

May 2023 Monthly Compliance Report

Solid Waste Permit No. 588
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02218208.05-18 | June 9, 2023

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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 May 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

SCS performed the Second Quarter surface emissions monitoring event on May 30, 2023. 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 outside of the active filling area.

No exceedances were detected during this quarterly monitoring event on the serpentine route, but one exceedance was detected at the pipe penetrations. This monitoring event also represented the weekly monitoring event for that week. A quarterly SEM report will be submitted to the VDEQ as part of the Semi-Annual Report. In addition, monitoring results were presented to the VDEQ in a letter dated June 7, 2023.

1.1.1.2 Weekly SEM

In addition to the standard regulatory quarterly surface emissions monitoring, SCS performed additional surface emissions monitoring on May 5, 2023; May 10, 2023; May 18, 2023; May 25, 2023; and May 30, 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 May 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 May 10, 2023; May 17, 2023; May 24, 2023; May 31, 2023; and June 7, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the five monitoring events in May.

Table 1. Summary of May Surface Emissions Monitoring

Description	May 5, 2023	May 10, 2023	May 18 2023	May 25, 2023	May 30, 2023
Number of Points Sampled	163	163	164	163	162
Number of Points in Serpentine Route	100	100	100	100	100
Number of Points at Surface Cover Penetrations	63	63	64	63	62
Number of Exceedances	2	2	1	3	1
Number of Serpentine Exceedances	0	0	0	0	0
Number of Pipe Penetration Exceedances	2	2	1	3	1

No serpentine exceedances were detected in May 2023. This is an improvement from April where three separate exceedances were detected adjacent to construction of the Sidewall Odor Mitigation System (SOMS). Additional soil was placed in the vicinity of the April exceedances as a result of the ongoing construction of the SOMS. Based on the results of the May monitoring, soil placement was effective at reducing emissions at these locations.

Exceedances were detected at the pipe penetration of four vertical extraction wells. Three of these points were located at recently installed vertical wells 89, 95, and 100. These three wells along with newly installed vertical wells 84, 90, and 94, were equipped with wellbore seals during May and subsequently recorded compliant readings. The remaining exceedance, 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. Corrective actions to address exceedances at well 66 are planned for the month of June 2023.

1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on May 1, 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 ₂ O)	Adj Static Pressure (in H ₂ O)	System Pressure (in H ₂ O)
Southern Cleanouts Gradient West	LC01	49.8	49.9	0.0	0.3	57.6	57.6	-17.0	-16.9	-17.7
Southern Cleanouts Gradient East	LC02	44.7	54.2	0.0	1.1	56.8	56.8	-17.4	-17.4	-17.8
Southern Cleanouts Leachate Center	LC03	4.8	6.2	19.5	69.6	47.3	47.4	-17.6	-17.6	-17.7
Southern Cleanouts Witness East	LC04	19.2	15.9	12.2	52.7	47.7	47.7	-17.8	-17.7	-17.8
Southern Cleanouts Leachate West	LC05	49.0	50.1	0.0	0.8	57.7	57.6	-16.8	-16.8	-17.5
Southern Cleanouts Gradient Center West	LC06	37.5	33.9	6.0	22.7	51.3	51.2	-17.4	-17.5	-17.5
Southern Cleanouts Leachate East	LC08	48.2	51.1	0.0	0.8	57.2	57.2	-16.9	-16.9	-17.6
Southern Cleanouts Gradient Center East	LC09	36.2	28.7	6.1	29.0	49.9	49.9	-17.5	-17.6	-17.6
Southern Cleanouts Leachate West	LC10	25.5	18.3	11.6	44.5	50.1	50.1	-17.6	-17.5	-17.6
Northern Cleanouts Leachate East	NC01	0.2	3.1	20.9	75.8	57.1	58.7	-16.8	-16.6	0.3
Northern Cleanouts Leachate Center	NC02	0.1	0.7	21.3	78.0	53.3	53.2	-20.2	-20.0	0.0
Northern Cleanouts Leachate West	NC03	0.0	0.0	21.5	78.5	51.1	52.0	-16.9	-16.9	0.3
Northern Cleanouts Witness East	NC04	0.0	0.0	21.6	78.4	52.8	51.8	-15.4	-15.3	0.2
Northern Cleanouts Witness Center	NC05	0.0	0.0	21.7	78.4	51.1	53.0	-15.3	-15.3	0.2
Northern Cleanouts Witness West	NC06	0.0	0.0	21.7	78.3	54.3	53.2	-15.3	-15.2	0.3
Northern Cleanouts Gradient East	NC07	52.5	35.3	1.7	10.6	51.7	51.6	-17.2	-17.2	0.2
Northern Cleanouts Gradient Center East	NC08	58.2	39.5	0.0	2.3	54.9	55.4	-17.3	-17.4	0.3
Northern Cleanouts Gradient Center West	NC09	55.6	39.7	0.7	4.1	54.8	54.7	-17.3	-17.4	0.2
Northern Cleanouts Gradient West	NC10	0.2	3.0	21.2	75.6	52.2	51.8	-15.2	-15.2	0.2

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 semi-monthly reports for May are 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 May, work on the expansion of the GCCS focused on the construction of deep well gas collection system. Eight wells were drilled reaching a depth of 185 feet. The City and SCS-CONS anticipate installation of the first five pumps in June, and are awaiting the delivery of the remaining pumps. The expanded GCCS is on track to connect to these wells vacuum and begin liquids extraction no later than June 30, 2023.

Figure 1. Deep-Well Drilling 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.

Figure 2. Perimeter Landfill Gas Extraction Well EW-78 Connected to Lateral Piping



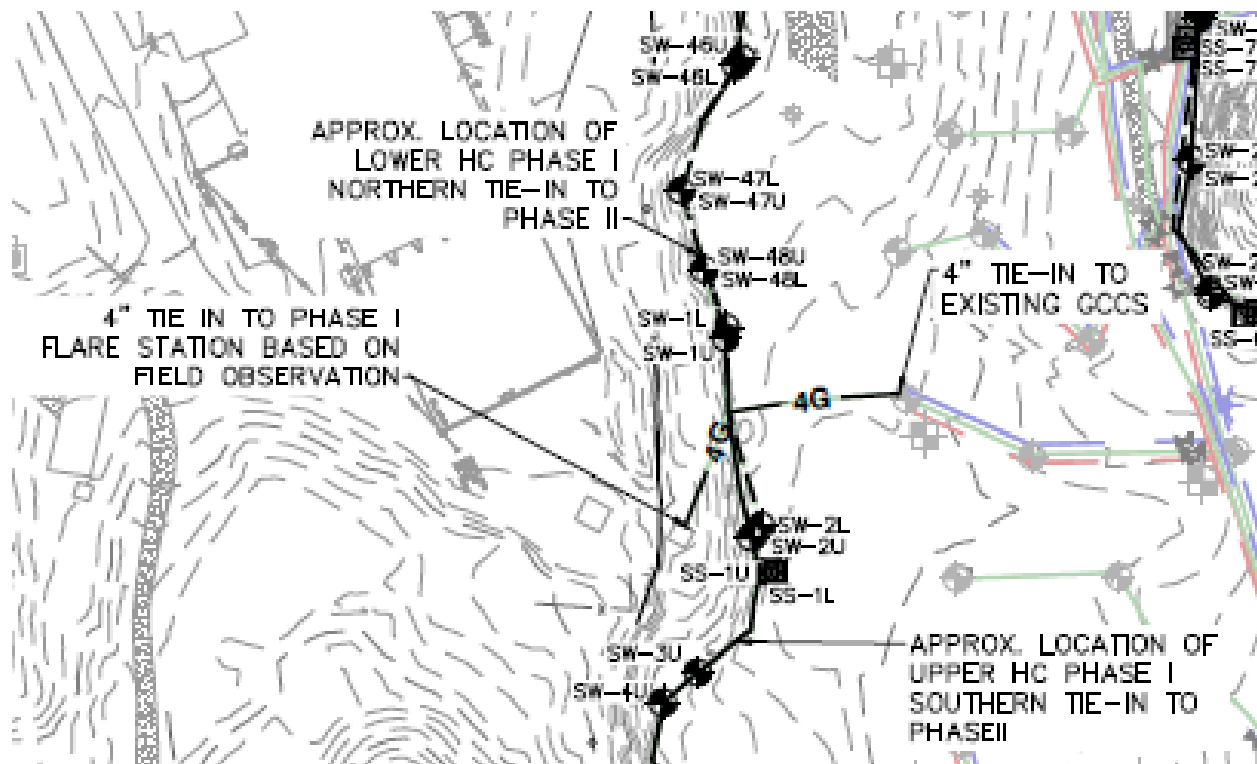
2.2 SIDEWALL ODOR MITIGATION SYSTEM

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 3. SOMS Phase I As-Built¹



¹ Location data was collected using mapping grade global positioning system equipment.

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 May 2023. A summary of those measurements is shown in Table 3.

Table 3. Sidewall HC Wellhead Gas Quality Measurements

Device ID	Date/Time	CH ₄ (%)	CO ₂ (%)	O ₂ (%)
SW1L	5/4/2023 9:12:00 AM	16.7	31.8	8.9
SW1L	5/8/2023 11:16:05 AM	8.8	25.9	11.6
SW1L	5/15/2023 9:17:54 AM	8.9	28.0	10.2
SW1L	5/22/2023 12:49:19 PM	7.9	24.4	10.3
SW1L	5/30/2023 9:43:51 AM	4.7	18.2	13.0
SW1U	5/4/2023 9:09:32 AM	3.0	11.5	17.1
SW1U	5/8/2023 11:13:40 AM	0.4	6.3	20.1
SW1U	5/15/2023 9:15:43 AM	1.1	4.0	18.9
SW1U	5/22/2023 12:47:24 PM	3.7	12.5	15.4
SW1U	5/30/2023 9:45:53 AM	3.8	13.9	15.8
SW2L	5/4/2023 9:14:41 AM	18.1	35.6	7.9
SW2L	5/8/2023 11:18:38 AM	15.4	34.0	9.1
SW2L	5/15/2023 9:23:36 AM	15.4	35.3	9.1
SW2L	5/22/2023 12:52:28 PM	14.3	29.3	9.0
SW2L	5/30/2023 9:48:26 AM	11.2	23.1	10.9
SW2U	5/4/2023 5:07:00 PM	17.9	60.6	2.2
SW2U	5/8/2023 11:23:16 AM	1.6	7.7	18.5
SW2U	5/15/2023 9:25:45 AM	1.8	6.7	18.1
SW2U	5/22/2023 1:02:06 PM	2.3	8.5	17.7
SW2U	5/30/2023 9:52:31 AM	0.8	2.8	18.7

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 low, 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. SW1U is close to the northern limit of Phase 1. Measurements of gas composition taken at SW1U indicate that ambient air is being pulled in at this location. This is expected for the proximity of this section of the horizontal collector to the Phase 1 temporary termination.

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 partially completed Phase 2 of the system. Because construction of Phase 2 is ongoing, higher levels of ambient air are being captured by the Phase 1 system through these connections. This is expected to be addressed as construction progresses.

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 is being constructed utilizing the same general configuration. SCS-FS will continue to monitor Phase 1 of the system during the month of June 2023.

2.4 FULL SYSTEM CONSTRUCTION

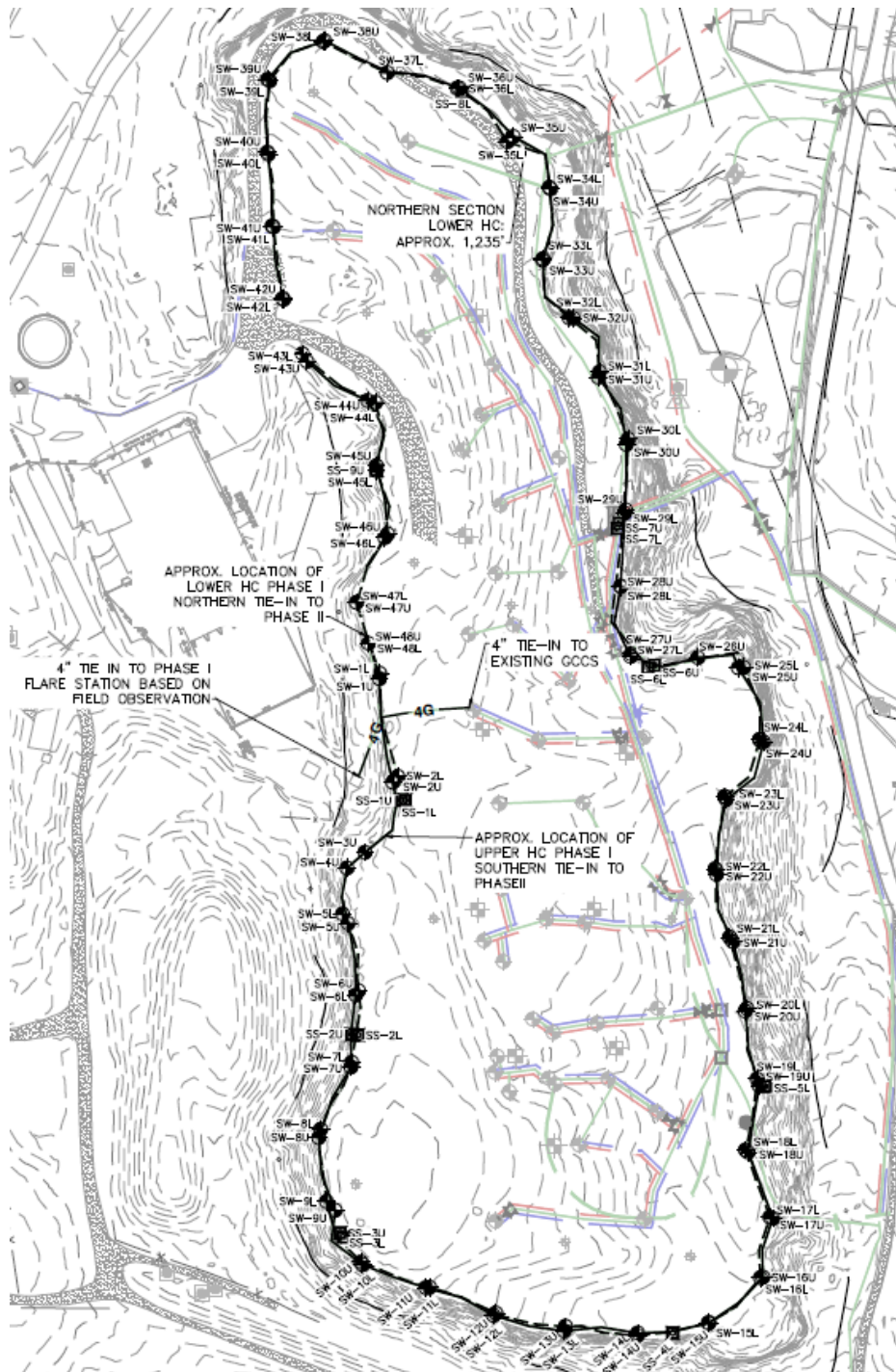
SCS-CONS continued construction of Phase 2 of the SOMS during the month of May 2023. Lower horizontal collector (HC) placement was considered complete along all sections of the sidewall as of May 5, 2023. Liner and clay placement continued throughout the month of May and will continue into June. The remaining section of the upper horizontal collector was installed along the northern sidewall with a section of solid piping for the road crossing in that area. Figure 4 shows Phase 2 construction activities. The crew continued the installation of liquids collection sumps at low elevation points, and wellhead(s) installation at every 100'. Phase 2 lower and upper collectors construction progress, including HC wellhead and sump locations, is shown in the as-built depicted as Figure 5². An additional drawing showing the completed portions of the SOMS is included in Appendix G.

Figure 4. Phase 2 SOMS Low Permeability Soil Placement



² During construction, redundant risers were put in place to accommodate supplemental wellhead installation in the future. Figure 5 shows all riser locations. A final submittal to VDEQ will show the locations of actual wellhead installation.

Figure 5. Phase 2 Sidewall Odor Mitigation System Progress As-Built³



During the month of May 2023, SCS-CONS completed installation of Phase 2 lower and upper horizontal collectors. GCCS liquids removal infrastructure and header pipes were temporarily relocated successfully in order to complete the remaining portions of the SOMS. Installation of the

³ Location data was collected using mapping grade global positioning system equipment.

lower collector at the location previously occupied by GCCS liquids removal infrastructure is shown in Figure 6.

Figure 6. Phase 2 SOMS Lower 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 IloT 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.

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 May. Average daily temperatures recorded by the sensors for the Month of May 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 May are shown in Appendix B. The average temperatures for the month recorded during the months of March, April, and May are shown in Figures 7 through 15 on the following pages.

Figure 7 shows daily average temperatures in Temperature Probe 1 (TP-1) in March, April, and May. Based on the data, temperatures have been consistent during the last three months. 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, April, and May

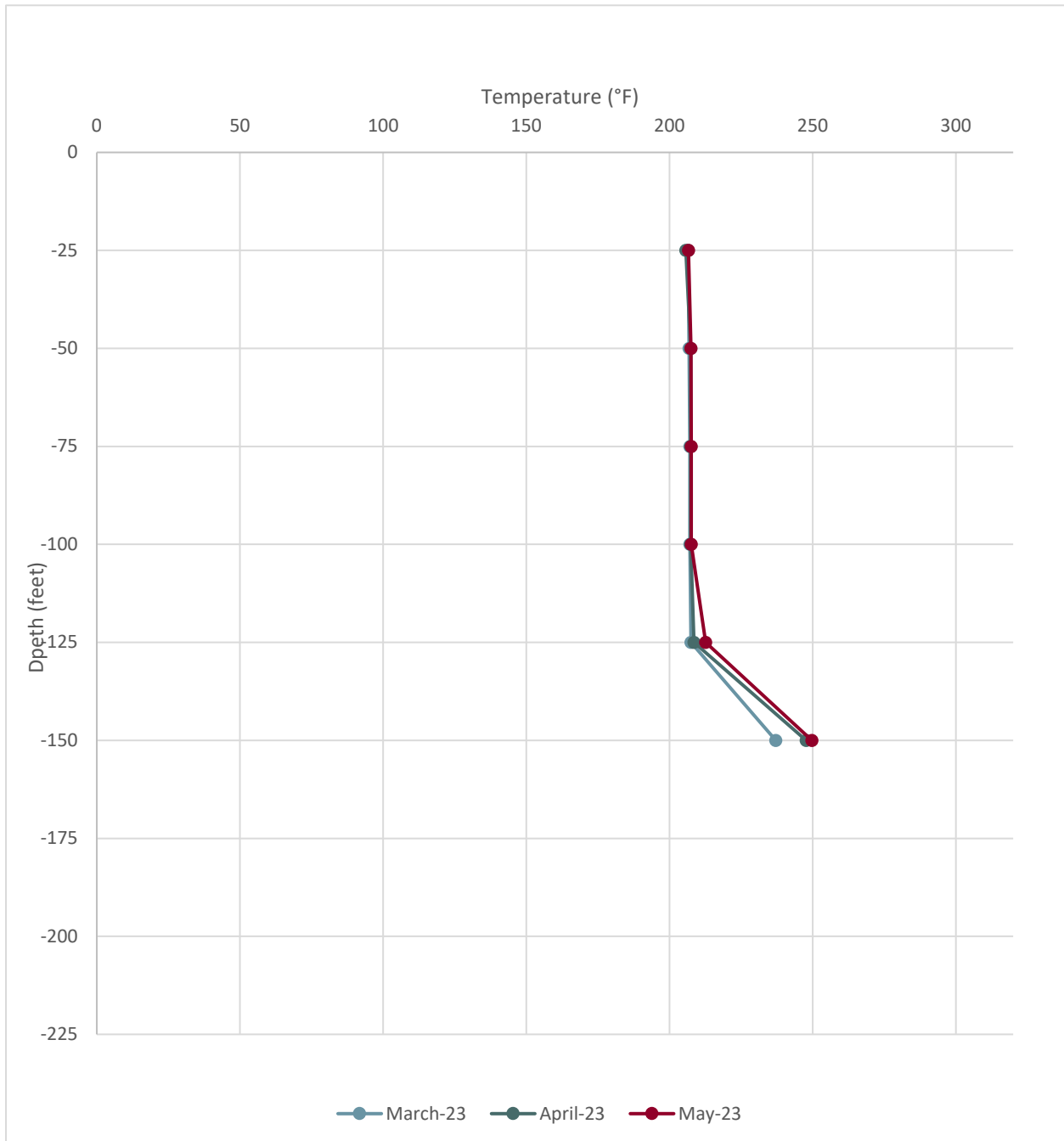


Figure 8 shows daily average temperatures in Temperature Probe 2 (TP-2) in March, April, and May. Based on the data, temperatures have been consistent during the last three months. TP-2 was originally drilled to a depth of 160 feet.

Figure 8. Average Temperatures within TP-2 During the Months of March, April, and May

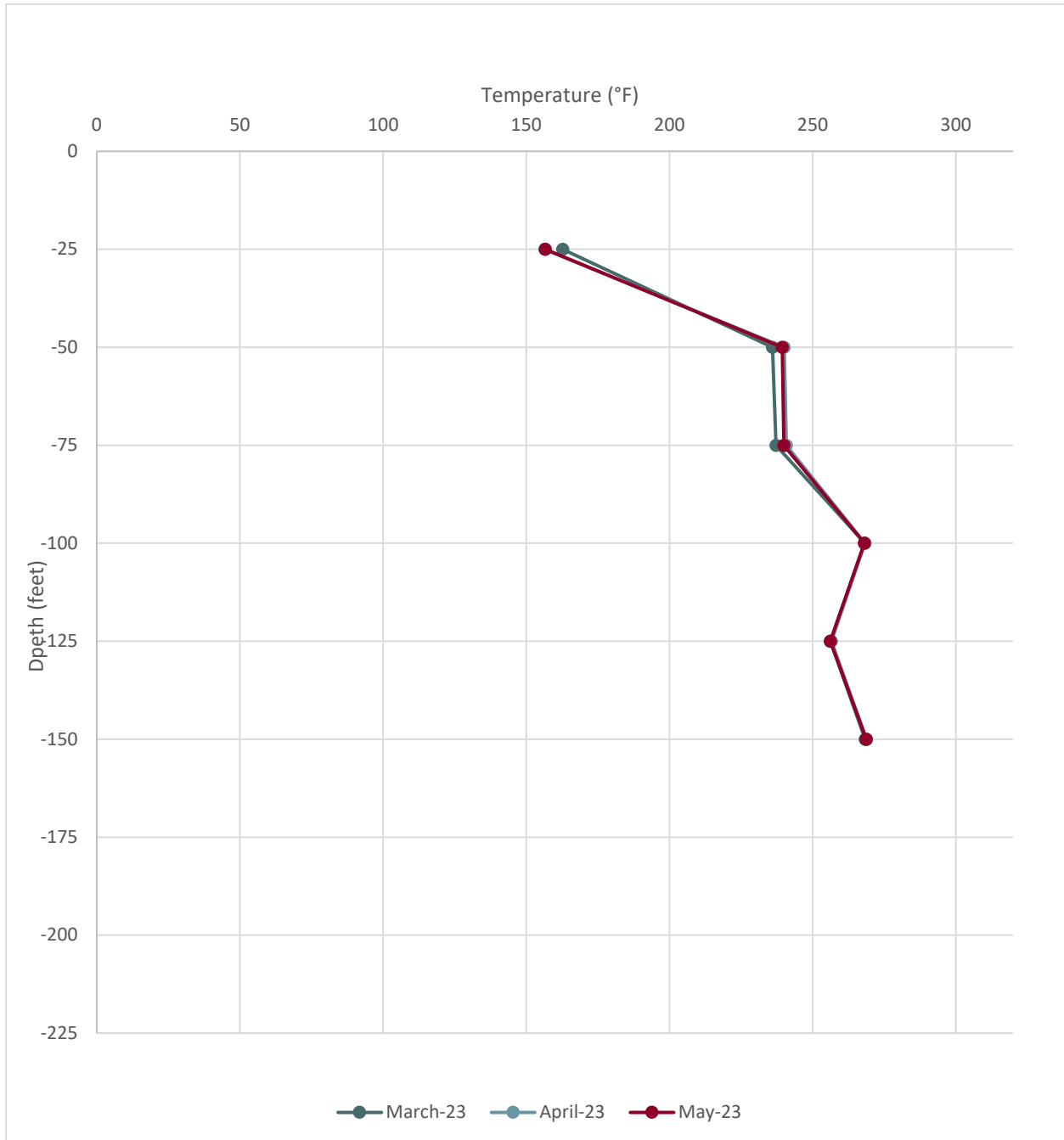


Figure 9 shows daily average temperatures in Temperature Probe 3 (TP-3) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 9. Average Temperatures within TP-3 During the Months of March, April, and May

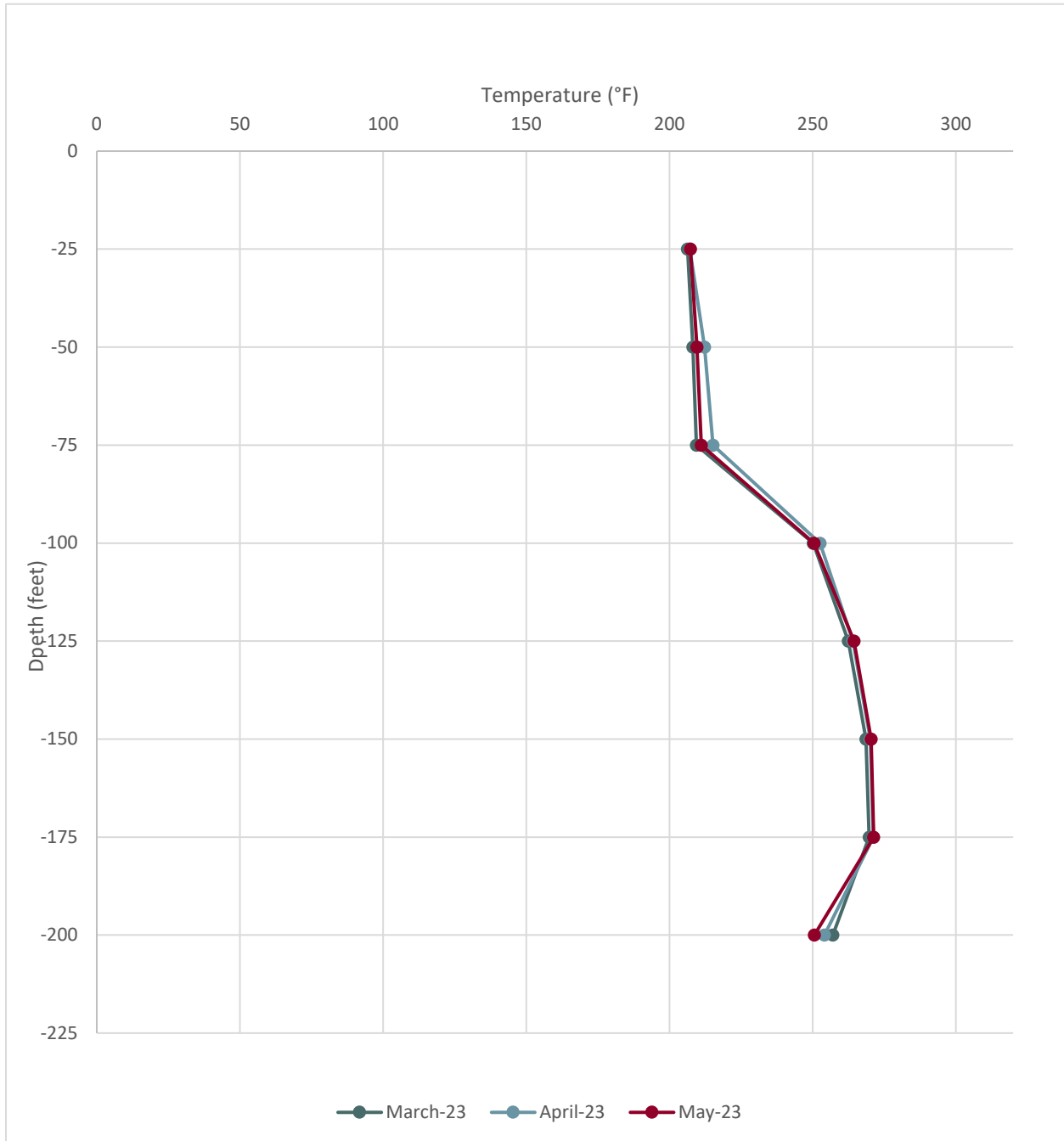


Figure 10 shows daily average temperatures in Temperature Probe 4 (TP-4) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 10. Average Temperatures within TP-4 During the Months of March, April, and May

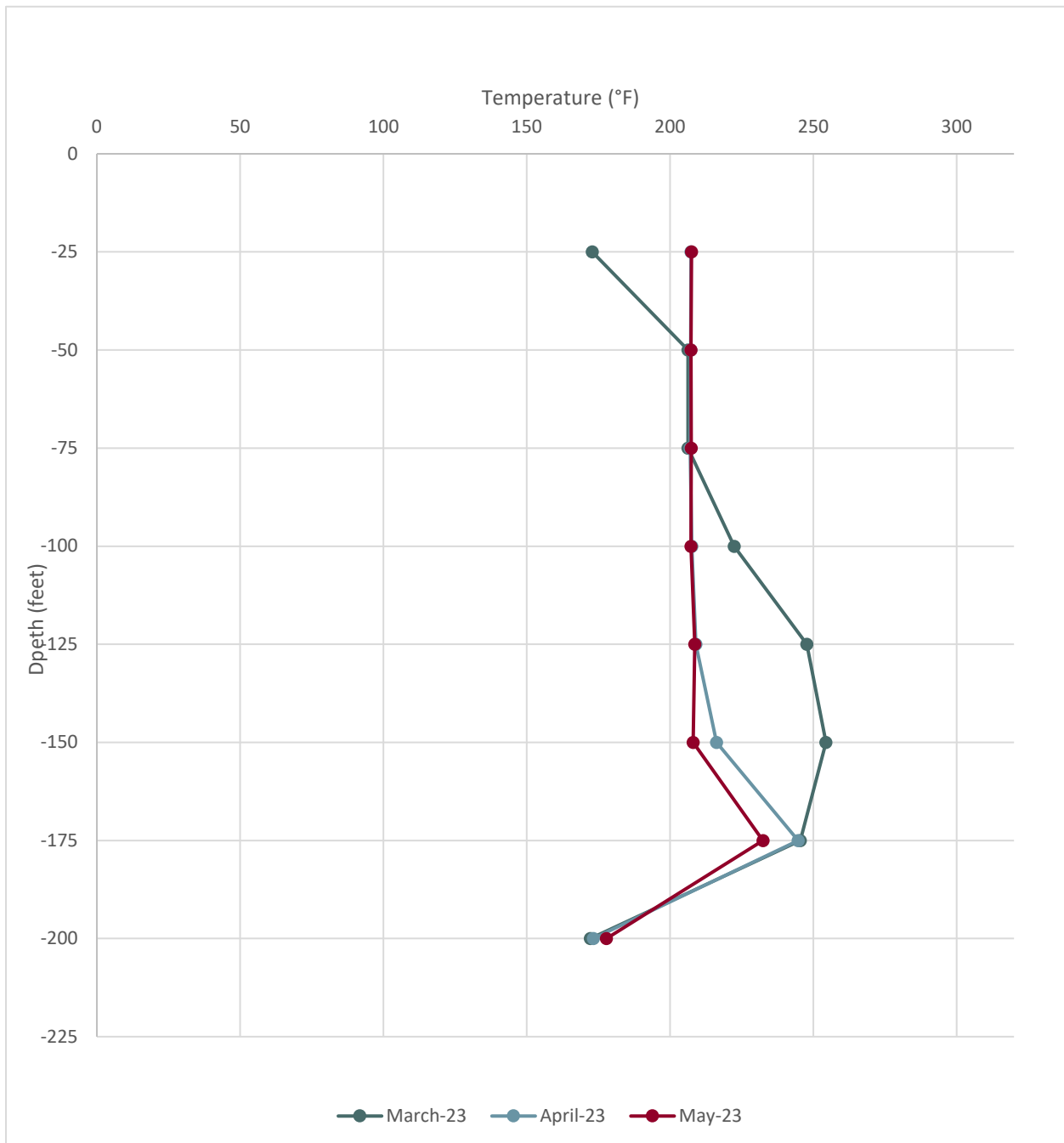


Figure 11 shows daily average temperatures in Temperature Probe 5 (TP-5) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 11. Average Temperatures within TP-5 During the Months of March, April, and May

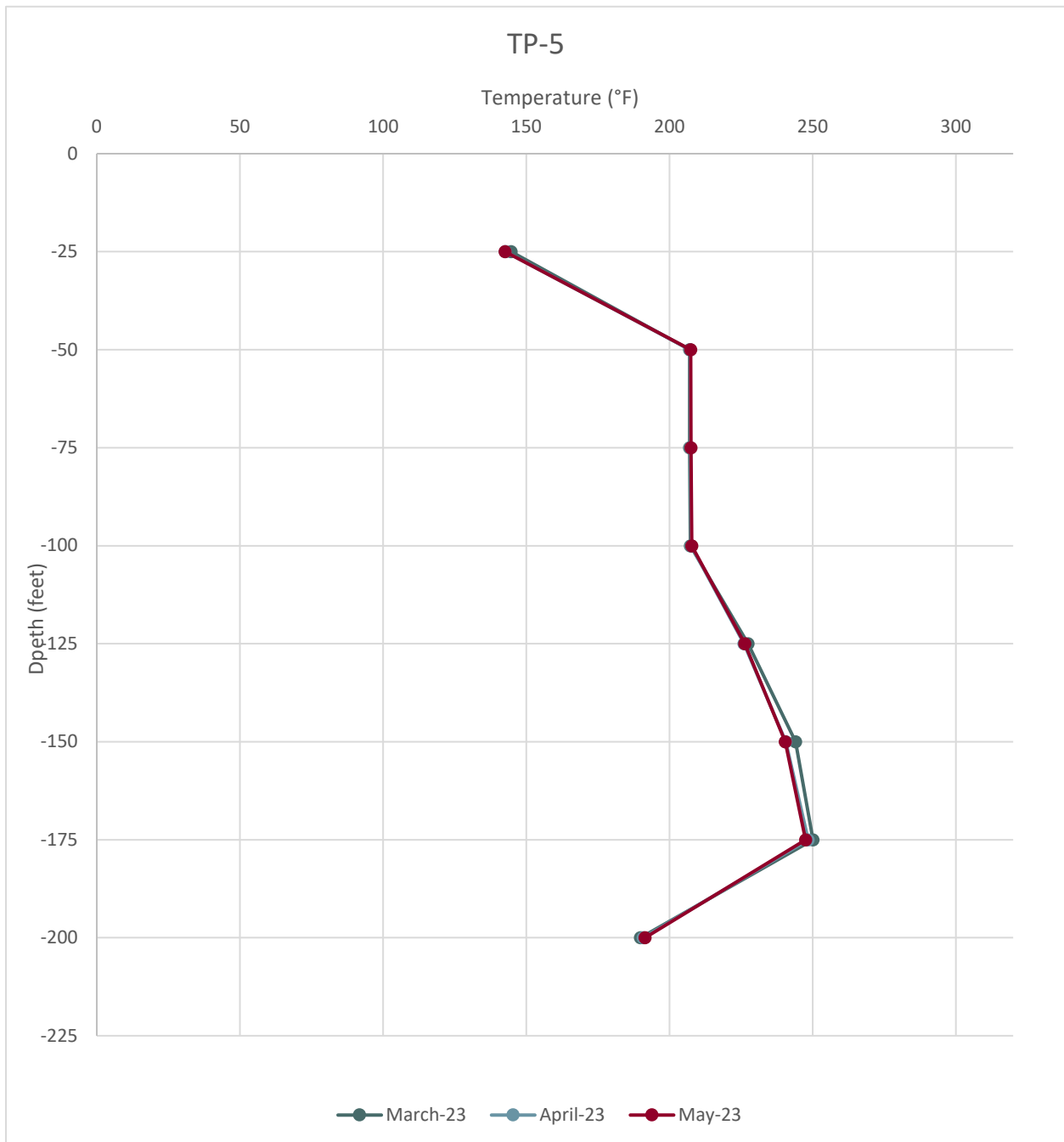


Figure 12 shows daily average temperatures in Temperature Probe 6 (TP-6) in March, April, and May. Based on the data, temperatures have been consistent during the last three months. TP-6 was originally drilled to a depth of 208 feet and casing was installed to the full depth. During the installation 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, April, and May

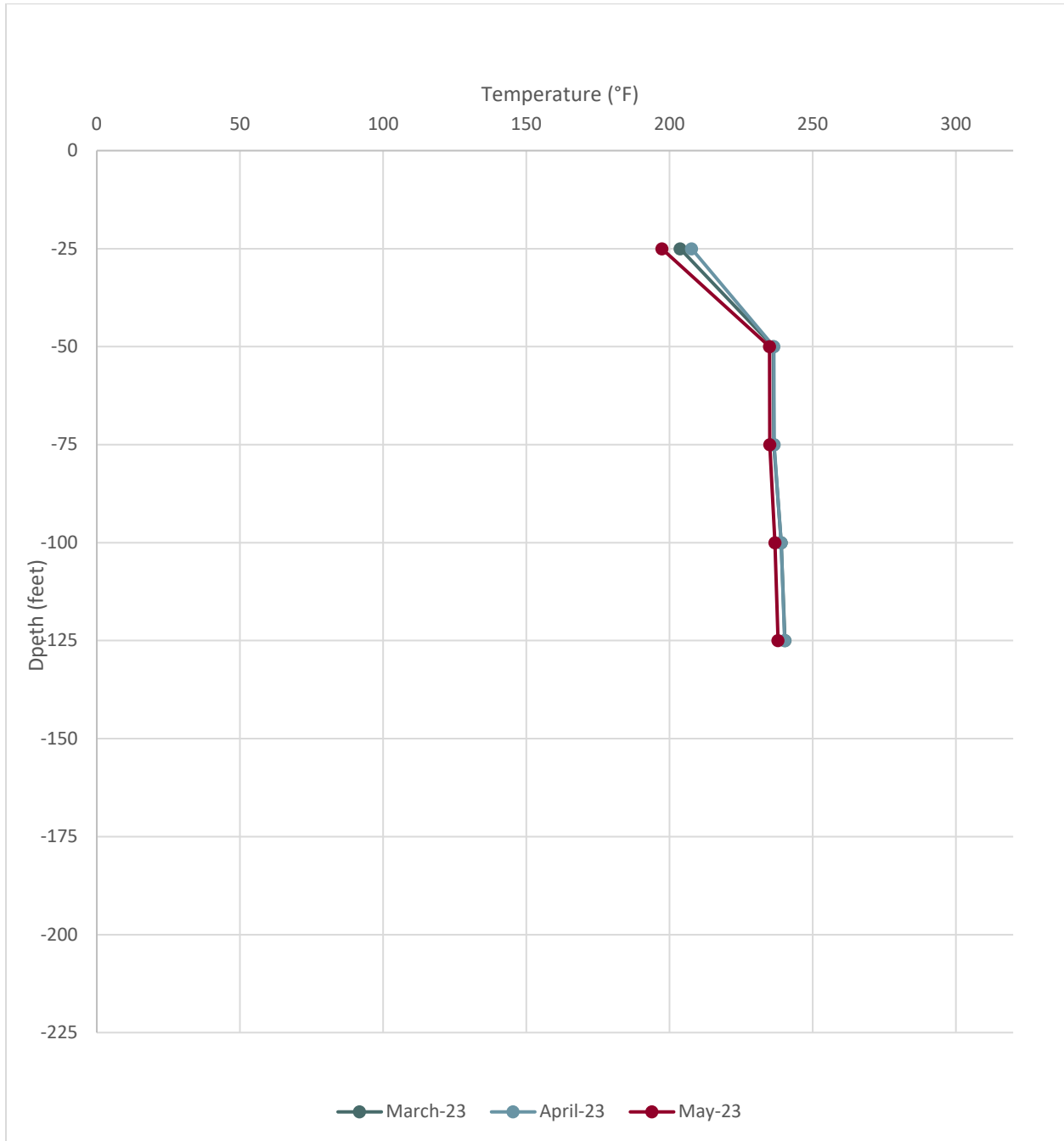


Figure 13 shows daily average temperatures in Temperature Probe 7 (TP-7) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 13. Average Temperatures within TP-7 During the Months of March, April, and May

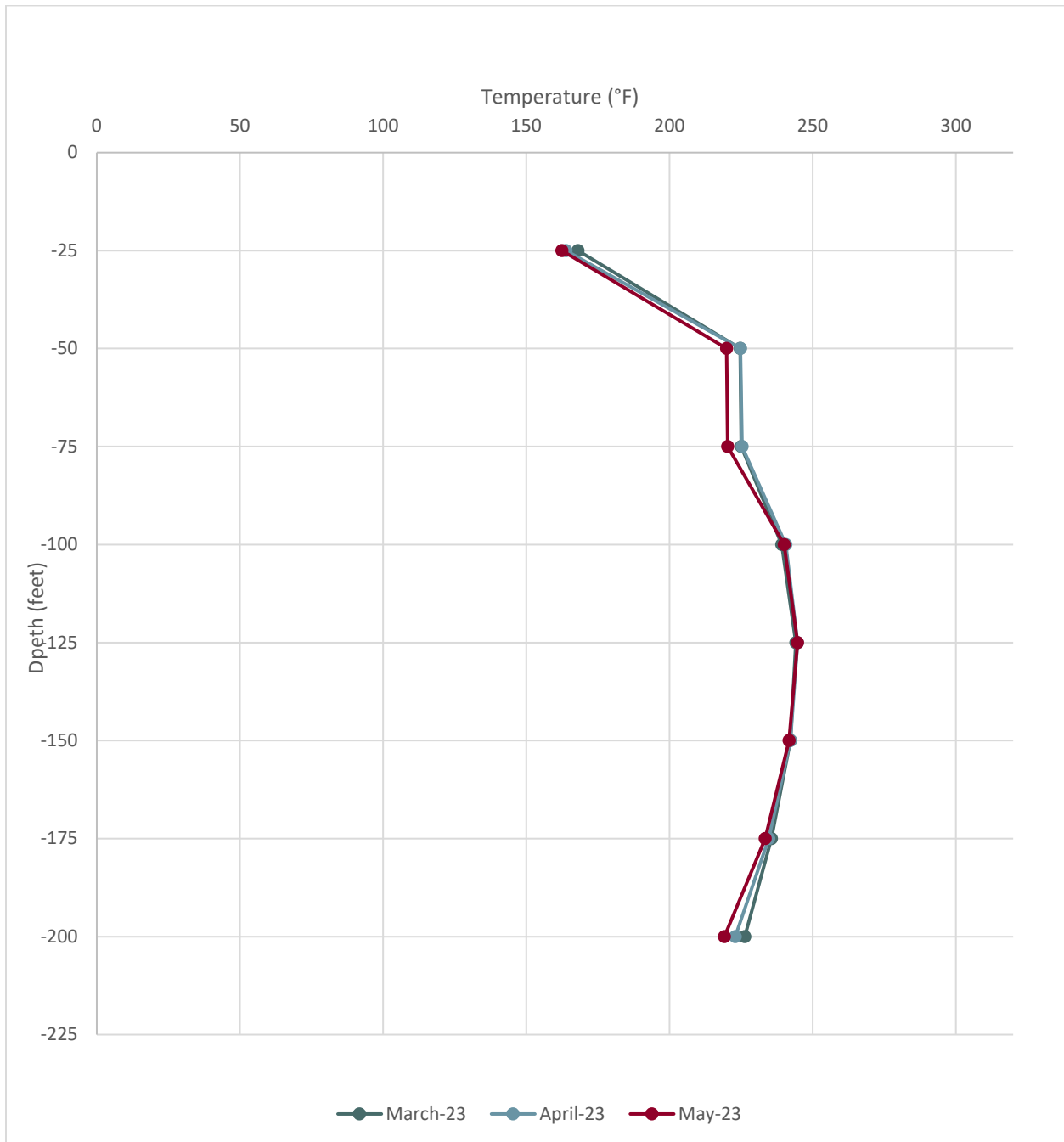


Figure 14 shows daily average temperatures in Temperature Probe 8 (TP-8) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 14. Average Temperatures within TP-8 During the Months of March, April, and May

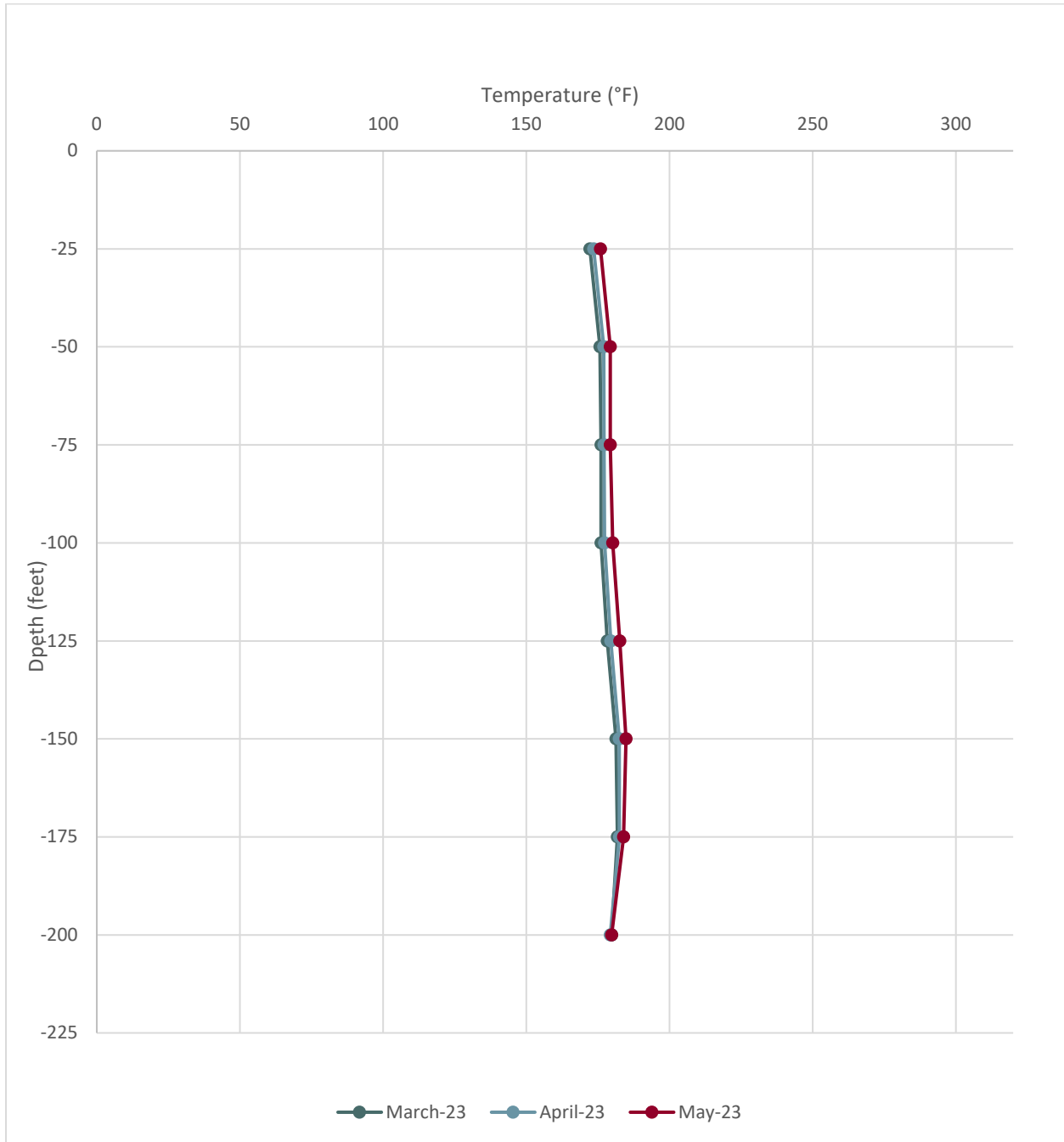
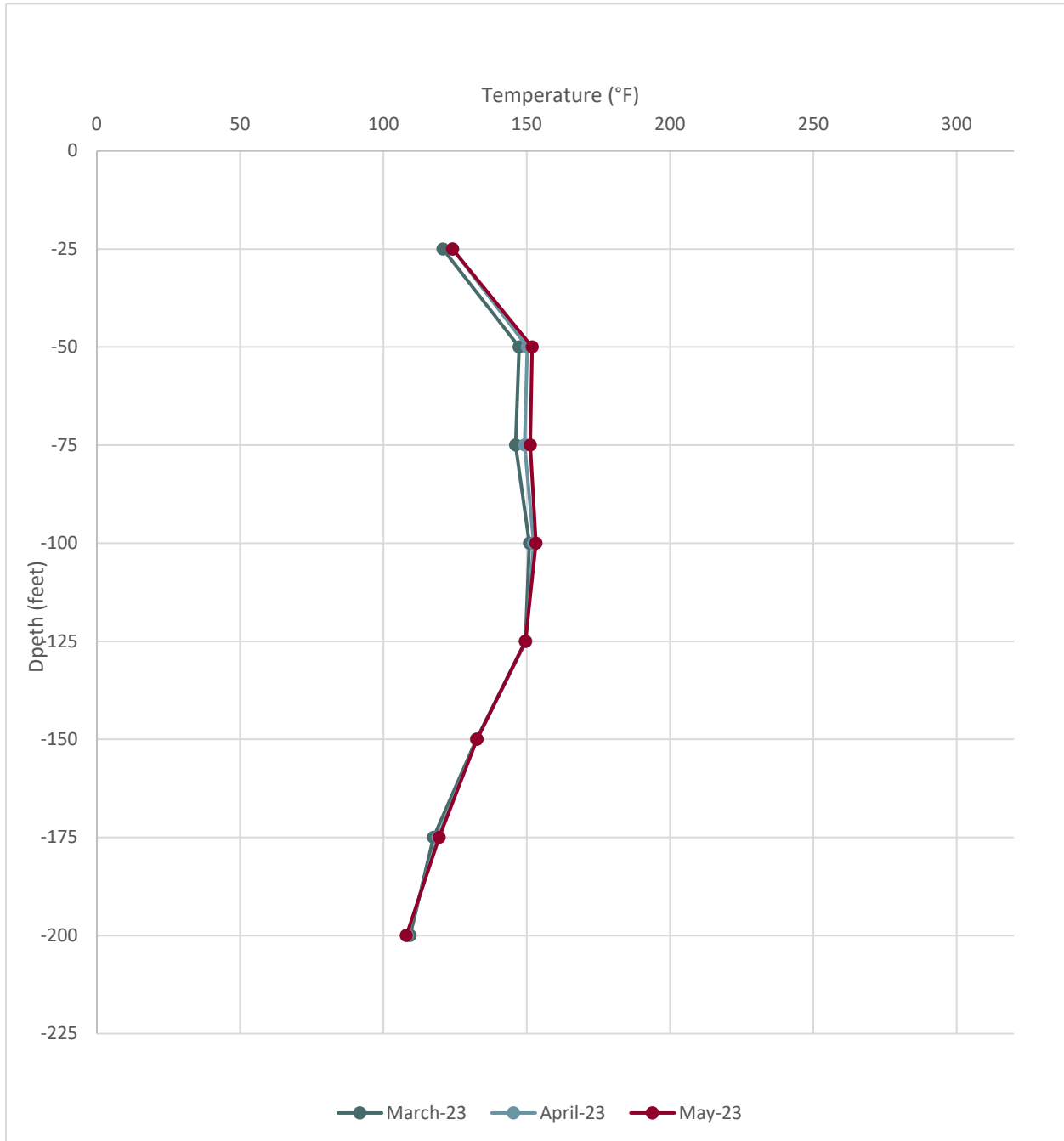


Figure 15 shows daily average temperatures in Temperature Probe 9 (TP-9) in March, April, and May. Based on the data, temperatures have been consistent during the last three months.

Figure 15. Average Temperatures within TP-9 During the Months of March, April, and May



The data indicate that temperatures within the landfill are stable and are typical of those observed at elevated temperature landfills (ETLFs). 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 4, 2023; May 8, 2023; May 15, 2023; May 22, 2023; and May 30, 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 4. Summary of Dual Extraction Well Pump Stroke Counter Data

Well	May 4, 2023	May 8, 2023	May 15, 2023	May 22, 2023	May 30, 2023
EW49	562596	582704	582708	602671	630900
EW50	931616	944471	945222	951297	961571
EW51	*	*	*	*	*
EW52	6	12	15	5097	39412
EW53	2088656	2093928	2093928	2128068	2158667
EW54	241211	241220	241220	307143	317679
EW55	115064	118770	149748	164622	171553
EW57	272446	279934	282603	282616	300616
EW58	1902975	1913310	1935845	1982769	1994080
EW59	1718560	1777230	1791736	1820711	1878472
EW60	172066	172071	247396	268597	278402
EW61	215034	222181	223211	232757	234133
EW62	114045	114047	117810	124136	130883
EW63	*	*	*	*	*
EW64	98090	98090	98099	98116	117654
EW65	3973	*	*	*	*
EW67	462026	470570	470574	480714	481717
EW68	1852972	1853386	1853898	1955873	2032232
EW94	102290	104849	168976	169002	292269

Based on this data and stroke counts taken on May 30, 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

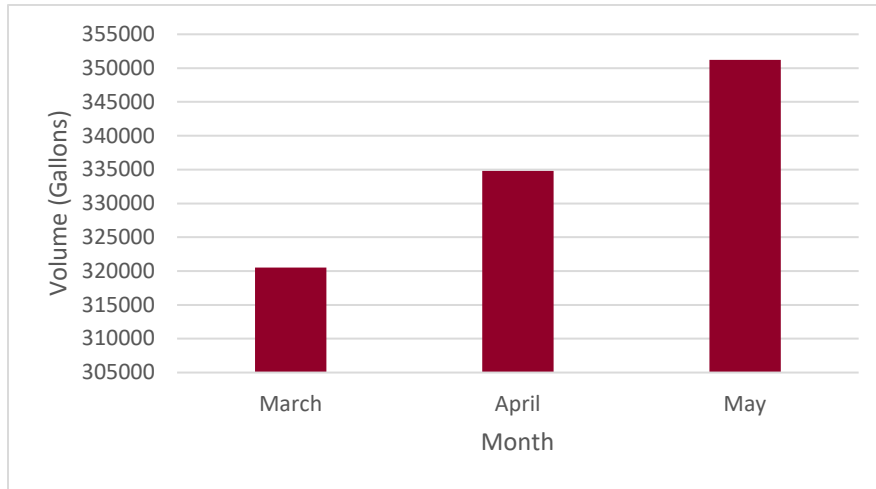
replace nonfunctional stroke counters. Estimates of the quantities of liquids removed between the reading dates is shown in Table 5.

Table 5. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) April 24, 2023 to May 4, 2023	Liquids Removed (gal) May 4, 2023 to May 8, 2023	Liquids Removed (gal) May 8, 2023 to May 15, 2023	Liquids Removed (gal) May 15, 2023 to May 22, 2023	Liquids Removed (gal) May 22, 2023 to May 30, 2023
EW49	26714	6032	2	5989	8469
EW50	16820	3857	225	1822	3082
EW51	*	*	*	*	*
EW52	2	2	1	1524	10294
EW53	8920	1581	0	10242	9179
EW54	1	3	0	19776	3160
EW55	12359	1112	9293	4462	2079
EW57	355	2246	801	4	5400
EW58	12293	3100	6760	14077	3933
EW59	31560	17601	4352	8692	17328
EW60	3	2	22597	6361	2941
EW61	877	2144	309	2863	412
EW62	0	1	1129	1897	2024
EW63	0	*	*	*	*
EW64	0	0	3	5	5861
EW65	*	*	*	*	*
EW67	3468	2563	2	3042	301
EW68	306	124	153	30592	22907
EW94	20699	768	19238	8	36980

SCS estimates that approximately 351,200 gallons of liquids were removed from the landfill gas collection and control system during the month of May. This is an increase of approximately 17,000 gallons when compared to the previous month. 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 May pump maintenance occurred on 5/3, 5/11, 5/12, 5/15, 5/16, 5/17, 5/24, 5/25, and 5/31.

Pumps that were determined to be inoperative were removed from their respective extraction wells and replaced with a clean, functioning pump. In May, EW-49, EW-52, EW-53, EW-54, EW-57, EW-58, EW-60, EW-61, EW-63, EW-67, EW-68, and EW-94 had their pumps removed and replaced. The pump tri-tubing for EW-67 was found to be compromised and was repaired while the pump was being maintained.

Seven new Pump One pneumatic pumps were delivered to the site during May. These pumps have been designated as spares and will be used to streamline repairs and replacements in the field. This is likely a contributor to the increase in liquids removed month over month.

During April, four pumps were removed and shipped back to the manufacturer's facility (Pump One) for cleaning and repair. These pumps were returned to the site in May and have been put back into rotation for when repairs, replacements, or installations are necessary.

EW-65 was disconnected from the airline used to power the pumps for the month of May 2023 due infrastructure relocation associated with the sidewall odor mitigation system and landfill GCCS expansion construction projects. The pump for EW-51 has also been removed for construction activities and will be reinstalled once feasible. The pump for EW-63 was reinstalled now that construction has progressed further.

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.

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 May 4, 2023, SCS collected leachate samples from three Dual Phase LFG-EWs (EW-50, EW-58 and EW-59). 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-53, EW-54, EW-55, EW-57, EW-60, EW-61, EW-62, EW-63, EW-64, EW-65, EW-67, and EW-68.
- Pump was disconnected in well EW-56
- No pump was installed in well EW-51.
- The airline was disconnected from well EW-52.

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 May 2023 monitoring event. The laboratory analysis report for the May 2023 monitoring event trip blank is included in **Appendix F**. The May 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) guidance⁴. 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

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.

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 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 May 2023 monitoring event as no constituents were detected in the May 2023 method and trip blanks. The constituent detection flagged with a "J" qualifier is shown on **Table 6**.

4.2.4 Laboratory Analytical Results

Chemical characteristics of leachate samples collected from extraction wells EW-50, EW-58 and EW-59 are summarized in **Table 6**. The associated COA is included in **Appendix F**. Parameter results from May 2023 and previous monitoring events (November 2022 – April 2023) are presented on a table in **Appendix F**.

Table 6. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-58	EW-59	LOD	LOQ
Parameter	May 2023 Concentration				
Ammonia as N (mg/L)	1390	1860	2380	146	200
Biological Oxygen Demand (mg/L)	7350	11900	35300	0.2	2
Chemical Oxygen Demand (mg/L)	7590	18700	---	2000	2000
	---	---	44700	4000	4000
Nitrate as N (mg/L)	ND	---	---	1.1	5.1
	---	ND	ND	1.2	5.2
Nitrite as N (mg/L)	ND	ND	ND	1	5
Total Kjeldahl Nitrogen (mg/L)	1590	1950	2910	40	100
Total Recoverable Phenolics (mg/L)	18.6	20	50	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)					
Anthracene	ND	---	ND	93.5	187
	---	ND	---	467	935
TOTAL METALS (mg/L)					
Arsenic	0.26	0.3	0.27	0.0025	0.005
Barium	0.636	---	---	0.005	0.025
	---	1.2	1.83	0.01	0.05
Cadmium	ND	ND	ND	0.0005	0.005
Chromium	0.422	0.281	0.237	0.002	0.005
Copper	ND	ND	ND	0.0015	0.005
Lead	ND	ND	ND	0.005	0.005
Mercury	ND	ND	ND	0.0002	0.0002
Nickel	0.113	0.09726	0.05657	0.005	0.005

Table 6. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-58	EW-59	LOD	LOQ
Parameter	May 2023 Concentration				
Selenium	ND	ND	0.00569	0.0043	0.005
Silver	ND	ND	ND	0.0003	0.005
Zinc	0.079	0.0635	0.0519	0.0125	0.025
VOLATILE FATTY ACIDS (mg/L)					
Acetic Acid	990	1800	3000	370	500
Butyric Acid	ND	ND	1200	330	500
Propionic Acid	520	800	1400	340	500
VOLATILE ORGANIC COMPOUNDS (ug/L)					
2-Butanone (MEK)	5360	5970	---	150	500
	---	---	13600	750	2500
Acetone	10700	11700	---	350	500
	---	---	29600	1750	2500
Benzene	814	4890	3370	20	50
Ethylbenzene	124	276	144	20	50
Tetrahydrofuran	ND	2740	2380	500	500
Toluene	258	371	239	25	50
Xylenes, Total	274	441	230	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

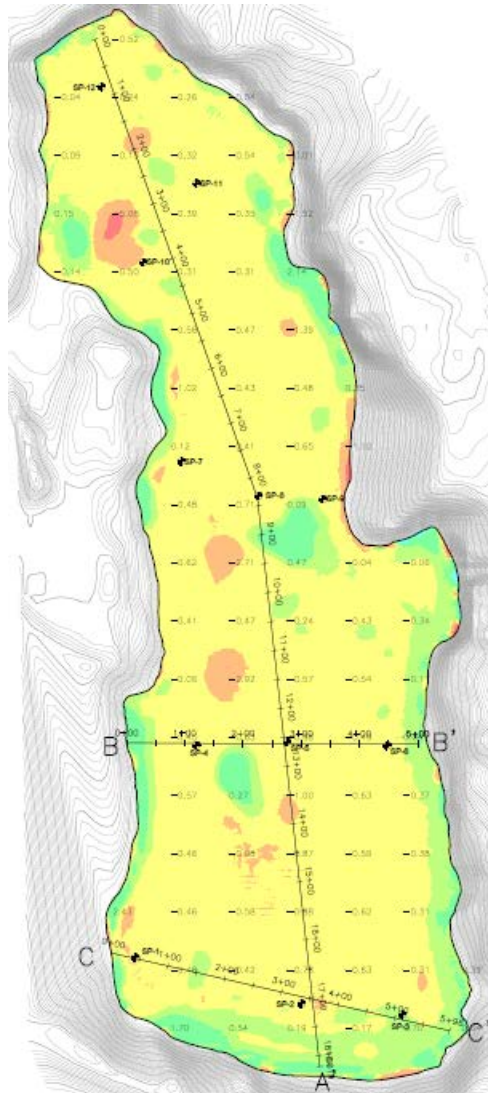
The City, through SCS, collected topographic data of the Solid Waste Permit No. 588 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On May 11, 2023 the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 2 in Appendix E.

The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on April 11, 2023. A drawing depicting the April 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 13,200 cubic yards. During that same time period approximately 4,900 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 8,300 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 0.5 feet or more in some areas. Settlement in the southern end of the landfill appears to have slowed 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 eastern side of the landfill exhibited an increase in elevation, likely due to soil placement associated with construction of the Sidewall Odor Mitigation System. Increases in elevation along the western edge of the landfill are most likely also due to installation of the Sidewall Odor Mitigation System. Some soil stockpile locations associated with the Sidewall Odor Mitigation System showed a large negative elevation change 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.

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 June using photogrammetric methods via UAV. This data will be compared to the data collected in May and March.

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 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; and May 11, 2023. The settlement plate locations are depicted in Figure 19 on Sheet 1 in Appendix E. The surveyed coordinates⁵ and elevation changes of the settlement plates are shown in Table 7.

⁵ Settlement plate locations and coordinates are based on a local coordinate system.

Figure 19. Settlement Plate Locations

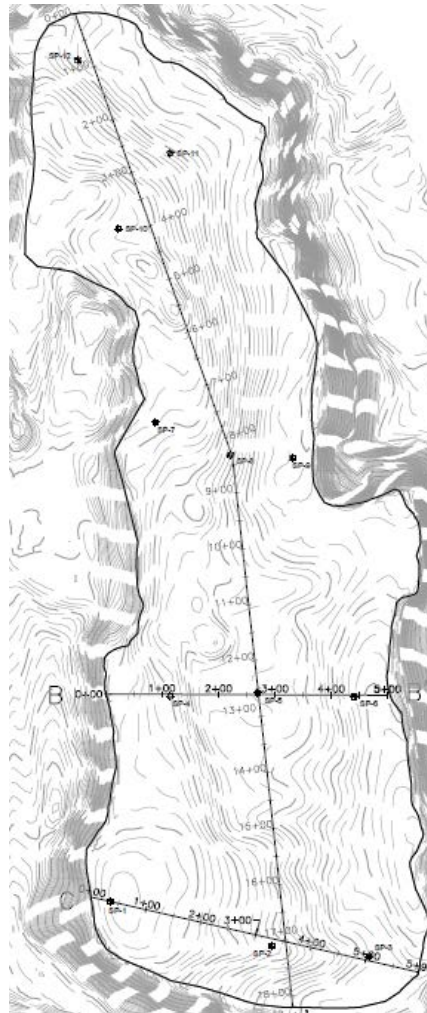


Table 7. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation on May 11, 2023	Elevation Change Since April 4, 2023	Strain ⁶ Since April 4, 2023	Elevation Change Since Installation	Strain Since Installation
SP-1	3,397,886.6	10,412,078.6	1,832.4	-0.6	-0.9%	-2.0	-3.1%
SP-2	3,397,807.9	10,412,364.8	1,806.5	-0.9	-0.5%	-4.0	-2.5%
SP-3	3,397,787.3	10,412,536.6	1,783.2	-0.2	-0.3%	-0.4	-0.7%
SP-4 ⁷	3,398,250.2	10,412,187.8	1,812.6	-1.1	-0.7%	-4.9	-3.1%
SP-5	3,398,256.0	10,412,338.8	1,797.6	-0.7	-0.3%	-3.2	-1.2%

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.

Settlement Plate	Northing	Easting	Elevation on May 11, 2023	Elevation Change Since April 4, 2023	Strain ⁶ Since April 4, 2023	Elevation Change Since Installation	Strain Since Installation
SP-6	3,398,249.4	10,412,511.0	1,776.7	-0.3	-0.2%	-1.0	-0.7%
SP-7 ⁸	3,398,736.1	10,412,157.2	1,827.4	-0.3	-0.2%	-1.2	-1.0%
SP-8	3,398,679.2	10,412,290.6	1,804.8	-0.6	-0.2%	-2.5	-1.0%
SP-9	3,398,674.0	10,412,401.2	1,784.5	-0.5	-0.5%	-1.3	-1.3%
SP-10	3,399,080.6	10,412,092.3	1,839.3	-0.1	-0.1%	-0.9	-0.3%
SP-11	3,399,216.2	10,412,183.8	1,815.9	-0.2	-0.1%	-0.5	-0.2%
SP-12	3,399,382.1	10,412,019.6	1,810.5	0.0	0.0%	-0.2	-0.2%

Settlement Plates 1, 2, and 4 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 (1 and 2) 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 changed in elevation at Settlement Plates 10, 11, and 12 is lower and more representative of typical settlement at municipal landfills. The change in elevation at Settlement Plates 3, 5, 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 June. The elevations surveyed will be compared to the elevations surveyed the previous months.

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.

⁸ Based on field observations SP-7 appears to have been disturbed during grading on an adjacent stockpile.

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.

SCS is preparing construction drawings for the EVOH Cover System, including revisions discussed in the response to comments letter. The construction drawings build upon the preliminary design plans. The stormwater management plan drawings will be incorporated into the construction drawing set. 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 received a comment letter dated May 16, 2023 concerning the stormwater management plan, and SCS is preparing a response letter and revised drawings. SCS is also drafting 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.

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 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.

SCS received a comments letter from DEQ concerning the stormwater management plan dated May 16, 2023. SCS is preparing a response letter with revised documents.

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.

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 adjacent to the 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.

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.

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.

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 May, those actions include:

- **May – ongoing basis:** Thirteen 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 of the Sidewall Odor Mitigation System (SOMS).
 - Progress updates during installation of the gas well expansion project
 - Released statement regarding No Deficiency Letters from Virginia DEQ dated April 28, 2023.
 - Shared information related to the scheduling of public comment in the Federal District Court for the Western District of Virginia related to the consent order between Bristol, VA and Bristol, TN.
 - Shared content of letter sent by City of Bristol to President Biden related to request for funds to assist in remediation at the quarry landfill.
 - Provided links to news articles chronicling construction updates and information on legal updates about the quarry landfill.
- **New drone footage of progress at the quarry landfill posted this month:** footage taken on May 17th highlights the progress made on the Sidewall Odor Mitigation System and gas well expansion project.
- **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, May 5th
 - Friday, May 12th

- Friday, May 19th
- Friday, May 26th



Appendix A
Surface Emissions Monitoring Summary Letters

May 10, 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 – May 5, 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 May 5, 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 monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	163
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	63
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 retests.

The two exceedance locations identified during this monitoring event were located at newly installed landfill gas extraction wells. 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 after the expansion is complete.

