135-DUP5)			**Source: 23F0137-05**		Prepared & Analyzed: 06/06/2023					
Methane	0.66	0.45	Vol%		0.66			0.0464	5	
Methane	6600	4500	ppmv		6600			0.0464	25	
Carbon dioxide	654000	4500	ppmv		654000			0.00893	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Hydrogen (H2)	388000	1800	ppmv		388000			0.0420	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	954	90.0	ppmv		939			1.59	25	
Carbon Monoxide	0.10	0.009	Vol%		0.09			1.59	5	
Duplicate (BGF0135-DUP6)			**Source: 23F0137-06**		Prepared & Analyzed: 06/06/2023					
Methane	0.70	0.45	Vol%		0.70			0.329	5	
Methane	7020	4500	ppmv		7000			0.329	25	
Carbon dioxide	726000	4500	ppmv		725000			0.186	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	230000	1800	ppmv		229000			0.212	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	0.13	0.009	Vol%		0.13			1.07	5	
Carbon Monoxide	1280	90.0	ppmv		1260			1.07	25	

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Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0135 - No Prep VOC GC Air										
Duplicate (BGF0135-DUP7)			**Source: 23F0134-01**		Prepared & Analyzed: 06/06/2023					
Methane	45.3	0.45	Vol%		45.2			0.202	5	
Methane	453000	4500	ppmv		452000			0.202	25	
Carbon dioxide	43.2	0.45	Vol%		43.0			0.471	5	
Carbon dioxide	432000	4500	ppmv		430000			0.471	25	
Oxygen (O2)	0.48	0.45	Vol%		0.48			1.34	5	
Oxygen (O2)	4760	4500	ppmv		4830			1.34	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Hydrogen (H2)	0.40	0.18	Vol%		0.42			4.49	5	
Nitrogen (N2)	55500	18000	ppmv		55800			0.463	25	
Hydrogen (H2)	3980	1800	ppmv		4170			4.49	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
EPA TO-15 in Air			
Benzene	VELAP		

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Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental	93016	06/14/2023
TXCEQ	Texas Comm on Environmental Quality #T10470	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12333	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

Qualifiers and Definitions

L	LCS recovery is outside of established acceptance limits
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume

TIC — Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside ± 10% of the absolute.

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formerly Air, Water & Soil Laboratories

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AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 6/30/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07223016.00
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): LOGAN CULHANE	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: 10 (5 Days) or __ Day(s)

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0018

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)	84			277	1.4	BC230518-01	30	5.0	6/1	1034	30	175.7	6/1	1038	10	175.6	LG	x	x	x
2)	86			300	1.4	BC230518-01	30	4.6	6/1	10:43	30	149.7	6-1	10:47	10	149.7	LG	x	x	x
3)	90			1151	1.4	BC230518-01	30	4.4	6/1	10:53	30	151.6	6-1	10:57	10	151.5	LG	x	x	x
4)	100			10039	1.4	BC230518-01	30	5.0	6-1	11:03	30	159.1	6-1	11:07	10	159.0	LG	x	x	x

RELINQUISHED:	DATE / TIME	RECEIVED: DATE / TIME	QC Data Package
RELINQUISHED:	DATE / TIME	RECEIVED:	Level I ☐
	6/1 4:00	6-2-23 1130	Level II ☐
RELINQUISHED: Fed Ex G	DATE / TIME	RECEIVED: DATE / TIME	Level III ☐
			Level IV ☐

LAB USE ONLY 310 20.1 no Ice
no seal

SCS Field Services 23F0137
Bristol
Recd: 06/02/2023 Due: 06/09/2023

v130325002

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AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 6/30/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07223U600
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: VA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): LOGAN CULHANE SAMPLER SIGNATURE:		Turn Around Time: Circle: 10 (5 Days) or __ Day(s)

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0018

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)	89			12785	1.4	BC230518-01	30	5.6	6-1	11:19	30	156.3	6-1	11:23	10	157.2	LG	x	x	x
2)	34			12850	1.4	BC230518-01	30	11.8	6-1	11:41	30	199.6	6-1	11:44	15	199.5	LG	x	x	x
3)	NOT SAMPLED			12851	1.4	BC230518-01	30		6-1				6-1				LG	x	x	x
4)				13368	1.4	BC230518-01	30										LG	x	x	x

RELINQUISHED:		RECEIVED: DATE / TIME	QC Data Package
RELINQUISHED: DATE / TIME 6/1 4:00		RECEIVED: DATE / TIME 6-2-23 11 30	Level I ☐
RELINQUISHED: DATE / TIME Fedex 6		RECEIVED: DATE / TIME	Level II ☐
			Level III ☐
			Level IV ☐

LAB USE ONLY 3/0 2 0.1 no Ice
no seal

SCS Field Services 23F0137
Bristol
Recd: 06/02/2023 Due: 06/09/2023

v130325002

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 6/30/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07223016.00
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): LOGAN CULBERTSON SAMPLER SIGNATURE:		**Turn Around Time:** Circle: 10 (5 Days) or __ Day(s)

PWS I.D. #:

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0018

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)				13958	1.4	BC230518-01	30										LG	x	x	x
2)	NOT SAMPLED			14291	1.4	BC230518-01	30										LG	x	x	x
3)																				
4)																				

RELINQUISHED:		RECEIVED: DATE / TIME	QC Data Package
RELINQUISHED: DATE / TIME	6/1 4:00	RECEIVED: DATE / TIME	6-2-23 1130
RELINQUISHED: DATE / TIME	Fed Ex G	RECEIVED: DATE / TIME	

QC Data Package
Level I ☐
Level II ☐
Level III ☐
Level IV ☐

LAB USE ONLY 3/0 20.1 no Ice
no Seal

SCS Field Services 23F0137
Bristol
Recd: 06/02/2023 Due: 06/09/2023

v130325002

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0137

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 2, 2023 11:30 June 9, 2023 15:56
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**20.10°C**
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	June 12, 2023 11:14
	4330 Lewis Road, Suite 1	Date Issued:	June 16, 2023 15:07
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07223016.00
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 06/12/2023 11:14. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

TNI Accredited
VELAP ID 460021

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	June 12, 2023 11:14
	4330 Lewis Road, Suite 1	Date Issued:	June 16, 2023 15:07
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07223016.00

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
84	23F0579-01	Air	06/08/2023 09:47	06/12/2023 11:14
86	23F0579-02	Air	06/08/2023 09:54	06/12/2023 11:14
90	23F0579-03	Air	06/08/2023 10:11	06/12/2023 11:14
100	23F0579-04	Air	06/08/2023 10:19	06/12/2023 11:14
89	23F0579-05	Air	06/08/2023 10:28	06/12/2023 11:14
53	23F0579-06	Air	06/08/2023 10:38	06/12/2023 11:14
BLRI	23F0579-07	Air	06/08/2023 04:46	06/12/2023 11:14

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 84

Sample ID: 23F0579-01

Sample Matrix: Air

Sampled: 6/8/2023 09:47

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00217::00261

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.2

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	400	90.0	90.0		9	1	6/13/23 11:12	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	12.2	0.45	0.45		9	1	6/13/23 11:12	MER
Carbon dioxide, as received	48.5	0.45	0.45		9	1	6/13/23 11:12	MER
Oxygen (O2), as received	0.57	0.45	0.45		9	1	6/13/23 11:12	MER
Hydrogen (H2), as received	8.84	0.54	0.54		27	1	6/13/23 13:24	MER
Nitrogen (N2), as received	22.3	9.00	9.00		9	1	6/13/23 11:12	MER
Carbon Monoxide, as received	0.04	0.009	0.009		9	1	6/13/23 11:12	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	514000	10500	26200		1600000	34000	84000	52500	1	6/14/23 12:32	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	111	80-120	6/14/23 12:32

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 86

Sample ID: 23F0579-02

Sample Matrix: Air

Sampled: 6/8/2023 09:54

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00074::10045

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 4.6

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	106	90.0	90.0		9	1	6/13/23 12:48	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	35.0	0.45	0.45		9	1	6/13/23 12:48	MER
Carbon dioxide, as received	48.6	0.45	0.45		9	1	6/13/23 12:48	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/13/23 12:48	MER
Hydrogen (H2), as received	2.01	0.18	0.18		9	1	6/13/23 12:48	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/13/23 12:48	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	6/13/23 12:48	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	460000	21000	52500		1500000	67000	170000	105000	1	6/15/23 13:10	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	109	80-120	6/15/23 13:10

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 90

Sample ID: 23F0579-03

Sample Matrix: Air

Sampled: 6/8/2023 10:11

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00320::11297

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.0

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	110	90.0	90.0		9	1	6/13/23 14:03	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	36.8	0.45	0.45		9	1	6/13/23 14:03	MER
Carbon dioxide, as received	52.1	0.45	0.45		9	1	6/13/23 14:03	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/13/23 14:03	MER
Hydrogen (H2), as received	2.16	0.18	0.18		9	1	6/13/23 14:03	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/13/23 14:03	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	6/13/23 14:03	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	534000	14000	35000		1700000	45000	110000	70000	1	6/15/23 16:02	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	109	80-120	6/15/23 16:02

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 100

Sample ID: 23F0579-04

Sample Matrix: Air

Sampled: 6/8/2023 10:19

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00220::12464

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.0

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	6/13/23 14:54	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	39.3	0.45	0.45		9	1	6/13/23 14:54	MER
Carbon dioxide, as received	45.7	0.45	0.45		9	1	6/13/23 14:54	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/13/23 14:54	MER
Hydrogen (H2), as received	3.81	0.18	0.18		9	1	6/13/23 14:54	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/13/23 14:54	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	6/13/23 14:54	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	52300	778	1940		170000	2500	6200	3890	1	6/14/23 21:46	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	108	80-120	6/14/23 21:46

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 89

Sample ID: 23F0579-05

Sample Matrix: Air

Sampled: 6/8/2023 10:28

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00317::12473

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 4.8

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	963	90.0	90.0		9	1	6/13/23 15:45	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	0.68	0.45	0.45		9	1	6/13/23 15:45	MER
Carbon dioxide, as received	68.0	0.90	0.90		18	1	6/13/23 17:15	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/13/23 15:45	MER
Hydrogen (H2), as received	38.2	2.16	2.16		108	1	6/13/23 17:46	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/13/23 15:45	MER
Carbon Monoxide, as received	0.10	0.009	0.009		9	1	6/13/23 15:45	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	509000	7000	17500		1600000	22000	56000	35000	1	6/15/23 0:52	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	98.8	80-120	6/15/23 0:52

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: 53

Sample ID: 23F0579-06

Sample Matrix: Air

Sampled: 6/8/2023 10:38

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00020::12658

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 4.8

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	671	90.0	90.0		9	1	6/13/23 16:39	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	18.3	0.45	0.45		9	1	6/13/23 16:39	MER
Carbon dioxide, as received	66.4	0.90	0.90		18	1	6/13/23 17:30	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	6/13/23 16:39	MER
Hydrogen (H2), as received	13.1	1.08	1.08		54	1	6/13/23 18:02	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	6/13/23 16:39	MER
Carbon Monoxide, as received	0.07	0.009	0.009		9	1	6/13/23 16:39	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	299000	4670	11700		960000	15000	37000	23300	1	6/15/23 3:12	DFH

Surrogate(s)	% Recovery	% Recovery Limits		
4-Bromofluorobenzene (Surr)	97.4	80-120		6/15/23 3:12

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

ANALYTICAL RESULTS

Project Location:

Field Sample #: BLRI

Sample ID: 23F0579-07

Sample Matrix: Air

Sampled: 6/8/2023 04:46

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00480::15041

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.8

Receipt Vacuum(in Hg):

Flow Controller Type: Passive

Flow Controller ID:

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
ALT-145

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	6/14/23 11:53	MER

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis
EPA 3C

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	25.8	0.45	0.45		9	1	6/14/23 11:53	MER
Carbon dioxide, as received	32.4	0.45	0.45		9	1	6/14/23 11:53	MER
Oxygen (O2), as received	4.35	0.45	0.45		9	1	6/14/23 11:53	MER
Hydrogen (H2), as received	1.25	0.18	0.18		9	1	6/14/23 11:53	MER
Nitrogen (N2), as received	25.9	9.00	9.00		9	1	6/14/23 11:53	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	6/14/23 11:53	MER

Volatile Organic Compounds by GCMS
EPA TO-15

Analyte	ppbv Results	MDL	LOQ	Flag/Qual	ug/M³ Results	MDL	LOQ	Dilution	PF	Date/Time Analyzed	Analyst
Benzene	87700	4670	11700		280000	15000	37000	23300	1	6/15/23 11:38	DFH

Surrogate(s)	% Recovery	% Recovery Limits	
4-Bromofluorobenzene (Surr)	103	80-120	6/15/23 11:38

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23F0579-01	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-02	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-03	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-04	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-05	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-06	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0492	AG00026
23F0579-07	1.00 mL / 1.00 mL	ALT-145	BGF0490	SGF0565	AG00026
23F0579-01	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-02	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-03	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-04	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-05	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-05RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-05RE2	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-06	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-06RE1	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-06RE2	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0492	AG00026
23F0579-07	1.00 mL / 1.00 mL	EPA 3C	BGF0490	SGF0565	AG00026

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**No Prep VOC Air**	
23F0579-01	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0556	AE30194
23F0579-02	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0611	AE30194
23F0579-03	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0611	AE30194
23F0579-04	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0556	AE30194
23F0579-05	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0556	AE30194
23F0579-06	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0556	AE30194
23F0579-07	400 mL / 400 mL	EPA TO-15	BGF0543	SGF0611	AE30194

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0543 - No Prep VOC Air										
Blank (BGF0543-BLK1)				Prepared & Analyzed: 06/14/2023						
Benzene	<	0.50	ppbv							
Surr: 4-Bromofluorobenzene (Surr)	*4.60*		ppbv	*5.00*		*92.0*	*80-120*			
LCS (BGF0543-BS1)				Prepared & Analyzed: 06/14/2023						
1,1,1-Trichloroethane	4.57	0.5	ppbv	5.00		91.4	70-130			
1,1,2,2-Tetrachloroethane	4.80	0.5	ppbv	5.00		96.0	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane	4.34	0.5	ppbv	5.00		86.8	70-130			
1,1,2-Trichloroethane	4.71	0.5	ppbv	5.00		94.2	70-130			
1,1-Dichloroethane	4.22	0.5	ppbv	5.00		84.4	70-130			
1,1-Dichloroethylene	4.32	0.5	ppbv	5.00		86.4	70-130			
1,2,4-Trimethylbenzene	4.93	0.5	ppbv	5.00		98.6	70-130			
1,2-Dibromoethane (EDB)	4.58	0.5	ppbv	5.00		91.6	70-130			
1,2-Dichlorobenzene	4.86	0.5	ppbv	5.00		97.2	70-130			
1,2-Dichloroethane	4.65	0.5	ppbv	5.00		93.0	70-130			
1,2-Dichloropropane	4.75	0.5	ppbv	5.00		95.0	70-130			
1,2-Dichlorotetrafluoroethane	4.47	0.5	ppbv	5.00		89.4	70-130			
1,3,5-Trimethylbenzene	4.78	0.5	ppbv	5.00		95.6	70-130			
1,3-Butadiene	4.50	0.5	ppbv	5.00		90.0	70-130			
1,3-Dichlorobenzene	4.77	0.5	ppbv	5.00		95.4	70-130			
1,4-Dichlorobenzene	4.72	0.5	ppbv	5.00		94.4	70-130			
1,4-Dioxane	4.89	0.5	ppbv	5.00		97.8	70-130			
2-Butanone (MEK)	4.32	0.5	ppbv	5.00		86.4	70-130			
4-Methyl-2-pentanone (MIBK)	4.97	0.5	ppbv	5.00		99.4	70-130			
Allyl chloride	4.20	0.5	ppbv	5.00		84.0	70-130			
Benzene	4.67	0.5	ppbv	5.00		93.4	70-130			
Benzyl Chloride	3.87	0.5	ppbv	5.00		77.4	70-130			
Bromodichloromethane	4.11	0.5	ppbv	5.00		82.2	70-130			
Bromoform	0.38	0.5	ppbv	5.00		7.60	70-130			L
Bromomethane	4.97	0.5	ppbv	5.00		99.4	70-130			
Carbon Disulfide	4.22	0.5	ppbv	5.00		84.4	70-130			

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Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0543 - No Prep VOC Air										
LCS (BGF0543-BS1)				Prepared & Analyzed: 06/14/2023						
Carbon Tetrachloride	4.48	0.5	ppbv	5.00		89.6	70-130			
Chlorobenzene	4.57	0.5	ppbv	5.00		91.4	70-130			
Chloroethane	4.50	0.5	ppbv	5.00		90.0	70-130			
Chloroform	4.32	0.5	ppbv	5.00		86.4	70-130			
Chloromethane	4.63	0.5	ppbv	5.00		92.6	70-130			
cis-1,2-Dichloroethylene	4.35	0.5	ppbv	5.00		87.0	70-130			
cis-1,3-Dichloropropene	4.82	0.5	ppbv	5.00		96.4	70-130			
Cyclohexane	4.75	0.5	ppbv	5.00		95.0	70-130			
Dichlorodifluoromethane	4.38	0.5	ppbv	5.00		87.6	70-130			
Ethyl acetate	4.38	0.5	ppbv	5.00		87.6	70-130			
Ethylbenzene	4.78	0.5	ppbv	5.00		95.6	70-130			
Heptane	5.06	0.5	ppbv	5.00		101	70-130			
Hexane	4.64	0.5	ppbv	5.00		92.8	70-130			
m+p-Xylenes	9.41	1	ppbv	10.0		94.1	70-130			
Methylene chloride	4.42	1	ppbv	5.00		88.4	70-130			
Methyl-t-butyl ether (MTBE)	4.40	0.5	ppbv	5.00		88.0	70-130			
Naphthalene	3.82	0.5	ppbv	5.00		76.4	60-140			
o-Xylene	4.74	0.5	ppbv	5.00		94.8	70-130			
Propylene	4.66	1	ppbv	5.00		93.2	70-130			
Styrene	4.80	0.5	ppbv	5.00		96.0	70-130			
Tetrachloroethylene (PCE)	4.41	0.5	ppbv	5.00		88.2	70-130			
Tetrahydrofuran	5.15	0.5	ppbv	5.00		103	70-130			
Toluene	4.79	0.5	ppbv	5.00		95.8	70-130			
trans-1,2-Dichloroethylene	3.71	0.5	ppbv	5.00		74.2	70-130			
trans-1,3-Dichloropropene	4.34	0.5	ppbv	5.00		86.8	70-130			
Trichloroethylene	4.71	0.5	ppbv	5.00		94.2	70-130			
Trichlorofluoromethane	4.24	0.5	ppbv	5.00		84.8	70-130			
Vinyl acetate	4.49	0.5	ppbv	5.00		89.8	70-130			
Vinyl bromide	4.47	0.5	ppbv	5.00		89.4	70-130			
Vinyl chloride	4.57	0.5	ppbv	5.00		91.4	70-130			
Surr: 4-Bromofluorobenzene (Surr)	*5.01*		ppbv	*5.00*		*100*	*70-130*			

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0543 - No Prep VOC Air										
LCS Dup (BGF0543-BSD1)				Prepared & Analyzed: 06/14/2023						
1,1,1-Trichloroethane	4.53	0.5	ppbv	5.00		90.6	70-130	0.879	25	
1,1,2,2-Tetrachloroethane	4.84	0.5	ppbv	5.00		96.8	70-130	0.830	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	3.35	0.5	ppbv	5.00		67.0	70-130	25.7	25	L, P
1,1,2-Trichloroethane	4.62	0.5	ppbv	5.00		92.4	70-130	1.93	25	
1,1-Dichloroethane	4.18	0.5	ppbv	5.00		83.6	70-130	0.952	25	
1,1-Dichloroethylene	4.32	0.5	ppbv	5.00		86.4	70-130	0.00	25	
1,2,4-Trimethylbenzene	4.97	0.5	ppbv	5.00		99.4	70-130	0.808	25	
1,2-Dibromoethane (EDB)	4.68	0.5	ppbv	5.00		93.6	70-130	2.16	25	
1,2-Dichlorobenzene	4.91	0.5	ppbv	5.00		98.2	70-130	1.02	25	
1,2-Dichloroethane	4.63	0.5	ppbv	5.00		92.6	70-130	0.431	25	
1,2-Dichloropropane	4.72	0.5	ppbv	5.00		94.4	70-130	0.634	25	
1,2-Dichlorotetrafluoroethane	4.46	0.5	ppbv	5.00		89.2	70-130	0.224	25	
1,3,5-Trimethylbenzene	4.86	0.5	ppbv	5.00		97.2	70-130	1.66	25	
1,3-Butadiene	4.37	0.5	ppbv	5.00		87.4	70-130	2.93	25	
1,3-Dichlorobenzene	4.81	0.5	ppbv	5.00		96.2	70-130	0.835	25	
1,4-Dichlorobenzene	4.76	0.5	ppbv	5.00		95.2	70-130	0.844	25	
1,4-Dioxane	4.84	0.5	ppbv	5.00		96.8	70-130	1.03	25	
2-Butanone (MEK)	4.20	0.5	ppbv	5.00		84.0	70-130	2.82	25	
4-Methyl-2-pentanone (MIBK)	4.92	0.5	ppbv	5.00		98.4	70-130	1.01	25	
Allyl chloride	4.07	0.5	ppbv	5.00		81.4	70-130	3.14	25	
Benzene	4.61	0.5	ppbv	5.00		92.2	70-130	1.29	25	
Benzyl Chloride	3.87	0.5	ppbv	5.00		77.4	70-130	0.00	25	
Bromodichloromethane	4.07	0.5	ppbv	5.00		81.4	70-130	0.978	25	
Bromoform	0.38	0.5	ppbv	5.00		7.60	70-130	0.00	25	L
Bromomethane	4.91	0.5	ppbv	5.00		98.2	70-130	1.21	25	
Carbon Disulfide	3.06	0.5	ppbv	5.00		61.2	70-130	31.9	25	L, P
Carbon Tetrachloride	4.42	0.5	ppbv	5.00		88.4	70-130	1.35	25	
Chlorobenzene	4.60	0.5	ppbv	5.00		92.0	70-130	0.654	25	
Chloroethane	4.42	0.5	ppbv	5.00		88.4	70-130	1.79	25	
Chloroform	4.23	0.5	ppbv	5.00		84.6	70-130	2.11	25	
Chloromethane	4.77	0.5	ppbv	5.00		95.4	70-130	2.98	25	
cis-1,2-Dichloroethylene	4.33	0.5	ppbv	5.00		86.6	70-130	0.461	25	
cis-1,3-Dichloropropene	4.79	0.5	ppbv	5.00		95.8	70-130	0.624	25	

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Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0543 - No Prep VOC Air										
LCS Dup (BGF0543-BSD1)				Prepared & Analyzed: 06/14/2023						
Cyclohexane	4.75	0.5	ppbv	5.00		95.0	70-130	0.00	25	
Dichlorodifluoromethane	4.30	0.5	ppbv	5.00		86.0	70-130	1.84	25	
Ethyl acetate	4.17	0.5	ppbv	5.00		83.4	70-130	4.91	25	
Ethylbenzene	4.77	0.5	ppbv	5.00		95.4	70-130	0.209	25	
Heptane	4.94	0.5	ppbv	5.00		98.8	70-130	2.40	25	
Hexane	4.58	0.5	ppbv	5.00		91.6	70-130	1.30	25	
m+p-Xylenes	9.42	1	ppbv	10.0		94.2	70-130	0.106	25	
Methylene chloride	4.43	1	ppbv	5.00		88.6	70-130	0.226	25	
Methyl-t-butyl ether (MTBE)	4.33	0.5	ppbv	5.00		86.6	70-130	1.60	25	
Naphthalene	3.90	0.5	ppbv	5.00		78.0	60-140	2.07	25	
o-Xylene	4.73	0.5	ppbv	5.00		94.6	70-130	0.211	25	
Propylene	4.58	1	ppbv	5.00		91.6	70-130	1.73	25	
Styrene	4.80	0.5	ppbv	5.00		96.0	70-130	0.00	25	
Tetrachloroethylene (PCE)	4.50	0.5	ppbv	5.00		90.0	70-130	2.02	25	
Tetrahydrofuran	5.02	0.5	ppbv	5.00		100	70-130	2.56	25	
Toluene	4.78	0.5	ppbv	5.00		95.6	70-130	0.209	25	
trans-1,2-Dichloroethylene	3.64	0.5	ppbv	5.00		72.8	70-130	1.90	25	
trans-1,3-Dichloropropene	4.28	0.5	ppbv	5.00		85.6	70-130	1.39	25	
Trichloroethylene	4.70	0.5	ppbv	5.00		94.0	70-130	0.213	25	
Trichlorofluoromethane	4.30	0.5	ppbv	5.00		86.0	70-130	1.41	25	
Vinyl acetate	4.39	0.5	ppbv	5.00		87.8	70-130	2.25	25	
Vinyl bromide	4.46	0.5	ppbv	5.00		89.2	70-130	0.224	25	
Vinyl chloride	4.56	0.5	ppbv	5.00		91.2	70-130	0.219	25	
Surr: 4-Bromofluorobenzene (Surr)	*5.14*		ppbv	*5.00*		*103*	*70-130*			

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0490 - No Prep VOC GC Air										
Blank (BGF0490-BLK1)						Prepared & Analyzed: 06/13/2023				
Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							
Blank (BGF0490-BLK2)						Prepared & Analyzed: 06/13/2023				
Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							
LCS (BGF0490-BS1)						Prepared & Analyzed: 06/13/2023				
Methane	4610	500	ppmv	5000		92.2	0-200			
Methane	4610	0.05	ppmv	5000		92.2	80-120			
Carbon dioxide	5660	500	ppmv	5000		113	0-200			
Carbon dioxide	5660	0.05	ppmv	5000		113	80-120			
Oxygen (O2)	5110	500	ppmv	5000		102	0-200			
Oxygen (O2)	5110	0.05	ppmv	5000		102	80-120			
Hydrogen (H2)	5900	200	ppmv	5100		116	0-200			
Hydrogen (H2)	5900	0.02	ppmv	5100		116	80-120			
Nitrogen (N2)	5470	2000	ppmv	5000		109	0-200			
Nitrogen (N2)	5470	1	ppmv	5000		109	80-120			
Carbon Monoxide	4810	10	ppmv	5000		96.2	0-200			
Carbon Monoxide	4810	0.001	ppmv	5000		96.2	80-120			

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4330 Lewis Road, Suite 1

Harrisburg, PA 17111

Date Received: June 12, 2023 11:14
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Submitted To: Tom Lock
Client Site I.D.: Bristol

Project Number: [none]
Purchase Order: 07223016.00

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0490 - No Prep VOC GC Air										
Duplicate (BGF0490-DUP1)				**Source: 23F0579-01**	Prepared & Analyzed: 06/13/2023					
Methane	12.3	0.45	Vol%		12.2			0.696	5	
Methane	123000	4500	ppmv		122000			0.695	25	
Carbon dioxide	48.9	0.45	Vol%		48.5			0.773	5	
Carbon dioxide	489000	4500	ppmv		485000			0.773	25	
Oxygen (O2)	0.57	0.45	Vol%		0.57			0.160	5	
Oxygen (O2)	5680	4500	ppmv		5690			0.160	25	
Nitrogen (N2)	225000	18000	ppmv		223000			0.693	25	
Nitrogen (N2)	22.5	9.00	Vol%		22.3			0.693	5	
Hydrogen (H2)	90600	1800	ppmv		89700			0.966	25	
Carbon Monoxide	0.04	0.009	Vol%		0.04			0.382	5	
Carbon Monoxide	401	90.0	ppmv		400			0.382	25	
Duplicate (BGF0490-DUP2)				**Source: 23F0579-02**	Prepared & Analyzed: 06/13/2023					
Methane	347000	4500	ppmv		350000			0.900	25	
Methane	34.7	0.45	Vol%		35.0			0.900	5	
Carbon dioxide	482000	4500	ppmv		486000			0.882	25	
Carbon dioxide	48.2	0.45	Vol%		48.6			0.882	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Hydrogen (H2)	20000	1800	ppmv		20100			0.0691	25	
Hydrogen (H2)	2.00	0.18	Vol%		2.01			0.0691	5	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Nitrogen (N2)	62600	18000	ppmv		63200			0.982	25	
Carbon Monoxide	104	90.0	ppmv		106			2.05	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			2.05	5	
Duplicate (BGF0490-DUP3)				**Source: 23F0579-03**	Prepared & Analyzed: 06/13/2023					
Methane	369000	4500	ppmv		368000			0.410	25	
Methane	36.9	0.45	Vol%		36.8			0.410	5	
Carbon dioxide	521000	4500	ppmv		521000			0.0344	25	
Carbon dioxide	52.1	0.45	Vol%		52.1			0.0344	5	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0490 - No Prep VOC GC Air										
Duplicate (BGF0490-DUP3)				**Source: 23F0579-03**	Prepared & Analyzed: 06/13/2023					
Hydrogen (H2)	2.20	0.18	Vol%		2.16			1.72	5	
Hydrogen (H2)	22000	1800	ppmv		21600			1.72	25	
Carbon Monoxide	111	90.0	ppmv		110			0.407	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			0.407	5	
Duplicate (BGF0490-DUP4)				**Source: 23F0579-04**	Prepared & Analyzed: 06/13/2023					
Methane	394000	4500	ppmv		393000			0.274	25	
Methane	39.4	0.45	Vol%		39.3			0.274	5	
Carbon dioxide	460000	4500	ppmv		457000			0.613	25	
Carbon dioxide	46.0	0.45	Vol%		45.7			0.613	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Hydrogen (H2)	38500	1800	ppmv		38100			1.08	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	3.85	0.18	Vol%		3.81			1.08	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGF0490-DUP5)				**Source: 23F0579-05**	Prepared & Analyzed: 06/13/2023					
Methane	6830	4500	ppmv		6850			0.175	25	
Methane	0.68	0.45	Vol%		0.68			0.175	5	
Carbon dioxide	657000	4500	ppmv		657000			0.103	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	392000	1800	ppmv		389000			0.638	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	959	90.0	ppmv		963			0.459	25	
Carbon Monoxide	0.10	0.009	Vol%		0.10			0.459	5	

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis - Quality Control

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0490 - No Prep VOC GC Air										
Duplicate (BGF0490-DUP6)				**Source: 23F0579-06**	Prepared & Analyzed: 06/13/2023					
Methane	184000	4500	ppmv		183000			0.786	25	
Methane	18.4	0.45	Vol%		18.3			0.786	5	
Carbon dioxide	65.0	0.45	Vol%		65.9			1.37	5	
Carbon dioxide	650000	4500	ppmv		659000			1.37	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Hydrogen (H2)	135000	1800	ppmv		134000			0.742	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	0.07	0.009	Vol%		0.07			0.762	5	
Carbon Monoxide	676	90.0	ppmv		671			0.762	25	
Duplicate (BGF0490-DUP7)				**Source: 23F0579-07**	Prepared & Analyzed: 06/14/2023					
Methane	26.2	0.45	Vol%		25.8			1.26	5	
Methane	262000	4500	ppmv		258000			1.26	25	
Carbon dioxide	32.7	0.45	Vol%		32.4			0.926	5	
Carbon dioxide	327000	4500	ppmv		324000			0.926	25	
Oxygen (O2)	4.39	0.45	Vol%		4.35			0.815	5	
Oxygen (O2)	43900	4500	ppmv		43500			0.815	25	
Nitrogen (N2)	26.1	9.00	Vol%		25.9			0.784	5	
Hydrogen (H2)	1.28	0.18	Vol%		1.25			2.11	5	
Hydrogen (H2)	12800	1800	ppmv		12500			2.11	25	
Nitrogen (N2)	261000	18000	ppmv		259000			0.784	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

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Final Report

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
EPA TO-15 in Air			
Benzene	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental	93016	06/14/2023
TXCEQ	Texas Comm on Environmental Quality #T10470	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12417	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Qualifiers and Definitions

L	LCS recovery is outside of established acceptance limits
P	Duplicate analysis does not meet the acceptance criteria for precision
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

All EPA method 3C results are reported as normalized values when the sum total of all evaluated constituents is outside ± 10% of the absolute.