The City and the installation contractor are working diligently to minimize the duration and impacts of these temporary factors.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	5/5/23 Event	5/5/23 Event Result	Comments
Tag 26	4/4/23	30-Day Retest	Passed	Exceedance Resolved
EW-59	4/13/23	N/A	Passed	Requires 30-Day Retest
Tag 21	4/20/23	N/A	Passed	Requires 30-Day Retest
EW-38	4/20/23	N/A	Passed	Requires 30-Day Retest
EW-84	4/20/23	N/A	Passed	Requires 30-Day Retest
EW-90	4/20/23	N/A	Passed	Requires 30-Day Retest
EW-94	4/20/23	N/A	Passed	Requires 30-Day Retest
Tag 37	4/27/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-89	4/27/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-95	4/27/23	10-Day Retest	Failed	Requires 2 nd 10-Day Retest
EW-100	4/27/23	10-Day Retest	Failed	Requires 2 nd 10 Day Retest

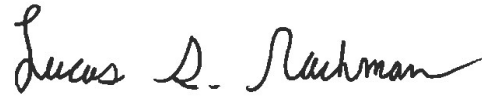
Mr. Jonathan Chapman
May 10, 2023
Page 4

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/NG/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

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 5, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	51.6 PPM	OK			Start Serpentine Route
2	1.2 PPM	OK			
3	1.1 PPM	OK			
4	1.1 PPM	OK			
5	1.1 PPM	OK			
6	0.9 PPM	OK			
7	1.1 PPM	OK			
8	1.1 PPM	OK			
9	1.2 PPM	OK			
10	21.2 PPM	OK			
11	3.1 PPM	OK			
12	3.4 PPM	OK			
13	10.5 PPM	OK			
14	51.1 PPM	OK			
15	99.9 PPM	OK			
16	29.9 PPM	OK			
17	64.2 PPM	OK			
18	111 PPM	OK			
19	2.2 PPM	OK			
20	18.1 PPM	OK			
21	29.6 PPM	OK			
22	7.4 PPM	OK			
23	196 PPM	OK			
24	254 PPM	OK			
25	182 PPM	OK			
26	459 PPM	OK			
27	308 PPM	OK			
28	4.7 PPM	OK			
29	295 PPM	OK			
30	20.9 PPM	OK			
31	191 PPM	OK			
32	19.7 PPM	OK			
33	11.1 PPM	OK			
34	3.8 PPM	OK			
35	1.8 PPM	OK			
36	8.7 PPM	OK			
37	20.5 PPM	OK			
38	43.5 PPM	OK			
39	5.2 PPM	OK			
40	4.4 PPM	OK			
41	4.1 PPM	OK			
42	5.9 PPM	OK			

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 5, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	2.2 PPM	OK			
44	12.1 PPM	OK			
45	2 PPM	OK			
46	1.4 PPM	OK			
47	1.3 PPM	OK			
48	1.3 PPM	OK			
49	2.1 PPM	OK			
50	9.9 PPM	OK			
51	0.6 PPM	OK			
52	0.6 PPM	OK			
53	0.7 PPM	OK			
54	0.6 PPM	OK			
55	3 PPM	OK			
56	1.2 PPM	OK			
57	2.7 PPM	OK			
58	0.9 PPM	OK			
59	1.7 PPM	OK			
60	4.8 PPM	OK			
61	3.2 PPM	OK			
62	1.3 PPM	OK			
63	21.1 PPM	OK			
64	33.5 PPM	OK			
65	38 PPM	OK			
66	69.1 PPM	OK			
67	20.9 PPM	OK			
68	3.5 PPM	OK			
69	68 PPM	OK			
70	23.7 PPM	OK			
71	3.8 PPM	OK			
72	11.8 PPM	OK			
73	2.8 PPM	OK			
74	6.6 PPM	OK			
75	20.5 PPM	OK			
76	10.2 PPM	OK			
77	46.8 PPM	OK			
78	29.2 PPM	OK			
79	0.7 PPM	OK			
80	0.7 PPM	OK			
81	0.5 PPM	OK			
82	0.8 PPM	OK			
83	0.4 PPM	OK			
84	0.4 PPM	OK			

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 5, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	2.9 PPM	OK			
86	20.6 PPM	OK			
87	8.5 PPM	OK			
88	2.3 PPM	OK			
89	0.6 PPM	OK			
90	0.4 PPM	OK			
91	53 PPM	OK			
92	36.5 PPM	OK			
93	10.8 PPM	OK			
94	200 PPM	OK			
95	24.2 PPM	OK			
96	3.8 PPM	OK			
97	6.7 PPM	OK			
98	12.3 PPM	OK			
99	1.2 PPM	OK			
100	1.4 PPM	OK			End Serpentine Route
101	42.7 PPM	OK			EW-35
102	190 PPM	OK			EW-52
103	184 PPM	OK			TP-4
104	138 PPM	OK			EW-60
105	232 PPM	OK			EW-48
106	1.3 PPM	OK			TP-6
107	0.6 PPM	OK			EW-61
108	5 PPM	OK			EW-34
109	7.1 PPM	OK			EW-50
110	186 PPM	OK			EW-67
111	217 PPM	OK			EW-47
112	93.6 PPM	OK			EW-54
113	39.2 PPM	OK			EW-55
114	5.3 PPM	OK			TP-2
115	0 PPM	OK			EW-46
116	157 PPM	OK			EW-66
117	1 PPM	OK			EW-58
118	37.2 PPM	OK			EW-57
119	2.8 PPM	OK			TP-1
120	97.7 PPM	OK			EW-59
121	268 PPM	OK			EW-56
122	55 PPM	OK			EW-41
123	43.1 PPM	OK			EW-53
124	47.3 PPM	OK			EW-40
125	4.7 PPM	OK			TP-3

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 5, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	28.5 PPM	OK			EW-51
127	96.3 PPM	OK			EW-39
128	173 PPM	OK			TP-5
129	206 PPM	OK			EW-68
130	136 PPM	OK			EW-38
131	49.5 PPM	OK			TP-7
132	10.1 PPM	OK			EW-49
133	0 PPM	OK			EW-31R
134	0.7 PPM	OK			EW-65
135	0.2 PPM	OK			EW-37
136	0 PPM	OK			TP-8
137	0 PPM	OK			EW-64
138	1 PPM	OK			EW-30R
139	0.1 PPM	OK			EW-63
140	0 PPM	OK			EW-42
141	6.1 PPM	OK			TP-9
142	3.8 PPM	OK			EW-33R
143	0.2 PPM	OK			EW-62
144	0.6 PPM	OK			EW-29R
145	0 PPM	OK			EW-32R
146	2.3 PPM	OK			EW-69
147	0 PPM	OK			EW-70
148	2.5 PPM	OK			EW-73
149	0 PPM	OK			EW-76
150	165 PPM	OK			EW-78
151	3.2 PPM	OK			EW-85
152	82.6 PPM	OK			EW-88
153	353 PPM	OK			EW-89
154	2 PPM	OK			EW-93
155	299 PPM	OK			EW-94
156	6.7 PPM	OK			EW-98
157	2258 PPM	HIGH_ALARM	36.59775	-82.14757	EW-100
158	3.7 PPM	OK			EW-99
159	959 PPM	HIGH_ALARM	36.59835	-82.14834	EW-95
160	1.5 PPM	OK			EW-90
161	467 PPM	OK			EW-86
162	1.6 PPM	OK			EW-84
163	5.4 PPM	OK			EW-80

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 5, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

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

Number of locations sampled:	163
Number of exceedance locations:	2

NOTES:

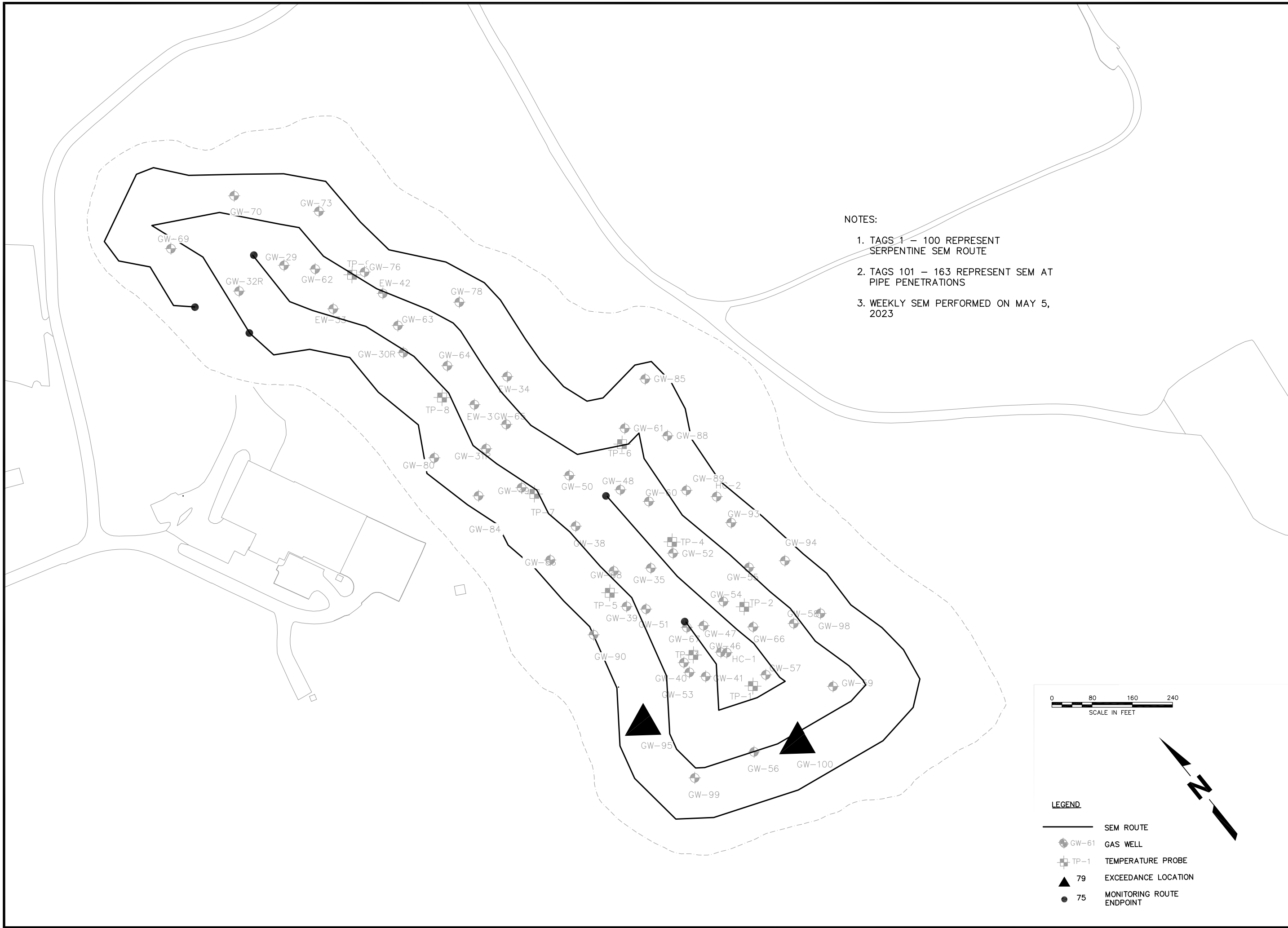
Points 1 through 100 represent serpentine SEM route.
 Points 101 through 163 represent SEM at Pipe Penetrations
 Weather Conditions: Sunny, 60°F Wind: Calm

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

5/5/2023	9:31	ZERO	0.0 PPM
5/5/2023	9:34	SPAN	501.0 PPM

Background Reading:

5/5/2023	9:34	Upwind	4.1 PPM
5/5/2023	9:37	Downwind	2.4 PPM



NOTES:

1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 - 163 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MAY 5, 2023

LEGEND

- SEM ROUTE
- GW-61 GAS WELL
- TP-1 TEMPERATURE PROBE
- 79 EXCEEDANCE LOCATION
- 75 MONITORING ROUTE ENDPOINT

0 80 160 240
SCALE IN FEET

NO.	Δ	Δ	Δ	Δ	Δ
	Δ	Δ	Δ	Δ	Δ
REVISION					
DATE					
SHEET TITLE	WEEKLY SEM ROUTE				
PROJECT TITLE	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY				
	2655 VALLEY DRIVE BRISTOL, VA 24201				
CLIENT	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY				
SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 1000 COMMONWEALTH AVENUE, SUITE 200 BRISTOL, VA 24201 PH: (804) 378-7440 FAX: (804) 378-7433	DWG. BY: LSN	CHK. BY: SN	D/A RW BY: DBK	APP. BY:	
	PROJ. NO.: 02218208.04	DATE: 05/05/23	SCALE: AS SHOWN	DRAWING NO. 1	of 1
FILE:	02218208.04				
DATE:	5/5/23				
SCALE:	AS SHOWN				
DRAWING NO.:	1 of 1				

May 17, 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 – May 10, 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 May 10, 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 monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	163
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	63
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 retests.

The two exceedance locations identified during this monitoring event were located at newly installed landfill gas extraction wells. 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 after the expansion is complete.

The City and the installation contractor are working diligently to minimize the duration and impacts of these temporary factors.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	5/10/23 Event	5/10/23 Event Result	Comments
EW-59	4/13/2023	30-Day Retest	Passed	Exceedance Resolved
Tag 21	4/20/2023	N/A	Passed	Requires 30-Day Retest
EW-38	4/20/2023	N/A	Passed	Requires 30-Day Retest
EW-84	4/20/2023	N/A	Passed	Requires 30-Day Retest
EW-90	4/20/2023	N/A	Passed	Requires 30-Day Retest
EW-94	4/20/2023	N/A	Passed	Requires 30-Day Retest
Tag 37	4/27/2023	N/A	Passed	Requires 30-Day Retest
EW-89	4/27/2023	N/A	Failed	Requires 2 nd 10-Day Retest
EW-95	4/27/2023	2 nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-100	4/27/2023	2 nd 10-Day Retest	Failed	Subject to 1960(c)(4)(v)

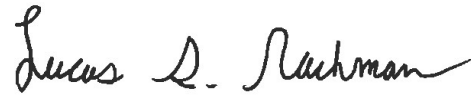
Mr. Jonathan Chapman
May 17, 2023
Page 4

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

Sincerely,



Will J. Fabrie
Staff Professional
SCS Engineers



Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WJF/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

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 10, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
1	36.2 PPM	OK			Start Serpentine Route
2	3.3 PPM	OK			
3	2.2 PPM	OK			
4	2.9 PPM	OK			
5	4.6 PPM	OK			
6	5.3 PPM	OK			
7	4.6 PPM	OK			
8	4.4 PPM	OK			
9	5.9 PPM	OK			
10	1.5 PPM	OK			
11	9.6 PPM	OK			
12	21.8 PPM	OK			
13	29.7 PPM	OK			
14	24.9 PPM	OK			
15	6.7 PPM	OK			
16	5 PPM	OK			
17	8.6 PPM	OK			
18	13.5 PPM	OK			
19	28.6 PPM	OK			
20	214 PPM	OK			
21	157 PPM	OK			
22	192 PPM	OK			
23	167 PPM	OK			
24	64.1 PPM	OK			
25	239 PPM	OK			
26	234 PPM	OK			
27	58.7 PPM	OK			
28	255 PPM	OK			
29	311 PPM	OK			
30	135 PPM	OK			
31	34.1 PPM	OK			
32	5.4 PPM	OK			
33	8.1 PPM	OK			
34	34.5 PPM	OK			
35	7 PPM	OK			
36	5.9 PPM	OK			
37	1.7 PPM	OK			
38	29.5 PPM	OK			
39	24.5 PPM	OK			
40	7.9 PPM	OK			
41	5.2 PPM	OK			
42	2.6 PPM	OK			

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 10, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	4.1 PPM	OK			
44	4 PPM	OK			
45	1.1 PPM	OK			
46	0.8 PPM	OK			
47	1 PPM	OK			
48	7.6 PPM	OK			
49	260 PPM	OK			
50	2.8 PPM	OK			
51	4.4 PPM	OK			
52	1.7 PPM	OK			
53	3.8 PPM	OK			
54	1.8 PPM	OK			
55	0.7 PPM	OK			
56	0.9 PPM	OK			
57	0.7 PPM	OK			
58	5.5 PPM	OK			
59	0.7 PPM	OK			
60	7.3 PPM	OK			
61	1.7 PPM	OK			
62	1.3 PPM	OK			
63	1.2 PPM	OK			
64	1.4 PPM	OK			
65	3.2 PPM	OK			
66	38.9 PPM	OK			
67	65.1 PPM	OK			
68	3.8 PPM	OK			
69	106 PPM	OK			
70	3.9 PPM	OK			
71	3.3 PPM	OK			
72	58.4 PPM	OK			
73	13.5 PPM	OK			
74	16.6 PPM	OK			
75	13.5 PPM	OK			
76	61.1 PPM	OK			
77	4.2 PPM	OK			
78	15 PPM	OK			
79	99.7 PPM	OK			
80	33.6 PPM	OK			
81	13.6 PPM	OK			
82	20.1 PPM	OK			
83	9.8 PPM	OK			
84	9.1 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MAY 10, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
85	10.4 PPM	OK			
86	6.2 PPM	OK			
87	1.4 PPM	OK			
88	1 PPM	OK			
89	1.1 PPM	OK			
90	0.2 PPM	OK			
91	6.2 PPM	OK			
92	20 PPM	OK			
93	81.3 PPM	OK			
94	47.4 PPM	OK			
95	62.9 PPM	OK			
96	113 PPM	OK			
97	25.6 PPM	OK			
98	40.9 PPM	OK			
99	34.7 PPM	OK			
100	4.4 PPM	OK			End Serpentine
101	96.2 PPM	OK			Route
102	438 PPM	OK			EW-35
103	2.7 PPM	OK			EW-52
104	194 PPM	OK			TP-4
105	307 PPM	OK			EW-60
106	2.5 PPM	OK			EW-48
107	0.4 PPM	OK			TP-6
108	249 PPM	OK			EW-61
109	0 PPM	OK			EW-34
110	277 PPM	OK			EW-50
111	30 PPM	OK			EW-67
112	110 PPM	OK			EW-47
113	135 PPM	OK			EW-54
114	14.3 PPM	OK			EW-55
115	11.4 PPM	OK			TP-2
116	15.5 PPM	OK			EW-46
117	1 PPM	OK			EW-66
118	104 PPM	OK			EW-58
119	170 PPM	OK			EW-57
120	192 PPM	OK			TP-1
121	189 PPM	OK			EW-59
122	68.6 PPM	OK			EW-56
123	13.5 PPM	OK			EW-41
124	22 PPM	OK			EW-53
125	18.4 PPM	OK			EW-40
					TP-3

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 10, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
126	40.9 PPM	OK			EW-51
127	38.9 PPM	OK			EW-39
128	203 PPM	OK			TP-5
129	0.8 PPM	OK			EW-68
130	71.7 PPM	OK			EW-38
131	17.3 PPM	OK			TP-7
132	5.4 PPM	OK			EW-49
133	0.1 PPM	OK			EW-31R
134	0.4 PPM	OK			EW-65
135	2.6 PPM	OK			EW-37
136	0.5 PPM	OK			TP-8
137	5.5 PPM	OK			EW-64
138	1.1 PPM	OK			EW-30R
139	0 PPM	OK			EW-63
140	1.2 PPM	OK			EW-42
141	3.7 PPM	OK			TP-9
142	0.1 PPM	OK			EW-33R
143	2 PPM	OK			EW-62
144	5.3 PPM	OK			EW-29R
145	0.7 PPM	OK			EW-32R
146	13.3 PPM	OK			EW-69
147	1.5 PPM	OK			EW-70
148	0.8 PPM	OK			EW-73
149	2 PPM	OK			EW-76
150	25.5 PPM	OK			EW-78
151	207 PPM	OK			EW-85
152	8.4 PPM	OK			EW-88
153	14800 PPM	HIGH_ALARM	36.59923	-82.14716	EW-89
154	20.7 PPM	OK			EW-93
155	143 PPM	OK			EW-94
156	9.5 PPM	OK			EW-98
157	10020 PPM	HIGH_ALARM	36.59775	-82.14757	EW-100
158	1 PPM	OK			EW-99
159	3.5 PPM	OK			EW-95
160	30.8 PPM	OK			EW-90
161	31.8 PPM	OK			EW-86
162	0.3 PPM	OK			EW-84
163	5.5 PPM	OK			EW-80

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 10, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

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

Number of locations sampled:	163
Number of exceedance locations:	2

NOTES:

Points 1 through 100 represent serpentine SEM route.

Points 101 through 163 represent SEM at Pipe Penetrations

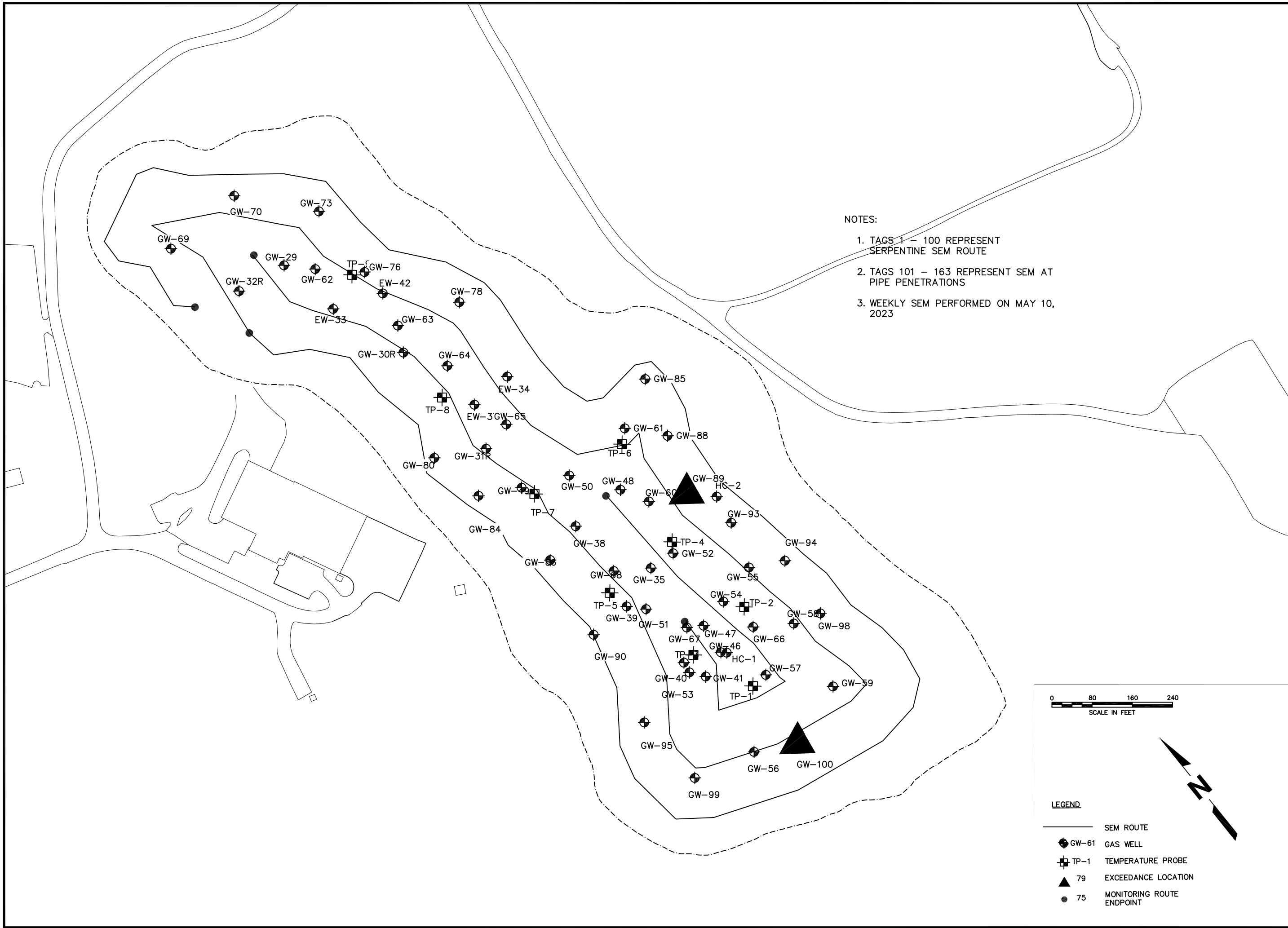
Weather Conditions: Sunny, 78°F Wind: 3 SW

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

5/10/2023	10:33	ZERO	0.0 PPM
5/10/2023	10:34	SPAN	501.0 PPM

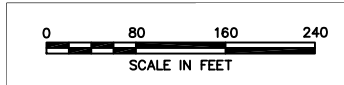
Background Reading:

5/10/2023	10:38	Upwind	2.2 PPM
5/10/2023	10:40	Downwind	5.6 PPM



NOTES:

1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 - 163 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MAY 10, 2023



- LEGEND**
- SEM ROUTE
 - ⊕ GW-61 GAS WELL
 - ⊕ TP-1 TEMPERATURE PROBE
 - ▲ 79 EXCEEDANCE LOCATION
 - 75 MONITORING ROUTE ENDPOINT

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. 10000 WOODBURN AVENUE, VA 23113 PH: (804) 376-7440 FAX: (804) 376-7433 PROJ. NO. 02218208.04 DATE: 5/5/23 DWN. BY: LSN CHK. BY: LSN APP. BY: DBK		
FILE: 02218208.04			DATE: 5/5/23		
SCALE: AS SHOWN			DRAWING NO. 1 of 1		

May 24, 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 – May 18, 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 May 18, 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 monitoring 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	1
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	1

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 retests.

The one exceedance location identified during this monitoring event was located at a newly installed landfill gas extraction well. This well has been connected to vacuum but has not yet been equipped with supplemental emissions reducing components, such as liquids extraction pumps and wellbore seals. Those components will be added after the expansion is complete.

The City and the installation contractor are working diligently to minimize the duration and impacts of these temporary factors.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	5/18/23 Event	5/18/23 Event Result	Comments
Tag 21	4/20/2023	30-Day Retest	Passed	Exceedance Resolved
EW-38	4/20/2023	30-Day Retest	Passed	Exceedance Resolved
EW-84	4/20/2023	30-Day Retest	Passed	Exceedance Resolved
EW-90	4/20/2023	30-Day Retest	Passed	Exceedance Resolved
EW-94	4/20/2023	30-Day Retest	Passed	Exceedance Resolved
Tag 37	4/27/2023	N/A	Passed	Requires 30-Day Retest
EW-89	4/27/2023	2 nd 10-Day Retest	Failed	Subject to 1960(c)(4)(v)
EW-95	4/27/2023	N/A	Passed	Requires 30-Day Retest
EW-100	4/27/2023	N/A	Failed	Subject to 1960(c)(4)(v)

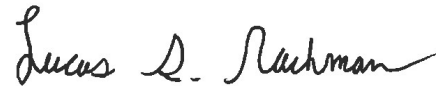
Mr. Jonathan Chapman
May 24, 2023
Page 4

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

Sincerely,



Will J. Fabrie
Staff Professional
SCS Engineers



Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WJF/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

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 18, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
1	9.2	PPM	OK			Start Serpentine Route
2	16.5	PPM	OK			
3	7.7	PPM	OK			
4	2.4	PPM	OK			
5	5.2	PPM	OK			
6	3.7	PPM	OK			
7	3.4	PPM	OK			
8	1.9	PPM	OK			
9	2.8	PPM	OK			
10	1.7	PPM	OK			
11	4	PPM	OK			
12	4.8	PPM	OK			
13	3.9	PPM	OK			
14	1.4	PPM	OK			
15	4	PPM	OK			
16	18.4	PPM	OK			
17	5.2	PPM	OK			
18	8.4	PPM	OK			
19	3.8	PPM	OK			
20	8.1	PPM	OK			
21	45.3	PPM	OK			
22	24.7	PPM	OK			
23	12	PPM	OK			
24	8.6	PPM	OK			
25	31	PPM	OK			
26	13.7	PPM	OK			
27	8.1	PPM	OK			
28	71.6	PPM	OK			
29	47.5	PPM	OK			
30	74.2	PPM	OK			
31	367	PPM	OK			
32	265	PPM	OK			
33	28.8	PPM	OK			
34	14.1	PPM	OK			
35	13.4	PPM	OK			
36	9.9	PPM	OK			
37	7.4	PPM	OK			
38	17.3	PPM	OK			
39	2.1	PPM	OK			
40	2.4	PPM	OK			
41	1.7	PPM	OK			
42	25.7	PPM	OK			

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 18, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane Concentration	Compliance	GPS Coordinates		Comments
			Lat.	Long.	
43	45.4	PPM	OK		
44	4.2	PPM	OK		
45	6.1	PPM	OK		
46	1.7	PPM	OK		
47	36.3	PPM	OK		
48	10.8	PPM	OK		
49	4.2	PPM	OK		
50	4.1	PPM	OK		
51	8.9	PPM	OK		
52	9.5	PPM	OK		
53	30.3	PPM	OK		
54	1.1	PPM	OK		
55	0.8	PPM	OK		
56	1	PPM	OK		
57	1	PPM	OK		
58	1.3	PPM	OK		
59	1.2	PPM	OK		
60	1.8	PPM	OK		
61	2.4	PPM	OK		
62	1.3	PPM	OK		
63	1.6	PPM	OK		
64	2.1	PPM	OK		
65	4.7	PPM	OK		
66	7.9	PPM	OK		
67	20	PPM	OK		
68	6.7	PPM	OK		
69	2.8	PPM	OK		
70	52.4	PPM	OK		
71	29.1	PPM	OK		
72	8	PPM	OK		
73	33.3	PPM	OK		
74	97.9	PPM	OK		
75	1.2	PPM	OK		
76	2.6	PPM	OK		
77	62.6	PPM	OK		
78	0.1	PPM	OK		
79	0.3	PPM	OK		
80	10.4	PPM	OK		
81	70.7	PPM	OK		
82	12.9	PPM	OK		
83	2.3	PPM	OK		
84	3.5	PPM	OK		

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS WEEKLY MONITORING EVENT - MAY 18, 2023 BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	PPM	Compliance	GPS Coordinates		Comments
				Lat.	Long.	
85	0.7	PPM	OK			
86	2.3	PPM	OK			
87	4.2	PPM	OK			
88	2.2	PPM	OK			
89	2	PPM	OK			
90	0.8	PPM	OK			
91	13.8	PPM	OK			
92	36.3	PPM	OK			
93	49.3	PPM	OK			
94	50	PPM	OK			
95	77.6	PPM	OK			
96	5	PPM	OK			
97	4.6	PPM	OK			
98	31.7	PPM	OK			
99	2.9	PPM	OK			
100	8.4	PPM	OK			End Serpentine Route
101	462	PPM	OK			EW-35
102	51.7	PPM	OK			EW-52
103	1.3	PPM	OK			TP-4
104	419	PPM	OK			EW-60
105	170	PPM	OK			EW-48
106	9.4	PPM	OK			TP-6
107	7	PPM	OK			EW-61
108	4.1	PPM	OK			EW-34
109	3.9	PPM	OK			EW-50
110	3.3	PPM	OK			EW-67
111	11.9	PPM	OK			EW-47
112	21.5	PPM	OK			EW-54
113	51.2	PPM	OK			EW-55
114	3.2	PPM	OK			TP-2
115	2.9	PPM	OK			EW-46
116	19.7	PPM	OK			EW-66
117	4.1	PPM	OK			EW-58
118	95.9	PPM	OK			EW-57
119	30.4	PPM	OK			TP-1
120	86.7	PPM	OK			EW-59
121	86.3	PPM	OK			EW-56
122	131	PPM	OK			EW-41
123	13.2	PPM	OK			EW-53
124	51.4	PPM	OK			EW-40
125	9.3	PPM	OK			TP-3

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 18, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
126	2	PPM	OK			EW-51
127	4.8	PPM	OK			EW-39
128	182	PPM	OK			TP-5
129	34.1	PPM	OK			EW-68
130	41	PPM	OK			EW-38
131	15.5	PPM	OK			TP-7
132	178	PPM	OK			EW-49
133	1.1	PPM	OK			EW-31R
134	0.1	PPM	OK			EW-65
135	0.9	PPM	OK			EW-37
136	1	PPM	OK			TP-8
137	1.6	PPM	OK			EW-64
138	0.7	PPM	OK			EW-30R
139	0.1	PPM	OK			EW-63
140	2.2	PPM	OK			EW-42
141	2.1	PPM	OK			TP-9
142	1.3	PPM	OK			EW-33R
143	1.3	PPM	OK			EW-62
144	2.5	PPM	OK			EW-29R
145	2.7	PPM	OK			EW-32R
146	3.5	PPM	OK			EW-69
147	6.2	PPM	OK			EW-32
148	2.5	PPM	OK			EW-70
149	3.5	PPM	OK			EW-73
150	0.5	PPM	OK			EW-76
151	5.8	PPM	OK			EW-78
152	10.9	PPM	OK			EW-85
153	6.1	PPM	OK			EW-88
154	7330	PPM	HIGH_ALARM	36.59923	-82.14716	EW-89
155	46.1	PPM	OK			EW-93
156	4.9	PPM	OK			EW-94
157	6.4	PPM	OK			EW-98
158	80.8	PPM	OK			EW-100
159	0.2	PPM	OK			EW-99
160	0.5	PPM	OK			EW-95
161	8.6	PPM	OK			EW-90
162	201	PPM	OK			EW-86
163	0.7	PPM	OK			EW-84
164	0.1	PPM	OK			EW-80

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 18, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

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

Number of locations sampled:	164
Number of exceedance locations:	1

NOTES:

Points 1 through 100 represent serpentine SEM route.

Points 101 through 164 represent SEM at Pipe Penetrations

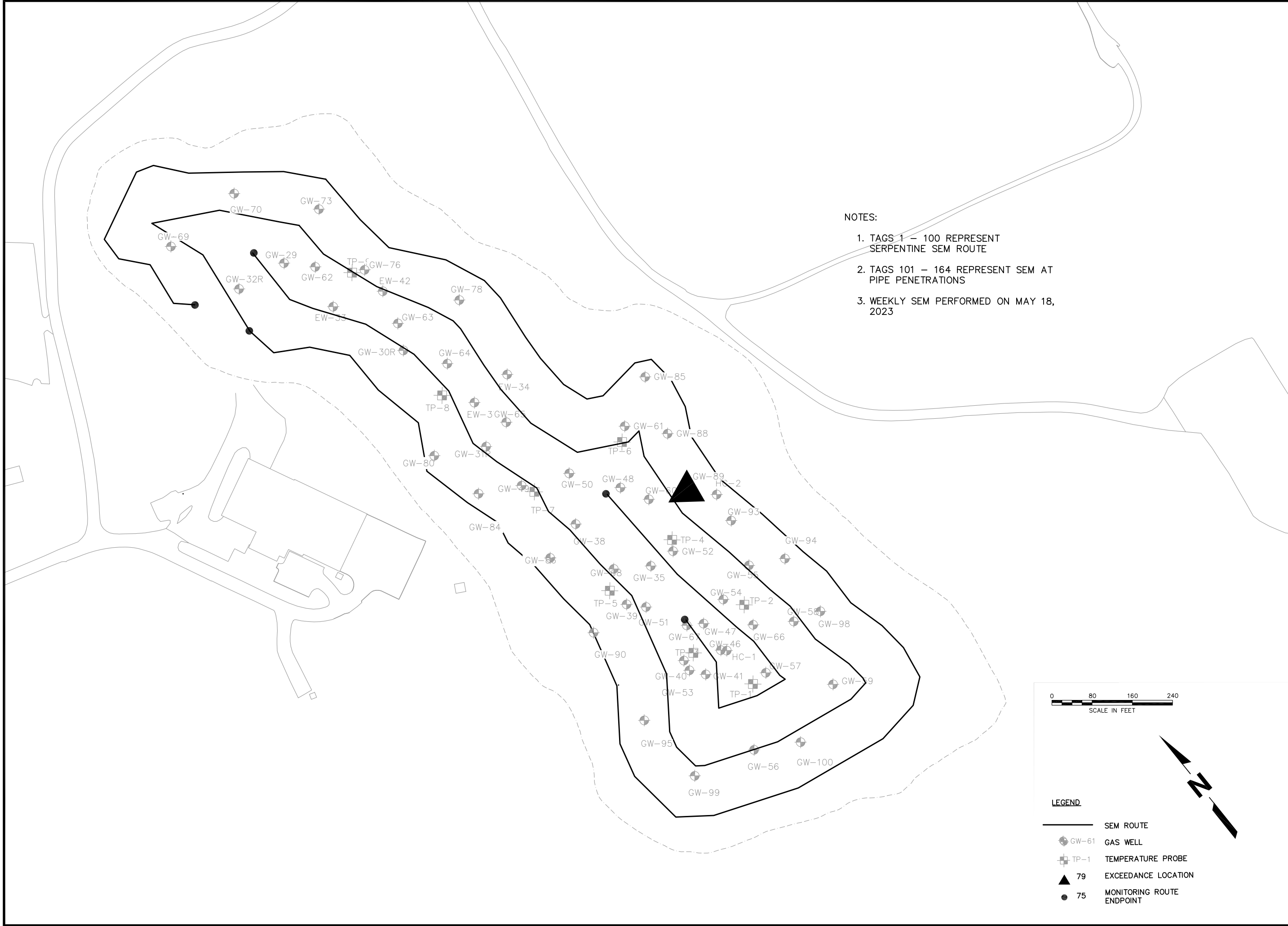
Weather Conditions: Sunny, 73°F Wind: 9 S

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

5/18/2023	10:26	ZERO	0.0 PPM
5/18/2023	10:28	SPAN	501.0 PPM

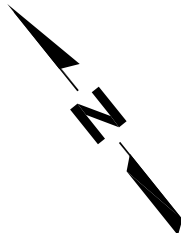
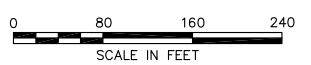
Background Reading:

5/18/2023	10:29	Upwind	3.1 PPM
5/18/2023	10:42	Downwind	13.6 PPM



NOTES:

1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 - 164 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MAY 18, 2023



- LEGEND**
- SEM ROUTE
 - GW-61 GAS WELL
 - TP-1 TEMPERATURE PROBE
 - 79 EXCEEDANCE LOCATION
 - 75 MONITORING ROUTE ENDPOINT

	REVISION	DATE			
NO.	<	<	<	<	<
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 STERNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 10000 WOODBURN AVENUE, SUITE 200 PH: (804) 376-7440 FAX: (804) 376-7433	DWG. BY: LSN CHK. BY: DBK	D/A RW BY: APP. BY:			
FILE:	02218208.04				
DATE:	5/18/23				
SCALE:	AS SHOWN				
DRAWING NO.	1 of 1				

May 31, 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 – May 25, 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 May 25, 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 monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	163
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	63
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 retests.

Two of the three 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 after the expansion is complete.

The City and the LFG installation contractor are working diligently to minimize the duration and impacts of these temporary factors.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	5/25/23 Event	5/25/23 Event Result	Comments
Tag 37	4/27/2023	30-Day Retest	Passed	Exceedance resolved
EW-89	4/27/2023	N/A	Failed	Subject to 1960(c)(4)(v)
EW-95	4/27/2023	30-Day Retest	Passed	Exceedance resolved
EW-100	4/27/2023	N/A	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

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 25, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
1	0.9	PPM	OK			Start Serpentine Route
2	0.7	PPM	OK			
3	0.6	PPM	OK			
4	0.6	PPM	OK			
5	1.5	PPM	OK			
6	7.5	PPM	OK			
7	9	PPM	OK			
8	19.2	PPM	OK			
9	22.4	PPM	OK			
10	29.3	PPM	OK			
11	22	PPM	OK			
12	7.9	PPM	OK			
13	4.9	PPM	OK			
14	61.8	PPM	OK			
15	38.9	PPM	OK			
16	9.9	PPM	OK			
17	195	PPM	OK			
18	31.6	PPM	OK			
19	16.8	PPM	OK			
20	13.5	PPM	OK			
21	194	PPM	OK			
22	42.6	PPM	OK			
23	218	PPM	OK			
24	225	PPM	OK			
25	57.8	PPM	OK			
26	169	PPM	OK			
27	5.3	PPM	OK			
28	4	PPM	OK			
29	1.6	PPM	OK			
30	8	PPM	OK			
31	7.7	PPM	OK			
32	11	PPM	OK			
33	3	PPM	OK			
34	3	PPM	OK			
35	2.8	PPM	OK			
36	10.9	PPM	OK			
37	0.9	PPM	OK			
38	7.6	PPM	OK			
39	2.6	PPM	OK			
40	2.2	PPM	OK			
41	4.3	PPM	OK			
42	65.2	PPM	OK			

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 25, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
43	22.1	PPM	OK			
44	26.6	PPM	OK			
45	7.4	PPM	OK			
46	5.8	PPM	OK			
47	6.1	PPM	OK			
48	7.3	PPM	OK			
49	6.9	PPM	OK			
50	31.8	PPM	OK			
51	9.1	PPM	OK			
52	8.1	PPM	OK			
53	8.1	PPM	OK			
54	27.1	PPM	OK			
55	10.8	PPM	OK			
56	10	PPM	OK			
57	9.6	PPM	OK			
58	5	PPM	OK			
59	6	PPM	OK			
60	7.8	PPM	OK			
61	5.6	PPM	OK			
62	40.8	PPM	OK			
63	20.6	PPM	OK			
64	29.1	PPM	OK			
65	85.6	PPM	OK			
66	96.3	PPM	OK			
67	26.8	PPM	OK			
68	43.4	PPM	OK			
69	42.4	PPM	OK			
70	3.6	PPM	OK			
71	1	PPM	OK			
72	3	PPM	OK			
73	12.2	PPM	OK			
74	1.6	PPM	OK			
75	7.3	PPM	OK			
76	34.7	PPM	OK			
77	5	PPM	OK			
78	2.8	PPM	OK			
79	3	PPM	OK			
80	2.7	PPM	OK			
81	3.9	PPM	OK			
82	4.3	PPM	OK			
83	4.1	PPM	OK			
84	4.2	PPM	OK			

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 25, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
85	4.2	PPM	OK			
86	6.3	PPM	OK			
87	2.9	PPM	OK			
88	3	PPM	OK			
89	5	PPM	OK			
90	9.3	PPM	OK			
91	39.5	PPM	OK			
92	118	PPM	OK			
93	132	PPM	OK			
94	2	PPM	OK			
95	65.6	PPM	OK			
96	32.3	PPM	OK			
97	13	PPM	OK			
98	18.7	PPM	OK			
99	21.8	PPM	OK			
100	108	PPM	OK			End Serpentine
						Route
101	200	PPM	OK			EW-35
102	134	PPM	OK			EW-52
103	25.8	PPM	OK			TP-4
104	459	PPM	OK			EW-60
105	144	PPM	OK			EW-48
106	15.5	PPM	OK			TP-6
107	18.3	PPM	OK			EW-61
108	11.3	PPM	OK			EW-34
109	2.2	PPM	OK			EW-50
110	230	PPM	OK			EW-67
111	96	PPM	OK			EW-47
112	333	PPM	OK			EW-54
113	2.1	PPM	OK			EW-55
114	59.9	PPM	OK			TP-2
115	3966	PPM	HIGH_ALARM	36.59829	-82.14754	EW-66
116	5.7	PPM	OK			EW-58
117	143	PPM	OK			EW-57
118	134	PPM	OK			TP-1
119	207	PPM	OK			EW-59
120	29.9	PPM	OK			EW-56
121	194	PPM	OK			EW-41
122	192	PPM	OK			EW-53
123	59.5	PPM	OK			EW-40
124	9.5	PPM	OK			TP-3
125	18	PPM	OK			EW-51

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 25, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
126	226	PPM	OK			EW-39
127	1	PPM	OK			TP-5
128	2.6	PPM	OK			EW-68
129	53.9	PPM	OK			EW-38
130	49.9	PPM	OK			TP-7
131	2.3	PPM	OK			EW-49
132	2.7	PPM	OK			EW-31R
133	4.1	PPM	OK			EW-65
134	1.2	PPM	OK			EW-37
135	0	PPM	OK			TP-8
136	0.7	PPM	OK			EW-64
137	2.3	PPM	OK			EW-30R
138	2.9	PPM	OK			EW-63
139	0.9	PPM	OK			EW-42
140	3.3	PPM	OK			TP-9
141	3	PPM	OK			EW-33R
142	3.8	PPM	OK			EW-62
143	-0.2	PPM	OK			EW-29R
144	2.1	PPM	OK			EW-32R
145	46.1	PPM	OK			EW-69
146	3.4	PPM	OK			EW-32
147	8.5	PPM	OK			EW-70
148	148	PPM	OK			EW-73
149	0	PPM	OK			EW-76
150	54.7	PPM	OK			EW-78
151	4.2	PPM	OK			EW-85
152	4.5	PPM	OK			EW-88
153	22200	PPM	HIGH_ALRM	36.59931	-82.14683	EW-89
154	45.7	PPM	OK			EW-93
155	275	PPM	OK			EW-94
156	8	PPM	OK			EW-98
157	807	PPM	HIGH_ALRM	36.59773	-82.14748	EW-100
158	1	PPM	OK			EW-99
159	1.3	PPM	OK			EW-95
160	111	PPM	OK			EW-90
161	403	PPM	OK			EW-86
162	4.7	PPM	OK			EW-84
163	8.5	PPM	OK			EW-80

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 25, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

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

Number of locations sampled:	163
Number of exceedance locations:	3

NOTES:

Points 1 through 100 represent serpentine SEM route.

Points 101 through 163 represent SEM at Pipe Penetrations

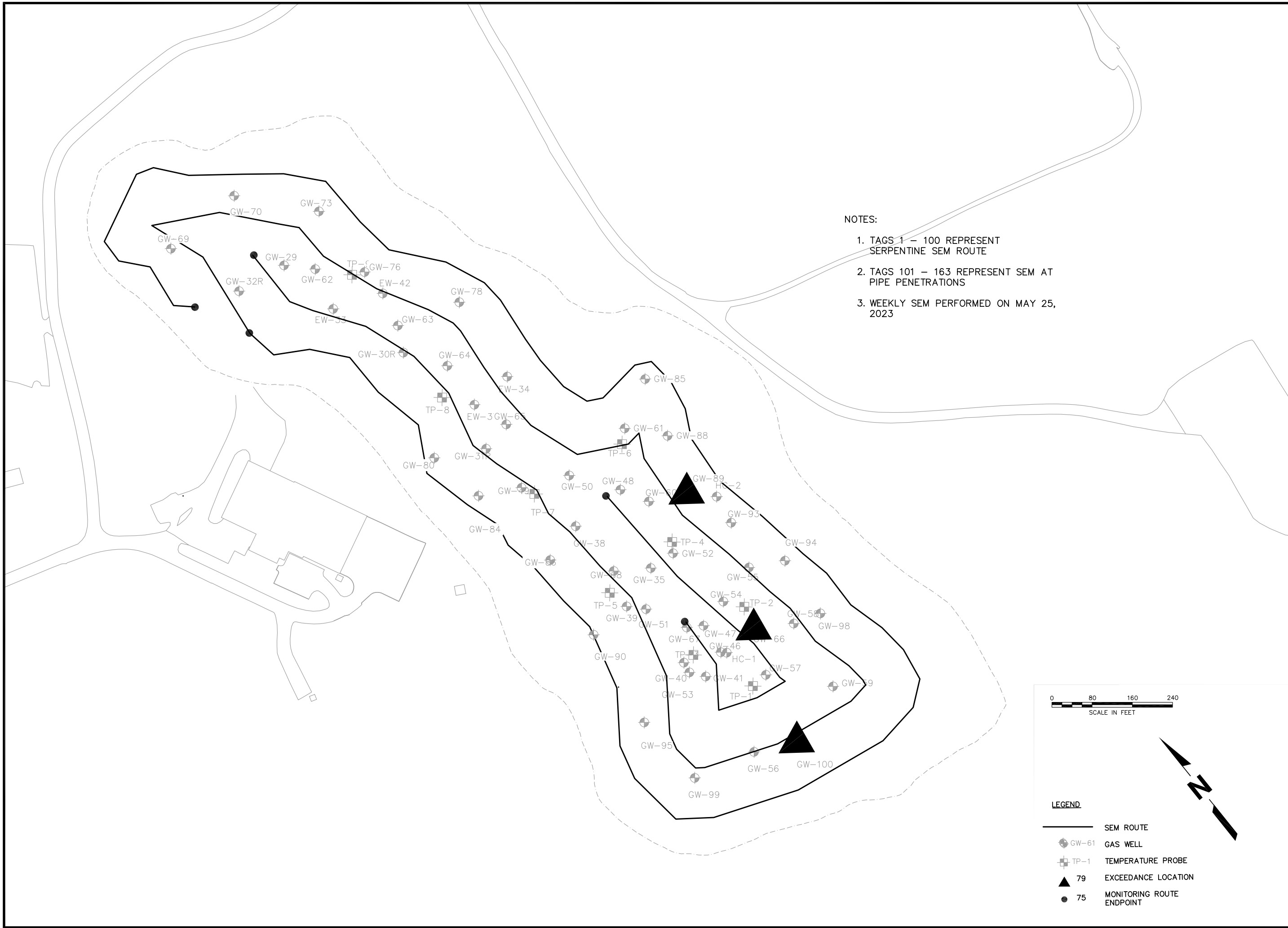
Weather Conditions: Sunny, 73°F Wind: 5 S

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

5/25/2023	10:03	ZERO	0.0 PPM
5/25/2023	10:08	SPAN	502.0 PPM

Background Reading:

5/25/2023	10:20	Upwind	2.5 PPM
5/25/2023	10:31	Downwind	1.8 PPM



NOTES:

1. TAGS 1 - 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 - 163 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MAY 25, 2023

LEGEND

- SEM ROUTE
- GW-61 GAS WELL
- TP-1 TEMPERATURE PROBE
- 79 EXCEEDANCE LOCATION
- 75 MONITORING ROUTE ENDPOINT

0 80 160 240
SCALE IN FEET

NO.	Δ	Δ	Δ	Δ	Δ
	Δ	Δ	Δ	Δ	Δ
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 STARNES, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 10000 WOODBURN AVENUE, SUITE 100 PH: (804) 376-7440 FAX: (804) 376-7433	DWG. BY: LSN CHK. BY: DBK	D/A RW BY: APP. BY:	FILE: 02218208.04 DATE: 5/25/23 SCALE: AS SHOWN DRAWING NO. 1 of 1		

June 7, 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 – May 30, 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 May 30, 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 monitoring is provided in Table 1.



Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	162
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	62
Number of Exceedances	1
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	1

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 retests.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	5/30/23 Event	5/30/23 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	First 10-day retest	Failed	Requires 2 nd 10-day retest

Mr. Jonathan Chapman
June 7, 2023
Page 3

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

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 30, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
1	4.2	PPM	OK			Start Serpentine Route
2	14.4	PPM	OK			
3	7.2	PPM	OK			
4	4.2	PPM	OK			
5	4.1	PPM	OK			
6	4.9	PPM	OK			
7	4.2	PPM	OK			
8	1.8	PPM	OK			
9	2	PPM	OK			
10	1.9	PPM	OK			
11	5.3	PPM	OK			
12	5	PPM	OK			
13	11.1	PPM	OK			
14	5.9	PPM	OK			
15	3.3	PPM	OK			
16	3.1	PPM	OK			
17	10.8	PPM	OK			
18	16.7	PPM	OK			
19	16.1	PPM	OK			
20	1.2	PPM	OK			
21	1.5	PPM	OK			
22	5.5	PPM	OK			
23	3.8	PPM	OK			
24	2	PPM	OK			
25	1.2	PPM	OK			
26	3.9	PPM	OK			
27	86.5	PPM	OK			
28	110	PPM	OK			
29	196	PPM	OK			
30	149	PPM	OK			
31	469	PPM	OK			
32	60.9	PPM	OK			
33	52.5	PPM	OK			
34	14.7	PPM	OK			
35	2.5	PPM	OK			
36	3.4	PPM	OK			
37	7.9	PPM	OK			
38	1.9	PPM	OK			
39	5.6	PPM	OK			
40	3.1	PPM	OK			
41	323	PPM	OK			
42	171	PPM	OK			

SCS ENGINEERS**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 30, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
43	10.3	PPM	OK			
44	1.8	PPM	OK			
45	1.9	PPM	OK			
46	2.6	PPM	OK			
47	16.5	PPM	OK			
48	17.4	PPM	OK			
49	13.2	PPM	OK			
50	2.2	PPM	OK			
51	1.2	PPM	OK			
52	2.8	PPM	OK			
53	1	PPM	OK			
54	1	PPM	OK			
55	0.8	PPM	OK			
56	92.8	PPM	OK			
57	63.1	PPM	OK			
58	1.2	PPM	OK			
59	1.4	PPM	OK			
60	0.8	PPM	OK			
61	0.7	PPM	OK			
62	0.6	PPM	OK			
63	0.6	PPM	OK			
64	1	PPM	OK			
65	0.6	PPM	OK			
66	0.4	PPM	OK			
67	1.5	PPM	OK			
68	1.6	PPM	OK			
69	3.4	PPM	OK			
70	32.9	PPM	OK			
71	3.9	PPM	OK			
72	21.1	PPM	OK			
73	86.8	PPM	OK			
74	15.5	PPM	OK			
75	12.4	PPM	OK			
76	33.9	PPM	OK			
77	4.6	PPM	OK			
78	216	PPM	OK			
79	48.8	PPM	OK			
80	7.3	PPM	OK			
81	3.8	PPM	OK			
82	5.2	PPM	OK			
83	4.2	PPM	OK			
84	27.6	PPM	OK			

SCS ENGINEERS

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 30, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
85	4.5	PPM	OK			
86	3	PPM	OK			
87	4.8	PPM	OK			
88	4.5	PPM	OK			
89	4.3	PPM	OK			
90	4.3	PPM	OK			
91	8.4	PPM	OK			
92	7.1	PPM	OK			
93	19.3	PPM	OK			
94	175	PPM	OK			
95	47.1	PPM	OK			
96	42.7	PPM	OK			
97	86.9	PPM	OK			
98	3.5	PPM	OK			
99	67.2	PPM	OK			
100	9.4	PPM	OK			End Serpentine Route
101	185	PPM	OK			EW-35
102	127	PPM	OK			EW-52
103	9.5	PPM	OK			TP-4
104	370	PPM	OK			EW-60
105	119	PPM	OK			EW-48
106	3.1	PPM	OK			TP-6
107	12	PPM	OK			EW-61
108	98.4	PPM	OK			EW-34
109	1.5	PPM	OK			EW-50
110	186	PPM	OK			EW-67
111	129	PPM	OK			EW-47
112	254	PPM	OK			EW-54
113	453	PPM	OK			EW-55
114	278	PPM	OK			TP-2
115	5924	PPM	HIGH_ALARM	36.59842	-82.14736	EW-66
116	178	PPM	OK			EW-58
117	259	PPM	OK			EW-57
118	5.3	PPM	OK			TP-1
119	402	PPM	OK			EW-59
120	409	PPM	OK			EW-56
121	227	PPM	OK			EW-41
122	435	PPM	OK			EW-53
123	171	PPM	OK			EW-40
124	59.4	PPM	OK			TP-3
125	26.6	PPM	OK			EW-51

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 30, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

ID #	Methane		Compliance	GPS Coordinates		Comments
	Concentration			Lat.	Long.	
126	10.5	PPM	OK			EW-39
127	17.4	PPM	OK			TP-5
128	3	PPM	OK			EW-68
129	31.2	PPM	OK			EW-38
130	2.5	PPM	OK			TP-7
131	10.3	PPM	OK			EW-49
132	2.6	PPM	OK			EW-31R
133	3	PPM	OK			EW-65
134	3.1	PPM	OK			TP-8
135	0.2	PPM	OK			EW-64
136	3.9	PPM	OK			EW-30R
137	0.1	PPM	OK			EW-63
138	0.1	PPM	OK			EW-42
139	0.5	PPM	OK			TP-9
140	0.8	PPM	OK			EW-33R
141	0.1	PPM	OK			EW-62
142	0.3	PPM	OK			EW-29R
143	0.5	PPM	OK			EW-32R
144	309	PPM	OK			EW-69
145	10.8	PPM	OK			EW-32
146	0.1	PPM	OK			EW-70
147	487	PPM	OK			EW-73
148	11.4	PPM	OK			EW-76
149	34	PPM	OK			EW-78
150	11.5	PPM	OK			EW-85
151	13.5	PPM	OK			EW-88
152	97.4	PPM	OK			EW-89
153	18	PPM	OK			EW-93
154	8.9	PPM	OK			EW-94
155	135	PPM	OK			EW-98
156	0.8	PPM	OK			EW-100
157	0.5	PPM	OK			EW-99
158	19.1	PPM	OK			EW-95
159	155	PPM	OK			EW-90
160	18.4	PPM	OK			EW-86
161	12	PPM	OK			EW-84
162	3	PPM	OK			EW-80

**EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - MAY 30, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA**

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

Number of locations sampled:	162
Number of exceedance locations:	1

NOTES:

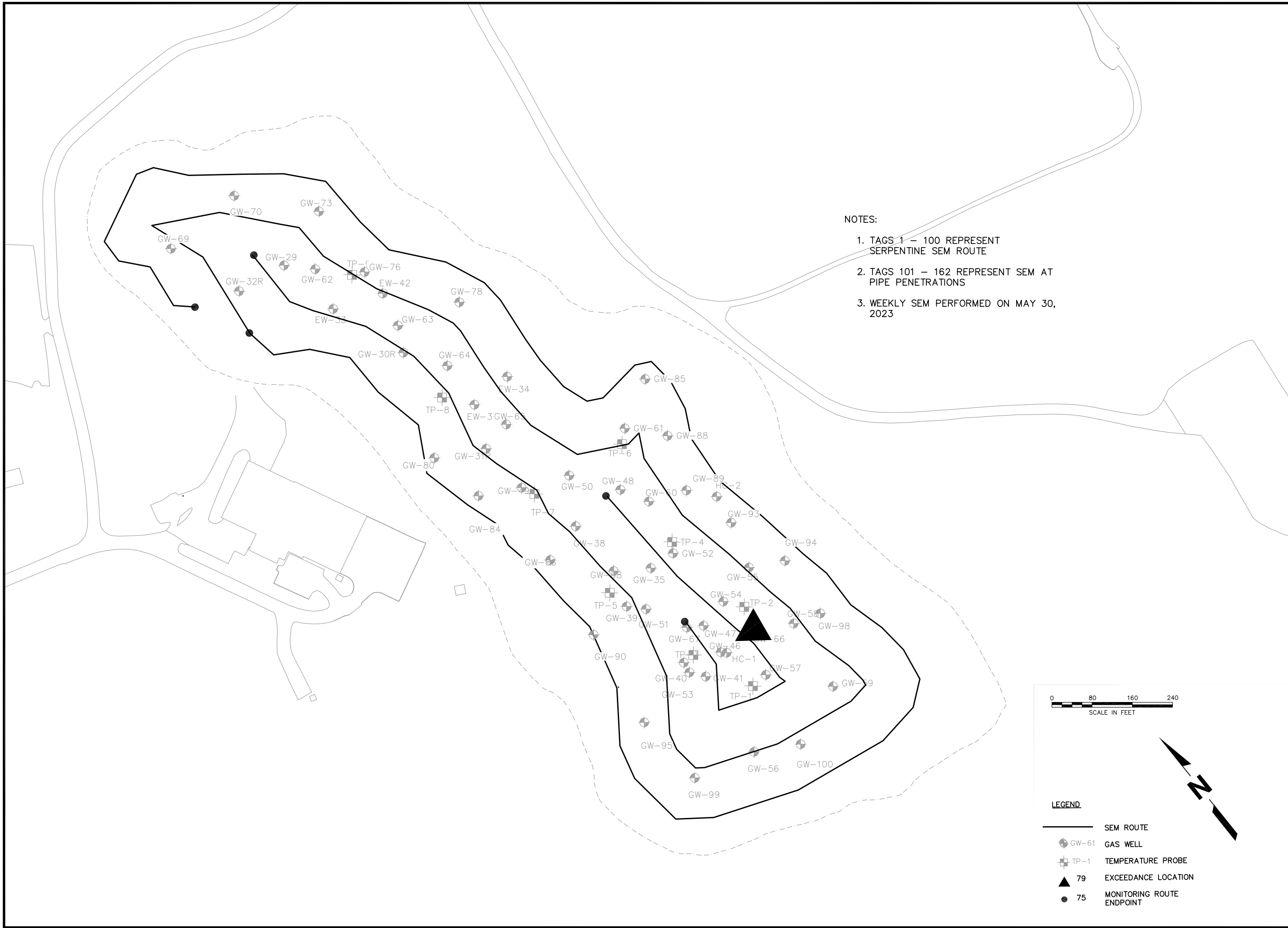
Points 1 through 100 represent serpentine SEM route.
 Points 101 through 162 represent SEM at Pipe Penetrations
 Weather Conditions: Sunny, 65°F Wind: 3 S

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

5/30/2023	11:13	ZERO	0.1 PPM
5/30/2023	11:16	SPAN	500.0 PPM

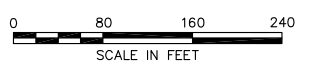
Background Reading:

5/30/2023	11:18	Upwind	3.7 PPM
5/30/2023	11:25	Downwind	2.9 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 162 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON MAY 30, 2023



- LEGEND**
- SEM ROUTE
 - GW-61 GAS WELL
 - TP-1 TEMPERATURE PROBE
 - 79 EXCEEDANCE LOCATION
 - 75 MONITORING ROUTE ENDPOINT

	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. 10000 WOODBURN AVENUE, SUITE 100 PH: (804) 376-7440 FAX: (804) 376-7433	DWG. BY: LSN DATE: 02/21/2025	D/A RW BY: SN APP. BY: DBK	FILE: 02218208.04
	DATE:	5/30/23	
	SCALE:	AS SHOWN	
DRAWING NO.	1 of 1		

Appendix B

In-Waste Temperatures on Select Days in May

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

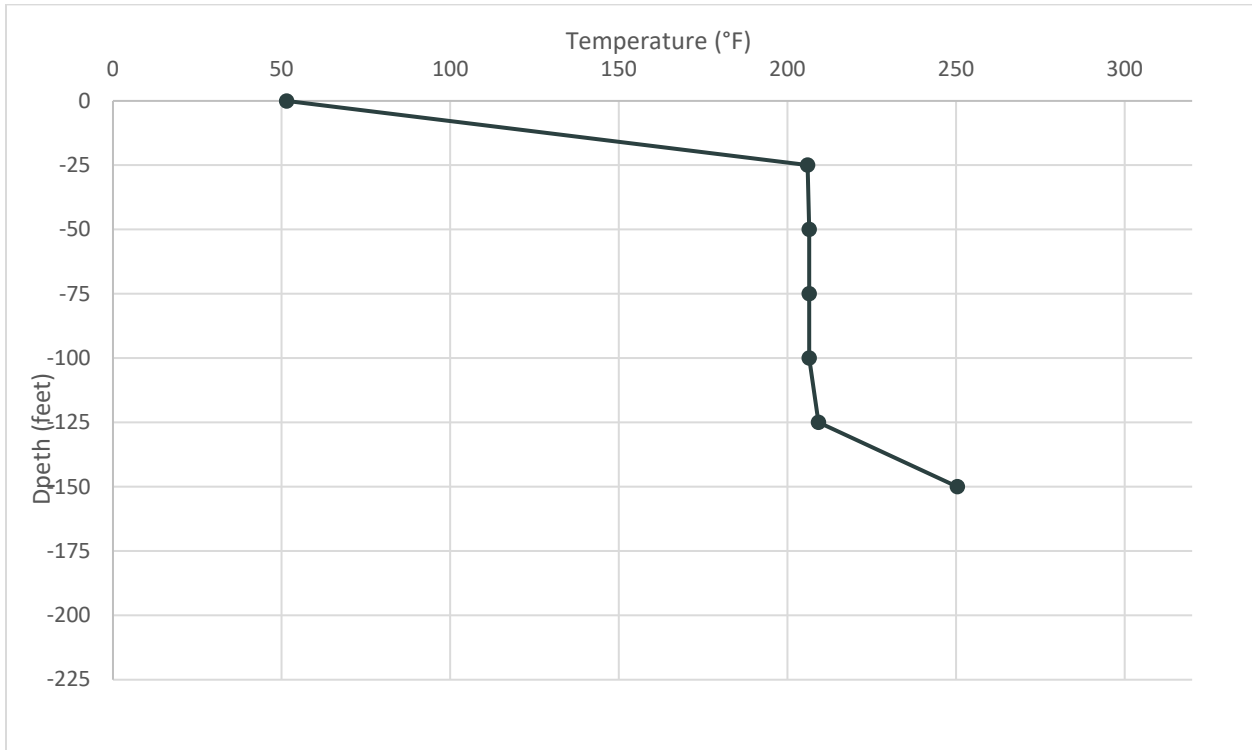


Figure B-2. Average Temperatures Recorded by TP-1 on May 10, 2023

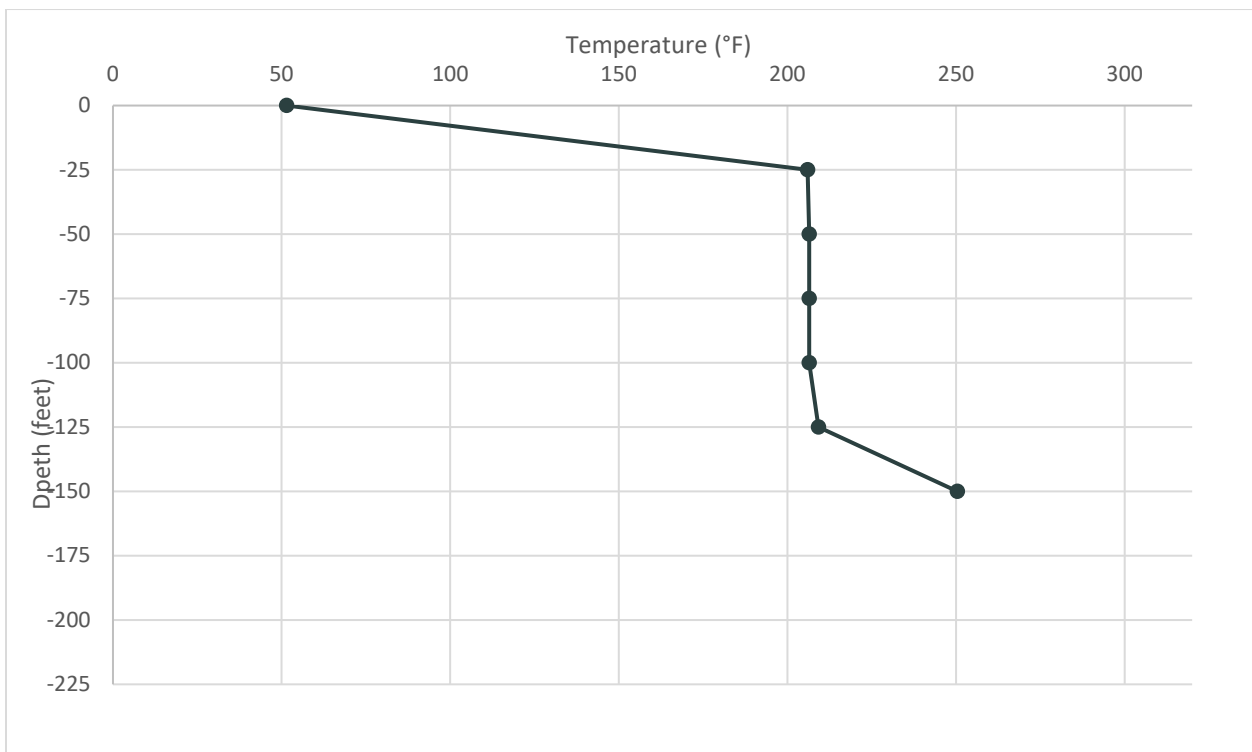


Figure B- 3. Average Temperatures Recorded by TP-1 on May 17, 2023

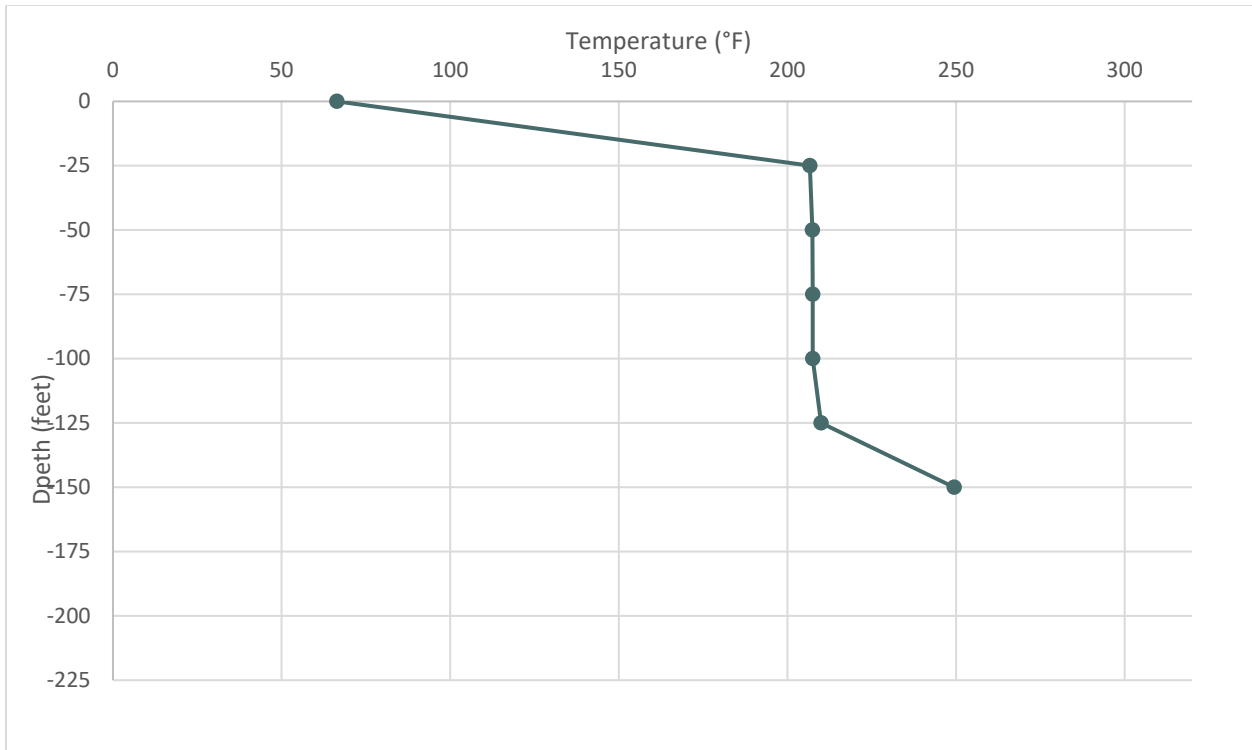


Figure B- 4. Average Temperatures Recorded by TP-1 on May 25, 2023

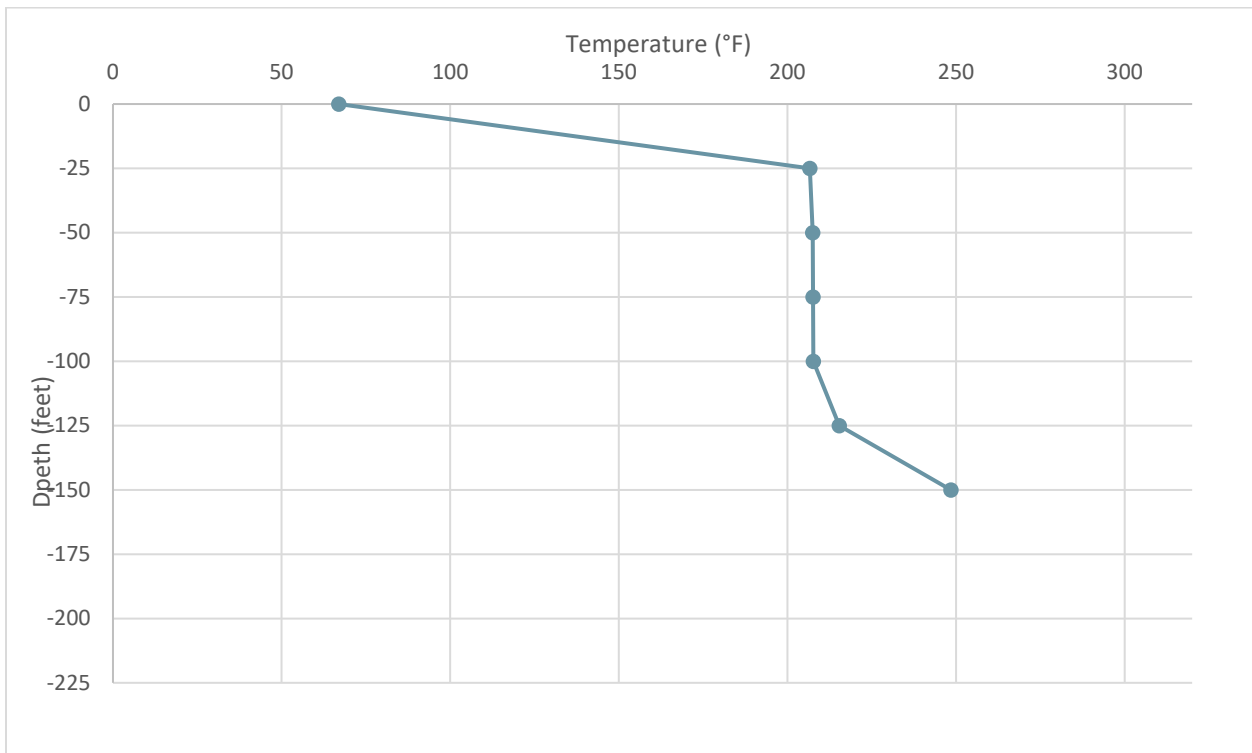


Figure B- 5. Average Temperatures Recorded by TP-1 on May 31, 2023

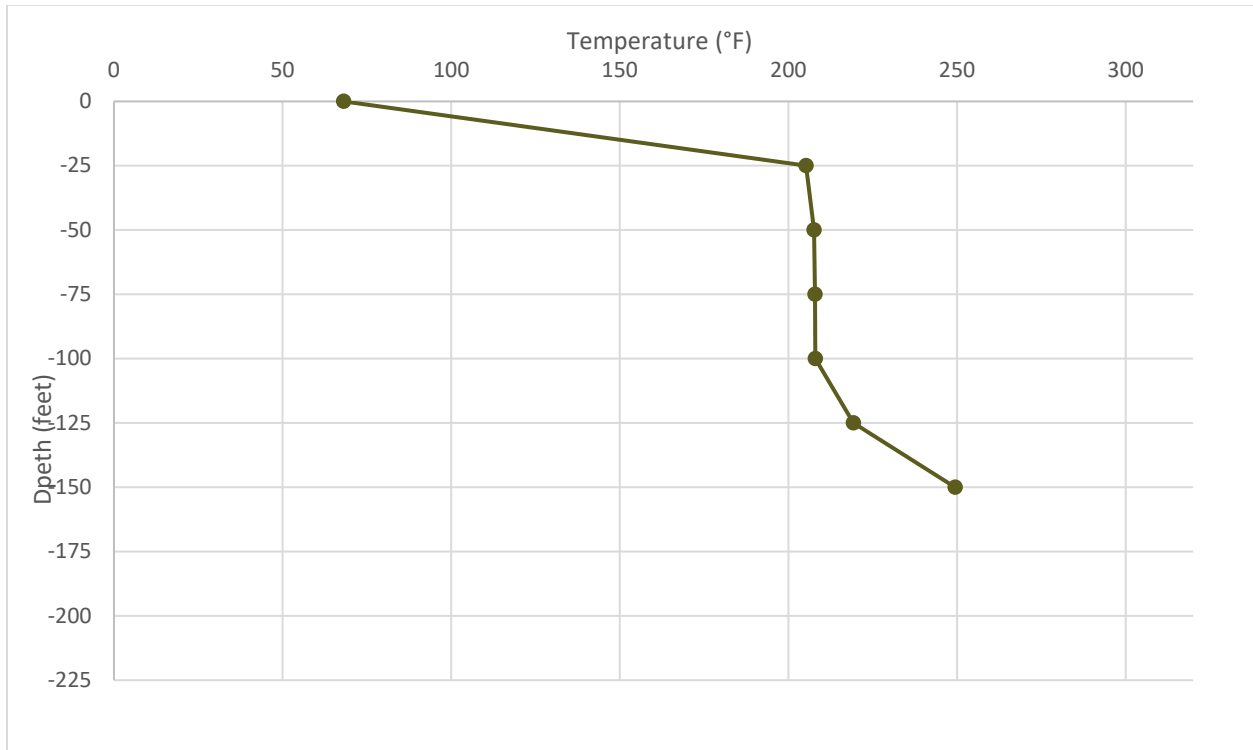


Figure B- 6. Average Temperatures Recorded by TP-2 on May 3, 2023

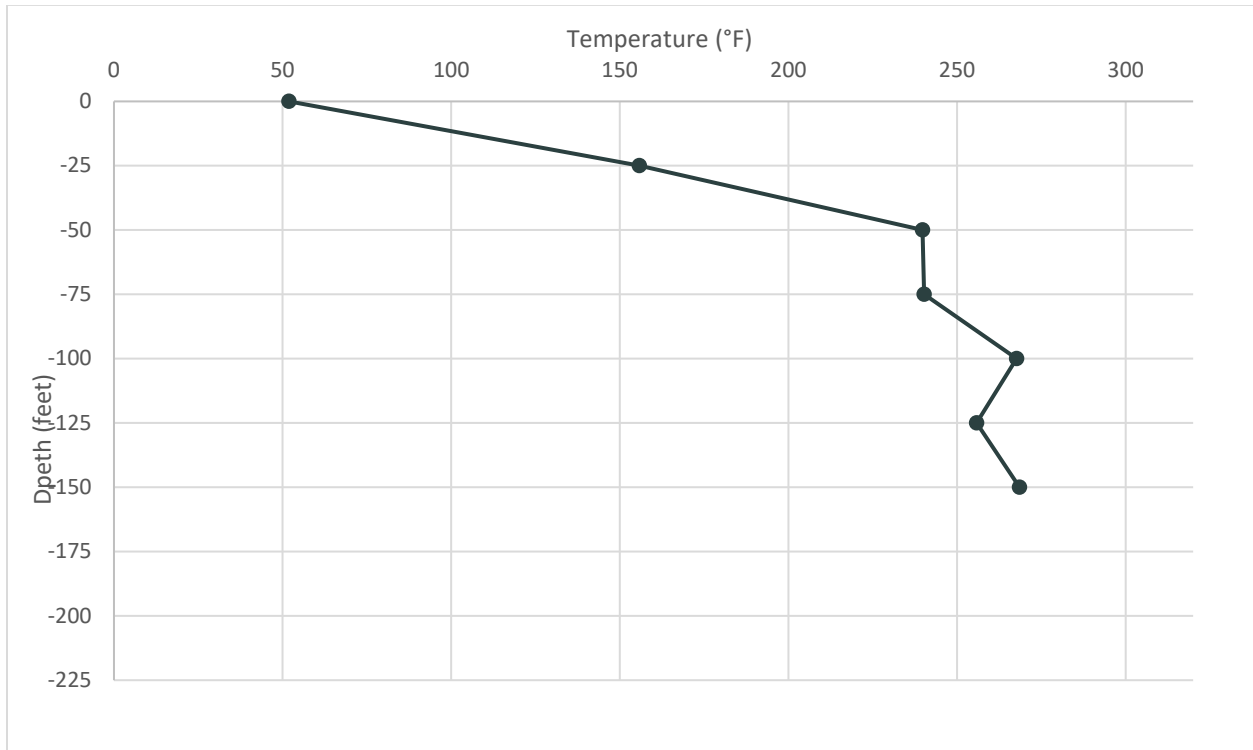


Figure B- 7. Average Temperatures Recorded by TP-2 on May 10, 2023

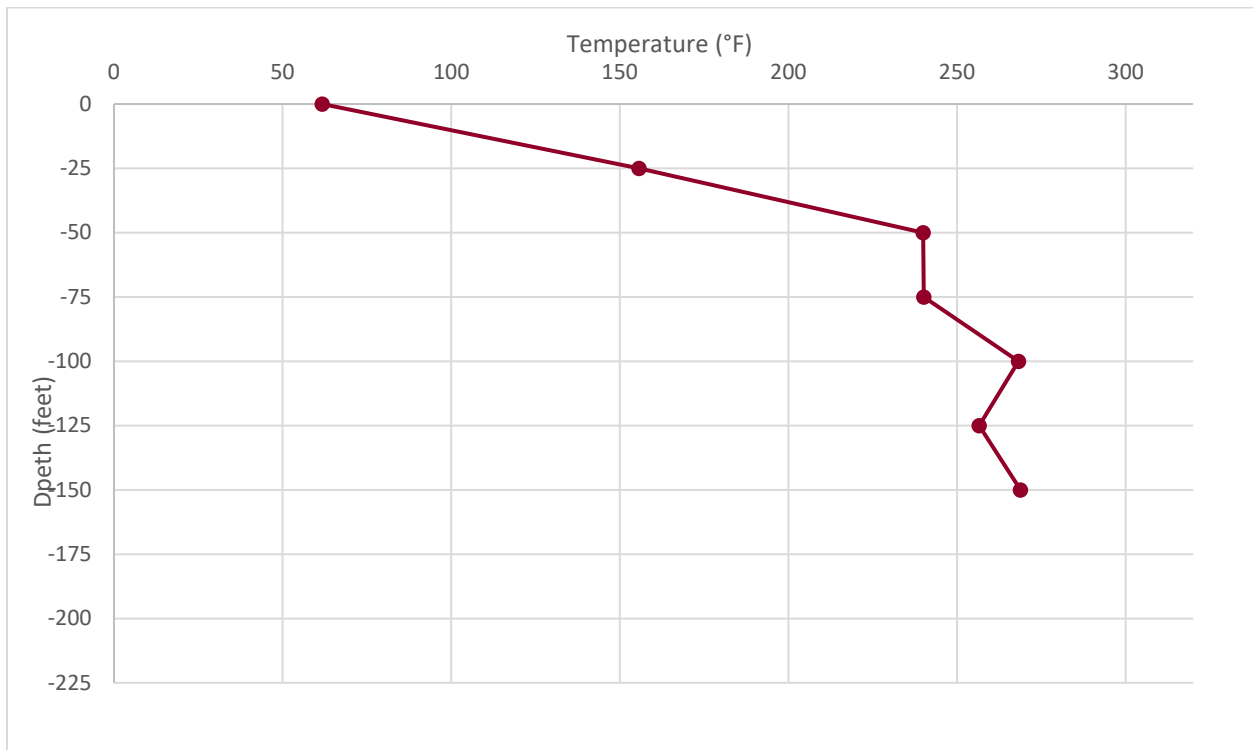


Figure B- 8. Average Temperatures Recorded by TP-2 on May 17, 2023

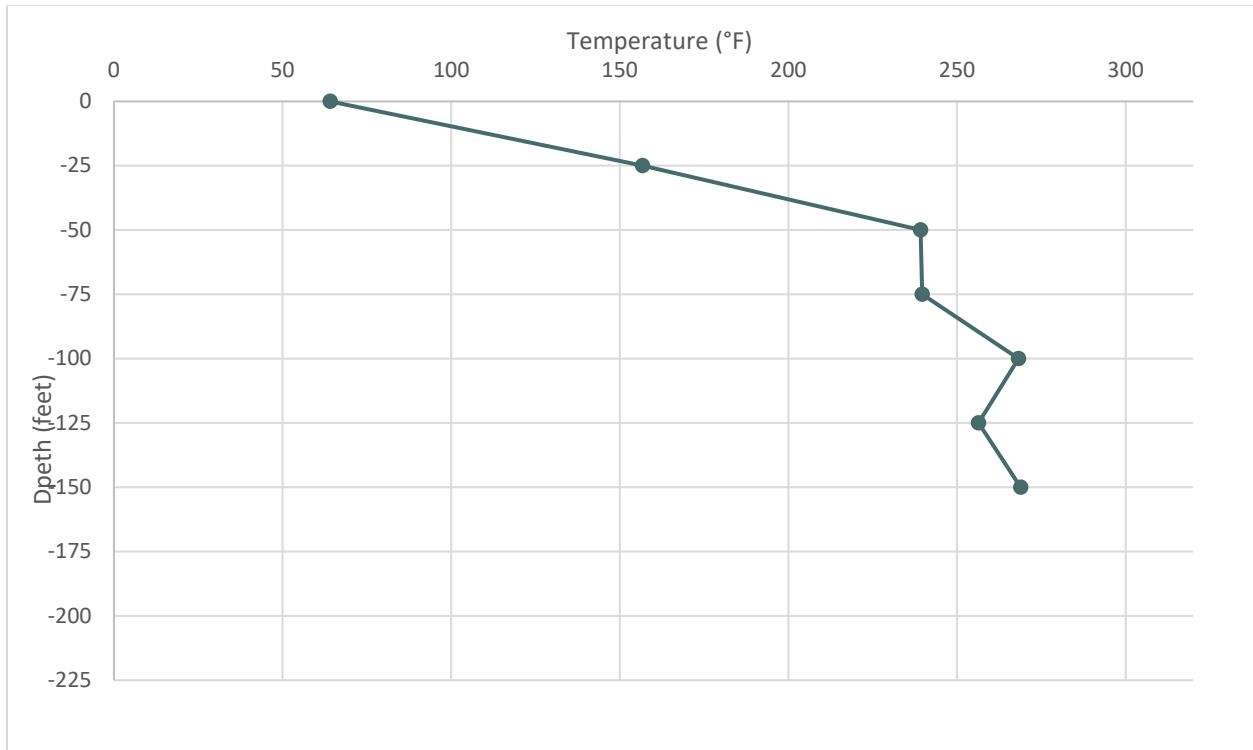


Figure B- 9. Average Temperatures Recorded by TP-2 on May 25, 2023

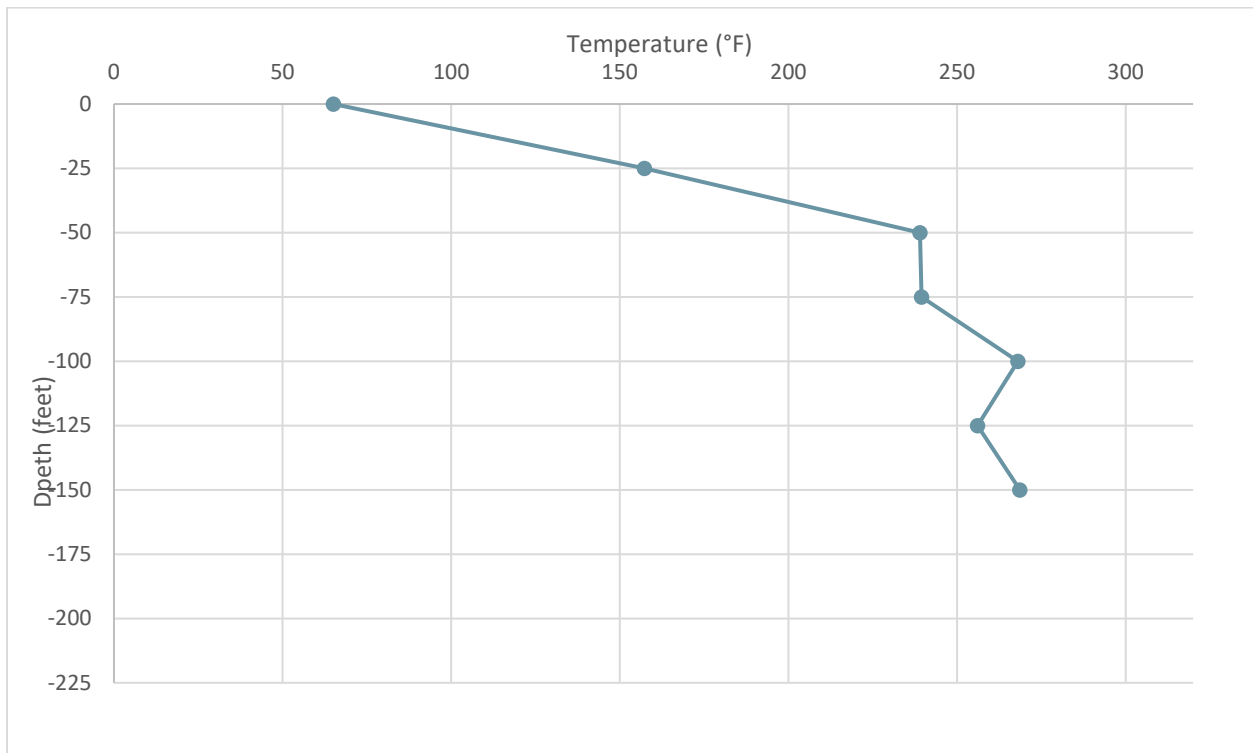


Figure B- 10. Average Temperatures Recorded by TP-2 on May 31, 2023

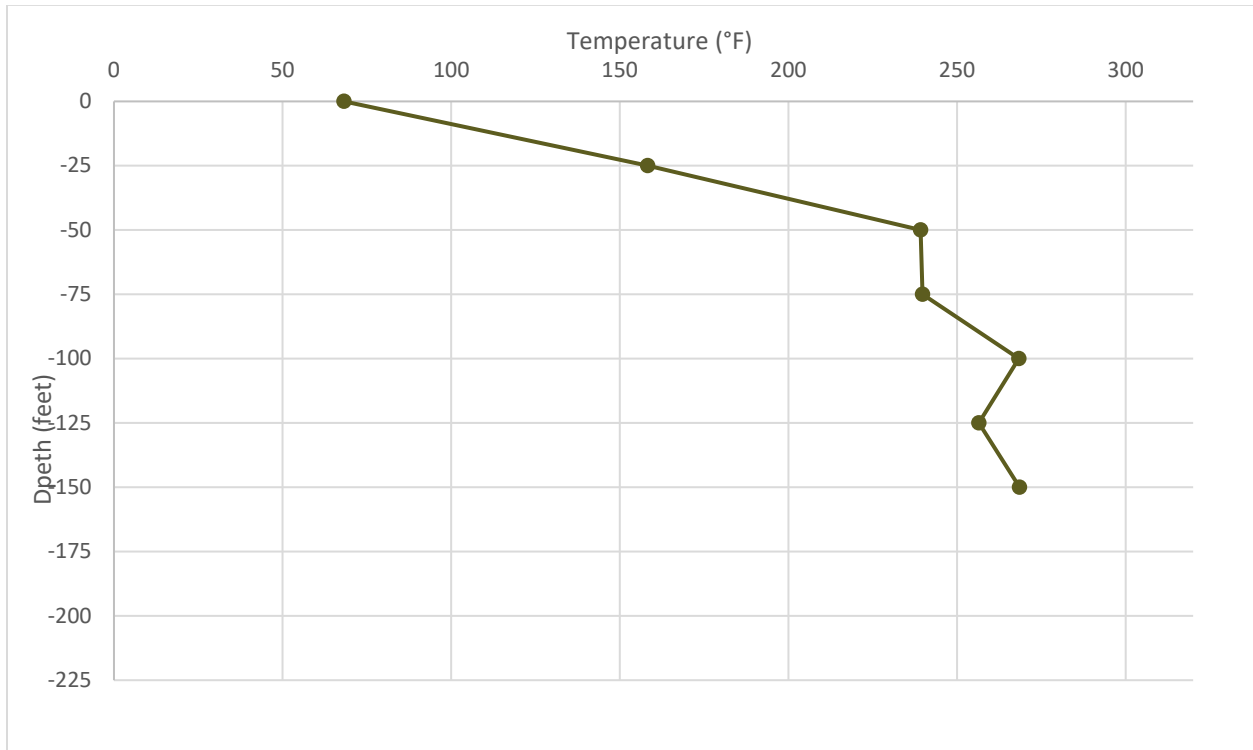


Figure B- 11. Average Temperatures Recorded by TP-3 on May 3, 2023

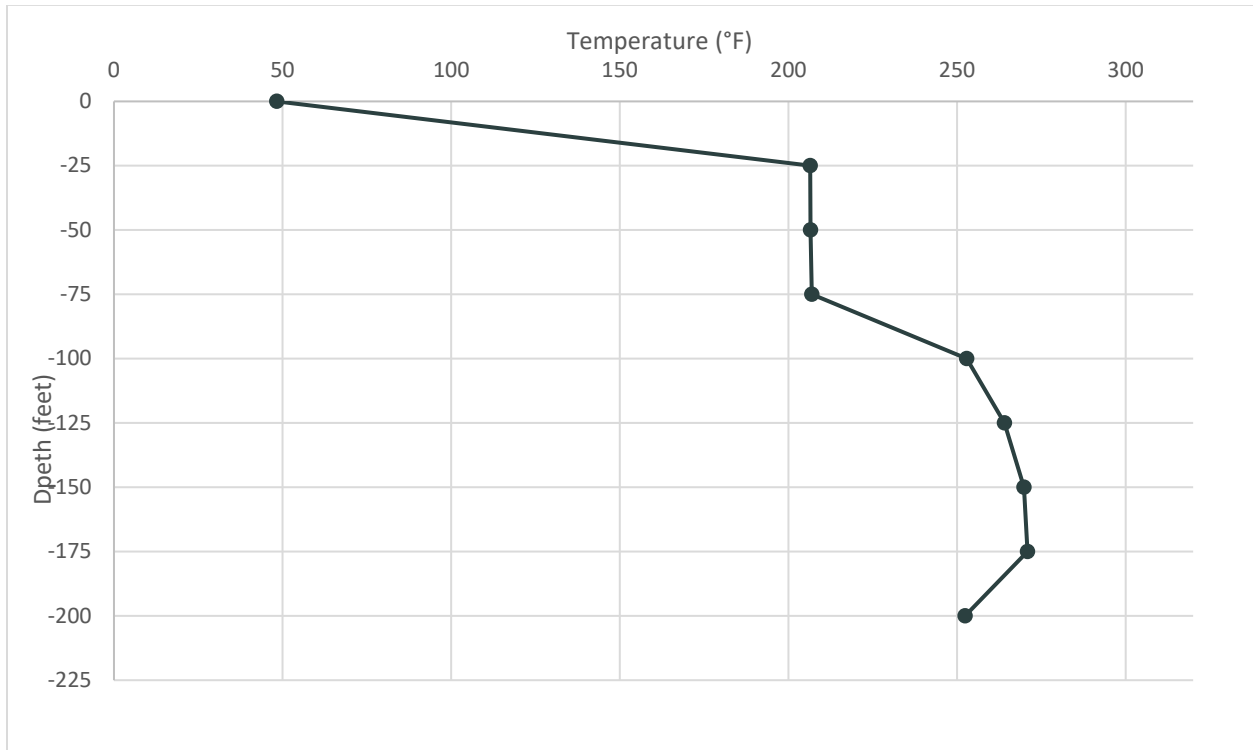


Figure B- 12. Average Temperatures Recorded by TP-3 on May 10, 2023

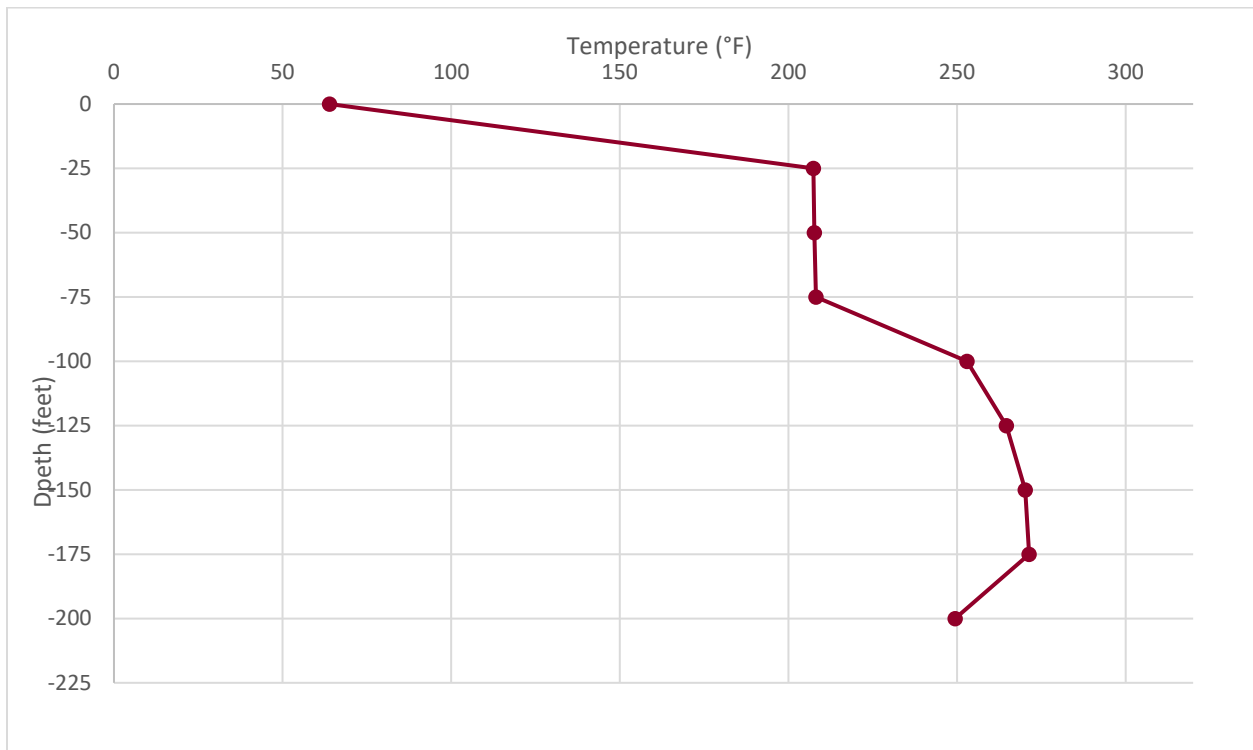


Figure B- 13. Average Temperatures Recorded by TP-3 on May 17, 2023

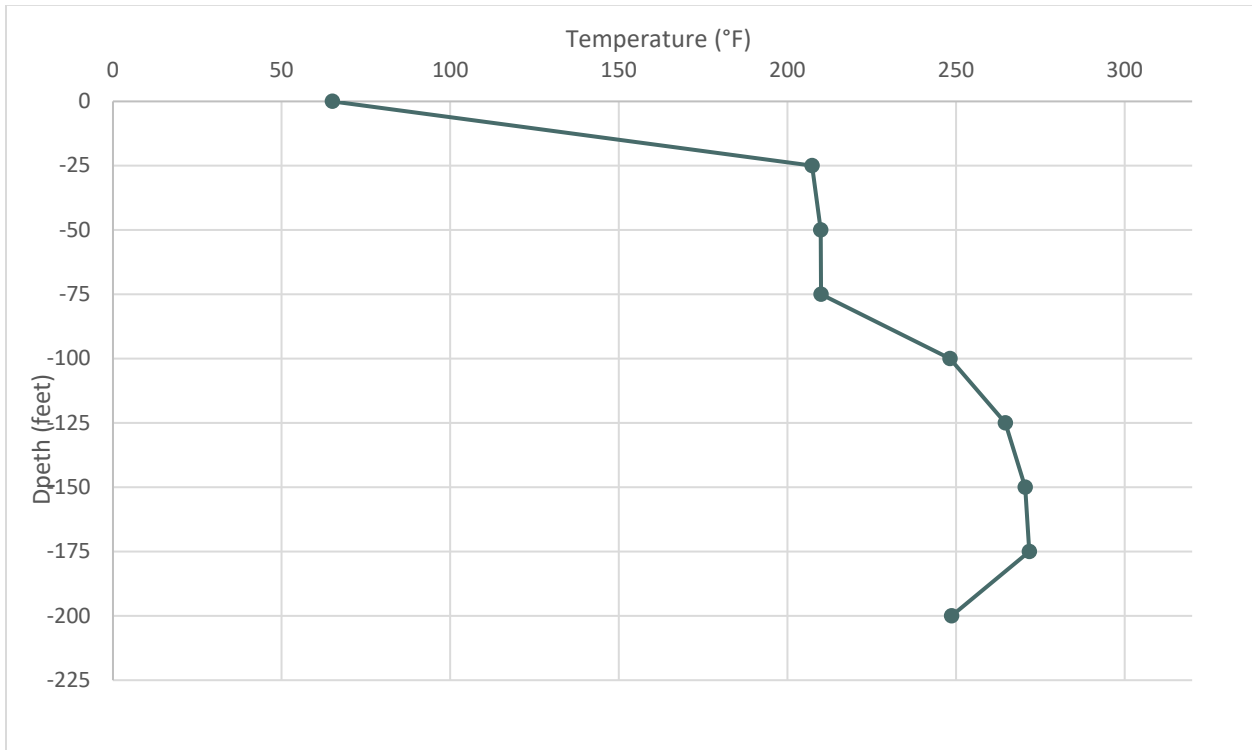


Figure B- 14. Average Temperatures Recorded by TP-3 on May 25, 2023

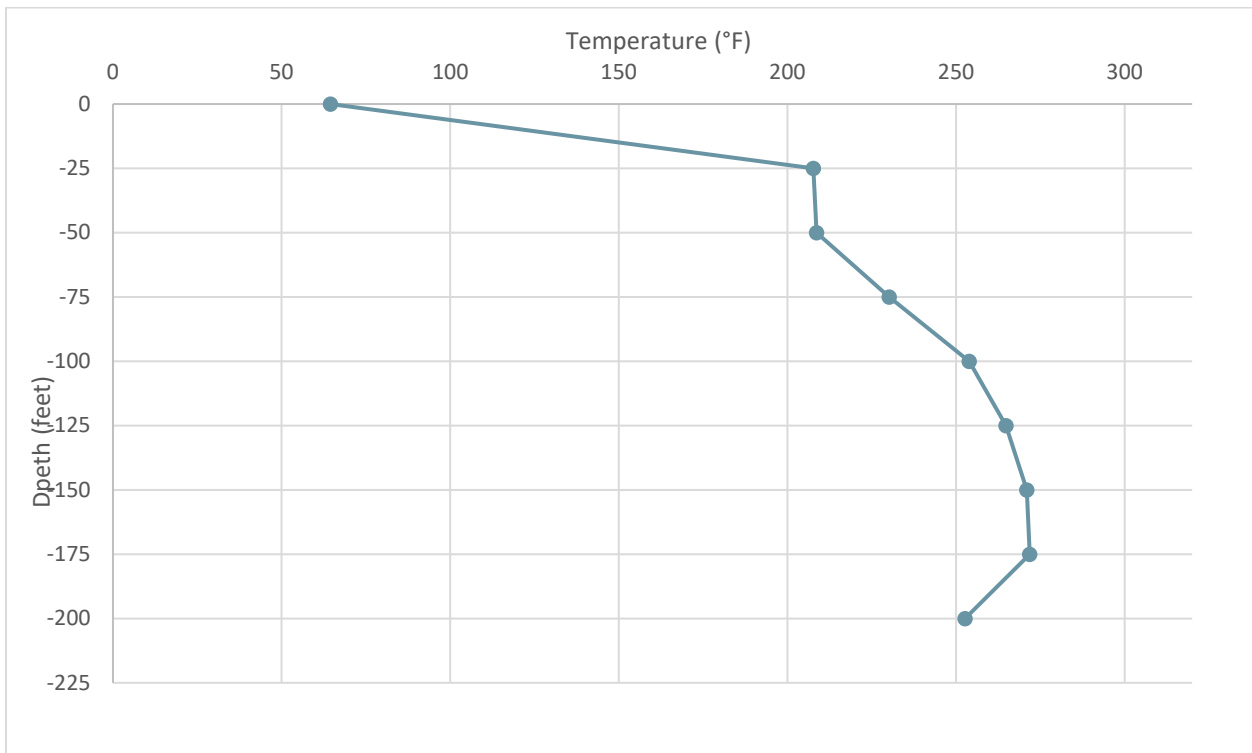


Figure B- 15. Average Temperatures Recorded by TP-3 on May 31, 2023

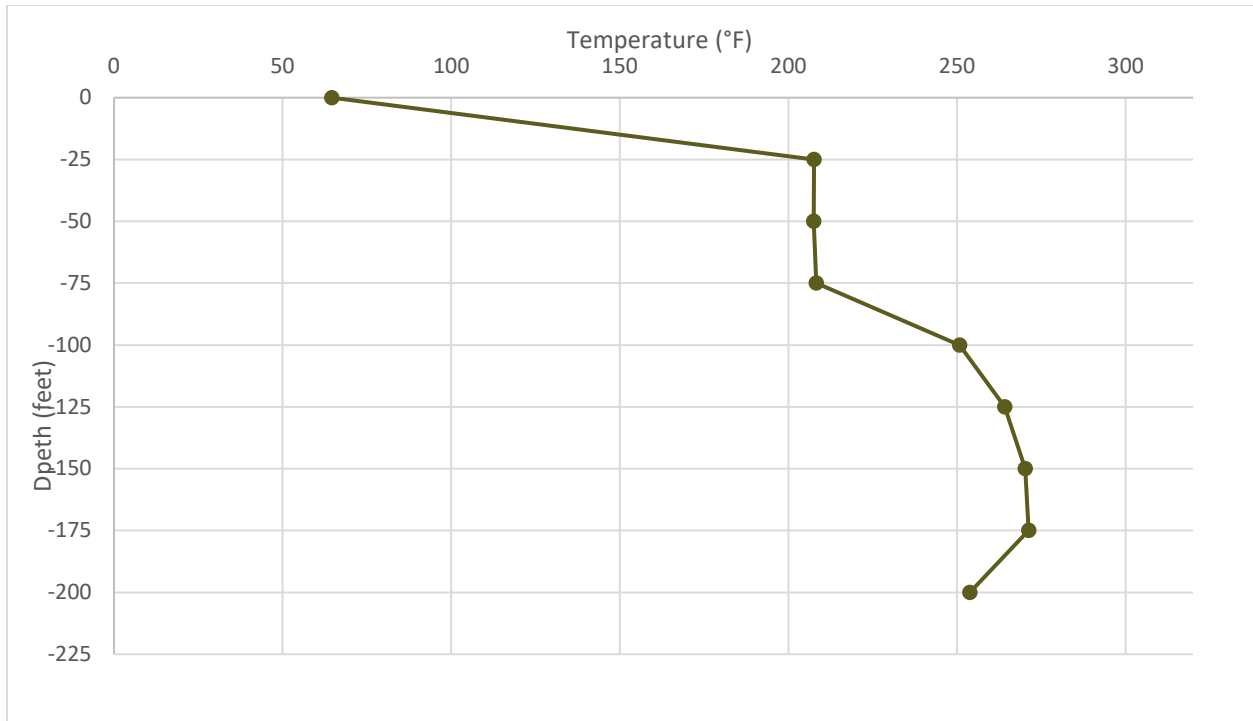


Figure B- 16. Average Temperatures Recorded by TP-4 on May 3, 2023

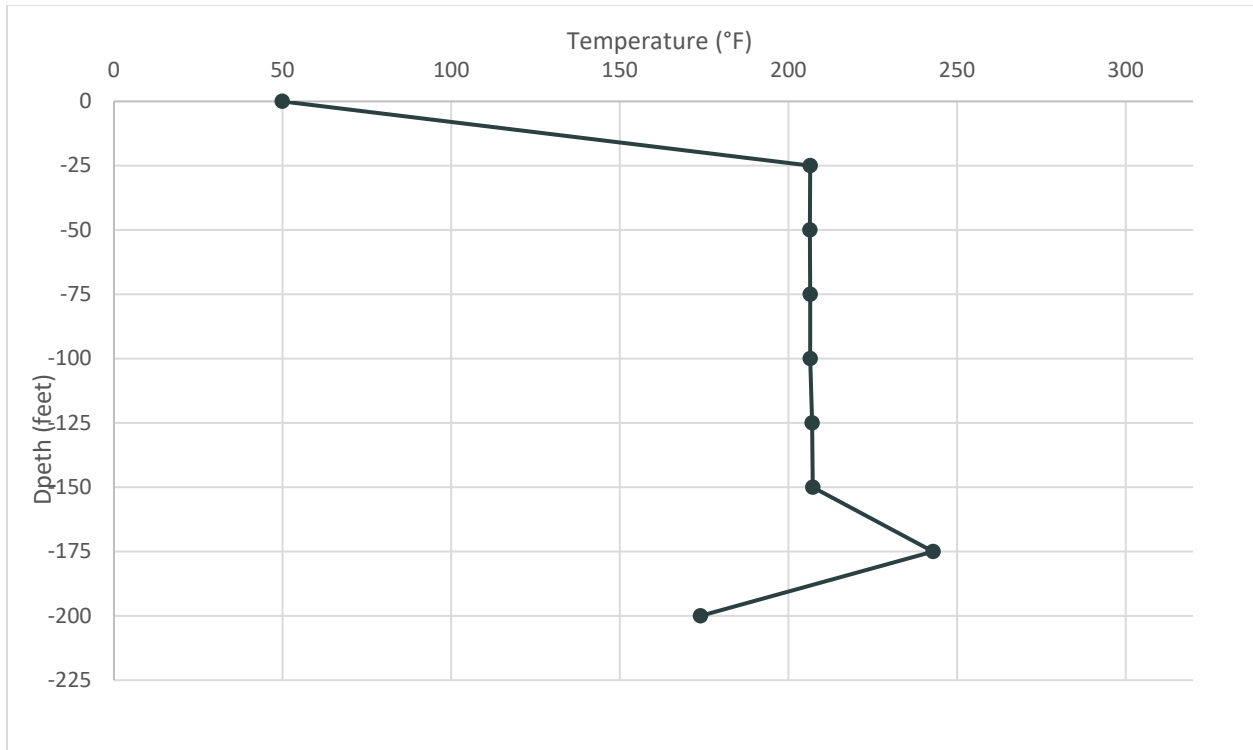


Figure B- 17. Average Temperatures Recorded by TP-4 on May 10, 2023

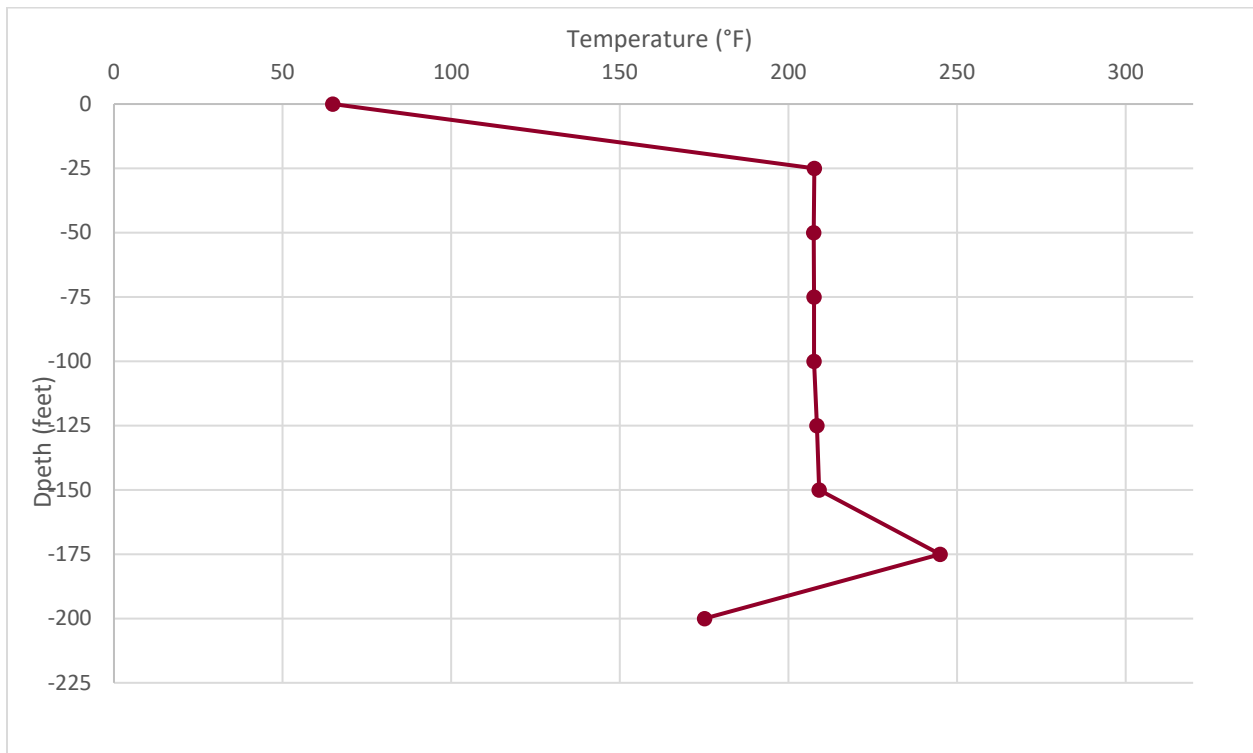


Figure B- 18. Average Temperatures Recorded by TP-4 on May 17, 2023

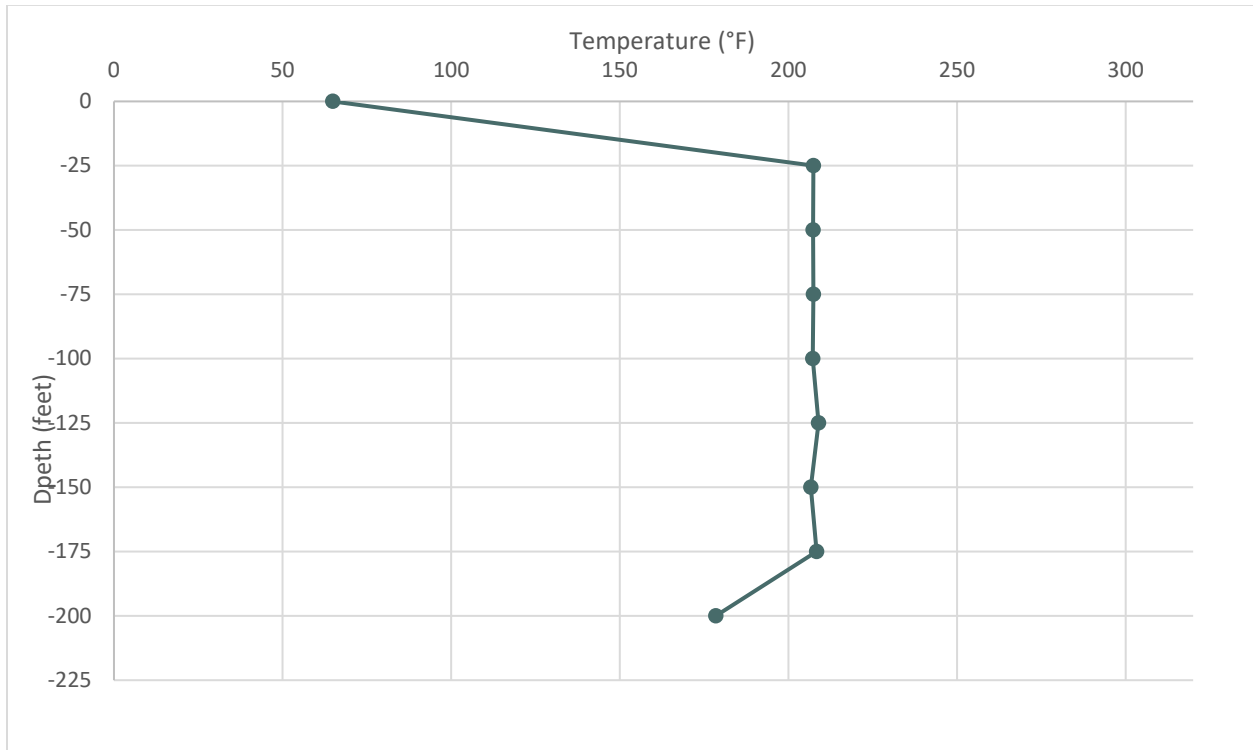


Figure B- 19. Average Temperatures Recorded by TP-4 on May 25, 2023

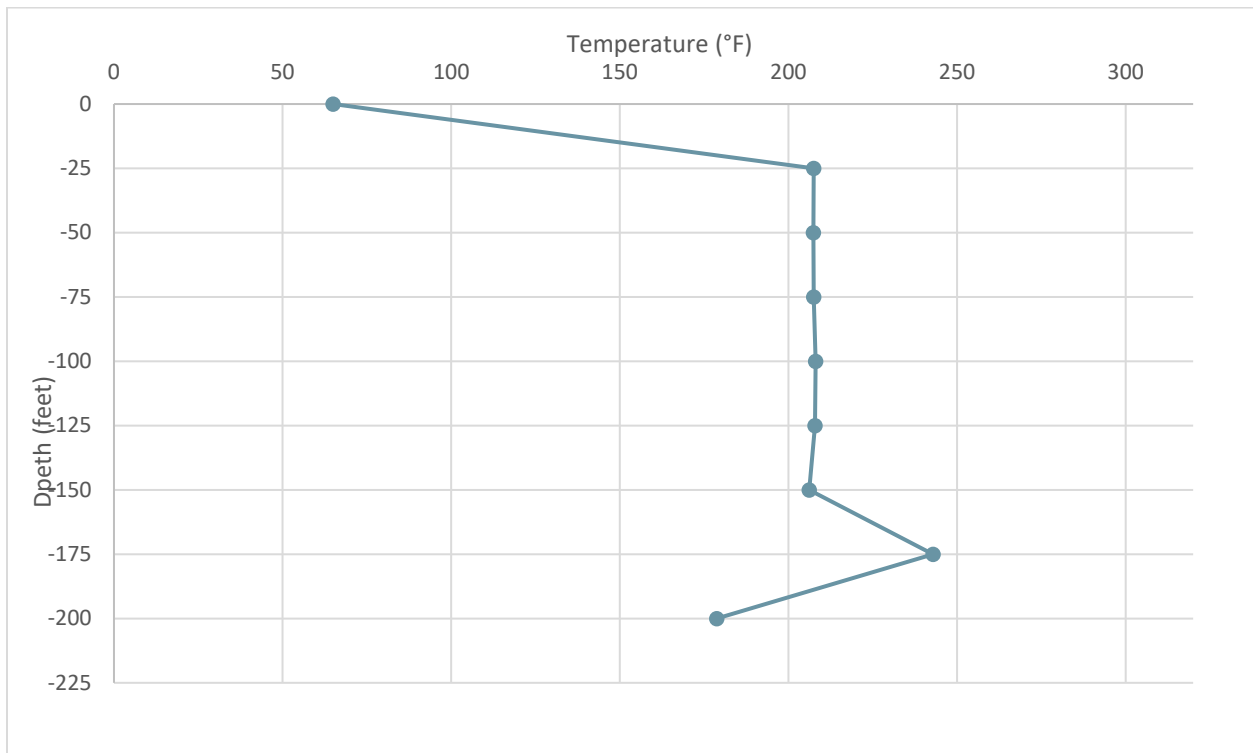


Figure B- 20. Average Temperatures Recorded by TP-4 on May 31, 2023

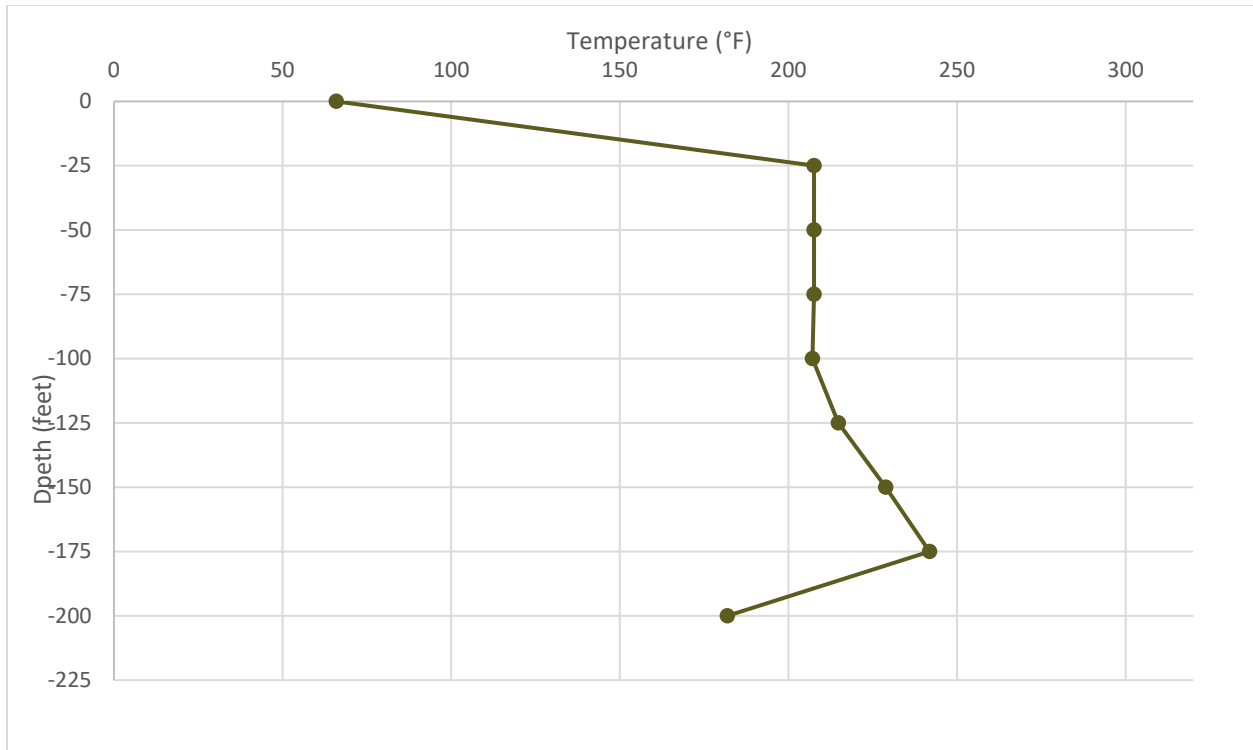


Figure B- 21. Average Temperatures Recorded by TP-5 on May 3, 2023

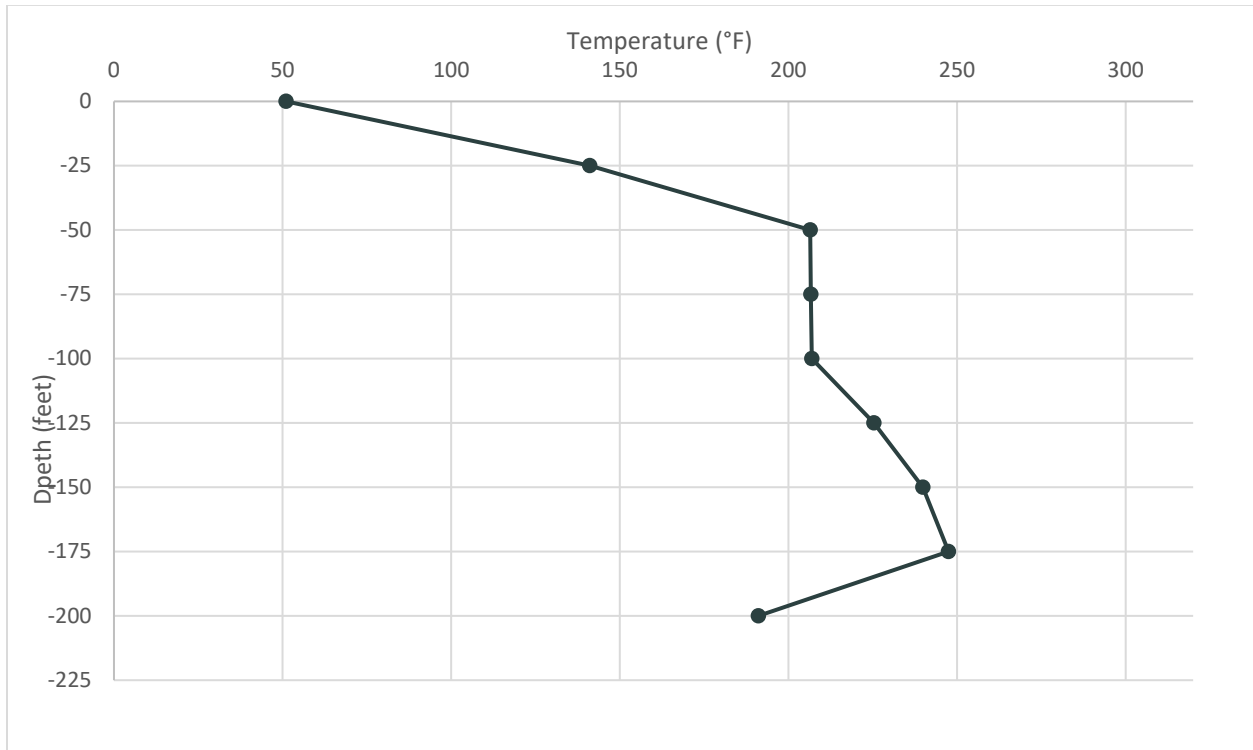


Figure B- 22. Average Temperatures Recorded by TP-5 on May 10, 2023

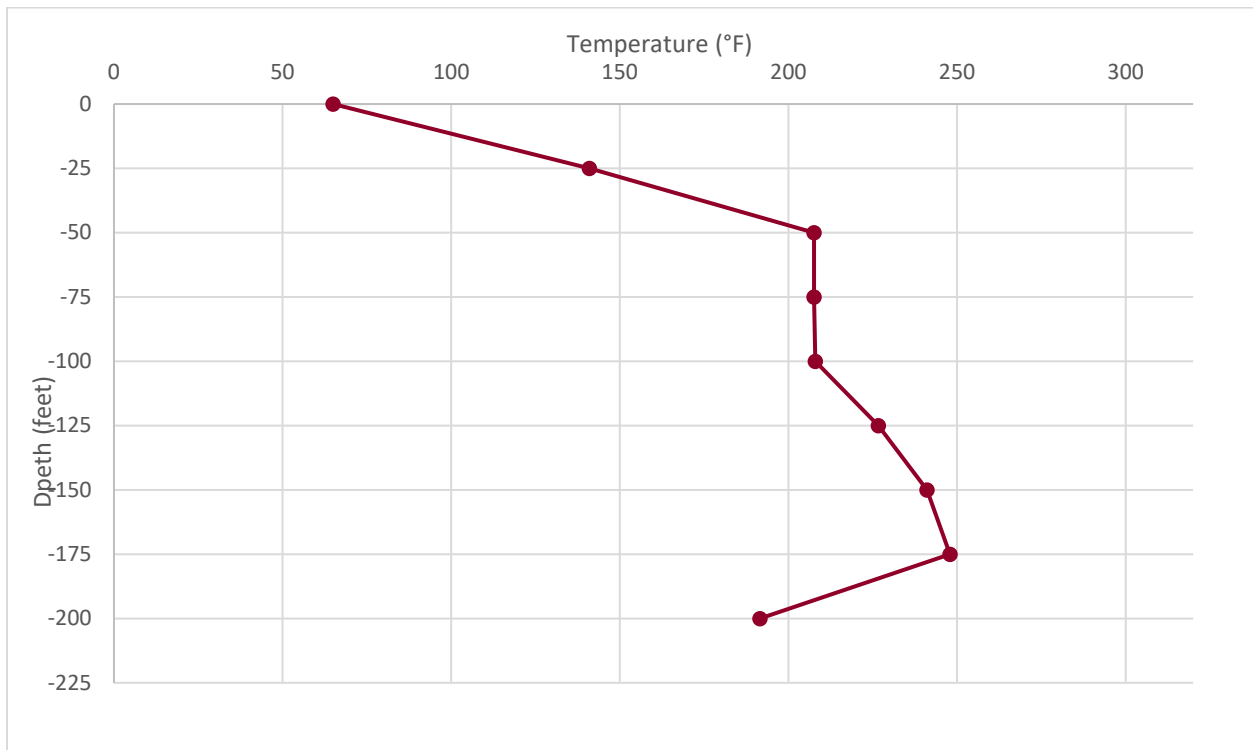


Figure B- 23. Average Temperatures Recorded by TP-5 on May 17, 2023

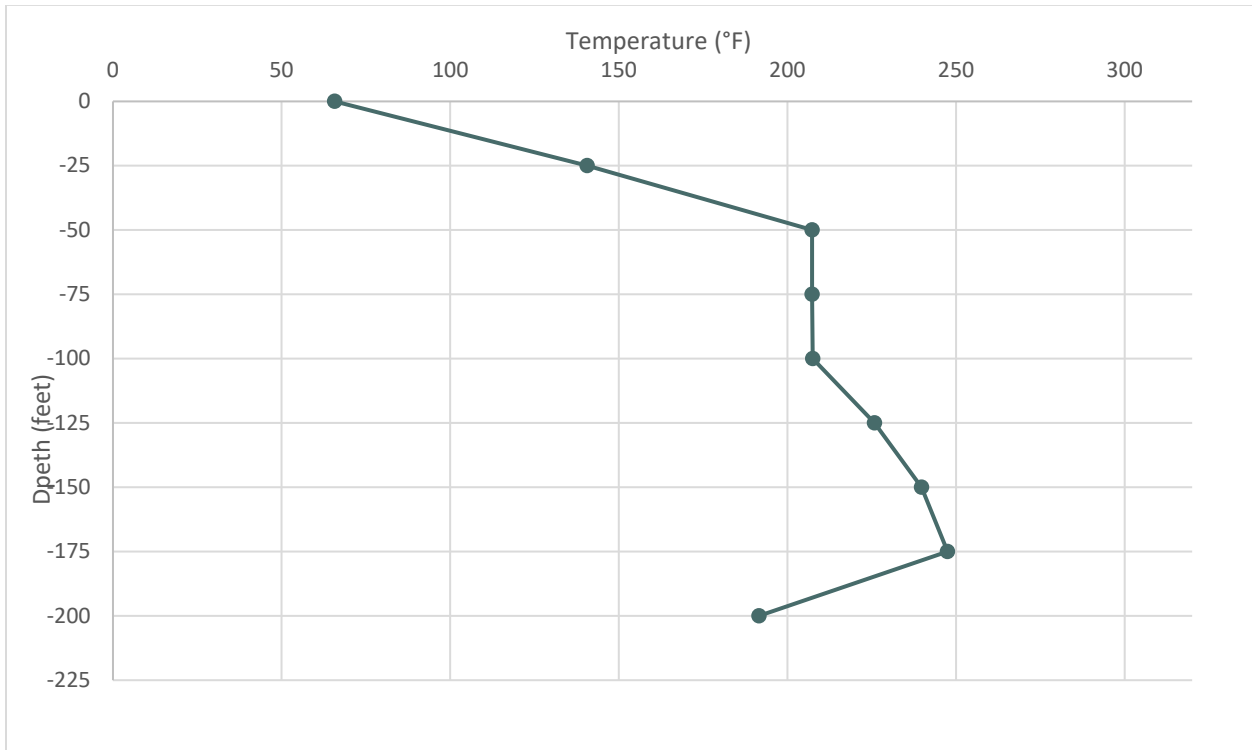


Figure B- 24. Average Temperatures Recorded by TP-5 on May 25, 2023

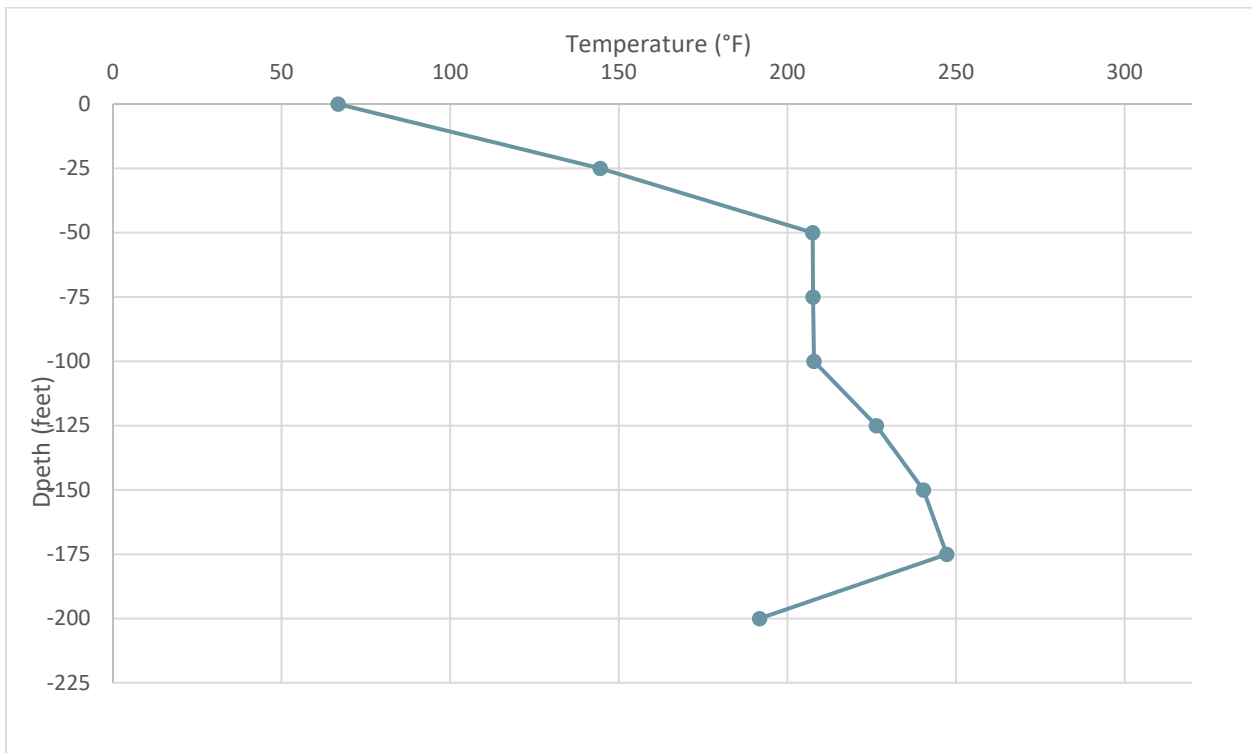


Figure B- 25. Average Temperatures Recorded by TP-5 on May 31, 2023

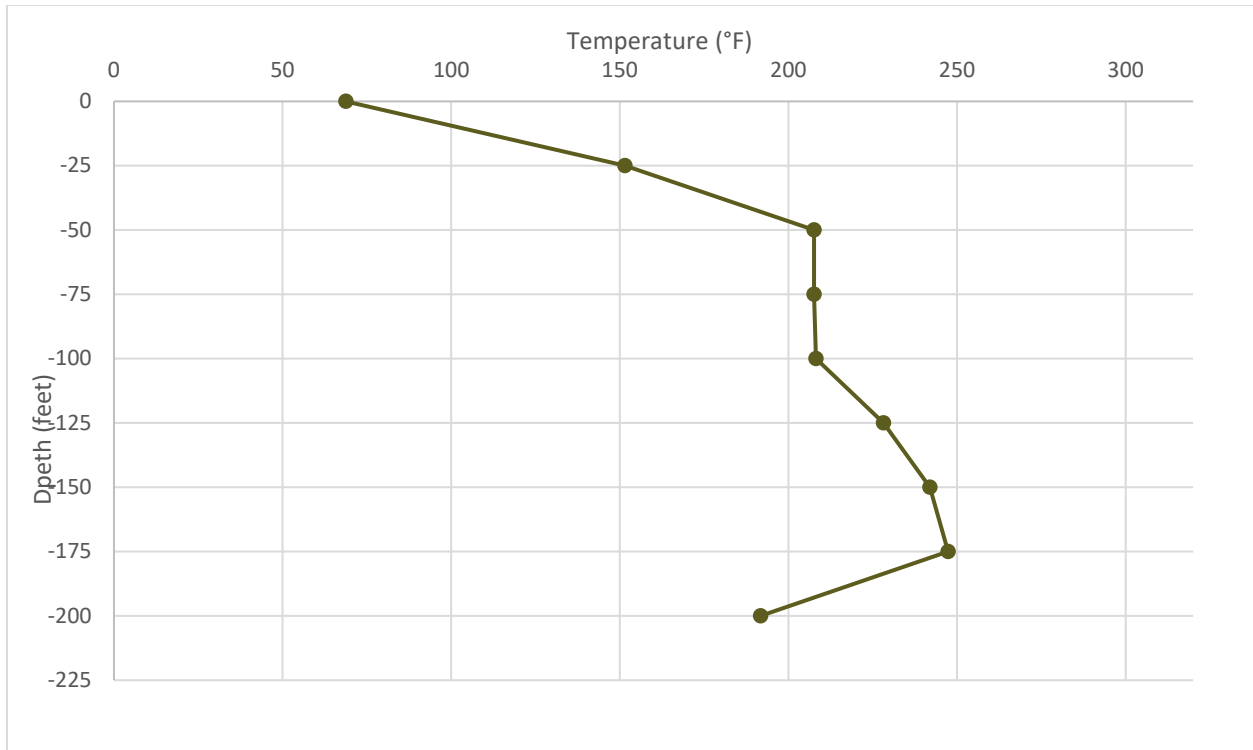


Figure B- 26. Average Temperatures Recorded by TP-6 on May 3, 2023

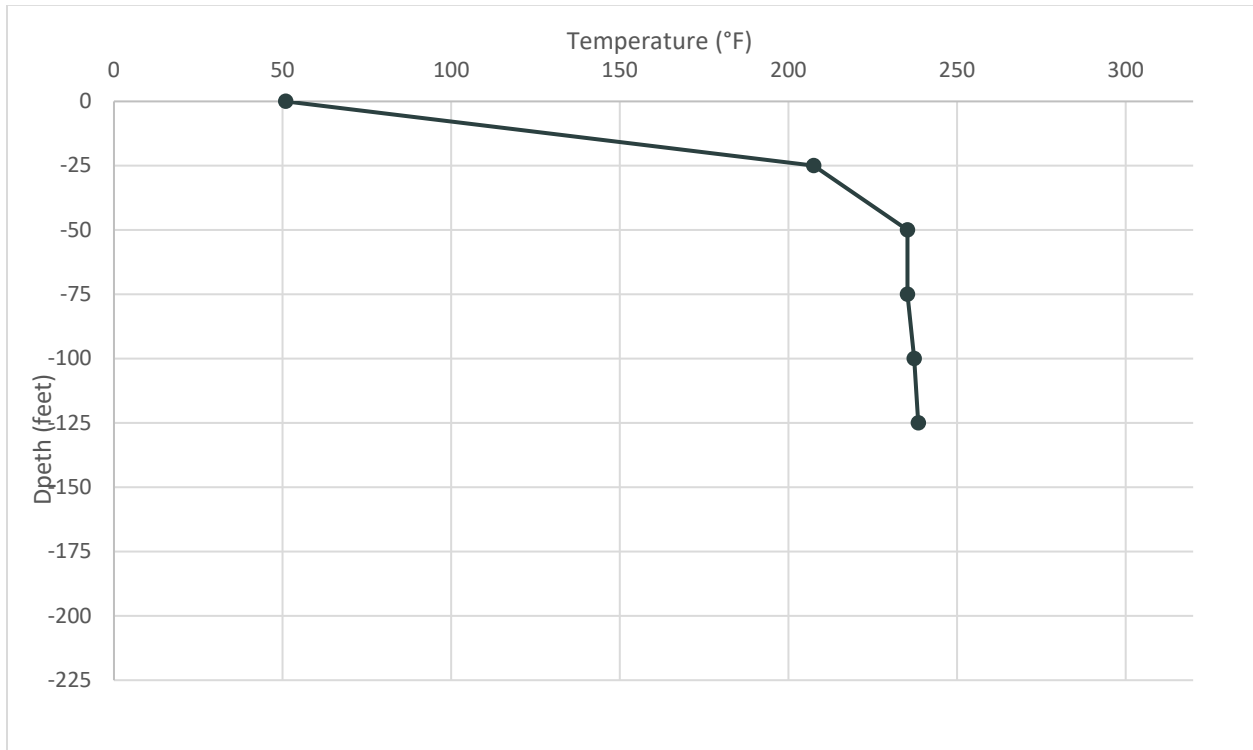


Figure B- 27. Average Temperatures Recorded by TP-6 on May 10, 2023

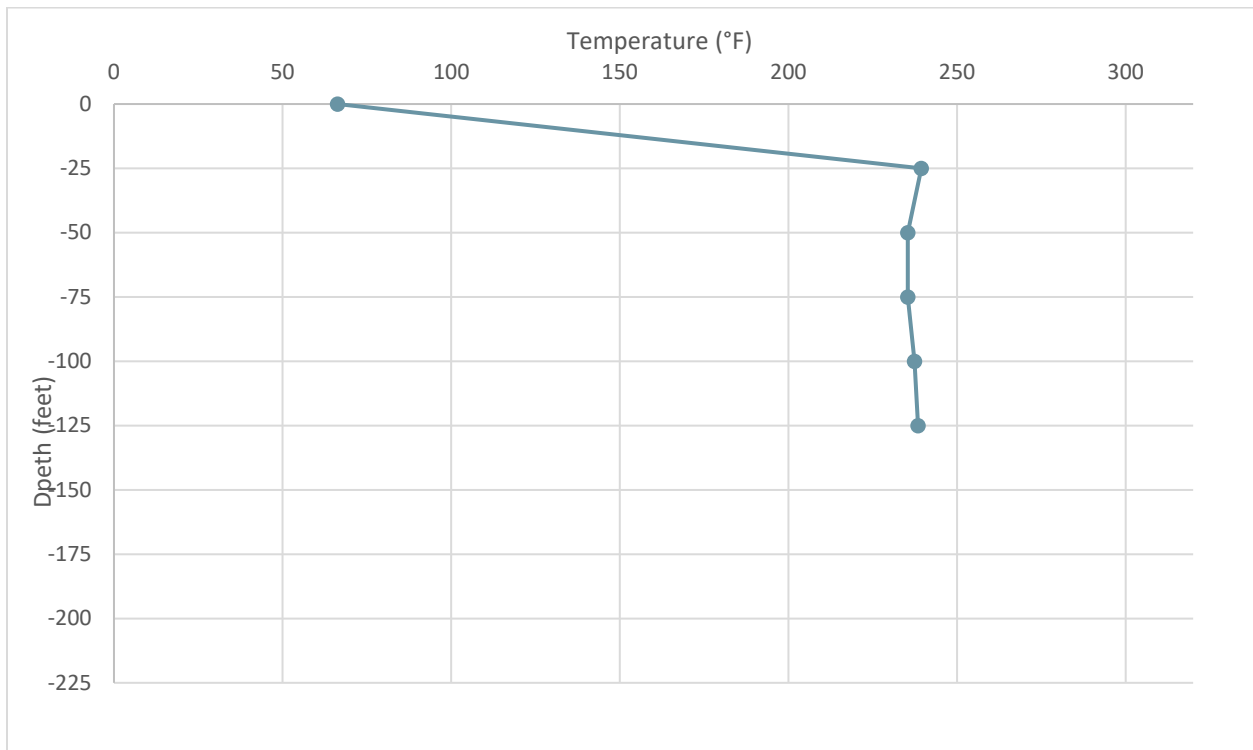


Figure B- 28. Average Temperatures Recorded by TP-6 on May 17, 2023

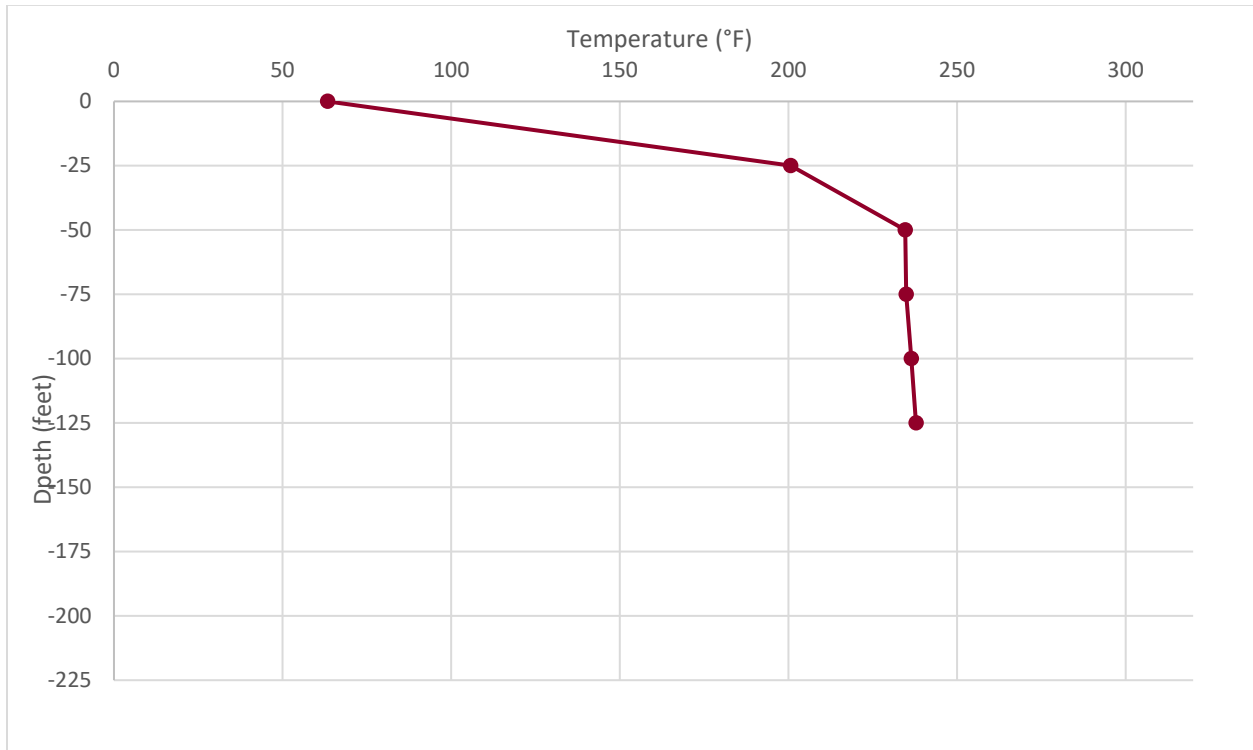


Figure B- 29. Average Temperatures Recorded by TP-6 on May 25, 2023

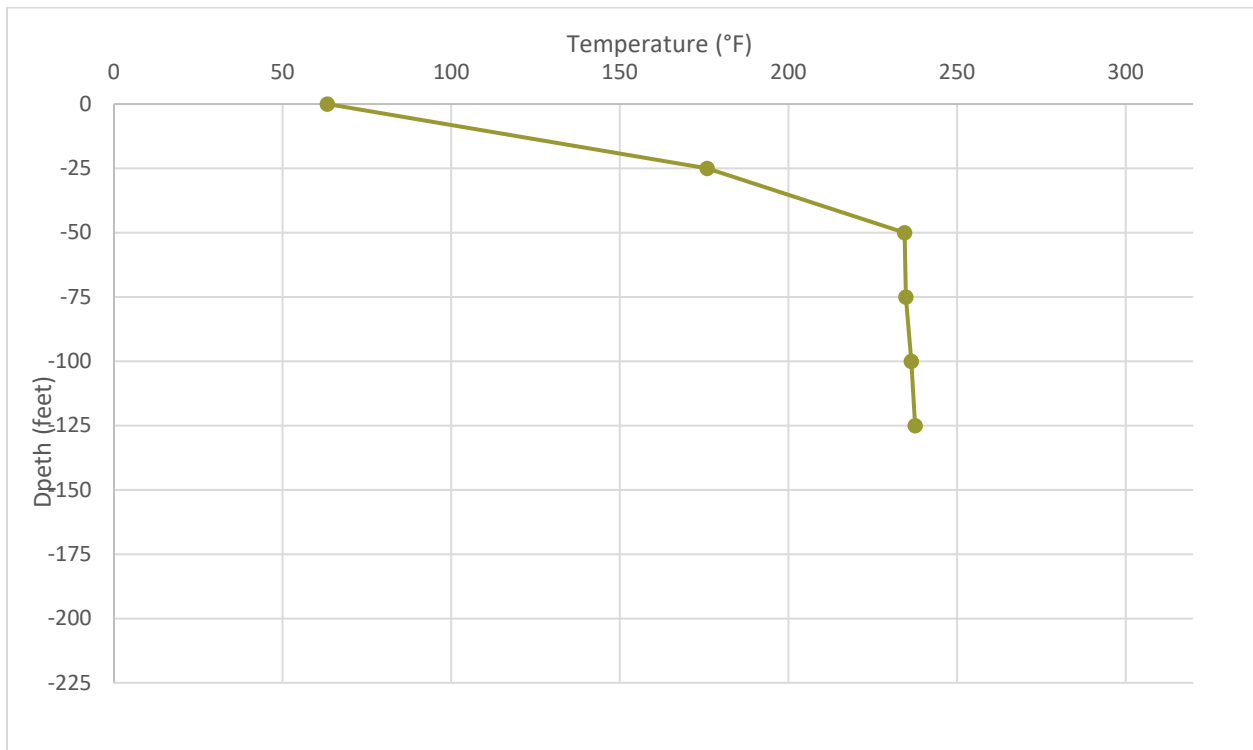


Figure B- 30. Average Temperatures Recorded by TP-6 on May 31, 2023

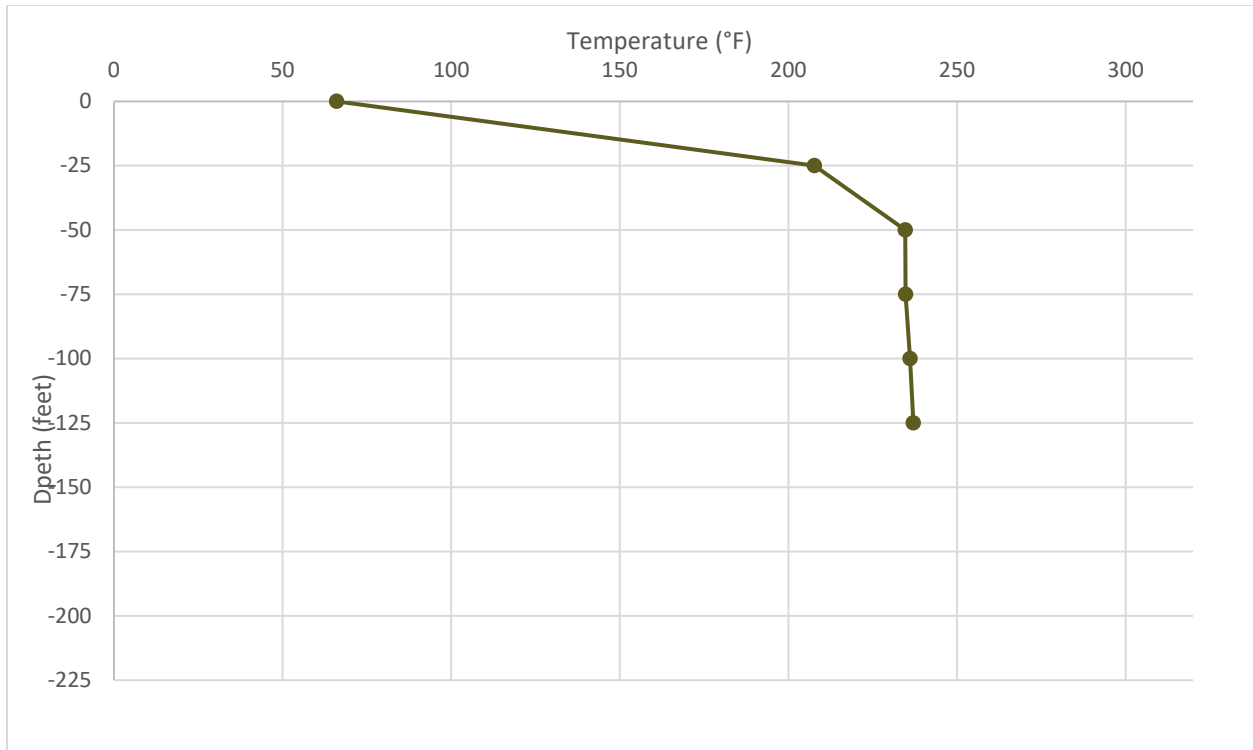


Figure B- 31. Average Temperatures Recorded by TP-7 on May 3, 2023

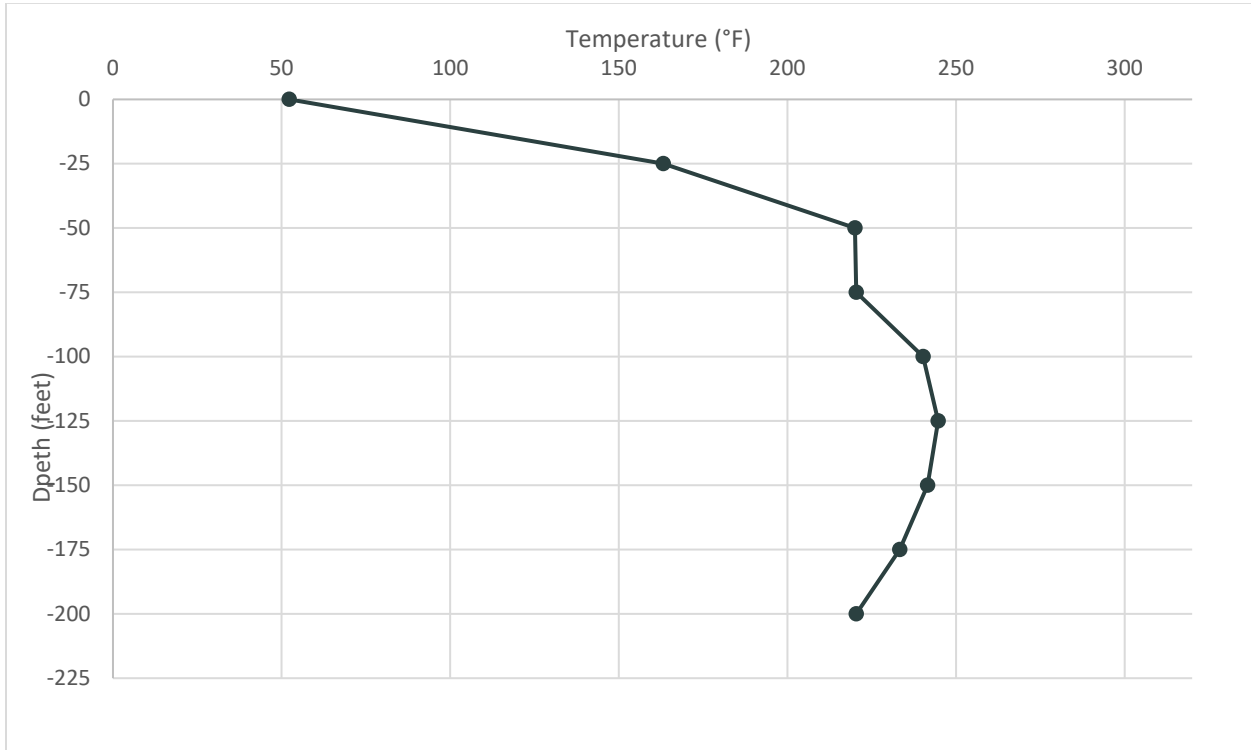


Figure B- 32. Average Temperatures Recorded by TP-7 on May 10, 2023

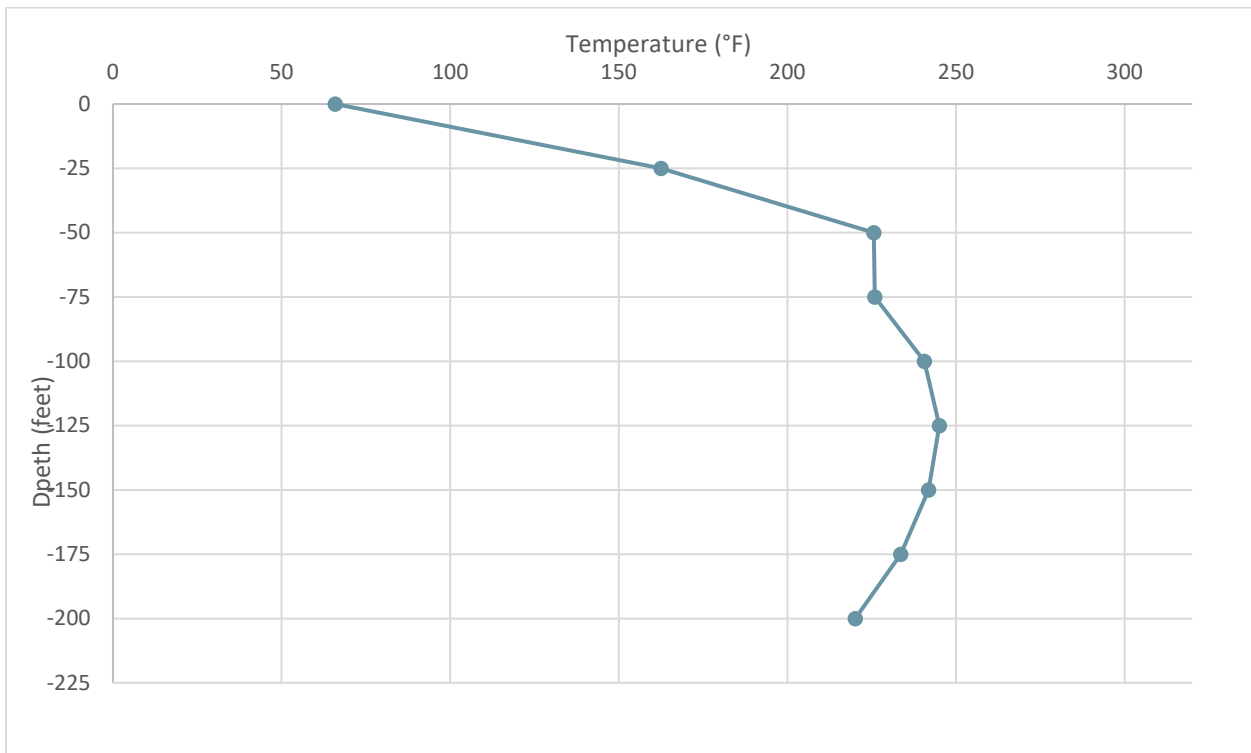


Figure B- 33. Average Temperatures Recorded by TP-7 on May 17, 2023

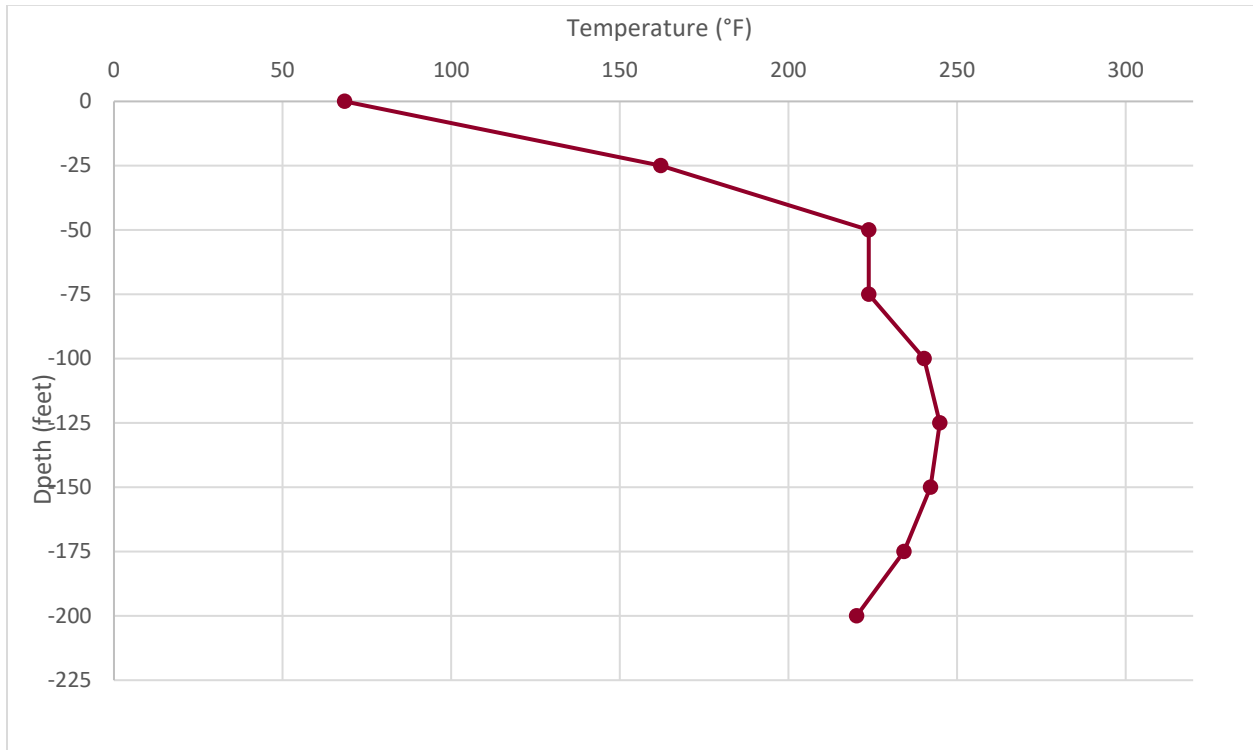


Figure B- 34. Average Temperatures Recorded by TP-7 on May 25, 2023

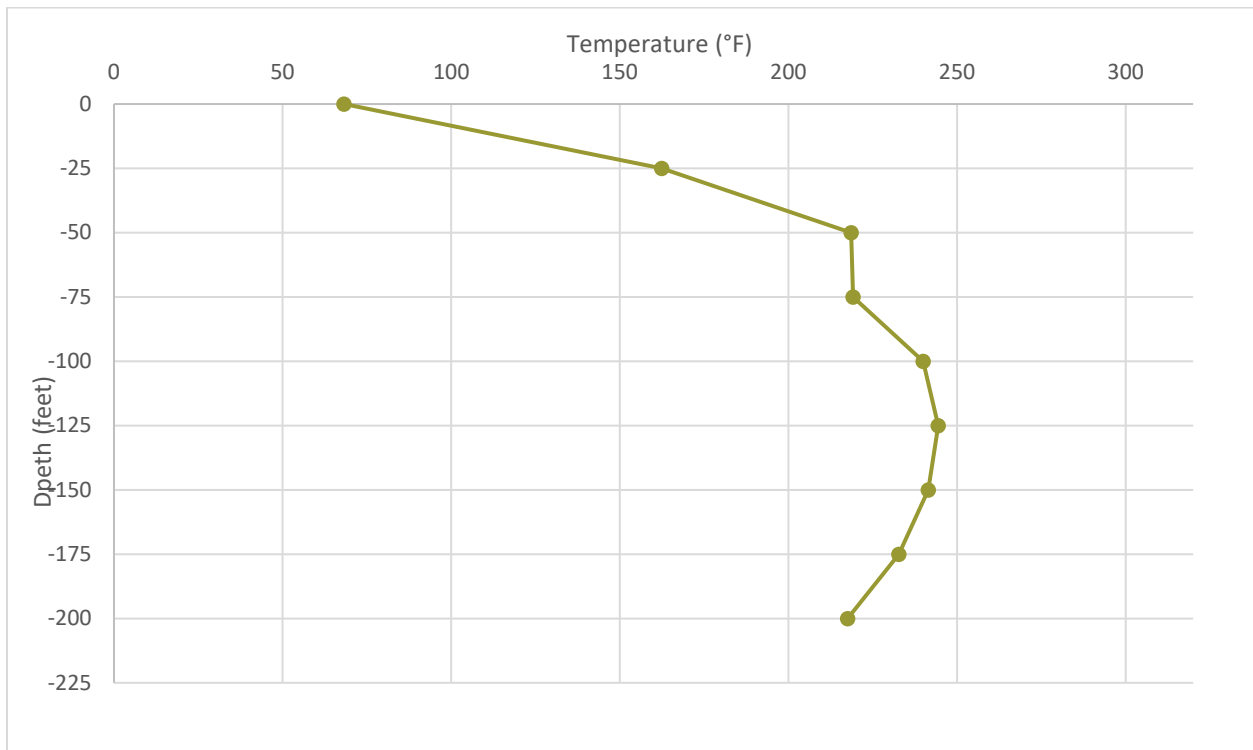


Figure B- 35. Average Temperatures Recorded by TP-7 on May 31, 2023

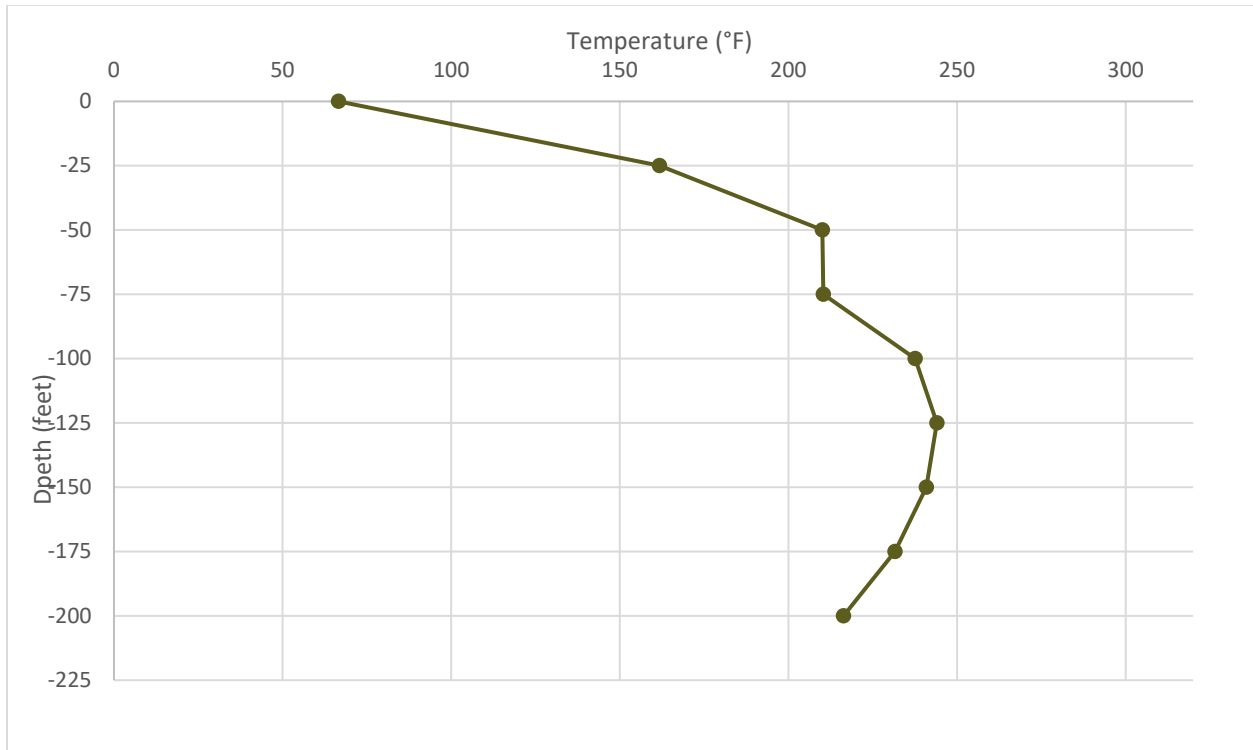


Figure B- 36. Average Temperatures Recorded by TP-8 on May 3, 2023

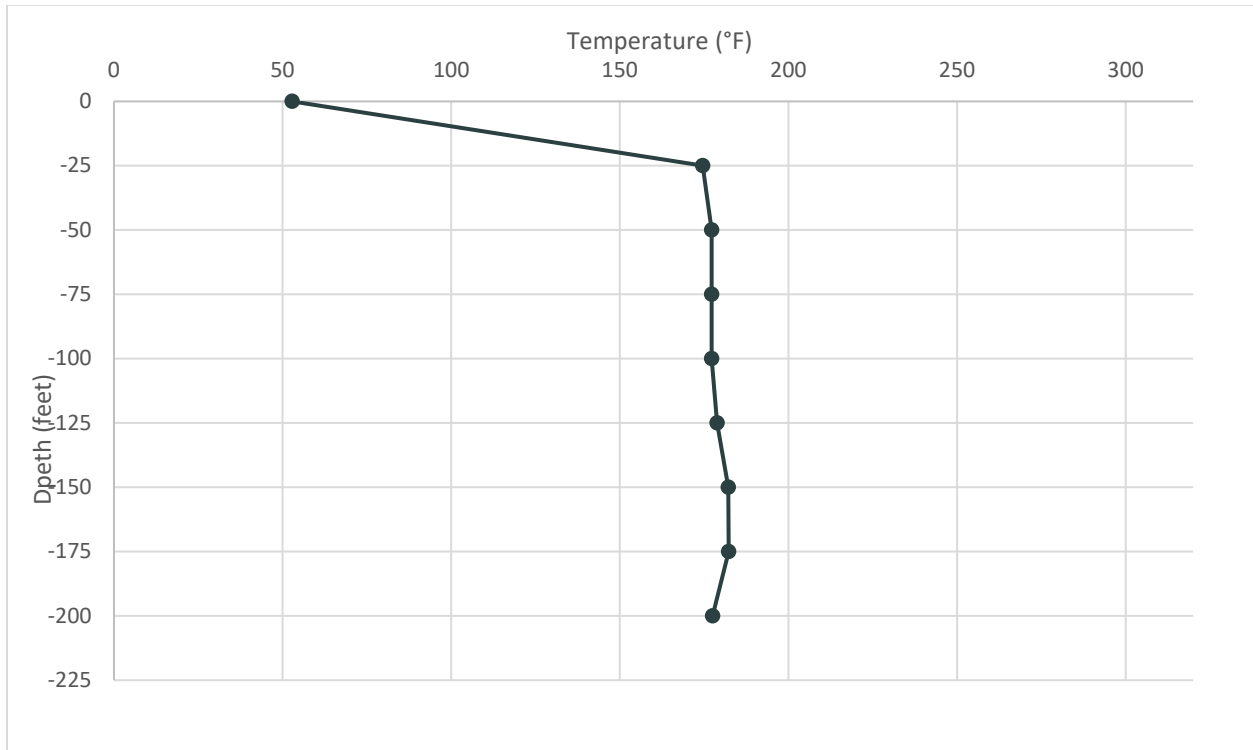


Figure B- 37. Average Temperatures Recorded by TP-8 on May 10, 2023

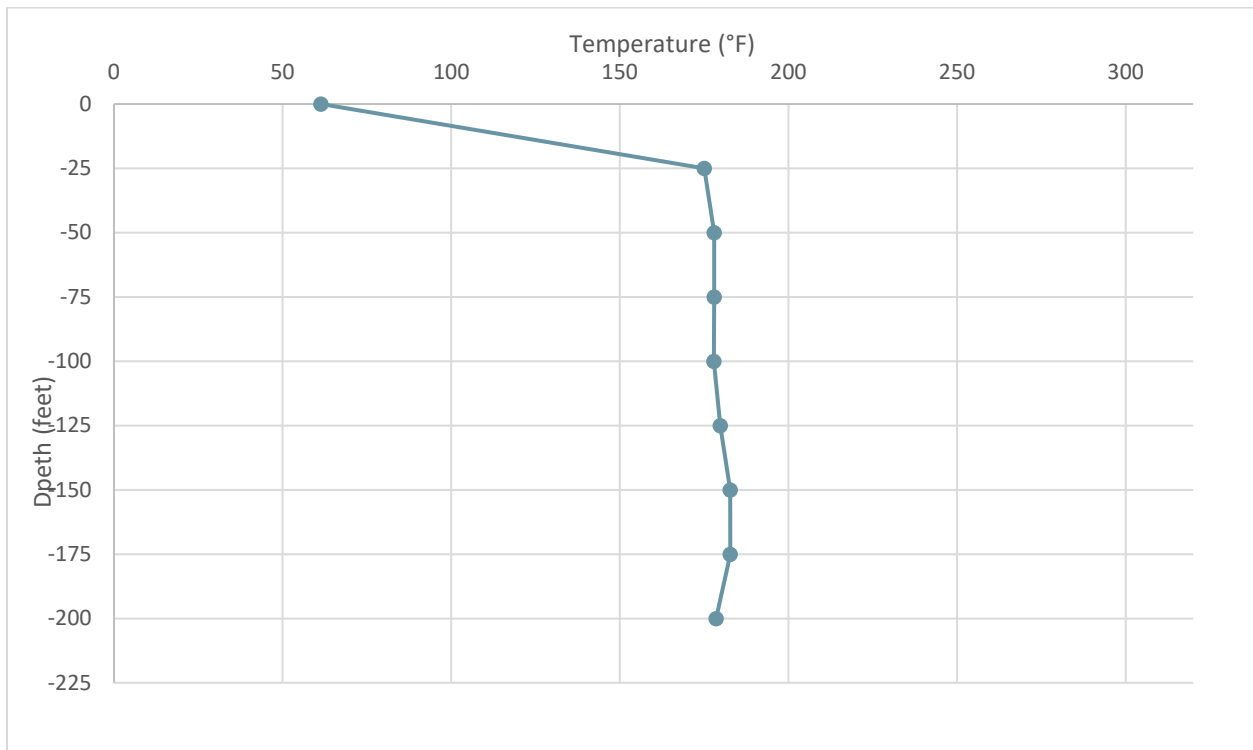


Figure B- 38. Average Temperatures Recorded by TP-8 on May 17, 2023

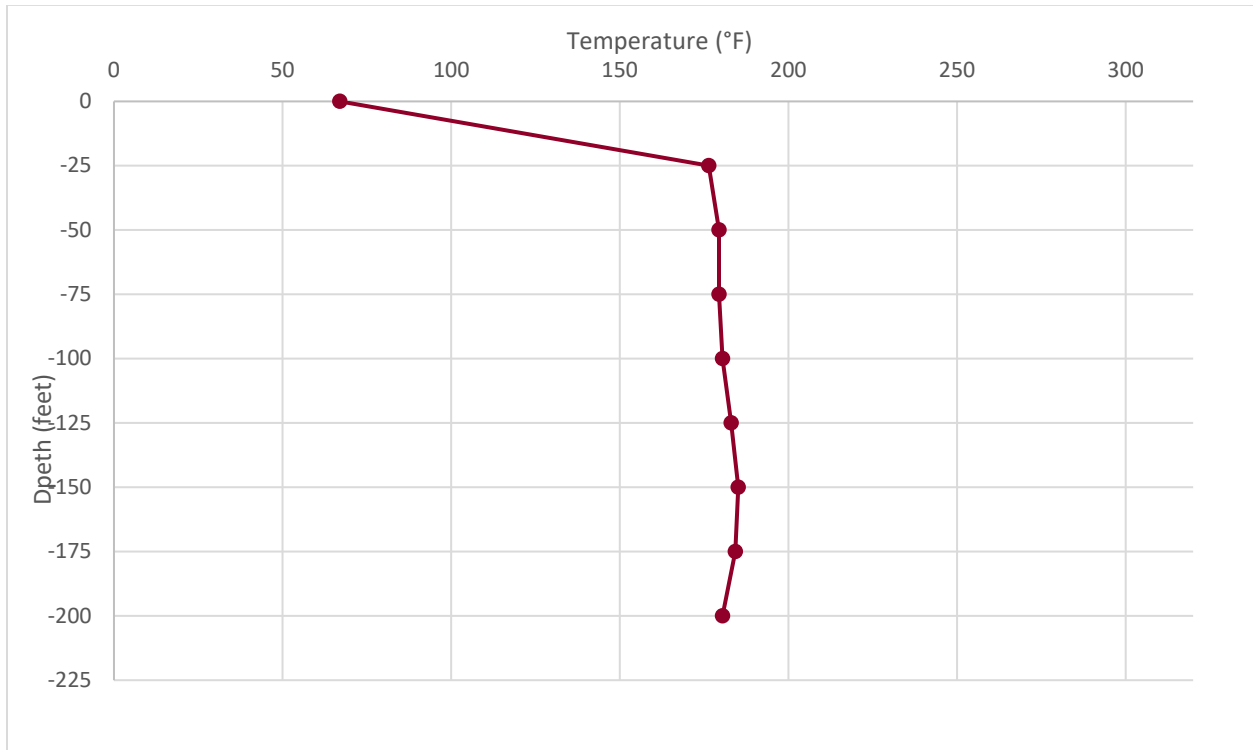


Figure B- 39. Average Temperatures Recorded by TP-8 on May 25, 2023

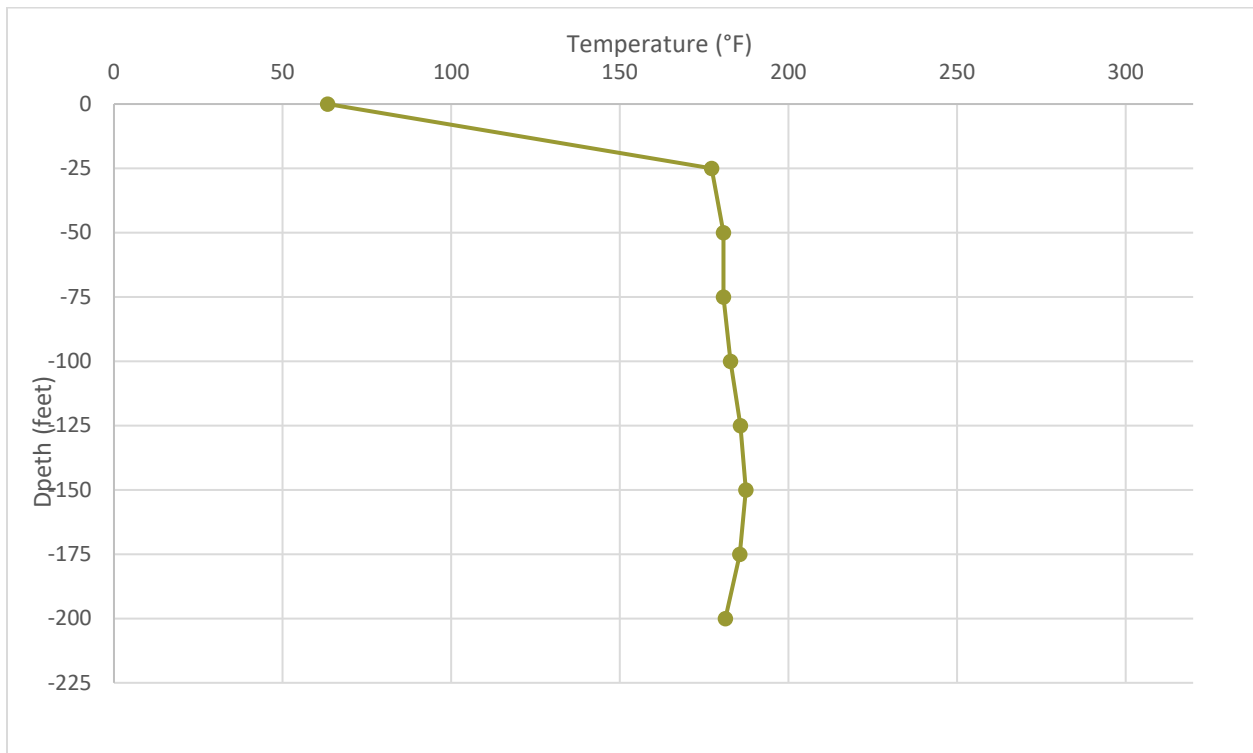


Figure B- 40. Average Temperatures Recorded by TP-8 on May 31, 2023

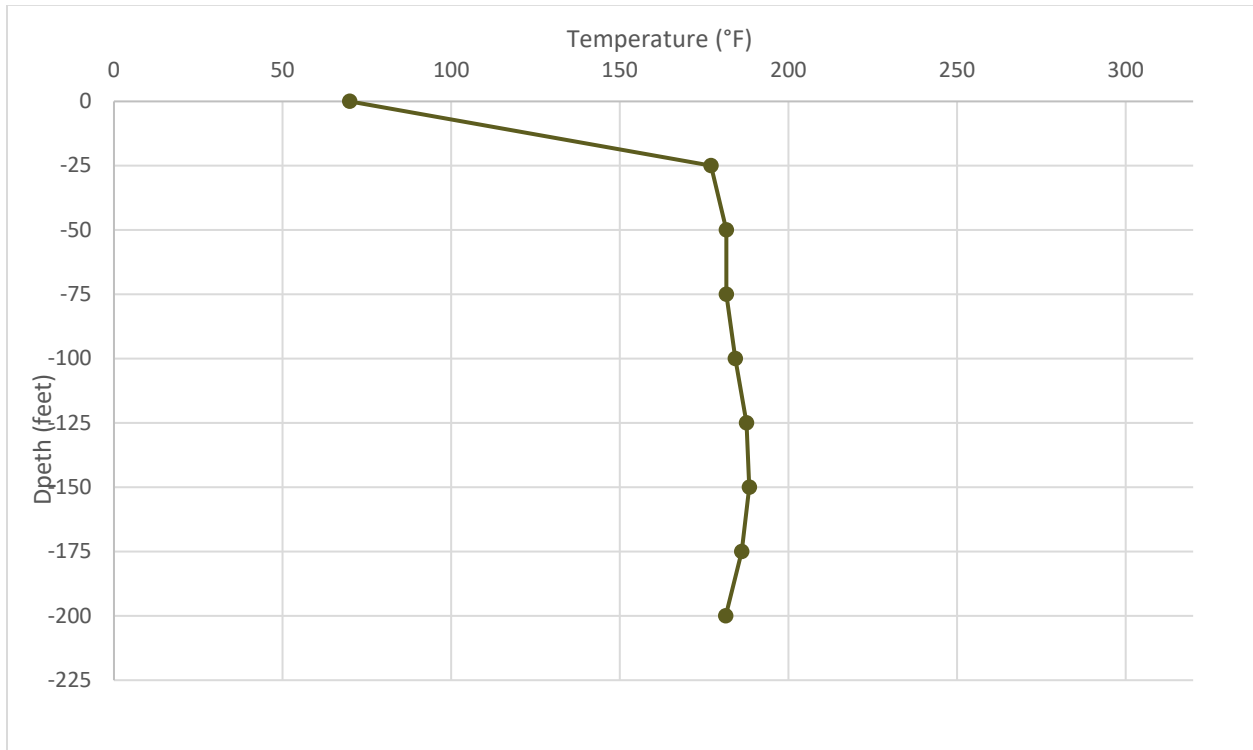


Figure B- 41. Average Temperatures Recorded by TP-9 on May 3, 2023

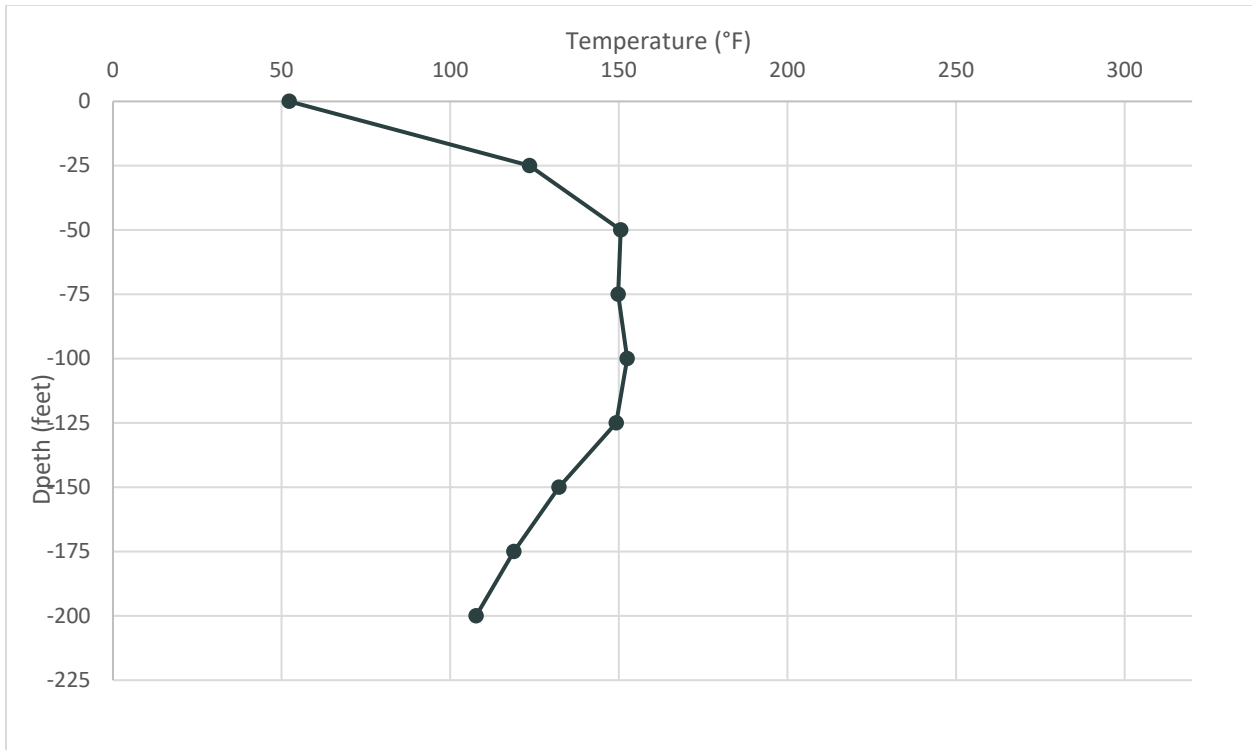


Figure B- 42. Average Temperatures Recorded by TP-9 on May 10, 2023

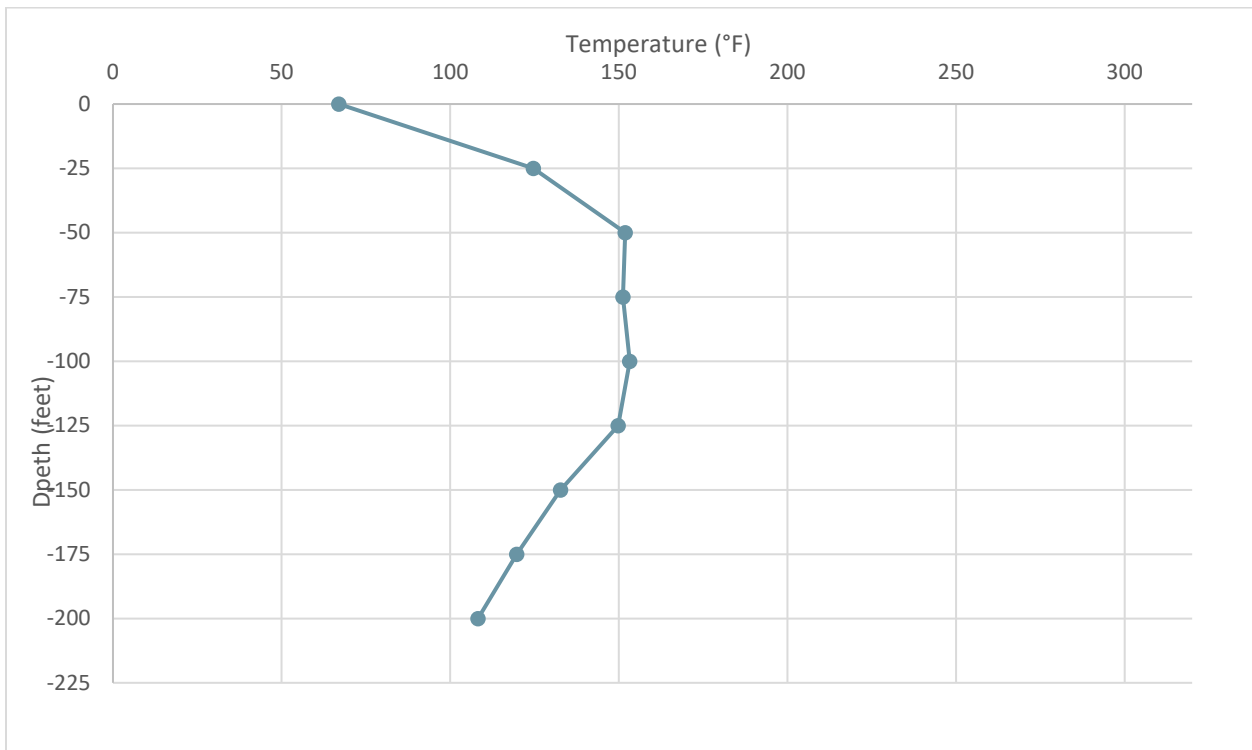


Figure B- 43. Average Temperatures Recorded by TP-9 on May 17, 2023

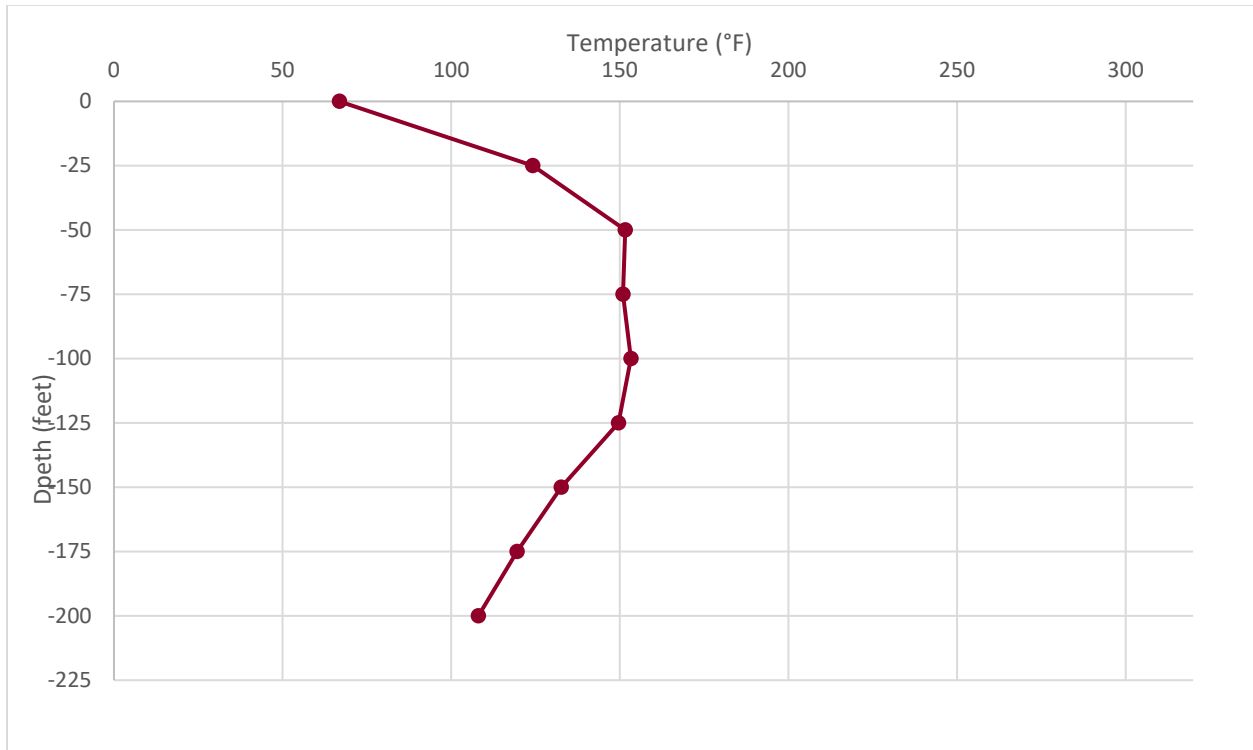


Figure B- 44. Average Temperatures Recorded by TP-9 on May 25, 2023

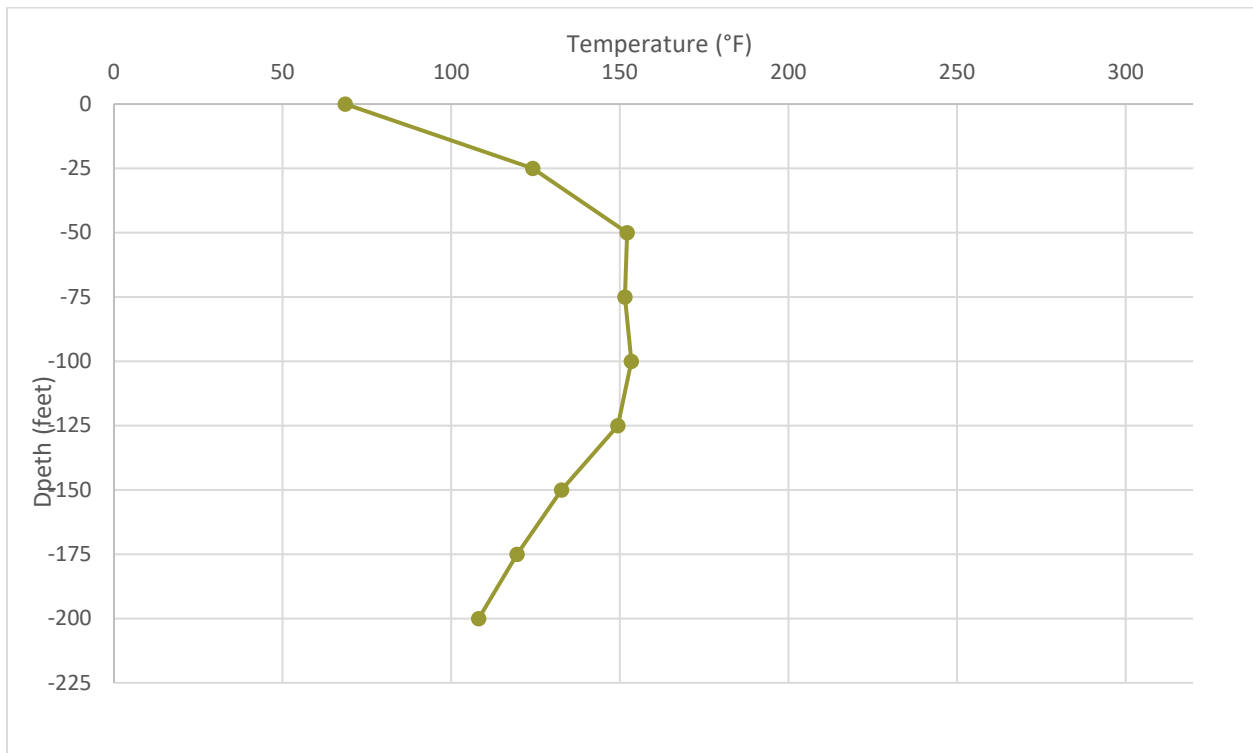
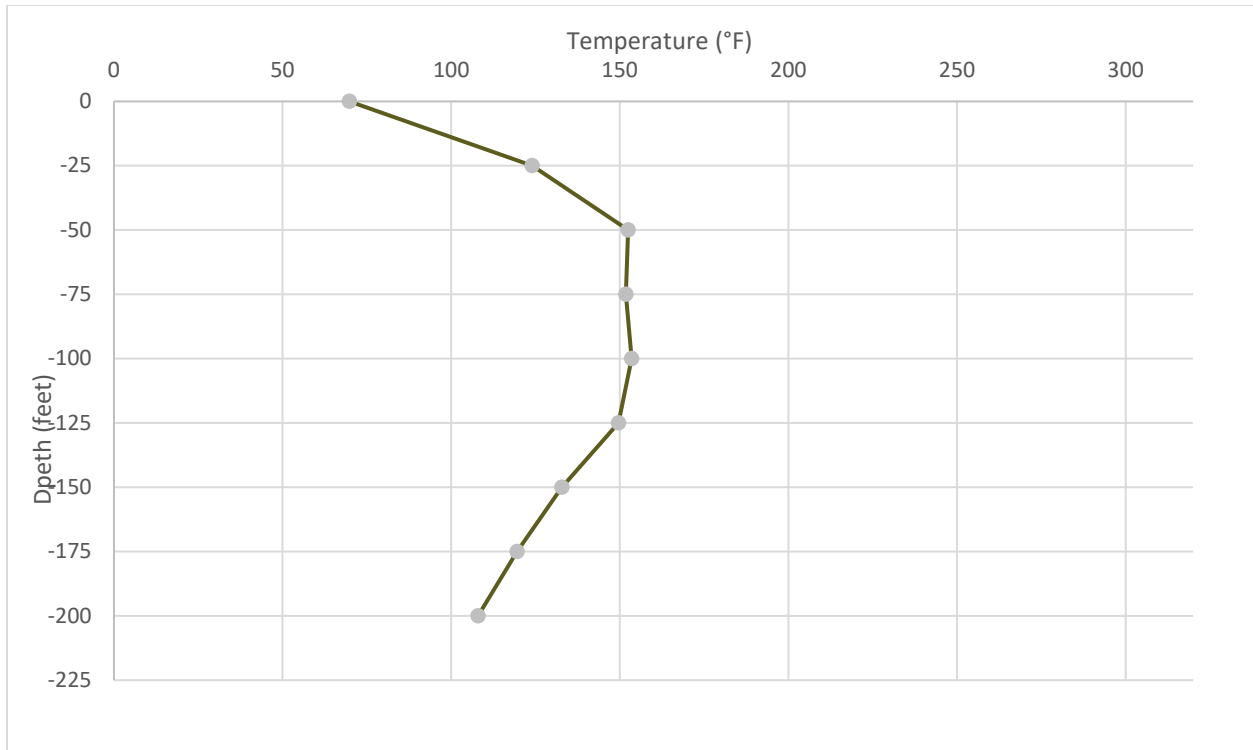



Figure B- 45. Average Temperatures Recorded by TP-9 on May 31, 2023





Appendix C

Semi-Monthly Temperature Update Memos

May 30, 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 – May 1st through May 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 5/1/23 through 5/15/23.

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.

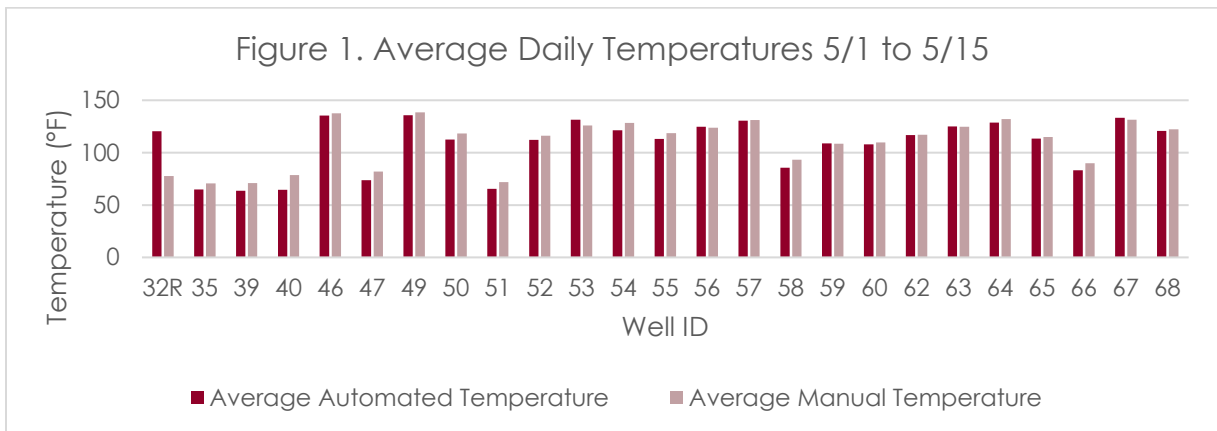
The 25 wellheads have 2-inch automated sensors. SCS believes that the 2-inch sensors measure temperature with more accuracy than the 1-inch sensors that were used in the majority of the 25 wells prior to March 1, 2023, but we are still comparing with manual temperature to assess the validity of this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

SCS reviewed the automated hourly temperature measurements from 5/1/23 to 5/15/23, and identified the following trends:

- **Temperatures over 145 °F:** Temperatures over the NESHAP AAAA compliance threshold of 145 °F were recorded at eight wells during this monitoring period. This represents a continuation of higher temperatures across the wellfield since mid-March 2023. Temperatures greater than 145 °F were again recorded most consistently at EW-46, however the highest temperatures were measured at EW-52 (greater than 170 °F at times), and EW-55 and EW-67 (greater than 180 °F at times). Field staff believe that the general increase in wellfield temperatures suggests that, with the increase in pneumatic pump operation, the collection system is being successfully dewatered. Due to the increased perforations available from these efforts, the warmer landfill gases are being collected, thus the elevated average temperature.



- **Low temperatures at certain wells:** Average temperatures between 50°F and 80°F at five wells 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.
- **Temperature Trends by Location:**



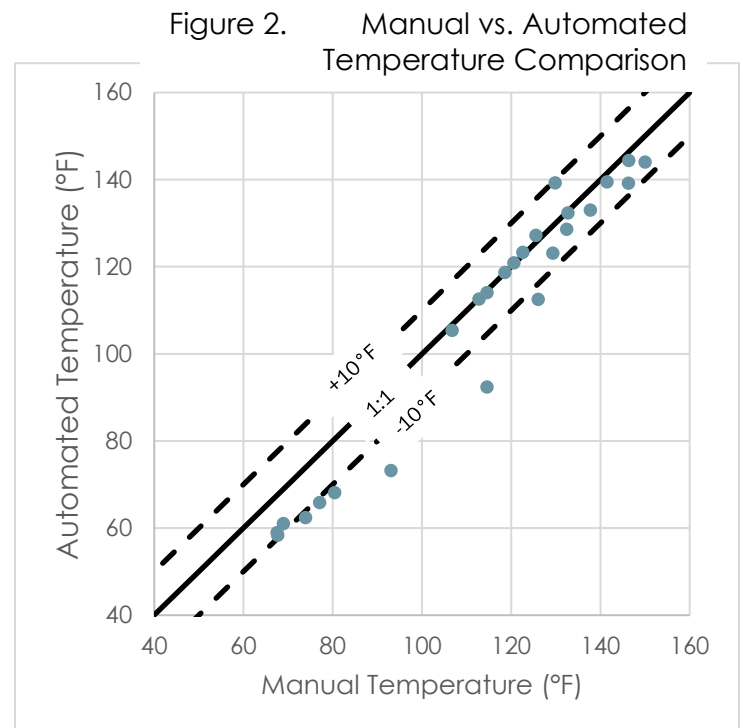
Manual Daily Temperature Monitoring

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 show continued correlation. The largest discrepancy between measurement methods was noticed at EW-32R. The automated temperature probe for this device has recorded what appears to be erroneous data on multiple monitoring periods and should be inspected for proper operation.

Comparing the difference between manual temperature measurements and automated temperature measurements in Figure 2, the new 2-inch sensors appear to have satisfactory