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AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 7/5/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:	INVOICE PHONE #:	P.O. #: 07223016.00
FAX #:	EMAIL:	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): LOGAN CULHANE	SAMPLER SIGNATURE:	Turn Around Time: Circle: 10 (5 Days) or __ Day(s)

PWS I.D. #:

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0033

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)	84			261	1.4	BC230515-01	30	5.2	6/8	9:43	30	173.6	6/8	9:47	10	173.6	LG	x	x	x
2)	86			10045	1.4	BC230511-03	30	4.6	6/8	9:51	30	148	6/8	9:54	10	148	LG	x	x	x
3)	90			11297	1.4	BC230511-03	30	5.0	6/8	10:07	30	151	6/8	10:11	10	151	LG	x	x	x
4)	100			12464	1.4	BC230511-03	30	5.0	6/8	10:15	30	158.9	6/8	10:19	10	158.9	LG	x	x	x

310 noire noseq 20.2c

RELINQUISHED:		RECEIVED: DATE / TIME	QC Data Package
RELINQUISHED: DATE / TIME: 6/8 5:00		RECEIVED: Fedex Gr DATE / TIME	Level I ☐
RELINQUISHED: Fedex Gr DATE / TIME		RECEIVED: Jami Harris 6/12/23 1114 DATE / TIME	Level II ☐
			Level III ☐
			Level IV ☐

LAB USE ONLY

SCS Field Services 23F0579
Bristol
Recd: 06/12/2023 Due: 06/19/2023
v130325002

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AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 7/5/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:	INVOICE PHONE #:	P.O. #: 07223016.00
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: NA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): LOGAN CULHANE	SAMPLER SIGNATURE:	Turn Around Time: Circle: 10 (5 Days) or __ Day(s)

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0033

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)	89			12473	1.4	BC230511-03	30	4.8	6/8	10:25	30	152.5	6/8	10:28	10	162	LG	x	x	x
2)	53			12658	1.4	BC230511-03	30	4.8	6/8	10:35	30	155	6/8	10:39	10	155	LG	x	x	x
3)	NOT SAMPLED			12848	1.4	BC230511-03	30										LG	x	x	x
4)				13953	1.4	BC230511-03	30										LG	x	x	x

310. noise noted 20.2 -

RELINQUISHED:		RECEIVED: DATE / TIME	QC Data Package: Level I ☐
RELINQUISHED: DATE / TIME 6/8 5:00		RECEIVED: Fedex G DATE / TIME	Level II ☐
RELINQUISHED: Fedex G DATE / TIME		RECEIVED: Jenni Harris 6/12/23 1114 DATE / TIME	Level III ☐ Level IV ☐

LAB USE ONLY
SCS Field Services 23F0579
Bristol
Recd: 06/12/2023 Due: 06/19/2023
v130325002

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AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 7/5/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: Same	PROJECT NAME/Quote #: Bristol
CONTACT:	INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #:	INVOICE PHONE #:	P.O. #: 07223016.00
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? YES NO	Regulatory State: VA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT):	SAMPLER SIGNATURE:	Turn Around Time: Circle: 10 (5 Days) or __ Day(s)

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas (LV=Landfill/Vent Gas) OT=Other_____

063-23E-0033

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	3C	TO-15 Benzene only
1)	NOT SAMPLED			14294	1.4	BC230515-01	30										LG	x	x	x
2)	BLEI			15041	1.4	BC230515-01	30	5.8	6/8	4:43	30	84.6	6/8	4:46	10	84.6	LG	x	x	x
3)																				
4)																				

310 no ice no seal 20.2°C

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED: Fedex Gr	6/8 5:00	RECEIVED: Fedex Gr	
RELINQUISHED: Fedex Gr		RECEIVED: Jami Hamm	6/12/23 1114

QC Data Package
Level I ☐
Level II ☐
Level III ☐
Level IV ☐

LAB USE ONLY
SCS Field Services 23F0579
Bristol
Recd: 06/12/2023 Due: 06/19/2023
v130325002

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 23F0579

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	June 12, 2023 11:14 June 16, 2023 15:07
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07223016.00

Sample Conditions Checklist

Samples Received at:	**20.20°C**
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

Appendix D

Solid Waste Permit 588 Daily Borehole Temperature Averages

Appendix D Table of Contents

Section Page

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 1

	Depth from Surface					
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Jun	205.4	207.7	207.7	207.9	220.4	249.6
2-Jun	205.3	207.6	207.7	207.7	220.8	250.0
3-Jun	204.8	207.6	207.7	207.8	221.4	250.3
4-Jun	204.7	207.5	207.7	207.8	222.1	250.5
5-Jun	204.3	207.4	207.6	207.6	223.0	250.6
6-Jun	204.2	207.4	207.5	207.6	223.9	250.9
7-Jun	201.5	206.5	207.0	207.0	225.4	251.5
8-Jun	198.4	206.8	207.2	207.5	228.0	253.3
9-Jun	193.4	206.8	207.0	207.6	230.5	254.6
10-Jun	191.1	207.0	207.2	207.9	233.2	255.9
11-Jun	188.6	207.0	207.1	207.7	235.1	256.8
12-Jun	185.6	206.9	207.0	207.9	237.2	257.6
13-Jun	186.9	207.0	207.2	210.5	239.2	258.8
14-Jun	185.3	206.8	207.0	211.0	241.3	259.8
15-Jun	183.1	207.2	207.4	211.7	243.2	260.7
16-Jun	180.6	206.9	207.1	215.3	245.6	261.3
17-Jun	177.0	206.8	207.0	219.7	248.5	262.0
18-Jun	175.7	206.3	206.5	224.6	252.1	262.9
19-Jun	174.8	205.3	205.6	227.8	255.6	263.6
20-Jun	174.0	205.1	205.6	229.7	258.3	263.9
21-Jun	173.4	205.5	206.3	230.6	259.5	264.3
22-Jun	173.1	206.6	207.2	231.6	260.3	264.6
23-Jun	172.8	207.6	207.9	232.6	261.1	265.1
24-Jun	172.4	207.7	208.0	234.3	262.1	265.5
25-Jun	172.2	207.4	207.8	235.7	262.9	265.9
26-Jun	172.0	208.0	208.4	237.2	263.4	266.3
27-Jun	171.4	208.0	208.4	238.0	263.6	266.4
28-Jun	171.4	208.3	208.8	238.7	264.0	266.8
29-Jun	171.3	208.6	209.1	239.5	264.4	267.1
30-Jun	171.1	208.8	209.2	239.8	264.4	267.1
Average	**184.9**	**207.1**	**207.4**	**220.0**	**244.3**	**259.5**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 2

	Depth from Surface					
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Jun	158.3	239.2	239.7	268.4	256.5	268.8
2-Jun	158.3	239.1	239.5	268.3	256.5	268.6
3-Jun	158.4	239.1	239.5	268.4	256.4	268.5
4-Jun	158.7	239.0	239.4	268.4	256.4	268.5
5-Jun	159.1	239.4	239.7	268.3	256.4	268.6
6-Jun	159.5	239.1	239.6	268.2	256.5	268.5
7-Jun	159.7	238.5	239.2	268.0	256.0	268.0
8-Jun	161.0	239.3	239.8	268.3	256.4	268.5
9-Jun	161.0	239.0	239.4	267.9	256.5	268.3
10-Jun	160.6	239.4	239.9	268.0	256.4	268.3
11-Jun	160.8	239.4	239.9	268.0	256.5	268.4
12-Jun	161.5	239.6	240.1	268.2	256.3	268.4
13-Jun	161.0	239.5	239.9	268.1	256.4	268.4
14-Jun	161.0	239.6	240.0	268.0	256.5	268.5
15-Jun	161.1	240.1	240.4	268.3	256.5	268.5
16-Jun	161.1	239.7	240.1	268.3	256.6	268.5
17-Jun	160.7	240.0	240.4	268.1	256.7	268.4
18-Jun	160.8	239.9	240.4	268.1	256.7	268.3
19-Jun	161.3	239.9	240.3	268.0	256.5	268.3
20-Jun	161.4	239.8	240.2	268.0	256.4	268.2
21-Jun	161.0	239.6	240.0	267.8	256.3	268.1
22-Jun	160.6	240.0	240.3	267.8	256.4	268.1
23-Jun	160.4	239.8	240.2	268.0	256.5	268.3
24-Jun	160.0	239.9	240.3	268.1	256.5	268.3
25-Jun	159.9	240.0	240.3	268.0	256.4	268.2
26-Jun	159.9	240.0	240.4	268.1	256.4	268.4
27-Jun	159.7	239.9	240.3	268.0	256.4	268.3
28-Jun	159.3	240.1	240.5	268.1	256.5	268.4
29-Jun	159.5	240.2	240.6	268.0	256.5	268.3
30-Jun	159.0	240.2	240.6	268.0	256.5	268.3
Average	**160.1**	**239.6**	**240.0**	**268.1**	**256.4**	**268.4**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 3

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	208.0	234.6	233.7	253.5	264.6	270.8	271.9	253.9
2-Jun	207.7	236.9	235.9	253.6	264.5	270.8	271.9	253.8
3-Jun	207.7	233.7	232.6	253.7	264.6	270.8	272.0	254.2
4-Jun	207.8	217.1	222.8	253.6	264.6	271.1	272.0	254.3
5-Jun	207.9	208.3	208.1	253.5	264.5	271.3	271.9	254.3
6-Jun	207.4	207.6	207.8	253.4	264.2	270.9	271.5	253.8
7-Jun	207.0	212.0	211.4	253.0	264.0	270.6	271.1	253.5
8-Jun	207.5	211.9	212.7	253.5	264.3	270.9	271.6	253.7
9-Jun	207.5	233.0	232.6	253.5	264.1	270.9	271.7	253.9
10-Jun	207.5	210.0	210.9	253.6	264.4	271.0	271.8	254.1
11-Jun	207.4	208.0	207.8	253.4	264.3	270.9	271.4	254.0
12-Jun	207.1	207.2	207.3	251.1	264.2	270.9	271.6	254.0
13-Jun	207.3	207.4	207.5	253.3	264.0	270.4	271.4	254.2
14-Jun	206.8	207.3	207.8	252.8	263.9	270.4	271.0	254.3
15-Jun	206.8	207.3	208.3	252.1	263.5	270.1	270.6	254.4
16-Jun	207.0	208.4	208.3	252.1	263.9	270.2	270.9	254.5
17-Jun	207.0	215.0	208.4	251.9	263.6	270.0	270.6	254.6
18-Jun	206.8	215.8	208.3	252.0	263.8	269.9	270.7	254.8
19-Jun	206.6	207.5	208.2	251.8	263.4	269.7	270.5	254.6
20-Jun	206.6	207.5	208.1	251.9	263.7	269.8	270.7	254.3
21-Jun	206.8	207.7	208.0	252.0	263.7	269.8	270.8	254.2
22-Jun	206.5	208.3	207.9	251.7	263.6	269.7	270.6	253.9
23-Jun	206.6	211.0	208.2	251.6	263.5	269.5	270.4	254.0
24-Jun	207.4	207.7	207.9	251.6	264.1	270.4	271.4	254.1
25-Jun	206.8	207.4	208.4	249.0	263.3	269.4	270.7	254.3
26-Jun	207.0	207.4	208.3	227.7	262.6	269.7	270.9	254.5
27-Jun	206.9	207.1	208.3	208.0	260.8	268.4	270.6	254.4
28-Jun	207.4	207.6	209.1	207.7	260.3	268.1	270.5	255.0
29-Jun	207.7	207.9	209.6	208.2	258.4	267.6	270.3	255.3
30-Jun	207.6	207.9	209.5	208.1	257.1	266.9	269.9	255.1
Average	**207.2**	**212.6**	**212.5**	**245.8**	**263.3**	**270.0**	**271.1**	**254.3**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 4

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	200.8	207.6	207.9	207.3	235.0	234.2	242.8	182.5
2-Jun	189.1	207.5	207.7	207.4	240.8	237.7	243.2	181.6
3-Jun	184.7	207.5	207.6	207.5	243.7	240.2	243.7	182.0
4-Jun	182.3	207.6	207.2	207.7	245.9	242.4	243.8	184.5
5-Jun	181.4	207.5	206.9	207.5	247.7	244.3	244.3	184.1
6-Jun	179.8	207.5	206.8	207.9	248.8	245.4	244.3	183.0
7-Jun	176.9	207.0	206.1	209.8	249.5	246.4	244.0	181.0
8-Jun	171.2	207.4	206.6	211.3	251.1	248.3	244.5	183.1
9-Jun	173.8	207.2	206.6	232.4	251.7	250.0	244.7	183.2
10-Jun	175.8	207.5	206.7	238.9	252.3	252.0	244.8	177.8
11-Jun	174.9	207.5	206.5	242.0	253.0	254.2	244.6	173.1
12-Jun	170.5	207.3	206.7	242.8	253.6	255.8	244.9	171.5
13-Jun	169.3	207.5	207.1	242.4	254.1	257.1	244.8	171.3
14-Jun	170.0	207.4	207.0	244.5	254.5	256.0	244.9	171.3
15-Jun	170.5	207.7	207.5	246.0	255.0	255.4	245.2	172.1
16-Jun	170.4	208.9	209.9	246.9	255.4	255.1	245.2	172.4
17-Jun	170.1	210.7	209.2	247.3	255.5	255.3	245.2	173.2
18-Jun	170.2	212.9	213.1	247.4	255.5	256.3	245.2	173.4
19-Jun	169.7	214.6	215.7	247.7	255.6	256.7	245.1	173.8
20-Jun	169.6	217.4	219.2	248.2	255.6	256.4	245.2	174.2
21-Jun	169.1	217.6	219.4	247.8	255.9	255.3	245.0	174.6
22-Jun	168.6	221.3	222.9	248.4	256.2	255.0	245.1	174.9
23-Jun	168.3	223.8	224.3	248.9	256.2	255.0	245.2	175.4
24-Jun	167.6	224.4	224.2	248.8	256.8	256.2	245.4	175.2
25-Jun	167.2	224.6	224.2	249.1	257.3	255.7	245.2	175.4
26-Jun	167.6	226.1	225.7	249.6	257.6	256.3	245.5	175.7
27-Jun	167.1	226.5	226.3	249.7	257.5	256.3	245.4	175.7
28-Jun	167.0	226.0	226.0	249.9	258.0	256.8	245.6	176.1
29-Jun	166.7	226.9	226.9	250.1	258.1	256.9	245.6	176.1
30-Jun	166.0	226.3	226.2	250.1	258.2	257.2	245.6	176.2
Average	**173.2**	**214.0**	**213.9**	**236.2**	**252.9**	**252.0**	**244.8**	**176.8**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 5

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	152.5	207.7	207.7	208.4	228.6	242.8	247.6	192.0
2-Jun	153.1	207.4	207.5	208.0	228.3	242.5	247.4	191.9
3-Jun	153.8	207.4	207.6	207.7	228.1	242.6	247.6	192.2
4-Jun	155.1	207.5	207.6	207.8	228.5	242.5	247.6	192.3
5-Jun	156.0	207.5	207.5	207.9	228.3	242.6	247.6	192.4
6-Jun	156.3	207.4	207.5	207.5	228.1	242.5	247.5	192.0
7-Jun	156.8	207.0	207.0	207.1	227.8	242.1	247.0	191.9
8-Jun	162.5	207.1	207.3	207.4	228.1	242.5	247.2	192.2
9-Jun	164.8	207.0	207.2	207.6	228.1	242.7	247.1	191.9
10-Jun	167.1	207.3	207.4	207.7	228.5	242.7	247.6	192.2
11-Jun	168.1	207.4	207.4	207.5	228.4	242.9	247.4	192.3
12-Jun	168.8	207.2	207.3	207.4	228.3	243.1	247.4	192.3
13-Jun	171.0	207.3	207.4	207.6	228.3	242.9	247.4	192.3
14-Jun	171.7	206.8	207.0	207.5	228.3	243.0	247.3	192.3
15-Jun	172.4	207.3	207.3	207.6	228.3	243.3	247.4	192.4
16-Jun	173.4	207.1	207.2	207.6	228.3	243.2	247.3	192.4
17-Jun	173.8	207.3	207.5	207.9	228.6	243.4	247.5	192.6
18-Jun	174.5	207.4	207.5	207.8	228.6	243.4	247.4	192.6
19-Jun	176.0	207.3	207.4	207.7	228.6	243.5	247.4	192.5
20-Jun	175.9	207.2	207.3	207.6	228.5	243.4	247.3	192.4
21-Jun	173.5	207.2	207.4	207.6	228.6	243.5	247.3	192.4
22-Jun	172.4	207.1	207.2	207.5	228.7	243.9	247.2	192.4
23-Jun	173.0	207.2	207.3	207.6	228.9	244.2	247.4	192.5
24-Jun	173.3	207.4	207.5	207.7	228.9	244.4	247.5	192.6
25-Jun	174.1	207.4	207.5	207.7	228.9	244.5	247.7	192.7
26-Jun	175.6	207.2	207.3	207.6	228.8	244.5	247.7	192.7
27-Jun	175.9	207.1	207.3	207.6	228.8	244.5	247.6	192.6
28-Jun	177.5	207.5	207.7	207.9	228.7	244.2	247.9	192.7
29-Jun	177.5	207.7	208.4	208.1	229.0	244.1	248.1	192.9
30-Jun	178.2	207.6	211.5	208.1	228.7	243.9	248.0	192.8
Average	**168.5**	**207.3**	**207.6**	**207.7**	**228.5**	**243.3**	**247.5**	**192.4**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 6

	Depth from Surface				
Date	25 ft	50 ft	75 ft	100 ft	125 ft
1-Jun	207.5	234.8	235.1	236.5	237.5
2-Jun	198.7	235.1	235.3	236.5	237.6
3-Jun	185.6	234.8	234.9	236.4	237.5
4-Jun	180.9	234.5	234.6	236.3	237.4
5-Jun	178.5	234.5	234.5	236.2	237.2
6-Jun	177.2	234.4	234.4	235.5	236.8
7-Jun	175.9	234.0	234.0	235.3	236.5
8-Jun	175.5	234.4	234.4	235.6	236.8
9-Jun	177.2	234.1	234.4	235.9	237.0
10-Jun	195.8	234.3	234.4	235.9	237.0
11-Jun	195.0	234.4	234.5	235.7	237.0
12-Jun	178.8	234.3	234.4	235.7	236.9
13-Jun	187.8	234.3	234.5	235.5	236.7
14-Jun	193.9	234.2	234.4	235.5	236.8
15-Jun	176.3	234.4	234.5	235.9	237.1
16-Jun	175.4	234.5	234.6	235.7	237.1
17-Jun	174.4	234.5	234.6	235.9	237.1
18-Jun	173.7	234.5	234.7	235.9	237.1
19-Jun	173.5	234.6	234.7	235.9	237.1
20-Jun	172.9	234.6	234.7	235.9	237.1
21-Jun	172.5	234.6	234.7	235.9	237.1
22-Jun	172.3	234.1	234.2	235.4	236.6
23-Jun	172.4	234.1	234.2	235.4	236.4
24-Jun	172.1	234.1	234.2	235.5	236.6
25-Jun	172.0	234.1	234.2	235.4	236.6
26-Jun	172.4	234.1	234.2	235.4	236.6
27-Jun	172.2	233.9	234.1	235.4	236.4
28-Jun	172.1	234.1	234.2	235.5	236.5
29-Jun	171.4	234.1	234.1	235.5	236.5
30-Jun	171.4	234.0	234.2	235.5	236.4
Average	**179.2**	**234.3**	**234.5**	**235.8**	**236.9**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 7

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	161.7	208.0	208.0	236.9	244.0	240.7	231.5	215.8
2-Jun	161.7	206.5	206.5	235.6	244.1	240.6	230.9	215.0
3-Jun	161.5	205.0	204.9	233.5	244.4	240.6	230.7	214.3
4-Jun	161.4	207.0	207.2	233.0	244.3	240.4	230.6	213.6
5-Jun	161.3	209.1	209.9	232.8	244.3	240.4	230.6	213.3
6-Jun	161.0	207.5	207.8	232.5	244.1	240.0	230.5	212.6
7-Jun	160.5	203.0	202.9	228.8	243.9	239.9	230.0	212.0
8-Jun	160.9	204.5	204.5	229.0	244.1	239.8	230.2	212.1
9-Jun	160.8	208.3	207.9	231.1	243.9	239.7	229.9	211.8
10-Jun	160.9	208.9	209.2	231.9	244.0	239.7	229.8	211.4
11-Jun	161.2	208.9	209.1	232.4	244.1	239.7	229.9	210.5
12-Jun	160.8	208.8	208.8	232.4	244.1	239.6	230.1	211.0
13-Jun	160.6	205.0	205.3	231.8	244.0	239.8	229.7	211.4
14-Jun	160.5	206.7	207.0	231.9	243.9	239.6	229.7	210.3
15-Jun	160.5	207.7	208.1	232.3	244.1	239.8	229.8	210.1
16-Jun	160.6	208.2	208.5	232.4	243.8	239.6	229.8	209.5
17-Jun	160.5	208.5	208.9	232.6	243.9	239.6	229.9	209.9
18-Jun	160.7	208.4	208.8	232.7	243.7	239.4	229.7	209.5
19-Jun	160.7	207.6	208.0	232.7	243.6	239.3	229.6	209.0
20-Jun	160.5	206.0	206.3	232.2	243.5	239.3	229.7	208.7
21-Jun	160.2	207.6	207.9	232.3	243.3	239.2	229.6	208.4
22-Jun	160.0	208.3	208.7	232.3	243.3	239.2	229.5	208.4
23-Jun	159.9	207.2	207.6	232.2	243.4	239.3	229.6	208.3
24-Jun	159.9	207.6	208.0	232.3	243.4	239.3	229.7	208.2
25-Jun	160.2	208.0	208.6	232.3	243.2	238.9	229.6	207.9
26-Jun	159.8	208.0	208.6	232.6	243.3	239.0	229.8	207.9
27-Jun	159.5	207.2	207.9	232.4	243.3	239.1	229.7	208.1
28-Jun	159.7	207.9	208.7	232.7	243.4	239.2	229.4	207.9
29-Jun	159.8	209.1	209.8	232.7	243.4	239.0	228.6	207.8
30-Jun	159.9	209.2	209.8	232.7	243.3	238.8	229.5	207.6
Average	**160.6**	**207.5**	**207.8**	**232.4**	**243.8**	**239.6**	**229.9**	**210.4**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 8

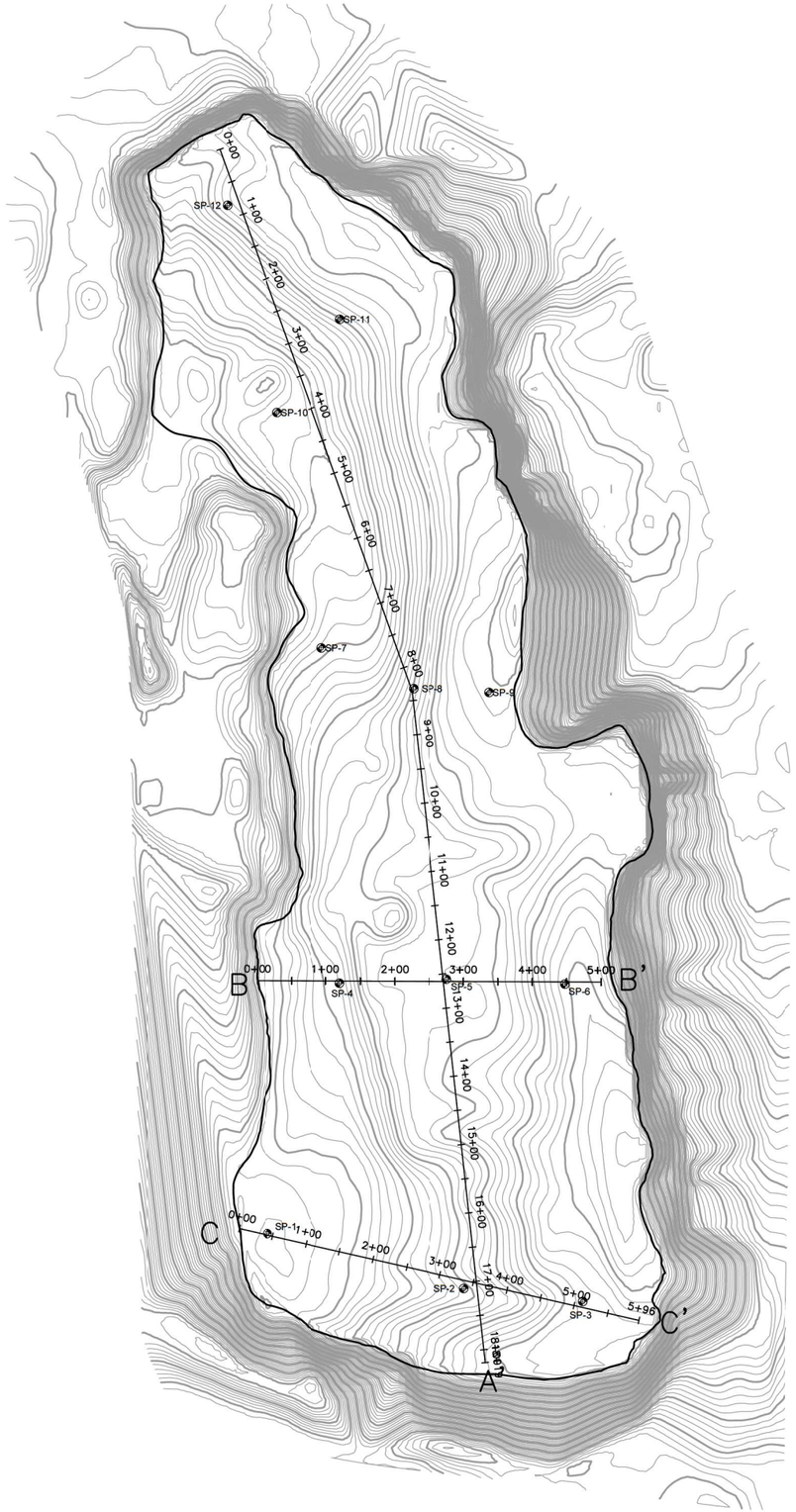
	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	177.0	181.7	181.6	184.3	187.6	188.6	186.3	181.5
2-Jun	177.0	182.0	181.8	184.3	187.8	188.6	186.4	181.5
3-Jun	177.4	182.1	181.8	184.4	188.0	188.8	186.5	181.5
4-Jun	177.4	182.2	182.1	184.3	188.2	189.0	186.3	181.5
5-Jun	177.6	182.3	182.2	184.6	188.4	189.4	186.6	181.8
6-Jun	177.5	182.3	182.2	184.7	188.4	189.1	186.7	181.7
7-Jun	177.3	182.0	182.0	184.8	188.0	189.0	186.3	181.5
8-Jun	177.6	182.4	182.3	185.0	188.5	189.2	186.5	181.4
9-Jun	178.0	182.5	182.4	185.0	188.7	189.1	186.7	181.5
10-Jun	178.6	182.6	182.5	185.4	189.0	189.6	186.7	181.6
11-Jun	178.7	182.7	182.7	185.5	189.3	189.6	186.7	181.5
12-Jun	178.9	183.1	182.9	185.9	189.3	189.8	187.1	181.7
13-Jun	179.0	183.1	183.0	185.7	189.5	189.7	186.9	181.7
14-Jun	179.2	183.4	183.2	185.8	189.5	189.8	186.8	181.7
15-Jun	179.4	183.5	183.5	186.2	189.8	190.2	187.2	182.2
16-Jun	179.5	183.6	183.5	186.2	189.8	190.0	187.1	182.0
17-Jun	179.8	183.8	183.7	186.4	190.0	190.2	187.1	182.1
18-Jun	179.8	183.9	183.8	186.6	190.2	190.3	187.2	182.1
19-Jun	180.1	184.1	183.9	186.8	190.2	190.3	187.2	182.1
20-Jun	180.2	184.2	184.0	187.0	190.2	190.2	187.1	182.0
21-Jun	180.1	184.3	184.1	187.1	190.3	190.2	187.0	182.0
22-Jun	180.5	184.4	184.3	187.4	190.3	190.2	187.0	182.0
23-Jun	180.7	184.7	184.6	187.7	190.5	190.3	187.2	182.1
24-Jun	181.0	184.9	184.8	187.8	190.7	190.4	187.2	182.1
25-Jun	181.1	185.0	184.9	187.8	190.6	190.3	187.1	182.0
26-Jun	181.4	185.1	185.1	187.9	190.6	190.4	187.3	182.2
27-Jun	181.5	185.2	185.1	188.0	190.6	190.4	187.2	182.1
28-Jun	181.7	185.5	185.4	188.2	190.9	190.7	187.3	182.2
29-Jun	181.9	185.6	185.5	188.4	190.9	190.8	187.4	182.1
30-Jun	182.1	185.8	185.7	188.6	191.1	191.0	187.5	182.2
Average	**179.4**	**183.6**	**183.5**	**186.3**	**189.6**	**189.8**	**186.9**	**181.9**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 9

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jun	124.3	152.7	152.1	153.7	149.8	132.8	119.8	108.3
2-Jun	124.1	152.8	152.0	153.8	149.8	132.9	119.8	108.7
3-Jun	123.9	152.8	152.0	153.7	149.7	132.8	119.7	108.7
4-Jun	124.1	152.8	152.0	153.7	149.7	132.8	119.7	108.9
5-Jun	123.9	152.7	152.0	153.6	149.6	132.7	119.7	109.2
6-Jun	123.9	152.7	151.8	153.5	149.5	132.7	119.7	108.8
7-Jun	123.1	152.0	151.2	153.1	149.1	132.1	119.1	108.5
8-Jun	123.6	152.4	151.6	153.5	149.5	132.6	119.6	108.8
9-Jun	123.4	152.2	151.6	153.2	149.2	132.5	119.4	108.8
10-Jun	123.8	152.6	151.8	153.5	149.3	132.7	119.6	108.8
11-Jun	123.8	152.5	151.9	153.5	149.4	132.5	119.5	108.5
12-Jun	123.6	152.4	151.8	153.4	149.4	132.6	119.6	108.7
13-Jun	123.7	152.6	152.0	153.5	149.3	132.7	119.6	108.6
14-Jun	123.6	152.4	151.9	153.4	149.1	132.6	119.5	108.1
15-Jun	123.7	152.6	152.2	153.6	149.4	132.7	119.7	108.6
16-Jun	123.9	152.7	152.1	153.5	149.3	132.7	119.6	108.5
17-Jun	124.0	152.8	152.2	153.5	149.3	132.7	119.6	108.5
18-Jun	123.9	153.0	152.3	153.6	149.3	132.8	119.7	108.4
19-Jun	123.9	152.9	152.2	153.6	149.3	132.7	119.7	108.3
20-Jun	123.7	152.9	152.2	153.5	149.2	132.6	119.6	108.2
21-Jun	123.6	152.7	152.1	153.4	149.0	132.5	119.4	108.0
22-Jun	123.7	152.8	152.1	153.4	149.0	132.5	119.5	108.1
23-Jun	123.9	153.0	152.3	153.5	149.2	132.7	119.6	108.3
24-Jun	123.8	153.1	152.5	153.6	149.2	132.8	119.7	108.4
25-Jun	123.7	152.9	152.3	153.6	149.2	132.7	119.6	108.2
26-Jun	123.9	153.1	152.4	153.7	149.3	132.9	119.8	108.1
27-Jun	123.7	153.0	152.4	153.6	149.1	132.7	119.6	108.0
28-Jun	124.0	153.2	152.7	153.9	149.3	132.9	119.9	108.3
29-Jun	123.9	153.2	152.6	153.8	149.2	132.9	119.8	108.3
30-Jun	123.8	153.1	152.7	153.7	149.1	132.8	119.7	108.3
Average	**123.8**	**152.7**	**152.1**	**153.6**	**149.3**	**132.7**	**119.6**	**108.5**

Appendix E

Monthly Topography Analysis



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- SP-9 SETTLEMENT PLATE

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENTS THE TOPOGRAPHY CAPTURED ON MAY 11, 2023 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88.

100 50 0 100 200

SCALE: 1"=100'

NO.	REVISION	DATE

SHEET TITLE
MAY 2023 LANDFILL TOPOGRAPHY

PROJECT TITLE
MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
53 SOUTH MAIN ST, SUITE 1, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

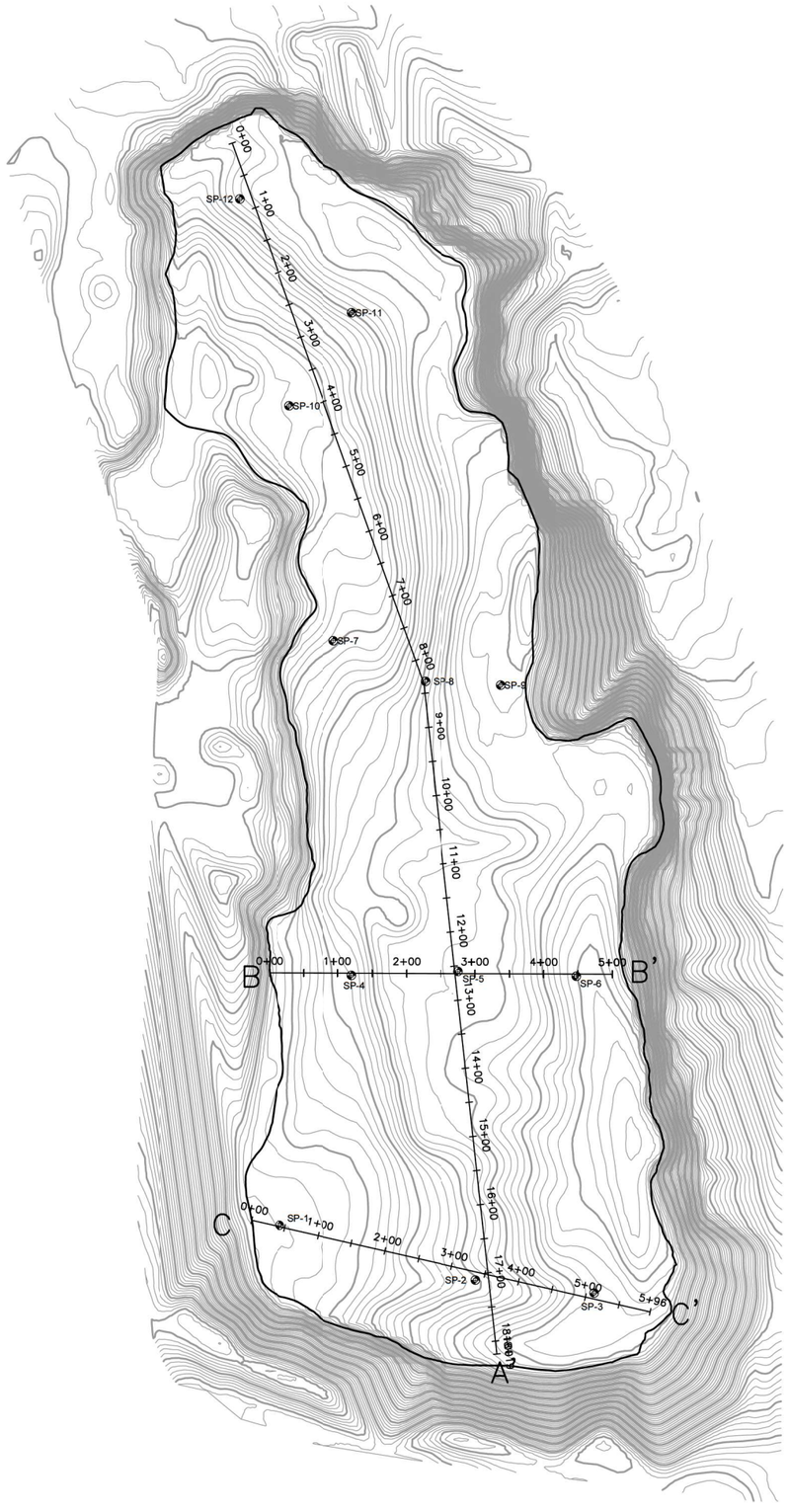
PROJ. NO. 02218208.05
DSN. BY: CMW
DWN. BY: CMW
CHK. BY: CJW
Q/A RVW. BY: CJW
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 6/19/2023

SCALE: 1" = 100'

DRAWING NO. **1** of **5**



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- SP-9 SETTLEMENT PLATE

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENTS THE TOPOGRAPHY CAPTURED ON JUNE 9, 2023 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88.

100 50 0 100 200
SCALE: 1"=100'

NO.	REVISION	DATE

SHEET TITLE: **JUNE 2023 LANDFILL TOPO**

PROJECT TITLE: **MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
53 SOUTH MAIN ST, SUITE 4, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

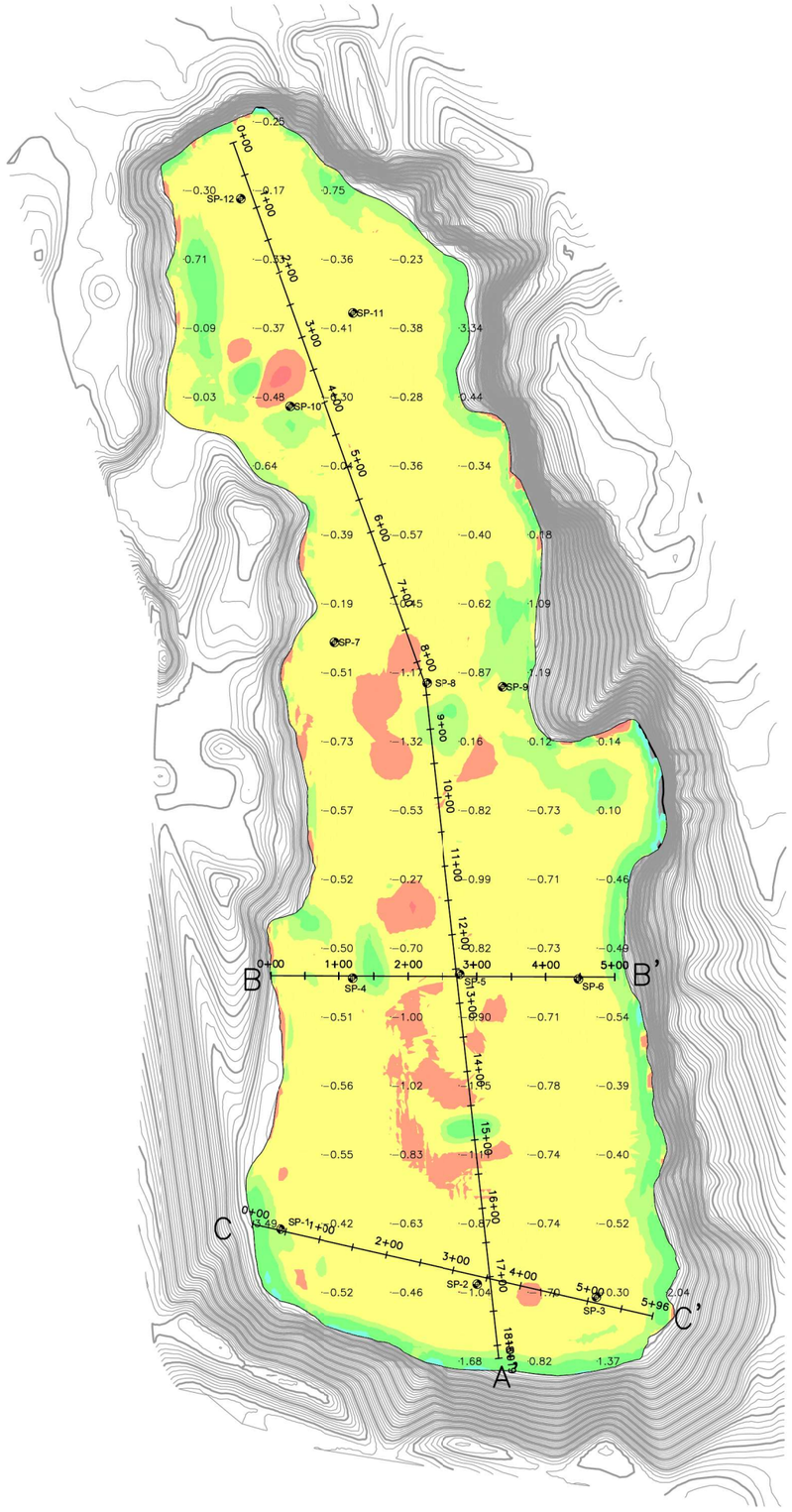
PROJ. NO. 02278208.05
DSN. BY: CMW | DWN. BY: CMW | CHK. BY: CJW | Q/A RVW. BY: | APP. BY: CJW

CADD FILE: SURF COMP

DATE: 6/19/2023

SCALE: 1" = 100'

DRAWING NO. **2** of **5**



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- SP-9 SETTLEMENT PLATE
- −0.39 SPOT ELEVATION ON 100' GRID

Volume

Base Surface TOPO – MAY 11, 2023
Comparison Surface TOPO – JUNE 9, 2023

Cut Volume	14,664 Cu. Yd.
Fill Volume	5,458 Cu. Yd.
Net Cut	9,206 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−10.000	−5.000	
2	−5.000	−1.000	
3	−1.000	0.000	
4	0.000	1.000	
5	1.000	5.000	
6	5.000	10.000	

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON MAY 11, 2023 AND JUNE 9, 2023 BY SCS ENGINEERS. POSITIVE VALUES (+) INDICATE AREAS OF FILL AND NEGATIVE VALUES (−) NDICATE AREAS OF CUT (SETTLEMENT). VALUES ARE ROUNDED TO THE NEAREST FOOT
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD−83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD−88.