correlation with manual measurements, with a few outliers. This supports SCS' belief that the 2-inch automated sensors are measuring temperature accurately. SCS recommends that daily manual temperature monitoring be discontinued based on six weeks of reliable results from the automated sensors.



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 5/4/23, with follow-up monitoring on several days after. During this monitoring period, temperature exceedances were resolved at EW-49, EW-55, EW-61, EW-67, and EW-89. See Table 1 for the statuses of all exceedances recorded during this monitoring period.

Table 1. May Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 5/15/23
EW-31R	5/15/23	5/15/23 166.0°F	1 day	Ongoing, within 15-day timeline
EW-37	3/28/23	5/15/23 148.9°F	48 days	Ongoing, within 60-day timeline
EW-49	5/4/23	5/9/23 144.8°F	5 days	Resolved within 15-day timeline
EW-55	4/24/23	5/4/23 113.2°F	10 days	Resolved within 15-day timeline
EW-55	5/8/23	5/15/23 105.8°F	7 days	Resolved within 15-day timeline
EW-61	5/4/23	5/10/23 129.0°F	6 days	Resolved within 15-day timeline
EW-67	5/4/23	5/8/23 137.8°F	4 days	Resolved within 15-day timeline
EW-84	4/18/23	5/15/23 181.2°F	27 days	Ongoing, within 60-day timeline
EW-86	4/18/23	5/15/23 152.7°F	27 days	Ongoing, within 60-day timeline
EW-89	5/4/23	5/8/23 143.2°F	4 days	Resolved within 15-day timeline
EW-89	5/15/23	5/15/23 154.3°F	1 day	Ongoing, within 15-day timeline
EW-90	4/18/23	5/15/23 150.8°F	27 days	Ongoing, within 60-day timeline
EW-100	4/20/23	5/15/23 158.7°	25 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 5/5/23 and 5/10/23 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

(H₂) 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		5/5/2023	5/10/23
EW-37	CO (ppmv)	182	160
	H2 (Vol. %)	2.97	2.5
EW-49	CO (ppmv)	203	
	H2 (Vol. %)	3.52	
EW-61	CO (ppmv)	182	
	H2 (Vol. %)	4.69	
EW-67	CO (ppmv)	593	
	H2 (Vol. %)	12.7	
EW-84	CO (ppmv)	536	529
	H2 (Vol. %)	12.3	12.0
EW-86	CO (ppmv)	162	138
	H2 (Vol. %)	3.19	2.5
EW-89	CO (ppmv)	891	
	H2 (Vol. %)	33.9	
EW-90	CO (ppmv)	129	124
	H2 (Vol. %)	2.53	2.5
EW-100	CO (ppmv)	ND	ND
	H2 (Vol. %)	5.46	4.5

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. The measurement on 5/10/23 makes the fourth carbon monoxide measurement less than 100 ppmv, indicating that continued weekly CO sampling can be discontinued per 40 CFR 63.1961(a)(5)(viii). Continued sampling is required at the other 8 wells.

Construction Activities

The drilling contractor commenced drilling of the 304 stainless steel LFG wells on 5/2/23 with EW-92. The drilling contractor and SCS-FS drilled and installed eight 304 stainless steel deep LFG wells during this monitoring period (EW-92, EW-71, EW-72, EW-74, EW-33B, EW-77, EW-79, and EW-81). SCS-FS Phase I LFG System crew connected new LFG header across the existing eastern access road, as well as the airline and dewatering forcemain along the path of the new 12-inch LFG header. A new 18-inch condensate sump at the low point in the new 12-inch LFG System header was also installed. These connections required a temporary isolation of parts of the LFG collection system.

SCS-Field Services (SCS-FS) removed the poly tank (LCT-1), condensate sump CPS-1, and associated LFG header, air, and forcemain piping from the immediate sidewall odor mitigation system (SOMS)

working area along the eastern sidewall, then installed the final 300-foot section of lower horizontal collector. Additional soil cover was added to the lower liner in select sections in the northwest, southwest, and southern sections of the SOMS.

Weekly SEM

SCS is continuing weekly surface emissions monitoring (SEM) per the Plan of Action Report dated 7/6/22. Two exceedances of the 500-ppmv threshold were recorded during the weekly SEM event held on 5/5/23, and two exceedances were recorded during the weekly event conducted on 5/10/23. 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 reoccurrence of exceedances at pipe penetrations in May. As SCS' dewatering efforts continue to advance, landfill gas collection will increase, and pipe penetration exceedances will 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 the May initial monthly LFG wellfield monitoring on 5/1/23 and 5/4/23, including the 18 new CPVC wells during this reporting period. The O&M contractor replaced pumps in wells EW-60, EW-61, and EW-63. A check valve was replaced at EW-68 and sample ports were replaced at various other wells. Dewatering system regulators were replaced in EW-53 and EW-67.

Routine well and pump maintenance continued during this reporting period. Eight spare Pump One pumps were procured to assist O&M with dewatering system maintenance.

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	May	May	May	May	May	May	May	May	May	May	May	May	May	May	May
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Well Number															
35	54	46	57	68	79	48	67	69	63	79	90	91	84	89	74
39	52	49	57	64	78	46	70	66	63	80	88	98	88	89	74
40	52	52	59	68	83	46	71	67	62	86	94	90	137	86	124
46	117	52	146	145	145	144	147	145	145	145	146	146	147	147	148
47	63	52	61	77	95	59	87	78	82	94	101	103	96	97	82
29	78	75	70	76	77	92	104	102	103	106	105	110	106	112	106
30R	93	92	90	92	90	127	127	126	126	127	125	127	127	128	128
31R	116	116	117	120	118	135	137	135	132	132	130	131	131	165	170
32	74	75	77	78	76	70	70	70	71	77	90	96	82	87	73
33	123	122	123	124	120	132	122	128	127	126	128	130	77	123	123
34	127	128	126	128	118	141	140	141	140	140	145	146	145	151	138
36	62	66	Being Redrilled												
37	150	150	149	150	149	149	149	150	149	149	150	150	147	147	150
38	66	62	64	66	68	90	89	91	91	92	90	92	100	105	101
41	118	111	112	110	112	85	86	88	86	86	88	89	85	95	73
42	108	110	110	112	116	110	112	113	112	110	112	114	117	117	116
48	62	67	68	70	72	45	68	69	68	65	70	77	82	91	76
32R	119	119	113	120	121	121	121	120	121	121	121	121	120	121	122
49	144	54	145	146	148	146	145	143	143	143	144	144	143	144	143
50	115	96	119	118	116	115	160	119	120	116	117	117	114	116	116
51	55	55	57	66	78	47	68	66	69	81	89	91	88	92	75
52	109	92	74	105	116	96	110	122	110	120	126	128	126	137	171
53	122	121	119	130	137	125	135	133	135	138	141	143	96	132	82
54	107	98	98	123	136	122	142	127	131	132	135	137	143	134	163
55	59	50	144	112	101	73	86	147	155	165	131	169	99	115	175
56	110	106	112	121	127	123	129	128	129	129	130	132	132	131	120
57	118	118	121	154	142	128	129	134	124	132	136	141	129	147	116
58	52	47	83	94	98	78	112	94	93	98	101	104	113	114	119
59	106	50	114	118	118	121	110	112	110	111	111	117	110	111	110
60	104	46	99	106	108	105	108	106	108	108	122	133	146	113	134
61	145	52	144	136	138	139	138	140	132	122	123	126	121	121	136
62	113	112	112	114	115	113	114	114	115	128	127	128	117	118	118
63	122	121	118	124	127	124	127	126	127	128	107	130	129	132	129
64	126	126	124	129	131	137	137	129	129	132	132	132	138	139	139
65	53	52	57	67	140	135	136	134	134	134	135	135	137	138	136
66	55	48	61	74	94	61	88	81	90	109	118	119	115	122	113
67	99	96	85	177	154	134	140	135	132	133	139	148	146	138	115
68	123	111	111	123	125	123	124	124	124	125	125	128	123	123	122

Attachment B
Laboratory Analytical Reports



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0499

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	May 8, 2023 11:20
	4330 Lewis Road, Suite 1	Date Issued:	May 15, 2023 16:34
	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 05/08/2023 11:20. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

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.

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 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	23E0499-01	Air	05/05/2023 09:51	05/08/2023 11:20
86	23E0499-02	Air	05/05/2023 10:01	05/08/2023 11:20
90	23E0499-03	Air	05/05/2023 10:12	05/08/2023 11:20
100	23E0499-04	Air	05/05/2023 10:20	05/08/2023 11:20
89	23E0499-05	Air	05/05/2023 10:32	05/08/2023 11:20
61	23E0499-06	Air	05/05/2023 10:42	05/08/2023 11:20
49	23E0499-07	Air	05/05/2023 10:51	05/08/2023 11:20
67	23E0499-08	Air	05/05/2023 11:02	05/08/2023 11:20
37	23E0499-09	Air	05/05/2023 11:11	05/08/2023 11:20



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Harrisburg, PA 17111

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: 23E0499-01
Sample Matrix: Air
Sampled: 5/5/2023 09:51
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00187::10092
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 5.4
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			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Carbon Monoxide, as received	536	90.0	90.0		9	1	5/12/23	9:32	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Methane, as received	17.7	0.45	0.45		9	1	5/12/23	9:32	MER
Carbon dioxide, as received	55.4	0.45	0.45		9	1	5/12/23	9:32	MER
Oxygen (O2), as received	0.50	0.45	0.45		9	1	5/12/23	9:32	MER
Hydrogen (H2), as received	12.3	1.08	1.08		54	1	5/12/23	11:50	MER
Nitrogen (N2), as received	10.2	9.00	9.00		9	1	5/12/23	9:32	MER
Carbon Monoxide, as received	0.05	0.009	0.009		9	1	5/12/23	9:32	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time		
	Results	MDL	LOQ		Results	MDL	LOQ			Analized		Analyst
Benzene	462000	9330	23300		1500000	30000	75000	46700	1	5/12/23	14:17	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	101				80-120					5/12/23	14:17	



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Harrisburg, PA 17111

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: 23E0499-02
Sample Matrix: Air
Sampled: 5/5/2023 10:01
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00178::10224
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	162	90.0	90.0		9	1	5/12/23 10:23	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	39.4	0.45	0.45		9	1	5/12/23 10:23	MER
Carbon dioxide, as received	47.0	0.45	0.45		9	1	5/12/23 10:23	MER
Oxygen (O2), as received	0.55	0.45	0.45		9	1	5/12/23 10:23	MER
Hydrogen (H2), as received	3.19	0.18	0.18		9	1	5/12/23 10:23	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23 10:23	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/12/23 10:23	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	116000	4670	11700		370000	15000	37000	23300	1	5/12/23 17:23	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	99.8				80-120					5/12/23 17:23	



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Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 90
Sample ID: 23E0499-03
Sample Matrix: Air
Sampled: 5/5/2023 10:12
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00247::11083
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	129	90.0	90.0		9	1	5/12/23 11:14	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	36.5	0.45	0.45		9	1	5/12/23 11:14	MER
Carbon dioxide, as received	50.9	0.45	0.45		9	1	5/12/23 11:14	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/12/23 11:14	MER
Hydrogen (H2), as received	2.53	0.18	0.18		9	1	5/12/23 11:14	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23 11:14	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/12/23 11:14	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	249000	5250	13100		800000	17000	42000	26200	1	5/12/23 18:53	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	95.8				80-120					5/12/23 18:53	



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 100
Sample ID: 23E0499-04
Sample Matrix: Air
Sampled: 5/5/2023 10:20
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00091::12063
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	ND	90.0	90.0		9	1	5/12/23 12:21	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	41.6	0.45	0.45		9	1	5/12/23 12:21	MER
Carbon dioxide, as received	45.9	0.45	0.45		9	1	5/12/23 12:21	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/12/23 12:21	MER
Hydrogen (H2), as received	5.46	0.36	0.36		18	1	5/12/23 13:48	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23 12:21	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	5/12/23 12:21	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	41100	778	1940		130000	2500	6200	3890	1	5/15/23 11:12	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	99.6				80-120					5/15/23 11:12	



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 89
Sample ID: 23E0499-05
Sample Matrix: Air
Sampled: 5/5/2023 10:32
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00037::12409
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			Flag/Qual	Dilution	PF	Date/Time Analyzed		Analyst
	Result	MDL	LOQ						
Carbon Monoxide, as received	891	90.0	90.0		9	1	5/12/23	13:12	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed		Analyst
	Result	MDL	LOQ						
Methane, as received	1.32	0.45	0.45		9	1	5/12/23	13:12	MER
Carbon dioxide, as received	67.6	0.90	0.90		18	1	5/12/23	14:59	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/12/23	13:12	MER
Hydrogen (H2), as received	33.9	3.24	3.24		162	1	5/12/23	15:22	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23	13:12	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	5/12/23	13:12	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed		Analyst
	Results	MDL	LOQ		Results	MDL	LOQ					
Benzene	542000	7000	17500		1700000	22000	56000	35000	1	5/15/23	11:57	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	96.2				80-120					5/15/23	11:57	



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Final Report

Laboratory Order ID 23E0499

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 8, 2023 11:20
Date Issued: May 15, 2023 16:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 61
Sample ID: 23E0499-06
Sample Matrix: Air
Sampled: 5/5/2023 10:42
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00319::12471
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	182	90.0	90.0		9	1	5/12/23 14:23	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	15.0	0.45	0.45		9	1	5/12/23 14:23	MER
Carbon dioxide, as received	30.4	0.45	0.45		9	1	5/12/23 14:23	MER
Oxygen (O2), as received	5.93	0.45	0.45		9	1	5/12/23 14:23	MER
Hydrogen (H2), as received	4.69	0.36	0.36		18	1	5/12/23 15:37	MER
Nitrogen (N2), as received	38.3	9.00	9.00		9	1	5/12/23 14:23	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/12/23 14:23	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	131000	3110	7780		420000	9900	25000	15600	1	5/15/23 12:42	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	93.8				80-120					5/15/23 12:42	



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Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 49
Sample ID: 23E0499-07
Sample Matrix: Air
Sampled: 5/5/2023 10:51
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00154::12659
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			Flag/Qual	Dilution	PF	Date/Time Analyzed		Analyst
	Result	MDL	LOQ						
Carbon Monoxide, as received	203	90.0	90.0		9	1	5/12/23	16:08	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed		Analyst
	Result	MDL	LOQ						
Methane, as received	37.8	0.45	0.45		9	1	5/12/23	16:08	MER
Carbon dioxide, as received	46.3	0.45	0.45		9	1	5/12/23	16:08	MER
Oxygen (O2), as received	1.04	0.45	0.45		9	1	5/12/23	16:08	MER
Hydrogen (H2), as received	3.52	0.18	0.18		9	1	5/12/23	16:08	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23	16:08	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/12/23	16:08	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed		Analyst
	Results	MDL	LOQ		Results	MDL	LOQ					
Benzene	150000	2330	5830		480000	7500	19000	11700	1	5/15/23	13:27	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	95.0				80-120					5/15/23	13:27	



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Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 67
Sample ID: 23E0499-08
Sample Matrix: Air
Sampled: 5/5/2023 11:02
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00282::13378
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 4.0
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	593	90.0	90.0		9	1	5/12/23 17:50	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	17.8	0.45	0.45		9	1	5/12/23 17:50	MER
Carbon dioxide, as received	57.9	0.45	0.45		9	1	5/12/23 17:50	MER
Oxygen (O2), as received	2.08	0.45	0.45		9	1	5/12/23 17:50	MER
Hydrogen (H2), as received	12.7	1.08	1.08		54	1	5/12/23 18:42	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/12/23 17:50	MER
Carbon Monoxide, as received	0.06	0.009	0.009		9	1	5/12/23 17:50	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	202000	10500	26200		650000	34000	84000	52500	1	5/15/23 14:12	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	93.4				80-120					5/15/23 14:12	



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Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 37
Sample ID: 23E0499-09
Sample Matrix: Air
Sampled: 5/5/2023 11:11
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00379::13963
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	182	90.0	90.0		9	1	5/12/23 16:59	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.5	0.45	0.45		9	1	5/12/23 16:59	MER
Carbon dioxide, as received	26.6	0.45	0.45		9	1	5/12/23 16:59	MER
Oxygen (O2), as received	6.76	0.45	0.45		9	1	5/12/23 16:59	MER
Hydrogen (H2), as received	2.97	0.18	0.18		9	1	5/12/23 16:59	MER
Nitrogen (N2), as received	45.3	18.0	18.0		18	1	5/12/23 18:26	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/12/23 16:59	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	122000	1560	3890		390000	5000	12000	7780	1	5/15/23 14:57	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	95.2				80-120					5/15/23 14:57	



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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	
23E0499-01	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-02	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-03	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-04	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-05	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-06	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-07	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-08	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-09	1.00 mL / 1.00 mL	ALT-145	BGE0409	SGE0510	AG00026
23E0499-01	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-02	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-03	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-04	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-04RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-05	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-05RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-05RE2	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-06	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-06RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-07	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-08	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-08RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-09	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	AG00026
23E0499-09RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0409	SGE0510	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	
23E0499-01	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0504	AE30194
23E0499-02	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0504	AE30194
23E0499-03	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0504	AE30194
23E0499-04	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194
23E0499-05	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194
23E0499-06	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194
23E0499-07	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194



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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			Preparation Method:	No Prep VOC Air	
23E0499-08	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194
23E0499-09	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0558	AE30194



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0427 - No Prep VOC Air

Blank (BGE0427-BLK1)

Prepared & Analyzed: 05/10/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.76 ppbv 5.00 95.2 80-120

LCS (BGE0427-BS1)

Prepared & Analyzed: 05/10/2023

1,1,1-Trichloroethane	5.15	0.5	ppbv	5.00	103	70-130		
1,1,1,2-Tetrachloroethane	5.26	0.5	ppbv	5.00	105	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	4.78	0.5	ppbv	5.00	95.6	70-130		
1,1,2-Trichloroethane	5.22	0.5	ppbv	5.00	104	70-130		
1,1-Dichloroethane	4.55	0.5	ppbv	5.00	91.0	70-130		
1,1-Dichloroethylene	4.91	0.5	ppbv	5.00	98.2	70-130		
1,2,4-Trimethylbenzene	5.48	0.5	ppbv	5.00	110	70-130		
1,2-Dibromoethane (EDB)	5.21	0.5	ppbv	5.00	104	70-130		
1,2-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130		
1,2-Dichloroethane	5.18	0.5	ppbv	5.00	104	70-130		
1,2-Dichloropropane	5.30	0.5	ppbv	5.00	106	70-130		
1,2-Dichlorotetrafluoroethane	5.01	0.5	ppbv	5.00	100	70-130		
1,3,5-Trimethylbenzene	5.27	0.5	ppbv	5.00	105	70-130		
1,3-Butadiene	4.77	0.5	ppbv	5.00	95.4	70-130		
1,3-Dichlorobenzene	5.20	0.5	ppbv	5.00	104	70-130		
1,4-Dichlorobenzene	5.25	0.5	ppbv	5.00	105	70-130		
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130		
2-Butanone (MEK)	4.64	0.5	ppbv	5.00	92.8	70-130		
4-Methyl-2-pentanone (MIBK)	5.61	0.5	ppbv	5.00	112	70-130		
Allyl chloride	4.72	0.5	ppbv	5.00	94.4	70-130		
Benzene	5.17	0.5	ppbv	5.00	103	70-130		
Benzyl Chloride	4.25	0.5	ppbv	5.00	85.0	70-130		
Bromodichloromethane	4.67	0.5	ppbv	5.00	93.4	70-130		
Bromoform	0.51	0.5	ppbv	5.00	10.2	70-130		L
Bromomethane	5.45	0.5	ppbv	5.00	109	70-130		
Carbon Disulfide	4.67	0.5	ppbv	5.00	93.4	70-130		



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

Batch BGE0427 - No Prep VOC Air

LCS (BGE0427-BS1)

Prepared & Analyzed: 05/10/2023

Carbon Tetrachloride	5.04	0.5	ppbv	5.00	101	70-130			
Chlorobenzene	5.06	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.92	0.5	ppbv	5.00	98.4	70-130			
Chloroform	4.72	0.5	ppbv	5.00	94.4	70-130			
Chloromethane	5.19	0.5	ppbv	5.00	104	70-130			
cis-1,2-Dichloroethylene	4.77	0.5	ppbv	5.00	95.4	70-130			
cis-1,3-Dichloropropene	5.44	0.5	ppbv	5.00	109	70-130			
Cyclohexane	5.34	0.5	ppbv	5.00	107	70-130			
Dichlorodifluoromethane	4.73	0.5	ppbv	5.00	94.6	70-130			
Ethyl acetate	4.81	0.5	ppbv	5.00	96.2	70-130			
Ethylbenzene	5.32	0.5	ppbv	5.00	106	70-130			
Heptane	5.50	0.5	ppbv	5.00	110	70-130			
Hexane	5.06	0.5	ppbv	5.00	101	70-130			
m+p-Xylenes	10.4	1	ppbv	10.0	104	70-130			
Methylene chloride	4.96	1	ppbv	5.00	99.2	70-130			
Methyl-t-butyl ether (MTBE)	4.87	0.5	ppbv	5.00	97.4	70-130			
Naphthalene	4.31	0.5	ppbv	5.00	86.2	60-140			
o-Xylene	5.23	0.5	ppbv	5.00	105	70-130			
Propylene	4.95	1	ppbv	5.00	99.0	70-130			
Styrene	5.33	0.5	ppbv	5.00	107	70-130			
Tetrachloroethylene (PCE)	4.95	0.5	ppbv	5.00	99.0	70-130			
Tetrahydrofuran	5.60	0.5	ppbv	5.00	112	70-130			
Toluene	5.36	0.5	ppbv	5.00	107	70-130			
trans-1,2-Dichloroethylene	4.07	0.5	ppbv	5.00	81.4	70-130			
trans-1,3-Dichloropropene	4.88	0.5	ppbv	5.00	97.6	70-130			
Trichloroethylene	5.20	0.5	ppbv	5.00	104	70-130			
Trichlorofluoromethane	5.17	0.5	ppbv	5.00	103	70-130			
Vinyl acetate	4.85	0.5	ppbv	5.00	97.0	70-130			
Vinyl bromide	4.93	0.5	ppbv	5.00	98.6	70-130			
Vinyl chloride	5.04	0.5	ppbv	5.00	101	70-130			
Surr: 4-Bromofluorobenzene (Surr)	4.98		ppbv	5.00	99.6	70-130			



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	RPD	Limit	

Batch BGE0427 - No Prep VOC Air

LCS Dup (BGE0427-BSD1)

Prepared & Analyzed: 05/10/2023

1,1,1-Trichloroethane	5.12	0.5	ppbv	5.00	102	70-130	0.584	25	
1,1,1,2-Tetrachloroethane	5.28	0.5	ppbv	5.00	106	70-130	0.380	25	
1,1,1,2-Trichloro-1,2,2-trifluoroethane	4.86	0.5	ppbv	5.00	97.2	70-130	1.66	25	
1,1,2-Trichloroethane	5.23	0.5	ppbv	5.00	105	70-130	0.191	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	1.53	25	
1,1-Dichloroethylene	5.26	0.5	ppbv	5.00	105	70-130	6.88	25	
1,2,4-Trimethylbenzene	5.49	0.5	ppbv	5.00	110	70-130	0.182	25	
1,2-Dibromoethane (EDB)	5.21	0.5	ppbv	5.00	104	70-130	0.00	25	
1,2-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.00	25	
1,2-Dichloroethane	5.17	0.5	ppbv	5.00	103	70-130	0.193	25	
1,2-Dichloropropane	5.26	0.5	ppbv	5.00	105	70-130	0.758	25	
1,2-Dichlorotetrafluoroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.601	25	
1,3,5-Trimethylbenzene	5.28	0.5	ppbv	5.00	106	70-130	0.190	25	
1,3-Butadiene	4.86	0.5	ppbv	5.00	97.2	70-130	1.87	25	
1,3-Dichlorobenzene	5.21	0.5	ppbv	5.00	104	70-130	0.192	25	
1,4-Dichlorobenzene	5.20	0.5	ppbv	5.00	104	70-130	0.957	25	
1,4-Dioxane	5.52	0.5	ppbv	5.00	110	70-130	0.902	25	
2-Butanone (MEK)	4.72	0.5	ppbv	5.00	94.4	70-130	1.71	25	
4-Methyl-2-pentanone (MIBK)	5.64	0.5	ppbv	5.00	113	70-130	0.533	25	
Allyl chloride	4.86	0.5	ppbv	5.00	97.2	70-130	2.92	25	
Benzene	5.18	0.5	ppbv	5.00	104	70-130	0.193	25	
Benzyl Chloride	4.28	0.5	ppbv	5.00	85.6	70-130	0.703	25	
Bromodichloromethane	4.67	0.5	ppbv	5.00	93.4	70-130	0.00	25	
Bromoform	0.51	0.5	ppbv	5.00	10.2	70-130	0.00	25	L
Bromomethane	5.41	0.5	ppbv	5.00	108	70-130	0.737	25	
Carbon Disulfide	4.78	0.5	ppbv	5.00	95.6	70-130	2.33	25	
Carbon Tetrachloride	4.98	0.5	ppbv	5.00	99.6	70-130	1.20	25	
Chlorobenzene	5.06	0.5	ppbv	5.00	101	70-130	0.00	25	
Chloroethane	4.88	0.5	ppbv	5.00	97.6	70-130	0.816	25	
Chloroform	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
Chloromethane	5.20	0.5	ppbv	5.00	104	70-130	0.192	25	
cis-1,2-Dichloroethylene	4.79	0.5	ppbv	5.00	95.8	70-130	0.418	25	
cis-1,3-Dichloropropene	5.45	0.5	ppbv	5.00	109	70-130	0.184	25	



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Certificate of Analysis

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4330 Lewis Road, Suite 1

Date Received: May 8, 2023 11:20
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Harrisburg, PA 17111

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	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

Batch BGE0427 - No Prep VOC Air

LCS Dup (BGE0427-BSD1)

Prepared & Analyzed: 05/10/2023

Cyclohexane	5.24	0.5	ppbv	5.00	105	70-130	1.89	25	
Dichlorodifluoromethane	4.81	0.5	ppbv	5.00	96.2	70-130	1.68	25	
Ethyl acetate	4.63	0.5	ppbv	5.00	92.6	70-130	3.81	25	
Ethylbenzene	5.32	0.5	ppbv	5.00	106	70-130	0.00	25	
Heptane	5.43	0.5	ppbv	5.00	109	70-130	1.28	25	
Hexane	5.13	0.5	ppbv	5.00	103	70-130	1.37	25	
m+p-Xylenes	10.4	1	ppbv	10.0	104	70-130	0.384	25	
Methylene chloride	5.28	1	ppbv	5.00	106	70-130	6.25	25	
Methyl-t-butyl ether (MTBE)	4.90	0.5	ppbv	5.00	98.0	70-130	0.614	25	
Naphthalene	4.30	0.5	ppbv	5.00	86.0	60-140	0.232	25	
o-Xylene	5.25	0.5	ppbv	5.00	105	70-130	0.382	25	
Propylene	5.03	1	ppbv	5.00	101	70-130	1.60	25	
Styrene	5.35	0.5	ppbv	5.00	107	70-130	0.375	25	
Tetrachloroethylene (PCE)	4.91	0.5	ppbv	5.00	98.2	70-130	0.811	25	
Tetrahydrofuran	5.57	0.5	ppbv	5.00	111	70-130	0.537	25	
Toluene	5.36	0.5	ppbv	5.00	107	70-130	0.00	25	
trans-1,2-Dichloroethylene	4.15	0.5	ppbv	5.00	83.0	70-130	1.95	25	
trans-1,3-Dichloropropene	4.88	0.5	ppbv	5.00	97.6	70-130	0.00	25	
Trichloroethylene	5.15	0.5	ppbv	5.00	103	70-130	0.966	25	
Trichlorofluoromethane	5.20	0.5	ppbv	5.00	104	70-130	0.579	25	
Vinyl acetate	4.96	0.5	ppbv	5.00	99.2	70-130	2.24	25	
Vinyl bromide	4.94	0.5	ppbv	5.00	98.8	70-130	0.203	25	
Vinyl chloride	5.03	0.5	ppbv	5.00	101	70-130	0.199	25	

Surr: 4-Bromofluorobenzene
(Surr)

4.98 ppbv 5.00 99.6 70-130



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Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0409 - No Prep VOC GC Air

Blank (BGE0409-BLK1)

Prepared & Analyzed: 05/09/2023

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 (BGE0409-BS1)

Prepared & Analyzed: 05/09/2023

Methane	4650	500	ppmv	5000	93.0	0-200			
Methane	4650	0.05	ppmv	5000	93.0	80-120			
Carbon dioxide	5750	500	ppmv	5000	115	0-200			
Carbon dioxide	5750	0.05	ppmv	5000	115	80-120			
Oxygen (O2)	5100	500	ppmv	5000	102	0-200			
Oxygen (O2)	5100	0.05	ppmv	5000	102	80-120			
Nitrogen (N2)	5390	2000	ppmv	5000	108	0-200			
Hydrogen (H2)	5870	200	ppmv	5100	115	0-200			
Hydrogen (H2)	5870	0.02	ppmv	5100	115	80-120			
Nitrogen (N2)	5390	1	ppmv	5000	108	80-120			
Carbon Monoxide	4850	10	ppmv	5000	97.0	0-200			
Carbon Monoxide	4850	0.001	ppmv	5000	97.0	80-120			

Duplicate (BGE0409-DUP1)

Source: 23E0463-01

Prepared & Analyzed: 05/09/2023

Methane	430000	4500	ppmv	432000	0.500	25			
Methane	43.0	0.45	Vol%	43.2	0.500	5			
Carbon dioxide	424000	4500	ppmv	427000	0.619	25			
Carbon dioxide	42.4	0.45	Vol%	42.7	0.619	5			
Oxygen (O2)	5980	4500	ppmv	5980	0.0316	25			
Oxygen (O2)	0.60	0.45	Vol%	0.60	0.0316	5			
Hydrogen (H2)	113000	1800	ppmv	113000	0.243	25			
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5			
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25			
Carbon Monoxide	103	90.0	ppmv	105	2.08	25			
Carbon Monoxide	0.01	0.009	Vol%	0.01	2.08	5			



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Purchase Order: 07-SO04485

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

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0409 - No Prep VOC GC Air

Duplicate (BGE0409-DUP2)			Source: 23E0463-02	Prepared & Analyzed: 05/09/2023		
Methane	40.9	0.45	Vol%	41.1	0.426	5
Methane	409000	4500	ppmv	411000	0.426	25
Carbon dioxide	35.6	0.45	Vol%	35.6	0.196	5
Carbon dioxide	356000	4500	ppmv	356000	0.196	25
Oxygen (O2)	1.65	0.45	Vol%	1.66	0.258	5
Oxygen (O2)	16500	4500	ppmv	16600	0.258	25
Nitrogen (N2)	12.0	9.00	Vol%	12.1	0.604	5
Hydrogen (H2)	0.75	0.18	Vol%	0.73	2.20	5
Nitrogen (N2)	120000	18000	ppmv	121000	0.604	25
Hydrogen (H2)	7460	1800	ppmv	7300	2.20	25
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGE0409-DUP3)			Source: 23E0499-01	Prepared & Analyzed: 05/12/2023		
Methane	176000	4500	ppmv	177000	0.366	25
Methane	17.6	0.45	Vol%	17.7	0.366	5
Carbon dioxide	553000	4500	ppmv	554000	0.169	25
Carbon dioxide	55.3	0.45	Vol%	55.4	0.169	5
Oxygen (O2)	4910	4500	ppmv	4960	0.950	25
Oxygen (O2)	0.49	0.45	Vol%	0.50	0.950	5
Hydrogen (H2)	128000	1800	ppmv	128000	0.442	25
Nitrogen (N2)	101000	18000	ppmv	102000	0.595	25
Nitrogen (N2)	10.1	9.00	Vol%	10.2	0.595	5
Carbon Monoxide	0.05	0.009	Vol%	0.05	0.285	5
Carbon Monoxide	537	90.0	ppmv	536	0.285	25

Duplicate (BGE0409-DUP4)			Source: 23E0499-02	Prepared & Analyzed: 05/12/2023		
Methane	39.3	0.45	Vol%	39.4	0.209	5
Methane	393000	4500	ppmv	394000	0.209	25
Carbon dioxide	469000	4500	ppmv	470000	0.274	25
Carbon dioxide	46.9	0.45	Vol%	47.0	0.274	5
Oxygen (O2)	5430	4500	ppmv	5470	0.614	25
Oxygen (O2)	0.54	0.45	Vol%	0.55	0.614	5
Nitrogen (N2)	34600	18000	ppmv	34800	0.585	25
Hydrogen (H2)	31900	1800	ppmv	31900	0.0914	25



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Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0409 - No Prep VOC GC Air

Duplicate (BGE0409-DUP4) Source: 23E0499-02 Prepared & Analyzed: 05/12/2023

Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Hydrogen (H2)	3.19	0.18	Vol%	3.19	0.0914	5
Carbon Monoxide	165	90.0	ppmv	162	1.98	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	1.98	5

Duplicate (BGE0409-DUP5) Source: 23E0499-03 Prepared & Analyzed: 05/12/2023

Methane	36.6	0.45	Vol%	36.5	0.171	5
Methane	366000	4500	ppmv	365000	0.171	25
Carbon dioxide	507000	4500	ppmv	509000	0.380	25
Carbon dioxide	50.7	0.45	Vol%	50.9	0.380	5
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Hydrogen (H2)	26000	1800	ppmv	25300	2.60	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Nitrogen (N2)	29000	18000	ppmv	28800	0.524	25
Hydrogen (H2)	2.60	0.18	Vol%	2.53	2.60	5
Carbon Monoxide	132	90.0	ppmv	129	2.83	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	2.83	5

Duplicate (BGE0409-DUP6) Source: 23E0499-04 Prepared & Analyzed: 05/12/2023

Methane	413000	4500	ppmv	416000	0.784	25
Methane	41.3	0.45	Vol%	41.6	0.784	5
Carbon dioxide	459000	4500	ppmv	459000	0.00846	25
Carbon dioxide	45.9	0.45	Vol%	45.9	0.00845	5
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)	54200	1800	ppmv	54700	0.828	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5



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

Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGE0409 - No Prep VOC GC Air

Duplicate (BGE0409-DUP7)				Source: 23E0499-05	Prepared & Analyzed: 05/12/2023		
Methane	13100	4500	ppmv		13200	0.657	25
Methane	1.31	0.45	Vol%		1.32	0.657	5
Carbon dioxide	657000	4500	ppmv		659000	0.216	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)	360000	1800	ppmv		360000	0.0838	25
Nitrogen (N2)	<	18000	ppmv		<18000	NA	25
Carbon Monoxide	0.09	0.009	Vol%		0.09	0.584	5
Carbon Monoxide	897	90.0	ppmv		891	0.584	25

Duplicate (BGE0409-DUP8)				Source: 23E0499-06	Prepared & Analyzed: 05/12/2023		
Methane	151000	4500	ppmv		150000	0.0903	25
Methane	15.1	0.45	Vol%		15.0	0.0903	5
Carbon dioxide	302000	4500	ppmv		304000	0.683	25
Carbon dioxide	30.2	0.45	Vol%		30.4	0.683	5
Oxygen (O2)	59400	4500	ppmv		59300	0.0705	25
Oxygen (O2)	5.94	0.45	Vol%		5.93	0.0705	5
Nitrogen (N2)	38.3	9.00	Vol%		38.3	0.0663	5
Nitrogen (N2)	383000	18000	ppmv		383000	0.0663	25
Hydrogen (H2)	47900	1800	ppmv		47800	0.210	25
Carbon Monoxide	178	90.0	ppmv		182	2.20	25
Carbon Monoxide	0.02	0.009	Vol%		0.02	2.20	5

Duplicate (BGE0409-DUP9)				Source: 23E0499-07	Prepared & Analyzed: 05/12/2023		
Methane	374000	4500	ppmv		378000	0.947	25
Methane	37.4	0.45	Vol%		37.8	0.947	5
Carbon dioxide	458000	4500	ppmv		463000	1.07	25
Carbon dioxide	45.8	0.45	Vol%		46.3	1.07	5
Oxygen (O2)	10300	4500	ppmv		10400	0.928	25
Oxygen (O2)	1.03	0.45	Vol%		1.04	0.928	5
Hydrogen (H2)	34600	1800	ppmv		35200	1.94	25
Nitrogen (N2)	62200	18000	ppmv		62800	0.939	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Hydrogen (H2)	3.46	0.18	Vol%		3.52	1.94	5



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Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGE0409 - No Prep VOC GC Air

Duplicate (BGE0409-DUP9) Source: 23E0499-07 Prepared & Analyzed: 05/12/2023

Carbon Monoxide	204	90.0	ppmv		203		0.221	25	
Carbon Monoxide	0.02	0.009	Vol%		0.02		0.221	5	

Duplicate (BGE0409-DUPA) Source: 23E0499-08 Prepared & Analyzed: 05/12/2023

Methane	177000	4500	ppmv		178000		0.247	25	
Methane	17.7	0.45	Vol%		17.8		0.247	5	
Carbon dioxide	577000	4500	ppmv		579000		0.245	25	
Carbon dioxide	57.7	0.45	Vol%		57.9		0.245	5	
Oxygen (O2)	20800	4500	ppmv		20800		0.0857	25	
Oxygen (O2)	2.08	0.45	Vol%		2.08		0.0857	5	
Nitrogen (N2)	<	9.00	Vol%		<9.00		NA	5	
Hydrogen (H2)	131000	1800	ppmv		131000		0.209	25	
Nitrogen (N2)	75300	18000	ppmv		75600		0.400	25	
Carbon Monoxide	590	90.0	ppmv		593		0.441	25	
Carbon Monoxide	0.06	0.009	Vol%		0.06		0.441	5	

Duplicate (BGE0409-DUPB) Source: 23E0499-09 Prepared & Analyzed: 05/12/2023

Methane	11.5	0.45	Vol%		11.5		0.191	5	
Methane	115000	4500	ppmv		115000		0.191	25	
Carbon dioxide	270000	4500	ppmv		266000		1.14	25	
Carbon dioxide	27.0	0.45	Vol%		26.6		1.14	5	
Oxygen (O2)	67600	4500	ppmv		67600		0.105	25	
Oxygen (O2)	6.76	0.45	Vol%		6.76		0.105	5	
Hydrogen (H2)	29400	1800	ppmv		29700		0.824	25	
Nitrogen (N2)	447000	18000	ppmv		448000		0.135	25	
Hydrogen (H2)	2.94	0.18	Vol%		2.97		0.824	5	
Carbon Monoxide	184	90.0	ppmv		182		1.28	25	
Carbon Monoxide	0.02	0.009	Vol%		0.02		1.28	5	



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Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
<i>EPA 3C in Air</i>			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		
<i>EPA TO-15 in Air</i>			
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
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 Qualifiers
- 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 $\pm 10\%$ of the absolute.

AIR ANALYSIS
CHAIN OF CUSTODY


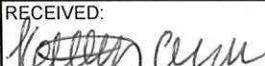
Equipment due 6/1/2023

Page 1 of 3

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 CULHANE		SAMPLER SIGNATURE: 	PWS I.D. #:
		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 _____ **063-23D-0023**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):			Barometric Pres. (in Hg):			Alt 145 CO		3C	TO-15 Benzene only		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 84			10092	1.4	230426-01	30	5.4	5/5	9:47	30	185	5/5	9:51	10	185.1	LG	x	x	x
2) 86			10224	1.4	230421-01	30	4.8	5/5	9:58	30	161.4	5/5	10:01	10	161.3	LG	x	x	x
3) 90			11083	1.4	230421-01	30	4.4	5/5	10:07	30	160.3	5/5	10:12	10	160.4	LG	x	x	x
4) 100			12063	1.4	230426-01	30	4.4	5/5	10:18	30	158.6	5/5	10:20	10	158.6	LG	x	x	x


RELINQUISHED:	RECEIVED: DATE / TIME	QC Data Package	LAB USE ONLY SCS Field Services 23E0499 Bristol Recd: 05/08/2023 Due: 05/15/2023 v130325002
RELINQUISHED:  5/5 2:15	RECEIVED: Fedex DATE / TIME	Level I <input type="checkbox"/>	
RELINQUISHED: Fedex DATE / TIME	RECEIVED:  5/18/23 11:20	Level II <input type="checkbox"/>	
		Level III <input type="checkbox"/>	
		Level IV <input type="checkbox"/>	

310
20.3°C
NOISE
MUSEAL

AIR ANALYSIS
CHAIN OF CUSTODY


Equipment due 6/1/2023

Page 2 of 3

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 _____ **063-23D-0023**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):			Barometric Pres. (in Hg):			Alt 145 CO		3C	TO-15 Benzene only		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 89			12409	1.4	230421-01	30	4.8	515	10:28	30	150.6	515	10:32	10	151	LG	x	x	x
2) 61			12471	1.4	230421-01	30	4.4	515	10:38	30	151.6	515	10:42	10	151.5	LG	x	x	x
3) 49			12659	1.4	230421-01	30	5.2	515	10:48	30	149.3	515	10:51	10	149.3	LG	x	x	x
4) 67			13378	1.4	230421-01	30	4.0	515	10:57	30	154.7	515	11:02	10	155.5	LG	x	x	x


RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY SCS Field Services 23E0499 Bristol Recd: 05/08/2023 Due: 05/15/2023 v130325002
RELINQUISHED:  515 2:15	RECEIVED: Fedex G	DATE / TIME	Level I <input type="checkbox"/>	
RELINQUISHED: Fedex G	RECEIVED: Matthew Am 5/8/23 1120	DATE / TIME	Level II <input type="checkbox"/>	
			Level III <input type="checkbox"/>	
			Level IV <input type="checkbox"/>	

310
20.3°C
noise
noseau

AIR ANALYSIS
CHAIN OF CUSTODY


Equipment due 6/1/2023

Page 3 of 3

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same		PROJECT NAME/Quote #: Bristol	
CONTACT:		INVOICE CONTACT:		SITE NAME: BRISTOL	
ADDRESS:		INVOICE ADDRESS:		PROJECT NUMBER: 072230600	
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 _____ **063-23D-0023**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):			Barometric Pres. (in Hg):			Alt 145 CO		3C	TO-15 Benzene only		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 37			13963	1.4	230421-01	30	5.2	515	11:08	30	149.7	515	11:11	10	149.9	LG	x	x	x
2) NOT SAMPLED			15037	1.4	230421-01	30										LG	x	x	x
3)																			
4)																			

RELINQUISHED:	RECEIVED: DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED:  DATE / TIME 515 2:15	RECEIVED: Fedex DATE / TIME	Level I <input type="checkbox"/>	
RELINQUISHED: Fedex DATE / TIME	RECEIVED: Logan Culhane DATE / TIME 05/15/23 1120	Level II <input type="checkbox"/>	
		Level III <input type="checkbox"/>	
		Level IV <input type="checkbox"/>	<p>SCS Field Services 23E0499 Bristol Recd: 05/08/2023 Due: 05/15/2023</p>

310
20.3°C
NOTE
NUSEC

v130325002



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0499

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 8, 2023 11:20
Date Issued: May 15, 2023 16:34

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

Sample Conditions Checklist

Samples Received at:	20.30°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 23E0755

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	May 11, 2023 11:30
	4330 Lewis Road, Suite 1	Date Issued:	May 18, 2023 16:33
	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 05/11/2023 11:30. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

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.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical, Inc.



TNI Accredited
VELAP ID 460021



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA Date Received: May 11, 2023 11:30
4330 Lewis Road, Suite 1 Date Issued: May 18, 2023 16:33
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	23E0755-01	Air	05/10/2023 10:00	05/11/2023 11:30
86	23E0755-02	Air	05/10/2023 10:11	05/11/2023 11:30
100	23E0755-03	Air	05/10/2023 10:43	05/11/2023 11:30
90	23E0755-04	Air	05/10/2023 11:12	05/11/2023 11:30
37	23E0755-05	Air	05/10/2023 11:21	05/11/2023 11:30



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

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: 23E0755-01
Sample Matrix: Air
Sampled: 5/10/2023 10:00
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00192::11084
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analyzed		
Carbon Monoxide, as received	529	90.0	90.0		9	1	5/16/23	11:36	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analyzed		
Methane, as received	13.0	0.45	0.45		9	1	5/16/23	11:36	MER
Carbon dioxide, as received	53.1	0.45	0.45		9	1	5/16/23	11:36	MER
Oxygen (O2), as received	0.75	0.45	0.45		9	1	5/16/23	11:36	MER
Hydrogen (H2), as received	12.0	1.08	1.08		54	1	5/16/23	14:52	MER
Nitrogen (N2), as received	16.8	9.00	9.00		9	1	5/16/23	11:36	MER
Carbon Monoxide, as received	0.05	0.009	0.009		9	1	5/16/23	11:36	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time		
	Results	MDL	LOQ		Results	MDL	LOQ			Analyzed		
Benzene	323000	9330	23300		1000000	30000	75000	46700	1	5/17/23	14:01	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	92.0				80-120					5/17/23	14:01	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

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: 23E0755-02
Sample Matrix: Air
Sampled: 5/10/2023 10:11
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00109::11305
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Carbon Monoxide, as received	138	90.0	90.0		9	1	5/16/23	13:10	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Methane, as received	34.5	0.45	0.45		9	1	5/16/23	13:10	MER
Carbon dioxide, as received	48.2	0.45	0.45		9	1	5/16/23	13:10	MER
Oxygen (O2), as received	0.89	0.45	0.45		9	1	5/16/23	13:10	MER
Hydrogen (H2), as received	2.53	0.18	0.18		9	1	5/16/23	13:10	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/16/23	13:10	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/16/23	13:10	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time		Analyst
	Results	MDL	LOQ		Results	MDL	LOQ			Analized		
Benzene	113000	2330	5830		360000	7500	19000	11700	1	5/17/23	12:31	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	94.8				80-120					5/17/23	12:31	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 100
Sample ID: 23E0755-03
Sample Matrix: Air
Sampled: 5/10/2023 10:43
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00096::12401
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	ND	90.0	90.0		9	1	5/16/23 14:01	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	41.0	0.45	0.45		9	1	5/16/23 14:01	MER
Carbon dioxide, as received	46.0	0.45	0.45		9	1	5/16/23 14:01	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/16/23 14:01	MER
Hydrogen (H2), as received	4.51	0.18	0.18		9	1	5/16/23 14:01	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/16/23 14:01	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	5/16/23 14:01	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	26600	778	1940		85000	2500	6200	3890	1	5/17/23 14:46	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	97.8				80-120					5/17/23 14:46	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 90
Sample ID: 23E0755-04
Sample Matrix: Air
Sampled: 5/10/2023 11:12
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00309::12860
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Carbon Monoxide, as received	124	90.0	90.0		9	1	5/16/23	15:23	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Methane, as received	37.0	0.45	0.45		9	1	5/16/23	15:23	MER
Carbon dioxide, as received	51.7	0.45	0.45		9	1	5/16/23	15:23	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/16/23	15:23	MER
Hydrogen (H2), as received	2.54	0.18	0.18		9	1	5/16/23	15:23	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/16/23	15:23	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/16/23	15:23	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time		Analyst
	Results	MDL	LOQ		Results	MDL	LOQ			Analized		
Benzene	321000	4670	11700		1000000	15000	37000	23300	1	5/17/23	13:16	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	95.4				80-120					5/17/23	13:16	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 37
Sample ID: 23E0755-05
Sample Matrix: Air
Sampled: 5/10/2023 11:21
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00268::13370
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	160	90.0	90.0		9	1	5/16/23 16:15	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	9.34	0.45	0.45		9	1	5/16/23 16:15	MER
Carbon dioxide, as received	23.2	0.45	0.45		9	1	5/16/23 16:15	MER
Oxygen (O2), as received	7.31	0.45	0.45		9	1	5/16/23 16:15	MER
Hydrogen (H2), as received	2.51	0.18	0.18		9	1	5/16/23 16:15	MER
Nitrogen (N2), as received	49.0	18.0	18.0		18	1	5/16/23 17:41	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/16/23 16:15	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	54000	1560	3890		170000	5000	12000	7780	1	5/17/23 15:30	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	98.0				80-120					5/17/23 15:30	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

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	
23E0755-01	1.00 mL / 1.00 mL	ALT-145	BGE0656	SGE0618	AG00026
23E0755-02	1.00 mL / 1.00 mL	ALT-145	BGE0656	SGE0618	AG00026
23E0755-03	1.00 mL / 1.00 mL	ALT-145	BGE0656	SGE0618	AG00026
23E0755-04	1.00 mL / 1.00 mL	ALT-145	BGE0656	SGE0618	AG00026
23E0755-05	1.00 mL / 1.00 mL	ALT-145	BGE0656	SGE0618	AG00026
23E0755-01	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-02	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-03	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-04	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-05	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	AG00026
23E0755-05RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0656	SGE0618	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	
23E0755-01	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0668	AE30194
23E0755-02	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0668	AE30194
23E0755-03	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0668	AE30194
23E0755-04	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0668	AE30194
23E0755-05	400 mL / 400 mL	EPA TO-15	BGE0427	SGE0668	AE30194



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0427 - No Prep VOC Air

Blank (BGE0427-BLK1)

Prepared & Analyzed: 05/10/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.76 ppbv 5.00 95.2 80-120

LCS (BGE0427-BS1)

Prepared & Analyzed: 05/10/2023

1,1,1-Trichloroethane	5.15	0.5	ppbv	5.00	103	70-130		
1,1,1,2-Tetrachloroethane	5.26	0.5	ppbv	5.00	105	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	4.78	0.5	ppbv	5.00	95.6	70-130		
1,1,2-Trichloroethane	5.22	0.5	ppbv	5.00	104	70-130		
1,1-Dichloroethane	4.55	0.5	ppbv	5.00	91.0	70-130		
1,1-Dichloroethylene	4.91	0.5	ppbv	5.00	98.2	70-130		
1,2,4-Trimethylbenzene	5.48	0.5	ppbv	5.00	110	70-130		
1,2-Dibromoethane (EDB)	5.21	0.5	ppbv	5.00	104	70-130		
1,2-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130		
1,2-Dichloroethane	5.18	0.5	ppbv	5.00	104	70-130		
1,2-Dichloropropane	5.30	0.5	ppbv	5.00	106	70-130		
1,2-Dichlorotetrafluoroethane	5.01	0.5	ppbv	5.00	100	70-130		
1,3,5-Trimethylbenzene	5.27	0.5	ppbv	5.00	105	70-130		
1,3-Butadiene	4.77	0.5	ppbv	5.00	95.4	70-130		
1,3-Dichlorobenzene	5.20	0.5	ppbv	5.00	104	70-130		
1,4-Dichlorobenzene	5.25	0.5	ppbv	5.00	105	70-130		
1,4-Dioxane	5.57	0.5	ppbv	5.00	111	70-130		
2-Butanone (MEK)	4.64	0.5	ppbv	5.00	92.8	70-130		
4-Methyl-2-pentanone (MIBK)	5.61	0.5	ppbv	5.00	112	70-130		
Allyl chloride	4.72	0.5	ppbv	5.00	94.4	70-130		
Benzene	5.17	0.5	ppbv	5.00	103	70-130		
Benzyl Chloride	4.25	0.5	ppbv	5.00	85.0	70-130		
Bromodichloromethane	4.67	0.5	ppbv	5.00	93.4	70-130		
Bromoform	0.51	0.5	ppbv	5.00	10.2	70-130		L
Bromomethane	5.45	0.5	ppbv	5.00	109	70-130		
Carbon Disulfide	4.67	0.5	ppbv	5.00	93.4	70-130		



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0427 - No Prep VOC Air

LCS (BGE0427-BS1)

Prepared & Analyzed: 05/10/2023

Carbon Tetrachloride	5.04	0.5	ppbv	5.00	101	70-130			
Chlorobenzene	5.06	0.5	ppbv	5.00	101	70-130			
Chloroethane	4.92	0.5	ppbv	5.00	98.4	70-130			
Chloroform	4.72	0.5	ppbv	5.00	94.4	70-130			
Chloromethane	5.19	0.5	ppbv	5.00	104	70-130			
cis-1,2-Dichloroethylene	4.77	0.5	ppbv	5.00	95.4	70-130			
cis-1,3-Dichloropropene	5.44	0.5	ppbv	5.00	109	70-130			
Cyclohexane	5.34	0.5	ppbv	5.00	107	70-130			
Dichlorodifluoromethane	4.73	0.5	ppbv	5.00	94.6	70-130			
Ethyl acetate	4.81	0.5	ppbv	5.00	96.2	70-130			
Ethylbenzene	5.32	0.5	ppbv	5.00	106	70-130			
Heptane	5.50	0.5	ppbv	5.00	110	70-130			
Hexane	5.06	0.5	ppbv	5.00	101	70-130			
m+p-Xylenes	10.4	1	ppbv	10.0	104	70-130			
Methylene chloride	4.96	1	ppbv	5.00	99.2	70-130			
Methyl-t-butyl ether (MTBE)	4.87	0.5	ppbv	5.00	97.4	70-130			
Naphthalene	4.31	0.5	ppbv	5.00	86.2	60-140			
o-Xylene	5.23	0.5	ppbv	5.00	105	70-130			
Propylene	4.95	1	ppbv	5.00	99.0	70-130			
Styrene	5.33	0.5	ppbv	5.00	107	70-130			
Tetrachloroethylene (PCE)	4.95	0.5	ppbv	5.00	99.0	70-130			
Tetrahydrofuran	5.60	0.5	ppbv	5.00	112	70-130			
Toluene	5.36	0.5	ppbv	5.00	107	70-130			
trans-1,2-Dichloroethylene	4.07	0.5	ppbv	5.00	81.4	70-130			
trans-1,3-Dichloropropene	4.88	0.5	ppbv	5.00	97.6	70-130			
Trichloroethylene	5.20	0.5	ppbv	5.00	104	70-130			
Trichlorofluoromethane	5.17	0.5	ppbv	5.00	103	70-130			
Vinyl acetate	4.85	0.5	ppbv	5.00	97.0	70-130			
Vinyl bromide	4.93	0.5	ppbv	5.00	98.6	70-130			
Vinyl chloride	5.04	0.5	ppbv	5.00	101	70-130			
Surr: 4-Bromofluorobenzene (Surr)	4.98		ppbv	5.00	99.6	70-130			



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

Batch BGE0427 - No Prep VOC Air

LCS Dup (BGE0427-BSD1)

Prepared & Analyzed: 05/10/2023

1,1,1-Trichloroethane	5.12	0.5	ppbv	5.00	102	70-130	0.584	25	
1,1,1,2-Tetrachloroethane	5.28	0.5	ppbv	5.00	106	70-130	0.380	25	
1,1,1,2-Trichloro-1,2,2-trifluoroethane	4.86	0.5	ppbv	5.00	97.2	70-130	1.66	25	
1,1,2-Trichloroethane	5.23	0.5	ppbv	5.00	105	70-130	0.191	25	
1,1-Dichloroethane	4.62	0.5	ppbv	5.00	92.4	70-130	1.53	25	
1,1-Dichloroethylene	5.26	0.5	ppbv	5.00	105	70-130	6.88	25	
1,2,4-Trimethylbenzene	5.49	0.5	ppbv	5.00	110	70-130	0.182	25	
1,2-Dibromoethane (EDB)	5.21	0.5	ppbv	5.00	104	70-130	0.00	25	
1,2-Dichlorobenzene	5.32	0.5	ppbv	5.00	106	70-130	0.00	25	
1,2-Dichloroethane	5.17	0.5	ppbv	5.00	103	70-130	0.193	25	
1,2-Dichloropropane	5.26	0.5	ppbv	5.00	105	70-130	0.758	25	
1,2-Dichlorotetrafluoroethane	4.98	0.5	ppbv	5.00	99.6	70-130	0.601	25	
1,3,5-Trimethylbenzene	5.28	0.5	ppbv	5.00	106	70-130	0.190	25	
1,3-Butadiene	4.86	0.5	ppbv	5.00	97.2	70-130	1.87	25	
1,3-Dichlorobenzene	5.21	0.5	ppbv	5.00	104	70-130	0.192	25	
1,4-Dichlorobenzene	5.20	0.5	ppbv	5.00	104	70-130	0.957	25	
1,4-Dioxane	5.52	0.5	ppbv	5.00	110	70-130	0.902	25	
2-Butanone (MEK)	4.72	0.5	ppbv	5.00	94.4	70-130	1.71	25	
4-Methyl-2-pentanone (MIBK)	5.64	0.5	ppbv	5.00	113	70-130	0.533	25	
Allyl chloride	4.86	0.5	ppbv	5.00	97.2	70-130	2.92	25	
Benzene	5.18	0.5	ppbv	5.00	104	70-130	0.193	25	
Benzyl Chloride	4.28	0.5	ppbv	5.00	85.6	70-130	0.703	25	
Bromodichloromethane	4.67	0.5	ppbv	5.00	93.4	70-130	0.00	25	
Bromoform	0.51	0.5	ppbv	5.00	10.2	70-130	0.00	25	L
Bromomethane	5.41	0.5	ppbv	5.00	108	70-130	0.737	25	
Carbon Disulfide	4.78	0.5	ppbv	5.00	95.6	70-130	2.33	25	
Carbon Tetrachloride	4.98	0.5	ppbv	5.00	99.6	70-130	1.20	25	
Chlorobenzene	5.06	0.5	ppbv	5.00	101	70-130	0.00	25	
Chloroethane	4.88	0.5	ppbv	5.00	97.6	70-130	0.816	25	
Chloroform	4.71	0.5	ppbv	5.00	94.2	70-130	0.212	25	
Chloromethane	5.20	0.5	ppbv	5.00	104	70-130	0.192	25	
cis-1,2-Dichloroethylene	4.79	0.5	ppbv	5.00	95.8	70-130	0.418	25	
cis-1,3-Dichloropropene	5.45	0.5	ppbv	5.00	109	70-130	0.184	25	



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4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
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Harrisburg, PA 17111

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	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	Limit	RPD	

Batch BGE0427 - No Prep VOC Air

LCS Dup (BGE0427-BSD1)

Prepared & Analyzed: 05/10/2023

Cyclohexane	5.24	0.5	ppbv	5.00	105	70-130	1.89	25	
Dichlorodifluoromethane	4.81	0.5	ppbv	5.00	96.2	70-130	1.68	25	
Ethyl acetate	4.63	0.5	ppbv	5.00	92.6	70-130	3.81	25	
Ethylbenzene	5.32	0.5	ppbv	5.00	106	70-130	0.00	25	
Heptane	5.43	0.5	ppbv	5.00	109	70-130	1.28	25	
Hexane	5.13	0.5	ppbv	5.00	103	70-130	1.37	25	
m+p-Xylenes	10.4	1	ppbv	10.0	104	70-130	0.384	25	
Methylene chloride	5.28	1	ppbv	5.00	106	70-130	6.25	25	
Methyl-t-butyl ether (MTBE)	4.90	0.5	ppbv	5.00	98.0	70-130	0.614	25	
Naphthalene	4.30	0.5	ppbv	5.00	86.0	60-140	0.232	25	
o-Xylene	5.25	0.5	ppbv	5.00	105	70-130	0.382	25	
Propylene	5.03	1	ppbv	5.00	101	70-130	1.60	25	
Styrene	5.35	0.5	ppbv	5.00	107	70-130	0.375	25	
Tetrachloroethylene (PCE)	4.91	0.5	ppbv	5.00	98.2	70-130	0.811	25	
Tetrahydrofuran	5.57	0.5	ppbv	5.00	111	70-130	0.537	25	
Toluene	5.36	0.5	ppbv	5.00	107	70-130	0.00	25	
trans-1,2-Dichloroethylene	4.15	0.5	ppbv	5.00	83.0	70-130	1.95	25	
trans-1,3-Dichloropropene	4.88	0.5	ppbv	5.00	97.6	70-130	0.00	25	
Trichloroethylene	5.15	0.5	ppbv	5.00	103	70-130	0.966	25	
Trichlorofluoromethane	5.20	0.5	ppbv	5.00	104	70-130	0.579	25	
Vinyl acetate	4.96	0.5	ppbv	5.00	99.2	70-130	2.24	25	
Vinyl bromide	4.94	0.5	ppbv	5.00	98.8	70-130	0.203	25	
Vinyl chloride	5.03	0.5	ppbv	5.00	101	70-130	0.199	25	

Surr: 4-Bromofluorobenzene
(Surr)

4.98 ppbv 5.00 99.6 70-130



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

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0656 - No Prep VOC GC Air

Blank (BGE0656-BLK1)

Prepared & Analyzed: 05/16/2023

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 (BGE0656-BS1)

Prepared & Analyzed: 05/16/2023

Methane	4660	500	ppmv	5000	93.1	0-200
Methane	4660	0.05	ppmv	5000	93.1	80-120
Carbon dioxide	4440	500	ppmv	5000	88.8	0-200
Carbon dioxide	4440	0.05	ppmv	5000	88.8	80-120
Oxygen (O2)	5120	500	ppmv	5000	102	0-200
Oxygen (O2)	5120	0.05	ppmv	5000	102	80-120
Nitrogen (N2)	5410	2000	ppmv	5000	108	0-200
Hydrogen (H2)	5990	200	ppmv	5100	117	0-200
Hydrogen (H2)	5990	0.02	ppmv	5100	117	80-120
Nitrogen (N2)	5410	1	ppmv	5000	108	80-120
Carbon Monoxide	4870	10	ppmv	5000	97.3	0-200
Carbon Monoxide	4870	0.001	ppmv	5000	97.3	80-120

Duplicate (BGE0656-DUP1)

Source: 23E0755-01

Prepared & Analyzed: 05/16/2023

Methane	131000	4500	ppmv	130000	0.186	25
Methane	13.1	0.45	Vol%	13.0	0.186	5
Carbon dioxide	53.3	0.45	Vol%	53.1	0.249	5
Carbon dioxide	533000	4500	ppmv	531000	0.249	25
Oxygen (O2)	7490	4500	ppmv	7480	0.111	25
Oxygen (O2)	0.75	0.45	Vol%	0.75	0.111	5
Hydrogen (H2)	122000	1800	ppmv	121000	0.346	25
Nitrogen (N2)	168000	18000	ppmv	168000	0.0802	25
Nitrogen (N2)	16.8	9.00	Vol%	16.8	0.0803	5
Carbon Monoxide	536	90.0	ppmv	529	1.39	25
Carbon Monoxide	0.05	0.009	Vol%	0.05	1.39	5



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

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0656 - No Prep VOC GC Air

Duplicate (BGE0656-DUP2)			Source: 23E0755-02	Prepared & Analyzed: 05/16/2023		
Methane	350000	4500	ppmv	345000	1.35	25
Methane	35.0	0.45	Vol%	34.5	1.35	5
Carbon dioxide	490000	4500	ppmv	482000	1.73	25
Carbon dioxide	49.0	0.45	Vol%	48.2	1.73	5
Oxygen (O2)	0.89	0.45	Vol%	0.89	0.00704	5
Oxygen (O2)	8950	4500	ppmv	8950	0.00704	25
Nitrogen (N2)	61900	18000	ppmv	61000	1.40	25
Hydrogen (H2)	25500	1800	ppmv	25300	0.488	25
Hydrogen (H2)	2.55	0.18	Vol%	2.53	0.488	5
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	144	90.0	ppmv	138	4.09	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	4.09	5

Duplicate (BGE0656-DUP3)			Source: 23E0755-03	Prepared & Analyzed: 05/16/2023		
Methane	40.9	0.45	Vol%	41.0	0.287	5
Methane	409000	4500	ppmv	410000	0.287	25
Carbon dioxide	45.8	0.45	Vol%	46.0	0.441	5
Carbon dioxide	458000	4500	ppmv	460000	0.441	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Hydrogen (H2)	4.49	0.18	Vol%	4.51	0.514	5
Hydrogen (H2)	44900	1800	ppmv	45100	0.514	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25

Duplicate (BGE0656-DUP4)			Source: 23E0755-04	Prepared & Analyzed: 05/16/2023		
Methane	364000	4500	ppmv	370000	1.64	25
Methane	36.4	0.45	Vol%	37.0	1.64	5
Carbon dioxide	505000	4500	ppmv	517000	2.21	25
Carbon dioxide	50.5	0.45	Vol%	51.7	2.21	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	25100	1800	ppmv	25400	1.12	25



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Certificate of Analysis

Final Report

Laboratory Order ID 23E0755

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 11, 2023 11:30
Date Issued: May 18, 2023 16:33

Harrisburg, PA 17111

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	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0656 - No Prep VOC GC Air

Duplicate (BGE0656-DUP4)			Source: 23E0755-04	Prepared & Analyzed: 05/16/2023		
Nitrogen (N2)	24000	18000	ppmv	24400	1.74	25
Hydrogen (H2)	2.51	0.18	Vol%	2.54	1.12	5
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	117	90.0	ppmv	124	5.59	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	5.59	5

Duplicate (BGE0656-DUP5)			Source: 23E0755-05	Prepared & Analyzed: 05/16/2023		
Methane	91900	4500	ppmv	93400	1.66	25
Methane	9.19	0.45	Vol%	9.34	1.66	5
Carbon dioxide	22.9	0.45	Vol%	23.2	1.21	5
Carbon dioxide	229000	4500	ppmv	232000	1.21	25
Oxygen (O2)	72200	4500	ppmv	73100	1.29	25
Oxygen (O2)	7.22	0.45	Vol%	7.31	1.29	5
Hydrogen (H2)	2.48	0.18	Vol%	2.51	1.08	5
Nitrogen (N2)	481000	18000	ppmv	488000	1.44	25
Hydrogen (H2)	24800	1800	ppmv	25100	1.08	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	3.37	5
Carbon Monoxide	155	90.0	ppmv	160	3.37	25

Duplicate (BGE0656-DUP6)			Source: 23E0742-01	Prepared & Analyzed: 05/16/2023		
Methane	429000	4500	ppmv	428000	0.240	25
Methane	42.9	0.45	Vol%	42.8	0.240	5
Carbon dioxide	42.2	0.45	Vol%	42.2	0.120	5
Carbon dioxide	422000	4500	ppmv	422000	0.120	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Hydrogen (H2)	68000	1800	ppmv	68000	0.0352	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5



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Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0656 - No Prep VOC GC Air

Duplicate (BGE0656-DUP7)			Source: 23E0742-02	Prepared & Analyzed: 05/16/2023		
Methane	443000	4500	ppmv	443000	0.0658	25
Methane	44.3	0.45	Vol%	44.3	0.0658	5
Carbon dioxide	368000	4500	ppmv	369000	0.163	25
Carbon dioxide	36.8	0.45	Vol%	36.9	0.163	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	<	1800	ppmv	<1800	NA	25
Nitrogen (N2)	93900	18000	ppmv	93900	0.00528	25
Nitrogen (N2)	9.39	9.00	Vol%	9.39	0.00527	5
Hydrogen (H2)	<	0.18	Vol%	<0.18	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGE0656-DUP8)			Source: 23E0742-03	Prepared & Analyzed: 05/17/2023		
Methane	393000	4500	ppmv	390000	0.679	25
Methane	39.3	0.45	Vol%	39.0	0.679	5
Carbon dioxide	429000	4500	ppmv	427000	0.519	25
Carbon dioxide	42.9	0.45	Vol%	42.7	0.519	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	96800	1800	ppmv	96900	0.115	25
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGE0656-DUP9)			Source: 23E0742-04	Prepared & Analyzed: 05/17/2023		
Methane	430000	4500	ppmv	427000	0.697	25
Methane	43.0	0.45	Vol%	42.7	0.697	5
Carbon dioxide	426000	4500	ppmv	422000	0.936	25
Carbon dioxide	42.6	0.45	Vol%	42.2	0.936	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	23100	1800	ppmv	23000	0.249	25
Nitrogen (N2)	34700	18000	ppmv	34500	0.575	25



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Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD	Limit	Qual
	Result	Limit			Units	%REC				

Batch BGE0656 - No Prep VOC GC Air

Duplicate (BGE0656-DUP9)	Source: 23E0742-04			Prepared & Analyzed: 05/17/2023		
Hydrogen (H2)	2.31	0.18	Vol%	2.30	0.249	5
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

Duplicate (BGE0656-DUPA)	Source: 23E0742-05			Prepared & Analyzed: 05/17/2023		
Methane	33.1	0.45	Vol%	32.7	1.20	5
Methane	331000	4500	ppmv	327000	1.20	25
Carbon dioxide	430000	4500	ppmv	426000	0.978	25
Carbon dioxide	43.0	0.45	Vol%	42.6	0.978	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	183000	1800	ppmv	182000	0.776	25
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

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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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

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 #T104704	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
- P Duplicate analysis does not meet the acceptance criteria for precision
- RPD Relative Percent Difference
- Qual Qualifiers
- 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 $\pm 10\%$ of the absolute.

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 6/8/2023

Page 1 of 3

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-0005**


CLIENT SAMPLE I.D.	Regulator Info		Canister Information					Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):			Barometric Pres. (in Hg):			Alt 145 CO	3C		TO-15 Benzene only			
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F	
1) 84	NA		11084	1.4	230503-01	30	4.8	5/10	9:56	30	183.4	5/10	10:00	10	183.1	183.1	LG	x	x	x
2) 86	NA		11305	1.4	230503-01	30	4.4	5/10	10:07	30	156.1	5/10	10:11	10	154.9	154.9	LG	x	x	x
3) 100	NA		12401	1.4	230503-01	30	4.8	5/10	10:39	30	158.3	5/10	10:43	10	158.3	158.3	LG	x	x	x
4) 90	NA		12860	1.4	230503-01	30	4.8	5/10	11:09	30	154.2	5/10	11:12	10	154.2	154.2	LG	x	x	x

RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED:	RECEIVED:	DATE / TIME	Level I <input type="checkbox"/>	SCS Field Services 23E0755 Bristol Recd: 05/11/2023 Due: 05/18/2023
RELINQUISHED: 5/10 3:30	RECEIVED:	DATE / TIME	Level II <input type="checkbox"/>	
RELINQUISHED: Fedex G	RECEIVED:	DATE / TIME	Level III <input type="checkbox"/>	
	RECEIVED:	DATE / TIME: 5-11-23 11:30	Level IV <input type="checkbox"/>	

AIR ANALYSIS
CHAIN OF CUSTODY



Equipment due 6/8/2023

Page 2 of 3

COMPANY NAME: SCS Field Services - Harrisburg		INVOICE TO: Same		PROJECT NAME/Quote #: Bristol	
CONTACT:		INVOICE CONTACT:		SITE NAME: BRISTOL	
ADDRESS:		INVOICE ADDRESS:		PROJECT NUMBER: 0723016.00	
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-0005**


CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):			Barometric Pres. (in Hg):			Alt 145 CO		3C	TO-15 Benzene only		
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) 37	NA		13370	1.4	230503-01	30	5.0	5/10	11:18	30	149.4	5/10	11:21	10	149.4	LG	x	x	x
2) SAMPLED	NA		13964	1.4	230503-01	30										LG	x	x	x
3) SAMPLED	NA		14294	1.4	230503-01	30										LG	x	x	x
4) NOT	NA		14308	1.4	230503-01	30										LG	x	x	x

RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY 916 20.3 °C no ice no seal
RELINQUISHED: 	RECEIVED:	DATE / TIME	Level I <input type="checkbox"/>	SCS Field Services 23E0755 Bristol Recd: 05/11/2023 Due: 05/18/2023
RELINQUISHED: 5/10 3:30	RECEIVED:	DATE / TIME	Level II <input type="checkbox"/>	
RELINQUISHED: Fedex	RECEIVED:	DATE / TIME	Level III <input type="checkbox"/>	
	RECEIVED: 	DATE / TIME	Level IV <input type="checkbox"/>	

**AIR ANALYSIS
CHAIN OF CUSTODY**



Equipment due 6/8/2023

Page 3 of 3

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CONTACT:		INVOICE CONTACT:	SITE NAME: BRISTOL
ADDRESS:		INVOICE ADDRESS:	PROJECT NUMBER: 0723016-00
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 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-0005**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
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								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)					Final Canister Vacuum (in Hg)	Ending Sample Temp °F
1) NOT SAMPLED	NA		15039	1.4	230503-01	30									LG	x	x	x	
2)	NA		15042	1.4	230503-01	30									LG	x	x	x	
3)																			
4)																			

RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY 310 26.3°C no Ice no seal
RELINQUISHED:  5/10 3:30	RECEIVED:	DATE / TIME	Level I <input type="checkbox"/>	SCS Field Services 23E0755 Bristol Recd: 05/11/2023 Due: 05/18/2023
RELINQUISHED: Fedex 6	RECEIVED:	DATE / TIME	Level II <input type="checkbox"/>	
	RECEIVED:	DATE / TIME	Level III <input type="checkbox"/>	
	RECEIVED:  5-11-23 11:30	DATE / TIME	Level IV <input type="checkbox"/>	



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		Date Issued:	May 18, 2023 16:33
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	20.30°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

June 9, 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 – May 16th through May 31st, 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 5/16/23 through 5/31/23.

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.

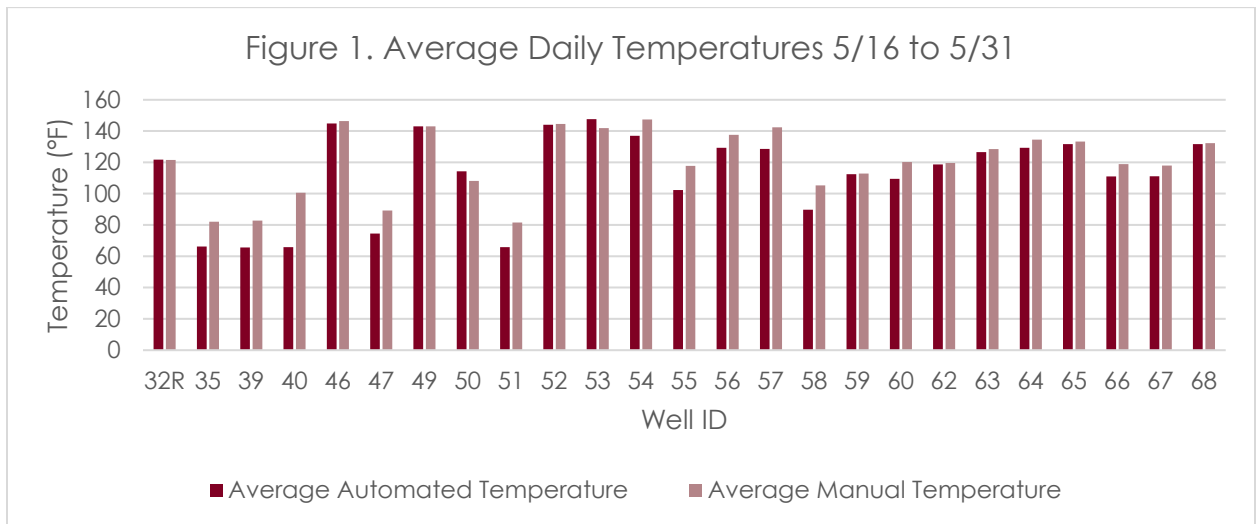
The 25 wellheads have 2-inch automated sensors. SCS believes that the 2-inch sensors measure temperature with more accuracy than the 1-inch sensors that were used in the majority of the 25 wells prior to March 1, 2023, but we are still comparing with manual temperature to assess the validity of this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

SCS reviewed the automated hourly temperature measurements from 5/16/23 to 5/31/23, and identified the following trends:

- **Temperatures over 145°F:** Temperatures over the NESHAP AAAA compliance threshold of 145°F were recorded at seven 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-53 and EW-67 (greater than 180° 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. Due to increased perforations available from these efforts, the warmer landfill gases are being collected, thus the elevated average temperature.



- Low temperatures at certain wells:** Average temperatures between 50°F and 80°F have been consistent at five 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.



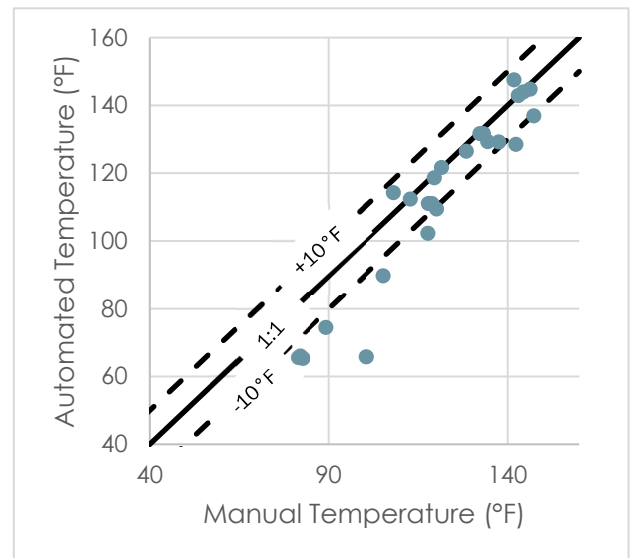
Manual Daily Temperature Monitoring

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 $\pm 10^\circ\text{F}$. 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 May, the flow recorded by a GEM5000 was less than 4 scfm.

The automated temperature sensor at EW-32R continues to erroneously record 0°F at select time intervals, which were removed from the dataset used to produce Figure 1 and 2 because the temperatures that are recorded appear to be accurate. SCS is investigating what we suspect is an issue with signal.

Figure 2. Manual vs. Automated Temperature Comparison



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 5/4/23, 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-31R, EW-54, EW-86, EW-89, and EW-90. See Table 1 for the statuses of all exceedances recorded during this monitoring period.

Table 1. May Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 5/31/23
EW-31R	5/15/23	5/30/23 109.3°F	15 days	Resolved, within 60-day timeline
EW-34	5/30/23	5/30/23 175.4°F	1 day	Ongoing, within 15-day timeline
EW-37	4/4/23	5/26/23 181.9°F	58 days	Ongoing, within 60-day timeline
EW-54	5/22/23	5/30/23 140.4°F	8 days	Resolved, within 15-day timeline
EW-84	4/27/23	5/30/23 175.2°F	34 days	Ongoing, within 60-day timeline
EW-86	4/27/23	5/30/23 149.6°F	34 days	Ongoing, within 60-day timeline
EW-89	5/15/23	5/18/23 146.8°F	3 days	Resolved within 15-day timeline
EW-89	5/30/23	5/30/23 150.5°F	1 day	Ongoing, within 15-day timeline
EW-90	4/27/23	5/30/23 149.8°F	34 days	Ongoing, within 60-day timeline
EW-94	5/26/23	5/30/23 176.0°F	4 days	Ongoing, within 15-day timeline
EW-100	4/27/23	5/30/23 158.9°	33 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 5/18/23 and 5/23/23 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

(H₂) 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		5/18/2023	5/23/23
31R	CO (ppmv)	209	473
	H2 (Vol. %)	3.77	9.53
37	CO (ppmv)	330	345
	H2 (Vol. %)	5.43	6.47
54	CO (ppmv)	--	218
	H2 (Vol. %)	--	10.6
84	CO (ppmv)	478	409
	H2 (Vol. %)	11.2	9.03
86	CO (ppmv)	137	137
	H2 (Vol. %)	2.50	2.30
89	CO (ppmv)	906	--
	H2 (Vol. %)	37.0	--
90	CO (ppmv)	131	126
	H2 (Vol. %)	2.57	2.38
100	CO (ppmv)	ND	ND
	H2 (Vol. %)	4.59	4.15

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. The measurement on 5/10/23 makes the fourth carbon monoxide measurement less than 100 ppmv, indicating that CO sampling frequency may be decreased to a monthly basis per 40 CFR 63.1961(a)(5)(viii). Continued weekly sampling is required at the other 8 wells.

Construction Activities

Thirteen of the 304 stainless steel LFG wells have been completed as of 5/31/23. During this monitoring period, EW-81, EW-82, EW-91, EW-96 and EW-36A were drilled. HC-01 was raised to accommodate the changes in topography from construction activities. The stainless-steel wellhead parts arrived and the contractor began assembly for installation and engineer QA review. EW-46 and EW-36 were cut, capped, and abandoned below grade after replacement extraction wells had been installed.

SCS-Field Services (SCS-FS) continued placing soil cover on the southwestern side of the sidewall odor mitigation system (SOMS) during the week of 5/15/23. SCS-FS continued placing soil on southeast side of the SOMS during the week of 5/22/23. The liner subcontractor, Chesapeake Containment, arrived at the end of this monitoring period to begin installation of the upper liner at

the northwest portion of the SOMS between the quarry entrance and the SOMS Phase I Pilot Study area.

Weekly SEM

SCS is continuing weekly surface emissions monitoring (SEM) per the Plan of Action Report dated 7/6/22. Two exceedances of the 500-ppmv threshold were recorded during the weekly SEM event held on 5/18/23, and three exceedances were recorded during the weekly event conducted on 5/25/23. 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 May. 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 additional weekly LFG wellfield monitoring on 5/15/23, 5/22/23 and 5/30/23, including 18 new CPVC wells and the pilot SOMS during this monitoring period. The O&M contractor replaced pumps in EW-52, EW-53, EW-54, EW-57, EW-58, EW-64, EW-68 and EW-94. The pump and wellhead was replaced at EW-49 and its corresponding temperature probe was also reinstalled.

Routine well and pump maintenance continued during this monitoring period. Spare pumps were cleaned and rebuilt on 5/16/23 and 5/25/23.

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	May	May	May	May	May	May	May	May	May	May	May	May	May	May	May		
Day	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Wednesday		
Date	16	17	18	19	20	21	22	23	24	25	26	27	28	29	31		
Well Number																	
35	69	80	81	85	89	92	84	77	79	83	75	77	84	91	84		
39	71	78	79	83	95	97	84	78	81	85	74	80	82	87	87		
40	111	172	127	179	92	94	89	79	80	82	78	76	79	79	91		
46	148	146	145	146	146	147	Being Replaced										
47	80	89	91	89	101	97	94	85	87	82	86	88	86	93	90		
29	105	105	107	111	107	104	111	112	112	114	110	111	113	116	117		
30R	128	129	127	129	124	121	129	126	128	127	125	128	126	121	123		
31R	153	159	174	134	133	135	183	180	181	180	177	179	182	177	176		
32	67	80	79	82	94	91	87	88	88	84	85	83	86	90	90		
33	123	123	123	123	126	123	122	123	122	123	123	122	122	116	123		
34	131	131	135	114	143	145	94	94	96	97	98	96	95	96	98		
36	Decommissioned																
37	152	157	154	149	136	133	174	172	165	164	164	165	170	167			
38	100	106	107	107	91	93	105	101	104	104	100	103	101	96	97		
41	72	81	83	85	87	90	99	96	96	98	96	98	97	99	92		
42	114	116	114	115	111	108	116	112	114	111	112	113	115	117	116		
48	68	82	79	84	76	74	88	90	92	90	91	89	92	97	98		
32R	121	121	120	122	122	121	121	122	121	122	121	122	121	123	123		
49	143	144	144	143	143	144	141	144	146	142	141	144	143	140	143		
50	108	108	112	113	118	117	115	115	115	16	116	115	116	117	120		
51	72	84	84	89	90	88	84	80	78	80	73	75	81	81	84		
52	141	173	132	155	127	126	129	143	145	136	165	149	152	160	134		
53	82	99	96	96	145	142	151	170	167	167	170	168	163	165	146		
54	147	170	160	170	136	134	151	133	173	157	130	135	143	147	124		
55	111	161	100	121	167	165	99	104	111	99	101	109	104	112	102		
56	126	129	128	132	129	228	133	131	133	133	130	132	133	131	135		
57	130	136	122	125	139	135	150	144	154	138	145	152	153	149	163		
58	115	121	116	120	102	97	120	98	94	96	92	97	111	99	100		
59	112	113	111	114	115	114	112	113	111	112	113	115	112	114	111		
60	108	133	106	108	130	128	110	122	110	110	131	128	124	128	126		
61	121	138	144	145	125	126	128	127	124	120	127	125	127	120	122		
62	118	118	118	119	124	123	120	119	119	120	119	118	120	118	120		
63	128	129	128	131	125	129	129	129	128	129	128	130	128	127	129		
64	138	139	138	138	130	131	138	131	132	132	131	136	138	134	131		
65	136	137	136	101	128	135	136	136	136	137	136	135	137	135	138		
66	110	112	122	121	116	118	123	113	121	122	119	123	122	120	121		
67	117	168	126	145	146	144	104	86	92	91	92	101	95	99	162		
68	121	133	129	135	127	125	127	132	139	137	133	140	136	139	131		

Attachment B
Laboratory Analytical Reports



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Certificate of Analysis

Final Report

Laboratory Order ID 23E1169

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	May 19, 2023 12:20
	4330 Lewis Road, Suite 1	Date Issued:	May 26, 2023 14:31
	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 05/19/2023 12:20. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

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.