100 50 0 100 200
SCALE: 1"=100'

NO.	REVISION	DATE

SHEET TITLE: JUNE VOLUME CHANGE MAY 2023 TO JUNE 2023

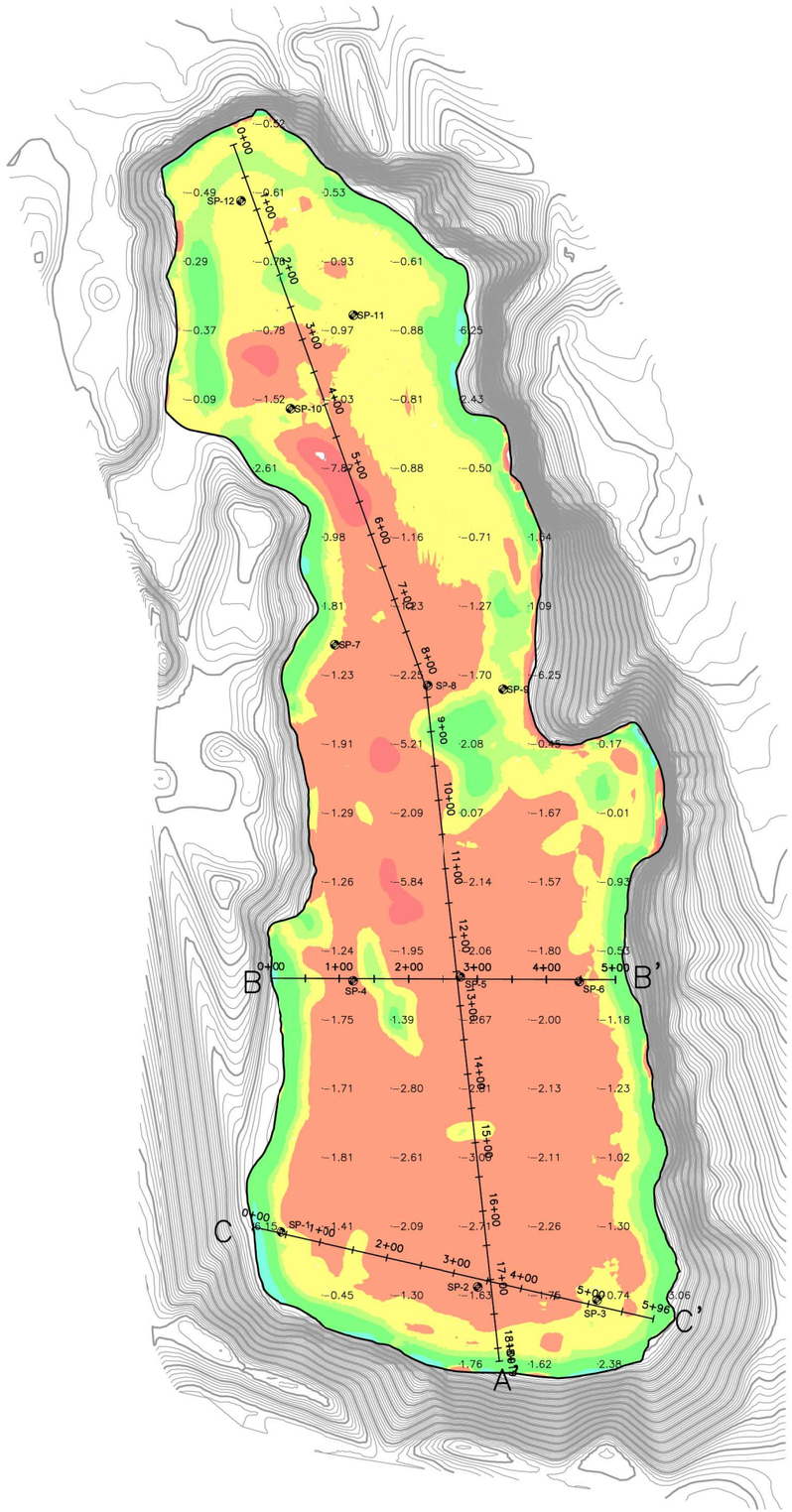
PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
53 SOUTH MAIN STREET, HEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

PROJ. NO. 2208.05
DSN. BY: CMW
DWN. BY: CMW
CHK. BY: CJW
QA/A RVW. BY:
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 6/19/2023
SCALE: 1" = 100'
DRAWING NO. 3 of 5



LEGEND

———	MAJOR CONTOURS (EVERY 10')
———	MINOR CONTOURS (EVERY 2')
———	APPROXIMATE SIDEWALL LOCATION
SP-9	SETTLEMENT PLATE
−0.39	SPOT ELEVATION ON 100' GRID

Volume

Base Surface TOPO – MARCH 9, 2023
Comparison Surface TOPO – JUNE 9, 2023

Cut Volume	36,784 Cu. Yd.
Fill Volume	9,429 Cu. Yd.
Net Cut	27,354 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−10.000	−5.000	
2	−5.000	−1.000	
3	−1.000	0.000	
4	0.000	1.000	
5	1.000	5.000	
6	5.000	10.000	

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON MARCH 9, 2023 AND JUNE 9, 2023 BY SCS ENGINEERS. POSTIVE VALUES (+) INDICATE AREAS OF FILL AND NEGATIVE VALUES (−) INDICATE AREAS OF CUT (SETTLEMENT). VALUES ARE ROUNDED TO THE NEAREST FOOT
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD−83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD−88.

100 50 0 100 200
SCALE: 1"=100'

NO. | REVISION | DATE

SHEET TITLE: JUNE VOLUME CHANGE MARCH 2023 TO JUNE 2023

PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

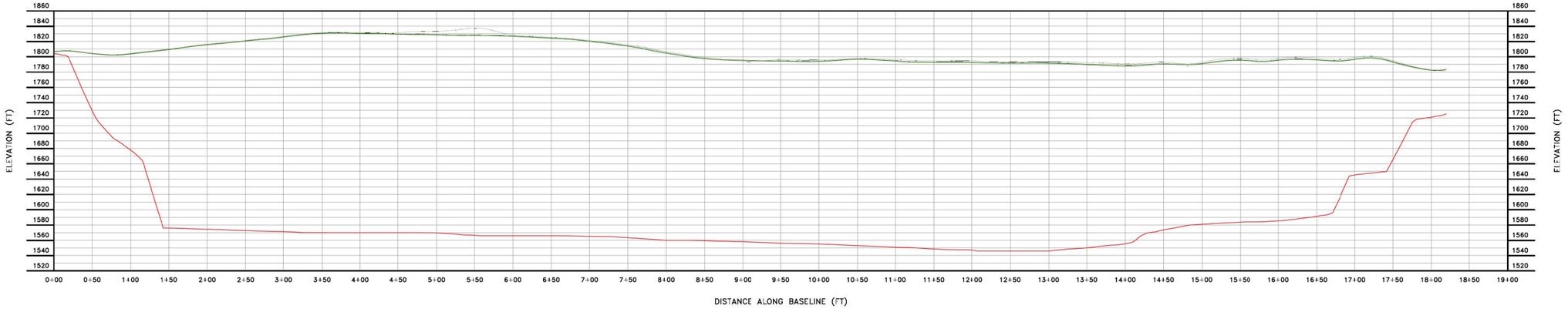
CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
55 SOUTH MAIN STREET, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

PROJ. NO. 02226208.05
DSN. BY: CMW | DWN. BY: CMW | CHK. BY: CJW | Q/A RVW. BY: CJW | APP. BY: CJW

CADD FILE: SURF COMP
DATE: 6/19/2023
SCALE: 1" = 100'
DRAWING NO. 4 of 5

LONGITUDINAL PROFILE A ALIGN



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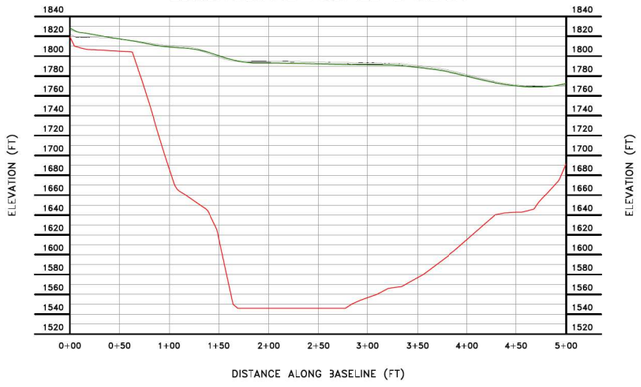

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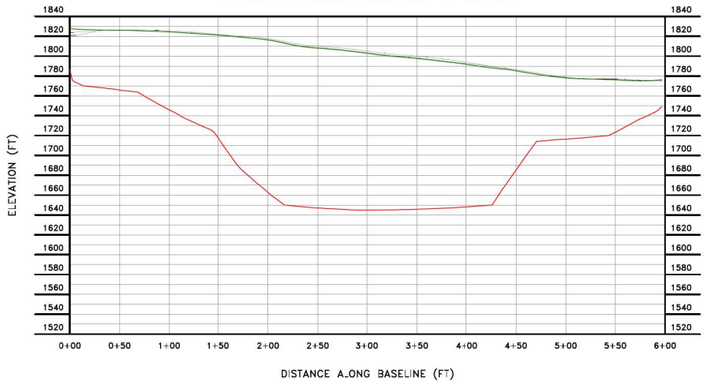

LEGEND

- BOTTOM LINER ELEVATION
- MARCH 2023 TOPO
- MAY 2023 TOPO
- JUNE 2023 TOPO

NO.	REVISION	DATE

SHEET TITLE: **PROFILES**

PROJECT TITLE: **MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
53 SOUTH MAIN STREET, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

PROJ. NO. 02272208.05
DSN. BY: CMW
DWN. BY: CMW
CHK. BY: CJW
QA/A. RVW. BY: CJW
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 6/19/2023

SCALE: AS NOTED

DRAWING NO. **5** of **5**

Appendix F

Sample Collection Log and Lab Report

Appendix F

Field Log

Lab Report

Historical LFG-EW Leachate Monitoring Results Summary

City of Bristol SWP 588 Landfill
Dual Phase LFG-EW Liquid Level Measurement Log

Date	06/20-21/2023										
Personnel	L. Howard & C. Kirby										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-32B		180									Decommisioned?
EW-49	6/21/2023		96.15	12/20-21/2022	x	90	1675634	55.30	5.49	40.85	
EW-50	6/21/2023		77.70	12/20-21/2022	x	83	1012311	33.90	2.71	43.80	
EW-51	6/21/2023		92.80	12/20-21/2022	x	95	23130	41.30	3.32	51.50	
EW-52	6/21/2023		98.70	12/20-21/2022	x	93	81077	40.85	2.41	57.85	
EW-53	6/21/2023		100.70	12/20-21/2022	x	---	N/A	26.15	3.61	74.55	No Pump
EW-54	6/21/2023		82.70	12/20-21/2022	x	75	351997	31.20	4.32	51.50	Air Off
EW-55	6/21/2023		90.40	12/20-21/2022	x	90	181110	31.95	5.28	58.45	Air Disconnected
EW-56	6/20/2023		58.50	12/20-21/2022		58	N/A	43.40	---	---	
EW-57	6/20/2023		107.40	12/20-21/2022	x	425173	40.56	39.06	3.69	68.34	Air Off, Tight spot at 25'
EW-58	6/20/2023		84.50	12/20-21/2022	x	82	199408	20.32	4.98	64.18	Air Off
EW-59	6/20/2023		73.40	12/20-21/2022	x	64	2002497	---	3.41	---	Sampled
EW-60	6/21/2023		81.80	12/20-21/2022	x	70	309437	39.70	2.52	42.10	
EW-61	6/20/2023		87.80	12/20-21/2022	x	66	236661	---	3.53	---	Sampled
EW-62	6/20/2023		110.60	12/20-21/2022	x	80	145873	89.70	3.62	20.90	One cycle approximately every 1 to 2 minutes
EW-63	6/20/2023		62.10	12/20-21/2022	x	64	N/A	55.10	4.09	7.00	Obtruction? Doesn't seem to be liquid
EW-64	6/21/2023		109.00	12/20-21/2022	x	113	129653	---	6.41	---	Sampled
EW-65	6/21/2023		88.40	12/20-21/2022	x	50	3973	47.5	5.23	40.90	
EW-67	6/21/2023		107.75	12/20-21/2022	x	62.5	55592	8.60	4.21	99.15	
EW-68	6/21/2023		73.57	12/20-21/2022	x	68	2082636	37.60	3.29	35.97	
EW-69	6/20/2023	93	98.00	5/3/2023			N/A	93.32		4.68	

City of Bristol SWP 588 Landfill
Dual Phase LFG-EW Liquid Level Measurement Log

Date	06/20-21/2023										
Personnel	L. Howard & C. Kirby										
Location ID	Date	Scheduled Borehole	Measured Well Casing Depth		Should Have	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup	Liquid Column	Comments
EW-70	6/20/2023	66	71.00	5/3/2023			N/A	67.70		3.30	
EW-71	6/21/2023	180			x		N/A	130.00			Lost 2 Bottles in well
EW-72	6/21/2023	180			x		N/A	103.50			
EW-73	6/20/2023	111	116.00	5/3/2023			N/A	108.20		7.80	
EW-74	6/21/2023	180			x		11	167.50			
EW-75	6/20/2023	179			x		9	176.50			
EW-76	6/20/2023	122	127.00	5/3/2023			N/A	113.20		13.80	
EW-77	6/20/2023	180					N/A	135.50			
EW-78	6/20/2023	52	57.00	5/3/2023			N/A	34.60		22.40	
EW-79	6/21/2023	180					N/A	145.50			
EW-80	6/20/2023	144	149.00	5/3/2023			N/A	133.90		15.10	
EW-81	6/21/2023	180					N/A	117.50			
EW-82	6/21/2023	180					N/A	---			Could not get Flange off
EW-83	6/21/2023	180					N/A	105.50			not certain on depth
EW-84	6/20/2023	137	142.00	5/3/2023			N/A	112.50		29.50	
EW-85	6/20/2023	86	91.00	5/3/2023			N/A	40.70		50.30	
EW-86	6/20/2023	148	153.00	5/3/2023			N/A	87.60		65.40	
EW-87	6/21/2023	180					N/A	43.70			

City of Bristol SWP 588 Landfill
Dual Phase LFG-EW Liquid Level Measurement Log

Date	06/20-21/2023										
Personnel	L. Howard & C. Kirby										
Location ID	Date	Scheduled Borehole	Measured Well Casing Depth		Should Have	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup	Liquid Column	Comments
EW-88	6/21/2023	95	100.00	5/3/2023			N/A	32.50		67.50	
EW-89	6/21/2023	121	126.00	5/3/2023			N/A	29.00		97.00	
EW-90	6/20/2023	109	114.00	5/3/2023			N/A	82.05		31.95	
EW-91	6/21/2023	180					N/A	31.00			
EW-92	6/21/2023	140					N/A	35.60			
EW-93	6/21/2023	106	111.00	5/3/2023			N/A	23.62		87.38	
EW-94	6/21/2023	45	50.00	5/3/2023	x		320206	19.09		30.91	Air Off
EW-95	6/20/2023	63	68.00	5/3/2023			N/A	65.74		2.26	
EW-96	6/21/2023	180					N/A	38.30			
EW-97	6/21/2023	180					N/A	61.30			
EW-98	6/21/2023	51	56.00	5/3/2023			N/A	17.17		38.83	
EW-99	6/20/2023	60	65.00	5/3/2023			N/A	62.84		2.16	
EW-100	6/20/2023	130	135.00	5/3/2023			N/A	59.32		75.68	

--- = not applicable/available

Well casing depths for EW-49 - EW-68 measured on 12/20-21/2022 from top of PVC.

Well casing stickup for EW-49 - EW-68 measured on 01/17/2023.

Well casing depths and stickup for EW-69 - EW-100 measured on 5/3/2023.

Log Checked B J. Robb

TNI Accredited
VELAP ID 460021

ENTHALPY ANALYTICAL

1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

DRAFT REPORT

Laboratory Order ID 23F1095

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	June 21, 2023 8:00
		Date Issued:	July 7, 2023 17:12
		Project Number:	02218208.15 Task 1
Submitted To:	Logan Howard	Purchase Order:	
Client Site I.D.:	2023 City of Bristol Landfill Leachate		

Enclosed are the results of analyses for samples received by the laboratory on 06/21/2023 08:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

Enthalpy Analytical
1941 Reymet Road
Richmond, VA 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Analysis Detects Report

Date Issued: 7/7/2023 5:12:03PM

Client Name: SCS Engineers-Winchester
Client Site ID: 2023 City of Bristol Landfill Leachate
Submitted To: Logan Howard

Laboratory Sample ID: **23F1095-01** **Client Sample ID:** **EW-59**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01RE1	SW6020B	260		2.5	5.0	5	ug/L
Barium	01RE1	SW6020B	1690		5.00	25.0	5	ug/L
Chromium	01RE1	SW6020B	251		2.00	5.00	5	ug/L
Copper	01RE1	SW6020B	1.54	J	1.50	5.00	5	ug/L
Nickel	01RE1	SW6020B	59.78		5.000	5.000	5	ug/L
Zinc	01RE1	SW6020B	53.8		12.5	25.0	5	ug/L
2-Butanone (MEK)	01RE1	SW8260D	13800		750	2500	250	ug/L
Acetone	01RE1	SW8260D	29600		1750	2500	250	ug/L
Benzene	01	SW8260D	2630		8.00	20.0	20	ug/L
Ethylbenzene	01	SW8260D	104		8.00	20.0	20	ug/L
Tetrahydrofuran	01	SW8260D	2100		200	200	20	ug/L
Toluene	01	SW8260D	165		10.0	20.0	20	ug/L
Xylenes, Total	01	SW8260D	177		20.0	60.0	20	ug/L
Ammonia as N	01	EPA350.1 R2.0	2740		146	200	2000	mg/L
BOD	01	SM5210B-2011	20000		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	41300		10000	10000	1000	mg/L
Nitrate+Nitrite as N	01RE1	SM4500-NO3F-2011	4.45		0.10	0.10	1	mg/L
Nitrite as N	01	SM4500-NO2B-2011	2.00	J	1.00	5.00	100	mg/L
TKN as N	01	EPA351.2 R2.0	3080		100	250	500	mg/L
Total Recoverable Phenolics	01	SW9065	39.1		1.50	2.50	50	mg/L

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 5:12:03PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Logan Howard

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-59	23F1095-01	Ground Water	06/20/2023 07:40	06/21/2023 08:00
Trip Blank	23F1095-02	Ground Water	06/20/2023 00:00	06/21/2023 08:00

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Client Sample ID: **EW-59** **Laboratory Sample ID:** **23F1095-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Metals (Total) by EPA 6000/7000 Series Methods												
Silver	01RE1	7440-22-4	SW6020B	06/23/2023 17:00	06/26/2023 14:17	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	01RE1	7440-38-2	SW6020B	06/23/2023 17:00	06/26/2023 14:17	260		2.5	5.0	5	ug/L	AB
Barium	01RE1	7440-39-3	SW6020B	06/23/2023 17:00	06/26/2023 14:17	1690		5.00	25.0	5	ug/L	AB
Cadmium	01RE1	7440-43-9	SW6020B	06/23/2023 17:00	06/26/2023 14:17	BLOD		0.500	5.00	5	ug/L	AB
Chromium	01RE1	7440-47-3	SW6020B	06/23/2023 17:00	06/26/2023 14:17	251		2.00	5.00	5	ug/L	AB
Copper	01RE1	7440-50-8	SW6020B	06/23/2023 17:00	06/26/2023 14:17	1.54	J	1.50	5.00	5	ug/L	AB
Mercury	01	7439-97-6	SW7470A	06/22/2023 10:20	06/22/2023 13:30	BLOD		0.00400	0.00400	1	mg/L	SGT
Nickel	01RE1	7440-02-0	SW6020B	06/23/2023 17:00	06/26/2023 14:17	59.78		5.000	5.000	5	ug/L	AB
Lead	01RE1	7439-92-1	SW6020B	06/23/2023 17:00	06/26/2023 14:17	BLOD		5.0	5.0	5	ug/L	AB
Selenium	01RE1	7782-49-2	SW6020B	06/23/2023 17:00	06/26/2023 14:17	BLOD		4.25	5.00	5	ug/L	AB
Zinc	01RE1	7440-66-6	SW6020B	06/23/2023 17:00	06/26/2023 14:17	53.8		12.5	25.0	5	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01RE1	78-93-3	SW8260D	06/22/2023 18:12	06/22/2023 18:12	13800		750	2500	250	ug/L	RJB
Acetone	01RE1	67-64-1	SW8260D	06/22/2023 18:12	06/22/2023 18:12	29600		1750	2500	250	ug/L	RJB
Benzene	01	71-43-2	SW8260D	06/21/2023 19:50	06/21/2023 19:50	2630		8.00	20.0	20	ug/L	TLH
Ethylbenzene	01	100-41-4	SW8260D	06/21/2023 19:50	06/21/2023 19:50	104		8.00	20.0	20	ug/L	TLH
Toluene	01	108-88-3	SW8260D	06/21/2023 19:50	06/21/2023 19:50	165		10.0	20.0	20	ug/L	TLH
Xylenes, Total	01	1330-20-7	SW8260D	06/21/2023 19:50	06/21/2023 19:50	177		20.0	60.0	20	ug/L	TLH
Tetrahydrofuran	01	109-99-9	SW8260D	06/21/2023 19:50	06/21/2023 19:50	2100		200	200	20	ug/L	TLH
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*94.1 %*	*70-120*	*06/21/2023 19:50*	*06/21/2023 19:50*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*103 %*	*75-120*	*06/21/2023 19:50*	*06/21/2023 19:50*							
Surr: Dibromofluoromethane (Surr)	*01*	*94.9 %*	*70-130*	*06/21/2023 19:50*	*06/21/2023 19:50*							
Surr: Toluene-d8 (Surr)	*01*	*101 %*	*70-130*	*06/21/2023 19:50*	*06/21/2023 19:50*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*	*100 %*	*70-120*	*06/22/2023 18:12*	*06/22/2023 18:12*							
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*	*102 %*	*75-120*	*06/22/2023 18:12*	*06/22/2023 18:12*							

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Certificate of Analysis

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Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Logan Howard

Client Sample ID: **EW-59** **Laboratory Sample ID:** **23F1095-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*01RE1*	*102 %*	*70-130*	*06/22/2023 18:12*	*06/22/2023 18:12*							
Surr: Toluene-d8 (Surr)	*01RE1*	*98.0 %*	*70-130*	*06/22/2023 18:12*	*06/22/2023 18:12*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	06/23/2023 09:00	06/23/2023 20:09	BLOD		485	971	50	ug/L	BMS
Naphthalene	01	91-20-3	SW8270E	06/23/2023 09:00	06/23/2023 20:09	BLOD		340	485	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*%*	*5-136*	*06/23/2023 09:00*	*06/23/2023 20:09*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*	*16.0 %*	*9-117*	*06/23/2023 09:00*	*06/23/2023 20:09*							
Surr: 2-Fluorophenol (Surr)	*01*	*15.0 %*	*5-60*	*06/23/2023 09:00*	*06/23/2023 20:09*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*38.0 %*	*5-151*	*06/23/2023 09:00*	*06/23/2023 20:09*							
Surr: Phenol-d5 (Surr)	*01*	*26.0 %*	*5-60*	*06/23/2023 09:00*	*06/23/2023 20:09*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*12.0 %*	*5-141*	*06/23/2023 09:00*	*06/23/2023 20:09*							

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Client Sample ID: **EW-59** **Laboratory Sample ID:** **23F1095-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Ammonia as N	01	7664-41-7	EPA350.1 R2.0	07/03/2023 13:04	07/03/2023 13:04	2740		146	200	2000	mg/L	MKS
BOD	01	E1640606	SM5210B-2011	06/21/2023 09:59	06/21/2023 09:59	20000		0.2	2.0	1	mg/L	NBT
COD	01	NA	SM5220D-2011	06/28/2023 09:30	06/28/2023 09:30	41300		10000	10000	1000	mg/L	MJRL
Nitrate as N	01	14797-55-8	Calc.	06/30/2023 15:10	06/30/2023 15:10	BLOD		1.10	5.10	100	mg/L	MKS
Nitrate+Nitrite as N	01RE1	E701177	SM4500-NO3F-2011	06/30/2023 15:10	06/30/2023 15:10	4.45		0.10	0.10	1	mg/L	MKS
Nitrite as N	01	14797-65-0	SM4500-NO2B-2011	06/21/2023 14:00	06/21/2023 14:00	2.00	J	1.00	5.00	100	mg/L	MKS
Total Recoverable Phenolics	01	NA	SW9065	07/05/2023 16:24	07/05/2023 16:24	39.1		1.50	2.50	50	mg/L	AAL
TKN as N	01	E17148461	EPA351.2 R2.0	07/02/2023 00:00	07/02/2023 00:00	3080		100	250	500	mg/L	TMB

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Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **23F1095-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	02	78-93-3	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		3.00	10.0	1	ug/L	TLH
Acetone	02	67-64-1	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		7.00	10.0	1	ug/L	TLH
Benzene	02	71-43-2	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		0.40	1.00	1	ug/L	TLH
Ethylbenzene	02	100-41-4	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		0.40	1.00	1	ug/L	TLH
Toluene	02	108-88-3	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		0.50	1.00	1	ug/L	TLH
Xylenes, Total	02	1330-20-7	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		1.00	3.00	1	ug/L	TLH
Tetrahydrofuran	02	109-99-9	SW8260D	06/21/2023 14:47	06/21/2023 14:47	BLOD		10.0	10.0	1	ug/L	TLH
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*	*101 %*	*70-120*	*06/21/2023 14:47*	*06/21/2023 14:47*							
Surr: 4-Bromofluorobenzene (Surr)	*02*	*104 %*	*75-120*	*06/21/2023 14:47*	*06/21/2023 14:47*							
Surr: Dibromofluoromethane (Surr)	*02*	*103 %*	*70-130*	*06/21/2023 14:47*	*06/21/2023 14:47*							
Surr: Toluene-d8 (Surr)	*02*	*97.6 %*	*70-130*	*06/21/2023 14:47*	*06/21/2023 14:47*							

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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0861 - SW7470A										
Blank (BGF0861-BLK1)				Prepared & Analyzed: 06/22/2023						
Mercury	ND	0.00020	mg/L							
LCS (BGF0861-BS1)				Prepared & Analyzed: 06/22/2023						
Mercury	0.00247	0.00020	mg/L	0.00250		98.8	80-120			
Batch BGF0945 - EPA200.8 R5.4										
Blank (BGF0945-BLK1)				Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	ND	1.0	ug/L							
Barium	ND	5.00	ug/L							
Cadmium	ND	1.00	ug/L							
Chromium	ND	1.00	ug/L							
Copper	ND	1.00	ug/L							
Lead	ND	1.0	ug/L							
Nickel	ND	1.000	ug/L							
Selenium	ND	1.00	ug/L							
Silver	ND	1.00	ug/L							
Zinc	ND	5.00	ug/L							
LCS (BGF0945-BS1)				Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0		102	80-120			
Barium	50.0	5.00	ug/L	50.0		99.9	80-120			
Cadmium	51.3	1.00	ug/L	50.0		103	80-120			
Chromium	50.8	1.00	ug/L	50.0		102	80-120			
Copper	50.7	1.00	ug/L	50.0		101	80-120			
Lead	51	1.0	ug/L	50.0		102	80-120			
Nickel	50.61	1.000	ug/L	50.0		101	80-120			

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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0945 - EPA200.8 R5.4										
LCS (BGF0945-BS1)				Prepared: 06/23/2023 Analyzed: 06/26/2023						
Selenium	50.8	1.00	ug/L	50.0		102	80-120			
Silver	10.1	1.00	ug/L	10.0		101	80-120			
Zinc	50.8	5.00	ug/L	50.0		102	80-120			
Matrix Spike (BGF0945-MS1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	BLOD	101	75-125			
Barium	51.6	5.00	ug/L	50.0	BLOD	103	75-125			
Cadmium	50.9	1.00	ug/L	50.0	BLOD	102	75-125			
Chromium	50.6	1.00	ug/L	50.0	BLOD	101	75-125			
Copper	50.3	1.00	ug/L	50.0	BLOD	101	75-125			
Lead	51	1.0	ug/L	50.0	BLOD	101	75-125			
Nickel	50.09	1.000	ug/L	50.0	BLOD	100	75-125			
Selenium	50.2	1.00	ug/L	50.0	BLOD	100	75-125			
Silver	10.0	1.00	ug/L	10.0	BLOD	100	75-125			
Zinc	50.9	5.00	ug/L	50.0	BLOD	102	75-125			
Matrix Spike (BGF0945-MS2)	**Source: 23F1222-01**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	0.61	102	75-125			
Barium	151	5.00	ug/L	50.0	99.8	103	75-125			
Cadmium	50.6	1.00	ug/L	50.0	BLOD	101	75-125			
Chromium	50.7	1.00	ug/L	50.0	BLOD	101	75-125			
Copper	47.2	1.00	ug/L	50.0	BLOD	94.4	75-125			
Lead	50	1.0	ug/L	50.0	BLOD	100	75-125			
Nickel	48.11	1.000	ug/L	50.0	BLOD	96.2	75-125			
Selenium	47.8	1.00	ug/L	50.0	BLOD	95.7	75-125			
Silver	9.91	1.00	ug/L	10.0	BLOD	99.1	75-125			

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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0945 - EPA200.8 R5.4										
Matrix Spike (BGF0945-MS2)	**Source: 23F1222-01**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Zinc	46.8	5.00	ug/L	50.0	BLOD	93.5	75-125			
Matrix Spike Dup (BGF0945-MSD1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	BLOD	102	75-125	0.761	20	
Barium	50.7	5.00	ug/L	50.0	BLOD	101	75-125	1.88	20	
Cadmium	51.0	1.00	ug/L	50.0	BLOD	102	75-125	0.116	20	
Chromium	50.4	1.00	ug/L	50.0	BLOD	101	75-125	0.252	20	
Copper	50.7	1.00	ug/L	50.0	BLOD	101	75-125	0.720	20	
Lead	51	1.0	ug/L	50.0	BLOD	101	75-125	0.0500	20	
Nickel	50.85	1.000	ug/L	50.0	BLOD	102	75-125	1.51	20	
Selenium	50.5	1.00	ug/L	50.0	BLOD	101	75-125	0.625	20	
Silver	10.0	1.00	ug/L	10.0	BLOD	100	75-125	0.329	20	
Zinc	50.7	5.00	ug/L	50.0	BLOD	101	75-125	0.303	20	
Matrix Spike Dup (BGF0945-MSD2)	**Source: 23F1222-01**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	52	1.0	ug/L	50.0	0.61	102	75-125	0.381	20	
Barium	152	5.00	ug/L	50.0	99.8	104	75-125	0.282	20	
Cadmium	50.2	1.00	ug/L	50.0	BLOD	100	75-125	0.802	20	
Chromium	49.9	1.00	ug/L	50.0	BLOD	99.8	75-125	1.49	20	
Copper	47.4	1.00	ug/L	50.0	BLOD	94.8	75-125	0.396	20	
Lead	50	1.0	ug/L	50.0	BLOD	99.8	75-125	0.232	20	
Nickel	48.28	1.000	ug/L	50.0	BLOD	96.6	75-125	0.348	20	
Selenium	47.6	1.00	ug/L	50.0	BLOD	95.2	75-125	0.484	20	
Silver	10.1	1.00	ug/L	10.0	BLOD	101	75-125	1.38	20	
Zinc	46.6	5.00	ug/L	50.0	BLOD	93.1	75-125	0.418	20	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Blank (BGF0832-BLK1)				Prepared & Analyzed: 06/21/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.5*		ug/L	*50.0*		*96.9*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.2*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.0*		ug/L	*50.0*		*100*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.1*		ug/L	*50.0*		*98.2*	*70-130*			
LCS (BGF0832-BS1)				Prepared & Analyzed: 06/21/2023						
1,1,1,2-Tetrachloroethane	39.4	0.4	ug/L	50.0		78.9	80-130			L
1,1,1-Trichloroethane	40.0	1	ug/L	50.0		79.9	65-130			
1,1,2,2-Tetrachloroethane	40.6	0.4	ug/L	50.0		81.3	65-130			
1,1,2-Trichloroethane	41.7	1	ug/L	50.0		83.4	75-125			
1,1-Dichloroethane	38.1	1	ug/L	50.0		76.3	70-135			
1,1-Dichloroethylene	36.5	1	ug/L	50.0		73.0	70-130			
1,1-Dichloropropene	37.7	1	ug/L	50.0		75.3	75-135			
1,2,3-Trichlorobenzene	38.9	1	ug/L	50.0		77.7	55-140			
1,2,3-Trichloropropane	41.3	1	ug/L	50.0		82.6	75-125			
1,2,4-Trichlorobenzene	38.4	1	ug/L	50.0		76.7	65-135			
1,2,4-Trimethylbenzene	36.7	1	ug/L	50.0		73.5	75-130			L
1,2-Dibromo-3-chloropropane (DBCP)	48.3	1	ug/L	50.0		96.5	50-130			
1,2-Dibromoethane (EDB)	40.5	1	ug/L	50.0		80.9	80-120			

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Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Logan Howard