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VELAP ID 460021



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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
89	23E1169-01	Air	05/18/2023 09:05	05/19/2023 12:20
37	23E1169-02	Air	05/18/2023 09:21	05/19/2023 12:20
31R	23E1169-03	Air	05/18/2023 09:28	05/19/2023 12:20
84	23E1169-04	Air	05/18/2023 08:33	05/19/2023 12:20
86	23E1169-05	Air	05/18/2023 08:40	05/19/2023 12:20
90	23E1169-06	Air	05/18/2023 08:48	05/19/2023 12:20
100	23E1169-07	Air	05/18/2023 08:56	05/19/2023 12:20



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 89
Sample ID: 23E1169-01
Sample Matrix: Air
Sampled: 5/18/2023 09:05
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00176::10094
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 4.0
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	906	90.0	90.0		9	1	5/24/23 10:52	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	0.73	0.45	0.45		9	1	5/24/23 10:52	MER
Carbon dioxide, as received	67.7	0.90	0.90		18	1	5/24/23 11:27	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/24/23 10:52	MER
Hydrogen (H2), as received	37.0	2.16	2.16		108	1	5/24/23 11:43	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/24/23 10:52	MER
Carbon Monoxide, as received	0.09	0.009	0.009		9	1	5/24/23 10:52	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	472000	7000	17500		1500000	22000	56000	35000	1	5/24/23 15:16	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	94.8				80-120					5/24/23 15:16	



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 37
Sample ID: 23E1169-02
Sample Matrix: Air
Sampled: 5/18/2023 09:21
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00194::11296
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	330	90.0	90.0		9	1	5/24/23 12:14	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	8.99	0.45	0.45		9	1	5/24/23 12:14	MER
Carbon dioxide, as received	30.6	0.45	0.45		9	1	5/24/23 12:14	MER
Oxygen (O2), as received	5.91	0.45	0.45		9	1	5/24/23 12:14	MER
Hydrogen (H2), as received	5.43	0.36	0.36		18	1	5/24/23 12:59	MER
Nitrogen (N2), as received	42.9	9.00	9.00		9	1	5/24/23 12:14	MER
Carbon Monoxide, as received	0.03	0.009	0.009		9	1	5/24/23 12:14	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	123000	1560	3890		390000	5000	12000	7780	1	5/24/23 16:48	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	89.4				80-120					5/24/23 16:48	



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 31R

Sample ID: 23E1169-03
Sample Matrix: Air
Sampled: 5/18/2023 09:28

Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00121::11317
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	209	90.0	90.0		9	1	5/24/23 13:30	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	9.33	0.45	0.45		9	1	5/24/23 13:30	MER
Carbon dioxide, as received	45.7	0.45	0.45		9	1	5/24/23 13:30	MER
Oxygen (O2), as received	6.42	0.45	0.45		9	1	5/24/23 13:30	MER
Hydrogen (H2), as received	3.77	0.18	0.18		9	1	5/24/23 13:30	MER
Nitrogen (N2), as received	29.3	9.00	9.00		9	1	5/24/23 13:30	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/24/23 13:30	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	333000	9330	23300		1100000	30000	75000	46700	1	5/25/23 11:06	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	92.2				80-120					5/25/23 11:06	



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Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 84
Sample ID: 23E1169-04
Sample Matrix: Air
Sampled: 5/18/2023 08:33
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00258::12420
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 4.0
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	478	90.0	90.0		9	1	5/24/23 14:25	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	13.6	0.45	0.45		9	1	5/24/23 14:25	MER
Carbon dioxide, as received	55.8	0.45	0.45		9	1	5/24/23 14:25	MER
Oxygen (O2), as received	0.51	0.45	0.45		9	1	5/24/23 14:25	MER
Hydrogen (H2), as received	11.2	1.08	1.08		54	1	5/24/23 16:01	MER
Nitrogen (N2), as received	17.2	9.00	9.00		9	1	5/24/23 14:25	MER
Carbon Monoxide, as received	0.05	0.009	0.009		9	1	5/24/23 14:25	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	211000	9330	23300		680000	30000	75000	46700	1	5/25/23 12:38	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	93.8				80-120					5/25/23 12:38	



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Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 86
Sample ID: 23E1169-05
Sample Matrix: Air
Sampled: 5/18/2023 08:40
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00249::12669
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 4.2
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	137	90.0	90.0		9	1	5/24/23 15:26	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	34.8	0.45	0.45		9	1	5/24/23 15:26	MER
Carbon dioxide, as received	48.9	0.45	0.45		9	1	5/24/23 15:26	MER
Oxygen (O2), as received	0.95	0.45	0.45		9	1	5/24/23 15:26	MER
Hydrogen (H2), as received	2.50	0.18	0.18		9	1	5/24/23 15:26	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/24/23 15:26	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/24/23 15:26	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	83900	2330	5830		270000	7500	19000	11700	1	5/25/23 14:09	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	90.0				80-120					5/25/23 14:09	



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Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 90
Sample ID: 23E1169-06
Sample Matrix: Air
Sampled: 5/18/2023 08:48
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00270::13369
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 4.0
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	131	90.0	90.0		9	1	5/24/23 16:52	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	36.7	0.45	0.45		9	1	5/24/23 16:52	MER
Carbon dioxide, as received	53.3	0.45	0.45		9	1	5/24/23 16:52	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/24/23 16:52	MER
Hydrogen (H2), as received	2.57	0.18	0.18		9	1	5/24/23 16:52	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/24/23 16:52	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/24/23 16:52	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	192000	4670	11700		610000	15000	37000	23300	1	5/25/23 15:41	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	92.8				80-120					5/25/23 15:41	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E1169

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 19, 2023 12:20
Date Issued: May 26, 2023 14:31

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 100
Sample ID: 23E1169-07
Sample Matrix: Air
Sampled: 5/18/2023 08:56
Sample Type: LG

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00373::13954
Canister Size: 1.4

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 3.8
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	ND	90.0	90.0		9	1	5/24/23 17:26	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	41.6	0.45	0.45		9	1	5/24/23 17:26	MER
Carbon dioxide, as received	48.1	0.45	0.45		9	1	5/24/23 17:26	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/24/23 17:26	MER
Hydrogen (H2), as received	4.59	0.36	0.36		18	1	5/24/23 18:01	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/24/23 17:26	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	5/24/23 17:26	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	27000	778	1940		86000	2500	6200	3890	1	5/25/23 17:13	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	84.6				80-120					5/25/23 17:13	



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Purchase Order: 07-SO04485

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	
23E1169-01	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-02	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-03	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-04	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-05	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-06	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-07	1.00 mL / 1.00 mL	ALT-145	BGE0963	SGE0920	AG00026
23E1169-01	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-01RE2	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-02	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-03	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-04	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-04RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-05	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-06	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-07	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	AG00026
23E1169-07RE1	1.00 mL / 1.00 mL	EPA 3C	BGE0963	SGE0920	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	
23E1169-01	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0950	AE30194
23E1169-02	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0950	AE30194
23E1169-03	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0964	AE30194
23E1169-04	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0964	AE30194
23E1169-05	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0964	AE30194
23E1169-06	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0964	AE30194
23E1169-07	400 mL / 400 mL	EPA TO-15	BGE0929	SGE0964	AE30194



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit Units			%REC	Limits			

Batch BGE0929 - No Prep VOC Air

Blank (BGE0929-BLK1)

Prepared & Analyzed: 05/23/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.74 ppbv 5.00 94.8 80-120

LCS (BGE0929-BS1)

Prepared & Analyzed: 05/23/2023

1,1,1-Trichloroethane	4.30	0.5	ppbv	5.00	86.0	70-130		
1,1,2,2-Tetrachloroethane	4.36	0.5	ppbv	5.00	87.2	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	3.04	0.5	ppbv	5.00	60.8	70-130		L
1,1,2-Trichloroethane	4.42	0.5	ppbv	5.00	88.4	70-130		
1,1-Dichloroethane	3.94	0.5	ppbv	5.00	78.8	70-130		
1,1-Dichloroethylene	4.07	0.5	ppbv	5.00	81.4	70-130		
1,2,4-Trimethylbenzene	4.48	0.5	ppbv	5.00	89.6	70-130		
1,2-Dibromoethane (EDB)	4.23	0.5	ppbv	5.00	84.6	70-130		
1,2-Dichlorobenzene	4.40	0.5	ppbv	5.00	88.0	70-130		
1,2-Dichloroethane	4.40	0.5	ppbv	5.00	88.0	70-130		
1,2-Dichloropropane	4.50	0.5	ppbv	5.00	90.0	70-130		
1,2-Dichlorotetrafluoroethane	4.31	0.5	ppbv	5.00	86.2	70-130		
1,3,5-Trimethylbenzene	4.30	0.5	ppbv	5.00	86.0	70-130		
1,3-Butadiene	4.23	0.5	ppbv	5.00	84.6	70-130		
1,3-Dichlorobenzene	4.25	0.5	ppbv	5.00	85.0	70-130		
1,4-Dichlorobenzene	4.30	0.5	ppbv	5.00	86.0	70-130		
1,4-Dioxane	4.56	0.5	ppbv	5.00	91.2	70-130		
2-Butanone (MEK)	4.03	0.5	ppbv	5.00	80.6	70-130		
4-Methyl-2-pentanone (MIBK)	4.53	0.5	ppbv	5.00	90.6	70-130		
Allyl chloride	4.05	0.5	ppbv	5.00	81.0	70-130		
Benzene	4.36	0.5	ppbv	5.00	87.2	70-130		
Benzyl Chloride	3.56	0.5	ppbv	5.00	71.2	70-130		
Bromodichloromethane	3.91	0.5	ppbv	5.00	78.2	70-130		
Bromoform	0.39	0.5	ppbv	5.00	7.80	70-130		L
Bromomethane	4.68	0.5	ppbv	5.00	93.6	70-130		
Carbon Disulfide	2.85	0.5	ppbv	5.00	57.0	70-130		L



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

Batch BGE0929 - No Prep VOC Air

LCS (BGE0929-BS1)

Prepared & Analyzed: 05/23/2023

Carbon Tetrachloride	4.24	0.5	ppbv	5.00	84.8	70-130			
Chlorobenzene	4.17	0.5	ppbv	5.00	83.4	70-130			
Chloroethane	4.28	0.5	ppbv	5.00	85.6	70-130			
Chloroform	4.00	0.5	ppbv	5.00	80.0	70-130			
Chloromethane	4.63	0.5	ppbv	5.00	92.6	70-130			
cis-1,2-Dichloroethylene	3.98	0.5	ppbv	5.00	79.6	70-130			
cis-1,3-Dichloropropene	4.65	0.5	ppbv	5.00	93.0	70-130			
Cyclohexane	4.52	0.5	ppbv	5.00	90.4	70-130			
Dichlorodifluoromethane	4.03	0.5	ppbv	5.00	80.6	70-130			
Ethyl acetate	3.92	0.5	ppbv	5.00	78.4	70-130			
Ethylbenzene	4.37	0.5	ppbv	5.00	87.4	70-130			
Heptane	4.74	0.5	ppbv	5.00	94.8	70-130			
Hexane	4.40	0.5	ppbv	5.00	88.0	70-130			
m+p-Xylenes	8.60	1	ppbv	10.0	86.0	70-130			
Methylene chloride	4.26	1	ppbv	5.00	85.2	70-130			
Methyl-t-butyl ether (MTBE)	4.10	0.5	ppbv	5.00	82.0	70-130			
Naphthalene	3.49	0.5	ppbv	5.00	69.8	60-140			
o-Xylene	4.27	0.5	ppbv	5.00	85.4	70-130			
Propylene	4.40	1	ppbv	5.00	88.0	70-130			
Styrene	4.35	0.5	ppbv	5.00	87.0	70-130			
Tetrachloroethylene (PCE)	4.02	0.5	ppbv	5.00	80.4	70-130			
Tetrahydrofuran	4.84	0.5	ppbv	5.00	96.8	70-130			
Toluene	4.54	0.5	ppbv	5.00	90.8	70-130			
trans-1,2-Dichloroethylene	3.43	0.5	ppbv	5.00	68.6	70-130			L
trans-1,3-Dichloropropene	4.14	0.5	ppbv	5.00	82.8	70-130			
Trichloroethylene	4.38	0.5	ppbv	5.00	87.6	70-130			
Trichlorofluoromethane	4.45	0.5	ppbv	5.00	89.0	70-130			
Vinyl acetate	4.25	0.5	ppbv	5.00	85.0	70-130			
Vinyl bromide	4.25	0.5	ppbv	5.00	85.0	70-130			
Vinyl chloride	4.38	0.5	ppbv	5.00	87.6	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.00		ppbv	5.00	100	70-130			



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			%REC	Limits	RPD	Limit	

Batch BGE0929 - No Prep VOC Air

LCS Dup (BGE0929-BSD1)

Prepared & Analyzed: 05/23/2023

Analyte	Result	Limit	Units	Spike Level	Source Result	%REC Limits	RPD	Limit	Qual
1,1,1-Trichloroethane	4.23	0.5	ppbv	5.00	84.6	70-130	1.64	25	
1,1,2,2-Tetrachloroethane	4.51	0.5	ppbv	5.00	90.2	70-130	3.38	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	3.10	0.5	ppbv	5.00	62.0	70-130	1.95	25	L
1,1,2-Trichloroethane	4.43	0.5	ppbv	5.00	88.6	70-130	0.226	25	
1,1-Dichloroethane	3.94	0.5	ppbv	5.00	78.8	70-130	0.00	25	
1,1-Dichloroethylene	4.51	0.5	ppbv	5.00	90.2	70-130	10.3	25	
1,2,4-Trimethylbenzene	4.58	0.5	ppbv	5.00	91.6	70-130	2.21	25	
1,2-Dibromoethane (EDB)	4.37	0.5	ppbv	5.00	87.4	70-130	3.26	25	
1,2-Dichlorobenzene	4.49	0.5	ppbv	5.00	89.8	70-130	2.02	25	
1,2-Dichloroethane	4.37	0.5	ppbv	5.00	87.4	70-130	0.684	25	
1,2-Dichloropropane	4.50	0.5	ppbv	5.00	90.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.27	0.5	ppbv	5.00	85.4	70-130	0.932	25	
1,3,5-Trimethylbenzene	4.47	0.5	ppbv	5.00	89.4	70-130	3.88	25	
1,3-Butadiene	4.28	0.5	ppbv	5.00	85.6	70-130	1.18	25	
1,3-Dichlorobenzene	4.42	0.5	ppbv	5.00	88.4	70-130	3.92	25	
1,4-Dichlorobenzene	4.41	0.5	ppbv	5.00	88.2	70-130	2.53	25	
1,4-Dioxane	4.60	0.5	ppbv	5.00	92.0	70-130	0.873	25	
2-Butanone (MEK)	4.07	0.5	ppbv	5.00	81.4	70-130	0.988	25	
4-Methyl-2-pentanone (MIBK)	4.59	0.5	ppbv	5.00	91.8	70-130	1.32	25	
Allyl chloride	4.31	0.5	ppbv	5.00	86.2	70-130	6.22	25	
Benzene	4.30	0.5	ppbv	5.00	86.0	70-130	1.39	25	
Benzyl Chloride	3.66	0.5	ppbv	5.00	73.2	70-130	2.77	25	
Bromodichloromethane	3.88	0.5	ppbv	5.00	77.6	70-130	0.770	25	
Bromoform	0.39	0.5	ppbv	5.00	7.80	70-130	0.00	25	L
Bromomethane	4.64	0.5	ppbv	5.00	92.8	70-130	0.858	25	
Carbon Disulfide	2.90	0.5	ppbv	5.00	58.0	70-130	1.74	25	L
Carbon Tetrachloride	4.16	0.5	ppbv	5.00	83.2	70-130	1.90	25	
Chlorobenzene	4.26	0.5	ppbv	5.00	85.2	70-130	2.14	25	
Chloroethane	4.20	0.5	ppbv	5.00	84.0	70-130	1.89	25	
Chloroform	3.99	0.5	ppbv	5.00	79.8	70-130	0.250	25	
Chloromethane	4.49	0.5	ppbv	5.00	89.8	70-130	3.07	25	
cis-1,2-Dichloroethylene	4.03	0.5	ppbv	5.00	80.6	70-130	1.25	25	
cis-1,3-Dichloropropene	4.59	0.5	ppbv	5.00	91.8	70-130	1.30	25	



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Units	Source Level	%REC		RPD		Qual
	Result	Limit			Result	%REC	Limits	RPD	

Batch BGE0929 - No Prep VOC Air

LCS Dup (BGE0929-BSD1)

Prepared & Analyzed: 05/23/2023

Cyclohexane	4.52	0.5	ppbv	5.00	90.4	70-130	0.00	25	
Dichlorodifluoromethane	4.10	0.5	ppbv	5.00	82.0	70-130	1.72	25	
Ethyl acetate	4.05	0.5	ppbv	5.00	81.0	70-130	3.26	25	
Ethylbenzene	4.50	0.5	ppbv	5.00	90.0	70-130	2.93	25	
Heptane	4.69	0.5	ppbv	5.00	93.8	70-130	1.06	25	
Hexane	4.36	0.5	ppbv	5.00	87.2	70-130	0.913	25	
m+p-Xylenes	8.81	1	ppbv	10.0	88.1	70-130	2.41	25	
Methylene chloride	4.51	1	ppbv	5.00	90.2	70-130	5.70	25	
Methyl-t-butyl ether (MTBE)	4.09	0.5	ppbv	5.00	81.8	70-130	0.244	25	
Naphthalene	3.61	0.5	ppbv	5.00	72.2	60-140	3.38	25	
o-Xylene	4.42	0.5	ppbv	5.00	88.4	70-130	3.45	25	
Propylene	2.21	1	ppbv	5.00	44.2	70-130	66.3	25	L, P
Styrene	4.51	0.5	ppbv	5.00	90.2	70-130	3.61	25	
Tetrachloroethylene (PCE)	4.10	0.5	ppbv	5.00	82.0	70-130	1.97	25	
Tetrahydrofuran	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Toluene	4.45	0.5	ppbv	5.00	89.0	70-130	2.00	25	
trans-1,2-Dichloroethylene	3.52	0.5	ppbv	5.00	70.4	70-130	2.59	25	
trans-1,3-Dichloropropene	4.15	0.5	ppbv	5.00	83.0	70-130	0.241	25	
Trichloroethylene	4.34	0.5	ppbv	5.00	86.8	70-130	0.917	25	
Trichlorofluoromethane	4.44	0.5	ppbv	5.00	88.8	70-130	0.225	25	
Vinyl acetate	4.30	0.5	ppbv	5.00	86.0	70-130	1.17	25	
Vinyl bromide	4.14	0.5	ppbv	5.00	82.8	70-130	2.62	25	
Vinyl chloride	4.37	0.5	ppbv	5.00	87.4	70-130	0.229	25	

Surr: 4-Bromofluorobenzene
(Surr)

5.17 ppbv 5.00 103 70-130



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

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0963 - No Prep VOC GC Air

Blank (BGE0963-BLK1)

Prepared & Analyzed: 05/24/2023

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 (BGE0963-BS1)

Prepared & Analyzed: 05/24/2023

Methane	4670	500	ppmv	5000	93.5	0-200			
Methane	4670	0.05	ppmv	5000	93.5	80-120			
Carbon dioxide	4760	500	ppmv	5000	95.2	0-200			
Carbon dioxide	4760	0.05	ppmv	5000	95.2	80-120			
Oxygen (O2)	5160	500	ppmv	5000	103	0-200			
Oxygen (O2)	5160	0.05	ppmv	5000	103	80-120			
Nitrogen (N2)	5460	2000	ppmv	5000	109	0-200			
Hydrogen (H2)	5780	200	ppmv	5100	113	0-200			
Hydrogen (H2)	5780	0.02	ppmv	5100	113	80-120			
Nitrogen (N2)	5460	1	ppmv	5000	109	80-120			
Carbon Monoxide	4890	10	ppmv	5000	97.7	0-200			
Carbon Monoxide	4890	0.001	ppmv	5000	97.7	80-120			

Duplicate (BGE0963-DUP1)

Source: 23E1169-01

Prepared & Analyzed: 05/24/2023

Methane	7270	4500	ppmv		7280	0.208	25		
Methane	0.73	0.45	Vol%		0.73	0.208	5		
Carbon dioxide	659000	4500	ppmv		657000	0.215	25		
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)	377000	1800	ppmv		377000	0.0221	25		
Nitrogen (N2)	<	18000	ppmv		<18000	NA	25		
Carbon Monoxide	906	90.0	ppmv		906	0.0397	25		
Carbon Monoxide	0.09	0.009	Vol%		0.09	0.0397	5		



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Certificate of Analysis

Final Report

Laboratory Order ID 23E1169

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 19, 2023 12:20
Date Issued: May 26, 2023 14:31

Harrisburg, PA 17111

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	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0963 - No Prep VOC GC Air

Duplicate (BGE0963-DUP2)			Source: 23E1169-02	Prepared & Analyzed: 05/24/2023		
Methane	8.94	0.45	Vol%	8.99	0.560	5
Methane	89400	4500	ppmv	89900	0.560	25
Carbon dioxide	306000	4500	ppmv	306000	0.0764	25
Carbon dioxide	30.6	0.45	Vol%	30.6	0.0764	5
Oxygen (O2)	59000	4500	ppmv	59100	0.206	25
Oxygen (O2)	5.90	0.45	Vol%	5.91	0.206	5
Hydrogen (H2)	54700	1800	ppmv	54800	0.187	25
Nitrogen (N2)	42.8	9.00	Vol%	42.9	0.189	5
Nitrogen (N2)	428000	18000	ppmv	429000	0.189	25
Carbon Monoxide	328	90.0	ppmv	330	0.465	25
Carbon Monoxide	0.03	0.009	Vol%	0.03	0.465	5
Duplicate (BGE0963-DUP3)			Source: 23E1169-03	Prepared & Analyzed: 05/24/2023		
Methane	92500	4500	ppmv	93300	0.863	25
Methane	9.25	0.45	Vol%	9.33	0.863	5
Carbon dioxide	451000	4500	ppmv	457000	1.27	25
Carbon dioxide	45.1	0.45	Vol%	45.7	1.27	5
Oxygen (O2)	64800	4500	ppmv	64200	0.904	25
Oxygen (O2)	6.48	0.45	Vol%	6.42	0.904	5
Nitrogen (N2)	294000	18000	ppmv	293000	0.473	25
Nitrogen (N2)	29.4	9.00	Vol%	29.3	0.473	5
Hydrogen (H2)	38200	1800	ppmv	37700	1.31	25
Hydrogen (H2)	3.82	0.18	Vol%	3.77	1.31	5
Carbon Monoxide	207	90.0	ppmv	209	1.08	25
Carbon Monoxide	0.02	0.009	Vol%	0.02	1.08	5
Duplicate (BGE0963-DUP4)			Source: 23E1169-04	Prepared & Analyzed: 05/24/2023		
Methane	13.6	0.45	Vol%	13.6	0.284	5
Methane	136000	4500	ppmv	136000	0.284	25
Carbon dioxide	557000	4500	ppmv	558000	0.0839	25
Carbon dioxide	55.7	0.45	Vol%	55.8	0.0838	5
Oxygen (O2)	5100	4500	ppmv	5100	0.0423	25
Oxygen (O2)	0.51	0.45	Vol%	0.51	0.0423	5
Nitrogen (N2)	172000	18000	ppmv	172000	0.0873	25
Hydrogen (H2)	112000	1800	ppmv	111000	1.12	25



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4330 Lewis Road, Suite 1

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Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

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

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0963 - No Prep VOC GC Air

Duplicate (BGE0963-DUP4)			Source: 23E1169-04	Prepared & Analyzed: 05/24/2023		
Nitrogen (N2)	17.2	9.00	Vol%	17.2	0.0873	5
Carbon Monoxide	477	90.0	ppmv	478	0.151	25
Carbon Monoxide	0.05	0.009	Vol%	0.05	0.151	5

Duplicate (BGE0963-DUP5)			Source: 23E1169-05	Prepared & Analyzed: 05/24/2023		
Methane	346000	4500	ppmv	348000	0.629	25
Methane	34.6	0.45	Vol%	34.8	0.629	5
Carbon dioxide	489000	4500	ppmv	489000	0.0306	25
Carbon dioxide	48.9	0.45	Vol%	48.9	0.0306	5
Oxygen (O2)	0.94	0.45	Vol%	0.95	0.652	5
Oxygen (O2)	9430	4500	ppmv	9500	0.652	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Hydrogen (H2)	25300	1800	ppmv	25000	1.33	25
Hydrogen (H2)	2.53	0.18	Vol%	2.50	1.33	5
Nitrogen (N2)	64600	18000	ppmv	65000	0.497	25
Carbon Monoxide	137	90.0	ppmv	137	0.329	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	0.329	5

Duplicate (BGE0963-DUP6)			Source: 23E1169-06	Prepared & Analyzed: 05/24/2023		
Methane	36.6	0.45	Vol%	36.7	0.463	5
Methane	366000	4500	ppmv	367000	0.463	25
Carbon dioxide	526000	4500	ppmv	533000	1.17	25
Carbon dioxide	52.6	0.45	Vol%	53.3	1.17	5
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)	2.58	0.18	Vol%	2.57	0.411	5
Hydrogen (H2)	25800	1800	ppmv	25700	0.411	25
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	4.06	5
Carbon Monoxide	126	90.0	ppmv	131	4.06	25



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Certificate of Analysis

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Laboratory Order ID 23E1169

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4330 Lewis Road, Suite 1

Date Received: May 19, 2023 12:20
Date Issued: May 26, 2023 14:31

Harrisburg, PA 17111

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	Reporting		Spike Level	Source Result	%REC		RPD	RPD	Limit	Qual
	Result	Limit			Units	%REC				

Batch BGE0963 - No Prep VOC GC Air

Duplicate (BGE0963-DUP7)	Source: 23E1169-07			Prepared & Analyzed: 05/24/2023		
Methane	418000	4500	ppmv	416000	0.487	25
Methane	41.8	0.45	Vol%	41.6	0.487	5
Carbon dioxide	483000	4500	ppmv	481000	0.461	25
Carbon dioxide	48.3	0.45	Vol%	48.1	0.461	5
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)	45700	1800	ppmv	46000	0.640	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5

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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Certificate of Analysis

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	Harrisburg, PA 17111	Date Issued:	May 26, 2023 14:31
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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 #T104704	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
 - P Duplicate analysis does not meet the acceptance criteria for precision
 - RPD Relative Percent Difference
 - Qual Qualifiers
 - 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 $\pm 10\%$ of the absolute.

**AIR ANALYSIS
CHAIN OF CUSTODY**

Equipment due 6/15/2023

Page 1 of 3

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. #:		Turn Around Time: Circle: 10 5 Days or ___ Day(s)	
SAMPLER NAME (PRINT): LOGAN CULHANE		SAMPLER SIGNATURE:	

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other _____

063-23E-0009

CLIENT SAMPLE I.D.	Regulator Info		Canister Information					Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS		
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F		Alt 145 CO	3C	TO-15 Benzene only
1) 89			10094	1.4	230504-01	30	4.0	5/19	9:02	30	146.5	5/19	9:05	10	146.8	LG	x	x	x
2) 37			11296	1.4	230504-01	30	4.6	5/18	9:18	30	158.9	5/18	9:21	10	158.8	LG	x	x	x
3) 31R			11317	1.4	230504-01	30	4.6	5/18	9:25	30	165.6	5/18	9:28	10	165	LG	x	x	x
4) NOT SAMPLED			11322	1.4	230504-01	30										LG	x	x	x

RELINQUISHED:	RECEIVED:	DATE / TIME:	QC Data Package
			Level I <input type="checkbox"/>
RELINQUISHED: 5/18 4:15	RECEIVED:	DATE / TIME:	Level II <input type="checkbox"/>
RELINQUISHED: Fides G	RECEIVED:	DATE / TIME: 5-19-23 12:20	Level III <input type="checkbox"/>
			Level IV <input type="checkbox"/>

LAB USE ONLY 20.2% no ICE
310 NO Seal


**SCS Field Services 23E1169
Bristol**

Recd: 05/19/2023 Due: 05/26/2023

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 6/15/2023

Page 2 of 3

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. #:		Turn Around Time: Circle: 10 5 Days or __ Day(s)	
SAMPLER NAME (PRINT): LOGAN CUCHANE		SAMPLER SIGNATURE: 	
Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other		063-23E-0009	

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)		Ending Sample Temp °F	Alt 145 CO	3C	TO-15 Benzene only
1) 84			12420	1.4	230504-01	30	4.0	5/18	8:30	30	179.7	5/18	8:33	10	179.6	LG	x	x	x
2) 86			12669	1.4	230504-01	30	4.2	5/18	8:38	30	151.2	5/18	8:40	10	151.3	LG	x	x	x
3) 90			13369	1.4	230504-01	30	4.0	5/18	8:45	30	151.7	5/18	8:48	10	151.7	LG	x	x	x
4) 100			13954	1.4	230504-01	30	3.8	5/18	8:54	30	158.7	5/18	8:56	10	158.7	LG	x	x	x

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME	QC Data Package
	5/18 4:15			Level I <input type="checkbox"/>
				Level II <input type="checkbox"/>
				Level III <input type="checkbox"/>
				Level IV <input type="checkbox"/>

LAB USE ONLY 20.2 °C 117 FC
310 115041

SCS Field Services 23E1169
Bristol

Recd: 05/19/2023 Due: 05/26/2023



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Certificate of Analysis Final Report

Laboratory Order ID 23E1169

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received:	May 19, 2023 12:20
		Date Issued:	May 26, 2023 14:31
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	20.20°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 23E1343

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	May 24, 2023 11:15
	4330 Lewis Road, Suite 1	Date Issued:	June 1, 2023 16:58
	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 05/24/2023 11:15. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

A handwritten signature in black ink that reads 'Ted Soyars'.

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.

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Certificate of Analysis

Final Report

Laboratory Order ID 23E1343

Client Name: SCS Field Services - Harrisburg, PA Date Received: May 24, 2023 11:15
4330 Lewis Road, Suite 1 Date Issued: June 1, 2023 16:58
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	23E1343-01	Air	05/23/2023 09:45	05/24/2023 11:15
86	23E1343-02	Air	05/23/2023 09:55	05/24/2023 11:15
90	23E1343-03	Air	05/23/2023 10:00	05/24/2023 11:15
100	23E1343-04	Air	05/23/2023 10:05	05/24/2023 11:15
54	23E1343-05	Air	05/23/2023 10:22	05/24/2023 11:15
31R	23E1343-06	Air	05/23/2023 10:38	05/24/2023 11:15
37	23E1343-07	Air	05/23/2023 10:43	05/24/2023 11:15



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4330 Lewis Road, Suite 1

Date Received: May 24, 2023 11:15
Date Issued: June 1, 2023 16:58

Harrisburg, PA 17111

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: 23E1343-01
Sample Matrix: Air
Sampled: 5/23/2023 09:45
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00113::289
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	409	90.0	90.0		9	1	5/26/23 10:13	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	12.7	0.45	0.45		9	1	5/26/23 10:13	MER
Carbon dioxide, as received	50.0	0.45	0.45		9	1	5/26/23 10:13	MER
Oxygen (O2), as received	1.28	0.45	0.45		9	1	5/26/23 10:13	MER
Hydrogen (H2), as received	9.03	0.54	0.54		27	1	5/26/23 11:24	MER
Nitrogen (N2), as received	20.9	9.00	9.00		9	1	5/26/23 10:13	MER
Carbon Monoxide, as received	0.04	0.009	0.009		9	1	5/26/23 10:13	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	198000	10500	26200		630000	34000	84000	52500	1	5/30/23 11:29	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	92.0				80-120					5/30/23 11:29	



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Harrisburg, PA 17111

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: 23E1343-02
Sample Matrix: Air
Sampled: 5/23/2023 09:55
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00248::00307
Canister Size: 1.4L

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg): 5.4
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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	137	90.0	90.0		9	1	5/26/23 10:46	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	32.9	0.45	0.45		9	1	5/26/23 10:46	MER
Carbon dioxide, as received	46.0	0.45	0.45		9	1	5/26/23 10:46	MER
Oxygen (O2), as received	1.76	0.45	0.45		9	1	5/26/23 10:46	MER
Hydrogen (H2), as received	2.30	0.18	0.18		9	1	5/26/23 10:46	MER
Nitrogen (N2), as received	9.59	9.00	9.00		9	1	5/26/23 10:46	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/26/23 10:46	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	88500	2330	5830		280000	7500	19000	11700	1	5/30/23 13:01	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	90.8				80-120					5/30/23 13:01	



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Laboratory Order ID 23E1343

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 24, 2023 11:15
Date Issued: June 1, 2023 16:58

Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 90
Sample ID: 23E1343-03
Sample Matrix: Air
Sampled: 5/23/2023 10:00
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00120::10048
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	126	90.0	90.0		9	1	5/26/23 11:56	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	36.5	0.45	0.45		9	1	5/26/23 11:56	MER
Carbon dioxide, as received	51.5	0.45	0.45		9	1	5/26/23 11:56	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/26/23 11:56	MER
Hydrogen (H2), as received	2.38	0.18	0.18		9	1	5/26/23 11:56	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/26/23 11:56	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	5/26/23 11:56	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	197000	4670	11700		630000	15000	37000	23300	1	5/30/23 14:33	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	87.6				80-120					5/30/23 14:33	



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ANALYTICAL RESULTS

Project Location:
Field Sample #: 100
Sample ID: 23E1343-04
Sample Matrix: Air
Sampled: 5/23/2023 10:05
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00180::11076
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	ND	90.0	90.0		9	1	5/26/23 12:51	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	39.2	0.45	0.45		9	1	5/26/23 12:51	MER
Carbon dioxide, as received	45.4	0.45	0.45		9	1	5/26/23 12:51	MER
Oxygen (O2), as received	ND	0.45	0.45		9	1	5/26/23 12:51	MER
Hydrogen (H2), as received	4.15	0.18	0.18		9	1	5/26/23 12:51	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/26/23 12:51	MER
Carbon Monoxide, as received	ND	0.009	0.009		9	1	5/26/23 12:51	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	30100	778	1940		96000	2500	6200	3890	1	5/30/23 16:04	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	96.0				80-120					5/30/23 16:04	



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ANALYTICAL RESULTS

Project Location:
Field Sample #: 54
Sample ID: 23E1343-05
Sample Matrix: Air
Sampled: 5/23/2023 10:22
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00052::11299
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Carbon Monoxide, as received	218	90.0	90.0		9	1	5/26/23	13:42	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time		Analyst
	Result	MDL	LOQ				Analized		
Methane, as received	22.8	0.45	0.45		9	1	5/26/23	13:42	MER
Carbon dioxide, as received	56.7	0.45	0.45		9	1	5/26/23	13:42	MER
Oxygen (O2), as received	0.75	0.45	0.45		9	1	5/26/23	13:42	MER
Hydrogen (H2), as received	10.6	0.72	0.72		36	1	5/26/23	14:17	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	5/26/23	13:42	MER
Carbon Monoxide, as received	0.02	0.009	0.009		9	1	5/26/23	13:42	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time		
	Results	MDL	LOQ		Results	MDL	LOQ			Analized		
Benzene	168000	14000	35000		540000	45000	110000	70000	1	5/30/23	17:35	DFH
Surrogate(s)	% Recovery				% Recovery Limits							
4-Bromofluorobenzene (Surr)	89.4				80-120					5/30/23	17:35	



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Client Site I.D.: Bristol

Purchase Order: 07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 31R
Sample ID: 23E1343-06
Sample Matrix: Air
Sampled: 5/23/2023 10:38
Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00090::11303
Canister Size: 1.4L

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			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	473	90.0	90.0		9	1	5/26/23 14:49	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	7.69	0.45	0.45		9	1	5/26/23 14:49	MER
Carbon dioxide, as received	51.6	0.45	0.45		9	1	5/26/23 14:49	MER
Oxygen (O2), as received	4.94	0.45	0.45		9	1	5/26/23 14:49	MER
Hydrogen (H2), as received	9.53	0.54	0.54		27	1	5/26/23 15:24	MER
Nitrogen (N2), as received	17.8	9.00	9.00		9	1	5/26/23 14:49	MER
Carbon Monoxide, as received	0.05	0.009	0.009		9	1	5/26/23 14:49	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	463000	10500	26200		1500000	34000	84000	52500	1	5/30/23 19:07	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	95.0				80-120					5/30/23 19:07	



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	Harrisburg, PA 17111	Date Issued:	June 1, 2023 16:58
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:	Sample Description/Location:	Initial Vacuum(in Hg): 30
Field Sample #: 37	Sub Description/Location:	Final Vacuum(in Hg): 5.6
Sample ID: 23E1343-07	Canister ID: 063-00003::12662	Receipt Vacuum(in Hg):
Sample Matrix: Air	Canister Size: 1.4L	Flow Controller Type: Passive
Sampled: 5/23/2023 10:43		Flow Controller ID:
Sample Type: LV		

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

Analyte	ppmv			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Carbon Monoxide, as received	345	90.0	90.0		9	1	5/26/23 16:46	MER

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

Analyte	Vol%			Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
	Result	MDL	LOQ					
Methane, as received	11.3	0.45	0.45		9	1	5/26/23 16:46	MER
Carbon dioxide, as received	39.6	0.45	0.45		9	1	5/26/23 16:46	MER
Oxygen (O2), as received	2.68	0.45	0.45		9	1	5/26/23 16:46	MER
Hydrogen (H2), as received	6.47	0.36	0.36		18	1	5/26/23 17:28	MER
Nitrogen (N2), as received	30.1	9.00	9.00		9	1	5/26/23 16:46	MER
Carbon Monoxide, as received	0.03	0.009	0.009		9	1	5/26/23 16:46	MER

Volatile Organic Compounds by GCMS EPA TO-15

Analyte	ppbv			Flag/Qual	ug/M ³			Dilution	PF	Date/Time Analyzed	Analyst
	Results	MDL	LOQ		Results	MDL	LOQ				
Benzene	207000	4670	11700		660000	15000	37000	23300	1	5/31/23 11:17	DFH
Surrogate(s)	% Recovery				% Recovery Limits						
4-Bromofluorobenzene (Surr)	89.8				80-120					5/31/23 11:17	



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Harrisburg, PA 17111

Submitted To: Tom Lock

Project Number: 07223016.00

Client Site I.D.: Bristol

Purchase Order: 07-SO04485

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	
23E1343-01	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-02	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-03	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-04	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-05	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-06	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-07	1.00 mL / 1.00 mL	ALT-145	BGE1066	SGE1021	AG00026
23E1343-01	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-02	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-03	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-04	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-05	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-05RE1	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-06	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-06RE1	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-07	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	AG00026
23E1343-07RE1	1.00 mL / 1.00 mL	EPA 3C	BGE1066	SGE1021	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	
23E1343-01	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-02	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-03	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-04	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-05	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-06	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1081	AE30194
23E1343-07	400 mL / 400 mL	EPA TO-15	BGE0929	SGE1137	AE30194



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE0929 - No Prep VOC Air

Blank (BGE0929-BLK1)

Prepared & Analyzed: 05/23/2023

Benzene < 0.50 ppbv

Surr: 4-Bromofluorobenzene (Surr) 4.74 ppbv 5.00 94.8 80-120

LCS (BGE0929-BS1)

Prepared & Analyzed: 05/23/2023

1,1,1-Trichloroethane	4.30	0.5	ppbv	5.00	86.0	70-130		
1,1,2,2-Tetrachloroethane	4.36	0.5	ppbv	5.00	87.2	70-130		
1,1,2-Trichloro-1,2,2-trifluoroethane	3.04	0.5	ppbv	5.00	60.8	70-130		L
1,1,2-Trichloroethane	4.42	0.5	ppbv	5.00	88.4	70-130		
1,1-Dichloroethane	3.94	0.5	ppbv	5.00	78.8	70-130		
1,1-Dichloroethylene	4.07	0.5	ppbv	5.00	81.4	70-130		
1,2,4-Trimethylbenzene	4.48	0.5	ppbv	5.00	89.6	70-130		
1,2-Dibromoethane (EDB)	4.23	0.5	ppbv	5.00	84.6	70-130		
1,2-Dichlorobenzene	4.40	0.5	ppbv	5.00	88.0	70-130		
1,2-Dichloroethane	4.40	0.5	ppbv	5.00	88.0	70-130		
1,2-Dichloropropane	4.50	0.5	ppbv	5.00	90.0	70-130		
1,2-Dichlorotetrafluoroethane	4.31	0.5	ppbv	5.00	86.2	70-130		
1,3,5-Trimethylbenzene	4.30	0.5	ppbv	5.00	86.0	70-130		
1,3-Butadiene	4.23	0.5	ppbv	5.00	84.6	70-130		
1,3-Dichlorobenzene	4.25	0.5	ppbv	5.00	85.0	70-130		
1,4-Dichlorobenzene	4.30	0.5	ppbv	5.00	86.0	70-130		
1,4-Dioxane	4.56	0.5	ppbv	5.00	91.2	70-130		
2-Butanone (MEK)	4.03	0.5	ppbv	5.00	80.6	70-130		
4-Methyl-2-pentanone (MIBK)	4.53	0.5	ppbv	5.00	90.6	70-130		
Allyl chloride	4.05	0.5	ppbv	5.00	81.0	70-130		
Benzene	4.36	0.5	ppbv	5.00	87.2	70-130		
Benzyl Chloride	3.56	0.5	ppbv	5.00	71.2	70-130		
Bromodichloromethane	3.91	0.5	ppbv	5.00	78.2	70-130		
Bromoform	0.39	0.5	ppbv	5.00	7.80	70-130		L
Bromomethane	4.68	0.5	ppbv	5.00	93.6	70-130		
Carbon Disulfide	2.85	0.5	ppbv	5.00	57.0	70-130		L



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0929 - No Prep VOC Air

LCS (BGE0929-BS1)

Prepared & Analyzed: 05/23/2023

Carbon Tetrachloride	4.24	0.5	ppbv	5.00	84.8	70-130			
Chlorobenzene	4.17	0.5	ppbv	5.00	83.4	70-130			
Chloroethane	4.28	0.5	ppbv	5.00	85.6	70-130			
Chloroform	4.00	0.5	ppbv	5.00	80.0	70-130			
Chloromethane	4.63	0.5	ppbv	5.00	92.6	70-130			
cis-1,2-Dichloroethylene	3.98	0.5	ppbv	5.00	79.6	70-130			
cis-1,3-Dichloropropene	4.65	0.5	ppbv	5.00	93.0	70-130			
Cyclohexane	4.52	0.5	ppbv	5.00	90.4	70-130			
Dichlorodifluoromethane	4.03	0.5	ppbv	5.00	80.6	70-130			
Ethyl acetate	3.92	0.5	ppbv	5.00	78.4	70-130			
Ethylbenzene	4.37	0.5	ppbv	5.00	87.4	70-130			
Heptane	4.74	0.5	ppbv	5.00	94.8	70-130			
Hexane	4.40	0.5	ppbv	5.00	88.0	70-130			
m+p-Xylenes	8.60	1	ppbv	10.0	86.0	70-130			
Methylene chloride	4.26	1	ppbv	5.00	85.2	70-130			
Methyl-t-butyl ether (MTBE)	4.10	0.5	ppbv	5.00	82.0	70-130			
Naphthalene	3.49	0.5	ppbv	5.00	69.8	60-140			
o-Xylene	4.27	0.5	ppbv	5.00	85.4	70-130			
Propylene	4.40	1	ppbv	5.00	88.0	70-130			
Styrene	4.35	0.5	ppbv	5.00	87.0	70-130			
Tetrachloroethylene (PCE)	4.02	0.5	ppbv	5.00	80.4	70-130			
Tetrahydrofuran	4.84	0.5	ppbv	5.00	96.8	70-130			
Toluene	4.54	0.5	ppbv	5.00	90.8	70-130			
trans-1,2-Dichloroethylene	3.43	0.5	ppbv	5.00	68.6	70-130			L
trans-1,3-Dichloropropene	4.14	0.5	ppbv	5.00	82.8	70-130			
Trichloroethylene	4.38	0.5	ppbv	5.00	87.6	70-130			
Trichlorofluoromethane	4.45	0.5	ppbv	5.00	89.0	70-130			
Vinyl acetate	4.25	0.5	ppbv	5.00	85.0	70-130			
Vinyl bromide	4.25	0.5	ppbv	5.00	85.0	70-130			
Vinyl chloride	4.38	0.5	ppbv	5.00	87.6	70-130			
Surr: 4-Bromofluorobenzene (Surr)	5.00		ppbv	5.00	100	70-130			



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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0929 - No Prep VOC Air

LCS Dup (BGE0929-BSD1)

Prepared & Analyzed: 05/23/2023

Analyte	Result	Limit	Units	Spike Level	Source Result	%REC	Limits	RPD	Limit	Qual
1,1,1-Trichloroethane	4.23	0.5	ppbv	5.00		84.6	70-130	1.64	25	
1,1,2,2-Tetrachloroethane	4.51	0.5	ppbv	5.00		90.2	70-130	3.38	25	
1,1,2-Trichloro-1,2,2-trifluoroethane	3.10	0.5	ppbv	5.00		62.0	70-130	1.95	25	L
1,1,2-Trichloroethane	4.43	0.5	ppbv	5.00		88.6	70-130	0.226	25	
1,1-Dichloroethane	3.94	0.5	ppbv	5.00		78.8	70-130	0.00	25	
1,1-Dichloroethylene	4.51	0.5	ppbv	5.00		90.2	70-130	10.3	25	
1,2,4-Trimethylbenzene	4.58	0.5	ppbv	5.00		91.6	70-130	2.21	25	
1,2-Dibromoethane (EDB)	4.37	0.5	ppbv	5.00		87.4	70-130	3.26	25	
1,2-Dichlorobenzene	4.49	0.5	ppbv	5.00		89.8	70-130	2.02	25	
1,2-Dichloroethane	4.37	0.5	ppbv	5.00		87.4	70-130	0.684	25	
1,2-Dichloropropane	4.50	0.5	ppbv	5.00		90.0	70-130	0.00	25	
1,2-Dichlorotetrafluoroethane	4.27	0.5	ppbv	5.00		85.4	70-130	0.932	25	
1,3,5-Trimethylbenzene	4.47	0.5	ppbv	5.00		89.4	70-130	3.88	25	
1,3-Butadiene	4.28	0.5	ppbv	5.00		85.6	70-130	1.18	25	
1,3-Dichlorobenzene	4.42	0.5	ppbv	5.00		88.4	70-130	3.92	25	
1,4-Dichlorobenzene	4.41	0.5	ppbv	5.00		88.2	70-130	2.53	25	
1,4-Dioxane	4.60	0.5	ppbv	5.00		92.0	70-130	0.873	25	
2-Butanone (MEK)	4.07	0.5	ppbv	5.00		81.4	70-130	0.988	25	
4-Methyl-2-pentanone (MIBK)	4.59	0.5	ppbv	5.00		91.8	70-130	1.32	25	
Allyl chloride	4.31	0.5	ppbv	5.00		86.2	70-130	6.22	25	
Benzene	4.30	0.5	ppbv	5.00		86.0	70-130	1.39	25	
Benzyl Chloride	3.66	0.5	ppbv	5.00		73.2	70-130	2.77	25	
Bromodichloromethane	3.88	0.5	ppbv	5.00		77.6	70-130	0.770	25	
Bromoform	0.39	0.5	ppbv	5.00		7.80	70-130	0.00	25	L
Bromomethane	4.64	0.5	ppbv	5.00		92.8	70-130	0.858	25	
Carbon Disulfide	2.90	0.5	ppbv	5.00		58.0	70-130	1.74	25	L
Carbon Tetrachloride	4.16	0.5	ppbv	5.00		83.2	70-130	1.90	25	
Chlorobenzene	4.26	0.5	ppbv	5.00		85.2	70-130	2.14	25	
Chloroethane	4.20	0.5	ppbv	5.00		84.0	70-130	1.89	25	
Chloroform	3.99	0.5	ppbv	5.00		79.8	70-130	0.250	25	
Chloromethane	4.49	0.5	ppbv	5.00		89.8	70-130	3.07	25	
cis-1,2-Dichloroethylene	4.03	0.5	ppbv	5.00		80.6	70-130	1.25	25	
cis-1,3-Dichloropropene	4.59	0.5	ppbv	5.00		91.8	70-130	1.30	25	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E1343

Client Name: SCS Field Services - Harrisburg, PA
4330 Lewis Road, Suite 1

Date Received: May 24, 2023 11:15
Date Issued: June 1, 2023 16:58

Harrisburg, PA 17111

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	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE0929 - No Prep VOC Air

LCS Dup (BGE0929-BSD1)

Prepared & Analyzed: 05/23/2023

Cyclohexane	4.52	0.5	ppbv	5.00	90.4	70-130	0.00	25	
Dichlorodifluoromethane	4.10	0.5	ppbv	5.00	82.0	70-130	1.72	25	
Ethyl acetate	4.05	0.5	ppbv	5.00	81.0	70-130	3.26	25	
Ethylbenzene	4.50	0.5	ppbv	5.00	90.0	70-130	2.93	25	
Heptane	4.69	0.5	ppbv	5.00	93.8	70-130	1.06	25	
Hexane	4.36	0.5	ppbv	5.00	87.2	70-130	0.913	25	
m+p-Xylenes	8.81	1	ppbv	10.0	88.1	70-130	2.41	25	
Methylene chloride	4.51	1	ppbv	5.00	90.2	70-130	5.70	25	
Methyl-t-butyl ether (MTBE)	4.09	0.5	ppbv	5.00	81.8	70-130	0.244	25	
Naphthalene	3.61	0.5	ppbv	5.00	72.2	60-140	3.38	25	
o-Xylene	4.42	0.5	ppbv	5.00	88.4	70-130	3.45	25	
Propylene	2.21	1	ppbv	5.00	44.2	70-130	66.3	25	L, P
Styrene	4.51	0.5	ppbv	5.00	90.2	70-130	3.61	25	
Tetrachloroethylene (PCE)	4.10	0.5	ppbv	5.00	82.0	70-130	1.97	25	
Tetrahydrofuran	4.77	0.5	ppbv	5.00	95.4	70-130	1.46	25	
Toluene	4.45	0.5	ppbv	5.00	89.0	70-130	2.00	25	
trans-1,2-Dichloroethylene	3.52	0.5	ppbv	5.00	70.4	70-130	2.59	25	
trans-1,3-Dichloropropene	4.15	0.5	ppbv	5.00	83.0	70-130	0.241	25	
Trichloroethylene	4.34	0.5	ppbv	5.00	86.8	70-130	0.917	25	
Trichlorofluoromethane	4.44	0.5	ppbv	5.00	88.8	70-130	0.225	25	
Vinyl acetate	4.30	0.5	ppbv	5.00	86.0	70-130	1.17	25	
Vinyl bromide	4.14	0.5	ppbv	5.00	82.8	70-130	2.62	25	
Vinyl chloride	4.37	0.5	ppbv	5.00	87.4	70-130	0.229	25	

Surr: 4-Bromofluorobenzene
(Surr)

5.17 ppbv 5.00 103 70-130



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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	Reporting		Spike Level	Source Result	%REC		RPD		Qual
	Result	Limit			Units	%REC	Limits	RPD	

Batch BGE1066 - No Prep VOC GC Air

Blank (BGE1066-BLK1)

Prepared & Analyzed: 05/26/2023

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 (BGE1066-BS1)

Prepared & Analyzed: 05/26/2023

Methane	4160	500	ppmv	5000	83.3	0-200
Methane	4160	0.05	ppmv	5000	83.3	80-120
Carbon dioxide	4520	500	ppmv	5000	90.4	0-200
Carbon dioxide	4520	0.05	ppmv	5000	90.4	80-120
Oxygen (O2)	5170	500	ppmv	5000	103	0-200
Oxygen (O2)	5170	0.05	ppmv	5000	103	80-120
Hydrogen (H2)	5940	200	ppmv	5100	116	0-200
Hydrogen (H2)	5940	0.02	ppmv	5100	116	80-120
Nitrogen (N2)	5480	2000	ppmv	5000	110	0-200
Nitrogen (N2)	5480	1	ppmv	5000	110	80-120
Carbon Monoxide	4890	10	ppmv	5000	97.9	0-200
Carbon Monoxide	4890	0.001	ppmv	5000	97.9	80-120

Duplicate (BGE1066-DUP1)

Source: 23E1000-01

Prepared & Analyzed: 05/26/2023

Methane	41.1	0.45	Vol%	41.4	0.856	5
Methane	411000	4500	ppmv	414000	0.856	25
Carbon dioxide	400000	4500	ppmv	402000	0.409	25
Carbon dioxide	40.0	0.45	Vol%	40.2	0.409	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
Hydrogen (H2)	102000	1800	ppmv	102000	0.0668	25
Carbon Monoxide	<	0.009	Vol%	<0.009	NA	5
Carbon Monoxide	<	90.0	ppmv	<90.0	NA	25



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Certificate of Analysis

Final Report

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4330 Lewis Road, Suite 1

Date Received: May 24, 2023 11:15
Date Issued: June 1, 2023 16:58

Harrisburg, PA 17111

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	Reporting		Spike Level	Source Result	%REC		RPD	RPD Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE1066 - No Prep VOC GC Air

Duplicate (BGE1066-DUP2)			Source: 23E1343-01	Prepared & Analyzed: 05/26/2023		
Methane	12.5	0.45	Vol%	12.7	1.71	5
Carbon dioxide	49.2	0.45	Vol%	50.0	1.61	5
Oxygen (O2)	1.26	0.45	Vol%	1.28	1.40	5
Nitrogen (N2)	20.6	9.00	Vol%	20.9	1.39	5
Carbon Monoxide	0.04	0.009	Vol%	0.04	2.09	5
Carbon Monoxide	400	90.0	ppmv	409	2.09	25

Duplicate (BGE1066-DUP3)			Source: 23E1343-02	Prepared & Analyzed: 05/26/2023		
Methane	331000	4500	ppmv	329000	0.699	25
Methane	33.1	0.45	Vol%	32.9	0.699	5
Carbon dioxide	463000	4500	ppmv	460000	0.690	25
Carbon dioxide	46.3	0.45	Vol%	46.0	0.690	5
Oxygen (O2)	17800	4500	ppmv	17600	1.13	25
Oxygen (O2)	1.78	0.45	Vol%	1.76	1.13	5
Hydrogen (H2)	23100	1800	ppmv	23000	0.155	25
Nitrogen (N2)	96700	18000	ppmv	95900	0.873	25
Nitrogen (N2)	9.67	9.00	Vol%	9.59	0.873	5
Hydrogen (H2)	2.31	0.18	Vol%	2.30	0.155	5
Carbon Monoxide	0.01	0.009	Vol%	0.01	4.42	5
Carbon Monoxide	131	90.0	ppmv	137	4.42	25

Duplicate (BGE1066-DUP4)			Source: 23E1343-03	Prepared & Analyzed: 05/26/2023		
Methane	364000	4500	ppmv	365000	0.329	25
Methane	36.4	0.45	Vol%	36.5	0.329	5
Carbon dioxide	515000	4500	ppmv	515000	0.0797	25
Carbon dioxide	51.5	0.45	Vol%	51.5	0.0797	5
Oxygen (O2)	<	4500	ppmv	<4500	NA	25
Oxygen (O2)	<	0.45	Vol%	<0.45	NA	5
Hydrogen (H2)	23800	1800	ppmv	23800	0.110	25
Nitrogen (N2)	<	18000	ppmv	<18000	NA	25
Nitrogen (N2)	<	9.00	Vol%	<9.00	NA	5
Hydrogen (H2)	2.38	0.18	Vol%	2.38	0.110	5
Carbon Monoxide	124	90.0	ppmv	126	1.51	25
Carbon Monoxide	0.01	0.009	Vol%	0.01	1.51	5



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Purchase Order: 07-SO04485

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

Enthalpy Analytical

Analyte	Reporting			Spike	Source	%REC			RPD	Qual
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGE1066 - No Prep VOC GC Air

Duplicate (BGE1066-DUP5)				Source: 23E1343-04	Prepared & Analyzed: 05/26/2023		
Methane	398000	4500	ppmv		392000	1.46	25
Methane	39.8	0.45	Vol%		39.2	1.46	5
Carbon dioxide	458000	4500	ppmv		454000	1.03	25
Carbon dioxide	45.8	0.45	Vol%		45.4	1.03	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)	42100	1800	ppmv		41500	1.30	25
Nitrogen (N2)	<	18000	ppmv		<18000	NA	25
Hydrogen (H2)	4.21	0.18	Vol%		4.15	1.30	5
Carbon Monoxide	<	90.0	ppmv		<90.0	NA	25
Carbon Monoxide	<	0.009	Vol%		<0.009	NA	5

Duplicate (BGE1066-DUP6)				Source: 23E1343-05	Prepared & Analyzed: 05/26/2023		
Methane	228000	4500	ppmv		228000	0.0785	25
Methane	22.8	0.45	Vol%		22.8	0.0785	5
Carbon dioxide	571000	4500	ppmv		567000	0.741	25
Carbon dioxide	57.1	0.45	Vol%		56.7	0.741	5
Oxygen (O2)	7460	4500	ppmv		7490	0.519	25
Oxygen (O2)	0.75	0.45	Vol%		0.75	0.519	5
Nitrogen (N2)	23400	18000	ppmv		23500	0.201	25
Hydrogen (H2)	107000	1800	ppmv		106000	0.608	25
Nitrogen (N2)	<	9.00	Vol%		<9.00	NA	5
Carbon Monoxide	0.02	0.009	Vol%		0.02	1.23	5
Carbon Monoxide	221	90.0	ppmv		218	1.23	25

Duplicate (BGE1066-DUP7)				Source: 23E1343-06	Prepared & Analyzed: 05/26/2023		
Methane	7.52	0.45	Vol%		7.69	2.30	5
Methane	75200	4500	ppmv		76900	2.30	25
Carbon dioxide	51.0	0.45	Vol%		51.6	1.15	5
Carbon dioxide	510000	4500	ppmv		516000	1.15	25
Oxygen (O2)	4.89	0.45	Vol%		4.94	0.935	5
Oxygen (O2)	48900	4500	ppmv		49400	0.935	25
Nitrogen (N2)	17.6	9.00	Vol%		17.8	1.23	5
Hydrogen (H2)	98600	1800	ppmv		98900	0.217	25



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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	Reporting		Spike Level	Source Result	%REC		RPD	Limit	Qual
	Result	Limit			Units	%REC			

Batch BGE1066 - No Prep VOC GC Air

Duplicate (BGE1066-DUP7)	Source: 23E1343-06			Prepared & Analyzed: 05/26/2023		
Nitrogen (N2)	176000	18000	ppmv	178000	1.23	25
Carbon Monoxide	0.05	0.009	Vol%	0.05	0.784	5
Carbon Monoxide	469	90.0	ppmv	473	0.784	25

Duplicate (BGE1066-DUP8)	Source: 23E1343-07			Prepared & Analyzed: 05/26/2023		
Methane	11.1	0.45	Vol%	11.3	1.64	5
Methane	111000	4500	ppmv	113000	1.64	25
Carbon dioxide	39.2	0.45	Vol%	39.6	0.878	5
Carbon dioxide	392000	4500	ppmv	396000	0.878	25
Oxygen (O2)	2.65	0.45	Vol%	2.68	1.10	5
Oxygen (O2)	26500	4500	ppmv	26800	1.10	25
Hydrogen (H2)	65600	1800	ppmv	66300	1.05	25
Nitrogen (N2)	29.9	9.00	Vol%	30.1	0.877	5
Nitrogen (N2)	299000	18000	ppmv	301000	0.877	25
Carbon Monoxide	0.03	0.009	Vol%	0.03	2.96	5
Carbon Monoxide	335	90.0	ppmv	345	2.96	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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Client Site I.D.: Bristol Purchase Order: 07-SO04485

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 #T104704	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
- P Duplicate analysis does not meet the acceptance criteria for precision
- RPD Relative Percent Difference
- Qual Qualifiers
- 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 $\pm 10\%$ of the absolute.

**AIR ANALYSIS
CHAIN OF CUSTODY**

Equipment due 6/22/2023

Page 1 of 3

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): LOCAN CULHANE		SAMPLER SIGNATURE: <i>[Signature]</i>	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-0017

CLIENT SAMPLE I.D.	Regulator Info		Canister Information					Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS		
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):				Barometric Pres. (in Hg):					Alt 145 CO	3C	TO-15 Benzene only
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp *F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp *F				
1) 84			289	1.4	BC230515-01	30	5.0	5/23	9:43	30	177.3	5/23	9:45	10	177.4	LG	x	x	x
2) 86			307	1.4	BC230515-01	30	5.4	5/23	9:52	30	149.9	5/23	9:55	10	149.6	LG	x	x	x
3) 90			10048	1.4	BC230515-01	30	4.6	5/23	9:57	30	153.1	5/23	10:00	10	153.0	LG	x	x	x
4) 100			11076	1.4	BC230515-01	30	5.2	5/23	10:03	30	158.8	5/23	10:05	10	158.7	LG	x	x	x

20.3°C, 310, no rec, no sec

RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY
<i>[Signature]</i>	<i>[Signature]</i>	5/23 3:30	Level I <input type="checkbox"/>	
<i>[Signature]</i>	Fedex G		Level II <input type="checkbox"/>	
<i>[Signature]</i>	<i>[Signature]</i>	5/24/23 1115	Level III <input type="checkbox"/>	
			Level IV <input type="checkbox"/>	


**SCS Field Services 23E1343
Bristol**
Recd: 05/24/2023 Due: 06/01/2023

v130325002

**AIR ANALYSIS
CHAIN OF CUSTODY**

Equipment due 6/22/2023


Page 2 of 3

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

Matrix Codes: AA=Indoor/Ambient Air SG=Soil Gas LV=Landfill/Vent Gas OT=Other _____ **063-23E-0017**

CLIENT SAMPLE I.D.	Regulator Info		Canister Information				Sampling Start Information				Sampling Stop Information				Matrix (See Codes)	ANALYSIS			
	Flow Controller ID	Cal Flow (mL/min)	Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Barometric Pres. (in Hg):				Barometric Pres. (in Hg):				Alt 145 CO	3C	TO-15 Benzene only	
								Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp *F	Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)					Ending Sample Temp *F
1) <u>54</u>			11299	1.4	BC230515-01	30	5.0	<u>5/23</u>	<u>10:19</u>	<u>30</u>	<u>153.2</u>	<u>5/23</u>	<u>10:22</u>	<u>10</u>	<u>153.2</u>	LG	x	x	x
2) <u>31R</u>			11303	1.4	BC230515-01	30	5.8	<u>5/23</u>	<u>10:34</u>	<u>30</u>	<u>183.9</u>	<u>5/23</u>	<u>10:38</u>	<u>10</u>	<u>183.5</u>	LG	x	x	x
3) <u>37</u>			12662	1.4	BC230515-01	30	5.6	<u>5/23</u>	<u>10:41</u>	<u>30</u>	<u>178.6</u>	<u>5/23</u>	<u>10:43</u>	<u>10</u>	<u>178.6</u>	LG	x	x	x
4) <u>NOT SAMPLED</u>			13382	1.4	BC230515-01	30										LG	x	x	x

20.3°C, 310, no ice, no seal

RELINQUISHED:	RECEIVED:	DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED:  <u>5ms</u> <u>3:30</u>	RECEIVED: <u>Fedex G</u>	DATE / TIME	Level I <input type="checkbox"/>	SCS Field Services 23E1343 Bristol Recd: 05/24/2023 Due: 06/01/2023 <small>v130325002</small>
RELINQUISHED: <u>Fedex G</u>	RECEIVED: <u>CarBel</u> <u>5/24/23</u> <u>1115</u>	DATE / TIME	Level II <input type="checkbox"/>	
			Level III <input type="checkbox"/>	
			Level IV <input type="checkbox"/>	



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Certificate of Analysis

Final Report

Laboratory Order ID 23E1343

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received:	May 24, 2023 11:15
		Date Issued:	June 1, 2023 16:58
Submitted To:	Tom Lock	Project Number:	07223016.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	20.30°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

Appendix D

Solid Waste Permit 588 Daily Borehole Temperature Averages

Solid Waste Permit 588 Daily Borehole Temperature Averages

May 2023

SCS ENGINEERS

02218208.05 | June 8, 2023

15521 Midlothian Turnpike
Midlothian, VA 23113
804-378-7440

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 1

Date	Depth from Surface					
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-May	205.6	206.0	206.0	206.0	208.8	251.0
2-May	205.9	206.5	206.6	206.5	209.4	251.0
3-May	206.0	206.4	206.4	206.4	209.3	250.4
4-May	206.7	207.1	207.1	207.1	210.1	250.8
5-May	207.0	207.7	207.8	207.7	210.7	250.8
6-May	207.2	208.0	208.0	207.9	210.7	250.9
7-May	206.8	207.5	207.5	207.5	210.4	250.9
8-May	206.8	207.5	207.5	207.5	210.4	251.2
9-May	207.0	207.5	207.7	207.6	210.7	251.3
10-May	207.2	207.8	208.0	208.0	211.6	251.2
11-May	207.3	208.0	208.0	208.0	211.5	251.1
12-May	207.3	208.0	208.3	208.2	211.6	250.6
13-May	207.3	208.1	208.1	208.1	211.3	250.4
14-May	207.5	208.4	208.4	208.4	211.6	250.4
15-May	207.3	208.0	208.1	208.1	211.1	250.0
16-May	206.8	207.5	207.7	207.8	210.5	249.3
17-May	206.6	207.4	207.5	207.5	210.0	249.4
18-May	206.8	207.5	207.8	207.7	210.3	249.4
19-May	207.0	207.8	208.1	207.9	211.9	249.7
20-May	206.5	207.5	207.6	207.6	212.5	249.3
21-May	206.6	207.6	207.8	207.7	213.1	249.5
22-May	206.8	207.8	208.0	207.9	213.9	249.1
23-May	206.7	207.6	207.8	207.8	214.2	248.8
24-May	206.6	207.5	207.7	207.7	215.0	248.9
25-May	206.6	207.5	207.6	207.7	215.3	248.5
26-May	206.7	207.8	208.0	208.1	216.0	247.5
27-May	206.3	207.4	207.5	207.5	216.4	247.3
28-May	206.0	207.0	207.0	207.0	216.4	247.1
29-May	206.1	207.2	207.3	207.3	217.8	248.1
30-May	205.6	207.6	207.7	207.8	218.8	248.8
31-May	205.2	207.6	207.9	208.0	219.3	249.4
Average	206.6	207.5	207.6	207.6	212.6	249.7

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 2

Date	Depth from Surface					
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-May	155.5	239.7	240.2	267.6	255.7	268.4
2-May	155.7	239.5	240.0	267.5	255.6	268.5
3-May	155.8	239.8	240.3	267.7	255.8	268.5
4-May	155.8	240.0	240.3	268.0	256.1	268.8
5-May	155.7	240.1	240.7	267.9	256.3	268.8
6-May	155.6	240.2	240.6	268.1	256.3	268.9
7-May	155.5	239.7	240.2	267.7	255.7	268.6
8-May	155.6	239.6	240.2	267.8	256.0	268.7
9-May	155.5	239.5	240.0	268.1	256.3	269.0
10-May	155.7	240.0	240.2	268.2	256.6	268.9
11-May	156.1	240.0	240.2	268.5	256.8	269.2
12-May	156.0	239.7	240.3	268.3	256.4	269.0
13-May	156.3	239.6	239.9	268.3	256.3	269.0
14-May	156.6	240.0	240.3	268.4	256.4	269.2
15-May	156.2	239.4	239.7	268.0	256.1	268.8
16-May	156.3	239.0	239.5	268.1	256.2	268.9
17-May	156.7	239.2	239.7	268.2	256.4	268.9
18-May	157.0	239.4	239.7	268.1	256.3	268.7
19-May	157.1	239.4	239.9	268.2	256.4	268.7
20-May	157.0	239.0	239.4	267.9	256.1	268.5
21-May	157.3	239.4	239.9	268.1	256.4	268.6
22-May	157.1	238.9	239.5	268.3	256.3	268.7
23-May	157.3	239.3	239.8	268.0	256.1	268.6
24-May	157.0	238.8	239.0	267.9	256.0	268.7
25-May	157.3	239.0	239.5	268.0	256.0	268.7
26-May	157.4	239.1	239.5	268.3	256.3	268.5
27-May	157.3	238.7	239.1	267.6	255.8	268.2
28-May	157.1	238.5	239.0	267.3	255.9	268.0
29-May	158.2	239.0	239.6	268.1	256.2	268.3
30-May	158.6	239.3	239.5	268.2	256.4	268.6
31-May	158.2	239.2	239.8	268.3	256.5	268.5
Average	156.6	239.4	239.9	268.0	256.2	268.7

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 3

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	205.7	205.9	206.5	252.2	263.5	269.3	270.4	253.2
2-May	206.1	206.3	206.8	252.5	264.0	269.8	270.8	253.3
3-May	206.5	206.5	207.0	252.8	264.1	269.9	270.9	252.5
4-May	206.8	206.8	207.6	252.5	263.8	269.8	270.7	249.8
5-May	206.9	206.9	208.1	248.5	264.1	269.8	270.6	248.5
6-May	207.0	207.1	208.5	247.8	264.1	269.8	270.8	249.0
7-May	206.7	206.8	208.2	251.8	263.8	269.4	270.4	248.8
8-May	206.4	206.6	208.1	252.3	263.7	269.4	270.3	249.0
9-May	207.1	207.3	208.2	249.5	264.3	270.0	271.1	249.3
10-May	207.4	207.8	208.2	253.0	264.7	270.3	271.4	249.5
11-May	207.7	208.0	208.7	253.6	264.8	270.5	271.6	249.7
12-May	207.7	207.9	208.5	253.7	264.8	270.7	271.6	249.5
13-May	208.1	208.6	208.4	254.2	265.0	271.3	271.9	249.0
14-May	207.9	208.3	208.4	253.8	264.9	270.8	271.7	249.0
15-May	207.5	207.7	208.3	253.1	264.3	270.1	271.2	249.0
16-May	207.2	207.3	208.0	248.9	264.5	270.3	271.2	248.6
17-May	207.3	208.8	208.9	248.0	264.6	270.5	271.7	248.7
18-May	207.8	218.5	217.8	253.9	264.8	270.8	271.7	248.8
19-May	208.0	208.3	208.3	254.1	265.0	271.2	272.0	248.8
20-May	207.9	208.0	207.9	254.0	264.7	271.0	271.7	248.8
21-May	207.8	208.0	208.0	254.0	264.8	271.1	271.8	249.4
22-May	207.7	208.0	208.3	253.7	264.9	271.0	271.6	250.0
23-May	208.0	233.3	232.8	254.2	265.0	271.2	271.9	251.1
24-May	207.6	234.5	233.0	254.0	264.8	271.0	271.8	251.9
25-May	207.7	208.7	230.2	253.9	264.8	271.0	271.8	252.7
26-May	208.1	208.4	222.0	253.7	264.6	270.9	271.6	253.1
27-May	207.5	208.0	207.9	253.4	264.4	270.4	271.4	252.8
28-May	206.9	207.3	207.1	242.1	264.0	270.0	271.1	253.0
29-May	207.5	207.4	207.5	218.6	264.3	270.4	271.4	253.3
30-May	207.6	207.6	207.9	237.3	264.3	270.7	271.4	253.5
31-May	207.5	207.5	208.3	250.8	264.1	270.2	271.2	253.8
Average	207.3	209.6	211.1	250.5	264.4	270.4	271.3	250.6

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 4

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	206.0	206.0	206.0	206.3	206.4	206.6	236.7	173.6
2-May	206.5	206.3	206.3	206.5	206.9	206.8	244.4	173.8
3-May	206.5	206.4	206.5	206.5	207.0	207.2	242.9	173.9
4-May	207.0	206.9	207.0	207.0	207.5	207.5	225.2	174.2
5-May	207.5	207.3	207.5	207.5	208.3	208.0	242.5	174.6
6-May	207.9	207.7	207.7	207.7	209.3	208.3	245.0	175.0
7-May	207.6	207.4	207.4	207.5	209.6	207.8	244.8	174.8
8-May	207.5	207.4	207.5	207.4	209.0	207.9	245.3	174.8
9-May	207.6	207.4	207.3	207.5	208.5	208.4	245.2	175.0
10-May	207.7	207.5	207.6	207.6	208.4	209.2	245.0	175.1
11-May	208.0	207.8	207.9	207.6	209.5	209.3	245.4	176.2
12-May	208.2	207.8	207.6	207.4	209.7	208.8	245.4	178.8
13-May	208.1	207.7	207.9	207.5	208.6	208.8	245.5	178.4
14-May	208.3	208.0	208.2	207.8	209.6	207.8	241.4	178.0
15-May	208.0	207.8	207.7	207.4	209.1	207.8	220.9	178.2
16-May	207.5	207.3	207.3	206.9	209.3	208.0	212.8	179.0
17-May	207.5	207.3	207.4	207.3	209.0	206.7	208.4	178.5
18-May	207.6	207.4	207.5	207.6	208.2	206.8	208.5	178.6
19-May	207.7	207.5	207.6	208.6	208.3	206.5	208.8	178.6
20-May	207.5	207.3	207.4	207.2	208.0	206.0	208.5	179.7
21-May	207.5	207.5	207.6	207.2	208.4	205.9	208.7	180.2
22-May	207.7	207.6	207.7	207.1	209.1	206.2	218.3	180.2
23-May	207.6	207.5	207.7	207.3	208.3	206.6	240.3	179.9
24-May	207.5	207.4	207.6	207.0	208.1	206.7	242.1	180.0
25-May	207.5	207.5	207.5	208.0	207.9	206.2	242.9	178.8
26-May	207.7	207.5	207.5	208.8	208.0	206.0	235.0	179.0
27-May	207.5	207.4	207.4	207.6	207.9	206.0	242.8	180.4
28-May	207.0	207.0	207.0	205.2	207.8	206.3	209.5	182.3
29-May	207.3	207.3	207.3	206.4	208.1	206.5	219.4	180.6
30-May	207.6	207.5	207.6	207.3	208.3	212.1	239.7	181.3
31-May	207.6	207.6	207.6	207.1	214.8	228.9	241.8	181.8
Average	207.5	207.3	207.4	207.3	208.6	208.1	232.4	177.8