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
LCS (BGF0832-BS1)				Prepared & Analyzed: 06/21/2023						
1,2-Dichlorobenzene	36.6	0.5	ug/L	50.0		73.2	70-120			
1,2-Dichloroethane	40.3	1	ug/L	50.0		80.6	70-130			
1,2-Dichloropropane	37.4	0.5	ug/L	50.0		74.7	75-125			L
1,3,5-Trimethylbenzene	35.7	1	ug/L	50.0		71.4	75-125			L
1,3-Dichlorobenzene	37.2	1	ug/L	50.0		74.4	75-125			L
1,3-Dichloropropane	38.7	1	ug/L	50.0		77.4	75-125			
1,4-Dichlorobenzene	34.5	1	ug/L	50.0		69.0	75-125			L
2,2-Dichloropropane	42.7	1	ug/L	50.0		85.4	70-135			
2-Butanone (MEK)	40.2	10	ug/L	50.0		80.4	30-150			
2-Chlorotoluene	35.2	1	ug/L	50.0		70.4	75-125			L
2-Hexanone (MBK)	43.6	5	ug/L	50.0		87.3	55-130			
4-Chlorotoluene	35.4	1	ug/L	50.0		70.9	75-130			L
4-Isopropyltoluene	37.0	1	ug/L	50.0		73.9	75-130			L
4-Methyl-2-pentanone (MIBK)	43.6	5	ug/L	50.0		87.1	60-135			
Acetone	36.7	10	ug/L	50.0		73.4	40-140			
Benzene	36.3	1	ug/L	50.0		72.5	80-120			L
Bromobenzene	37.8	1	ug/L	50.0		75.6	75-125			
Bromochloromethane	38.1	1	ug/L	50.0		76.2	65-130			
Bromodichloromethane	42.1	0.5	ug/L	50.0		84.1	75-120			
Bromoform	45.8	1	ug/L	50.0		91.6	70-130			
Bromomethane	24.7	1	ug/L	50.0		49.5	30-145			
Carbon disulfide	30.8	10	ug/L	50.0		61.7	35-160			
Carbon tetrachloride	40.4	1	ug/L	50.0		80.8	65-140			
Chlorobenzene	37.2	1	ug/L	50.0		74.5	80-120			L
Chloroethane	31.9	1	ug/L	50.0		63.7	60-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
LCS (BGF0832-BS1)				Prepared & Analyzed: 06/21/2023						
Chloroform	37.0	0.5	ug/L	50.0		74.0	65-135			
Chloromethane	33.7	1	ug/L	50.0		67.4	40-125			
cis-1,2-Dichloroethylene	36.9	1	ug/L	50.0		73.8	70-125			
cis-1,3-Dichloropropene	40.8	1	ug/L	50.0		81.6	70-130			
Dibromochloromethane	44.4	0.5	ug/L	50.0		88.8	60-135			
Dibromomethane	40.1	1	ug/L	50.0		80.1	75-125			
Dichlorodifluoromethane	52.3	1	ug/L	50.0		105	30-155			
Ethylbenzene	37.1	1	ug/L	50.0		74.2	75-125			L
Hexachlorobutadiene	41.7	0.8	ug/L	50.0		83.5	50-140			
Isopropylbenzene	35.4	1	ug/L	50.0		70.8	75-125			L
m+p-Xylenes	70.8	2	ug/L	100		70.8	75-130			L
Methylene chloride	33.5	4	ug/L	50.0		67.0	55-140			
Methyl-t-butyl ether (MTBE)	40.2	1	ug/L	50.0		80.4	65-125			
Naphthalene	40.1	1	ug/L	50.0		80.1	55-140			
n-Butylbenzene	36.6	1	ug/L	50.0		73.3	70-135			
n-Propylbenzene	35.7	1	ug/L	50.0		71.4	70-130			
o-Xylene	37.8	1	ug/L	50.0		75.6	80-120			L
sec-Butylbenzene	37.8	1	ug/L	50.0		75.6	70-125			
Styrene	37.2	1	ug/L	50.0		74.4	65-135			
tert-Butylbenzene	36.2	1	ug/L	50.0		72.4	70-130			
Tetrachloroethylene (PCE)	37.3	1	ug/L	50.0		74.7	45-150			
Toluene	37.3	1	ug/L	50.0		74.7	75-120			L
trans-1,2-Dichloroethylene	36.2	1	ug/L	50.0		72.3	60-140			
trans-1,3-Dichloropropene	45.8	1	ug/L	50.0		91.6	55-140			
Trichloroethylene	36.6	1	ug/L	50.0		73.3	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
LCS (BGF0832-BS1)				Prepared & Analyzed: 06/21/2023						
Trichlorofluoromethane	45.1	1	ug/L	50.0		90.1	60-145			
Vinyl chloride	34.8	0.5	ug/L	50.0		69.7	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*47.8*		ug/L	*50.0*		*95.6*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.6*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.5*		ug/L	*50.0*		*101*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.9*		ug/L	*50.0*		*99.9*	*70-130*			
Duplicate (BGF0832-DUP1)	**Source: 23F1020-02**			Prepared & Analyzed: 06/21/2023						
1,1,1,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	0.50	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	0.50	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Duplicate (BGF0832-DUP1)	**Source: 23F1020-02**			Prepared & Analyzed: 06/21/2023						
1,3-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
2,2-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	10.0	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	5.00	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	5.00	ug/L		BLOD			NA	30	
Acetone	ND	10.0	ug/L		BLOD			NA	30	
Benzene	ND	1.00	ug/L		BLOD			NA	30	
Bromobenzene	ND	1.00	ug/L		BLOD			NA	30	
Bromochloromethane	ND	1.00	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	0.50	ug/L		BLOD			NA	30	
Bromoform	ND	1.00	ug/L		BLOD			NA	30	
Bromomethane	ND	1.00	ug/L		BLOD			NA	30	
Carbon disulfide	ND	10.0	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	1.00	ug/L		BLOD			NA	30	
Chlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
Chloroethane	ND	1.00	ug/L		BLOD			NA	30	
Chloroform	ND	0.50	ug/L		BLOD			NA	30	
Chloromethane	ND	1.00	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
cis-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Duplicate (BGF0832-DUP1)	**Source: 23F1020-02**			Prepared & Analyzed: 06/21/2023						
Dibromochloromethane	ND	0.50	ug/L		BLOD			NA	30	
Dibromomethane	ND	1.00	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	5.00	ug/L		BLOD			NA	30	
Ethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	0.80	ug/L		BLOD			NA	30	
Iodomethane	ND	10.0	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	1.00	ug/L		BLOD			NA	30	
m+p-Xylenes	ND	2.00	ug/L		BLOD			NA	30	
Methylene chloride	ND	4.00	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	1.00	ug/L		BLOD			NA	30	
Naphthalene	ND	1.00	ug/L		BLOD			NA	30	
n-Butylbenzene	2.64	1.00	ug/L		2.64			0.00	30	
n-Propylbenzene	ND	1.00	ug/L		BLOD			NA	30	
o-Xylene	ND	1.00	ug/L		BLOD			NA	30	
sec-Butylbenzene	1.26	1.00	ug/L		BLOD			NA	30	
Styrene	ND	1.00	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	1.00	ug/L		BLOD			NA	30	
Toluene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
Trichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
Trichlorofluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Vinyl acetate	ND	10.0	ug/L		BLOD			NA	30	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Duplicate (BGF0832-DUP1)	**Source: 23F1020-02**			Prepared & Analyzed: 06/21/2023						
Vinyl chloride	ND	0.50	ug/L		BLOD			NA	30	
Xylenes, Total	ND	3.00	ug/L		BLOD			NA	30	
Tetrahydrofuran	ND	10.0	ug/L		BLOD			NA	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*54.2*		ug/L	*50.0*		*108*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.6*		ug/L	*50.0*		*103*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*53.5*		ug/L	*50.0*		*107*	*70-130*			
Surr: Toluene-d8 (Surr)	*45.7*		ug/L	*50.0*		*91.4*	*70-130*			
Matrix Spike (BGF0832-MS1)	**Source: 23F1020-01**			Prepared & Analyzed: 06/21/2023						
1,1,1,2-Tetrachloroethane	52.7	0.4	ug/L	50.0	BLOD	105	80-130			
1,1,1-Trichloroethane	55.0	1	ug/L	50.0	BLOD	110	65-130			
1,1,2,2-Tetrachloroethane	50.2	0.4	ug/L	50.0	BLOD	100	65-130			
1,1,2-Trichloroethane	54.9	1	ug/L	50.0	BLOD	110	75-125			
1,1-Dichloroethane	53.0	1	ug/L	50.0	BLOD	106	70-135			
1,1-Dichloroethylene	53.9	1	ug/L	50.0	BLOD	108	50-145			
1,1-Dichloropropene	52.3	1	ug/L	50.0	BLOD	105	75-135			
1,2,3-Trichlorobenzene	52.8	1	ug/L	50.0	BLOD	106	55-140			
1,2,3-Trichloropropane	49.1	1	ug/L	50.0	BLOD	98.1	75-125			
1,2,4-Trichlorobenzene	54.3	1	ug/L	50.0	BLOD	109	65-135			
1,2,4-Trimethylbenzene	55.3	1	ug/L	50.0	BLOD	111	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	54.8	1	ug/L	50.0	BLOD	110	50-130			
1,2-Dibromoethane (EDB)	50.1	1	ug/L	50.0	BLOD	100	80-120			
1,2-Dichlorobenzene	53.2	0.5	ug/L	50.0	BLOD	106	70-120			
1,2-Dichloroethane	49.3	1	ug/L	50.0	BLOD	98.5	70-130			
1,2-Dichloropropane	53.2	0.5	ug/L	50.0	BLOD	106	75-125			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Matrix Spike (BGF0832-MS1)	**Source: 23F1020-01**			Prepared & Analyzed: 06/21/2023						
1,3,5-Trimethylbenzene	53.6	1	ug/L	50.0	BLOD	107	75-124			
1,3-Dichlorobenzene	53.4	1	ug/L	50.0	BLOD	107	75-125			
1,3-Dichloropropane	51.4	1	ug/L	50.0	BLOD	103	75-125			
1,4-Dichlorobenzene	49.7	1	ug/L	50.0	BLOD	99.5	75-125			
2,2-Dichloropropane	50.5	1	ug/L	50.0	BLOD	101	70-135			
2-Butanone (MEK)	46.9	10	ug/L	50.0	BLOD	93.7	30-150			
2-Chlorotoluene	53.3	1	ug/L	50.0	BLOD	107	75-125			
2-Hexanone (MBK)	46.0	5	ug/L	50.0	BLOD	92.0	55-130			
4-Chlorotoluene	52.3	1	ug/L	50.0	BLOD	105	75-130			
4-Isopropyltoluene	55.6	1	ug/L	50.0	BLOD	111	75-130			
4-Methyl-2-pentanone (MIBK)	49.0	5	ug/L	50.0	BLOD	98.1	60-135			
Acetone	45.1	10	ug/L	50.0	BLOD	78.4	40-140			
Benzene	53.2	1	ug/L	50.0	BLOD	106	80-120			
Bromobenzene	52.7	1	ug/L	50.0	BLOD	105	75-125			
Bromochloromethane	51.8	1	ug/L	50.0	BLOD	104	65-130			
Bromodichloromethane	56.8	0.5	ug/L	50.0	BLOD	114	75-136			
Bromoform	55.8	1	ug/L	50.0	BLOD	112	70-130			
Bromomethane	32.0	1	ug/L	50.0	BLOD	63.9	30-145			
Carbon disulfide	31.8	10	ug/L	50.0	BLOD	63.5	35-160			
Carbon tetrachloride	56.2	1	ug/L	50.0	BLOD	112	65-140			
Chlorobenzene	51.8	1	ug/L	50.0	BLOD	104	80-120			
Chloroethane	46.5	1	ug/L	50.0	BLOD	93.0	60-135			
Chloroform	50.1	0.5	ug/L	50.0	BLOD	100	65-135			
Chloromethane	48.2	1	ug/L	50.0	BLOD	96.3	40-125			
cis-1,2-Dichloroethylene	52.5	1	ug/L	50.0	BLOD	105	70-125			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Matrix Spike (BGF0832-MS1)	**Source: 23F1020-01**			Prepared & Analyzed: 06/21/2023						
cis-1,3-Dichloropropene	54.8	1	ug/L	50.0	BLOD	110	47-136			
Dibromochloromethane	58.3	0.5	ug/L	50.0	BLOD	117	60-135			
Dibromomethane	51.8	1	ug/L	50.0	BLOD	104	75-125			
Dichlorodifluoromethane	65.7	1	ug/L	50.0	BLOD	131	30-155			
Ethylbenzene	53.3	1	ug/L	50.0	BLOD	107	75-125			
Hexachlorobutadiene	47.9	0.8	ug/L	50.0	BLOD	95.9	50-140			
Isopropylbenzene	50.9	1	ug/L	50.0	BLOD	102	75-125			
m+p-Xylenes	104	2	ug/L	100	BLOD	104	75-130			
Methylene chloride	51.9	4	ug/L	50.0	BLOD	104	55-140			
Methyl-t-butyl ether (MTBE)	50.3	1	ug/L	50.0	BLOD	101	65-125			
Naphthalene	55.9	1	ug/L	50.0	BLOD	112	55-140			
n-Butylbenzene	54.5	1	ug/L	50.0	BLOD	109	70-135			
n-Propylbenzene	54.8	1	ug/L	50.0	BLOD	110	70-130			
o-Xylene	54.7	1	ug/L	50.0	BLOD	109	80-120			
sec-Butylbenzene	56.9	1	ug/L	50.0	BLOD	114	70-125			
Styrene	53.8	1	ug/L	50.0	BLOD	108	65-135			
tert-Butylbenzene	54.2	1	ug/L	50.0	BLOD	108	70-130			
Tetrachloroethylene (PCE)	52.2	1	ug/L	50.0	BLOD	104	51-231			
Toluene	55.6	1	ug/L	50.0	BLOD	111	75-120			
trans-1,2-Dichloroethylene	51.4	1	ug/L	50.0	BLOD	103	60-140			
trans-1,3-Dichloropropene	59.6	1	ug/L	50.0	BLOD	119	55-140			
Trichloroethylene	53.0	1	ug/L	50.0	BLOD	106	70-125			
Trichlorofluoromethane	58.4	1	ug/L	50.0	BLOD	117	60-145			
Vinyl chloride	53.5	0.5	ug/L	50.0	BLOD	107	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.6*		ug/L	*50.0*		*99.3*	*70-120*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0832 - SW5030B-MS										
Matrix Spike (BGF0832-MS1)	**Source: 23F1020-01**			Prepared & Analyzed: 06/21/2023						
Surr: 4-Bromofluorobenzene (Surr)	*49.2*		ug/L	*50.0*		*98.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.4*		ug/L	*50.0*		*98.7*	*70-130*			
Surr: Toluene-d8 (Surr)	*51.0*		ug/L	*50.0*		*102*	*70-130*			
Batch BGF0891 - SW5030B-MS										
Blank (BGF0891-BLK1)				Prepared & Analyzed: 06/22/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.1*		ug/L	*50.0*		*98.2*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.6*		ug/L	*50.0*		*99.1*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.5*		ug/L	*50.0*		*97.0*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.6*		ug/L	*50.0*		*97.2*	*70-130*			
LCS (BGF0891-BS1)				Prepared & Analyzed: 06/22/2023						
1,1,1,2-Tetrachloroethane	51.3	0.4	ug/L	50.0		103	80-130			
1,1,1-Trichloroethane	55.8	1	ug/L	50.0		112	65-130			
1,1,2,2-Tetrachloroethane	46.6	0.4	ug/L	50.0		93.2	65-130			
1,1,2-Trichloroethane	51.0	1	ug/L	50.0		102	75-125			
1,1-Dichloroethane	52.1	1	ug/L	50.0		104	70-135			
1,1-Dichloroethylene	54.1	1	ug/L	50.0		108	70-130			
1,1-Dichloropropene	54.5	1	ug/L	50.0		109	75-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
LCS (BGF0891-BS1)				Prepared & Analyzed: 06/22/2023						
1,2,3-Trichlorobenzene	53.3	1	ug/L	50.0		107	55-140			
1,2,3-Trichloropropane	46.8	1	ug/L	50.0		93.7	75-125			
1,2,4-Trichlorobenzene	53.2	1	ug/L	50.0		106	65-135			
1,2,4-Trimethylbenzene	53.8	1	ug/L	50.0		108	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	53.1	1	ug/L	50.0		106	50-130			
1,2-Dibromoethane (EDB)	48.4	1	ug/L	50.0		96.8	80-120			
1,2-Dichlorobenzene	49.8	0.5	ug/L	50.0		99.6	70-120			
1,2-Dichloroethane	49.5	1	ug/L	50.0		99.0	70-130			
1,2-Dichloropropane	49.4	0.5	ug/L	50.0		98.9	75-125			
1,3,5-Trimethylbenzene	52.2	1	ug/L	50.0		104	75-125			
1,3-Dichlorobenzene	51.8	1	ug/L	50.0		104	75-125			
1,3-Dichloropropane	48.4	1	ug/L	50.0		96.9	75-125			
1,4-Dichlorobenzene	49.3	1	ug/L	50.0		98.5	75-125			
2,2-Dichloropropane	59.9	1	ug/L	50.0		120	70-135			
2-Butanone (MEK)	38.2	10	ug/L	50.0		76.4	30-150			
2-Chlorotoluene	51.0	1	ug/L	50.0		102	75-125			
2-Hexanone (MBK)	45.3	5	ug/L	50.0		90.6	55-130			
4-Chlorotoluene	51.1	1	ug/L	50.0		102	75-130			
4-Isopropyltoluene	55.4	1	ug/L	50.0		111	75-130			
4-Methyl-2-pentanone (MIBK)	45.4	5	ug/L	50.0		90.8	60-135			
Acetone	35.4	10	ug/L	50.0		70.9	40-140			
Benzene	49.7	1	ug/L	50.0		99.4	80-120			
Bromobenzene	51.2	1	ug/L	50.0		102	75-125			
Bromochloromethane	51.6	1	ug/L	50.0		103	65-130			
Bromodichloromethane	52.3	0.5	ug/L	50.0		105	75-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
LCS (BGF0891-BS1)				Prepared & Analyzed: 06/22/2023						
Bromoform	54.6	1	ug/L	50.0		109	70-130			
Bromomethane	35.6	1	ug/L	50.0		71.2	30-145			
Carbon disulfide	44.9	10	ug/L	50.0		89.8	35-160			
Carbon tetrachloride	55.7	1	ug/L	50.0		111	65-140			
Chlorobenzene	49.7	1	ug/L	50.0		99.3	80-120			
Chloroethane	46.5	1	ug/L	50.0		93.0	60-135			
Chloroform	50.4	0.5	ug/L	50.0		101	65-135			
Chloromethane	46.9	1	ug/L	50.0		93.9	40-125			
cis-1,2-Dichloroethylene	51.8	1	ug/L	50.0		104	70-125			
cis-1,3-Dichloropropene	53.0	1	ug/L	50.0		106	70-130			
Dibromochloromethane	55.2	0.5	ug/L	50.0		110	60-135			
Dibromomethane	48.9	1	ug/L	50.0		97.9	75-125			
Dichlorodifluoromethane	71.3	1	ug/L	50.0		143	30-155			
Ethylbenzene	51.2	1	ug/L	50.0		102	75-125			
Hexachlorobutadiene	56.9	0.8	ug/L	50.0		114	50-140			
Isopropylbenzene	49.8	1	ug/L	50.0		99.7	75-125			
m+p-Xylenes	100	2	ug/L	100		100	75-130			
Methylene chloride	46.2	4	ug/L	50.0		92.4	55-140			
Methyl-t-butyl ether (MTBE)	50.3	1	ug/L	50.0		101	65-125			
Naphthalene	52.5	1	ug/L	50.0		105	55-140			
n-Butylbenzene	54.4	1	ug/L	50.0		109	70-135			
n-Propylbenzene	52.5	1	ug/L	50.0		105	70-130			
o-Xylene	51.9	1	ug/L	50.0		104	80-120			
sec-Butylbenzene	55.0	1	ug/L	50.0		110	70-125			
Styrene	49.9	1	ug/L	50.0		99.7	65-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
LCS (BGF0891-BS1)				Prepared & Analyzed: 06/22/2023						
tert-Butylbenzene	52.3	1	ug/L	50.0		105	70-130			
Tetrachloroethylene (PCE)	51.8	1	ug/L	50.0		104	45-150			
Toluene	51.8	1	ug/L	50.0		104	75-120			
trans-1,2-Dichloroethylene	51.3	1	ug/L	50.0		103	60-140			
trans-1,3-Dichloropropene	57.8	1	ug/L	50.0		116	55-140			
Trichloroethylene	50.8	1	ug/L	50.0		102	70-125			
Trichlorofluoromethane	60.5	1	ug/L	50.0		121	60-145			
Vinyl chloride	52.2	0.5	ug/L	50.0		104	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.5*		ug/L	*50.0*		*97.0*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*48.6*		ug/L	*50.0*		*97.2*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*51.2*		ug/L	*50.0*		*102*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.0*		ug/L	*50.0*		*100*	*70-130*			
Duplicate (BGF0891-DUP1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
1,1,1,2-Tetrachloroethane	ND	8.00	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	20.0	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	8.00	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	20.0	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	20.0	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	ND	20.0	ug/L		BLOD			NA	30	
1,1-Dichloropropene	ND	20.0	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	20.0	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	20.0	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	20.0	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	20.0	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Duplicate (BGF0891-DUP1)		**Source: 23F1105-01**		Prepared & Analyzed: 06/22/2023						
1,2-Dibromo-3-chloropropane (DBCP)	ND	20.0	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	20.0	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	10.0	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	20.0	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	10.0	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	20.0	ug/L		BLOD			NA	30	
1,3-Dichlorobenzene	ND	20.0	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	20.0	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	20.0	ug/L		BLOD			NA	30	
2,2-Dichloropropane	ND	20.0	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	200	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	20.0	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	100	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	20.0	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	20.0	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	100	ug/L		BLOD			NA	30	
Acetone	38200	200	ug/L		35100			8.67	30	
Benzene	ND	20.0	ug/L		BLOD			NA	30	
Bromobenzene	ND	20.0	ug/L		BLOD			NA	30	
Bromochloromethane	ND	20.0	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	10.0	ug/L		BLOD			NA	30	
Bromoform	ND	20.0	ug/L		BLOD			NA	30	
Bromomethane	ND	20.0	ug/L		BLOD			NA	30	
Carbon disulfide	265	200	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	20.0	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Duplicate (BGF0891-DUP1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
Chlorobenzene	ND	20.0	ug/L		BLOD			NA	30	
Chloroethane	ND	20.0	ug/L		BLOD			NA	30	
Chloroform	ND	10.0	ug/L		BLOD			NA	30	
Chloromethane	ND	20.0	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	ND	20.0	ug/L		BLOD			NA	30	
cis-1,3-Dichloropropene	ND	20.0	ug/L		BLOD			NA	30	
Dibromochloromethane	ND	10.0	ug/L		BLOD			NA	30	
Dibromomethane	ND	20.0	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	20.0	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	100	ug/L		BLOD			NA	30	
Ethylbenzene	ND	20.0	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	16.0	ug/L		BLOD			NA	30	
Iodomethane	ND	200	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	20.0	ug/L		BLOD			NA	30	
m+p-Xylenes	ND	40.0	ug/L		BLOD			NA	30	
Methylene chloride	ND	80.0	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	20.0	ug/L		BLOD			NA	30	
Naphthalene	ND	20.0	ug/L		BLOD			NA	30	
n-Butylbenzene	ND	20.0	ug/L		BLOD			NA	30	
n-Propylbenzene	ND	20.0	ug/L		BLOD			NA	30	
o-Xylene	ND	20.0	ug/L		BLOD			NA	30	
sec-Butylbenzene	ND	20.0	ug/L		BLOD			NA	30	
Styrene	ND	20.0	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	20.0	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	20.0	ug/L		BLOD			NA	30	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Duplicate (BGF0891-DUP1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
Toluene	ND	20.0	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	ND	20.0	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	20.0	ug/L		BLOD			NA	30	
Trichloroethylene	ND	20.0	ug/L		BLOD			NA	30	
Trichlorofluoromethane	ND	20.0	ug/L		BLOD			NA	30	
Vinyl acetate	ND	200	ug/L		BLOD			NA	30	
Vinyl chloride	ND	10.0	ug/L		BLOD			NA	30	
Xylenes, Total	ND	60.0	ug/L		BLOD			NA	30	
Tetrahydrofuran	ND	200	ug/L		BLOD			NA	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.6*		ug/L	*50.0*		*97.3*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.8*		ug/L	*50.0*		*99.7*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.7*		ug/L	*50.0*		*99.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.1*		ug/L	*50.0*		*98.3*	*70-130*			
Matrix Spike (BGF0891-MS1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
1,1,1,2-Tetrachloroethane	49.4	0.4	ug/L	50.0	BLOD	98.9	80-130			
1,1,1-Trichloroethane	49.9	1	ug/L	50.0	BLOD	99.7	65-130			
1,1,2,2-Tetrachloroethane	45.6	0.4	ug/L	50.0	BLOD	91.2	65-130			
1,1,2-Trichloroethane	48.8	1	ug/L	50.0	BLOD	97.6	75-125			
1,1-Dichloroethane	47.4	1	ug/L	50.0	BLOD	94.7	70-135			
1,1-Dichloroethylene	46.9	1	ug/L	50.0	BLOD	93.8	50-145			
1,1-Dichloropropene	47.6	1	ug/L	50.0	BLOD	95.2	75-135			
1,2,3-Trichlorobenzene	47.9	1	ug/L	50.0	BLOD	95.7	55-140			
1,2,3-Trichloropropane	46.2	1	ug/L	50.0	BLOD	92.3	75-125			
1,2,4-Trichlorobenzene	48.8	1	ug/L	50.0	BLOD	97.5	65-135			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Matrix Spike (BGF0891-MS1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
1,2,4-Trimethylbenzene	49.8	1	ug/L	50.0	BLOD	99.5	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	50.9	1	ug/L	50.0	BLOD	102	50-130			
1,2-Dibromoethane (EDB)	46.5	1	ug/L	50.0	BLOD	92.9	80-120			
1,2-Dichlorobenzene	46.8	0.5	ug/L	50.0	BLOD	93.5	70-120			
1,2-Dichloroethane	47.0	1	ug/L	50.0	BLOD	94.1	70-130			
1,2-Dichloropropane	47.7	0.5	ug/L	50.0	BLOD	95.4	75-125			
1,3,5-Trimethylbenzene	48.1	1	ug/L	50.0	BLOD	96.2	75-124			
1,3-Dichlorobenzene	48.3	1	ug/L	50.0	BLOD	96.6	75-125			
1,3-Dichloropropane	46.5	1	ug/L	50.0	BLOD	93.1	75-125			
1,4-Dichlorobenzene	45.6	1	ug/L	50.0	BLOD	91.3	75-125			
2,2-Dichloropropane	50.2	1	ug/L	50.0	BLOD	100	70-135			
2-Butanone (MEK)	43.6	10	ug/L	50.0	BLOD	87.3	30-150			
2-Chlorotoluene	46.1	1	ug/L	50.0	BLOD	92.2	75-125			
2-Hexanone (MBK)	43.0	5	ug/L	50.0	BLOD	85.9	55-130			
4-Chlorotoluene	47.1	1	ug/L	50.0	BLOD	94.2	75-130			
4-Isopropyltoluene	49.7	1	ug/L	50.0	BLOD	99.4	75-130			
4-Methyl-2-pentanone (MIBK)	43.4	5	ug/L	50.0	BLOD	86.7	60-135			
Acetone	1950	10	ug/L	50.0	35100	-66200	40-140			M
Benzene	46.4	1	ug/L	50.0	BLOD	92.7	80-120			
Bromobenzene	47.9	1	ug/L	50.0	BLOD	95.8	75-125			
Bromochloromethane	45.8	1	ug/L	50.0	BLOD	91.5	65-130			
Bromodichloromethane	52.5	0.5	ug/L	50.0	BLOD	105	75-136			
Bromoform	52.1	1	ug/L	50.0	BLOD	104	70-130			
Bromomethane	26.6	1	ug/L	50.0	BLOD	53.1	30-145			
Carbon disulfide	43.8	10	ug/L	50.0	BLOD	87.7	35-160			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Matrix Spike (BGF0891-MS1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
Carbon tetrachloride	51.4	1	ug/L	50.0	BLOD	103	65-140			
Chlorobenzene	46.9	1	ug/L	50.0	BLOD	93.7	80-120			
Chloroethane	40.4	1	ug/L	50.0	BLOD	80.8	60-135			
Chloroform	46.8	0.5	ug/L	50.0	BLOD	93.5	65-135			
Chloromethane	41.2	1	ug/L	50.0	BLOD	82.3	40-125			
cis-1,2-Dichloroethylene	46.4	1	ug/L	50.0	BLOD	92.7	70-125			
cis-1,3-Dichloropropene	49.4	1	ug/L	50.0	BLOD	98.8	47-136			
Dibromochloromethane	52.5	0.5	ug/L	50.0	BLOD	105	60-135			
Dibromomethane	47.4	1	ug/L	50.0	BLOD	94.8	75-125			
Dichlorodifluoromethane	60.2	1	ug/L	50.0	BLOD	120	30-155			
Ethylbenzene	48.1	1	ug/L	50.0	BLOD	96.3	75-125			
Hexachlorobutadiene	49.2	0.8	ug/L	50.0	BLOD	98.5	50-140			
Isopropylbenzene	46.6	1	ug/L	50.0	BLOD	93.2	75-125			
m+p-Xylenes	93.4	2	ug/L	100	BLOD	93.4	75-130			
Methylene chloride	45.3	4	ug/L	50.0	BLOD	90.5	55-140			
Methyl-t-butyl ether (MTBE)	46.3	1	ug/L	50.0	BLOD	92.7	65-125			
Naphthalene	48.6	1	ug/L	50.0	BLOD	97.3	55-140			
n-Butylbenzene	49.0	1	ug/L	50.0	BLOD	98.0	70-135			
n-Propylbenzene	47.7	1	ug/L	50.0	BLOD	95.4	70-130			
o-Xylene	49.4	1	ug/L	50.0	BLOD	98.8	80-120			
sec-Butylbenzene	50.6	1	ug/L	50.0	BLOD	101	70-125			
Styrene	47.7	1	ug/L	50.0	BLOD	95.4	65-135			
tert-Butylbenzene	48.8	1	ug/L	50.0	BLOD	97.5	70-130			
Tetrachloroethylene (PCE)	46.7	1	ug/L	50.0	BLOD	93.5	51-231			
Toluene	47.9	1	ug/L	50.0	BLOD	95.8	75-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0891 - SW5030B-MS										
Matrix Spike (BGF0891-MS1)	**Source: 23F1105-01**			Prepared & Analyzed: 06/22/2023						
trans-1,2-Dichloroethylene	45.3	1	ug/L	50.0	BLOD	90.6	60-140			
trans-1,3-Dichloropropene	54.7	1	ug/L	50.0	BLOD	109	55-140			
Trichloroethylene	46.9	1	ug/L	50.0	BLOD	93.7	70-125			
Trichlorofluoromethane	54.7	1	ug/L	50.0	BLOD	109	60-145			
Vinyl chloride	43.4	0.5	ug/L	50.0	BLOD	86.9	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.7*		ug/L	*50.0*		*97.4*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.9*		ug/L	*50.0*		*99.8*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.6*		ug/L	*50.0*		*99.1*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.2*		ug/L	*50.0*		*98.4*	*70-130*			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
Blank (BGF0869-BLK1)				Prepared & Analyzed: 06/22/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*64.4*		ug/L	*100*		*64.4*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*31.2*		ug/L	*50.0*		*62.4*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*32.2*		ug/L	*100*		*32.2*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*34.1*		ug/L	*50.0*		*68.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*22.1*		ug/L	*100*		*22.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*60.6*		ug/L	*50.0*		*121*	*5-141*			
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
1,2,4-Trichlorobenzene	25.8	10.0	ug/L	50.0		51.5	57-130			L
1,2-Dichlorobenzene	19.6	10.0	ug/L	50.0		39.1	22-115			
1,3-Dichlorobenzene	20.8	10.0	ug/L	50.0		41.7	22-112			
1,4-Dichlorobenzene	22.3	10.0	ug/L	50.0		44.6	13-112			
2,4,6-Trichlorophenol	37.0	10.0	ug/L	50.0		74.0	52-129			
2,4-Dichlorophenol	31.3	10.0	ug/L	50.0		62.5	53-122			
2,4-Dimethylphenol	35.7	5.00	ug/L	50.0		71.4	42-120			
2,4-Dinitrophenol	21.9	50.0	ug/L	50.0		43.7	48-127			L
2,4-Dinitrotoluene	39.4	10.0	ug/L	50.0		78.8	10-173			
2,6-Dinitrotoluene	36.7	10.0	ug/L	50.0		73.3	68-137			
2-Chloronaphthalene	34.7	10.0	ug/L	50.0		69.4	65-120			
2-Chlorophenol	32.6	10.0	ug/L	50.0		65.2	36-120			
2-Nitrophenol	32.5	10.0	ug/L	50.0		65.1	45-167			
3,3'-Dichlorobenzidine	25.5	10.0	ug/L	50.0		51.1	10-213			
4,6-Dinitro-2-methylphenol	35.7	50.0	ug/L	50.0		71.4	53-130			
4-Bromophenyl phenyl ether	36.2	10.0	ug/L	50.0		72.4	65-120			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
4-Chlorophenyl phenyl ether	37.0	10.0	ug/L	50.0		74.1	38-145			
4-Nitrophenol	11.1	50.0	ug/L	50.0		22.2	13-129			
Acenaphthene	39.0	10.0	ug/L	50.0		78.0	60-132			
Acenaphthylene	40.6	10.0	ug/L	50.0		81.2	54-126			
Acetophenone	36.1	20.0	ug/L	50.0		72.2	0-200			
Anthracene	47.9	10.0	ug/L	50.0		95.8	43-120			
Benzo (a) anthracene	46.1	10.0	ug/L	50.0		92.2	42-133			
Benzo (a) pyrene	50.9	10.0	ug/L	50.0		102	32-148			
Benzo (b) fluoranthene	48.4	10.0	ug/L	50.0		96.8	42-140			
Benzo (g,h,i) perylene	60.0	10.0	ug/L	50.0		120	10-195			
Benzo (k) fluoranthene	46.7	10.0	ug/L	50.0		93.5	25-146			
bis (2-Chloroethoxy) methane	41.9	10.0	ug/L	50.0		83.9	49-165			
bis (2-Chloroethyl) ether	33.5	10.0	ug/L	50.0		66.9	43-126			
2,2'-Oxybis (1-chloropropane)	27.8	10.0	ug/L	50.0		55.6	63-139			L
bis (2-Ethylhexyl) phthalate	60.1	10.0	ug/L	50.0		120	29-137			
Butyl benzyl phthalate	62.1	10.0	ug/L	50.0		124	10-140			
Chrysene	46.5	10.0	ug/L	50.0		93.0	44-140			
Dibenz (a,h) anthracene	47.8	10.0	ug/L	50.0		95.5	10-200			
Diethyl phthalate	50.1	10.0	ug/L	50.0		100	10-120			
Dimethyl phthalate	42.7	10.0	ug/L	50.0		85.4	10-120			
Di-n-butyl phthalate	53.0	10.0	ug/L	50.0		106	10-120			
Di-n-octyl phthalate	75.2	10.0	ug/L	50.0		150	19-132			L
Fluoranthene	49.3	10.0	ug/L	50.0		98.6	43-121			
Fluorene	46.3	10.0	ug/L	50.0		92.6	70-120			
Hexachlorobenzene	40.0	1.00	ug/L	50.0		80.0	10-142			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
Hexachlorobutadiene	25.5	10.0	ug/L	50.0		51.1	38-120			
Hexachlorocyclopentadiene	14.6	10.0	ug/L	50.0		29.1	10-76			
Hexachloroethane	22.2	10.0	ug/L	50.0		44.5	55-120			L
Indeno (1,2,3-cd) pyrene	50.9	10.0	ug/L	50.0		102	10-151			
Isophorone	20.7	10.0	ug/L	50.0		41.4	47-180			L
Naphthalene	31.5	5.00	ug/L	50.0		62.9	36-120			
Nitrobenzene	35.3	10.0	ug/L	50.0		70.5	54-158			
n-Nitrosodimethylamine	23.0	10.0	ug/L	50.0		46.1	10-85			
n-Nitrosodi-n-propylamine	41.4	10.0	ug/L	50.0		82.7	14-198			
n-Nitrosodiphenylamine	33.3	10.0	ug/L	50.0		66.7	12-97			
p-Chloro-m-cresol	29.8	10.0	ug/L	50.0		59.6	10-142			
Pentachlorophenol	35.4	20.0	ug/L	50.0		70.9	38-152			
Phenanthrene	50.4	10.0	ug/L	50.0		101	65-120			
Phenol	11.2	10.0	ug/L	50.5		22.3	17-120			
Pyrene	66.4	10.0	ug/L	50.0		133	70-120			L
Pyridine	33.0	10.0	ug/L	50.0		66.1	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*89.7*		ug/L	*100*		*89.7*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*42.3*		ug/L	*50.0*		*84.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*41.9*		ug/L	*100*		*41.9*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*38.3*		ug/L	*50.0*		*76.6*	*5-151*			
Surr: Phenol-d5 (Surr)	*24.1*		ug/L	*100*		*24.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*39.0*		ug/L	*50.0*		*78.1*	*5-141*			

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0817 - No Prep Wet Chem										
Blank (BGF0817-BLK1)				Prepared & Analyzed: 06/21/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGF0817-BS1)				Prepared & Analyzed: 06/21/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		98.0	80-120			
Matrix Spike (BGF0817-MS1)	**Source: 23F1000-01**			Prepared & Analyzed: 06/21/2023						
Nitrite as N	0.10	0.05	mg/L	0.100	BLOD	96.0	80-120			
Matrix Spike Dup (BGF0817-MSD1)	**Source: 23F1000-01**			Prepared & Analyzed: 06/21/2023						
Nitrite as N	0.10	0.05	mg/L	0.100	BLOD	96.0	80-120	0.00	20	
Batch BGF0823 - No Prep Wet Chem										
Blank (BGF0823-BLK1)				Prepared & Analyzed: 06/21/2023						
BOD	ND	2.0	mg/L							
LCS (BGF0823-BS1)				Prepared & Analyzed: 06/21/2023						
BOD	195	2	mg/L	198		98.5	84.6-115.4			
Duplicate (BGF0823-DUP1)	**Source: 23F0993-01**			Prepared & Analyzed: 06/21/2023						
BOD	3.8	2.0	mg/L		3.4			11.5	20	
Batch BGF1095 - No Prep Wet Chem										
Blank (BGF1095-BLK1)				Prepared & Analyzed: 06/28/2023						
COD	ND	10.0	mg/L							

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF1095 - No Prep Wet Chem										
LCS (BGF1095-BS1)				Prepared & Analyzed: 06/28/2023						
COD	49.8	10.0	mg/L	50.0		99.5	88-119			
Matrix Spike (BGF1095-MS1)		**Source: 23F1162-01**		Prepared & Analyzed: 06/28/2023						
COD	57.2	10.0	mg/L	50.0	10.6	93.4	72.4-130			
Matrix Spike Dup (BGF1095-MSD1)		**Source: 23F1162-01**		Prepared & Analyzed: 06/28/2023						
COD	58.9	10.0	mg/L	50.0	10.6	96.6	72.4-130	2.82	20	
Batch BGF1206 - No Prep Wet Chem										
Blank (BGF1206-BLK1)				Prepared & Analyzed: 06/30/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGF1206-BS1)				Prepared & Analyzed: 06/30/2023						
Nitrate+Nitrite as N	2.54	0.1	mg/L	2.50		102	90-110			
Matrix Spike (BGF1206-MS1)		**Source: 23F1156-02**		Prepared & Analyzed: 06/30/2023						
Nitrate+Nitrite as N	4.51	0.1	mg/L	2.50	1.87	106	90-120			
Matrix Spike Dup (BGF1206-MSD1)		**Source: 23F1156-02**		Prepared & Analyzed: 06/30/2023						
Nitrate+Nitrite as N	4.53	0.1	mg/L	2.50	1.87	107	90-120	0.575	20	
Batch BGG0006 - No Prep Wet Chem										
Blank (BGG0006-BLK1)				Prepared & Analyzed: 07/02/2023						
TKN as N	ND	0.50	mg/L							

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0006 - No Prep Wet Chem										
LCS (BGG0006-BS1)				Prepared & Analyzed: 07/02/2023						
TKN as N	10.7	0.50	mg/L	10.0		107	90-110			
Matrix Spike (BGG0006-MS1)	**Source: 23F1129-01**			Prepared & Analyzed: 07/02/2023						
TKN as N	10.8	0.50	mg/L	10.0	0.28	105	90-110			
Matrix Spike (BGG0006-MS2)	**Source: 23F1501-02**			Prepared & Analyzed: 07/02/2023						
TKN as N	11.1	0.50	mg/L	10.0	BLOD	111	90-110			M
Matrix Spike Dup (BGG0006-MSD1)	**Source: 23F1129-01**			Prepared & Analyzed: 07/02/2023						
TKN as N	11.0	0.50	mg/L	10.0	0.28	107	90-110	1.75	20	
Matrix Spike Dup (BGG0006-MSD2)	**Source: 23F1501-02**			Prepared & Analyzed: 07/02/2023						
TKN as N	11.3	0.50	mg/L	10.0	BLOD	113	90-110	1.30	20	M
Batch BGG0023 - No Prep Wet Chem										
Blank (BGG0023-BLK1)				Prepared & Analyzed: 07/03/2023						
Ammonia as N	ND	0.10	mg/L							
LCS (BGG0023-BS1)				Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.08	0.1	mg/L	1.00		108	90-110			
Matrix Spike (BGG0023-MS1)	**Source: 23F1414-01**			Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.12	0.10	mg/L	1.00	0.20	92.1	89.3-131			
Matrix Spike (BGG0023-MS2)	**Source: 23F1499-03**			Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.22	0.10	mg/L	1.00	0.15	107	89.3-131			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0023 - No Prep Wet Chem										
Matrix Spike Dup (BGG0023-MSD1)	**Source: 23F1414-01**			Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.12	0.10	mg/L	1.00	0.20	92.0	89.3-131	0.0894	20	
Matrix Spike Dup (BGG0023-MSD2)	**Source: 23F1499-03**			Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.24	0.10	mg/L	1.00	0.15	109	89.3-131	1.54	20	
Batch BGG0077 - No Prep Wet Chem										
Blank (BGG0077-BLK1)				Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGG0077-BS1)				Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500		90.4	80-120			
Matrix Spike (BGG0077-MS1)	**Source: 23F1095-01**			Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	65.0	2.50	mg/L	25.0	39.1	104	70-130			
Matrix Spike Dup (BGG0077-MSD1)	**Source: 23F1095-01**			Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	62.6	2.50	mg/L	25.0	39.1	94.0	70-130	3.76	20	

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 5:12:03PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Logan Howard

Analytical Summary

23F1095-01 Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.8 R5.4**	
23F1095-01	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
23F1095-01RE1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23F1095-01	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
23F1095-01	300 mL / 300 mL	SM5210B-2011	BGF0823	SGF0978	
23F1095-01	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
23F1095-01	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333
23F1095-01RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333
23F1095-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
23F1095-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
23F1095-01	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23F1095-01	1030 mL / 2.00 mL	SW8270E	BGF0869	SGF0976	AE30336

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23F1095-01	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236

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Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23F1095-02	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236
23F1095-01RE1	5.00 mL / 5.00 mL	SW8260D	BGF0891	SGF0897	AF30236

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
23F1095-01	1.00 mL / 20.0 mL	SW7470A	BGF0861	SGF0889	AF30286

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Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.8 R5.4**	
BGF0945-BLK1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-BS1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MS1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MS2	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MSD1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MSD2	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGF0817-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
BGF0817-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
BGF0817-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
BGF0817-MS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
BGF0817-MSD1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0817	SGF0819	AD30177
BGF0823-BLK1	300 mL / 300 mL	SM5210B-2011	BGF0823	SGF0978	
BGF0823-BS1	300 mL / 300 mL	SM5210B-2011	BGF0823	SGF0978	
BGF0823-DUP1	300 mL / 300 mL	SM5210B-2011	BGF0823	SGF0978	
BGF1095-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1206-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333

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Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGF1206-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333
BGF1206-MS1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333
BGF1206-MSD1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGF1206	SGF1186	AF30333
BGG0006-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-MRL1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0006-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0006	SGG0004	AG30158
BGG0023-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-MRL1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0023-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0023	SGG0029	AG30161
BGG0077-BLK1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-BS1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MRL1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MS1	0.100 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MSD1	0.100 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGF0869-BLK1	1000 mL / 1.00 mL	SW8270E	BGF0869	SGF0961	AD30296
BGF0869-BS1	1000 mL / 1.00 mL	SW8270E	BGF0869	SGF0961	AD30296

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Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BGF0832-BLK1	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236
BGF0832-BS1	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236
BGF0832-DUP1	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236
BGF0832-MS1	5.00 mL / 5.00 mL	SW8260D	BGF0832	SGF0851	AF30236
BGF0891-BLK1	5.00 mL / 5.00 mL	SW8260D	BGF0891	SGF0897	AF30236
BGF0891-BS1	5.00 mL / 5.00 mL	SW8260D	BGF0891	SGF0897	AF30236
BGF0891-DUP1	5.00 mL / 5.00 mL	SW8260D	BGF0891	SGF0897	AF30236
BGF0891-MS1	5.00 mL / 5.00 mL	SW8260D	BGF0891	SGF0897	AF30236

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BGF0861-BLK1	20.0 mL / 20.0 mL	SW7470A	BGF0861	SGF0889	AF30286
BGF0861-BS1	20.0 mL / 20.0 mL	SW7470A	BGF0861	SGF0889	AF30286
BGF0861-MS1		SW7470A	BGF0861		
BGF0861-MSD1		SW7470A	BGF0861		

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Certified Analyses included in this Report

Analyte	Certifications
EPA350.1 R2.0 in Non-Potable Water	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
EPA351.2 R2.0 in Non-Potable Water	
TKN as N	VELAP,NCDEQ,WVDEP
SM4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP,NCDEQ
SM4500-NO3F-2011 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM5210B-2011 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6020B in Non-Potable Water	
Arsenic	VELAP,WVDEP
Barium	VELAP,WVDEP
Cadmium	VELAP,WVDEP
Chromium	VELAP,WVDEP
Copper	VELAP,WVDEP
Lead	VELAP,WVDEP
Nickel	VELAP,WVDEP
Selenium	VELAP,WVDEP
Silver	VELAP,WVDEP
Zinc	VELAP,WVDEP
SW7470A in Non-Potable Water	
Mercury	VELAP,NCDEQ,WVDEP

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Certified Analyses included in this Report

Analyte	Certifications
SW8260D in Non-Potable Water	
2-Butanone (MEK)	VELAP,NCDEQ,PADEP,WVDEP
Acetone	VELAP,NCDEQ,PADEP,WVDEP
Benzene	VELAP,NCDEQ,PADEP,WVDEP
Ethylbenzene	VELAP,NCDEQ,PADEP,WVDEP
Toluene	VELAP,NCDEQ,PADEP,WVDEP
Xylenes, Total	VELAP,NCDEQ,PADEP,WVDEP
Tetrahydrofuran	VELAP,PADEP
SW8270E in Non-Potable Water	
Anthracene	VELAP,PADEP,NCDEQ,WVDEP
Naphthalene	VELAP,PADEP,NCDEQ,WVDEP
SW9065 in Non-Potable Water	
Total Recoverable Phenolics	VELAP,WVDEP

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Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental Control Certificate 93016001	93016	06/30/2024
TXCEQ	Texas Comm on Environmental Quality #T104704576-23-1	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12417	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

DS	Surrogate concentration reflects a dilution factor.
J	The reported result is an estimated value.
L	LCS recovery is outside of established acceptance limits
M	Matrix spike recovery is outside established acceptance limits
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

ENTHALPY ANALYTICAL

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
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CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SAME	PROJECT NAME/Quote #:
CONTACT: Jennifer Robb	INVOICE CONTACT:	SITE NAME: 2023 City of Bristol Landfill Leachate
ADDRESS: 11260 Roger Bacon Drive,	INVOICE ADDRESS:	PROJECT NUMBER: 02218208.15 Task 1
Ste. 300, Reston VA 20190	INVOICE PHONE #:	P.O. #:
PHONE #: 703-471-6150 EMAIL: jrobb@scsengineers.com		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: V A	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): Logan Hurd Catherine Kirby	SAMPLER SIGNATURE:	Turn Around Time: 10 Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

	CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Ammonia - EPA 350.1	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011 (report seperatly from Nitrite)	Nitrite SM22 450-NO3F-2011	SVOC (Anthracene) 8270	Total Metals (As, Ba, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn) 6010	TKN - EPA 351.2 R2.0	Mercury - 7470	Total Recoverable Phenolics - 9065	V. Fatty Acids (See List) 8015	VOCs (See List) 8260
1)	EW-59	X					062023	740		GW	12												
2)										GW													
3)										GW													
4)										GW													
5)										GW													
6)										GW													
7)										GW													
8)										GW													
9)										GW													
10)	Trip Blank	X					062023	1520		DI	2												X

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

Note VOC 8260 no HCl

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
[signature]	062023/1200	1330 LCW	
RELINQUISHED: LCW	DATE / TIME	RECEIVED: [signature] Stan	6/21/23 0800 DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III
Level IV

LAB USE ONLY Therm ID: 271
Custody Seals used and intact? (Y) N)

COOLER TEMP 5.5 °C
Received on ice? (Y) N)

SCS-W 23F1095
2023 City of Bristol Landfill Leach:
Recd: 06/21/2023 Due: 07/06/2023

v130325002

Bottle Kit Example

Parameter	Analytical Method	Bottle	Preservative
Biological Oxygen Demand	SM22 5210B-2021	1 L Plastic	Cool <6C
Ammonia	EPA 350.1 R2.0	1 500 mL Plastic	H2SO4
Chemical Oxygen Demand	SM22 5220D-2011		
Nitrite	SM22 4500-NO3F-2011		
Nitrate	SM22 4500-NO3F-2011		
Total Kjeldahl Nitrogen	EPA 351.2 R2.0		
Nitrate	SM22 4500-NO3F-2011	1 250 mL Plastic	Cool <6C
Semi-Volatile Organic Compound: Anthracene	SW-846 Method 8270	1 L Amber	Cool <6C
Total Metals: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, and Zinc	SW-846 Method 6010	1 500 mL Plastic	HNO3
Total Metal: Mercury	SW-846 Method 7470		
Total Recoverable Phenolics	SW-846 Method 9065	1 250 mL glass Amber	H2SO4
Volatile Fatty Acids: Acetic Acid, Butyric Acid, Lactic Acid, Propionic Acid, and Pyruvic Acid	SW-846 Method 8015	3 40 mL VOA Clear	Cool <6C
Volatile Organic Compounds: Acetone, Benzene, Ethyl benzene, Methyl ethyl ketone, Tetrahydrofuran, Toluene, and Total Xylenes	SW-846 Method 8260	3 40 mL VOA Clear	HCl

ENTHALPY

Sample Preservation Log

Order ID 23F1095 Date Performed: 6-21-23 Analyst Performing Check: RCJ

Sample ID	Container ID	Metals			Cyanide			Sulfide			Ammonia			TKN			Phos, Tot			NO3+NO2			DRO			Pesticide (8081/608/508) PCB DW only			SVOC (525/8270/625)			CrVI * **		Pest/PCB (508) / SVOC(525)			COD			Phenolics		
		pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	Received Res. Cl		final + or -	Received Res. Cl		final + or -	Received pH	Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH
		<2	Other		>12	Other		>9	Other		<2	Other		<2	Other		<2	Other		<2	Other		<2	Other		+	-		+	-				<2	Other		<2	Other		<2	Other	
01	A		7	<2																																					
01	B											7	<2		7	<2					7	<2															7	<2			
01	E																																						7	<2

NaOH ID: _____ HNO3 ID: 3E04504 CrVI preserved date/time: _____ Analyst Initials: _____

pH must be adjusted between 9.3 - 9.7

H2SO4 ID: 3D04310 Na2S2O3 ID: _____ Buffer Sol'n ID: _____

HCL ID: _____ Na2SO3 ID: _____ 1N NaOH ID: _____ 5N NaOH: _____

Metals were received with pH = 7 HNO3 was added on 21 Jun 2023 at 0950 by RCJ in the Log-In room to bring pH= <2.

**W.Va only certifies DISS CrVI and not T CrVI as an approved analyte under 40CFR136 for waste water.

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Laboratory Order ID: 23F1095

Sample Conditions Checklist

Samples Received at:	**5.50°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	No
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	Yes
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

Work Order Comments

*Metals were logged for analysis by 6020 per project history, which differs from the chain of custody (6010).
*H2SO4-preserved bottles were received with a pH greater than 2; H2SO4 was added to bring the pH to less than 2.

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Jennifer Robb notified via email. MRS 06/21/23 1048

TNI Accredited
VELAP ID 460021

ENTHALPY ANALYTICAL

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DRAFT REPORT

Laboratory Order ID 23F1204

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	June 22, 2023 8:00
		Date Issued:	July 7, 2023 16:20
		Project Number:	02218208.15 Task 1
Submitted To:	Jennifer Robb	Purchase Order:	
Client Site I.D.:	2023 City of Bristol Landfill Leachate		

Enclosed are the results of analyses for samples received by the laboratory on 06/22/2023 08:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

Enthalpy Analytical
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Analysis Detects Report

Date Issued: 7/7/2023 4:20:33PM

Client Name: SCS Engineers-Winchester
Client Site ID: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Laboratory Sample ID: **23F1204-01** **Client Sample ID:** **EW-61**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01RE1	SW6020B	500		2.5	5.0	5	ug/L
Barium	01RE2	SW6020B	3010		10.0	50.0	10	ug/L
Chromium	01RE1	SW6020B	191		2.00	5.00	5	ug/L
Copper	01RE1	SW6020B	3.62	J	1.50	5.00	5	ug/L
Nickel	01RE1	SW6020B	58.92		5.000	5.000	5	ug/L
Zinc	01RE1	SW6020B	25.3		12.5	25.0	5	ug/L
2-Butanone (MEK)	01RE1	SW8260D	20100		1500	5000	500	ug/L
Acetone	01RE1	SW8260D	61800		3500	5000	500	ug/L
Benzene	01	SW8260D	1400		20.0	50.0	50	ug/L
Ethylbenzene	01	SW8260D	98.0		20.0	50.0	50	ug/L
Tetrahydrofuran	01	SW8260D	7320		500	500	50	ug/L
Toluene	01	SW8260D	67.0		25.0	50.0	50	ug/L
Xylenes, Total	01	SW8260D	92.0	J	50.0	150	50	ug/L
Ammonia as N	01RE1	EPA350.1 R2.0	2370		146	200	2000	mg/L
BOD	01	SM5210B-2011	27400		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	44800		5000	5000	500	mg/L
Nitrate+Nitrite as N	01RE2	SM4500-NO3F-2011	3.19		0.20	0.20	1	mg/L
TKN as N	01RE1	EPA351.2 R2.0	2650		200	500	1000	mg/L
Total Recoverable Phenolics	01	SW9065	45.6		1.50	2.50	50	mg/L

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-61	23F1204-01	Ground Water	06/20/2023 17:30	06/22/2023 08:00

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 4:20:33PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Client Sample ID: **EW-61** **Laboratory Sample ID:** **23F1204-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Metals (Total) by EPA 6000/7000 Series Methods												
Silver	01RE1	7440-22-4	SW6020B	06/23/2023 17:00	06/26/2023 14:25	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	01RE1	7440-38-2	SW6020B	06/23/2023 17:00	06/26/2023 14:25	500		2.5	5.0	5	ug/L	AB
Barium	01RE2	7440-39-3	SW6020B	06/23/2023 17:00	06/26/2023 14:30	3010		10.0	50.0	10	ug/L	AB
Cadmium	01RE1	7440-43-9	SW6020B	06/23/2023 17:00	06/26/2023 14:25	BLOD		0.500	5.00	5	ug/L	AB
Chromium	01RE1	7440-47-3	SW6020B	06/23/2023 17:00	06/26/2023 14:25	191		2.00	5.00	5	ug/L	AB
Copper	01RE1	7440-50-8	SW6020B	06/23/2023 17:00	06/26/2023 14:25	3.62	J	1.50	5.00	5	ug/L	AB
Mercury	01	7439-97-6	SW7470A	06/26/2023 10:00	06/26/2023 14:13	BLOD		0.00400	0.00400	1	mg/L	SGT
Nickel	01RE1	7440-02-0	SW6020B	06/23/2023 17:00	06/26/2023 14:25	58.92		5.000	5.000	5	ug/L	AB
Lead	01RE1	7439-92-1	SW6020B	06/23/2023 17:00	06/26/2023 14:25	BLOD		5.0	5.0	5	ug/L	AB
Selenium	01RE1	7782-49-2	SW6020B	06/23/2023 17:00	06/26/2023 14:25	BLOD		4.25	5.00	5	ug/L	AB
Zinc	01RE1	7440-66-6	SW6020B	06/23/2023 17:00	06/26/2023 14:25	25.3		12.5	25.0	5	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01RE1	78-93-3	SW8260D	06/26/2023 18:07	06/26/2023 18:07	20100		1500	5000	500	ug/L	ZDR
Acetone	01RE1	67-64-1	SW8260D	06/26/2023 18:07	06/26/2023 18:07	61800		3500	5000	500	ug/L	ZDR
Benzene	01	71-43-2	SW8260D	06/23/2023 17:01	06/23/2023 17:01	1400		20.0	50.0	50	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	06/23/2023 17:01	06/23/2023 17:01	98.0		20.0	50.0	50	ug/L	RJB
Toluene	01	108-88-3	SW8260D	06/23/2023 17:01	06/23/2023 17:01	67.0		25.0	50.0	50	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	06/23/2023 17:01	06/23/2023 17:01	92.0	J	50.0	150	50	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	06/23/2023 17:01	06/23/2023 17:01	7320		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*98.0 %*	*70-120*	*06/23/2023 17:01*	*06/23/2023 17:01*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*102 %*	*75-120*	*06/23/2023 17:01*	*06/23/2023 17:01*							
Surr: Dibromofluoromethane (Surr)	*01*	*99.0 %*	*70-130*	*06/23/2023 17:01*	*06/23/2023 17:01*							
Surr: Toluene-d8 (Surr)	*01*	*97.3 %*	*70-130*	*06/23/2023 17:01*	*06/23/2023 17:01*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*	*101 %*	*70-120*	*06/26/2023 18:07*	*06/26/2023 18:07*							
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*	*99.9 %*	*75-120*	*06/26/2023 18:07*	*06/26/2023 18:07*							

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 4:20:33PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Client Sample ID: **EW-61** **Laboratory Sample ID:** **23F1204-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*01RE1*	*103 %*	*70-130*	*06/26/2023 18:07*	*06/26/2023 18:07*							
Surr: Toluene-d8 (Surr)	*01RE1*	*97.8 %*	*70-130*	*06/26/2023 18:07*	*06/26/2023 18:07*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	06/23/2023 09:00	06/23/2023 22:08	BLOD		490	980	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*%*	*5-136*	*06/23/2023 09:00*	*06/23/2023 22:08*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*	*34.0 %*	*9-117*	*06/23/2023 09:00*	*06/23/2023 22:08*							
Surr: 2-Fluorophenol (Surr)	*01*	*17.0 %*	*5-60*	*06/23/2023 09:00*	*06/23/2023 22:08*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*28.0 %*	*5-151*	*06/23/2023 09:00*	*06/23/2023 22:08*							
Surr: Phenol-d5 (Surr)	*01*	*21.0 %*	*5-60*	*06/23/2023 09:00*	*06/23/2023 22:08*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*16.0 %*	*5-141*	*06/23/2023 09:00*	*06/23/2023 22:08*							
Wet Chemistry Analysis												
Ammonia as N	01RE1	7664-41-7	EPA350.1 R2.0	07/03/2023 13:10	07/03/2023 13:10	2370		146	200	2000	mg/L	MKS
BOD	01	E1640606	SM5210B-2011	06/22/2023 12:48	06/22/2023 12:48	27400		0.2	2.0	1	mg/L	NBT
COD	01	NA	SM5220D-2011	06/28/2023 09:30	06/28/2023 09:30	44800		5000	5000	500	mg/L	MJRL
Nitrate as N	01	14797-55-8	Calc.	07/03/2023 15:04	07/03/2023 15:04	BLOD		1.20	5.20	100	mg/L	MJRL
Nitrate+Nitrite as N	01RE2	E701177	SM4500-NO3F-2011	07/03/2023 15:04	07/03/2023 15:04	3.19		0.20	0.20	1	mg/L	MJRL
Nitrite as N	01	14797-65-0	SM4500-NO2B-2011	06/22/2023 14:00	06/22/2023 14:00	BLOD		1.00	5.00	100	mg/L	MKS
Total Recoverable Phenolics	01	NA	SW9065	07/05/2023 16:24	07/05/2023 16:24	45.6		1.50	2.50	50	mg/L	AAL
TKN as N	01RE1	E17148461	EPA351.2 R2.0	07/02/2023 00:00	07/06/2023 17:05	2650		200	500	1000	mg/L	AAL

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Certificate of Analysis

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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0945 - EPA200.8 R5.4										
Blank (BGF0945-BLK1)				Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	ND	1.0	ug/L							
Barium	ND	5.00	ug/L							
Cadmium	ND	1.00	ug/L							
Chromium	ND	1.00	ug/L							
Copper	ND	1.00	ug/L							
Lead	ND	1.0	ug/L							
Nickel	ND	1.000	ug/L							
Selenium	ND	1.00	ug/L							
Silver	ND	1.00	ug/L							
Zinc	ND	5.00	ug/L							
LCS (BGF0945-BS1)				Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0		102	80-120			
Barium	50.0	5.00	ug/L	50.0		99.9	80-120			
Cadmium	51.3	1.00	ug/L	50.0		103	80-120			
Chromium	50.8	1.00	ug/L	50.0		102	80-120			
Copper	50.7	1.00	ug/L	50.0		101	80-120			
Lead	51	1.0	ug/L	50.0		102	80-120			
Nickel	50.61	1.000	ug/L	50.0		101	80-120			
Selenium	50.8	1.00	ug/L	50.0		102	80-120			
Silver	10.1	1.00	ug/L	10.0		101	80-120			
Zinc	50.8	5.00	ug/L	50.0		102	80-120			
Matrix Spike (BGF0945-MS1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	BLOD	101	75-125			
Barium	51.6	5.00	ug/L	50.0	BLOD	103	75-125			

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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0945 - EPA200.8 R5.4										
Matrix Spike (BGF0945-MS1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Cadmium	50.9	1.00	ug/L	50.0	BLOD	102	75-125			
Chromium	50.6	1.00	ug/L	50.0	BLOD	101	75-125			
Copper	50.3	1.00	ug/L	50.0	BLOD	101	75-125			
Lead	51	1.0	ug/L	50.0	BLOD	101	75-125			
Nickel	50.09	1.000	ug/L	50.0	BLOD	100	75-125			
Selenium	50.2	1.00	ug/L	50.0	BLOD	100	75-125			
Silver	10.0	1.00	ug/L	10.0	BLOD	100	75-125			
Zinc	50.9	5.00	ug/L	50.0	BLOD	102	75-125			
Matrix Spike (BGF0945-MS2)	**Source: 23F1222-01**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	0.61	102	75-125			
Barium	151	5.00	ug/L	50.0	99.8	103	75-125			
Cadmium	50.6	1.00	ug/L	50.0	BLOD	101	75-125			
Chromium	50.7	1.00	ug/L	50.0	BLOD	101	75-125			
Copper	47.2	1.00	ug/L	50.0	BLOD	94.4	75-125			
Lead	50	1.0	ug/L	50.0	BLOD	100	75-125			
Nickel	48.11	1.000	ug/L	50.0	BLOD	96.2	75-125			
Selenium	47.8	1.00	ug/L	50.0	BLOD	95.7	75-125			
Silver	9.91	1.00	ug/L	10.0	BLOD	99.1	75-125			
Zinc	46.8	5.00	ug/L	50.0	BLOD	93.5	75-125			
Matrix Spike Dup (BGF0945-MSD1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	51	1.0	ug/L	50.0	BLOD	102	75-125	0.761	20	
Barium	50.7	5.00	ug/L	50.0	BLOD	101	75-125	1.88	20	
Cadmium	51.0	1.00	ug/L	50.0	BLOD	102	75-125	0.116	20	
Chromium	50.4	1.00	ug/L	50.0	BLOD	101	75-125	0.252	20	

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Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0945 - EPA200.8 R5.4										
Matrix Spike Dup (BGF0945-MSD1)	**Source: 23F1093-04**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Copper	50.7	1.00	ug/L	50.0	BLOD	101	75-125	0.720	20	
Lead	51	1.0	ug/L	50.0	BLOD	101	75-125	0.0500	20	
Nickel	50.85	1.000	ug/L	50.0	BLOD	102	75-125	1.51	20	
Selenium	50.5	1.00	ug/L	50.0	BLOD	101	75-125	0.625	20	
Silver	10.0	1.00	ug/L	10.0	BLOD	100	75-125	0.329	20	
Zinc	50.7	5.00	ug/L	50.0	BLOD	101	75-125	0.303	20	
Matrix Spike Dup (BGF0945-MSD2)	**Source: 23F1222-01**			Prepared: 06/23/2023 Analyzed: 06/26/2023						
Arsenic	52	1.0	ug/L	50.0	0.61	102	75-125	0.381	20	
Barium	152	5.00	ug/L	50.0	99.8	104	75-125	0.282	20	
Cadmium	50.2	1.00	ug/L	50.0	BLOD	100	75-125	0.802	20	
Chromium	49.9	1.00	ug/L	50.0	BLOD	99.8	75-125	1.49	20	
Copper	47.4	1.00	ug/L	50.0	BLOD	94.8	75-125	0.396	20	
Lead	50	1.0	ug/L	50.0	BLOD	99.8	75-125	0.232	20	
Nickel	48.28	1.000	ug/L	50.0	BLOD	96.6	75-125	0.348	20	
Selenium	47.6	1.00	ug/L	50.0	BLOD	95.2	75-125	0.484	20	
Silver	10.1	1.00	ug/L	10.0	BLOD	101	75-125	1.38	20	
Zinc	46.6	5.00	ug/L	50.0	BLOD	93.1	75-125	0.418	20	
Batch BGF0980 - SW7470A										
Blank (BGF0980-BLK1)				Prepared & Analyzed: 06/26/2023						
Mercury	ND	0.00020	mg/L							
LCS (BGF0980-BS1)				Prepared & Analyzed: 06/26/2023						
Mercury	0.00265	0.00020	mg/L	0.00250		106	80-120			