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 5

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	141.0	206.0	206.0	206.4	224.7	239.5	247.3	190.8
2-May	141.0	206.4	206.5	206.8	225.1	239.7	247.5	191.0
3-May	141.1	206.5	206.7	206.9	225.4	239.9	247.5	191.1
4-May	140.9	207.0	207.1	207.6	225.7	240.1	247.7	191.0
5-May	141.3	207.5	207.6	207.8	226.0	240.6	247.8	191.5
6-May	141.3	207.7	207.8	208.0	226.0	240.6	247.8	191.5
7-May	141.0	207.5	207.5	207.8	226.1	240.5	247.6	191.4
8-May	141.1	207.5	207.5	207.8	226.5	240.7	247.6	191.4
9-May	141.1	207.4	207.4	207.9	226.5	241.0	248.0	191.5
10-May	141.0	207.6	207.6	207.9	226.7	241.1	247.9	191.5
11-May	141.3	207.7	207.8	208.2	226.9	241.4	248.0	191.6
12-May	141.3	207.6	207.9	208.3	226.2	240.4	247.8	191.6
13-May	141.0	207.7	207.9	208.2	226.3	240.3	247.8	191.5
14-May	141.1	207.8	208.1	208.2	226.5	240.3	247.7	191.7
15-May	141.0	207.8	208.0	208.1	226.2	240.1	247.4	191.4
16-May	140.9	207.3	207.3	207.8	226.2	240.1	247.5	191.6
17-May	140.7	207.3	207.3	207.5	225.8	239.8	247.5	191.6
18-May	140.3	207.5	207.5	207.8	225.8	239.5	247.3	191.5
19-May	139.2	207.6	207.7	208.1	226.0	239.6	247.3	191.6
20-May	139.0	207.3	207.4	207.9	226.0	239.8	247.1	191.5
21-May	139.7	207.5	207.6	207.9	226.3	240.0	247.3	191.6
22-May	140.6	207.5	207.7	208.1	226.4	240.1	247.3	191.7
23-May	141.4	207.6	207.7	208.1	226.3	240.2	247.3	191.6
24-May	142.9	207.5	207.5	207.8	226.5	240.3	247.4	191.8
25-May	144.5	207.5	207.6	207.8	226.4	240.3	247.3	191.8
26-May	146.2	207.5	207.8	208.2	226.6	240.3	247.2	191.8
27-May	147.7	207.4	207.5	208.0	226.3	240.0	247.0	191.4
28-May	148.8	207.0	207.0	207.4	226.8	240.2	247.0	191.0
29-May	149.9	207.3	207.2	207.5	227.4	241.3	247.2	191.5
30-May	151.0	207.5	207.5	207.9	227.8	241.8	247.4	191.8
31-May	151.5	207.5	207.6	208.1	228.2	241.9	247.3	191.8
Average	142.6	207.4	207.5	207.8	226.3	240.4	247.5	191.5

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 6

Date	Depth from Surface				
	25 ft	50 ft	75 ft	100 ft	125 ft
1-May	207.0	235.0	235.0	237.2	238.3
2-May	207.4	235.4	235.4	237.4	238.4
3-May	207.5	235.3	235.3	237.3	238.5
4-May	207.9	235.3	235.4	237.4	238.5
5-May	208.5	235.5	235.5	237.3	238.5
6-May	208.8	235.5	235.5	237.5	238.5
7-May	208.6	235.2	235.3	237.2	238.1
8-May	208.6	235.3	235.4	237.3	238.1
9-May	208.7	235.4	235.4	237.4	238.3
10-May	208.5	235.4	235.4	237.4	238.5
11-May	208.5	235.4	235.5	237.4	238.5
12-May	208.3	235.3	235.3	237.3	238.4
13-May	208.3	235.2	235.2	237.0	238.1
14-May	208.4	235.3	235.3	236.9	238.2
15-May	208.0	235.0	235.0	236.5	238.0
16-May	208.2	235.0	235.0	236.4	238.0
17-May	201.3	234.7	235.0	236.5	237.8
18-May	183.5	234.8	235.0	236.5	237.8
19-May	179.4	234.8	235.2	236.5	237.9
20-May	177.6	234.8	235.0	236.3	237.7
21-May	177.6	234.5	234.7	236.5	237.6
22-May	177.0	234.5	234.8	236.5	237.7
23-May	175.8	234.5	234.7	236.4	237.5
24-May	175.7	234.6	234.8	236.5	237.6
25-May	175.9	234.5	234.8	236.4	237.6
26-May	176.2	234.6	234.9	236.4	237.5
27-May	175.6	234.3	234.4	236.0	237.3
28-May	188.6	234.0	234.0	236.0	237.0
29-May	207.2	234.3	234.3	236.0	237.0
30-May	207.4	234.4	234.4	236.2	237.0
31-May	207.7	234.6	234.7	236.1	237.0
Average	197.3	234.9	235.0	236.8	237.9

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 7


Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	162.7	209.5	209.5	240.1	244.7	241.2	232.7	219.4
2-May	163.0	220.4	220.5	240.3	244.9	241.5	233.1	220.0
3-May	163.3	219.9	220.3	240.3	244.7	241.6	233.3	220.5
4-May	163.0	223.4	223.9	240.3	244.8	241.9	233.6	220.6
5-May	162.8	219.3	219.7	240.5	245.0	241.9	233.7	220.8
6-May	162.8	214.3	214.6	240.8	245.2	241.8	233.8	220.3
7-May	162.8	223.1	223.7	240.5	244.9	241.7	233.4	220.2
8-May	163.0	224.5	224.6	240.7	245.2	242.0	233.6	220.2
9-May	163.0	225.3	225.5	241.1	245.3	242.0	233.4	220.3
10-May	162.6	225.7	225.9	240.7	245.1	242.0	233.7	220.2
11-May	162.8	226.0	226.2	240.8	245.2	242.1	233.9	220.3
12-May	162.6	225.3	225.7	240.7	245.2	242.3	233.9	220.3
13-May	162.4	224.5	225.0	240.6	245.2	242.3	234.5	220.6
14-May	162.5	224.1	224.5	240.5	245.3	242.4	234.5	220.8
15-May	162.3	224.1	224.3	240.3	245.0	242.1	234.2	220.4
16-May	162.3	224.1	224.2	240.3	245.0	242.3	234.2	220.5
17-May	162.1	223.8	223.8	240.3	244.9	242.2	234.3	220.3
18-May	162.0	223.1	223.3	240.0	244.9	241.9	234.0	219.8
19-May	162.5	220.0	220.4	239.9	245.1	241.8	233.5	218.8
20-May	162.3	217.3	217.8	240.3	244.5	241.5	233.2	218.2
21-May	162.8	222.3	222.9	240.4	244.6	241.7	233.5	218.5
22-May	162.4	223.1	223.4	240.3	244.5	241.6	233.5	218.5
23-May	162.5	223.2	223.5	240.4	244.5	241.6	233.4	218.4
24-May	162.4	221.5	221.7	239.8	244.5	241.7	233.2	218.2
25-May	162.4	218.6	219.2	239.9	244.4	241.5	232.8	217.5
26-May	162.0	220.0	220.5	240.2	244.3	241.3	232.7	217.3
27-May	161.6	213.0	213.3	239.8	243.9	240.8	232.0	216.5
28-May	160.8	206.0	206.5	236.8	243.7	241.0	232.1	217.0
29-May	160.7	211.1	211.3	236.9	243.7	241.3	232.5	217.9
30-May	161.0	211.5	212.0	237.4	244.1	241.3	232.3	217.1
31-May	161.8	210.1	210.3	237.6	244.0	240.9	231.6	216.3
Average	162.4	219.9	220.3	240.0	244.7	241.7	233.4	219.2

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 8

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	174.0	177.0	177.0	177.0	178.8	182.0	182.1	177.3
2-May	174.6	177.1	177.2	177.1	178.8	182.0	182.3	177.6
3-May	174.6	177.2	177.3	177.3	178.9	182.2	182.3	177.5
4-May	174.8	177.4	177.5	177.3	178.9	182.3	182.5	177.9
5-May	175.2	177.6	177.7	177.4	179.5	182.6	182.6	177.8
6-May	175.4	177.9	177.9	177.8	179.7	182.7	182.8	178.1
7-May	175.0	177.8	177.9	177.8	179.3	182.5	182.6	178.1
8-May	175.0	177.9	178.0	177.9	179.5	182.6	182.6	178.4
9-May	174.5	178.1	178.2	178.0	179.6	182.7	183.0	178.9
10-May	175.1	177.9	178.0	177.9	179.8	182.8	182.8	178.6
11-May	175.4	178.3	178.2	178.2	180.1	183.0	182.9	178.9
12-May	175.1	178.5	178.5	178.7	180.6	183.3	183.3	179.1
13-May	175.8	178.8	178.7	179.1	181.2	183.6	183.3	179.5
14-May	176.3	179.0	179.0	179.2	181.4	184.0	183.5	180.0
15-May	176.3	179.0	179.0	179.6	181.8	184.0	183.7	180.3
16-May	176.3	179.3	179.3	180.3	182.3	184.7	184.1	180.4
17-May	176.4	179.4	179.4	180.5	183.0	185.1	184.3	180.5
18-May	176.4	179.5	179.5	180.8	183.8	185.5	184.3	180.6
19-May	176.2	179.8	179.7	181.2	183.9	185.7	184.4	180.8
20-May	176.3	180.0	180.0	181.3	184.2	186.0	184.7	180.8
21-May	176.1	180.3	180.2	181.6	184.7	186.3	184.8	180.7
22-May	176.5	180.5	180.4	181.7	184.9	186.5	185.0	180.9
23-May	176.8	180.6	180.5	182.3	185.5	186.8	185.4	181.1
24-May	176.8	180.5	180.5	182.4	185.5	186.9	185.3	181.1
25-May	177.2	180.8	180.8	182.8	185.8	187.4	185.6	181.3
26-May	176.6	181.2	181.0	183.3	186.3	187.4	185.5	181.2
27-May	176.1	181.1	180.9	183.4	186.4	187.4	185.4	181.1
28-May	176.0	181.0	181.0	183.1	186.0	187.5	185.5	181.0
29-May	176.6	181.2	181.1	183.6	186.5	188.0	186.0	181.1
30-May	177.1	181.5	181.4	184.1	187.2	188.3	186.2	181.4
31-May	177.0	181.6	181.6	184.2	187.5	188.4	186.1	181.4
Average	175.9	179.3	179.3	180.2	182.6	184.8	184.0	179.8

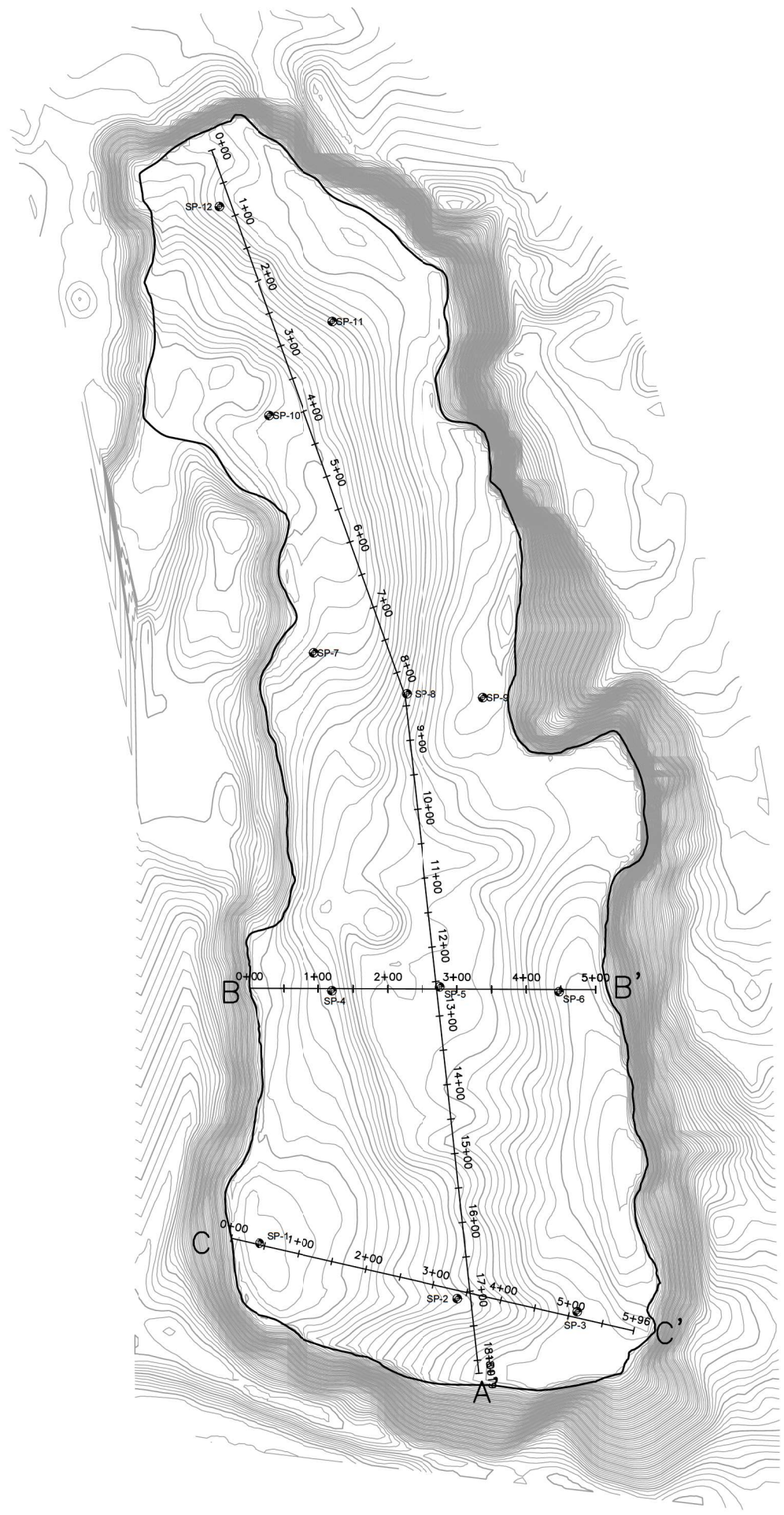
Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 9

Date	Depth from Surface							
	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-May	123.3	150.2	149.5	152.0	149.0	132.0	118.7	107.3
2-May	123.8	150.7	149.8	152.5	149.2	132.3	118.8	107.7
3-May	123.6	150.5	149.9	152.5	149.3	132.3	118.9	107.7
4-May	124.0	151.1	150.3	152.7	149.2	132.3	119.0	107.8
5-May	124.3	151.5	151.0	153.0	149.4	132.6	119.3	108.0
6-May	124.3	151.8	151.0	153.1	149.6	132.7	119.5	108.2
7-May	124.2	151.4	150.7	152.8	149.4	132.3	119.2	107.9
8-May	124.4	151.5	150.7	153.2	149.6	132.5	119.4	108.2
9-May	124.5	151.6	151.1	153.4	149.6	132.7	119.6	108.4
10-May	124.7	152.0	151.3	153.3	149.8	132.8	119.8	108.3
11-May	124.9	152.1	151.3	153.7	150.0	133.1	119.9	108.5
12-May	124.5	152.1	151.4	153.3	149.7	132.7	119.6	108.3
13-May	124.5	152.3	151.4	153.4	149.8	132.8	119.6	108.4
14-May	124.6	152.4	151.5	153.5	149.7	133.0	119.6	108.5
15-May	124.3	152.1	151.4	153.4	149.4	132.5	119.4	108.2
16-May	124.3	152.0	151.1	153.3	149.5	132.6	119.4	108.2
17-May	124.2	151.6	151.0	153.3	149.6	132.6	119.6	108.1
18-May	124.1	152.0	151.2	153.2	149.6	132.7	119.6	107.7
19-May	124.4	152.5	151.8	153.6	149.6	132.8	119.6	107.8
20-May	123.9	152.1	151.5	153.2	149.2	132.4	119.2	107.6
21-May	124.2	152.3	151.6	153.4	149.4	132.7	119.6	107.9
22-May	124.2	152.5	151.8	153.5	149.5	132.7	119.7	108.2
23-May	124.0	152.5	151.6	153.5	149.5	132.7	119.5	108.0
24-May	124.0	152.4	151.6	153.5	149.4	132.7	119.7	107.9
25-May	124.2	152.2	151.5	153.4	149.4	132.7	119.6	108.1
26-May	124.2	152.5	151.7	153.5	149.6	132.7	119.7	107.9
27-May	123.6	151.8	151.3	153.0	149.3	132.4	119.3	107.5
28-May	123.0	151.3	151.0	152.9	148.9	132.0	119.0	107.0
29-May	123.5	151.7	151.2	153.3	149.4	132.3	119.3	107.6
30-May	124.0	152.4	151.7	153.5	149.6	132.7	119.6	108.0
31-May	124.0	152.5	151.8	153.5	149.6	132.8	119.5	108.0
Average	124.1	151.9	151.2	153.2	149.5	132.6	119.4	108.0



Appendix E

Monthly Topography Analysis

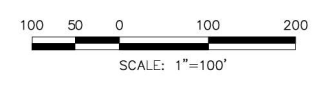


LEGEND

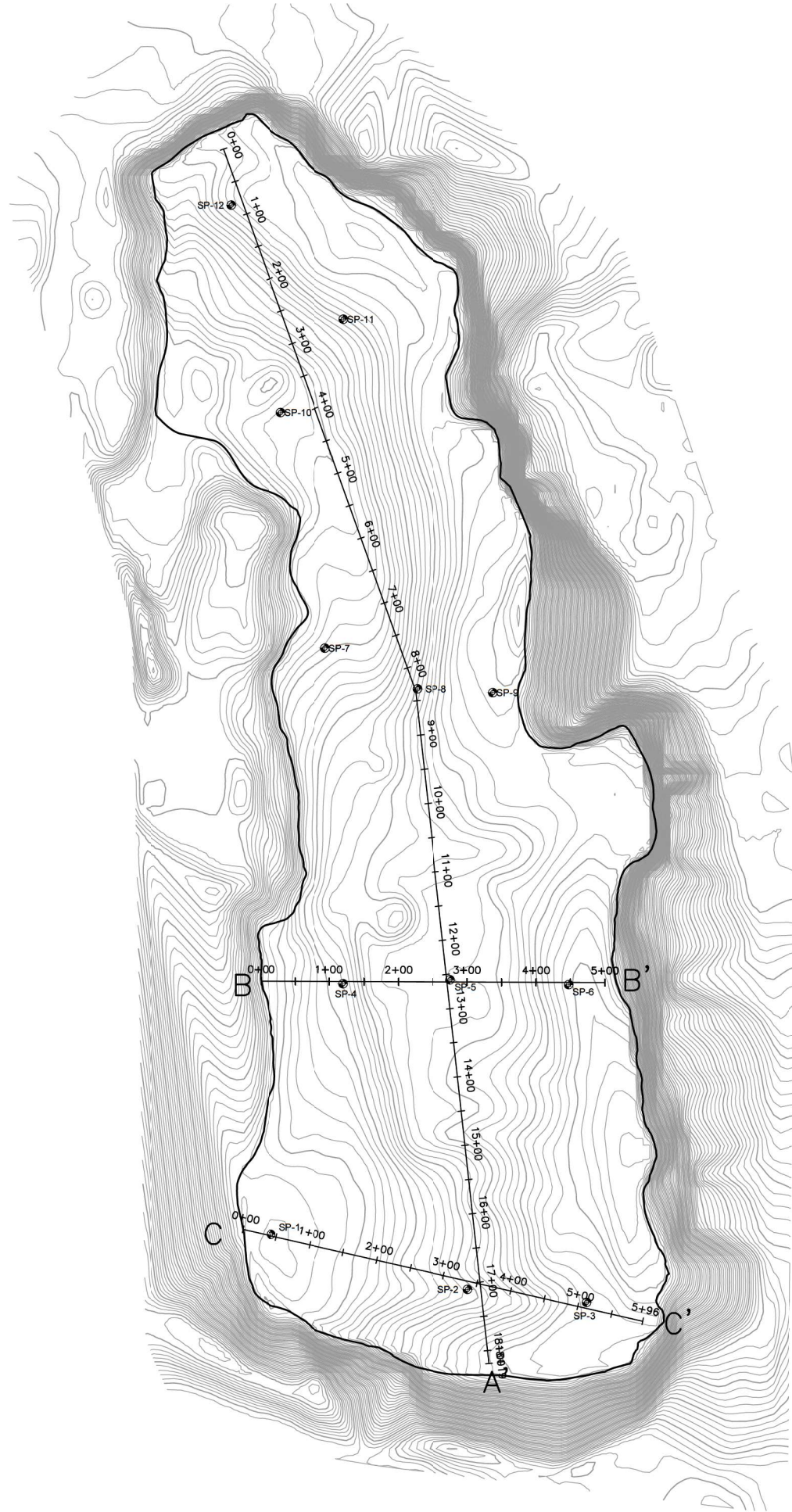
- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- ⊙ SP-9 SETTLEMENT PLATE

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENTS THE TOPOGRAPHY CAPTURED ON APRIL 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.



<p>SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 83 SOUTH MAIN ST. SUITE A. MEDFORD, NJ 08055 PH: (909) 654-6600 SCSENGINEERS.COM</p> <p>PROJ. NO. 02218208.05 DSN. BY: SRB DWN. BY: SRB C/K. BY: C.J.W APP. BY: C.J.W</p>	<p>CLIENT</p> <p>CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY 2655 VALLEY DRIVE BRISTOL, VIRGINIA 24201</p>	<p>SHEET TITLE</p> <p>APRIL 2023 LANDFILL TOPOGRAPHY</p>	<p>PROJECT TITLE</p> <p>MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588</p>															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 10%;">REVISION</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				NO.	REVISION	DATE											
NO.	REVISION	DATE																
<p>CADD FILE: SURF COMP</p> <p>DATE: 5/22/2023</p> <p>SCALE: 1" = 100'</p> <p>DRAWING NO. 1 of 5</p>																		

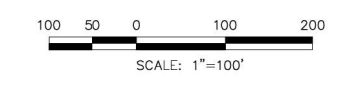


LEGEND

- 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.



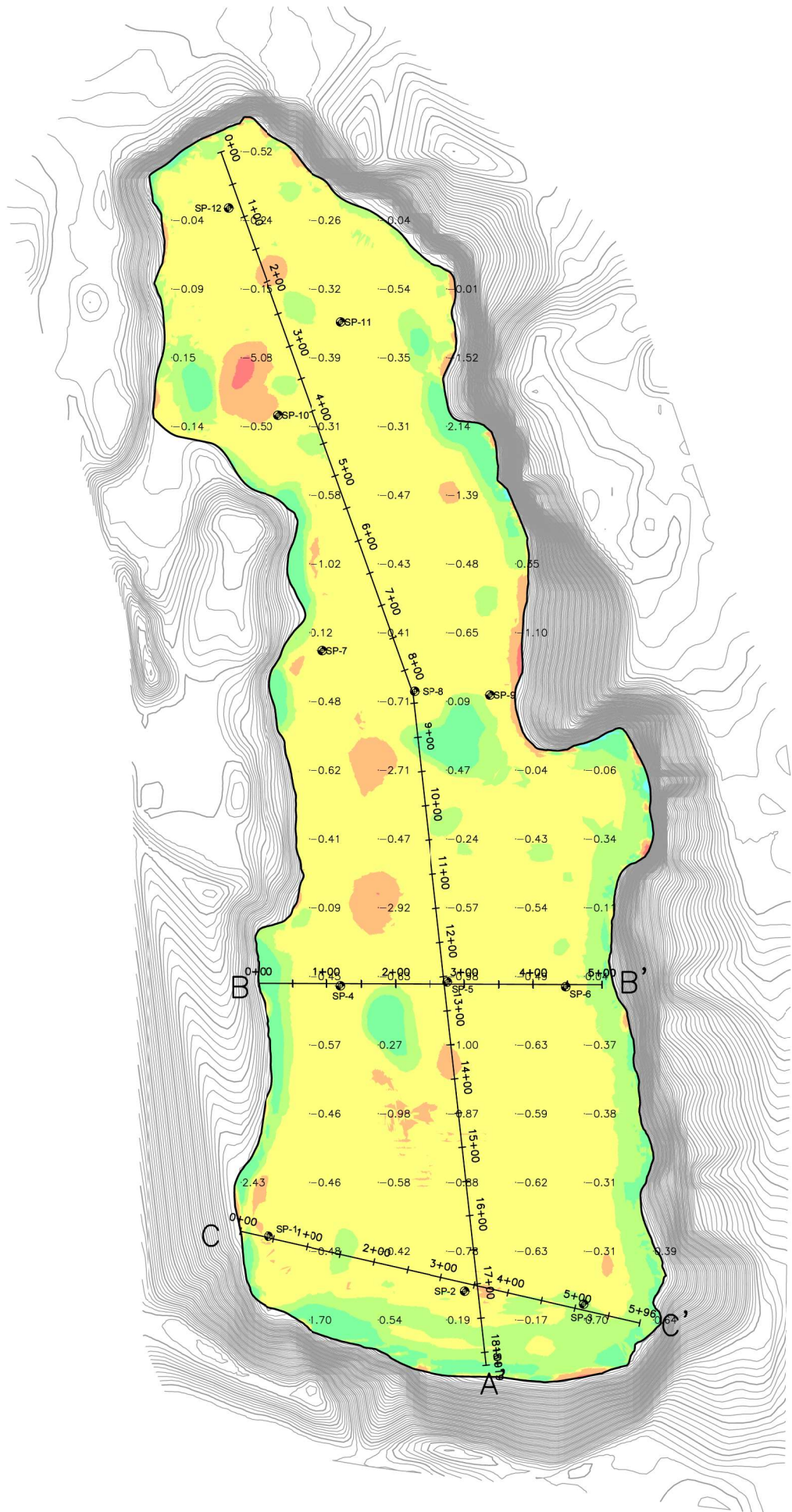
NO.	REVISION	DATE

SHEET TITLE	MAY 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 A. MEDFORD, NJ 08055 PH: (908) 684-6600 SCSENGINEERS.COM	PROJ. NO. 02218208.05 DESK BY: SRB DWN. BY: SRB CHK. BY: C.J.W. O/A R/W BY: C.J.W. APP. BY: C.J.W.
---	---

CADD FILE:	SURF COMP
DATE:	5/22/2023
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 – APRIL 11, 2023
 Comparison Surface TOPO – MAY 11, 2023

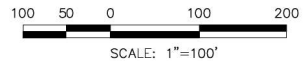
Cut Volume 13218.59 Cu. Yd.
 Fill Volume 4948.99 Cu. Yd.
 Net Cut 8269.60 Cu. Yd.

Elevations Table

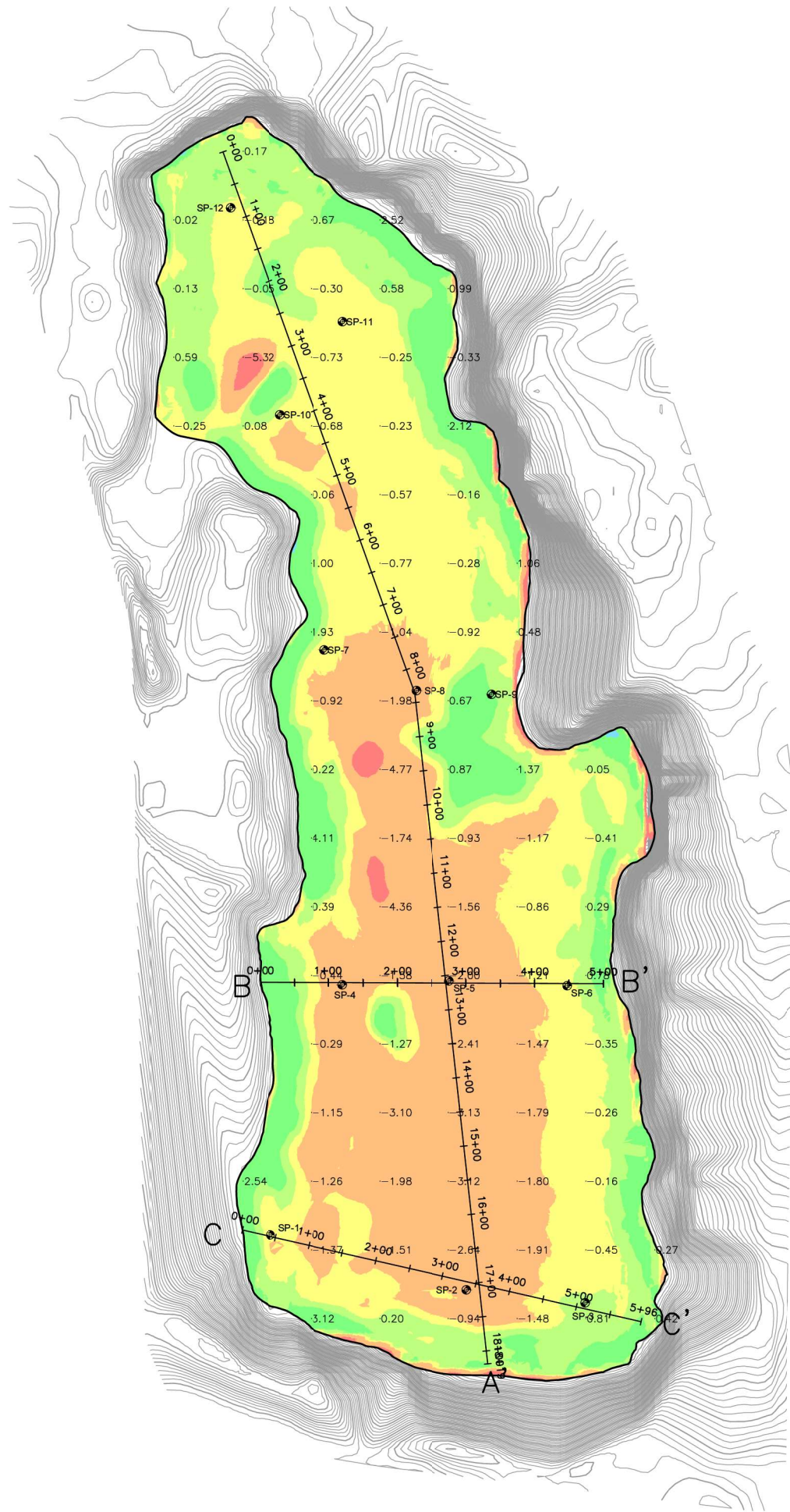
Number	Minimum Elevation	Maximum Elevation	Color
1	-10.000	-5.000	Red
2	-5.000	-1.000	Orange
3	-1.000	0.000	Yellow
4	0.000	1.000	Light Green
5	1.000	5.000	Green
6	5.000	10.000	Cyan

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON APRIL, 11 2023 AND MAY 11, 2023 BY SCS ENGINEERS. POSITIVE 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.



MAY VOLUME CHANGE APRIL 2023 TO MAY 2023		NO.	REVISION	DATE
PROJECT TITLE MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588		NO.	REVISION	DATE
CLIENT CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY 2655 VALLEY DRIVE BRISTOL, VIRGINIA 24201		SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 33 SOUTH MAIN ST. SUITE A. MEDFORD, NJ 08055 PH: (909) 654-6000 SCSENGINEERS.COM		
CADD FILE: SURF COMP		DATE: 5/22/2023		
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 - JAN 10, 2023
 Comparison Surface TOPO - MAY 11, 2023

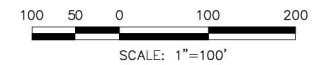
Cut Volume 25222.46 Cu. Yd.
 Fill Volume 10518.55 Cu. Yd.
 Net Cut 14703.91 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-10.000	-5.000	Red
2	-5.000	-1.000	Orange
3	-1.000	0.000	Yellow
4	0.000	1.000	Light Green
5	1.000	5.000	Green
6	5.000	10.000	Blue

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON JANUARY 10, 2023 AND MAY 11, 2023 BY SCS ENGINEERS. POSITIVE 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.



NO.	REVISION	DATE

SHEET TITLE: MAY VOLUME CHANGE
 JANUARY 2023 TO APRIL 2023

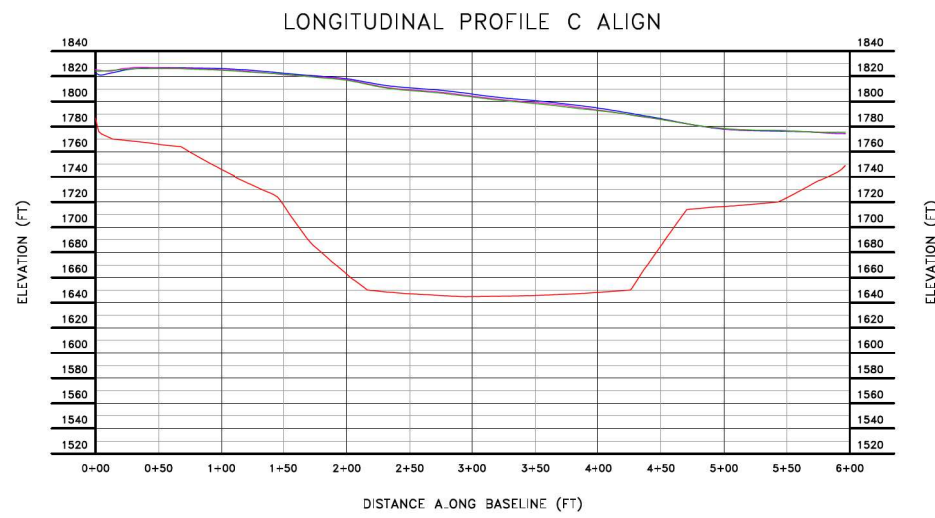
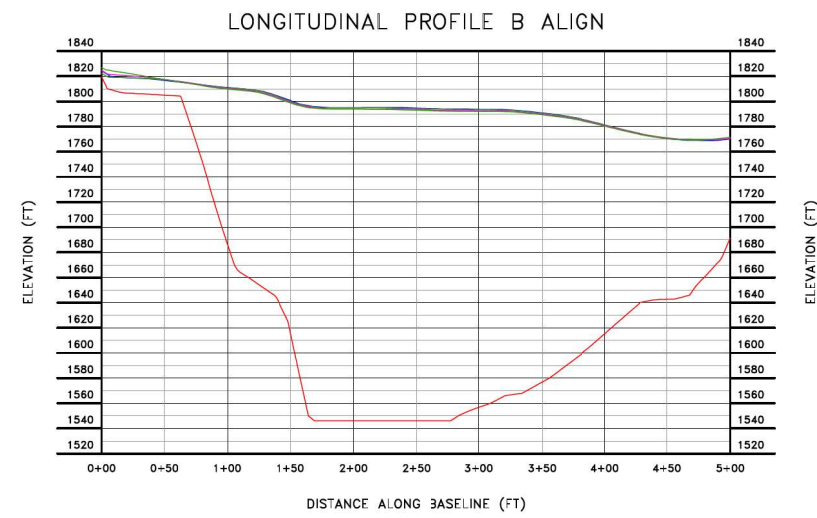
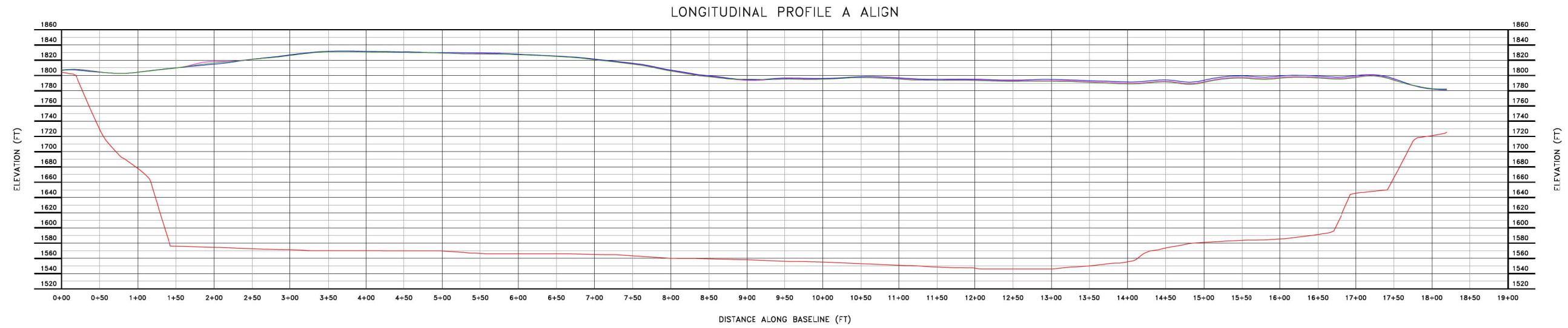
PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS
 SOLID WASTE PERMIT #588

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 ST. SUITE A. MEDFORD, NJ 08055
 PH: (908) 654-6600 SCSENGINEERS.COM

PROJ. NO. 02218208.05
 DESK. BY: SRB
 DWN. BY: SRB
 O/A R/W BY: C.J.W.
 APP. BY: C.J.W.

CADD FILE: SURF COMP
 DATE: 5/22/2023
 SCALE: 1" = 100'
 DRAWING NO.



LEGEND

- BOTTOM LINER ELEVATION
- JANUARY 2023 TOPO
- APRIL 2023 TOPO
- MAY 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.
 83 SOUTH MAIN ST. SUITE A. MEDFORD, NJ 08055
 PH: (908) 684-6600 SCSENGINEERS.COM

PROJ. NO.: 02218208.05
 DWG. BY: SRB
 C/K. BY: C.J.W.
 O/A R/W BY: C.J.W.
 APP. BY: C.J.W.

CADD FILE:
 SURF COMP

DATE:
 5/22/2023

SCALE:
 AS NOTED

DRAWING NO.

Appendix F
Sample Collection Log
Lab Report
Historical LFG-EW Leachate Monitoring Results Summary



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

Certificate of Analysis

Final Report

Laboratory Order ID 23E0399

Client Name: SCS Engineers-Winchester
296 Victory Road
Winchester, VA 22602

Date Received: May 4, 2023 17:10
Date Issued: June 5, 2023 16:26
Project Number: 02218208.15 Task 1
Purchase Order:

Submitted To: Jennifer Robb

Client Site I.D.: 2023 City of Bristol Landfill Leachate

Enclosed are the results of analyses for samples received by the laboratory on 05/04/2023 17:10. 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.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Enthalpy Analytical.

Analysis Detects Report

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

Date Issued: 6/5/2023 4:26:49PM

Laboratory Sample ID: 23E0399-01

Client Sample ID: EW-58

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01RE1	SW6020B	300		2.5	5.0	5	ug/L
Barium	01RE1	SW6020B	1200		10.0	50.0	10	ug/L
Chromium	01RE1	SW6020B	281		2.00	5.00	5	ug/L
Copper	01RE1	SW6020B	2.67	J	1.50	5.00	5	ug/L
Nickel	01RE1	SW6020B	97.26		5.000	5.000	5	ug/L
Zinc	01RE1	SW6020B	63.5		12.5	25.0	5	ug/L
2-Butanone (MEK)	01	SW8260D	5970		150	500	50	ug/L
Acetone	01	SW8260D	11700		350	500	50	ug/L
Benzene	01	SW8260D	4890		20.0	50.0	50	ug/L
Ethylbenzene	01	SW8260D	276		20.0	50.0	50	ug/L
Tetrahydrofuran	01	SW8260D	2740		500	500	50	ug/L
Toluene	01	SW8260D	371		25.0	50.0	50	ug/L
Xylenes, Total	01	SW8260D	441		50.0	150	50	ug/L
Ammonia as N	01RE1	EPA350.1 R2.0	1860		146	200	2000	mg/L
BOD	01	SM5210B-2011	11900		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	18700		2000	2000	200	mg/L
Nitrate+Nitrite as N	01RE2	SM4500-NO3F-2011	2.25		0.20	0.20	1	mg/L
TKN as N	01	EPA351.2 R2.0	1950		40.0	100	200	mg/L
Total Recoverable Phenolics	01	SW9065	20.0		1.50	2.50	50	mg/L

Analysis Detects Report

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

Date Issued: 6/5/2023 4:26:49PM

Laboratory Sample ID: 23E0399-02 Client Sample ID: EW-59

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02RE1	SW6020B	270		2.5	5.0	5	ug/L
Barium	02RE1	SW6020B	1830		10.0	50.0	10	ug/L
Chromium	02RE1	SW6020B	237		2.00	5.00	5	ug/L
Nickel	02RE1	SW6020B	56.57		5.000	5.000	5	ug/L
Selenium	02RE1	SW6020B	5.69		4.25	5.00	5	ug/L
Zinc	02RE1	SW6020B	51.9		12.5	25.0	5	ug/L
2-Butanone (MEK)	02RE1	SW8260D	13600		750	2500	250	ug/L
Acetone	02RE1	SW8260D	29600		1750	2500	250	ug/L
Benzene	02	SW8260D	3370		20.0	50.0	50	ug/L
Ethylbenzene	02	SW8260D	144		20.0	50.0	50	ug/L
Tetrahydrofuran	02	SW8260D	2380		500	500	50	ug/L
Toluene	02	SW8260D	239		25.0	50.0	50	ug/L
Xylenes, Total	02	SW8260D	230		50.0	150	50	ug/L
Ammonia as N	02RE1	EPA350.1 R2.0	2380		146	200	2000	mg/L
BOD	02	SM5210B-2011	35300		0.2	2.0	1	mg/L
COD	02	SM5220D-2011	44700		4000	4000	200	mg/L
Nitrate+Nitrite as N	02RE2	SM4500-NO3F-2011	2.56		0.20	0.20	1	mg/L
TKN as N	02	EPA351.2 R2.0	2910		40.0	100	200	mg/L
Total Recoverable Phenolics	02	SW9065	50.0		1.50	2.50	50	mg/L

Analysis Detects Report

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

Date Issued: 6/5/2023 4:26:49PM

Laboratory Sample ID: 23E0399-03 Client Sample ID: EW-50

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	03RE1	SW6020B	260		2.5	5.0	5	ug/L
Barium	03RE1	SW6020B	636		5.00	25.0	5	ug/L
Chromium	03RE1	SW6020B	422		2.00	5.00	5	ug/L
Nickel	03RE1	SW6020B	113.0		5.000	5.000	5	ug/L
Zinc	03RE1	SW6020B	79.0		12.5	25.0	5	ug/L
2-Butanone (MEK)	03	SW8260D	5360		150	500	50	ug/L
Acetone	03	SW8260D	10700		350	500	50	ug/L
Benzene	03	SW8260D	814		20.0	50.0	50	ug/L
Ethylbenzene	03	SW8260D	124		20.0	50.0	50	ug/L
Toluene	03	SW8260D	258		25.0	50.0	50	ug/L
Xylenes, Total	03	SW8260D	274		50.0	150	50	ug/L
Ammonia as N	03	EPA350.1 R2.0	1390		146	200	2000	mg/L
BOD	03	SM5210B-2011	7350		0.2	2.0	1	mg/L
COD	03	SM5220D-2011	7590		2000	2000	200	mg/L
Nitrate+Nitrite as N	03RE1	SM4500-NO3F-2011	1.41		0.10	0.10	1	mg/L
TKN as N	03	EPA351.2 R2.0	1590		40.0	100	200	mg/L
Total Recoverable Phenolics	03	SW9065	18.6		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".

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-58	23E0399-01	Ground Water	05/04/2023 08:16	05/04/2023 17:10
EW-59	23E0399-02	Ground Water	05/04/2023 08:00	05/04/2023 17:10
EW-50	23E0399-03	Ground Water	05/04/2023 07:35	05/04/2023 17:10
Trip Blank	23E0399-04	Ground Water	03/01/2023 11:15	05/04/2023 17:10

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-58

Laboratory Sample ID: 23E0399-01

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	05/09/2023 13:00	05/10/2023 15:13	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	01RE1	7440-38-2	SW6020B	05/09/2023 13:00	05/10/2023 15:13	300		2.5	5.0	5	ug/L	AB
Barium	01RE1	7440-39-3	SW6020B	05/09/2023 13:00	05/10/2023 15:24	1200		10.0	50.0	10	ug/L	AB
Cadmium	01RE1	7440-43-9	SW6020B	05/09/2023 13:00	05/10/2023 15:13	BLOD		0.500	5.00	5	ug/L	AB
Chromium	01RE1	7440-47-3	SW6020B	05/09/2023 13:00	05/10/2023 15:13	281		2.00	5.00	5	ug/L	AB
Copper	01RE1	7440-50-8	SW6020B	05/09/2023 13:00	05/10/2023 15:13	2.67	J	1.50	5.00	5	ug/L	AB
Mercury	01	7439-97-6	SW7470A	05/08/2023 10:45	05/09/2023 13:50	BLOD		0.00020	0.00020	1	mg/L	SGT
Nickel	01RE1	7440-02-0	SW6020B	05/09/2023 13:00	05/10/2023 15:13	97.26		5.000	5.000	5	ug/L	AB
Lead	01RE1	7439-92-1	SW6020B	05/09/2023 13:00	05/10/2023 15:13	BLOD		5.0	5.0	5	ug/L	AB
Selenium	01RE1	7782-49-2	SW6020B	05/09/2023 13:00	05/10/2023 15:13	BLOD		4.25	5.00	5	ug/L	AB
Zinc	01RE1	7440-66-6	SW6020B	05/09/2023 13:00	05/10/2023 15:13	63.5		12.5	25.0	5	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	05/05/2023 17:59	05/05/2023 17:59	5970		150	500	50	ug/L	RJB
Acetone	01	67-64-1	SW8260D	05/05/2023 17:59	05/05/2023 17:59	11700		350	500	50	ug/L	RJB
Benzene	01	71-43-2	SW8260D	05/05/2023 17:59	05/05/2023 17:59	4890		20.0	50.0	50	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	05/05/2023 17:59	05/05/2023 17:59	276		20.0	50.0	50	ug/L	RJB
Toluene	01	108-88-3	SW8260D	05/05/2023 17:59	05/05/2023 17:59	371		25.0	50.0	50	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	05/05/2023 17:59	05/05/2023 17:59	441		50.0	150	50	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	05/05/2023 17:59	05/05/2023 17:59	2740		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	01	104 %	70-120	05/05/2023 17:59	05/05/2023 17:59							
Surr: 4-Bromofluorobenzene (Surr)	01	100 %	75-120	05/05/2023 17:59	05/05/2023 17:59							
Surr: Dibromofluoromethane (Surr)	01	97.1 %	70-130	05/05/2023 17:59	05/05/2023 17:59							
Surr: Toluene-d8 (Surr)	01	101 %	70-130	05/05/2023 17:59	05/05/2023 17:59							

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-58

Laboratory Sample ID: 23E0399-01

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Semivolatle Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	05/08/2023 10:00	05/09/2023 14:21	BLOD		467	935	50	ug/L	BMS
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	01		% 5-136	05/08/2023 10:00	05/09/2023 14:21							DS
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	01	16.0	% 9-117	05/08/2023 10:00	05/09/2023 14:21							DS
<i>Surr: 2-Fluorophenol (Surr)</i>	01	5.00	% 5-60	05/08/2023 10:00	05/09/2023 14:21							DS
<i>Surr: Nitrobenzene-d5 (Surr)</i>	01	22.0	% 5-151	05/08/2023 10:00	05/09/2023 14:21							DS
<i>Surr: Phenol-d5 (Surr)</i>	01	11.0	% 5-60	05/08/2023 10:00	05/09/2023 14:21							DS
<i>Surr: p-Terphenyl-d14 (Surr)</i>	01	8.00	% 5-141	05/08/2023 10:00	05/09/2023 14:21							DS
Wet Chemistry Analysis												
Ammonia as N	01RE1	7664-41-7	EPA350.1 R2.0	05/10/2023 14:54	05/10/2023 14:54	1860		146	200	2000	mg/L	MKS
BOD	01	E1640606	SM5210B-20 11	05/05/2023 11:38	05/05/2023 11:38	11900		0.2	2.0	1	mg/L	NBT
COD	01	NA	SM5220D-20 11	05/09/2023 09:40	05/09/2023 09:40	18700		2000	2000	200	mg/L	MJRL
Nitrate as N	01	14797-55-8	Calc.	05/12/2023 15:32	05/12/2023 15:32	BLOD		1.20	5.20	100	mg/L	MKS
Nitrate+Nitrite as N	01RE2	E701177	SM4500-NO 3F-2011	05/12/2023 15:32	05/12/2023 15:32	2.25		0.20	0.20	1	mg/L	MKS
Nitrite as N	01	14797-65-0	SM4500-NO 2B-2011	05/05/2023 14:00	05/05/2023 14:00	BLOD		1.00	5.00	100	mg/L	MGC
Total Recoverable Phenolics	01	NA	SW9065	05/18/2023 16:35	05/18/2023 16:35	20.0		1.50	2.50	50	mg/L	MAH
TKN as N	01	E171148461	EPA351.2 R2.0	05/12/2023 16:32	05/12/2023 16:32	1950		40.0	100	200	mg/L	MJRL

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-59

Laboratory Sample ID: 23E0399-02

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	02RE1	7440-22-4	SW6020B	05/09/2023 13:00	05/10/2023 15:16	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	02RE1	7440-38-2	SW6020B	05/09/2023 13:00	05/10/2023 15:16	270		2.5	5.0	5	ug/L	AB
Barium	02RE1	7440-39-3	SW6020B	05/09/2023 13:00	05/10/2023 15:27	1830		10.0	50.0	10	ug/L	AB
Cadmium	02RE1	7440-43-9	SW6020B	05/09/2023 13:00	05/10/2023 15:16	BLOD		0.500	5.00	5	ug/L	AB
Chromium	02RE1	7440-47-3	SW6020B	05/09/2023 13:00	05/10/2023 15:16	237		2.00	5.00	5	ug/L	AB
Copper	02RE1	7440-50-8	SW6020B	05/09/2023 13:00	05/10/2023 15:16	BLOD		1.50	5.00	5	ug/L	AB
Mercury	02	7439-97-6	SW7470A	05/08/2023 10:45	05/09/2023 13:53	BLOD		0.00020	0.00020	1	mg/L	SGT
Nickel	02RE1	7440-02-0	SW6020B	05/09/2023 13:00	05/10/2023 15:16	56.57		5.000	5.000	5	ug/L	AB
Lead	02RE1	7439-92-1	SW6020B	05/09/2023 13:00	05/10/2023 15:16	BLOD		5.0	5.0	5	ug/L	AB
Selenium	02RE1	7782-49-2	SW6020B	05/09/2023 13:00	05/10/2023 15:16	5.69		4.25	5.00	5	ug/L	AB
Zinc	02RE1	7440-66-6	SW6020B	05/09/2023 13:00	05/10/2023 15:16	51.9		12.5	25.0	5	ug/L	AB

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-59

Laboratory Sample ID: 23E0399-02

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)	02RE1	78-93-3	SW8260D	05/08/2023 18:21	05/08/2023 18:21	13600		750	2500	250	ug/L	KCS
Acetone	02RE1	67-64-1	SW8260D	05/08/2023 18:21	05/08/2023 18:21	29600		1750	2500	250	ug/L	KCS
Benzene	02	71-43-2	SW8260D	05/05/2023 18:25	05/05/2023 18:25	3370		20.0	50.0	50	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	05/05/2023 18:25	05/05/2023 18:25	144		20.0	50.0	50	ug/L	RJB
Toluene	02	108-88-3	SW8260D	05/05/2023 18:25	05/05/2023 18:25	239		25.0	50.0	50	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	05/05/2023 18:25	05/05/2023 18:25	230		50.0	150	50	ug/L	RJB
Tetrahydrofuran	02	109-99-9	SW8260D	05/05/2023 18:25	05/05/2023 18:25	2380		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	02	102 %	70-120	05/05/2023 18:25	05/05/2023 18:25							
Surr: 4-Bromofluorobenzene (Surr)	02	100 %	75-120	05/05/2023 18:25	05/05/2023 18:25							
Surr: Dibromofluoromethane (Surr)	02	94.5 %	70-130	05/05/2023 18:25	05/05/2023 18:25							
Surr: Toluene-d8 (Surr)	02	101 %	70-130	05/05/2023 18:25	05/05/2023 18:25							
Surr: 1,2-Dichloroethane-d4 (Surr)	02RE1	120 %	70-120	05/08/2023 18:21	05/08/2023 18:21							
Surr: 4-Bromofluorobenzene (Surr)	02RE1	96.3 %	75-120	05/08/2023 18:21	05/08/2023 18:21							
Surr: Dibromofluoromethane (Surr)	02RE1	98.5 %	70-130	05/08/2023 18:21	05/08/2023 18:21							
Surr: Toluene-d8 (Surr)	02RE1	102 %	70-130	05/08/2023 18:21	05/08/2023 18:21							
Semivolatile Organic Compounds by GCMS												
Anthracene	02	120-12-7	SW8270E	05/08/2023 10:00	05/09/2023 14:56	BLOD		93.5	187	20	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	02	%	5-136	05/08/2023 10:00	05/09/2023 14:56							DS
Surr: 2-Fluorobiphenyl (Surr)	02	15.2 %	9-117	05/08/2023 10:00	05/09/2023 14:56							
Surr: 2-Fluorophenol (Surr)	02	0.400 %	5-60	05/08/2023 10:00	05/09/2023 14:56							DS
Surr: Nitrobenzene-d5 (Surr)	02	%	5-151	05/08/2023 10:00	05/09/2023 14:56							DS
Surr: Phenol-d5 (Surr)	02	0.600 %	5-60	05/08/2023 10:00	05/09/2023 14:56							DS
Surr: p-Terphenyl-d14 (Surr)	02	12.0 %	5-141	05/08/2023 10:00	05/09/2023 14:56							

Wet Chemistry Analysis

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-59

Laboratory Sample ID: 23E0399-02

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	02RE1	7664-41-7	EPA350.1 R2.0	05/10/2023 14:54	05/10/2023 14:54	2380		146	200	2000	mg/L	MKS
BOD	02	E1640606	SM5210B-20 11	05/05/2023 11:41	05/05/2023 11:41	35300		0.2	2.0	1	mg/L	NBT
COD	02	NA	SM5220D-20 11	05/09/2023 09:40	05/09/2023 09:40	44700		4000	4000	200	mg/L	MJRL
Nitrate as N	02	14797-55-8	Calc.	05/12/2023 15:32	05/12/2023 15:32	BLOD		1.20	5.20	100	mg/L	MKS
Nitrate+Nitrite as N	02RE2	E701177	SM4500-NO 3F-2011	05/12/2023 15:32	05/12/2023 15:32	2.56		0.20	0.20	1	mg/L	MKS
Nitrite as N	02	14797-65-0	SM4500-NO 2B-2011	05/05/2023 14:00	05/05/2023 14:00	BLOD		1.00	5.00	100	mg/L	MGC
Total Recoverable Phenolics	02	NA	SW9065	05/18/2023 16:35	05/18/2023 16:35	50.0		1.50	2.50	50	mg/L	MAH
TKN as N	02	E17148461	EPA351.2 R2.0	05/12/2023 16:32	05/12/2023 16:32	2910		40.0	100	200	mg/L	MJRL

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-50

Laboratory Sample ID: 23E0399-03

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	03RE1	7440-22-4	SW6020B	05/09/2023 13:00	05/10/2023 15:21	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	03RE1	7440-38-2	SW6020B	05/09/2023 13:00	05/10/2023 15:21	260		2.5	5.0	5	ug/L	AB
Barium	03RE1	7440-39-3	SW6020B	05/09/2023 13:00	05/10/2023 15:21	636		5.00	25.0	5	ug/L	AB
Cadmium	03RE1	7440-43-9	SW6020B	05/09/2023 13:00	05/10/2023 15:21	BLOD		0.500	5.00	5	ug/L	AB
Chromium	03RE1	7440-47-3	SW6020B	05/09/2023 13:00	05/10/2023 15:21	422		2.00	5.00	5	ug/L	AB
Copper	03RE1	7440-50-8	SW6020B	05/09/2023 13:00	05/10/2023 15:21	BLOD		1.50	5.00	5	ug/L	AB
Mercury	03	7439-97-6	SW7470A	05/08/2023 10:45	05/09/2023 13:54	BLOD		0.00020	0.00020	1	mg/L	SGT
Nickel	03RE1	7440-02-0	SW6020B	05/09/2023 13:00	05/10/2023 15:21	113.0		5.000	5.000	5	ug/L	AB
Lead	03RE1	7439-92-1	SW6020B	05/09/2023 13:00	05/10/2023 15:21	BLOD		5.0	5.0	5	ug/L	AB
Selenium	03RE1	7782-49-2	SW6020B	05/09/2023 13:00	05/10/2023 15:21	BLOD		4.25	5.00	5	ug/L	AB
Zinc	03RE1	7440-66-6	SW6020B	05/09/2023 13:00	05/10/2023 15:21	79.0		12.5	25.0	5	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	03	78-93-3	SW8260D	05/05/2023 18:50	05/05/2023 18:50	5360		150	500	50	ug/L	RJB
Acetone	03	67-64-1	SW8260D	05/05/2023 18:50	05/05/2023 18:50	10700		350	500	50	ug/L	RJB
Benzene	03	71-43-2	SW8260D	05/05/2023 18:50	05/05/2023 18:50	814		20.0	50.0	50	ug/L	RJB
Ethylbenzene	03	100-41-4	SW8260D	05/05/2023 18:50	05/05/2023 18:50	124		20.0	50.0	50	ug/L	RJB
Toluene	03	108-88-3	SW8260D	05/05/2023 18:50	05/05/2023 18:50	258		25.0	50.0	50	ug/L	RJB
Xylenes, Total	03	1330-20-7	SW8260D	05/05/2023 18:50	05/05/2023 18:50	274		50.0	150	50	ug/L	RJB
Tetrahydrofuran	03	109-99-9	SW8260D	05/05/2023 18:50	05/05/2023 18:50	BLOD		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	03	103 %	70-120	05/05/2023 18:50	05/05/2023 18:50							
Surr: 4-Bromofluorobenzene (Surr)	03	96.5 %	75-120	05/05/2023 18:50	05/05/2023 18:50							
Surr: Dibromofluoromethane (Surr)	03	93.1 %	70-130	05/05/2023 18:50	05/05/2023 18:50							
Surr: Toluene-d8 (Surr)	03	101 %	70-130	05/05/2023 18:50	05/05/2023 18:50							

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-50

Laboratory Sample ID: 23E0399-03

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Semivolatile Organic Compounds by GCMS												
Anthracene	03	120-12-7	SW8270E	05/08/2023 10:00	05/09/2023 15:30	BLOD		93.5	187	20	ug/L	BMS
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	03	116 %	5-136	05/08/2023 10:00	05/09/2023 15:30							
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	03	37.6 %	9-117	05/08/2023 10:00	05/09/2023 15:30							
<i>Surr: 2-Fluorophenol (Surr)</i>	03	21.2 %	5-60	05/08/2023 10:00	05/09/2023 15:30							
<i>Surr: Nitrobenzene-d5 (Surr)</i>	03	70.8 %	5-151	05/08/2023 10:00	05/09/2023 15:30							
<i>Surr: Phenol-d5 (Surr)</i>	03	19.6 %	5-60	05/08/2023 10:00	05/09/2023 15:30							
<i>Surr: p-Terphenyl-d14 (Surr)</i>	03	9.60 %	5-141	05/08/2023 10:00	05/09/2023 15:30							

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: EW-50

Laboratory Sample ID: 23E0399-03

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	03	7664-41-7	EPA350.1 R2.0	05/10/2023 14:54	05/10/2023 14:54	1390		146	200	2000	mg/L	MKS
BOD	03	E1640606	SM5210B-20 11	05/05/2023 11:44	05/05/2023 11:44	7350		0.2	2.0	1	mg/L	NBT
COD	03	NA	SM5220D-20 11	05/09/2023 09:40	05/09/2023 09:40	7590		2000	2000	200	mg/L	MJRL
Nitrate as N	03	14797-55-8	Calc.	05/12/2023 15:32	05/12/2023 15:32	BLOD		1.10	5.10	100	mg/L	MKS
Nitrate+Nitrite as N	03RE1	E701177	SM4500-NO 3F-2011	05/12/2023 15:32	05/12/2023 15:32	1.41		0.10	0.10	1	mg/L	MKS
Nitrite as N	03	14797-65-0	SM4500-NO 2B-2011	05/05/2023 14:00	05/05/2023 14:00	BLOD		1.00	5.00	100	mg/L	MGC
Total Recoverable Phenolics	03	NA	SW9065	05/18/2023 16:35	05/18/2023 16:35	18.6		1.50	2.50	50	mg/L	MAH
TKN as N	03	E17148461	EPA351.2 R2.0	05/12/2023 16:32	05/12/2023 16:32	1590		40.0	100	200	mg/L	MJRL

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Client Sample ID: Trip Blank

Laboratory Sample ID: 23E0399-04

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)	04	78-93-3	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	04	67-64-1	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	04	71-43-2	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	04	100-41-4	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	04	108-88-3	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	04	1330-20-7	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	04	109-99-9	SW8260D	05/05/2023 15:52	05/05/2023 15:52	BLOD		10.0	10.0	1	ug/L	RJB
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	04	95.8 %	70-120	05/05/2023 15:52	05/05/2023 15:52							
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	04	100 %	75-120	05/05/2023 15:52	05/05/2023 15:52							
<i>Surr: Dibromofluoromethane (Surr)</i>	04	95.9 %	70-130	05/05/2023 15:52	05/05/2023 15:52							
<i>Surr: Toluene-d8 (Surr)</i>	04	101 %	70-130	05/05/2023 15:52	05/05/2023 15:52							

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

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 BGE0300 - SW7470A										
Blank (BGE0300-BLK1)				Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	ND	0.00020	mg/L							
LCS (BGE0300-BS1)				Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	0.00256	0.00020	mg/L	0.00250		103	80-120			
Matrix Spike (BGE0300-MS1)				Source: 23E0396-01 Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	0.00268	0.00020	mg/L	0.00250	BLOD	107	80-120			
Matrix Spike (BGE0300-MS2)				Source: 23E0396-09 Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	0.00271	0.00020	mg/L	0.00250	BLOD	109	80-120			
Matrix Spike Dup (BGE0300-MSD1)				Source: 23E0396-01 Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	0.00270	0.00020	mg/L	0.00250	BLOD	108	80-120	0.997	20	
Matrix Spike Dup (BGE0300-MSD2)				Source: 23E0396-09 Prepared: 05/08/2023 Analyzed: 05/09/2023						
Mercury	0.00269	0.00020	mg/L	0.00250	BLOD	108	80-120	0.706	20	
Batch BGE0372 - EPA200.8 R5.4										
Blank (BGE0372-BLK1)				Prepared: 05/09/2023 Analyzed: 05/10/2023						
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							

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 BGE0372 - EPA200.8 R5.4										
Blank (BGE0372-BLK1)										
				Prepared: 05/09/2023 Analyzed: 05/10/2023						
Zinc	ND	5.00	ug/L							
LCS (BGE0372-BS1)										
				Prepared: 05/09/2023 Analyzed: 05/10/2023						
Arsenic	52	1.0	ug/L	50.0		104	80-120			
Barium	53.7	5.00	ug/L	50.0		107	80-120			
Cadmium	51.6	1.00	ug/L	50.0		103	80-120			
Chromium	51.8	1.00	ug/L	50.0		104	80-120			
Copper	52.6	1.00	ug/L	50.0		105	80-120			
Lead	52	1.0	ug/L	50.0		104	80-120			
Nickel	51.75	1.000	ug/L	50.0		103	80-120			
Selenium	51.9	1.00	ug/L	50.0		104	80-120			
Silver	10.3	1.00	ug/L	10.0		103	80-120			E
Zinc	52.4	5.00	ug/L	50.0		105	80-120			
Matrix Spike (BGE0372-MS1)										
				Source: 23E0274-02			Prepared: 05/09/2023 Analyzed: 05/10/2023			
Arsenic	51	1.0	ug/L	50.0	BLOD	103	75-125			
Barium	99.4	5.00	ug/L	50.0	47.3	104	75-125			
Cadmium	51.0	1.00	ug/L	50.0	BLOD	102	75-125			
Chromium	50.5	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	50.78	1.000	ug/L	50.0	BLOD	102	75-125			
Selenium	49.2	1.00	ug/L	50.0	BLOD	98.5	75-125			
Silver	10.1	1.00	ug/L	10.0	BLOD	101	75-125			E
Zinc	50.5	5.00	ug/L	50.0	BLOD	101	75-125			
Matrix Spike (BGE0372-MS2)										
				Source: 23E0274-03			Prepared: 05/09/2023 Analyzed: 05/10/2023			

Certificate of Analysis

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Date Issued: 6/5/2023 4:26:49PM

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 BGE0372 - EPA200.8 R5.4										
Matrix Spike (BGE0372-MS2) Source: 23E0274-03 Prepared: 05/09/2023 Analyzed: 05/10/2023										
Arsenic	51	1.0	ug/L	50.0	0.52	101	75-125			
Barium	217	5.00	ug/L	50.0	168	97.6	75-125			E
Cadmium	50.0	1.00	ug/L	50.0	BLOD	100	75-125			
Chromium	50.3	1.00	ug/L	50.0	BLOD	101	75-125			
Copper	47.7	1.00	ug/L	50.0	BLOD	95.5	75-125			
Lead	49	1.0	ug/L	50.0	BLOD	98.6	75-125			
Nickel	51.93	1.000	ug/L	50.0	4.103	95.7	75-125			
Selenium	47.3	1.00	ug/L	50.0	BLOD	94.6	75-125			
Silver	9.98	1.00	ug/L	10.0	BLOD	99.8	75-125			E
Zinc	47.9	5.00	ug/L	50.0	BLOD	95.8	75-125			
Matrix Spike Dup (BGE0372-MSD1) Source: 23E0274-02 Prepared: 05/09/2023 Analyzed: 05/10/2023										
Arsenic	53	1.0	ug/L	50.0	BLOD	106	75-125	3.12	20	
Barium	102	5.00	ug/L	50.0	47.3	110	75-125	2.94	20	
Cadmium	51.7	1.00	ug/L	50.0	BLOD	103	75-125	1.39	20	
Chromium	52.1	1.00	ug/L	50.0	BLOD	104	75-125	3.12	20	
Copper	51.5	1.00	ug/L	50.0	BLOD	103	75-125	2.33	20	
Lead	51	1.0	ug/L	50.0	BLOD	102	75-125	1.10	20	
Nickel	51.93	1.000	ug/L	50.0	BLOD	104	75-125	2.24	20	
Selenium	50.8	1.00	ug/L	50.0	BLOD	102	75-125	3.06	20	
Silver	10.2	1.00	ug/L	10.0	BLOD	102	75-125	1.67	20	E
Zinc	51.5	5.00	ug/L	50.0	BLOD	103	75-125	1.89	20	
Matrix Spike Dup (BGE0372-MSD2) Source: 23E0274-03 Prepared: 05/09/2023 Analyzed: 05/10/2023										
Arsenic	52	1.0	ug/L	50.0	0.52	103	75-125	1.74	20	
Barium	223	5.00	ug/L	50.0	168	110	75-125	2.75	20	E

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
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Batch BGE0372 - EPA200.8 R5.4

Matrix Spike Dup (BGE0372-MSD2)	Source: 23E0274-03			Prepared: 05/09/2023 Analyzed: 05/10/2023						
Cadmium	50.9	1.00	ug/L	50.0	BLOD	102	75-125	1.71	20	
Chromium	50.9	1.00	ug/L	50.0	BLOD	102	75-125	1.13	20	
Copper	48.3	1.00	ug/L	50.0	BLOD	96.6	75-125	1.16	20	
Lead	50	1.0	ug/L	50.0	BLOD	100	75-125	1.61	20	
Nickel	53.13	1.000	ug/L	50.0	4.103	98.0	75-125	2.27	20	
Selenium	47.7	1.00	ug/L	50.0	BLOD	95.4	75-125	0.899	20	
Silver	10.1	1.00	ug/L	10.0	BLOD	101	75-125	1.22	20	E
Zinc	48.5	5.00	ug/L	50.0	BLOD	97.0	75-125	1.27	20	

Certificate of Analysis

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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 BGE0279 - SW5030B-MS										
Blank (BGE0279-BLK1)				Prepared & Analyzed: 05/05/2023						
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							
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	45.2		ug/L	50.0		90.3	70-120			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	51.1		ug/L	50.0		102	75-120			
<i>Surr: Dibromofluoromethane (Surr)</i>	47.5		ug/L	50.0		95.0	70-130			
<i>Surr: Toluene-d8 (Surr)</i>	50.7		ug/L	50.0		101	70-130			
LCS (BGE0279-BS1)				Prepared & Analyzed: 05/05/2023						
1,1,1,2-Tetrachloroethane	48.8	0.4	ug/L	50.0		97.5	80-130			
1,1,1-Trichloroethane	50.4	1	ug/L	50.0		101	65-130			
1,1,2,2-Tetrachloroethane	46.8	0.4	ug/L	50.0		93.5	65-130			
1,1,2-Trichloroethane	52.7	1	ug/L	50.0		105	75-125			
1,1-Dichloroethane	50.8	1	ug/L	50.0		102	70-135			
1,1-Dichloroethylene	42.1	1	ug/L	50.0		84.1	70-130			
1,1-Dichloropropene	53.8	1	ug/L	50.0		108	75-135			
1,2,3-Trichlorobenzene	41.9	1	ug/L	50.0		83.8	55-140			
1,2,3-Trichloropropane	48.5	1	ug/L	50.0		97.0	75-125			
1,2,4-Trichlorobenzene	46.4	1	ug/L	50.0		92.7	65-135			
1,2,4-Trimethylbenzene	51.1	1	ug/L	50.0		102	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	49.0	1	ug/L	50.0		98.0	50-130			
1,2-Dibromoethane (EDB)	47.3	1	ug/L	50.0		94.6	80-120			

Certificate of Analysis

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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
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Batch BGE0279 - SW5030B-MS

LCS (BGE0279-BS1)