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Submitted To: Jennifer Robb

Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0980 - SW7470A										
Matrix Spike (BGF0980-MS1)		**Source: 23F1302-01**		Prepared & Analyzed: 06/26/2023						
Mercury	0.00284	0.00020	mg/L	0.00250	BLOD	114	80-120			
Matrix Spike Dup (BGF0980-MSD1)		**Source: 23F1302-01**		Prepared & Analyzed: 06/26/2023						
Mercury	0.00278	0.00020	mg/L	0.00250	BLOD	111	80-120	2.14	20	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Blank (BGF0926-BLK1)				Prepared & Analyzed: 06/23/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.7*		ug/L	*50.0*		*99.4*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.0*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*51.1*		ug/L	*50.0*		*102*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.1*		ug/L	*50.0*		*98.1*	*70-130*			
LCS (BGF0926-BS1)				Prepared & Analyzed: 06/23/2023						
1,1,1,2-Tetrachloroethane	53.6	0.4	ug/L	50.0		107	80-130			
1,1,1-Trichloroethane	55.2	1	ug/L	50.0		110	65-130			
1,1,2,2-Tetrachloroethane	47.8	0.4	ug/L	50.0		95.6	65-130			
1,1,2-Trichloroethane	52.0	1	ug/L	50.0		104	75-125			
1,1-Dichloroethane	50.7	1	ug/L	50.0		101	70-135			
1,1-Dichloroethylene	50.4	1	ug/L	50.0		101	70-130			
1,1-Dichloropropene	51.6	1	ug/L	50.0		103	75-135			
1,2,3-Trichlorobenzene	53.0	1	ug/L	50.0		106	55-140			
1,2,3-Trichloropropane	48.1	1	ug/L	50.0		96.1	75-125			
1,2,4-Trichlorobenzene	53.8	1	ug/L	50.0		108	65-135			
1,2,4-Trimethylbenzene	53.9	1	ug/L	50.0		108	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	57.8	1	ug/L	50.0		116	50-130			
1,2-Dibromoethane (EDB)	49.4	1	ug/L	50.0		98.8	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
LCS (BGF0926-BS1)				Prepared & Analyzed: 06/23/2023						
1,2-Dichlorobenzene	50.8	0.5	ug/L	50.0		102	70-120			
1,2-Dichloroethane	49.8	1	ug/L	50.0		99.6	70-130			
1,2-Dichloropropane	50.4	0.5	ug/L	50.0		101	75-125			
1,3,5-Trimethylbenzene	51.8	1	ug/L	50.0		104	75-125			
1,3-Dichlorobenzene	52.1	1	ug/L	50.0		104	75-125			
1,3-Dichloropropane	49.8	1	ug/L	50.0		99.6	75-125			
1,4-Dichlorobenzene	49.0	1	ug/L	50.0		98.0	75-125			
2,2-Dichloropropane	59.5	1	ug/L	50.0		119	70-135			
2-Butanone (MEK)	38.7	10	ug/L	50.0		77.3	30-150			
2-Chlorotoluene	52.0	1	ug/L	50.0		104	75-125			
2-Hexanone (MBK)	45.1	5	ug/L	50.0		90.3	55-130			
4-Chlorotoluene	51.5	1	ug/L	50.0		103	75-130			
4-Isopropyltoluene	55.5	1	ug/L	50.0		111	75-130			
4-Methyl-2-pentanone (MIBK)	46.6	5	ug/L	50.0		93.3	60-135			
Acetone	34.2	10	ug/L	50.0		68.4	40-140			
Benzene	50.1	1	ug/L	50.0		100	80-120			
Bromobenzene	51.2	1	ug/L	50.0		102	75-125			
Bromochloromethane	49.8	1	ug/L	50.0		99.5	65-130			
Bromodichloromethane	56.9	0.5	ug/L	50.0		114	75-120			
Bromoform	56.3	1	ug/L	50.0		113	70-130			
Bromomethane	32.8	1	ug/L	50.0		65.7	30-145			
Carbon disulfide	44.1	10	ug/L	50.0		88.3	35-160			
Carbon tetrachloride	59.1	1	ug/L	50.0		118	65-140			
Chlorobenzene	50.7	1	ug/L	50.0		101	80-120			
Chloroethane	42.6	1	ug/L	50.0		85.1	60-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
LCS (BGF0926-BS1)				Prepared & Analyzed: 06/23/2023						
Chloroform	49.4	0.5	ug/L	50.0		98.7	65-135			
Chloromethane	43.8	1	ug/L	50.0		87.7	40-125			
cis-1,2-Dichloroethylene	49.3	1	ug/L	50.0		98.7	70-125			
cis-1,3-Dichloropropene	54.3	1	ug/L	50.0		109	70-130			
Dibromochloromethane	58.2	0.5	ug/L	50.0		116	60-135			
Dibromomethane	50.2	1	ug/L	50.0		100	75-125			
Dichlorodifluoromethane	69.6	1	ug/L	50.0		139	30-155			
Ethylbenzene	51.9	1	ug/L	50.0		104	75-125			
Hexachlorobutadiene	57.5	0.8	ug/L	50.0		115	50-140			
Isopropylbenzene	50.5	1	ug/L	50.0		101	75-125			
m+p-Xylenes	100	2	ug/L	100		100	75-130			
Methylene chloride	43.8	4	ug/L	50.0		87.5	55-140			
Methyl-t-butyl ether (MTBE)	47.7	1	ug/L	50.0		95.5	65-125			
Naphthalene	51.6	1	ug/L	50.0		103	55-140			
n-Butylbenzene	55.6	1	ug/L	50.0		111	70-135			
n-Propylbenzene	53.4	1	ug/L	50.0		107	70-130			
o-Xylene	53.8	1	ug/L	50.0		108	80-120			
sec-Butylbenzene	55.8	1	ug/L	50.0		112	70-125			
Styrene	51.1	1	ug/L	50.0		102	65-135			
tert-Butylbenzene	54.5	1	ug/L	50.0		109	70-130			
Tetrachloroethylene (PCE)	53.4	1	ug/L	50.0		107	45-150			
Toluene	52.4	1	ug/L	50.0		105	75-120			
trans-1,2-Dichloroethylene	48.4	1	ug/L	50.0		96.8	60-140			
trans-1,3-Dichloropropene	60.2	1	ug/L	50.0		120	55-140			
Trichloroethylene	52.0	1	ug/L	50.0		104	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
LCS (BGF0926-BS1)				Prepared & Analyzed: 06/23/2023						
Trichlorofluoromethane	61.9	1	ug/L	50.0		124	60-145			
Vinyl chloride	46.8	0.5	ug/L	50.0		93.6	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.3*		ug/L	*50.0*		*92.6*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.4*		ug/L	*50.0*		*98.9*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.7*		ug/L	*50.0*		*95.4*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.8*		ug/L	*50.0*		*99.7*	*70-130*			
Matrix Spike (BGF0926-MS1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
1,1,1,2-Tetrachloroethane	50.2	0.4	ug/L	50.0	BLOD	100	80-130			
1,1,1-Trichloroethane	53.3	1	ug/L	50.0	BLOD	107	65-130			
1,1,2,2-Tetrachloroethane	46.1	0.4	ug/L	50.0	BLOD	92.2	65-130			
1,1,2-Trichloroethane	50.5	1	ug/L	50.0	BLOD	101	75-125			
1,1-Dichloroethane	49.0	1	ug/L	50.0	BLOD	98.0	70-135			
1,1-Dichloroethylene	49.8	1	ug/L	50.0	BLOD	99.6	50-145			
1,1-Dichloropropene	50.0	1	ug/L	50.0	BLOD	100	75-135			
1,2,3-Trichlorobenzene	50.4	1	ug/L	50.0	BLOD	101	55-140			
1,2,3-Trichloropropane	47.0	1	ug/L	50.0	BLOD	94.1	75-125			
1,2,4-Trichlorobenzene	51.2	1	ug/L	50.0	BLOD	102	65-135			
1,2,4-Trimethylbenzene	51.3	1	ug/L	50.0	BLOD	103	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	54.5	1	ug/L	50.0	BLOD	109	50-130			
1,2-Dibromoethane (EDB)	46.7	1	ug/L	50.0	BLOD	93.4	80-120			
1,2-Dichlorobenzene	47.6	0.5	ug/L	50.0	BLOD	95.2	70-120			
1,2-Dichloroethane	48.1	1	ug/L	50.0	BLOD	96.2	70-130			
1,2-Dichloropropane	49.0	0.5	ug/L	50.0	BLOD	98.0	75-125			
1,3,5-Trimethylbenzene	50.1	1	ug/L	50.0	BLOD	100	75-124			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Matrix Spike (BGF0926-MS1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
1,3-Dichlorobenzene	49.7	1	ug/L	50.0	BLOD	99.4	75-125			
1,3-Dichloropropane	48.7	1	ug/L	50.0	BLOD	97.5	75-125			
1,4-Dichlorobenzene	47.3	1	ug/L	50.0	BLOD	94.6	75-125			
2,2-Dichloropropane	56.7	1	ug/L	50.0	BLOD	113	70-135			
2-Butanone (MEK)	42.6	10	ug/L	50.0	BLOD	85.2	30-150			
2-Chlorotoluene	47.3	1	ug/L	50.0	BLOD	94.6	75-125			
2-Hexanone (MBK)	45.0	5	ug/L	50.0	BLOD	90.0	55-130			
4-Chlorotoluene	48.9	1	ug/L	50.0	BLOD	97.8	75-130			
4-Isopropyltoluene	52.4	1	ug/L	50.0	BLOD	105	75-130			
4-Methyl-2-pentanone (MIBK)	45.6	5	ug/L	50.0	BLOD	91.1	60-135			
Acetone	34.2	10	ug/L	50.0	BLOD	68.3	40-140			
Benzene	48.0	1	ug/L	50.0	BLOD	95.9	80-120			
Bromobenzene	49.0	1	ug/L	50.0	BLOD	98.1	75-125			
Bromochloromethane	47.7	1	ug/L	50.0	BLOD	95.5	65-130			
Bromodichloromethane	53.7	0.5	ug/L	50.0	BLOD	107	75-136			
Bromoform	54.2	1	ug/L	50.0	BLOD	108	70-130			
Bromomethane	31.5	1	ug/L	50.0	BLOD	63.0	30-145			
Carbon disulfide	36.9	10	ug/L	50.0	BLOD	71.9	35-160			
Carbon tetrachloride	56.1	1	ug/L	50.0	BLOD	112	65-140			
Chlorobenzene	48.4	1	ug/L	50.0	BLOD	96.9	80-120			
Chloroethane	41.3	1	ug/L	50.0	BLOD	82.6	60-135			
Chloroform	48.1	0.5	ug/L	50.0	BLOD	96.2	65-135			
Chloromethane	43.3	1	ug/L	50.0	BLOD	86.6	40-125			
cis-1,2-Dichloroethylene	47.8	1	ug/L	50.0	BLOD	95.5	70-125			
cis-1,3-Dichloropropene	52.4	1	ug/L	50.0	BLOD	105	47-136			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Matrix Spike (BGF0926-MS1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
Dibromochloromethane	55.1	0.5	ug/L	50.0	BLOD	110	60-135			
Dibromomethane	48.8	1	ug/L	50.0	BLOD	97.7	75-125			
Dichlorodifluoromethane	67.3	1	ug/L	50.0	BLOD	135	30-155			
Ethylbenzene	49.7	1	ug/L	50.0	BLOD	99.3	75-125			
Hexachlorobutadiene	56.3	0.8	ug/L	50.0	BLOD	113	50-140			
Isopropylbenzene	48.4	1	ug/L	50.0	BLOD	96.9	75-125			
m+p-Xylenes	97.0	2	ug/L	100	BLOD	97.0	75-130			
Methylene chloride	42.3	4	ug/L	50.0	BLOD	84.7	55-140			
Methyl-t-butyl ether (MTBE)	47.6	1	ug/L	50.0	BLOD	95.2	65-125			
Naphthalene	51.0	1	ug/L	50.0	BLOD	102	55-140			
n-Butylbenzene	51.4	1	ug/L	50.0	BLOD	103	70-135			
n-Propylbenzene	50.0	1	ug/L	50.0	BLOD	100	70-130			
o-Xylene	50.6	1	ug/L	50.0	BLOD	101	80-120			
sec-Butylbenzene	53.1	1	ug/L	50.0	BLOD	106	70-125			
Styrene	49.0	1	ug/L	50.0	BLOD	98.1	65-135			
tert-Butylbenzene	50.3	1	ug/L	50.0	BLOD	101	70-130			
Tetrachloroethylene (PCE)	50.2	1	ug/L	50.0	BLOD	100	51-231			
Toluene	50.6	1	ug/L	50.0	BLOD	101	75-120			
trans-1,2-Dichloroethylene	48.2	1	ug/L	50.0	BLOD	96.4	60-140			
trans-1,3-Dichloropropene	57.4	1	ug/L	50.0	BLOD	115	55-140			
Trichloroethylene	50.0	1	ug/L	50.0	BLOD	100	70-125			
Trichlorofluoromethane	59.7	1	ug/L	50.0	BLOD	119	60-145			
Vinyl chloride	46.5	0.5	ug/L	50.0	BLOD	93.0	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*47.0*		ug/L	*50.0*		*94.0*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.5*		ug/L	*50.0*		*101*	*75-120*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Matrix Spike (BGF0926-MS1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
Surr: Dibromofluoromethane (Surr)	*49.7*		ug/L	*50.0*		*99.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.5*		ug/L	*50.0*		*101*	*70-130*			
Matrix Spike Dup (BGF0926-MSD1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
1,1,1,2-Tetrachloroethane	55.3	0.4	ug/L	50.0	BLOD	111	80-130	9.55	30	
1,1,1-Trichloroethane	55.6	1	ug/L	50.0	BLOD	111	65-130	4.19	30	
1,1,2,2-Tetrachloroethane	50.8	0.4	ug/L	50.0	BLOD	102	65-130	9.76	30	
1,1,2-Trichloroethane	53.3	1	ug/L	50.0	BLOD	107	75-125	5.45	30	
1,1-Dichloroethane	51.2	1	ug/L	50.0	BLOD	102	70-135	4.43	30	
1,1-Dichloroethylene	50.8	1	ug/L	50.0	BLOD	102	50-145	1.93	30	
1,1-Dichloropropene	52.3	1	ug/L	50.0	BLOD	105	75-135	4.50	30	
1,2,3-Trichlorobenzene	56.0	1	ug/L	50.0	BLOD	112	55-140	10.7	30	
1,2,3-Trichloropropane	50.4	1	ug/L	50.0	BLOD	101	75-125	6.78	30	
1,2,4-Trichlorobenzene	55.7	1	ug/L	50.0	BLOD	111	65-135	8.53	30	
1,2,4-Trimethylbenzene	55.2	1	ug/L	50.0	BLOD	110	75-130	7.34	30	
1,2-Dibromo-3-chloropropane (DBCP)	57.4	1	ug/L	50.0	BLOD	115	50-130	5.13	30	
1,2-Dibromoethane (EDB)	50.6	1	ug/L	50.0	BLOD	101	80-120	8.14	30	
1,2-Dichlorobenzene	52.0	0.5	ug/L	50.0	BLOD	104	70-120	8.89	30	
1,2-Dichloroethane	50.9	1	ug/L	50.0	BLOD	102	70-130	5.63	30	
1,2-Dichloropropane	52.3	0.5	ug/L	50.0	BLOD	105	75-125	6.52	30	
1,3,5-Trimethylbenzene	55.0	1	ug/L	50.0	BLOD	110	75-124	9.35	30	
1,3-Dichlorobenzene	54.3	1	ug/L	50.0	BLOD	109	75-125	8.88	30	
1,3-Dichloropropane	52.1	1	ug/L	50.0	BLOD	104	75-125	6.63	30	
1,4-Dichlorobenzene	50.2	1	ug/L	50.0	BLOD	100	75-125	6.03	30	
2,2-Dichloropropane	59.4	1	ug/L	50.0	BLOD	119	70-135	4.60	30	

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Matrix Spike Dup (BGF0926-MSD1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
2-Butanone (MEK)	39.1	10	ug/L	50.0	BLOD	78.2	30-150	8.61	30	
2-Chlorotoluene	51.5	1	ug/L	50.0	BLOD	103	75-125	8.42	30	
2-Hexanone (MBK)	44.6	5	ug/L	50.0	BLOD	89.2	55-130	0.871	30	
4-Chlorotoluene	53.2	1	ug/L	50.0	BLOD	106	75-130	8.42	30	
4-Isopropyltoluene	57.8	1	ug/L	50.0	BLOD	116	75-130	9.73	30	
4-Methyl-2-pentanone (MIBK)	45.0	5	ug/L	50.0	BLOD	90.1	60-135	1.15	30	
Acetone	34.4	10	ug/L	50.0	BLOD	68.9	40-140	0.816	30	
Benzene	51.4	1	ug/L	50.0	BLOD	103	80-120	6.91	30	
Bromobenzene	52.6	1	ug/L	50.0	BLOD	105	75-125	7.02	30	
Bromochloromethane	50.2	1	ug/L	50.0	BLOD	100	65-130	5.10	30	
Bromodichloromethane	56.7	0.5	ug/L	50.0	BLOD	113	75-136	5.40	30	
Bromoform	58.4	1	ug/L	50.0	BLOD	117	70-130	7.50	30	
Bromomethane	34.5	1	ug/L	50.0	BLOD	68.9	30-145	8.97	30	
Carbon disulfide	37.1	10	ug/L	50.0	BLOD	72.3	35-160	0.595	30	
Carbon tetrachloride	59.6	1	ug/L	50.0	BLOD	119	65-140	6.19	30	
Chlorobenzene	53.2	1	ug/L	50.0	BLOD	106	80-120	9.40	30	
Chloroethane	43.5	1	ug/L	50.0	BLOD	87.0	60-135	5.21	30	
Chloroform	49.8	0.5	ug/L	50.0	BLOD	99.5	65-135	3.43	30	
Chloromethane	45.3	1	ug/L	50.0	BLOD	90.5	40-125	4.47	30	
cis-1,2-Dichloroethylene	50.4	1	ug/L	50.0	BLOD	101	70-125	5.32	30	
cis-1,3-Dichloropropene	55.9	1	ug/L	50.0	BLOD	112	47-136	6.43	30	
Dibromochloromethane	59.5	0.5	ug/L	50.0	BLOD	119	60-135	7.70	30	
Dibromomethane	52.8	1	ug/L	50.0	BLOD	106	75-125	7.81	30	
Dichlorodifluoromethane	70.2	1	ug/L	50.0	BLOD	140	30-155	4.16	30	
Ethylbenzene	53.7	1	ug/L	50.0	BLOD	107	75-125	7.78	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0926 - SW5030B-MS										
Matrix Spike Dup (BGF0926-MSD1)	**Source: 23F1222-01**			Prepared & Analyzed: 06/23/2023						
Hexachlorobutadiene	60.6	0.8	ug/L	50.0	BLOD	121	50-140	7.24	30	
Isopropylbenzene	52.5	1	ug/L	50.0	BLOD	105	75-125	8.10	30	
m+p-Xylenes	105	2	ug/L	100	BLOD	105	75-130	7.94	30	
Methylene chloride	44.3	4	ug/L	50.0	BLOD	88.6	55-140	4.48	30	
Methyl-t-butyl ether (MTBE)	49.1	1	ug/L	50.0	BLOD	98.1	65-125	3.00	30	
Naphthalene	54.8	1	ug/L	50.0	BLOD	110	55-140	7.30	30	
n-Butylbenzene	56.1	1	ug/L	50.0	BLOD	112	70-135	8.74	30	
n-Propylbenzene	55.3	1	ug/L	50.0	BLOD	111	70-130	9.93	30	
o-Xylene	55.4	1	ug/L	50.0	BLOD	111	80-120	9.03	30	
sec-Butylbenzene	57.3	1	ug/L	50.0	BLOD	115	70-125	7.53	30	
Styrene	53.3	1	ug/L	50.0	BLOD	107	65-135	8.30	30	
tert-Butylbenzene	55.5	1	ug/L	50.0	BLOD	111	70-130	9.80	30	
Tetrachloroethylene (PCE)	54.4	1	ug/L	50.0	BLOD	109	51-231	8.09	30	
Toluene	54.3	1	ug/L	50.0	BLOD	109	75-120	6.99	30	
trans-1,2-Dichloroethylene	49.4	1	ug/L	50.0	BLOD	98.8	60-140	2.48	30	
trans-1,3-Dichloropropene	61.9	1	ug/L	50.0	BLOD	124	55-140	7.58	30	
Trichloroethylene	53.7	1	ug/L	50.0	BLOD	107	70-125	7.13	30	
Trichlorofluoromethane	62.5	1	ug/L	50.0	BLOD	125	60-145	4.49	30	
Vinyl chloride	47.0	0.5	ug/L	50.0	BLOD	94.0	50-145	1.05	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.5*		ug/L	*50.0*		*93.0*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.4*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.3*		ug/L	*50.0*		*96.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.8*		ug/L	*50.0*		*102*	*70-130*			
Batch BGF0971 - SW5030B-MS										

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
Blank (BGF0971-BLK1)				Prepared & Analyzed: 06/26/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.7*		ug/L	*50.0*		*99.4*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.2*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.7*		ug/L	*50.0*		*101*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.8*		ug/L	*50.0*		*97.7*	*70-130*			
LCS (BGF0971-BS1)				Prepared & Analyzed: 06/26/2023						
1,1,1,2-Tetrachloroethane	47.9	0.4	ug/L	50.0		95.9	80-130			
1,1,1-Trichloroethane	46.9	1	ug/L	50.0		93.8	65-130			
1,1,2,2-Tetrachloroethane	43.5	0.4	ug/L	50.0		86.9	65-130			
1,1,2-Trichloroethane	47.7	1	ug/L	50.0		95.4	75-125			
1,1-Dichloroethane	43.8	1	ug/L	50.0		87.7	70-135			
1,1-Dichloroethylene	44.2	1	ug/L	50.0		88.4	70-130			
1,1-Dichloropropene	45.0	1	ug/L	50.0		89.9	75-135			
1,2,3-Trichlorobenzene	47.8	1	ug/L	50.0		95.6	55-140			
1,2,3-Trichloropropane	43.5	1	ug/L	50.0		87.0	75-125			
1,2,4-Trichlorobenzene	48.3	1	ug/L	50.0		96.7	65-135			
1,2,4-Trimethylbenzene	47.2	1	ug/L	50.0		94.4	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	48.7	1	ug/L	50.0		97.4	50-130			
1,2-Dibromoethane (EDB)	45.9	1	ug/L	50.0		91.9	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
LCS (BGF0971-BS1)				Prepared & Analyzed: 06/26/2023						
1,2-Dichlorobenzene	44.8	0.5	ug/L	50.0		89.6	70-120			
1,2-Dichloroethane	42.8	1	ug/L	50.0		85.5	70-130			
1,2-Dichloropropane	43.4	0.5	ug/L	50.0		86.9	75-125			
1,3,5-Trimethylbenzene	46.1	1	ug/L	50.0		92.1	75-125			
1,3-Dichlorobenzene	46.8	1	ug/L	50.0		93.5	75-125			
1,3-Dichloropropane	44.8	1	ug/L	50.0		89.6	75-125			
1,4-Dichlorobenzene	43.6	1	ug/L	50.0		87.2	75-125			
2,2-Dichloropropane	51.3	1	ug/L	50.0		103	70-135			
2-Butanone (MEK)	37.7	10	ug/L	50.0		75.5	30-150			
2-Chlorotoluene	44.9	1	ug/L	50.0		89.9	75-125			
2-Hexanone (MBK)	46.6	5	ug/L	50.0		93.3	55-130			
4-Chlorotoluene	45.6	1	ug/L	50.0		91.2	75-130			
4-Isopropyltoluene	47.6	1	ug/L	50.0		95.2	75-130			
4-Methyl-2-pentanone (MIBK)	43.2	5	ug/L	50.0		86.3	60-135			
Acetone	35.3	10	ug/L	50.0		70.5	40-140			
Benzene	43.9	1	ug/L	50.0		87.9	80-120			
Bromobenzene	46.2	1	ug/L	50.0		92.4	75-125			
Bromochloromethane	46.1	1	ug/L	50.0		92.1	65-130			
Bromodichloromethane	47.8	0.5	ug/L	50.0		95.7	75-120			
Bromoform	52.5	1	ug/L	50.0		105	70-130			
Bromomethane	28.7	1	ug/L	50.0		57.5	30-145			
Carbon disulfide	38.8	10	ug/L	50.0		77.7	35-160			
Carbon tetrachloride	47.4	1	ug/L	50.0		94.8	65-140			
Chlorobenzene	45.3	1	ug/L	50.0		90.5	80-120			
Chloroethane	37.9	1	ug/L	50.0		75.9	60-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
LCS (BGF0971-BS1)				Prepared & Analyzed: 06/26/2023						
Chloroform	43.2	0.5	ug/L	50.0		86.4	65-135			
Chloromethane	36.4	1	ug/L	50.0		72.7	40-125			
cis-1,2-Dichloroethylene	44.1	1	ug/L	50.0		88.2	70-125			
cis-1,3-Dichloropropene	36.8	1	ug/L	50.0		73.5	70-130			
Dibromochloromethane	51.8	0.5	ug/L	50.0		104	60-135			
Dibromomethane	43.3	1	ug/L	50.0		86.7	75-125			
Dichlorodifluoromethane	53.4	1	ug/L	50.0		107	30-155			
Ethylbenzene	46.0	1	ug/L	50.0		92.0	75-125			
Hexachlorobutadiene	51.4	0.8	ug/L	50.0		103	50-140			
Isopropylbenzene	45.4	1	ug/L	50.0		90.9	75-125			
m+p-Xylenes	90.5	2	ug/L	100		90.5	75-130			
Methylene chloride	42.1	4	ug/L	50.0		84.2	55-140			
Methyl-t-butyl ether (MTBE)	44.4	1	ug/L	50.0		88.7	65-125			
Naphthalene	47.1	1	ug/L	50.0		94.1	55-140			
n-Butylbenzene	47.3	1	ug/L	50.0		94.6	70-135			
n-Propylbenzene	46.5	1	ug/L	50.0		93.0	70-130			
o-Xylene	47.0	1	ug/L	50.0		94.1	80-120			
sec-Butylbenzene	48.4	1	ug/L	50.0		96.9	70-125			
Styrene	46.3	1	ug/L	50.0		92.7	65-135			
tert-Butylbenzene	46.9	1	ug/L	50.0		93.9	70-130			
Tetrachloroethylene (PCE)	46.3	1	ug/L	50.0		92.7	45-150			
Toluene	46.6	1	ug/L	50.0		93.3	75-120			
trans-1,2-Dichloroethylene	42.8	1	ug/L	50.0		85.6	60-140			
trans-1,3-Dichloropropene	55.0	1	ug/L	50.0		110	55-140			
Trichloroethylene	45.0	1	ug/L	50.0		90.0	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
LCS (BGF0971-BS1)				Prepared & Analyzed: 06/26/2023						
Trichlorofluoromethane	49.6	1	ug/L	50.0		99.2	60-145			
Vinyl chloride	38.5	0.5	ug/L	50.0		77.0	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*47.6*		ug/L	*50.0*		*95.1*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.9*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.4*		ug/L	*50.0*		*96.7*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.6*		ug/L	*50.0*		*99.2*	*70-130*			
Duplicate (BGF0971-DUP1)	**Source: 23F1273-02**			Prepared & Analyzed: 06/26/2023						
1,1,1,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	0.50	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	0.50	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
Duplicate (BGF0971-DUP1)	**Source: 23F1273-02**			Prepared & Analyzed: 06/26/2023						
1,3-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
2,2-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	10.0	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	5.00	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	5.00	ug/L		BLOD			NA	30	
Acetone	ND	10.0	ug/L		BLOD			NA	30	
Benzene	ND	1.00	ug/L		BLOD			NA	30	
Bromobenzene	ND	1.00	ug/L		BLOD			NA	30	
Bromochloromethane	ND	1.00	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	0.50	ug/L		BLOD			NA	30	
Bromoform	ND	1.00	ug/L		BLOD			NA	30	
Bromomethane	ND	1.00	ug/L		BLOD			NA	30	
Carbon disulfide	ND	10.0	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	1.00	ug/L		BLOD			NA	30	
Chlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
Chloroethane	ND	1.00	ug/L		BLOD			NA	30	
Chloroform	ND	0.50	ug/L		BLOD			NA	30	
Chloromethane	ND	1.00	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
cis-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	

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Batch BGF0971 - SW5030B-MS										
Duplicate (BGF0971-DUP1)	**Source: 23F1273-02**			Prepared & Analyzed: 06/26/2023						
Dibromochloromethane	ND	0.50	ug/L		BLOD			NA	30	
Dibromomethane	ND	1.00	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	5.00	ug/L		BLOD			NA	30	
Ethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	0.80	ug/L		BLOD			NA	30	
Iodomethane	ND	10.0	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	1.00	ug/L		BLOD			NA	30	
m+p-Xylenes	ND	2.00	ug/L		BLOD			NA	30	
Methylene chloride	ND	4.00	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	1.00	ug/L		BLOD			NA	30	
Naphthalene	ND	1.00	ug/L		BLOD			NA	30	
n-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
n-Propylbenzene	ND	1.00	ug/L		BLOD			NA	30	
o-Xylene	ND	1.00	ug/L		BLOD			NA	30	
sec-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Styrene	ND	1.00	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	1.00	ug/L		BLOD			NA	30	
Toluene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
Trichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
Trichlorofluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Vinyl acetate	ND	10.0	ug/L		BLOD			NA	30	

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Batch BGF0971 - SW5030B-MS										
Duplicate (BGF0971-DUP1)	**Source: 23F1273-02**			Prepared & Analyzed: 06/26/2023						
Vinyl chloride	ND	0.50	ug/L		BLOD			NA	30	
Xylenes, Total	ND	3.00	ug/L		BLOD			NA	30	
Tetrahydrofuran	ND	10.0	ug/L		BLOD			NA	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*53.2*		ug/L	*50.0*		*106*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.8*		ug/L	*50.0*		*104*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*54.1*		ug/L	*50.0*		*108*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.5*		ug/L	*50.0*		*99.0*	*70-130*			
Matrix Spike (BGF0971-MS1)	**Source: 23F1273-04**			Prepared & Analyzed: 06/26/2023						
1,1,1,2-Tetrachloroethane	42.6	0.4	ug/L	50.0	BLOD	85.1	80-130			
1,1,1-Trichloroethane	39.7	1	ug/L	50.0	BLOD	79.4	65-130			
1,1,2,2-Tetrachloroethane	40.6	0.4	ug/L	50.0	BLOD	81.2	65-130			
1,1,2-Trichloroethane	42.7	1	ug/L	50.0	BLOD	85.4	75-125			
1,1-Dichloroethane	38.7	1	ug/L	50.0	BLOD	76.3	70-135			
1,1-Dichloroethylene	38.3	1	ug/L	50.0	BLOD	76.7	50-145			
1,1-Dichloropropene	38.4	1	ug/L	50.0	BLOD	76.9	75-135			
1,2,3-Trichlorobenzene	41.3	1	ug/L	50.0	BLOD	82.6	55-140			
1,2,3-Trichloropropane	40.4	1	ug/L	50.0	BLOD	80.9	75-125			
1,2,4-Trichlorobenzene	40.8	1	ug/L	50.0	BLOD	81.6	65-135			
1,2,4-Trimethylbenzene	40.6	1	ug/L	50.0	BLOD	81.2	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	44.2	1	ug/L	50.0	BLOD	88.5	50-130			
1,2-Dibromoethane (EDB)	41.2	1	ug/L	50.0	BLOD	82.4	80-120			
1,2-Dichlorobenzene	38.4	0.5	ug/L	50.0	BLOD	76.9	70-120			
1,2-Dichloroethane	38.1	1	ug/L	50.0	BLOD	76.1	70-130			
1,2-Dichloropropane	39.8	0.5	ug/L	50.0	BLOD	79.7	75-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
Matrix Spike (BGF0971-MS1)	**Source: 23F1273-04**			Prepared & Analyzed: 06/26/2023						
1,3,5-Trimethylbenzene	39.2	1	ug/L	50.0	BLOD	78.5	75-124			
1,3-Dichlorobenzene	40.0	1	ug/L	50.0	BLOD	79.9	75-125			
1,3-Dichloropropane	40.1	1	ug/L	50.0	BLOD	80.2	75-125			
1,4-Dichlorobenzene	37.5	1	ug/L	50.0	BLOD	75.0	75-125			M
2,2-Dichloropropane	43.4	1	ug/L	50.0	BLOD	86.9	70-135			
2-Butanone (MEK)	45.3	10	ug/L	50.0	BLOD	90.6	30-150			
2-Chlorotoluene	39.4	1	ug/L	50.0	BLOD	78.8	75-125			
2-Hexanone (MBK)	45.5	5	ug/L	50.0	BLOD	90.9	55-130			
4-Chlorotoluene	39.6	1	ug/L	50.0	BLOD	79.3	75-130			
4-Isopropyltoluene	42.2	1	ug/L	50.0	BLOD	84.5	75-130			
4-Methyl-2-pentanone (MIBK)	46.2	5	ug/L	50.0	BLOD	92.5	60-135			
Acetone	33.5	10	ug/L	50.0	BLOD	67.0	40-140			
Benzene	38.5	1	ug/L	50.0	BLOD	77.0	80-120			M
Bromobenzene	41.0	1	ug/L	50.0	BLOD	82.1	75-125			
Bromochloromethane	40.5	1	ug/L	50.0	BLOD	81.0	65-130			
Bromodichloromethane	43.3	0.5	ug/L	50.0	BLOD	86.5	75-136			
Bromoform	46.9	1	ug/L	50.0	BLOD	93.8	70-130			
Bromomethane	25.5	1	ug/L	50.0	BLOD	51.0	30-145			
Carbon disulfide	42.6	10	ug/L	50.0	BLOD	84.4	35-160			
Carbon tetrachloride	41.6	1	ug/L	50.0	BLOD	83.1	65-140			
Chlorobenzene	40.0	1	ug/L	50.0	BLOD	79.9	80-120			M
Chloroethane	31.6	1	ug/L	50.0	BLOD	63.3	60-135			
Chloroform	37.5	0.5	ug/L	50.0	BLOD	75.1	65-135			
Chloromethane	31.9	1	ug/L	50.0	BLOD	63.8	40-125			
cis-1,2-Dichloroethylene	38.9	1	ug/L	50.0	BLOD	77.7	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
Matrix Spike (BGF0971-MS1)	**Source: 23F1273-04**			Prepared & Analyzed: 06/26/2023						
cis-1,3-Dichloropropene	43.5	1	ug/L	50.0	BLOD	87.1	47-136			
Dibromochloromethane	46.3	0.5	ug/L	50.0	BLOD	92.6	60-135			
Dibromomethane	40.4	1	ug/L	50.0	BLOD	80.9	75-125			
Dichlorodifluoromethane	46.4	1	ug/L	50.0	BLOD	92.8	30-155			
Ethylbenzene	40.0	1	ug/L	50.0	BLOD	80.1	75-125			
Hexachlorobutadiene	45.8	0.8	ug/L	50.0	BLOD	91.6	50-140			
Isopropylbenzene	38.4	1	ug/L	50.0	BLOD	76.9	75-125			
m+p-Xylenes	77.0	2	ug/L	100	BLOD	77.0	75-130			
Methylene chloride	33.8	4	ug/L	50.0	BLOD	67.5	55-140			
Methyl-t-butyl ether (MTBE)	40.3	1	ug/L	50.0	BLOD	80.6	65-125			
Naphthalene	42.0	1	ug/L	50.0	BLOD	84.1	55-140			
n-Butylbenzene	40.7	1	ug/L	50.0	BLOD	81.4	70-135			
n-Propylbenzene	39.3	1	ug/L	50.0	BLOD	78.6	70-130			
o-Xylene	41.9	1	ug/L	50.0	BLOD	83.7	80-120			
sec-Butylbenzene	41.8	1	ug/L	50.0	BLOD	83.5	70-125			
Styrene	40.6	1	ug/L	50.0	BLOD	81.2	65-135			
tert-Butylbenzene	40.2	1	ug/L	50.0	BLOD	80.5	70-130			
Tetrachloroethylene (PCE)	41.2	1	ug/L	50.0	BLOD	82.4	51-231			
Toluene	40.0	1	ug/L	50.0	BLOD	80.0	75-120			
trans-1,2-Dichloroethylene	36.7	1	ug/L	50.0	BLOD	73.4	60-140			
trans-1,3-Dichloropropene	47.6	1	ug/L	50.0	BLOD	95.1	55-140			
Trichloroethylene	39.2	1	ug/L	50.0	BLOD	78.4	70-125			
Trichlorofluoromethane	42.6	1	ug/L	50.0	BLOD	85.1	60-145			
Vinyl chloride	34.9	0.5	ug/L	50.0	BLOD	69.7	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.0*		ug/L	*50.0*		*91.9*	*70-120*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0971 - SW5030B-MS										
Matrix Spike (BGF0971-MS1)	**Source: 23F1273-04**			Prepared & Analyzed: 06/26/2023						
Surr: 4-Bromofluorobenzene (Surr)	*50.1*		ug/L	*50.0*		*100*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.7*		ug/L	*50.0*		*95.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.4*		ug/L	*50.0*		*98.7*	*70-130*			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
Blank (BGF0869-BLK1)				Prepared & Analyzed: 06/22/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*64.4*		ug/L	*100*		*64.4*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*31.2*		ug/L	*50.0*		*62.4*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*32.2*		ug/L	*100*		*32.2*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*34.1*		ug/L	*50.0*		*68.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*22.1*		ug/L	*100*		*22.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*60.6*		ug/L	*50.0*		*121*	*5-141*			
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
1,2,4-Trichlorobenzene	25.8	10.0	ug/L	50.0		51.5	57-130			L
1,2-Dichlorobenzene	19.6	10.0	ug/L	50.0		39.1	22-115			
1,3-Dichlorobenzene	20.8	10.0	ug/L	50.0		41.7	22-112			
1,4-Dichlorobenzene	22.3	10.0	ug/L	50.0		44.6	13-112			
2,4,6-Trichlorophenol	37.0	10.0	ug/L	50.0		74.0	52-129			
2,4-Dichlorophenol	31.3	10.0	ug/L	50.0		62.5	53-122			
2,4-Dimethylphenol	35.7	5.00	ug/L	50.0		71.4	42-120			
2,4-Dinitrophenol	21.9	50.0	ug/L	50.0		43.7	48-127			L
2,4-Dinitrotoluene	39.4	10.0	ug/L	50.0		78.8	10-173			
2,6-Dinitrotoluene	36.7	10.0	ug/L	50.0		73.3	68-137			
2-Chloronaphthalene	34.7	10.0	ug/L	50.0		69.4	65-120			
2-Chlorophenol	32.6	10.0	ug/L	50.0		65.2	36-120			
2-Nitrophenol	32.5	10.0	ug/L	50.0		65.1	45-167			
3,3'-Dichlorobenzidine	25.5	10.0	ug/L	50.0		51.1	10-213			
4,6-Dinitro-2-methylphenol	35.7	50.0	ug/L	50.0		71.4	53-130			
4-Bromophenyl phenyl ether	36.2	10.0	ug/L	50.0		72.4	65-120			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
4-Chlorophenyl phenyl ether	37.0	10.0	ug/L	50.0		74.1	38-145			
4-Nitrophenol	11.1	50.0	ug/L	50.0		22.2	13-129			
Acenaphthene	39.0	10.0	ug/L	50.0		78.0	60-132			
Acenaphthylene	40.6	10.0	ug/L	50.0		81.2	54-126			
Acetophenone	36.1	20.0	ug/L	50.0		72.2	0-200			
Anthracene	47.9	10.0	ug/L	50.0		95.8	43-120			
Benzo (a) anthracene	46.1	10.0	ug/L	50.0		92.2	42-133			
Benzo (a) pyrene	50.9	10.0	ug/L	50.0		102	32-148			
Benzo (b) fluoranthene	48.4	10.0	ug/L	50.0		96.8	42-140			
Benzo (g,h,i) perylene	60.0	10.0	ug/L	50.0		120	10-195			
Benzo (k) fluoranthene	46.7	10.0	ug/L	50.0		93.5	25-146			
bis (2-Chloroethoxy) methane	41.9	10.0	ug/L	50.0		83.9	49-165			
bis (2-Chloroethyl) ether	33.5	10.0	ug/L	50.0		66.9	43-126			
2,2'-Oxybis (1-chloropropane)	27.8	10.0	ug/L	50.0		55.6	63-139			L
bis (2-Ethylhexyl) phthalate	60.1	10.0	ug/L	50.0		120	29-137			
Butyl benzyl phthalate	62.1	10.0	ug/L	50.0		124	10-140			
Chrysene	46.5	10.0	ug/L	50.0		93.0	44-140			
Dibenz (a,h) anthracene	47.8	10.0	ug/L	50.0		95.5	10-200			
Diethyl phthalate	50.1	10.0	ug/L	50.0		100	10-120			
Dimethyl phthalate	42.7	10.0	ug/L	50.0		85.4	10-120			
Di-n-butyl phthalate	53.0	10.0	ug/L	50.0		106	10-120			
Di-n-octyl phthalate	75.2	10.0	ug/L	50.0		150	19-132			L
Fluoranthene	49.3	10.0	ug/L	50.0		98.6	43-121			
Fluorene	46.3	10.0	ug/L	50.0		92.6	70-120			
Hexachlorobenzene	40.0	1.00	ug/L	50.0		80.0	10-142			

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Semivolatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0869 - SW3510C/EPA600-MS										
LCS (BGF0869-BS1)				Prepared & Analyzed: 06/22/2023						
Hexachlorobutadiene	25.5	10.0	ug/L	50.0		51.1	38-120			
Hexachlorocyclopentadiene	14.6	10.0	ug/L	50.0		29.1	10-76			
Hexachloroethane	22.2	10.0	ug/L	50.0		44.5	55-120			L
Indeno (1,2,3-cd) pyrene	50.9	10.0	ug/L	50.0		102	10-151			
Isophorone	20.7	10.0	ug/L	50.0		41.4	47-180			L
Naphthalene	31.5	5.00	ug/L	50.0		62.9	36-120			
Nitrobenzene	35.3	10.0	ug/L	50.0		70.5	54-158			
n-Nitrosodimethylamine	23.0	10.0	ug/L	50.0		46.1	10-85			
n-Nitrosodi-n-propylamine	41.4	10.0	ug/L	50.0		82.7	14-198			
n-Nitrosodiphenylamine	33.3	10.0	ug/L	50.0		66.7	12-97			
p-Chloro-m-cresol	29.8	10.0	ug/L	50.0		59.6	10-142			
Pentachlorophenol	35.4	20.0	ug/L	50.0		70.9	38-152			
Phenanthrene	50.4	10.0	ug/L	50.0		101	65-120			
Phenol	11.2	10.0	ug/L	50.5		22.3	17-120			
Pyrene	66.4	10.0	ug/L	50.0		133	70-120			L
Pyridine	33.0	10.0	ug/L	50.0		66.1	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*89.7*		ug/L	*100*		*89.7*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*42.3*		ug/L	*50.0*		*84.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*41.9*		ug/L	*100*		*41.9*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*38.3*		ug/L	*50.0*		*76.6*	*5-151*			
Surr: Phenol-d5 (Surr)	*24.1*		ug/L	*100*		*24.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*39.0*		ug/L	*50.0*		*78.1*	*5-141*			

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF0874 - No Prep Wet Chem										
Blank (BGF0874-BLK1)				Prepared & Analyzed: 06/22/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGF0874-BS1)				Prepared & Analyzed: 06/22/2023						
Nitrite as N	0.09	0.05	mg/L	0.100		91.0	80-120			
Matrix Spike (BGF0874-MS1)	**Source: 23F1157-03**			Prepared & Analyzed: 06/22/2023						
Nitrite as N	0.80	0.25	mg/L	0.500	0.32	97.0	80-120			
Matrix Spike Dup (BGF0874-MSD1)	**Source: 23F1157-03**			Prepared & Analyzed: 06/22/2023						
Nitrite as N	0.80	0.25	mg/L	0.500	0.32	97.0	80-120	0.00	20	
Batch BGF0881 - No Prep Wet Chem										
Blank (BGF0881-BLK1)				Prepared & Analyzed: 06/22/2023						
BOD	ND	2.0	mg/L							
LCS (BGF0881-BS1)				Prepared & Analyzed: 06/22/2023						
BOD	188	2	mg/L	198		94.9	84.6-115.4			
Duplicate (BGF0881-DUP1)	**Source: 23F1052-01**			Prepared & Analyzed: 06/22/2023						
BOD	5.4	2.0	mg/L		5.0			7.82	20	
Batch BGF1095 - No Prep Wet Chem										
Blank (BGF1095-BLK1)				Prepared & Analyzed: 06/28/2023						
COD	ND	10.0	mg/L							

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGF1095 - No Prep Wet Chem										
LCS (BGF1095-BS1)				Prepared & Analyzed: 06/28/2023						
COD	49.8	10.0	mg/L	50.0		99.5	88-119			
Matrix Spike (BGF1095-MS1)		**Source: 23F1162-01**		Prepared & Analyzed: 06/28/2023						
COD	57.2	10.0	mg/L	50.0	10.6	93.4	72.4-130			
Matrix Spike Dup (BGF1095-MSD1)		**Source: 23F1162-01**		Prepared & Analyzed: 06/28/2023						
COD	58.9	10.0	mg/L	50.0	10.6	96.6	72.4-130	2.82	20	
Batch BGG0005 - No Prep Wet Chem										
Blank (BGG0005-BLK1)				Prepared & Analyzed: 07/02/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGG0005-BS1)				Prepared & Analyzed: 07/02/2023						
TKN as N	10.8	0.50	mg/L	10.0		108	90-110			
Matrix Spike (BGG0005-MS1)		**Source: 23F1607-02**		Prepared & Analyzed: 07/02/2023						
TKN as N	11.0	0.50	mg/L	10.0	0.44	105	90-110			
Matrix Spike (BGG0005-MS2)		**Source: 23F1656-02**		Prepared & Analyzed: 07/02/2023						
TKN as N	11.3	0.50	mg/L	10.0	0.79	105	90-110			
Matrix Spike Dup (BGG0005-MSD1)		**Source: 23F1607-02**		Prepared & Analyzed: 07/02/2023						
TKN as N	11.1	0.50	mg/L	10.0	0.44	107	90-110	1.26	20	
Matrix Spike Dup (BGG0005-MSD2)		**Source: 23F1656-02**		Prepared & Analyzed: 07/02/2023						
TKN as N	ND	0.50	mg/L	10.0	0.79	-7.90	90-110		20	M, P

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0024 - No Prep Wet Chem										
Blank (BGG0024-BLK1)				Prepared & Analyzed: 07/03/2023						
Ammonia as N	ND	0.10	mg/L							
LCS (BGG0024-BS1)				Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.09	0.1	mg/L	1.00		109	90-110			
Matrix Spike (BGG0024-MS1)		**Source: 23F1499-08**		Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.25	0.10	mg/L	1.00	0.14	111	89.3-131			
Matrix Spike Dup (BGG0024-MSD1)		**Source: 23F1499-08**		Prepared & Analyzed: 07/03/2023						
Ammonia as N	1.26	0.10	mg/L	1.00	0.14	113	89.3-131	1.11	20	
Batch BGG0031 - No Prep Wet Chem										
Blank (BGG0031-BLK1)				Prepared & Analyzed: 07/03/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGG0031-BS1)				Prepared & Analyzed: 07/03/2023						
Nitrate+Nitrite as N	2.52	0.1	mg/L	2.50		101	90-110			
Matrix Spike (BGG0031-MS1)		**Source: 23F1297-01**		Prepared & Analyzed: 07/03/2023						
Nitrate+Nitrite as N	4.87	0.10	mg/L	2.50	2.26	104	90-120			
Matrix Spike Dup (BGG0031-MSD1)		**Source: 23F1297-01**		Prepared & Analyzed: 07/03/2023						
Nitrate+Nitrite as N	4.86	0.10	mg/L	2.50	2.26	104	90-120	0.0822	20	
Batch BGG0077 - No Prep Wet Chem										
Blank (BGG0077-BLK1)				Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							

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Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0077 - No Prep Wet Chem										
LCS (BGG0077-BS1)				Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500		90.4	80-120			
Matrix Spike (BGG0077-MS1)		**Source: 23F1095-01**		Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	65.0	2.50	mg/L	25.0	39.1	104	70-130			
Matrix Spike Dup (BGG0077-MSD1)		**Source: 23F1095-01**		Prepared & Analyzed: 07/05/2023						
Total Recoverable Phenolics	62.6	2.50	mg/L	25.0	39.1	94.0	70-130	3.76	20	
Batch BGG0162 - No Prep Wet Chem										
Blank (BGG0162-BLK1)				Prepared & Analyzed: 07/06/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGG0162-BS1)				Prepared & Analyzed: 07/06/2023						
TKN as N	10.1	0.50	mg/L	10.0		101	90-110			
Matrix Spike (BGG0162-MS1)		**Source: 23F1544-02**		Prepared & Analyzed: 07/06/2023						
TKN as N	10.4	0.50	mg/L	10.0	0.50	99.2	90-110			
Matrix Spike Dup (BGG0162-MSD1)		**Source: 23F1544-02**		Prepared & Analyzed: 07/06/2023						
TKN as N	10.4	0.50	mg/L	10.0	0.50	99.3	90-110	0.106	20	

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Analytical Summary

23F1204-01 Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.8 R5.4**	
23F1204-01	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
23F1204-01RE1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
23F1204-01RE2	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23F1204-01	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
23F1204-01	300 mL / 300 mL	SM5210B-2011	BGF0881	SGF1041	
23F1204-01	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
23F1204-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
23F1204-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
23F1204-01RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
23F1204-01	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
23F1204-01RE1	1.00 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
23F1204-01RE2	2.50 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
23F1204-01	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
23F1204-01RE1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0162	SGG0171	AG30191

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23F1204-01	1020 mL / 2.00 mL	SW8270E	BGF0869	SGF0976	AE30336

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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23F1204-01	5.00 mL / 5.00 mL	SW8260D	BGF0926	SGF0950	AF30236
23F1204-01RE1	5.00 mL / 5.00 mL	SW8260D	BGF0971	SGF0992	AF30236

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
23F1204-01	1.00 mL / 20.0 mL	SW7470A	BGF0980	SGF0988	AF30304

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QC Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.8 R5.4**	
BGF0945-BLK1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-BS1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MS1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MS2	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MSD1	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302
BGF0945-MSD2	50.0 mL / 50.0 mL	SW6020B	BGF0945	SGF0986	AF30302

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGF0874-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
BGF0874-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
BGF0874-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
BGF0874-MS1	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
BGF0874-MSD1	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGF0874	SGF0874	AD30177
BGF0881-BLK1	300 mL / 300 mL	SM5210B-2011	BGF0881	SGF1041	
BGF0881-BS1	300 mL / 300 mL	SM5210B-2011	BGF0881	SGF1041	
BGF0881-DUP1	300 mL / 300 mL	SM5210B-2011	BGF0881	SGF1041	
BGF1095-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGF1095-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGF1095	SGF1080	
BGG0005-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158

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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGG0005-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
BGG0005-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
BGG0005-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
BGG0005-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
BGG0005-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0005	SGG0004	AG30158
BGG0024-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
BGG0024-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
BGG0024-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
BGG0024-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0024	SGG0029	AG30161
BGG0031-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
BGG0031-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
BGG0031-MRL1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
BGG0031-MS1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
BGG0031-MSD1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGG0031	SGG0046	AG30163
BGG0077-BLK1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-BS1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MRL1	5.00 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MS1	0.100 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0077-MSD1	0.100 mL / 10.0 mL	SW9065	BGG0077	SGG0097	AG30176
BGG0162-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0162	SGG0171	AG30191
BGG0162-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0162	SGG0171	AG30191
BGG0162-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0162	SGG0171	AG30191
BGG0162-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0162	SGG0171	AG30191

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGF0869-BLK1	1000 mL / 1.00 mL	SW8270E	BGF0869	SGF0961	AD30296
BGF0869-BS1	1000 mL / 1.00 mL	SW8270E	BGF0869	SGF0961	AD30296

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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BGF0926-BLK1	5.00 mL / 5.00 mL	SW8260D	BGF0926	SGF0950	AF30236
BGF0926-BS1	5.00 mL / 5.00 mL	SW8260D	BGF0926	SGF0950	AF30236
BGF0926-MS1	5.00 mL / 5.00 mL	SW8260D	BGF0926	SGF0950	AF30236
BGF0926-MSD1	5.00 mL / 5.00 mL	SW8260D	BGF0926	SGF0950	AF30236
BGF0971-BLK1	5.00 mL / 5.00 mL	SW8260D	BGF0971	SGF0992	AF30236
BGF0971-BS1	5.00 mL / 5.00 mL	SW8260D	BGF0971	SGF0992	AF30236
BGF0971-DUP1	5.00 mL / 5.00 mL	SW8260D	BGF0971	SGF0992	AF30236
BGF0971-MS1	5.00 mL / 5.00 mL	SW8260D	BGF0971	SGF0992	AF30236

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BGF0980-BLK1	20.0 mL / 20.0 mL	SW7470A	BGF0980	SGF0988	AF30304
BGF0980-BS1	20.0 mL / 20.0 mL	SW7470A	BGF0980	SGF0988	AF30304
BGF0980-MS1	20.0 mL / 20.0 mL	SW7470A	BGF0980	SGF0988	AF30304
BGF0980-MSD1	20.0 mL / 20.0 mL	SW7470A	BGF0980	SGF0988	AF30304

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Certified Analyses included in this Report

Analyte	Certifications
EPA350.1 R2.0 in Non-Potable Water	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
EPA351.2 R2.0 in Non-Potable Water	
TKN as N	VELAP,NCDEQ,WVDEP
SM4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP,NCDEQ
SM4500-NO3F-2011 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM5210B-2011 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6020B in Non-Potable Water	
Arsenic	VELAP,WVDEP
Barium	VELAP,WVDEP
Cadmium	VELAP,WVDEP
Chromium	VELAP,WVDEP
Copper	VELAP,WVDEP
Lead	VELAP,WVDEP
Nickel	VELAP,WVDEP
Selenium	VELAP,WVDEP
Silver	VELAP,WVDEP
Zinc	VELAP,WVDEP
SW7470A in Non-Potable Water	
Mercury	VELAP,NCDEQ,WVDEP

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Certified Analyses included in this Report

Analyte	Certifications
SW8260D in Non-Potable Water	
2-Butanone (MEK)	VELAP,NCDEQ,PADEP,WVDEP
Acetone	VELAP,NCDEQ,PADEP,WVDEP
Benzene	VELAP,NCDEQ,PADEP,WVDEP
Ethylbenzene	VELAP,NCDEQ,PADEP,WVDEP
Toluene	VELAP,NCDEQ,PADEP,WVDEP
Xylenes, Total	VELAP,NCDEQ,PADEP,WVDEP
Tetrahydrofuran	VELAP,PADEP
SW8270E in Non-Potable Water	
Anthracene	VELAP,PADEP,NCDEQ,WVDEP
SW9065 in Non-Potable Water	
Total Recoverable Phenolics	VELAP,WVDEP

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Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental Control Certificate 93016001	93016	06/30/2024
TXCEQ	Texas Comm on Environmental Quality #T104704576-23-1	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12417	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

DS	Surrogate concentration reflects a dilution factor.
J	The reported result is an estimated value.
L	LCS recovery is outside of established acceptance limits
M	Matrix spike recovery is outside established acceptance limits
P	Duplicate analysis does not meet the acceptance criteria for precision
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

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CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SAME	PROJECT NAME/Quote #:
CONTACT: Jennifer Robb	INVOICE CONTACT:	SITE NAME: 2023 City of Bristol Landfill Leachate
ADDRESS: 11260 Roger Bacon Drive,	INVOICE ADDRESS:	PROJECT NUMBER: 02218208.15 Task 1
Ste. 300, Reston VA 20190	INVOICE PHONE #:	P.O. #:
PHONE #: 703-471-6150 EMAIL: jrobb@scsengineers.com		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: V A	Is sample from a chlorinated supply? YES (NO)
		PWS I.D. #:
SAMPLER NAME (PRINT): Logan Howard, Catherine Kirby	SAMPLER SIGNATURE:	Turn Around Time: 10 Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Ammonia - EPA 350.1	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011 (report seperatly from Nitrite)	Nitrite SM22 450-NO3F-2011	SVOC (Anthracene) 8270	Total Metals (As, Ba, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn) 6010	TKN - EPA 351.2 R2.0	Mercury - 7470	Total Recoverable Phenolics - 9065	V. Fatty Acids (See List) 8015	VOCs (See List) 8260
1) EW-61	X					062023	1730		GW	12												
2)									GW													
3)									GW													
4)									GW													
5)									GW													
6)									GW													
7)									GW													
8)									GW													
9)									GW													
10)									DI													

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

Note VOC 8260 no HCl

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
	062123/1230	LCW	
RELINQUISHED: LCW	DATE / TIME	RECEIVED:	DATE / TIME
			6/22/23 0850
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐

LAB USE ONLY Therm ID: 297 COOLER TEMP 2.2 °C
Custody Seals used and intact? (Y) N) Received on ice? (Y) N)

SCS-W 23F1204
2023 City of Bristol Landfill Leach
Recd: 06/22/2023 Due: 07/07/2023

v130325002

Bottle Kit Example

Parameter	Analytical Method	Bottle	Preservative
Biological Oxygen Demand	SM22 5210B-2021	1 L Plastic	Cool <6C
Ammonia	EPA 350.1 R2.0	1 500 mL Plastic	H2SO4
Chemical Oxygen Demand	SM22 5220D-2011		
Nitrite	SM22 4500-NO3F-2011		
Nitrate	SM22 4500-NO3F-2011		
Total Kjeldahl Nitrogen	EPA 351.2 R2.0		
Nitrate	SM22 4500-NO3F-2011	1 250 mL Plastic	Cool <6C
Semi-Volatile Organic Compound: Anthracene	SW-846 Method 8270	1 L Amber	Cool <6C
Total Metals: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, and Zinc	SW-846 Method 6010	1 500 mL Plastic	HNO3
Total Metal: Mercury	SW-846 Method 7470		
Total Recoverable Phenolics	SW-846 Method 9065	1 250 mL glass Amber	H2SO4
Volatile Fatty Acids: Acetic Acid, Butyric Acid, Lactic Acid, Propionic Acid, and Pyruvic Acid	SW-846 Method 8015	3 40 mL VOA Clear	Cool <6C
Volatile Organic Compounds: Acetone, Benzene, Ethyl benzene, Methyl ethyl ketone, Tetrahydrofuran, Toluene, and Total Xylenes	SW-846 Method 8260	3 40 mL VOA Clear	Cool <6C

11 or 12

2 reds (VOAs)

3 yellows (VOCs)

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Sample Preservation Log

Order ID 23F1204 Date Performed: 6-22-23 Analyst Performing Check: RCJ

Sample ID	Container ID	Metals pH as Received <2	Metals pH as Received Other	Metals Final pH	Cyanide pH as Received >12	Cyanide pH as Received Other	Cyanide Final pH	Sulfide pH as Received >9	Sulfide pH as Received Other	Sulfide Final pH	Ammonia pH as Received <2	Ammonia pH as Received Other	Ammonia Final pH	TKN pH as Received <2	TKN pH as Received Other	TKN Final pH	Phos, Tot pH as Received <2	Phos, Tot pH as Received Other	Phos, Tot Final pH	NO3+NO2 pH as Received <2	NO3+NO2 pH as Received Other	NO3+NO2 Final pH	DRO pH as Received <2	DRO pH as Received Other	DRO Final pH	Pesticide (8081/608/508) PCB DW only Received Res.Cl +	Pesticide Received Res.Cl -	Pesticide final+ or-	SVOC (625/8270/825) Received Res.Cl +	SVOC Received Res.Cl -	SVOC final+ or-	CrVI * ** Received pH	CrVI Final pH	Pest/PCB (508) / SVOC(525) pH as Received <2	Pest/PCB (508) / SVOC(525) pH as Received Other	Pest/PCB (508) / SVOC(525) Final pH	COD pH as Received <2	COD pH as Received Other	COD Final pH	Phenolics pH as Received	Phenolics pH as Received Other	Phenolics Final pH
01	A		7	<2																																							
01	B											7	<2		7	<2					7	<2																		7	<2			
01	G																																									7	<2
01	H																													-													

NaOH ID: _____ HNO3 ID: 3E04504

H2SO4 ID: 3D04310 Na2S2O3 ID: _____

HCL ID: _____ Na2SO3 ID: _____

CrVI preserved date/time: _____ Analyst Initials: _____

pH must be adjusted between 9.3 - 9.7

Buffer Sol'n ID: _____

Metals were received with pH = 7. HNO3 was added at 1240 on 22 JUNE 2023 by RCJ in the Log-In room to bring pH= <2.

**W.Va only certifies DISS CrVI and not T CrVI as an approved analyte under 40CFR136 for waste water.

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 4:20:33PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 7/7/2023 4:20:33PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Laboratory Order ID: 23F1204

Sample Conditions Checklist

Samples Received at:	**2.20°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	No
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

Jennifer Robb notified via email for headspace in all unpreserved VOAC40mL. KRC 6/22/23 1356

Per email from Jennifer Robb proceed with analysis. DFE 6/22/23 1527

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
Ammonia as N (mg/L)	November-2022	---	---	---	---	**1560**	---	**1400**	---	**1380**	---	---	50	50
	December-2022	**1700**	**2280**	**2110**	---	**1410**	**1310**	---	---	---	**1150**	**1780**	100	100
	January-2023	**1520**	---	---	**1500**	---	---	---	---	**1330**	---	---	50	50
		---	---	---	---	**2440**	---	---	---	---	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**1490**	100	100
	March-2023	---	---	---	**667**	**1480**	---	---	---	---	---	---	73.1	100
	April-2023	---	---	---	**1410**	---	**1220**	---	---	---	---	---	73.1	100
	May-2023	**1390**	---	---	**1860**	**2380**	---	---	---	---	---	---	146	200
	June-2023	---	---	---	---	**2740**	---	**2370**	**2170**	---	---	---	146	200
Biological Oxygen Demand (mg/L)	November-2022	---	---	---	---	**15700**	---	**5860**	---	**5140**	---	---	0.2	2
	December-2022	**6440**	**12500**	**11400**	---	**9240**	**3330**	---	---	---	**8360**	**6770**	0.2	2
	January-2023	**9920**	---	---	**999**	**28100**	---	---	---	**7060**	---	---	0.2	2
	February-2023	---	---	---	---	---	---	---	---	---	---	**7230**	0.2	2
	March-2023	---	---	---	**1570**	**9190**	---	---	---	---	---	---	0.2	2
	April-2023	---	---	---	**8430**	---	**2860**	---	---	---	---	---	0.2	2
	May-2023	**7350**	---	---	**11900**	**35300**	---	---	---	---	---	---	0.2	2
	June-2023	---	---	---	---	**20000**	---	**27400**	**23100**	---	---	---	0.2	2
Chemical Oxygen Demand (mg/L)	November-2022	---	---	---	---	---	---	**9790**	---	**10800**	---	---	1000	1000
		---	---	---	---	**23500**	---	---	---	---	---	---	2000	2000
	December-2022	**7440**	---	---	---	---	---	---	---	---	---	---	1000	1000
		---	---	---	---	**13200**	**8000**	---	---	---	**20300**	**14100**	2000	2000
		---	---	**22400**	---	---	---	---	---	---	---	---	5000	5000
		---	**86800**	---	---	---	---	---	---	---	---	---	10000	10000
	January-2023	---	---	---	**3630**	---	---	---	---	---	---	---	500	500
		14900	---	---	---	---	---	---	---	**8430**	---	---	2000	2000
		---	---	---	---	**47600**	---	---	---	---	---	---	5000	5000
	February-2023	---	---	---	---	---	---	---	---	---	---	**9210**	1000	1000
	March-2023	---	---	---	**1690**	---	---	---	---	---	---	---	500	500
		---	---	---	---	**10600**	---	---	---	---	---	---	2000	2000
	April-2023	---	---	---	---	---	**7370**	---	---	---	---	---	1000	1000
		---	---	---	**16800**	---	---	---	---	---	---	---	2000	2000
	May-2023	**7590**	---	---	**18700**	---	---	---	---	---	---	---	2000	2000
		---	---	---	---	**44700**	---	---	---	---	---	---	4000	4000
	June-2023	---	---	---	---	---	---	**44800**	---	---	---	---	5000	5000
		---	---	---	---	**41300**	---	---	**55000**	---	---	---	10000	10000
Nitrate+Nitrite as N (mg/L)	November-2022	---	---	---	---	**2.91**	---	**0.16**	---	**0.33**	---	---	0.1	0.1

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
Nitrate as N (mg/L)	December-2022	---	---	---	---	---	---	---	---	---	ND	---	0.2	0.2
		---	---	---	---	---	ND	---	---	---	---	---	0.2	0.6
		ND	ND	ND	---	ND	---	---	---	---	---	---	1.1	5.1
		---	---	---	---	---	---	---	---	---	---	ND	1.5	5.5
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	0.35	1.35
		---	---	---	---	---	---	---	---	ND	---	---	1.1	1.1
		3.9	---	---	---	---	---	---	---	---	---	---	2.1	2.1
		---	---	---	---	ND	---	---	---	---	---	---	2.2	2.2
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	0.35	1.35
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	1.04	5.1
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	0.6	2.6
	May-2023	ND	---	---	---	---	---	---	---	---	---	---	1.1	5.1
		---	---	---	ND	ND	---	---	---	---	---	---	1.2	5.2
	June-2023	---	---	---	---	ND	---	---	ND	---	---	---	1.1	5.1
		---	---	---	---	---	---	ND	---	---	---	---	1.2	5.2
Nitrite as N (mg/L)	December-2022	---	---	---	---	---	**0.12 J**	---	---	---	---	---	0.1	0.5
		ND	ND	ND	---	ND	---	---	---	---	ND	ND	1	5
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	0.25	1.25
		---	---	---	---	---	---	---	---	ND	---	---	1	1
		ND	---	---	---	ND	---	---	---	---	---	---	2	2
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.48 J**	0.25	1.25
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	1	5
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	0.5	2.5
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	1	5
	June-2023	---	---	---	---	**2 J**	---	ND	ND	---	---	---	1	5
Total Kjeldahl Nitrogen (mg/L)	November-2022	---	---	---	---	---	---	**1290**	---	**1470**	---	---	20	50
		---	---	---	---	**2110**	---	---	---	---	---	---	50	125
	December-2022	**1510**	**3570**	**1790**	---	**1830**	**1490**	---	---	---	**1340**	**1940**	200	500
	January-2023	**1840**	---	---	**881**	---	---	---	---	**1410**	---	---	20	50
		---	---	---	---	**2970**	---	---	---	---	---	---	40	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**1870**	16.8	50
	March-2023	---	---	---	**879**	**1920**	---	---	---	---	---	---	33.6	100
	April-2023	---	---	---	**1820**	---	**1510**	---	---	---	---	---	16.8	50
	May-2023	**1590**	---	---	**1950**	**2910**	---	---	---	---	---	---	40	100
	June-2023	---	---	---	---	**3080**	---	---	**2750**	---	---	---	100	250
		---	---	---	---	---	---	**2650**	---	---	---	---	200	500

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**												
Total Recoverable Phenolics (mg/L)	November-2022	---	---	---	---	---	---	**5.68**	---	**3**	---	---	0.3	0.5
		---	---	---	---	**28.8**	---	---	---	---	---	---	0.75	1.25
	December-2022	---	---	---	---	---	**8.94**	---	---	---	---	---	0.3	0.5
		24.9	**54.6**	**28.3**	---	**32**	---	---	---	---	**20.2**	**36**	1.5	2.5
	January-2023	**27.2**	---	---	**1.3**	---	---	---	---	**20.2**	---	---	0.75	1.25
		---	---	---	---	**56.5**	---	---	---	---	---	---	1.5	2.5
	February-2023	---	---	---	---	---	---	---	---	---	---	**22.4**	1.5	2.5
	March-2023	---	---	---	**0.4**	---	---	---	---	---	---	---	0.03	0.05
		---	---	---	---	**13.9**	---	---	---	---	---	---	0.3	0.5
	April-2023	---	---	---	**18.7**	---	**5.1**	---	---	---	---	---	0.3	0.5
	May-2023	**18.6**	---	---	**20**	**50**	---	---	---	---	---	---	1.5	2.5
	June-2023	---	---	---	---	**39.1**	---	**45.6**	**80.6**	---	---	---	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)														
Anthracene	November-2022	---	---	---	---	---	---	ND	---	ND	---	---	46.7	93.5
		---	---	---	---	ND	---	---	---	---	---	---	93.5	187
	December-2022	---	---	---	---	ND	ND	---	---	---	---	ND	9.35	9.35
		---	---	ND	---	---	---	---	---	---	ND	---	11.7	11.7
		---	ND	---	---	---	---	---	---	---	---	---	23.4	23.4
		ND	---	---	---	---	---	---	---	---	---	---	485	971
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	243	485
		---	---	---	---	---	---	---	---	ND	---	---	253	505
		ND	---	---	---	---	---	---	---	---	---	---	490	980
		---	---	---	---	ND	---	---	---	---	---	---	500	1000
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	187	374
	March-2023	---	---	---	---	ND	---	---	---	---	---	---	51	102
		---	---	---	ND	---	---	---	---	---	---	---	117	234
	April-2023	---	---	---	ND	---	---	---	---	---	---	---	37.4	74.8
		---	---	---	---	---	ND	---	---	---	---	---	38.8	77.7
	May-2023	ND	---	---	---	ND	---	---	---	---	---	---	93.5	187
		---	---	---	ND	---	---	---	---	---	---	---	467	935
	June-2023	---	---	---	---	ND	---	---	ND	---	---	---	485	971
		---	---	---	---	---	---	ND	---	---	---	---	490	980

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
TOTAL METALS (mg/L)														
Arsenic	November-2022	---	---	---	---	**0.863**	---	**0.464**	---	**1.3**	---	---	0.02	0.04
	December-2022	**1.02**	**0.406**	**0.174**	---	**1.69**	**0.49**	---	---	---	**0.159**	**0.574**	0.02	0.04
	January-2023	**0.285**	---	---	**0.596**	**0.225**	---	---	---	**0.846**	---	---	0.01	0.02
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.29**	0.005	0.01
	March-2023	---	---	---	**1.07**	**1**	---	---	---	---	---	---	0.01	0.02
	April-2023	---	---	---	---	---	**0.11**	---	---	---	---	---	0.0005	0.001
		---	---	---	**0.36**	---	---	---	---	---	---	---	0.005	0.01
	May-2023	**0.26**	---	---	**0.3**	**0.27**	---	---	---	---	---	---	0.0025	0.005
	June-2023	---	---	---	---	**0.26**	---	**0.5**	**0.14**	---	---	---	0.0025	0.005
Barium	November-2022	---	---	---	---	**0.871**	---	**0.485**	---	**0.36**	---	---	0.01	0.02
	December-2022	**0.566**	**0.803**	**0.978**	---	**0.438**	**0.214**	---	---	---	**0.856**	**0.793**	0.01	0.02
	January-2023	**0.643**	---	---	**0.683**	**1.92**	---	---	---	**0.554**	---	---	0.005	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**1.04**	0.01	0.05
	March-2023	---	---	---	**0.406**	**0.683**	---	---	---	---	---	---	0.005	0.01
	April-2023	---	---	---	**1.21**	---	**0.326**	---	---	---	---	---	0.01	0.05
	May-2023	**0.636**	---	---	---	---	---	---	---	---	---	---	0.005	0.025
		---	---	---	**1.2**	**1.83**	---	---	---	---	---	---	0.01	0.05
	June-2023	---	---	---	---	**1.69**	---	---	**1.65**	---	---	---	0.005	0.025
		---	---	---	---	---	---	**3.01**	---	---	---	---	0.01	0.05
Cadmium	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	0.004	0.008
	December-2022	ND	**0.0104**	ND	---	ND	ND	---	---	---	ND	ND	0.004	0.008
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	0.002	0.004
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.000297 J**	0.0001	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	0.002	0.004
	April-2023	---	---	---	**0.000158 J**	---	**0.000333 J**	---	---	---	---	---	0.0001	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	0.0005	0.005
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	0.0005	0.005
Chromium	November-2022	---	---	---	---	**0.208**	---	**0.112**	---	**0.354**	---	---	0.016	0.02
	December-2022	**0.503**	**1.08**	**1.76**	---	**0.274**	**0.319**	---	---	---	**0.499**	**0.822**	0.016	0.02
	January-2023	**0.31**	---	---	**0.488**	**0.178**	---	---	---	**0.155**	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.277**	0.004	0.01
	March-2023	---	---	---	**0.213**	**0.188**	---	---	---	---	---	---	0.008	0.01
	April-2023	---	---	---	---	---	**0.142**	---	---	---	---	---	0.0004	0.001
		---	---	---	**0.306**	---	---	---	---	---	---	---	0.004	0.01
	May-2023	**0.422**	---	---	**0.281**	**0.237**	---	---	---	---	---	---	0.002	0.005
	June-2023	---	---	---	---	**0.251**	---	**0.191**	**0.272**	---	---	---	0.002	0.005

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**												
TOTAL METALS (mg/L)														
Copper	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	0.016	0.02
	December-2022	ND	ND	ND	---	ND	ND	---	---	---	ND	ND	0.016	0.02
	January-2023	ND	---	---	**0.0127**	**0.0256**	---	---	---	ND	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.00365**	0.0003	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	0.008	0.01
	April-2023	---	---	---	**0.00664**	---	**0.00767**	---	---	---	---	---	0.0003	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	0.0015	0.005
	June-2023	---	---	---	---	**0.00154 J**	---	**0.00362 J**	**0.00269 J**	---	---	---	0.0015	0.005
Lead	November-2022	---	---	---	---	ND	---	ND	---	**0.017 J**	---	---	0.012	0.02
	December-2022	ND	**0.0381**	ND	---	ND	ND	---	---	---	ND	ND	0.012	0.02
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	0.006	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.006**	0.001	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	0.006	0.01
	April-2023	---	---	---	**0.0022**	---	**0.0067**	---	---	---	---	---	0.001	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	0.005	0.005
	June-2023	---	---	---	---	ND	---	ND	**0.0069**	---	---	---	0.005	0.005
Mercury	November-2022	---	---	---	---	---	---	**0.00169**	---	**0.00053**	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	---	0.0008	0.0008
	December-2022	**0.00051**	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
		---	---	**0.00118**	---	ND	**0.00588**	---	---	---	**0.0048**	ND	0.0008	0.0008
		---	ND	---	---	---	---	---	---	---	---	---	0.004	0.004
	January-2023	ND	---	---	ND	---	---	---	---	ND	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	---	0.004	0.004
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	0.0004	0.0004
	March-2023	---	---	---	ND	---	---	---	---	---	---	---	0.0002	0.0002
		---	---	---	---	ND	---	---	---	---	---	---	0.0004	0.0004
	April-2023	---	---	---	---	---	**0.00128**	---	---	---	---	---	0.0002	0.0002
		---	---	---	ND	---	---	---	---	---	---	---	0.0004	0.0004
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	0.0002	0.0002
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	0.004	0.004
Nickel	November-2022	---	---	---	---	**0.0866**	---	**0.1344**	---	**0.173**	---	---	0.014	0.02
	December-2022	**0.1722**	**0.5025**	**0.2989**	---	**0.1299**	**0.287**	---	---	---	**0.1853**	**0.346**	0.014	0.02
	January-2023	**0.1074**	---	---	**0.1442**	**0.0407**	---	---	---	**0.0769**	---	---	0.007	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.1726**	0.001	0.001
	March-2023	---	---	---	**0.1254**	**0.1033**	---	---	---	---	---	---	0.007	0.01
	April-2023	---	---	---	**0.1143**	---	**0.1732**	---	---	---	---	---	0.001	0.001
	May-2023	**0.113**	---	---	**0.09726**	**0.05657**	---	---	---	---	---	---	0.005	0.005
	June-2023	---	---	---	---	**0.05978**	---	**0.05892**	**0.07161**	---	---	---	0.005	0.005

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
TOTAL METALS (mg/L)														
Selenium	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	0.08	0.1
	December-2022	ND	ND	ND	---	ND	ND	---	---	---	ND	ND	0.08	0.1
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	0.04	0.05
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.00199**	0.00085	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	0.04	0.05
	April-2023	---	---	---	**0.00189**	---	**0.00185**	---	---	---	---	---	0.00085	0.001
	May-2023	ND	---	---	ND	**0.00569**	---	---	---	---	---	---	0.00425	0.005
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	0.00425	0.005
Silver	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	0.01	0.02
	December-2022	ND	**0.0187 J**	ND	---	ND	ND	---	---	---	ND	ND	0.01	0.02
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	0.005	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	0.00006	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	0.005	0.01
	April-2023	---	---	---	ND	---	**0.00011 J**	---	---	---	---	---	0.00006	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	0.0003	0.005
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	0.0003	0.005
Zinc	November-2022	---	---	---	---	ND	---	**0.032**	---	**0.694**	---	---	0.02	0.02
	December-2022	**0.208**	**29.7**	**0.162**	---	**0.0686**	**0.75**	---	---	---	**0.364**	**0.286**	0.02	0.02
	January-2023	**0.133**	---	---	**0.15**	**0.074**	---	---	---	**0.0752**	---	---	0.01	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.0851**	0.0025	0.005
	March-2023	---	---	---	**0.0689**	**0.0538**	---	---	---	---	---	---	0.01	0.01
	April-2023	---	---	---	**0.0539**	---	---	---	---	---	---	---	0.0025	0.005
		---	---	---	---	---	**0.414**	---	---	---	---	---	0.025	0.05
	May-2023	**0.079**	---	---	**0.0635**	**0.0519**	---	---	---	---	---	---	0.0125	0.025
	June-2023	---	---	---	---	**0.0538**	---	**0.0253**	**0.945**	---	---	---	0.0125	0.025

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**												
VOLATILE FATTY ACIDS mg/L														
Acetic Acid	November-2022	---	---	---	---	---	---	**1600**	---	---	---	---	25	100
		---	---	---	---	**3500**	---	---	---	**150 J**	---	---	62	250
	December-2022	**1800**	---	---	---	---	---	---	---	---	---	---	62	250
	January-2023	ND	---	---	ND	**4400**	---	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	500
	March-2023	---	---	---	ND	**640**	---	---	---	---	---	---	---	500
	April-2023	---	---	---	**1200**	---	**520**	---	---	---	---	---	370	500
	May-2023	**990**	---	---	**1800**	**3000**	---	---	---	---	---	---	370	500
Butyric Acid	November-2022	---	---	---	---	---	---	**430**	---	---	---	---	12	100
		---	---	---	---	**830**	---	---	---	ND	---	---	29	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	---	29	250
	January-2023	ND	---	---	ND	**1800**	---	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	500
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	500
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	330	500
	May-2023	ND	---	---	ND	**1200**	---	---	---	---	---	---	330	500
Lactic Acid	November-2022	---	---	---	---	---	---	ND	---	---	---	---	11	100
		---	---	---	---	ND	---	---	---	ND	---	---	27	250
	December-2022	**90 J**	---	---	---	---	---	---	---	---	---	---	27	250
Propionic Acid	November-2022	---	---	---	---	---	---	**620**	---	---	---	---	11	100
		---	---	---	---	**1600**	---	---	---	**73 J**	---	---	27	250
	December-2022	**640**	---	---	---	---	---	---	---	---	---	---	27	250
	January-2023	ND	---	---	ND	**2000**	---	---	---	ND	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	500
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	500
	April-2023	---	---	---	**600**	---	ND	---	---	---	---	---	340	500
	May-2023	**520**	---	---	**800**	**1400**	---	---	---	---	---	---	340	500
Pyruvic Acid	November-2022	---	---	---	---	---	---	**46 J**	---	---	---	---	12	100
		---	---	---	---	**98 J**	---	---	---	ND	---	---	30	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	---	30	250

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
VOLATILE ORGANIC COMPOUNDS (ug/L)														
2-Butanone (MEK)	November-2022	---	---	---	---	**3510**	---	---	---	**1140**	---	---	30	100
		---	---	---	---	---	---	**15600**	---	---	---	---	300	1000
	December-2022	**3140**	---	---	---	---	**3390**	---	---	---	---	---	30	100
		---	**26800**	**27700**	---	**5670**	---	---	---	---	**21700**	**7150**	300	1000
	January-2023	**3480**	---	---	**632**	---	---	---	---	---	---	---	30	100
		---	---	---	---	**7840**	---	---	---	**5470**	---	---	300	1000
	February-2023	---	---	---	---	---	---	---	---	---	---	**14400**	600	2000
	March-2023	---	---	---	**257**	**2770**	---	---	---	---	---	---	30	100
	April-2023	---	---	---	**3420**	---	**5530**	---	---	---	---	---	750	2500
	May-2023	**5360**	---	---	**5970**	---	---	---	---	---	---	---	150	500
		---	---	---	---	**13600**	---	---	---	---	---	---	750	2500
	June-2023	---	---	---	---	**13800**	---	---	---	---	---	---	750	2500
		---	---	---	---	---	---	**20100**	**22600**	---	---	---	1500	5000
Acetone	November-2022	---	---	---	---	---	---	---	---	**4420**	---	---	70	100
		---	---	---	---	**16100**	---	**38300**	---	---	---	---	700	1000
	December-2022	---	---	---	---	**15600**	**5170**	---	---	---	---	**9800**	700	1000
		8500	---	---	---	---	---	---	---	---	---	---	1750	2500
		---	**53100**	**49900**	---	---	---	---	---	---	**45600**	---	3500	5000
	January-2023	---	---	---	**1530**	---	---	---	---	---	---	---	70	100
		---	---	---	---	**22200**	---	---	---	**14000**	---	---	700	1000
		8130	---	---	---	---	---	---	---	---	---	---	1750	2500
	February-2023	---	---	---	---	---	---	---	---	---	---	**23900**	1400	2000
	March-2023	---	---	---	**375**	---	---	---	---	---	---	---	70	100
		---	---	---	---	**6810**	---	---	---	---	---	---	700	1000
	April-2023	---	---	---	**8290**	---	**7560**	---	---	---	---	---	1750	2500
	May-2023	**10700**	---	---	**11700**	---	---	---	---	---	---	---	350	500
		---	---	---	---	**29600**	---	---	---	---	---	---	1750	2500
	June-2023	---	---	---	---	**29600**	---	---	---	---	---	---	1750	2500
		---	---	---	---	---	---	**61800**	**50800**	---	---	---	3500	5000
Benzene	November-2022	---	---	---	---	**7.4 J**	---	**2860**	---	**50.4**	---	---	4	10
	December-2022	**301**	**2960**	---	---	**6.3 J**	**622**	---	---	---	**1750**	**179**	4	10
		---	---	**6550**	---	---	---	---	---	---	---	---	40	100
	January-2023	**240**	---	---	**28.7**	**1620**	---	---	---	**167**	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**1370**	4	10
	March-2023	---	---	---	**1540**	**727**	---	---	---	---	---	---	4	10
	April-2023	---	---	---	**3740**	---	**320**	---	---	---	---	---	4	10
	May-2023	**814**	---	---	**4890**	**3370**	---	---	---	---	---	---	20	50
	June-2023	---	---	---	---	**2630**	---	---	---	---	---	---	8	20
		---	---	---	---	---	---	**1400**	**1590**	---	---	---	20	50

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
VOLATILE ORGANIC COMPOUNDS (ug/L)														
Ethylbenzene	December-2022	**67.3**	**172**	**287**	---	ND	**48.5**	---	---	---	**108**	**27.4**	4	10
	November-2022	---	---	---	---	ND	---	**194**	---	**16.2**	---	---	4	10
	January-2023	**65.1**	---	---	ND	**93.9**	---	---	---	**20.8**	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**151**	4	10
	March-2023	---	---	---	**131**	**71.5**	---	---	---	---	---	---	4	10
	April-2023	---	---	---	**186**	---	**43.4**	---	---	---	---	---	4	10
	May-2023	**124**	---	---	**276**	**144**	---	---	---	---	---	---	20	50
	June-2023	---	---	---	---	**104**	---	---	---	---	---	---	8	20
		---	---	---	---	---	---	**98**	**116**	---	---	---	20	50
Tetrahydrofuran	November-2022	---	---	---	---	**309**	---	---	---	**176**	---	---	100	100
		---	---	---	---	---	---	**8530**	---	---	---	---	1000	1000
	December-2022	**151**	---	---	---	**170**	**1120**	---	---	---	---	**663**	100	100
		---	**5210**	**19800**	---	---	---	---	---	---	**6130**	---	1000	1000
	January-2023	**183**	---	---	**566**	**1810**	---	---	---	**352**	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**3760**	2000	2000
	March-2023	---	---	---	**353**	**464**	---	---	---	---	---	---	100	100
	April-2023	---	---	---	**2410**	---	**4790**	---	---	---	---	---	100	100
	May-2023	ND	---	---	**2740**	**2380**	---	---	---	---	---	---	500	500
	June-2023	---	---	---	---	**2100**	---	---	---	---	---	---	200	200
		---	---	---	---	---	---	**7320**	**6670**	---	---	---	500	500
Toluene	November-2022	---	---	---	---	ND	---	**214**	---	**32.8**	---	---	5	10
	December-2022	**122**	**175**	**195**	---	ND	**113**	---	---	---	**113**	**48.3**	5	10
	January-2023	**122**	---	---	**8 J**	**139**	---	---	---	**35.3**	---	---	5	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**224**	5	10
	March-2023	---	---	---	**182**	**98.1**	---	---	---	---	---	---	5	10
	April-2023	---	---	---	**303**	---	**94.4**	---	---	---	---	---	5	10
	May-2023	**258**	---	---	**371**	**239**	---	---	---	---	---	---	25	50
	June-2023	---	---	---	---	**165**	---	---	---	---	---	---	10	20
		---	---	---	---	---	---	**67**	**212**	---	---	---	25	50

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration												
VOLATILE ORGANIC COMPOUND (ug/L)														
Xylenes, Total	November-2022	---	---	---	---	ND	---	**185**	---	**37.8**	---	---	10	30
	December-2022	**161**	**222**	**186**	---	ND	**112**	---	---	---	**197**	**59.9**	10	30
	January-2023	**138**	---	---	ND	**134**	---	---	---	**38.1**	---	---	10	30
	February-2023	---	---	---	---	---	---	---	---	---	---	**240**	10	30
	March-2023	---	---	---	**240**	**111**	---	---	---	---	---	---	10	30
	April-2023	---	---	---	**329**	---	**97.4**	---	---	---	---	---	10	30
	May-2023	**274**	---	---	**441**	**230**	---	---	---	---	---	---	50	150
	June-2023	---	---	---	---	**177**	---	---	---	---	---	---	20	60
		---	---	---	---	---	---	**92 J**	**136 J**	---	---	---	50	150

--- = not applicable/available

J = Parameter was detected at a concentration greater than the laboratory's LOD, but less than the laboratory's LOQ. Concentration is considered estimated.

LOD = laboratory's Limit of Detection

LOQ = laboratory's Limit of Quantitation

mg/L = milligrams per liter

ND = Not Detected

ug/L = micrograms per liter

Appendix G

Sidewall Odor Mitigation System Certification Letter

Revised June 26, 2023
File No. 02218208.11

Mr. Jonathan Chapman
Enforcement Specialist
VA DEQ – Southwest Regional Office
355-A Deadmore Street
Abingdon, Virginia

Subject: Design Engineer Certification –Sidewall Odor Mitigation System
Integrated Solid Waste Management Facility – Solid Waste Permit No. 588
Bristol, Virginia

Dear Mr. Chapman:

SCS Engineers (SCS) served as Design Engineer and conducted periodic site visits to observe construction of the Sidewall Odor Mitigation System (SOMS) within the Solid Waste Permit No. 588 landfill at the Integrated Solid Waste Management Facility (ISMWF) operated by the City of Bristol, Virginia (City). The SOMS is a landfill gas collection system to mitigate landfill gases emanating along and from behind the landfill sidewall liner system and quarry sidewalls. The SOMS is approximately 4500-feet long and is placed near the outer edge of waste in the landfill. The system includes the initial section that was constructed prior to February 10, 2023 which is referred to as the pilot sidewall odor mitigation system or Phase 1.

Our site visits to observe construction activities occurred between December of 2022 and June of 2023. Please refer to SCS' correspondence, dated November 1, 2022 and titled "Sidewall Odor Mitigation System Design" for general background regarding the construction project, as well as SCS correspondence dated February 10, 2023 titled "Design Engineer Certification – Pilot Sidewall Odor Mitigation System"

Construction of SOMS is substantially complete and functional as of the date of this letter, June 14, 2023. Substantial completion was determined as a point at which the system could begin operation to achieve the intended purpose. Once construction of the system was substantially complete, the SOMS was connected to the existing landfill gas collection and control system (LFGCCS).

SCS measured gas quality and system pressures at the SOMS wellheads. The data collected from those initial measurements are included in Attachment 1 – Sidewall Odor Mitigation System Monitoring Data. Measurements using field instrumentation indicate that methane represented an average of 22.4 percent of the gas and that oxygen represented an average of 8 percent of gas composition. This data supports that the SOMS is functioning as designed because it indicates that landfill gas is being withdrawn and oxygen intrusion is acceptable. Adjustments will be made to apply additional vacuum to the sections where measurements indicate higher level of landfill gas.

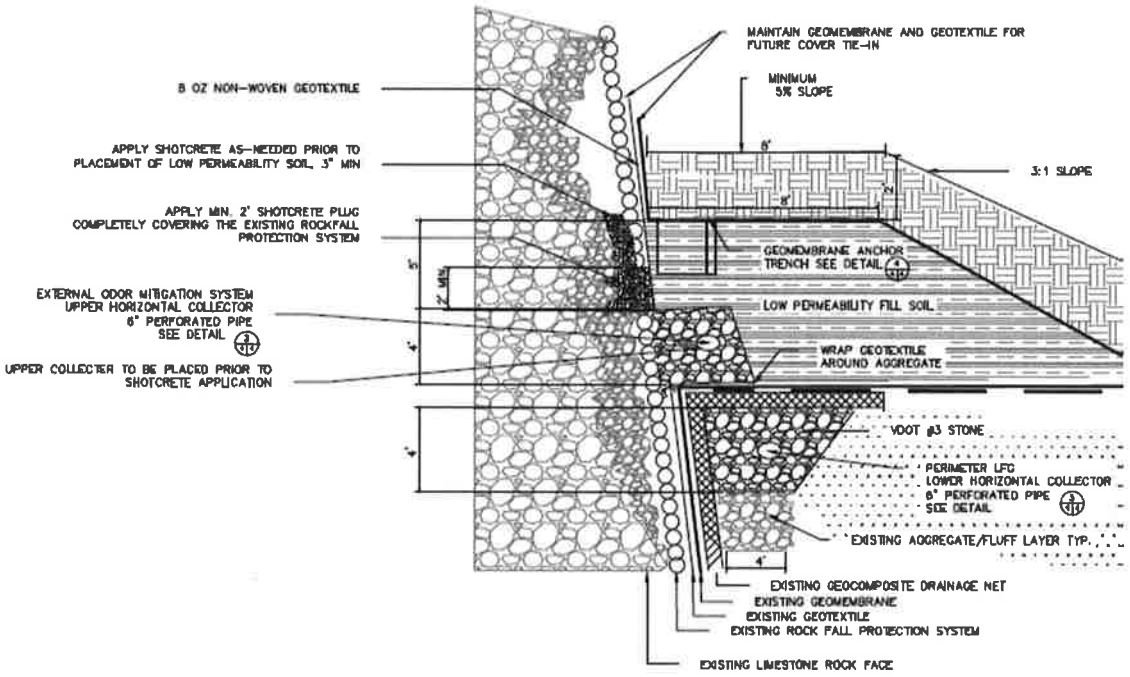
The extent of the SOMS system and associated infrastructure are shown in Attachment 2 – Sidewall Odor Mitigation System Approximate As-Built Locations. The system was constructed along the outer edge of waste and adjacent to the quarry wall, apart from a gap at the entrance of the landfill where

there is effectively no sidewall. The ramp used to access the quarry that was in place prior to the landfill's operation is located in this area. The locations of the SOMS infrastructure were collected using mapping grade field equipment.

SCS coordinated with the City, and the construction contractor (SCS Field Services) regarding the following field modifications prior to and during the construction of the SOMS:

- Changes were made to the planned application of shotcrete:
  - The rockfall protection system was not removed as depicted on Detail 1 on Sheet 4 of the design drawings. Removal of the rockfall protection system presented a safety hazard to those constructing the SOMS and to future landfill staff and contractors working in the landfill. Additional shotcrete and concrete was used to cover portions of the rock fall protection system to improve the interface between the rock wall and the soil.
  - Shotcrete was not applied to the section of the quarry wall adjacent to the upper collector. Based on field observations during construction of Phase 1 of the project, SCS believes that maintaining direct contact between the upper collector and the rock face would result in optimum collection of sidewall emissions.
  - These changes resulted in revisions of the typical SOMS detail that resulted in the revised configuration shown in Figure 1.

Figure 1. Revised SOMS Typical Detail

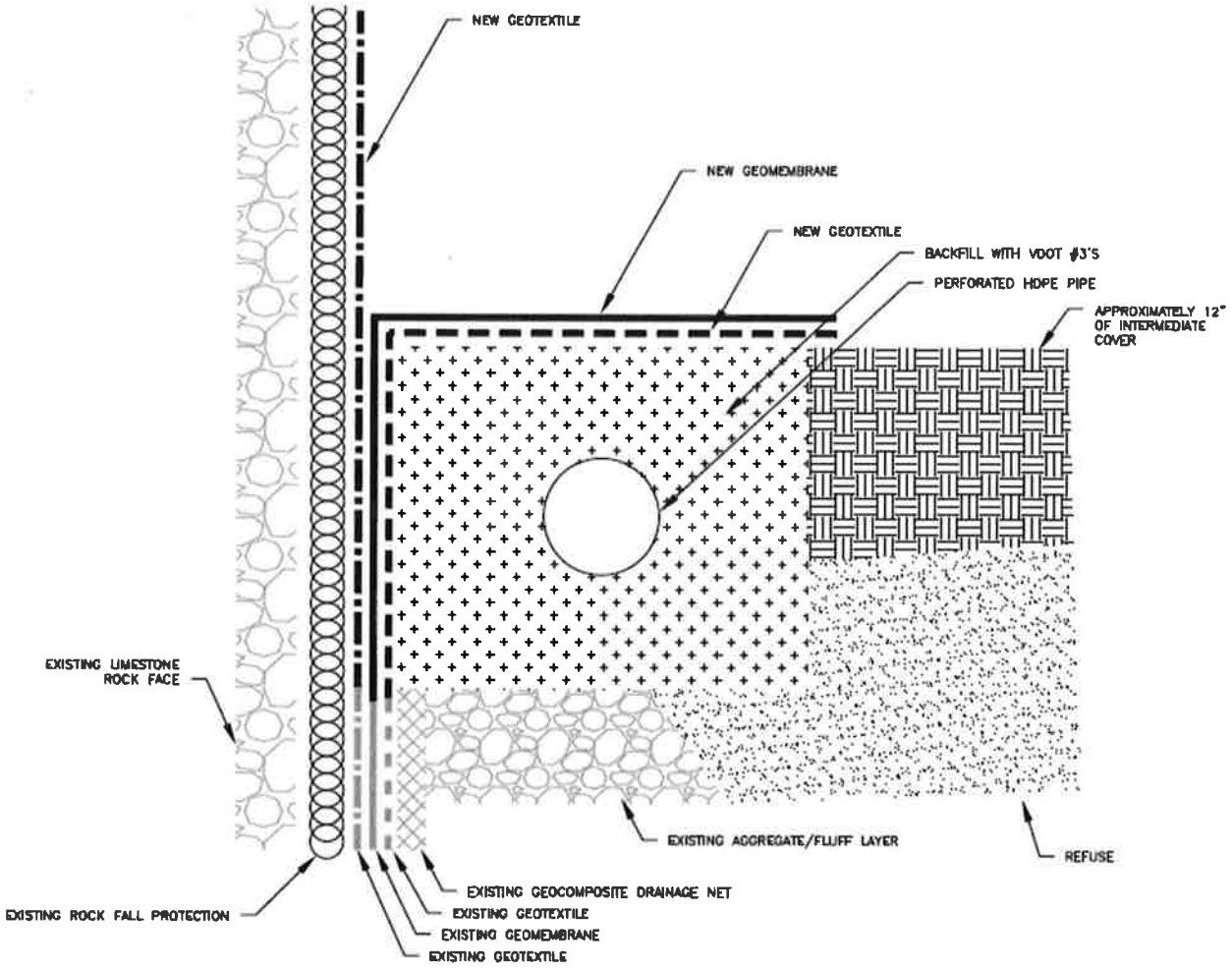


- At the time of this certification, placement of low permeability soil, geomembrane cover, and general fill layers is still in progress on some portions of the SOMS. SCS Field

Services has demonstrated that there is enough low permeability soil cover to operate the SOMS effectively. The placement of these layers will serve to enhance the resiliency of the SOMS in the future, but are not required for the system to serve the purpose of collecting emissions from the quarry sidewalls.

- In some cases the existing sidewall liner components were damaged or missing to such an extent that they could not be connected to the SOMS as intended. In those cases, additional geomembrane and geotextile were placed between the lower collector and the quarry wall. If feasible, the new geosynthetics were affixed to any remaining portions of the sidewall liner system. The general arrangement of new geosynthetics placed adjacent to the lower collector in these instances is shown in Figure 2.

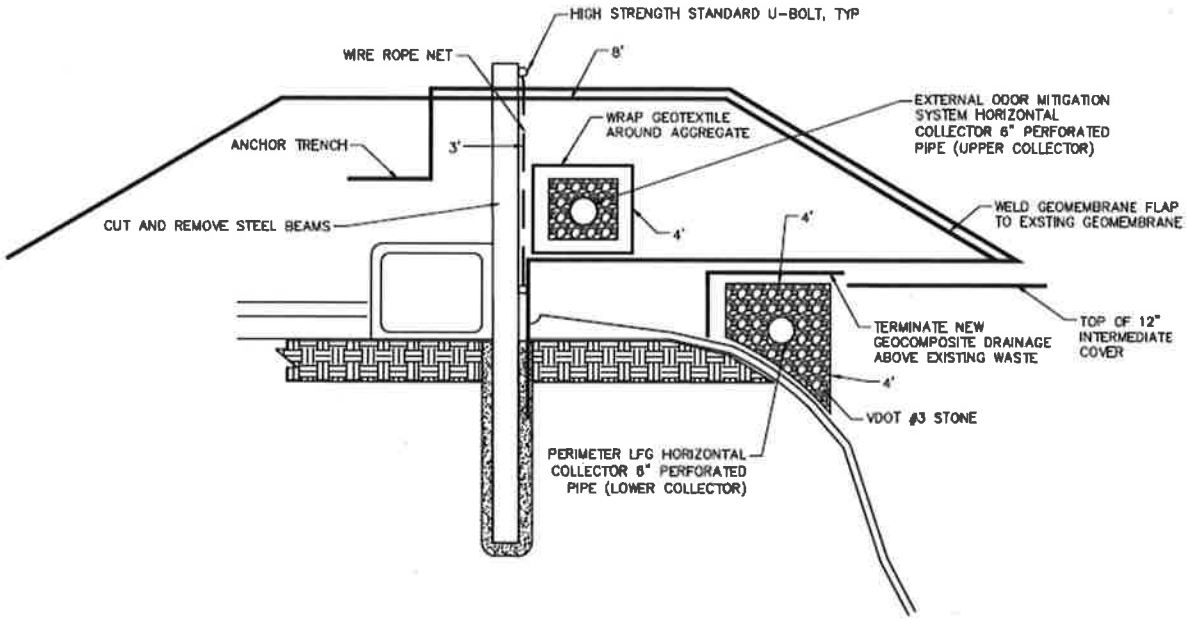
Figure 2. General Arrangement of Supplemental Geomembrane and Geotextile Installed Coincidently with SOMS Construction



- Along the northern portion of the SWP No. 588 landfill (between wellheads SW-37L and SW 42L), the liner system terminated south of the existing access road. The liner system terminated at the existing bench such that there was no sidewall above grade at the

edge of liner. In this case the SOMS typical detail was modified to a configuration that was better suited to this liner termination arrangement. The general arrangement of the SOMS infrastructure in this area is shown in Figure 3. Given the low volumes of gas anticipated in this area, wellheads were not installed at regular intervals along this section. Gas is still collected from other wellheads connected to the horizontal collectors at other points in the system.

Figure 3. General Arrangement of SOMS Components in Areas with No Above-Grade Sidewall



- The drawings for Phase 2 of the SOMS showed wellheads and risers approximately every 200 linear feet along the system. During construction, risers were placed on average every 100 linear feet. Wellheads were installed every 200 linear feet on average. The redundant risers will provide the City with the option to relocate wellheads in the event that a riser becomes damaged or place additional wellheads if additional capacity is required. All risers were assigned a reference number regardless of whether a wellhead was installed.

- Supporting Infrastructure such as liquids removal pumps within the installed sump vessels and compressed air lines have not yet been installed because, based on the observations of SCS' field staff, landfill liquids do not appear to be building up in the horizontal collectors or horizontal collector sumps. Unless liquids are observed in the horizontal collectors or their corresponding sumps, liquid pumps are not required for operation of the SOMS.

SCS will prepare a Construction Quality Assurance (CQA) Report after construction of supplemental components and infrastructure is complete. The CQA report will include relevant supporting data such as photographs, lab tests, and field reports.

Based on the information described above and review of design plans, the following certification statement is submitted for your consideration and determination of compliance with item 2.iv of Appendix A of the Consent Decree between the Department and the City:

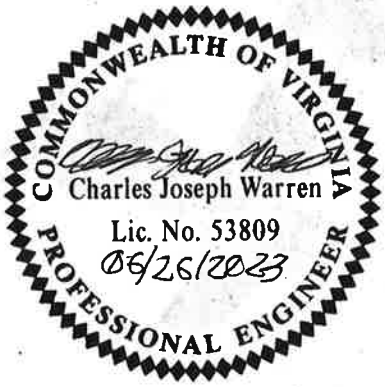
> I hereby certify as the Design Engineer that the construction of the sidewall odor mitigation system has been completed in substantial accordance, with the exception of the changes described in this letter, with the drawings entitled "Sidewall Odor Mitigation System Bristol, Virginia Integrated Solid Waste Management Facility Solid Waste Permit #588" dated November 1, 2022.

If you have questions, please contact either of the undersigned at the letterhead address.

Sincerely,

Charles J. Warren, PE
Project Manager
SCS Engineers
Virginia PE #053809

H. Grace Wohlford
Staff Engineer
SCS Engineers



CJW/HGW

cc: Randall Eads, City of Bristol
Tamrya Spradlin, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Jon Hayes, City of Bristol
Jeff Hurst, VDEQ
Susan Blalock, VDEQ
Stacy Bowers, VDEQ
Daniel Scott, VDEQ

Encl. Attachment 1 – Sidewall Odor Mitigation System Monitoring Data
Attachment 2 – Sidewall Odor Mitigation System Approximate As-Built Locations

Attachment 1 - Sidewall Odor Mitigation System Monitoring Data
Phase 2

Point Name	Status	Record Date	CH4 [%]	CO2 [%]	O2 [%]	Bal Gas [%]
SW-1L	Active	6/14/2023 9:20:07 AM	5.9	19.4	11.5	63.2
SW-1U	Active	6/14/2023 9:18:17 AM	4.9	17.0	15.5	62.6
SW-2L	Active	6/14/2023 9:13:32 AM	19.2	38.1	6.1	36.6
SW-2U	Active	6/14/2023 9:15:41 AM	2.6	7.4	17.5	72.6
SW-5L	Active	6/14/2023 10:59:06 AM	51.9	43.3	0.0	4.9
SW-5U	Active	6/14/2023 11:03:11 AM	21.3	19.2	10.5	49.1
SW-7L	Active	6/14/2023 11:08:36 AM	54.5	44.5	0.0	1.1
SW-7U	Active	6/14/2023 11:13:26 AM	40.3	38.2	2.4	19.2
SW-9L	Active	6/14/2023 11:23:40 AM	54.4	45.1	0.0	0.5
SW-9U	Active	6/14/2023 11:28:06 AM	29.6	30.5	7.6	32.3
SW-11L	Active	6/14/2023 11:52:20 AM	52.1	47.8	0.0	0.1
SW-11U	Active	6/14/2023 11:37:29 AM	10.7	12.1	15.0	62.2
SW-13L	Active	6/14/2023 1:04:38 PM	48.4	48.4	0.0	3.2
SW-13U	Active	6/14/2023 11:57:03 AM	31.1	36.0	6.0	26.9
SW-15L	Active	6/14/2023 1:18:53 PM	50.8	48.3	0.0	0.9
SW-15U	Active	6/14/2023 1:15:05 PM	21.1	25.5	10.9	42.6
SW-17L	Active	6/14/2023 1:26:17 PM	38.2	60.0	0.0	1.8
SW-17U	Active	6/14/2023 1:22:50 PM	32.9	46.6	4.1	16.4
SW-19L	Active	6/14/2023 1:34:14 PM	26.8	66.6	0.2	6.4
SW-19U	Active	6/14/2023 1:31:05 PM	18.7	43.3	8.1	30.0
SW-21L	Active	6/14/2023 1:42:48 PM	31.3	65.9	0.2	2.6
SW-21U	Active	6/14/2023 1:40:09 PM	22.0	61.7	2.3	14.0
SW-23L	Active	6/14/2023 1:49:19 PM	29.6	49.2	0.7	20.6
SW-23U	Active	6/14/2023 1:47:34 PM	16.3	32.5	8.5	42.7
SW-24L	Active	6/14/2023 1:54:21 PM	28.9	50.0	1.2	19.9
SW-24U	Active	6/14/2023 1:52:05 PM	4.2	9.2	15.9	70.7
SW-26L	Active	6/14/2023 2:01:09 PM	25.8	50.0	2.1	22.1
SW-26U	Active	6/14/2023 1:58:15 PM	20.9	47.6	3.5	28.0
SW-28L	Active	6/14/2023 2:11:18 PM	24.0	44.1	2.7	29.2
SW-28U	Active	6/14/2023 2:08:15 PM	19.0	36.2	5.8	39.0
SW-29L	Active	6/14/2023 2:19:56 PM	40.6	40.9	0.3	18.3
SW-29U	Active	6/14/2023 2:22:26 PM	1.0	3.0	18.8	77.2
SW-30L	Active	6/14/2023 2:16:19 PM	10.4	17.9	11.2	60.5
SW-30U	Active	6/14/2023 2:14:52 PM	34.1	44.3	1.0	20.6
SW-32L	Active	6/14/2023 2:29:26 PM	35.7	34.6	1.7	28.0
SW-32U	Active	6/14/2023 2:26:59 PM	6.7	7.0	15.7	70.6
SW-34L	Active	6/14/2023 2:34:26 PM	5.2	5.5	15.6	73.8
SW-34U	Active	6/14/2023 2:32:31 PM	0.9	3.1	18.9	77.2
SW-36L	Active	6/14/2023 2:41:49 PM	0.4	1.1	18.7	79.8
SW-36U	Active	6/14/2023 2:39:15 PM	0.0	0.1	19.6	80.3

Attachment 1 - Sidewall Odor Mitigation System Monitoring Data
Phase 2

Point Name	Status	Record Date	CH4 [%]	CO2 [%]	O2 [%]	Bal Gas [%]
SW-43L	Active	6/14/2023 9:43:49 AM	28.4	25.8	4.6	41.2
SW-43U	Active	6/14/2023 9:40:35 AM	20.1	17.7	8.0	54.2
SW-45L	Active	6/14/2023 9:34:30 AM	7.3	9.7	16.3	66.7
SW-45U	Active	6/14/2023 9:37:42 AM	5.5	7.1	16.3	71.1
SW-46L	Active	6/14/2023 9:27:07 AM	14.3	17.5	11.9	56.3
SW-46U	Active	6/14/2023 9:32:00 AM	18.8	22.3	10.8	48.2
SW-47L	Active	6/14/2023 9:22:15 AM	0.8	1.9	19.3	78.0
SW-47U	Active	6/14/2023 9:24:56 AM	8.4	10.5	15.0	66.1

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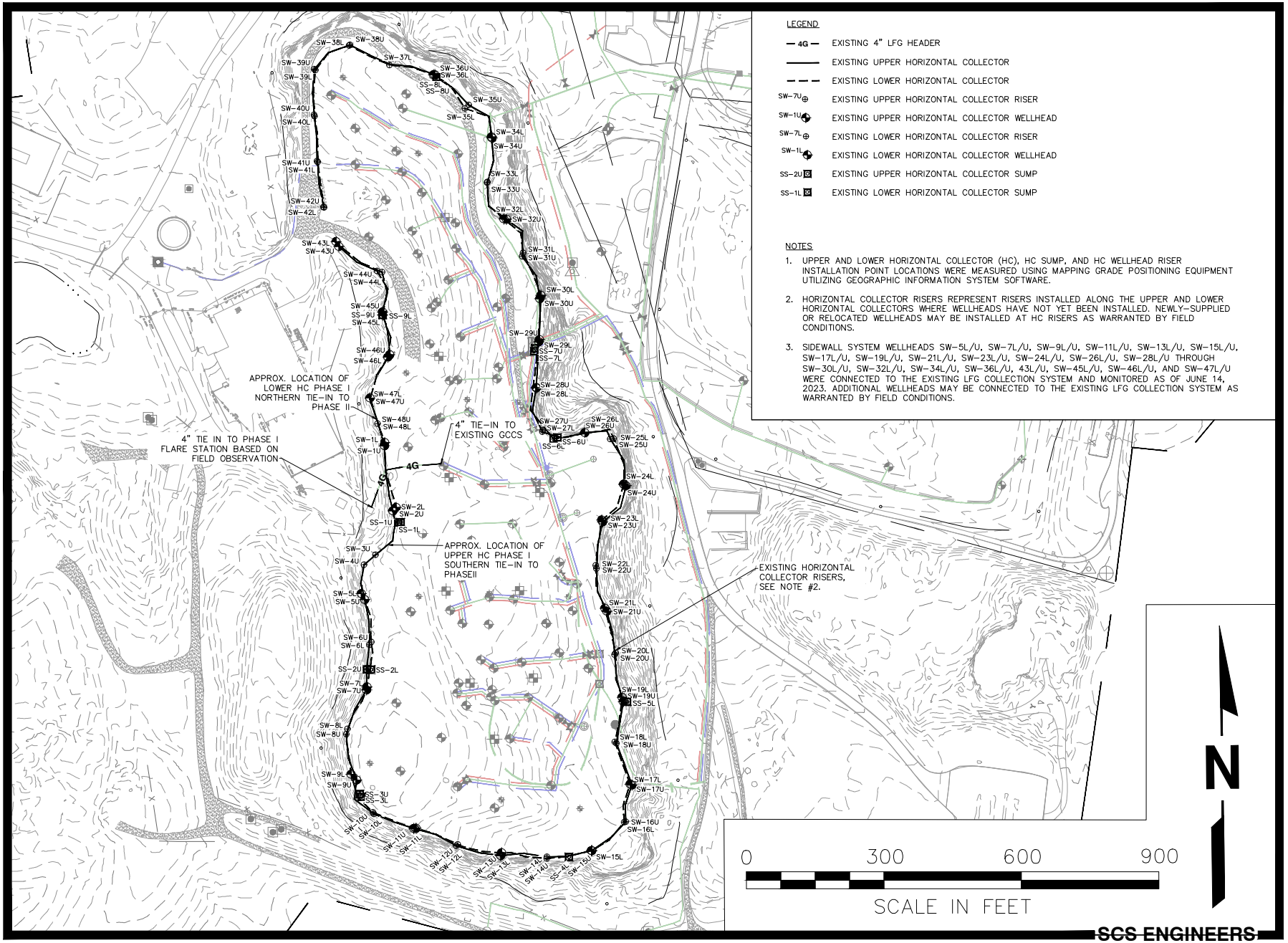

SIDEWALL ODOR MITIGATION SYSTEM APPROXIMATE AS-BUILT LOCATIONS