Prepared & Analyzed: 05/05/2023

1,2-Dichlorobenzene	47.3	0.5	ug/L	50.0		94.6	70-120			
1,2-Dichloroethane	45.0	1	ug/L	50.0		90.0	70-130			
1,2-Dichloropropane	49.9	0.5	ug/L	50.0		99.8	75-125			
1,3,5-Trimethylbenzene	49.9	1	ug/L	50.0		99.7	75-125			
1,3-Dichlorobenzene	47.2	1	ug/L	50.0		94.3	75-125			
1,3-Dichloropropane	51.4	1	ug/L	50.0		103	75-125			
1,4-Dichlorobenzene	47.2	1	ug/L	50.0		94.4	75-125			
2,2-Dichloropropane	50.6	1	ug/L	50.0		101	70-135			
2-Butanone (MEK)	46.2	10	ug/L	50.0		92.5	30-150			
2-Chlorotoluene	48.8	1	ug/L	50.0		97.6	75-125			
2-Hexanone (MBK)	40.1	5	ug/L	50.0		80.1	55-130			
4-Chlorotoluene	47.9	1	ug/L	50.0		95.8	75-130			
4-Isopropyltoluene	50.6	1	ug/L	50.0		101	75-130			
4-Methyl-2-pentanone (MIBK)	46.5	5	ug/L	50.0		93.0	60-135			
Acetone	45.5	10	ug/L	50.0		90.9	40-140			
Benzene	57.4	1	ug/L	50.0		115	80-120			
Bromobenzene	48.0	1	ug/L	50.0		96.1	75-125			
Bromochloromethane	45.2	1	ug/L	50.0		90.5	65-130			
Bromodichloromethane	48.5	0.5	ug/L	50.0		97.1	75-120			
Bromoform	46.8	1	ug/L	50.0		93.6	70-130			
Bromomethane	57.0	1	ug/L	50.0		114	30-145			
Carbon disulfide	50.5	10	ug/L	50.0		101	35-160			
Carbon tetrachloride	52.4	1	ug/L	50.0		105	65-140			
Chlorobenzene	48.9	1	ug/L	50.0		97.7	80-120			
Chloroethane	50.4	1	ug/L	50.0		101	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
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Batch BGE0279 - SW5030B-MS

LCS (BGE0279-BS1)

Prepared & Analyzed: 05/05/2023

Chloroform	39.0	0.5	ug/L	50.0		77.9	65-135			
Chloromethane	80.8	1	ug/L	50.0		162	40-125			L
cis-1,2-Dichloroethylene	51.3	1	ug/L	50.0		103	70-125			
cis-1,3-Dichloropropene	42.0	1	ug/L	50.0		84.0	70-130			
Dibromochloromethane	52.0	0.5	ug/L	50.0		104	60-135			
Dibromomethane	55.0	1	ug/L	50.0		110	75-125			
Dichlorodifluoromethane	67.9	1	ug/L	50.0		136	30-155			
Ethylbenzene	53.9	1	ug/L	50.0		108	75-125			
Hexachlorobutadiene	44.8	0.8	ug/L	50.0		89.7	50-140			
Isopropylbenzene	48.0	1	ug/L	50.0		96.0	75-125			
m+p-Xylenes	104	2	ug/L	100		104	75-130			
Methylene chloride	44.1	4	ug/L	50.0		88.2	55-140			
Methyl-t-butyl ether (MTBE)	49.6	1	ug/L	50.0		99.2	65-125			
Naphthalene	47.8	1	ug/L	50.0		95.5	55-140			
n-Butylbenzene	54.4	1	ug/L	50.0		109	70-135			
n-Propylbenzene	51.8	1	ug/L	50.0		104	70-130			
o-Xylene	51.8	1	ug/L	50.0		104	80-120			
sec-Butylbenzene	54.0	1	ug/L	50.0		108	70-125			
Styrene	39.1	1	ug/L	50.0		78.1	65-135			
tert-Butylbenzene	50.5	1	ug/L	50.0		101	70-130			
Tetrachloroethylene (PCE)	51.7	1	ug/L	50.0		103	45-150			
Toluene	54.3	1	ug/L	50.0		109	75-120			
trans-1,2-Dichloroethylene	45.4	1	ug/L	50.0		90.7	60-140			
trans-1,3-Dichloropropene	45.6	1	ug/L	50.0		91.2	55-140			
Trichloroethylene	50.4	1	ug/L	50.0		101	70-125			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

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 BGE0279 - SW5030B-MS										
LCS (BGE0279-BS1)			Prepared & Analyzed: 05/05/2023							
Trichlorofluoromethane	60.7	1	ug/L	50.0		121	60-145			
Vinyl chloride	56.7	0.5	ug/L	50.0		113	50-145			
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	<i>50.5</i>		ug/L	<i>50.0</i>		<i>101</i>	<i>70-120</i>			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	<i>52.4</i>		ug/L	<i>50.0</i>		<i>105</i>	<i>75-120</i>			
<i>Surr: Dibromofluoromethane (Surr)</i>	<i>43.1</i>		ug/L	<i>50.0</i>		<i>86.2</i>	<i>70-130</i>			
<i>Surr: Toluene-d8 (Surr)</i>	<i>51.5</i>		ug/L	<i>50.0</i>		<i>103</i>	<i>70-130</i>			
Matrix Spike (BGE0279-MS1)			Source: 23E0301-01		Prepared & Analyzed: 05/05/2023					
1,1,1,2-Tetrachloroethane	47.7	0.4	ug/L	50.0	BLOD	95.4	80-130			
1,1,1-Trichloroethane	53.5	1	ug/L	50.0	BLOD	107	65-130			
1,1,2,2-Tetrachloroethane	46.6	0.4	ug/L	50.0	BLOD	93.2	65-130			
1,1,2-Trichloroethane	52.0	1	ug/L	50.0	BLOD	104	75-125			
1,1-Dichloroethane	49.4	1	ug/L	50.0	BLOD	98.7	70-135			
1,1-Dichloroethylene	44.9	1	ug/L	50.0	BLOD	89.9	50-145			
1,1-Dichloropropene	59.2	1	ug/L	50.0	BLOD	118	75-135			
1,2,3-Trichlorobenzene	53.1	1	ug/L	50.0	BLOD	106	55-140			
1,2,3-Trichloropropane	48.4	1	ug/L	50.0	BLOD	96.9	75-125			
1,2,4-Trichlorobenzene	51.6	1	ug/L	50.0	BLOD	103	65-135			
1,2,4-Trimethylbenzene	52.7	1	ug/L	50.0	BLOD	105	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	55.9	1	ug/L	50.0	BLOD	112	50-130			
1,2-Dibromoethane (EDB)	47.5	1	ug/L	50.0	BLOD	95.0	80-120			
1,2-Dichlorobenzene	48.9	0.5	ug/L	50.0	BLOD	97.8	70-120			
1,2-Dichloroethane	44.7	1	ug/L	50.0	BLOD	89.4	70-130			
1,2-Dichloropropane	54.2	0.5	ug/L	50.0	BLOD	108	75-125			
1,3,5-Trimethylbenzene	51.0	1	ug/L	50.0	BLOD	102	75-124			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0279 - SW5030B-MS

Matrix Spike (BGE0279-MS1)

Source: 23E0301-01

Prepared & Analyzed: 05/05/2023

1,3-Dichlorobenzene	47.8	1	ug/L	50.0	BLOD	95.6	75-125			
1,3-Dichloropropane	51.4	1	ug/L	50.0	BLOD	103	75-125			
1,4-Dichlorobenzene	47.5	1	ug/L	50.0	BLOD	95.0	75-125			
2,2-Dichloropropane	50.5	1	ug/L	50.0	BLOD	101	70-135			
2-Butanone (MEK)	50.0	10	ug/L	50.0	BLOD	100	30-150			
2-Chlorotoluene	49.0	1	ug/L	50.0	BLOD	98.1	75-125			
2-Hexanone (MBK)	43.5	5	ug/L	50.0	BLOD	87.1	55-130			
4-Chlorotoluene	49.3	1	ug/L	50.0	BLOD	98.5	75-130			
4-Isopropyltoluene	52.1	1	ug/L	50.0	BLOD	104	75-130			
4-Methyl-2-pentanone (MIBK)	48.0	5	ug/L	50.0	BLOD	96.1	60-135			
Acetone	43.8	10	ug/L	50.0	BLOD	87.6	40-140			
Benzene	58.0	1	ug/L	50.0	BLOD	116	80-120			
Bromobenzene	47.9	1	ug/L	50.0	BLOD	95.9	75-125			
Bromochloromethane	46.9	1	ug/L	50.0	BLOD	93.7	65-130			
Bromodichloromethane	52.8	0.5	ug/L	50.0	BLOD	106	75-136			
Bromoform	46.4	1	ug/L	50.0	BLOD	92.7	70-130			
Bromomethane	46.0	1	ug/L	50.0	BLOD	91.9	30-145			
Carbon disulfide	54.2	10	ug/L	50.0	13.4	81.6	35-160			
Carbon tetrachloride	53.6	1	ug/L	50.0	BLOD	107	65-140			
Chlorobenzene	47.6	1	ug/L	50.0	BLOD	95.2	80-120			
Chloroethane	49.4	1	ug/L	50.0	BLOD	98.9	60-135			
Chloroform	43.2	0.5	ug/L	50.0	BLOD	86.3	65-135			
Chloromethane	77.8	1	ug/L	50.0	BLOD	156	40-125			M
cis-1,2-Dichloroethylene	48.9	1	ug/L	50.0	18.4	60.9	70-125			M
cis-1,3-Dichloropropene	40.7	1	ug/L	50.0	BLOD	81.5	47-136			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0279 - SW5030B-MS

Matrix Spike (BGE0279-MS1)

Source: 23E0301-01

Prepared & Analyzed: 05/05/2023

Dibromochloromethane	51.0	0.5	ug/L	50.0	BLOD	102	60-135			
Dibromomethane	52.8	1	ug/L	50.0	BLOD	106	75-125			
Dichlorodifluoromethane	67.7	1	ug/L	50.0	BLOD	135	30-155			
Ethylbenzene	53.1	1	ug/L	50.0	BLOD	106	75-125			
Hexachlorobutadiene	49.1	0.8	ug/L	50.0	BLOD	98.1	50-140			
Isopropylbenzene	46.5	1	ug/L	50.0	BLOD	92.9	75-125			
m+p-Xylenes	104	2	ug/L	100	BLOD	104	75-130			
Methylene chloride	42.8	4	ug/L	50.0	BLOD	85.5	55-140			
Methyl-t-butyl ether (MTBE)	48.7	1	ug/L	50.0	BLOD	97.4	65-125			
Naphthalene	60.9	1	ug/L	50.0	BLOD	122	55-140			
n-Butylbenzene	55.6	1	ug/L	50.0	BLOD	111	70-135			
n-Propylbenzene	52.6	1	ug/L	50.0	BLOD	105	70-130			
o-Xylene	50.8	1	ug/L	50.0	BLOD	102	80-120			
sec-Butylbenzene	54.1	1	ug/L	50.0	BLOD	108	70-125			
Styrene	37.8	1	ug/L	50.0	BLOD	75.6	65-135			
tert-Butylbenzene	51.5	1	ug/L	50.0	BLOD	103	70-130			
Tetrachloroethylene (PCE)	51.3	1	ug/L	50.0	BLOD	103	51-231			
Toluene	53.2	1	ug/L	50.0	BLOD	106	75-120			
trans-1,2-Dichloroethylene	50.1	1	ug/L	50.0	BLOD	100	60-140			
trans-1,3-Dichloropropene	43.3	1	ug/L	50.0	BLOD	86.6	55-140			
Trichloroethylene	52.4	1	ug/L	50.0	9.40	86.0	70-125			
Trichlorofluoromethane	58.5	1	ug/L	50.0	BLOD	117	60-145			
Vinyl chloride	59.1	0.5	ug/L	50.0	BLOD	118	50-145			
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Surr: 1,2-Dichloroethane-d4 (Surr)	49.2		ug/L	50.0		98.4	70-120			
Surr: 4-Bromofluorobenzene (Surr)	51.6		ug/L	50.0		103	75-120			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0279 - SW5030B-MS

Matrix Spike (BGE0279-MS1)

Source: 23E0301-01

Prepared & Analyzed: 05/05/2023

<i>Surr: Dibromofluoromethane (Surr)</i>	45.3		ug/L	50.0		90.6	70-130		
<i>Surr: Toluene-d8 (Surr)</i>	50.7		ug/L	50.0		101	70-130		

Matrix Spike Dup (BGE0279-MSD1)

Source: 23E0301-01

Prepared & Analyzed: 05/05/2023

1,1,1,2-Tetrachloroethane	46.4	0.4	ug/L	50.0	BLOD	92.8	80-130	2.74	30
1,1,1-Trichloroethane	50.9	1	ug/L	50.0	BLOD	102	65-130	4.96	30
1,1,2,2-Tetrachloroethane	46.3	0.4	ug/L	50.0	BLOD	92.7	65-130	0.602	30
1,1,2-Trichloroethane	48.2	1	ug/L	50.0	BLOD	96.3	75-125	7.59	30
1,1-Dichloroethane	47.3	1	ug/L	50.0	BLOD	94.7	70-135	4.20	30
1,1-Dichloroethylene	39.9	1	ug/L	50.0	BLOD	79.8	50-145	11.9	30
1,1-Dichloropropene	56.6	1	ug/L	50.0	BLOD	113	75-135	4.54	30
1,2,3-Trichlorobenzene	53.0	1	ug/L	50.0	BLOD	106	55-140	0.264	30
1,2,3-Trichloropropane	47.1	1	ug/L	50.0	BLOD	94.1	75-125	2.87	30
1,2,4-Trichlorobenzene	49.5	1	ug/L	50.0	BLOD	98.9	65-135	4.33	30
1,2,4-Trimethylbenzene	50.4	1	ug/L	50.0	BLOD	101	75-130	4.39	30
1,2-Dibromo-3-chloropropane (DBCP)	55.9	1	ug/L	50.0	BLOD	112	50-130	0.107	30
1,2-Dibromoethane (EDB)	46.3	1	ug/L	50.0	BLOD	92.6	80-120	2.54	30
1,2-Dichlorobenzene	47.4	0.5	ug/L	50.0	BLOD	94.7	70-120	3.16	30
1,2-Dichloroethane	42.9	1	ug/L	50.0	BLOD	85.7	70-130	4.25	30
1,2-Dichloropropane	50.3	0.5	ug/L	50.0	BLOD	101	75-125	7.52	30
1,3,5-Trimethylbenzene	48.6	1	ug/L	50.0	BLOD	97.3	75-124	4.68	30
1,3-Dichlorobenzene	46.6	1	ug/L	50.0	BLOD	93.1	75-125	2.63	30
1,3-Dichloropropane	47.6	1	ug/L	50.0	BLOD	95.2	75-125	7.63	30
1,4-Dichlorobenzene	45.8	1	ug/L	50.0	BLOD	91.7	75-125	3.58	30
2,2-Dichloropropane	47.1	1	ug/L	50.0	BLOD	94.3	70-135	6.86	30

Certificate of Analysis

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 Submitted To: Jennifer Robb

Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0279 - SW5030B-MS

Matrix Spike Dup (BGE0279-MSD1)	Source: 23E0301-01			Prepared & Analyzed: 05/05/2023						
2-Butanone (MEK)	46.8	10	ug/L	50.0	BLOD	93.6	30-150		30	
2-Chlorotoluene	46.9	1	ug/L	50.0	BLOD	93.7	75-125	4.53	30	
2-Hexanone (MBK)	41.9	5	ug/L	50.0	BLOD	83.9	55-130		30	
4-Chlorotoluene	47.8	1	ug/L	50.0	BLOD	95.5	75-130	3.11	30	
4-Isopropyltoluene	50.6	1	ug/L	50.0	BLOD	101	75-130	3.06	30	
4-Methyl-2-pentanone (MIBK)	47.3	5	ug/L	50.0	BLOD	94.6	60-135	1.55	30	
Acetone	44.1	10	ug/L	50.0	BLOD	88.2	40-140		30	
Benzene	54.6	1	ug/L	50.0	BLOD	109	80-120	6.11	30	
Bromobenzene	45.5	1	ug/L	50.0	BLOD	91.0	75-125	5.22	30	
Bromochloromethane	44.3	1	ug/L	50.0	BLOD	88.6	65-130	5.66	30	
Bromodichloromethane	48.7	0.5	ug/L	50.0	BLOD	97.4	75-136	8.00	30	
Bromoform	45.1	1	ug/L	50.0	BLOD	90.3	70-130	2.67	30	
Bromomethane	44.0	1	ug/L	50.0	BLOD	88.0	30-145	4.36	30	
Carbon disulfide	53.7	10	ug/L	50.0	13.4	80.7	35-160		30	
Carbon tetrachloride	47.3	1	ug/L	50.0	BLOD	94.7	65-140	12.4	30	
Chlorobenzene	45.3	1	ug/L	50.0	BLOD	90.7	80-120	4.88	30	
Chloroethane	46.2	1	ug/L	50.0	BLOD	92.3	60-135	6.84	30	
Chloroform	41.4	0.5	ug/L	50.0	BLOD	82.9	65-135	4.11	30	
Chloromethane	71.9	1	ug/L	50.0	BLOD	144	40-125	7.89	30	M
cis-1,2-Dichloroethylene	47.8	1	ug/L	50.0	18.4	58.8	70-125	2.17	30	M
cis-1,3-Dichloropropene	38.0	1	ug/L	50.0	BLOD	76.0	47-136	6.96	30	
Dibromochloromethane	47.0	0.5	ug/L	50.0	BLOD	94.1	60-135	8.18	30	
Dibromomethane	50.7	1	ug/L	50.0	BLOD	101	75-125	4.08	30	
Dichlorodifluoromethane	63.6	1	ug/L	50.0	BLOD	127	30-155	6.24	30	
Ethylbenzene	51.5	1	ug/L	50.0	BLOD	103	75-125	3.08	30	

Certificate of Analysis

Client Name: SCS Engineers-Winchester
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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
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Batch BGE0279 - SW5030B-MS

Matrix Spike Dup (BGE0279-MSD1)	Source: 23E0301-01			Prepared & Analyzed: 05/05/2023						
Hexachlorobutadiene	47.8	0.8	ug/L	50.0	BLOD	95.5	50-140	2.68	30	
Isopropylbenzene	44.9	1	ug/L	50.0	BLOD	89.7	75-125	3.50	30	
m+p-Xylenes	99.2	2	ug/L	100	BLOD	99.2	75-130	4.31	30	
Methylene chloride	43.7	4	ug/L	50.0	BLOD	87.4	55-140		30	
Methyl-t-butyl ether (MTBE)	47.3	1	ug/L	50.0	BLOD	94.6	65-125	2.94	30	
Naphthalene	60.6	1	ug/L	50.0	BLOD	121	55-140	0.412	30	
n-Butylbenzene	52.6	1	ug/L	50.0	BLOD	105	70-135	5.51	30	
n-Propylbenzene	49.9	1	ug/L	50.0	BLOD	99.8	70-130	5.13	30	
o-Xylene	48.7	1	ug/L	50.0	BLOD	97.4	80-120	4.32	30	
sec-Butylbenzene	53.1	1	ug/L	50.0	BLOD	106	70-125	1.90	30	
Styrene	36.5	1	ug/L	50.0	BLOD	72.9	65-135	3.56	30	
tert-Butylbenzene	49.2	1	ug/L	50.0	BLOD	98.4	70-130	4.57	30	
Tetrachloroethylene (PCE)	49.0	1	ug/L	50.0	BLOD	97.9	51-231	4.71	30	
Toluene	50.2	1	ug/L	50.0	BLOD	100	75-120	5.94	30	
trans-1,2-Dichloroethylene	48.4	1	ug/L	50.0	BLOD	96.7	60-140	3.51	30	
trans-1,3-Dichloropropene	39.9	1	ug/L	50.0	BLOD	79.7	55-140	8.20	30	
Trichloroethylene	47.6	1	ug/L	50.0	9.40	76.3	70-125	9.70	30	
Trichlorofluoromethane	53.8	1	ug/L	50.0	BLOD	108	60-145	8.37	30	
Vinyl chloride	51.5	0.5	ug/L	50.0	BLOD	103	50-145	13.9	30	
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Surr: 1,2-Dichloroethane-d4 (Surr)	49.0		ug/L	50.0		98.0	70-120			
Surr: 4-Bromofluorobenzene (Surr)	51.4		ug/L	50.0		103	75-120			
Surr: Dibromofluoromethane (Surr)	45.2		ug/L	50.0		90.4	70-130			
Surr: Toluene-d8 (Surr)	50.6		ug/L	50.0		101	70-130			

Batch BGE0314 - SW5030B-MS

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

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 BGE0314 - SW5030B-MS										
Blank (BGE0314-BLK1)				Prepared & Analyzed: 05/08/2023						
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							
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	54.6		ug/L	50.0		109	70-120			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	48.5		ug/L	50.0		97.1	75-120			
<i>Surr: Dibromofluoromethane (Surr)</i>	49.5		ug/L	50.0		99.1	70-130			
<i>Surr: Toluene-d8 (Surr)</i>	50.4		ug/L	50.0		101	70-130			
LCS (BGE0314-BS1)				Prepared & Analyzed: 05/08/2023						
1,1,1,2-Tetrachloroethane	51.0	0.4	ug/L	50.0		102	80-130			
1,1,1-Trichloroethane	53.4	1	ug/L	50.0		107	65-130			
1,1,2,2-Tetrachloroethane	48.9	0.4	ug/L	50.0		97.7	65-130			
1,1,2-Trichloroethane	49.7	1	ug/L	50.0		99.3	75-125			
1,1-Dichloroethane	51.5	1	ug/L	50.0		103	70-135			
1,1-Dichloroethylene	44.3	1	ug/L	50.0		88.6	70-130			
1,1-Dichloropropene	55.7	1	ug/L	50.0		111	75-135			
1,2,3-Trichlorobenzene	43.7	1	ug/L	50.0		87.4	55-140			
1,2,3-Trichloropropane	49.7	1	ug/L	50.0		99.4	75-125			
1,2,4-Trichlorobenzene	49.6	1	ug/L	50.0		99.2	65-135			
1,2,4-Trimethylbenzene	58.3	1	ug/L	50.0		117	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	55.2	1	ug/L	50.0		110	50-130			
1,2-Dibromoethane (EDB)	49.2	1	ug/L	50.0		98.4	80-120			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0314 - SW5030B-MS

LCS (BGE0314-BS1)

Prepared & Analyzed: 05/08/2023

1,2-Dichlorobenzene	55.0	0.5	ug/L	50.0		110	70-120			
1,2-Dichloroethane	47.8	1	ug/L	50.0		95.5	70-130			
1,2-Dichloropropane	54.0	0.5	ug/L	50.0		108	75-125			
1,3,5-Trimethylbenzene	56.3	1	ug/L	50.0		113	75-125			
1,3-Dichlorobenzene	53.4	1	ug/L	50.0		107	75-125			
1,3-Dichloropropane	49.6	1	ug/L	50.0		99.1	75-125			
1,4-Dichlorobenzene	52.7	1	ug/L	50.0		105	75-125			
2,2-Dichloropropane	52.7	1	ug/L	50.0		105	70-135			
2-Butanone (MEK)	41.6	10	ug/L	50.0		83.1	30-150			
2-Chlorotoluene	54.2	1	ug/L	50.0		108	75-125			
2-Hexanone (MBK)	42.7	5	ug/L	50.0		85.4	55-130			
4-Chlorotoluene	53.2	1	ug/L	50.0		106	75-130			
4-Isopropyltoluene	58.1	1	ug/L	50.0		116	75-130			
4-Methyl-2-pentanone (MIBK)	44.0	5	ug/L	50.0		88.1	60-135			
Acetone	45.7	10	ug/L	50.0		91.4	40-140			
Benzene	54.3	1	ug/L	50.0		109	80-120			
Bromobenzene	51.0	1	ug/L	50.0		102	75-125			
Bromochloromethane	48.1	1	ug/L	50.0		96.2	65-130			
Bromodichloromethane	52.1	0.5	ug/L	50.0		104	75-120			
Bromoform	49.8	1	ug/L	50.0		99.6	70-130			
Bromomethane	57.0	1	ug/L	50.0		114	30-145			
Carbon disulfide	44.9	10	ug/L	50.0		89.9	35-160			
Carbon tetrachloride	48.5	1	ug/L	50.0		97.0	65-140			
Chlorobenzene	49.8	1	ug/L	50.0		99.6	80-120			
Chloroethane	51.8	1	ug/L	50.0		104	60-135			

Certificate of Analysis

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

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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
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Batch BGE0314 - SW5030B-MS

LCS (BGE0314-BS1)

Prepared & Analyzed: 05/08/2023

Chloroform	41.0	0.5	ug/L	50.0		82.0	65-135			
Chloromethane	80.5	1	ug/L	50.0		161	40-125			L
cis-1,2-Dichloroethylene	47.7	1	ug/L	50.0		95.5	70-125			
cis-1,3-Dichloropropene	40.8	1	ug/L	50.0		81.7	70-130			
Dibromochloromethane	48.8	0.5	ug/L	50.0		97.6	60-135			
Dibromomethane	51.5	1	ug/L	50.0		103	75-125			
Dichlorodifluoromethane	66.6	1	ug/L	50.0		133	30-155			
Ethylbenzene	56.7	1	ug/L	50.0		113	75-125			
Hexachlorobutadiene	49.1	0.8	ug/L	50.0		98.2	50-140			
Isopropylbenzene	50.3	1	ug/L	50.0		101	75-125			
m+p-Xylenes	110	2	ug/L	100		110	75-130			
Methylene chloride	45.1	4	ug/L	50.0		90.1	55-140			
Methyl-t-butyl ether (MTBE)	51.6	1	ug/L	50.0		103	65-125			
Naphthalene	49.5	1	ug/L	50.0		99.1	55-140			
n-Butylbenzene	61.9	1	ug/L	50.0		124	70-135			
n-Propylbenzene	57.9	1	ug/L	50.0		116	70-130			
o-Xylene	53.6	1	ug/L	50.0		107	80-120			
sec-Butylbenzene	61.2	1	ug/L	50.0		122	70-125			
Styrene	40.2	1	ug/L	50.0		80.4	65-135			
tert-Butylbenzene	56.8	1	ug/L	50.0		114	70-130			
Tetrachloroethylene (PCE)	53.3	1	ug/L	50.0		107	45-150			
Toluene	51.4	1	ug/L	50.0		103	75-120			
trans-1,2-Dichloroethylene	46.8	1	ug/L	50.0		93.7	60-140			
trans-1,3-Dichloropropene	42.3	1	ug/L	50.0		84.6	55-140			
Trichloroethylene	48.8	1	ug/L	50.0		97.6	70-125			

Certificate of Analysis

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

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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
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Batch BGE0314 - SW5030B-MS

LCS (BGE0314-BS1)

Prepared & Analyzed: 05/08/2023

Trichlorofluoromethane	63.3	1	ug/L	50.0		127	60-145			
Vinyl chloride	56.7	0.5	ug/L	50.0		113	50-145			
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	<i>56.4</i>		<i>ug/L</i>	<i>50.0</i>		<i>113</i>	<i>70-120</i>			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	<i>49.9</i>		<i>ug/L</i>	<i>50.0</i>		<i>99.8</i>	<i>75-120</i>			
<i>Surr: Dibromofluoromethane (Surr)</i>	<i>45.6</i>		<i>ug/L</i>	<i>50.0</i>		<i>91.2</i>	<i>70-130</i>			
<i>Surr: Toluene-d8 (Surr)</i>	<i>50.8</i>		<i>ug/L</i>	<i>50.0</i>		<i>102</i>	<i>70-130</i>			

Matrix Spike (BGE0314-MS1)

Source: 23E0452-04

Prepared & Analyzed: 05/08/2023

1,1,1,2-Tetrachloroethane	49.2	0.4	ug/L	50.0	BLOD	98.5	80-130			
1,1,1-Trichloroethane	49.9	1	ug/L	50.0	BLOD	99.7	65-130			
1,1,2,2-Tetrachloroethane	46.2	0.4	ug/L	50.0	BLOD	92.4	65-130			
1,1,2-Trichloroethane	47.0	1	ug/L	50.0	BLOD	94.0	75-125			
1,1-Dichloroethane	46.7	1	ug/L	50.0	BLOD	93.4	70-135			
1,1-Dichloroethylene	41.7	1	ug/L	50.0	BLOD	83.4	50-145			
1,1-Dichloropropene	54.2	1	ug/L	50.0	BLOD	108	75-135			
1,2,3-Trichlorobenzene	47.5	1	ug/L	50.0	BLOD	95.1	55-140			
1,2,3-Trichloropropane	46.5	1	ug/L	50.0	BLOD	93.0	75-125			
1,2,4-Trichlorobenzene	47.5	1	ug/L	50.0	BLOD	95.1	65-135			
1,2,4-Trimethylbenzene	58.4	1	ug/L	50.0	BLOD	117	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	52.4	1	ug/L	50.0	BLOD	105	50-130			
1,2-Dibromoethane (EDB)	46.9	1	ug/L	50.0	BLOD	93.8	80-120			
1,2-Dichlorobenzene	51.7	0.5	ug/L	50.0	BLOD	103	70-120			
1,2-Dichloroethane	41.0	1	ug/L	50.0	BLOD	82.1	70-130			
1,2-Dichloropropane	50.0	0.5	ug/L	50.0	BLOD	99.9	75-125			
1,3,5-Trimethylbenzene	53.9	1	ug/L	50.0	BLOD	108	75-124			

Certificate of Analysis

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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
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Batch BGE0314 - SW5030B-MS

Matrix Spike (BGE0314-MS1)

Source: 23E0452-04

Prepared & Analyzed: 05/08/2023

1,3-Dichlorobenzene	50.6	1	ug/L	50.0	BLOD	101	75-125			
1,3-Dichloropropane	46.8	1	ug/L	50.0	BLOD	93.6	75-125			
1,4-Dichlorobenzene	50.6	1	ug/L	50.0	BLOD	101	75-125			
2,2-Dichloropropane	41.8	1	ug/L	50.0	BLOD	83.5	70-135			
2-Butanone (MEK)	39.8	10	ug/L	50.0	BLOD	79.7	30-150			
2-Chlorotoluene	52.3	1	ug/L	50.0	BLOD	105	75-125			
2-Hexanone (MBK)	40.5	5	ug/L	50.0	BLOD	80.9	55-130			
4-Chlorotoluene	53.1	1	ug/L	50.0	BLOD	106	75-130			
4-Isopropyltoluene	52.8	1	ug/L	50.0	BLOD	106	75-130			
4-Methyl-2-pentanone (MIBK)	42.2	5	ug/L	50.0	BLOD	84.4	60-135			
Acetone	40.1	10	ug/L	50.0	7.46	65.3	40-140			
Benzene	56.0	1	ug/L	50.0	BLOD	112	80-120			
Bromobenzene	47.8	1	ug/L	50.0	BLOD	95.6	75-125			
Bromochloromethane	44.6	1	ug/L	50.0	BLOD	89.1	65-130			
Bromodichloromethane	48.3	0.5	ug/L	50.0	BLOD	96.6	75-136			
Bromoform	46.0	1	ug/L	50.0	BLOD	92.0	70-130			
Bromomethane	40.6	1	ug/L	50.0	BLOD	81.3	30-145			
Carbon disulfide	45.1	10	ug/L	50.0	BLOD	90.3	35-160			
Carbon tetrachloride	48.4	1	ug/L	50.0	BLOD	96.7	65-140			
Chlorobenzene	49.0	1	ug/L	50.0	BLOD	98.0	80-120			
Chloroethane	48.5	1	ug/L	50.0	BLOD	97.0	60-135			
Chloroform	39.7	0.5	ug/L	50.0	BLOD	79.5	65-135			
Chloromethane	68.8	1	ug/L	50.0	BLOD	138	40-125			M
cis-1,2-Dichloroethylene	45.4	1	ug/L	50.0	0.49	89.8	70-125			
cis-1,3-Dichloropropene	37.4	1	ug/L	50.0	BLOD	74.8	47-136			

Certificate of Analysis

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Date Issued: 6/5/2023 4:26:49PM

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0314 - SW5030B-MS

Matrix Spike (BGE0314-MS1)

Source: 23E0452-04

Prepared & Analyzed: 05/08/2023

Dibromochloromethane	45.7	0.5	ug/L	50.0	BLOD	91.4	60-135			
Dibromomethane	48.4	1	ug/L	50.0	BLOD	96.9	75-125			
Dichlorodifluoromethane	55.5	1	ug/L	50.0	BLOD	111	30-155			
Ethylbenzene	55.8	1	ug/L	50.0	BLOD	112	75-125			
Hexachlorobutadiene	33.3	0.8	ug/L	50.0	BLOD	66.6	50-140			
Isopropylbenzene	53.8	1	ug/L	50.0	7.71	92.3	75-125			
m+p-Xylenes	105	2	ug/L	100	BLOD	105	75-130			
Methylene chloride	42.6	4	ug/L	50.0	BLOD	85.2	55-140			
Methyl-t-butyl ether (MTBE)	44.7	1	ug/L	50.0	BLOD	89.5	65-125			
Naphthalene	76.8	1	ug/L	50.0	BLOD	154	55-140			M
n-Butylbenzene	57.4	1	ug/L	50.0	5.24	104	70-135			
n-Propylbenzene	62.6	1	ug/L	50.0	5.86	113	70-130			
o-Xylene	51.6	1	ug/L	50.0	BLOD	103	80-120			
sec-Butylbenzene	65.8	1	ug/L	50.0	13.4	105	70-125			
Styrene	38.7	1	ug/L	50.0	BLOD	77.4	65-135			
tert-Butylbenzene	54.8	1	ug/L	50.0	1.36	107	70-130			
Tetrachloroethylene (PCE)	52.1	1	ug/L	50.0	BLOD	104	51-231			
Toluene	49.7	1	ug/L	50.0	BLOD	99.4	75-120			
trans-1,2-Dichloroethylene	45.5	1	ug/L	50.0	BLOD	91.1	60-140			
trans-1,3-Dichloropropene	38.3	1	ug/L	50.0	BLOD	76.6	55-140			
Trichloroethylene	46.0	1	ug/L	50.0	BLOD	92.0	70-125			
Trichlorofluoromethane	52.4	1	ug/L	50.0	BLOD	105	60-145			
Vinyl chloride	47.0	0.5	ug/L	50.0	BLOD	94.1	50-145			
<hr/>										
Surr: 1,2-Dichloroethane-d4 (Surr)	52.5		ug/L	50.0		105	70-120			
Surr: 4-Bromofluorobenzene (Surr)	48.6		ug/L	50.0		97.2	75-120			

Certificate of Analysis

Client Name: SCS Engineers-Winchester
 Client Site I.D.: 2023 City of Bristol Landfill Leachate
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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
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Batch BGE0314 - SW5030B-MS

Matrix Spike (BGE0314-MS1)

Source: 23E0452-04

Prepared & Analyzed: 05/08/2023

<i>Surr: Dibromofluoromethane (Surr)</i>	45.9		ug/L	50.0		91.8	70-130		
<i>Surr: Toluene-d8 (Surr)</i>	50.4		ug/L	50.0		101	70-130		

Matrix Spike Dup (BGE0314-MSD1)

Source: 23E0452-04

Prepared & Analyzed: 05/08/2023

1,1,1,2-Tetrachloroethane	48.5	0.4	ug/L	50.0	BLOD	97.0	80-130	1.51	30
1,1,1-Trichloroethane	47.8	1	ug/L	50.0	BLOD	95.6	65-130	4.24	30
1,1,2,2-Tetrachloroethane	48.0	0.4	ug/L	50.0	BLOD	96.0	65-130	3.84	30
1,1,2-Trichloroethane	48.7	1	ug/L	50.0	BLOD	97.4	75-125	3.57	30
1,1-Dichloroethane	46.5	1	ug/L	50.0	BLOD	93.0	70-135	0.429	30
1,1-Dichloroethylene	43.6	1	ug/L	50.0	BLOD	87.3	50-145	4.48	30
1,1-Dichloropropene	53.0	1	ug/L	50.0	BLOD	106	75-135	2.18	30
1,2,3-Trichlorobenzene	55.6	1	ug/L	50.0	BLOD	111	55-140	15.6	30
1,2,3-Trichloropropane	49.2	1	ug/L	50.0	BLOD	98.4	75-125	5.66	30
1,2,4-Trichlorobenzene	53.2	1	ug/L	50.0	BLOD	106	65-135	11.2	30
1,2,4-Trimethylbenzene	58.0	1	ug/L	50.0	BLOD	116	75-130	0.756	30
1,2-Dibromo-3-chloropropane (DBCP)	57.8	1	ug/L	50.0	BLOD	116	50-130	9.76	30
1,2-Dibromoethane (EDB)	48.5	1	ug/L	50.0	BLOD	96.9	80-120	3.31	30
1,2-Dichlorobenzene	53.5	0.5	ug/L	50.0	BLOD	107	70-120	3.42	30
1,2-Dichloroethane	39.8	1	ug/L	50.0	BLOD	79.7	70-130	2.92	30
1,2-Dichloropropane	51.8	0.5	ug/L	50.0	BLOD	104	75-125	3.66	30
1,3,5-Trimethylbenzene	55.5	1	ug/L	50.0	BLOD	111	75-124	3.00	30
1,3-Dichlorobenzene	53.4	1	ug/L	50.0	BLOD	107	75-125	5.25	30
1,3-Dichloropropane	48.3	1	ug/L	50.0	BLOD	96.5	75-125	3.14	30
1,4-Dichlorobenzene	52.3	1	ug/L	50.0	BLOD	105	75-125	3.32	30
2,2-Dichloropropane	41.5	1	ug/L	50.0	BLOD	83.0	70-135	0.601	30

Certificate of Analysis

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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
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Batch BGE0314 - SW5030B-MS

Matrix Spike Dup (BGE0314-MSD1)	Source: 23E0452-04			Prepared & Analyzed: 05/08/2023						
2-Butanone (MEK)	36.0	10	ug/L	50.0	BLOD	71.9	30-150	10.2	30	
2-Chlorotoluene	55.0	1	ug/L	50.0	BLOD	110	75-125	5.05	30	
2-Hexanone (MBK)	41.7	5	ug/L	50.0	BLOD	83.3	55-130	2.92	30	
4-Chlorotoluene	53.8	1	ug/L	50.0	BLOD	108	75-130	1.33	30	
4-Isopropyltoluene	54.6	1	ug/L	50.0	BLOD	109	75-130	3.24	30	
4-Methyl-2-pentanone (MIBK)	45.4	5	ug/L	50.0	BLOD	90.8	60-135	7.30	30	
Acetone	44.7	10	ug/L	50.0	7.46	74.5	40-140	10.9	30	
Benzene	55.5	1	ug/L	50.0	BLOD	111	80-120	0.843	30	
Bromobenzene	49.5	1	ug/L	50.0	BLOD	99.1	75-125	3.62	30	
Bromochloromethane	45.6	1	ug/L	50.0	BLOD	91.1	65-130	2.22	30	
Bromodichloromethane	49.0	0.5	ug/L	50.0	BLOD	98.0	75-136	1.50	30	
Bromoform	48.0	1	ug/L	50.0	BLOD	95.9	70-130	4.13	30	
Bromomethane	41.3	1	ug/L	50.0	BLOD	82.7	30-145	1.68	30	
Carbon disulfide	42.3	10	ug/L	50.0	BLOD	84.5	35-160	6.59	30	
Carbon tetrachloride	48.5	1	ug/L	50.0	BLOD	97.1	65-140	0.330	30	
Chlorobenzene	50.0	1	ug/L	50.0	BLOD	100	80-120	2.04	30	
Chloroethane	44.8	1	ug/L	50.0	BLOD	89.6	60-135	7.96	30	
Chloroform	40.2	0.5	ug/L	50.0	BLOD	80.5	65-135	1.28	30	
Chloromethane	67.2	1	ug/L	50.0	BLOD	134	40-125	2.49	30	M
cis-1,2-Dichloroethylene	46.2	1	ug/L	50.0	0.49	91.5	70-125	1.83	30	
cis-1,3-Dichloropropene	38.7	1	ug/L	50.0	BLOD	77.5	47-136	3.55	30	
Dibromochloromethane	48.0	0.5	ug/L	50.0	BLOD	96.0	60-135	4.85	30	
Dibromomethane	49.8	1	ug/L	50.0	BLOD	99.6	75-125	2.77	30	
Dichlorodifluoromethane	58.0	1	ug/L	50.0	BLOD	116	30-155	4.49	30	
Ethylbenzene	56.0	1	ug/L	50.0	BLOD	112	75-125	0.394	30	

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

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 BGE0314 - SW5030B-MS										
Matrix Spike Dup (BGE0314-MSD1)		Source: 23E0452-04			Prepared & Analyzed: 05/08/2023					
Hexachlorobutadiene	40.8	0.8	ug/L	50.0	BLOD	81.6	50-140	20.2	30	
Isopropylbenzene	55.5	1	ug/L	50.0	7.71	95.5	75-125	2.98	30	
m+p-Xylenes	106	2	ug/L	100	BLOD	106	75-130	0.482	30	
Methylene chloride	44.0	4	ug/L	50.0	BLOD	87.9	55-140	3.14	30	
Methyl-t-butyl ether (MTBE)	45.7	1	ug/L	50.0	BLOD	91.5	65-125	2.21	30	
Naphthalene	73.8	1	ug/L	50.0	BLOD	148	55-140	4.02	30	M
n-Butylbenzene	58.9	1	ug/L	50.0	5.24	107	70-135	2.56	30	
n-Propylbenzene	64.3	1	ug/L	50.0	5.86	117	70-130	2.76	30	
o-Xylene	53.1	1	ug/L	50.0	BLOD	106	80-120	2.83	30	
sec-Butylbenzene	69.3	1	ug/L	50.0	13.4	112	70-125	5.20	30	
Styrene	39.5	1	ug/L	50.0	BLOD	79.0	65-135	2.12	30	
tert-Butylbenzene	56.0	1	ug/L	50.0	1.36	109	70-130	2.27	30	
Tetrachloroethylene (PCE)	52.8	1	ug/L	50.0	BLOD	106	51-231	1.28	30	
Toluene	51.2	1	ug/L	50.0	BLOD	102	75-120	2.91	30	
trans-1,2-Dichloroethylene	48.6	1	ug/L	50.0	BLOD	97.1	60-140	6.44	30	
trans-1,3-Dichloropropene	40.0	1	ug/L	50.0	BLOD	79.9	55-140	4.22	30	
Trichloroethylene	47.6	1	ug/L	50.0	BLOD	95.2	70-125	3.48	30	
Trichlorofluoromethane	51.7	1	ug/L	50.0	BLOD	103	60-145	1.31	30	
Vinyl chloride	48.4	0.5	ug/L	50.0	BLOD	96.7	50-145	2.77	30	
<i>Surr: 1,2-Dichloroethane-d4 (Surr)</i>	<i>50.5</i>		ug/L	<i>50.0</i>		<i>101</i>	<i>70-120</i>			
<i>Surr: 4-Bromofluorobenzene (Surr)</i>	<i>47.5</i>		ug/L	<i>50.0</i>		<i>95.0</i>	<i>75-120</i>			
<i>Surr: Dibromofluoromethane (Surr)</i>	<i>44.9</i>		ug/L	<i>50.0</i>		<i>89.7</i>	<i>70-130</i>			
<i>Surr: Toluene-d8 (Surr)</i>	<i>49.6</i>		ug/L	<i>50.0</i>		<i>99.3</i>	<i>70-130</i>			

Certificate of Analysis

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

Blank (BGE0310-BLK1)

Prepared & Analyzed: 05/08/2023

Anthracene	ND	10.0	ug/L							
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	29.0		ug/L	100		29.0	5-136			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	17.6		ug/L	50.0		35.1	9-117			
<i>Surr: 2-Fluorophenol (Surr)</i>	25.5		ug/L	100		25.5	5-60			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	19.7		ug/L	50.0		39.4	5-151			
<i>Surr: Phenol-d5 (Surr)</i>	15.0		ug/L	100		15.0	5-60			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	39.4		ug/L	50.0		78.9	5-141			

LCS (BGE0310-BS1)

Prepared & Analyzed: 05/08/2023

1,2,4-Trichlorobenzene	27.8	10.0	ug/L	50.0		55.6	57-130			L
1,2-Dichlorobenzene	24.8	10.0	ug/L	50.0		49.6	22-115			
1,3-Dichlorobenzene	25.6	10.0	ug/L	50.0		51.2	22-112			
1,4-Dichlorobenzene	27.5	10.0	ug/L	50.0		55.0	13-112			
2,4,6-Trichlorophenol	37.4	10.0	ug/L	50.0		74.7	52-129			
2,4-Dichlorophenol	33.1	10.0	ug/L	50.0		66.3	53-122			
2,4-Dimethylphenol	35.6	5.00	ug/L	50.0		71.3	42-120			
2,4-Dinitrophenol	33.1	50.0	ug/L	50.0		66.2	48-127			
2,4-Dinitrotoluene	39.0	10.0	ug/L	50.0		78.0	10-173			
2,6-Dinitrotoluene	34.3	10.0	ug/L	50.0		68.6	68-137			
2-Chloronaphthalene	37.4	10.0	ug/L	50.0		74.8	65-120			
2-Chlorophenol	39.3	10.0	ug/L	50.0		78.6	36-120			
2-Nitrophenol	35.8	10.0	ug/L	50.0		71.6	45-167			
3,3'-Dichlorobenzidine	18.1	10.0	ug/L	50.0		36.2	10-213			
4,6-Dinitro-2-methylphenol	41.9	50.0	ug/L	50.0		83.8	53-130			
4-Bromophenyl phenyl ether	31.9	10.0	ug/L	50.0		63.8	65-120			L

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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
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Batch BGE0310 - SW3510C/EPA600-MS

LCS (BGE0310-BS1)

Prepared & Analyzed: 05/08/2023

4-Chlorophenyl phenyl ether	35.8	10.0	ug/L	50.0		71.5	38-145			
4-Nitrophenol	21.4	50.0	ug/L	50.0		42.7	13-129			
Acenaphthene	39.6	10.0	ug/L	50.0		79.2	60-132			
Acenaphthylene	41.0	10.0	ug/L	50.0		81.9	54-126			
Acetophenone	37.8	20.0	ug/L	50.0		75.5	0-200			
Anthracene	39.7	10.0	ug/L	50.0		79.4	43-120			
Benzo (a) anthracene	43.5	10.0	ug/L	50.0		87.1	42-133			
Benzo (a) pyrene	51.8	10.0	ug/L	50.0		104	32-148			
Benzo (b) fluoranthene	60.3	10.0	ug/L	50.0		121	42-140			
Benzo (g,h,i) perylene	36.2	10.0	ug/L	50.0		72.4	10-195			
Benzo (k) fluoranthene	58.7	10.0	ug/L	50.0		117	25-146			
bis (2-Chloroethoxy) methane	40.3	10.0	ug/L	50.0		80.7	49-165			
bis (2-Chloroethyl) ether	38.0	10.0	ug/L	50.0		76.1	43-126			
2,2'-Oxybis (1-chloropropane)	35.9	10.0	ug/L	50.0		71.8	63-139			
bis (2-Ethylhexyl) phthalate	58.4	10.0	ug/L	50.0		117	29-137			
Butyl benzyl phthalate	59.6	10.0	ug/L	50.0		119	10-140			
Chrysene	48.3	10.0	ug/L	50.0		96.6	44-140			
Dibenz (a,h) anthracene	29.8	10.0	ug/L	50.0		59.7	10-200			
Diethyl phthalate	44.9	10.0	ug/L	50.0		89.7	10-120			
Dimethyl phthalate	40.9	10.0	ug/L	50.0		81.8	10-120			
Di-n-butyl phthalate	48.9	10.0	ug/L	50.0		97.8	10-120			
Di-n-octyl phthalate	111	10.0	ug/L	50.0		223	19-132			L
Fluoranthene	44.7	10.0	ug/L	50.0		89.4	43-121			
Fluorene	41.5	10.0	ug/L	50.0		83.0	70-120			
Hexachlorobenzene	32.1	1.00	ug/L	50.0		64.2	10-142			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

LCS (BGE0310-BS1)

Prepared & Analyzed: 05/08/2023

Hexachlorobutadiene	24.6	10.0	ug/L	50.0		49.2	38-120			
Hexachlorocyclopentadiene	10.5	10.0	ug/L	50.0		21.0	10-76			
Hexachloroethane	23.8	10.0	ug/L	50.0		47.7	55-120			L
Indeno (1,2,3-cd) pyrene	31.1	10.0	ug/L	50.0		62.2	10-151			
Isophorone	21.1	10.0	ug/L	50.0		42.2	47-180			L
Naphthalene	37.2	5.00	ug/L	50.0		74.4	36-120			
Nitrobenzene	41.4	10.0	ug/L	50.0		82.8	54-158			
n-Nitrosodimethylamine	22.1	10.0	ug/L	50.0		44.1	10-85			
n-Nitrosodi-n-propylamine	44.1	10.0	ug/L	50.0		88.2	14-198			
n-Nitrosodiphenylamine	32.6	10.0	ug/L	50.0		65.2	12-97			
p-Chloro-m-cresol	32.9	10.0	ug/L	50.0		65.8	10-142			
Pentachlorophenol	42.4	20.0	ug/L	50.0		84.7	38-152			
Phenanthrene	46.8	10.0	ug/L	50.0		93.7	65-120			
Phenol	14.5	10.0	ug/L	50.5		28.7	17-120			
Pyrene	60.4	10.0	ug/L	50.0		121	70-120			L
Pyridine	32.1	10.0	ug/L	50.0		64.2	10-103			
<hr/>										
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	<i>84.0</i>		ug/L	<i>100</i>		<i>84.0</i>	<i>5-136</i>			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	<i>42.0</i>		ug/L	<i>50.0</i>		<i>84.0</i>	<i>9-117</i>			
<i>Surr: 2-Fluorophenol (Surr)</i>	<i>45.5</i>		ug/L	<i>100</i>		<i>45.5</i>	<i>5-60</i>			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>43.3</i>		ug/L	<i>50.0</i>		<i>86.6</i>	<i>5-151</i>			
<i>Surr: Phenol-d5 (Surr)</i>	<i>30.1</i>		ug/L	<i>100</i>		<i>30.1</i>	<i>5-60</i>			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	<i>62.6</i>		ug/L	<i>50.0</i>		<i>125</i>	<i>5-141</i>			

Matrix Spike (BGE0310-MS1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

1,2,4-Trichlorobenzene	243	100	ug/L	500	BLOD	48.6	44-142			
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

1,2-Dichlorobenzene	208	100	ug/L	500	BLOD	41.5	22-115			
1,3-Dichlorobenzene	217	100	ug/L	500	BLOD	43.4	22-112			
1,4-Dichlorobenzene	233	100	ug/L	500	BLOD	46.5	13-112			
2,4,6-Trichlorophenol	321	100	ug/L	500	BLOD	64.2	37-144			
2,4-Dichlorophenol	274	100	ug/L	500	BLOD	54.8	39-135			
2,4-Dimethylphenol	306	50.0	ug/L	500	BLOD	61.2	32-120			
2,4-Dinitrophenol	306	500	ug/L	500	BLOD	61.3	39-139			
2,4-Dinitrotoluene	346	100	ug/L	500	BLOD	69.1	10-191			
2,6-Dinitrotoluene	292	100	ug/L	500	BLOD	58.4	50-158			
2-Chloronaphthalene	340	100	ug/L	500	BLOD	67.9	60-120			
2-Chlorophenol	321	100	ug/L	500	BLOD	64.1	23-134			
2-Nitrophenol	307	100	ug/L	500	BLOD	61.4	29-182			
3,3'-Dichlorobenzidine	156	100	ug/L	500	BLOD	31.1	10-262			
4,6-Dinitro-2-methylphenol	396	500	ug/L	500	BLOD	79.2	10-181			
4-Bromophenyl phenyl ether	281	100	ug/L	500	40.1	48.2	53-127			M
4-Chlorophenyl phenyl ether	319	100	ug/L	500	BLOD	63.7	25-158			
4-Nitrophenol	204	500	ug/L	500	BLOD	40.8	10-132			
Acenaphthene	350	100	ug/L	500	BLOD	70.0	47-145			
Acenaphthylene	350	100	ug/L	500	BLOD	70.1	33-145			
Acetophenone	305	200	ug/L	500	BLOD	61.1	0-200			
Anthracene	345	100	ug/L	500	BLOD	69.0	27-133			
Benzo (a) anthracene	379	100	ug/L	500	BLOD	75.8	33-143			
Benzo (a) pyrene	455	100	ug/L	500	BLOD	91.1	17-163			
Benzo (b) fluoranthene	485	100	ug/L	500	BLOD	97.0	24-159			
Benzo (g,h,i) perylene	240	100	ug/L	500	BLOD	48.0	10-219			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS1)	Source: 23E0403-05			Prepared & Analyzed: 05/08/2023						
Benzo (k) fluoranthene	511	100	ug/L	500	BLOD	102	11-162			
bis (2-Chloroethoxy) methane	316	100	ug/L	500	BLOD	63.2	33-184			
bis (2-Chloroethyl) ether	294	100	ug/L	500	BLOD	58.9	12-158			
2,2'-Oxybis (1-chloropropane)	286	100	ug/L	500	BLOD	57.3	36-166			
bis (2-Ethylhexyl) phthalate	454	100	ug/L	500	BLOD	90.8	10-158			
Butyl benzyl phthalate	479	100	ug/L	500	BLOD	95.9	10-152			
Chrysene	416	100	ug/L	500	BLOD	83.2	17-169			
Dibenz (a,h) anthracene	231	100	ug/L	500	BLOD	46.2	10-227			
Diethyl phthalate	378	100	ug/L	500	BLOD	75.5	10-120			
Dimethyl phthalate	354	100	ug/L	500	BLOD	70.8	10-120			
Di-n-butyl phthalate	424	100	ug/L	500	BLOD	84.8	10-120			
Di-n-octyl phthalate	1010	100	ug/L	500	BLOD	201	10-146			M
Fluoranthene	407	100	ug/L	500	BLOD	81.3	26-137			
Fluorene	371	100	ug/L	500	BLOD	74.2	59-121			
Hexachlorobenzene	280	10.0	ug/L	500	BLOD	56.0	10-152			
Hexachlorobutadiene	232	100	ug/L	500	BLOD	46.4	24-120			
Hexachlorocyclopentadiene	110	100	ug/L	500	BLOD	22.1	10-90			
Hexachloroethane	235	100	ug/L	500	BLOD	47.0	40-120			
Indeno (1,2,3-cd) pyrene	232	100	ug/L	500	BLOD	46.4	10-171			
Isophorone	165	100	ug/L	500	BLOD	33.0	21-196			
Naphthalene	1180	50.0	ug/L	500	1080	19.7	21-133			M
Nitrobenzene	333	100	ug/L	500	BLOD	66.6	35-180			
n-Nitrosodimethylamine	200	100	ug/L	500	BLOD	40.0	10-85			
n-Nitrosodi-n-propylamine	343	100	ug/L	500	BLOD	68.6	10-230			
n-Nitrosodiphenylamine	287	100	ug/L	500	BLOD	57.3	12-111			

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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

p-Chloro-m-cresol	280	100	ug/L	500	BLOD	56.0	10-127			
Pentachlorophenol	363	200	ug/L	500	BLOD	72.6	14-176			
Phenanthrene	407	100	ug/L	500	BLOD	81.3	54-120			
Phenol	115	100	ug/L	505	BLOD	22.8	10-120			
Pyrene	475	100	ug/L	500	BLOD	95.0	52-120			
Pyridine	284	100	ug/L	500	BLOD	56.8	10-110			
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	714		ug/L	1000		71.4	5-136			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	349		ug/L	500		69.7	9-117			
<i>Surr: 2-Fluorophenol (Surr)</i>	481		ug/L	1000		48.1	5-60			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	345		ug/L	500		68.9	5-151			
<i>Surr: Phenol-d5 (Surr)</i>	234		ug/L	1000		23.4	5-60			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	492		ug/L	500		98.4	5-141			

Matrix Spike (BGE0310-MS2)

Source: 23E0452-04

Prepared & Analyzed: 05/09/2023

1,2,4-Trichlorobenzene	22.3	10.0	ug/L	50.0	BLOD	44.7	44-142			
1,2-Dichlorobenzene	18.3	10.0	ug/L	50.0	BLOD	36.6	22-115			
1,3-Dichlorobenzene	17.7	10.0	ug/L	50.0	BLOD	35.3	22-112			
1,4-Dichlorobenzene	20.9	10.0	ug/L	50.0	BLOD	41.8	13-112			
2,4,6-Trichlorophenol	24.9	10.0	ug/L	50.0	BLOD	49.8	37-144			
2,4-Dichlorophenol	23.1	10.0	ug/L	50.0	BLOD	46.3	39-135			
2,4-Dimethylphenol	26.4	5.00	ug/L	50.0	BLOD	52.9	32-120			
2,4-Dinitrophenol	10.5	50.0	ug/L	50.0	BLOD	21.0	39-139			M
2,4-Dinitrotoluene	26.5	10.0	ug/L	50.0	BLOD	52.9	10-191			
2,6-Dinitrotoluene	26.7	10.0	ug/L	50.0	BLOD	53.3	50-158			
2-Chloronaphthalene	22.8	10.0	ug/L	50.0	BLOD	45.7	60-120			M

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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS2)
Source: 23E0452-04
Prepared & Analyzed: 05/09/2023

2-Chlorophenol	20.4	10.0	ug/L	50.0	BLOD	40.9	23-134			
2-Nitrophenol	27.6	10.0	ug/L	50.0	BLOD	55.1	29-182			
3,3'-Dichlorobenzidine	9.35	10.0	ug/L	50.0	BLOD	18.7	10-262			
4,6-Dinitro-2-methylphenol	27.0	50.0	ug/L	50.0	BLOD	54.1	10-181			
4-Bromophenyl phenyl ether	25.2	10.0	ug/L	50.0	BLOD	50.5	53-127			M
4-Chlorophenyl phenyl ether	27.0	10.0	ug/L	50.0	BLOD	54.0	25-158			
4-Nitrophenol	ND	50.0	ug/L	50.0	BLOD		10-132			M
Acenaphthene	26.4	10.0	ug/L	50.0	BLOD	52.8	47-145			
Acenaphthylene	25.2	10.0	ug/L	50.0	BLOD	50.3	33-145			
Acetophenone	22.2	20.0	ug/L	50.0	BLOD	44.5	0-200			
Anthracene	25.0	10.0	ug/L	50.0	BLOD	49.9	27-133			
Benzidine	ND	50.0	ug/L	50.0	BLOD		12-309			M
Benzo (a) anthracene	29.2	10.0	ug/L	50.0	BLOD	58.5	33-143			
Benzo (a) pyrene	36.8	10.0	ug/L	50.0	BLOD	73.5	17-163			
Benzo (b) fluoranthene	34.9	10.0	ug/L	50.0	BLOD	69.9	24-159			
Benzo (g,h,i) perylene	32.2	10.0	ug/L	50.0	BLOD	64.4	10-219			
Benzo (k) fluoranthene	35.6	10.0	ug/L	50.0	BLOD	71.2	11-162			
bis (2-Chloroethoxy) methane	26.3	10.0	ug/L	50.0	BLOD	52.5	33-184			
bis (2-Chloroethyl) ether	20.6	10.0	ug/L	50.0	BLOD	41.2	12-158			
2,2'-Oxybis (1-chloropropane)	20.4	10.0	ug/L	50.0	BLOD	40.9	36-166			
bis (2-Ethylhexyl) phthalate	36.5	10.0	ug/L	50.0	BLOD	73.0	10-158			
Butyl benzyl phthalate	35.3	10.0	ug/L	50.0	BLOD	70.5	10-152			
Chrysene	26.9	10.0	ug/L	50.0	BLOD	53.9	17-169			
Dibenz (a,h) anthracene	38.1	10.0	ug/L	50.0	BLOD	76.2	10-227			
Diethyl phthalate	29.1	10.0	ug/L	50.0	BLOD	58.3	10-120			

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS2)

Source: 23E0452-04

Prepared & Analyzed: 05/09/2023

Dimethyl phthalate	22.8	10.0	ug/L	50.0	BLOD	45.5	10-120			
Di-n-butyl phthalate	33.6	10.0	ug/L	50.0	BLOD	67.1	10-120			
Di-n-octyl phthalate	43.3	10.0	ug/L	50.0	BLOD	86.6	10-146			
Fluoranthene	29.1	10.0	ug/L	50.0	BLOD	58.1	26-137			
Fluorene	27.7	10.0	ug/L	50.0	BLOD	55.4	59-121			M
Hexachlorobenzene	36.8	1.00	ug/L	50.0	BLOD	73.7	10-152			
Hexachlorobutadiene	27.7	10.0	ug/L	50.0	BLOD	55.4	24-120			
Hexachlorocyclopentadiene	10.3	10.0	ug/L	50.0	BLOD	20.5	10-90			
Hexachloroethane	22.5	10.0	ug/L	50.0	BLOD	45.1	40-120			
Indeno (1,2,3-cd) pyrene	36.8	10.0	ug/L	50.0	BLOD	73.6	10-171			
Isophorone	ND	10.0	ug/L	50.0	BLOD		21-196			M
Naphthalene	27.8	5.00	ug/L	50.0	BLOD	55.5	21-133			
Nitrobenzene	31.1	10.0	ug/L	50.0	BLOD	62.1	35-180			
n-Nitrosodimethylamine	17.1	10.0	ug/L	50.0	BLOD	34.3	10-85			
n-Nitrosodi-n-propylamine	27.6	10.0	ug/L	50.0	BLOD	55.3	10-230			
n-Nitrosodiphenylamine	22.3	10.0	ug/L	50.0	BLOD	44.5	12-111			
p-Chloro-m-cresol	25.2	10.0	ug/L	50.0	BLOD	50.3	10-127			
Pentachlorophenol	14.0	20.0	ug/L	50.0	BLOD	28.0	14-176			
Phenanthrene	31.2	10.0	ug/L	50.0	BLOD	62.5	54-120			
Phenol	9.98	10.0	ug/L	50.5	BLOD	19.8	10-120			
Pyrene	27.6	10.0	ug/L	50.0	BLOD	55.3	52-120			
Pyridine	22.0	10.0	ug/L	50.0	BLOD	44.0	10-110			
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Surr: 2,4,6-Tribromophenol (Surr)	93.9		ug/L	100		93.9	5-136			
Surr: 2-Fluorobiphenyl (Surr)	26.1		ug/L	50.0		52.1	9-117			
Surr: 2-Fluorophenol (Surr)	25.2		ug/L	100		25.2	5-60			

Certificate of Analysis

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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
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike (BGE0310-MS2)

Source: 23E0452-04

Prepared & Analyzed: 05/09/2023

Surr: Nitrobenzene-d5 (Surr)	28.2		ug/L	50.0		56.4	5-151			
Surr: Phenol-d5 (Surr)	18.2		ug/L	100		18.2	5-60			
Surr: p-Terphenyl-d14 (Surr)	32.2		ug/L	50.0		64.5	5-141			

Matrix Spike Dup (BGE0310-MSD1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

1,2,4-Trichlorobenzene	167	100	ug/L	500	BLOD	33.4	44-142	37.2	20	M, P
1,2-Dichlorobenzene	145	100	ug/L	500	BLOD	29.0	22-115	35.6	20	P
1,3-Dichlorobenzene	152	100	ug/L	500	BLOD	30.3	22-112	35.5	20	P
1,4-Dichlorobenzene	167	100	ug/L	500	BLOD	33.4	13-112	32.9	20	P
2,4,6-Trichlorophenol	261	100	ug/L	500	BLOD	52.3	37-144	20.5	20	P
2,4-Dichlorophenol	204	100	ug/L	500	BLOD	40.8	39-135	29.3	20	P
2,4-Dimethylphenol	222	50.0	ug/L	500	BLOD	44.4	32-120	31.9	20	P
2,4-Dinitrophenol	268	500	ug/L	500	BLOD	53.6	39-139	13.4	20	
2,4-Dinitrotoluene	311	100	ug/L	500	BLOD	62.2	10-191	10.5	20	
2,6-Dinitrotoluene	247	100	ug/L	500	BLOD	49.5	50-158	16.6	20	M
2-Chloronaphthalene	245	100	ug/L	500	BLOD	49.0	60-120	32.4	20	M, P
2-Chlorophenol	230	100	ug/L	500	BLOD	46.0	23-134	33.0	20	P
2-Nitrophenol	227	100	ug/L	500	BLOD	45.4	29-182	29.9	20	P
3,3'-Dichlorobenzidine	147	100	ug/L	500	BLOD	29.4	10-262	5.55	20	
4,6-Dinitro-2-methylphenol	353	500	ug/L	500	BLOD	70.6	10-181	11.4	20	
4-Bromophenyl phenyl ether	250	100	ug/L	500	40.1	41.9	53-127	11.8	20	M
4-Chlorophenyl phenyl ether	260	100	ug/L	500	BLOD	52.0	25-158	20.3	20	P
4-Nitrophenol	193	500	ug/L	500	BLOD	38.5	10-132	5.70	20	
Acenaphthene	266	100	ug/L	500	BLOD	53.2	47-145	27.2	20	P
Acenaphthylene	272	100	ug/L	500	BLOD	54.3	33-145	25.3	20	P

Certificate of Analysis

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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
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike Dup (BGE0310-MSD1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

Acetophenone	226	200	ug/L	500	BLOD	45.3	0-200	29.6	20	P
Anthracene	316	100	ug/L	500	BLOD	63.2	27-133	8.75	20	
Benzo (a) anthracene	365	100	ug/L	500	BLOD	73.0	33-143	3.77	20	
Benzo (a) pyrene	414	100	ug/L	500	BLOD	82.8	17-163	9.50	20	
Benzo (b) fluoranthene	473	100	ug/L	500	BLOD	94.6	24-159	2.50	20	
Benzo (g,h,i) perylene	285	100	ug/L	500	BLOD	57.1	10-219	17.2	20	
Benzo (k) fluoranthene	465	100	ug/L	500	BLOD	93.0	11-162	9.43	20	
bis (2-Chloroethoxy) methane	221	100	ug/L	500	BLOD	44.2	33-184	35.2	20	P
bis (2-Chloroethyl) ether	210	100	ug/L	500	BLOD	42.1	12-158	33.2	20	P
2,2'-Oxybis (1-chloropropane)	209	100	ug/L	500	BLOD	41.8	36-166	31.2	20	P
bis (2-Ethylhexyl) phthalate	470	100	ug/L	500	BLOD	93.9	10-158	3.38	20	
Butyl benzyl phthalate	497	100	ug/L	500	BLOD	99.4	10-152	3.56	20	
Chrysene	400	100	ug/L	500	BLOD	79.9	17-169	3.97	20	
Dibenz (a,h) anthracene	249	100	ug/L	500	BLOD	49.8	10-227	7.58	20	
Diethyl phthalate	327	100	ug/L	500	BLOD	65.4	10-120	14.4	20	
Dimethyl phthalate	296	100	ug/L	500	BLOD	59.1	10-120	17.9	20	
Di-n-butyl phthalate	392	100	ug/L	500	BLOD	78.4	10-120	7.89	20	
Di-n-octyl phthalate	863	100	ug/L	500	BLOD	173	10-146	15.2	20	M
Fluoranthene	354	100	ug/L	500	BLOD	70.8	26-137	13.8	20	
Fluorene	307	100	ug/L	500	BLOD	61.4	59-121	18.8	20	
Hexachlorobenzene	260	10.0	ug/L	500	BLOD	52.0	10-152	7.33	20	
Hexachlorobutadiene	160	100	ug/L	500	BLOD	31.9	24-120	37.1	20	P
Hexachlorocyclopentadiene	96.3	100	ug/L	500	BLOD	19.3	10-90	13.6	20	
Hexachloroethane	160	100	ug/L	500	BLOD	31.9	40-120	38.1	20	M, P
Indeno (1,2,3-cd) pyrene	248	100	ug/L	500	BLOD	49.7	10-171	6.82	20	

Certificate of Analysis

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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
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike Dup (BGE0310-MSD1)

Source: 23E0403-05

Prepared & Analyzed: 05/08/2023

Isophorone	117	100	ug/L	500	BLOD	23.4	21-196	34.1	20	P
Naphthalene	935	50.0	ug/L	500	1080	-28.4	21-133	22.8	20	M, P
Nitrobenzene	237	100	ug/L	500	BLOD	47.4	35-180	33.7	20	P
n-Nitrosodimethylamine	141	100	ug/L	500	BLOD	28.3	10-85	34.3	20	P
n-Nitrosodi-n-propylamine	246	100	ug/L	500	BLOD	49.3	10-230	32.7	20	P
n-Nitrosodiphenylamine	250	100	ug/L	500	BLOD	49.9	12-111	13.8	20	
p-Chloro-m-cresol	238	100	ug/L	500	BLOD	47.5	10-127	16.4	20	
Pentachlorophenol	330	200	ug/L	500	BLOD	66.1	14-176	9.35	20	
Phenanthrene	364	100	ug/L	500	BLOD	72.7	54-120	11.2	20	
Phenol	107	100	ug/L	505	BLOD	21.3	10-120	6.83	20	
Pyrene	526	100	ug/L	500	BLOD	105	52-120	10.3	20	
Pyridine	217	100	ug/L	500	BLOD	43.4	10-110	26.7	20	P
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	620		ug/L	1000		62.0	5-136			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	251		ug/L	500		50.2	9-117			
<i>Surr: 2-Fluorophenol (Surr)</i>	268		ug/L	1000		26.8	5-60			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	248		ug/L	500		49.7	5-151			
<i>Surr: Phenol-d5 (Surr)</i>	189		ug/L	1000		18.9	5-60			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	547		ug/L	500		109	5-141			

Matrix Spike Dup (BGE0310-MSD2)

Source: 23E0452-04

Prepared & Analyzed: 05/09/2023

1,2,4-Trichlorobenzene	27.6	10.0	ug/L	50.0	BLOD	55.2	44-142	21.1	20	P
1,2-Dichlorobenzene	24.9	10.0	ug/L	50.0	BLOD	49.8	22-115	30.6	20	P
1,3-Dichlorobenzene	23.4	10.0	ug/L	50.0	BLOD	46.8	22-112	27.9	20	P
1,4-Dichlorobenzene	29.6	10.0	ug/L	50.0	BLOD	59.1	13-112	34.2	20	P
2,4,6-Trichlorophenol	33.1	10.0	ug/L	50.0	BLOD	66.1	37-144	28.2	20	P

Certificate of Analysis

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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
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike Dup (BGE0310-MSD2)	Source: 23E0452-04			Prepared & Analyzed: 05/09/2023						
2,4-Dichlorophenol	28.0	10.0	ug/L	50.0	BLOD	56.1	39-135	19.2	20	
2,4-Dimethylphenol	31.7	5.00	ug/L	50.0	BLOD	63.4	32-120	18.1	20	
2,4-Dinitrophenol	20.5	50.0	ug/L	50.0	BLOD	41.0	39-139	64.6	20	P
2,4-Dinitrotoluene	37.2	10.0	ug/L	50.0	BLOD	74.4	10-191	33.8	20	P
2,6-Dinitrotoluene	39.4	10.0	ug/L	50.0	BLOD	78.8	50-158	38.5	20	P
2-Chloronaphthalene	29.8	10.0	ug/L	50.0	BLOD	59.5	60-120	26.2	20	M, P
2-Chlorophenol	27.3	10.0	ug/L	50.0	BLOD	54.6	23-134	28.7	20	P
2-Nitrophenol	36.7	10.0	ug/L	50.0	BLOD	73.4	29-182	28.5	20	P
3,3'-Dichlorobenzidine	10.5	10.0	ug/L	50.0	BLOD	21.0	10-262	11.6	20	
4,6-Dinitro-2-methylphenol	39.1	50.0	ug/L	50.0	BLOD	78.2	10-181	36.4	20	P
4-Bromophenyl phenyl ether	34.9	10.0	ug/L	50.0	BLOD	69.9	53-127	32.3	20	P
4-Chlorophenyl phenyl ether	37.6	10.0	ug/L	50.0	BLOD	75.1	25-158	32.8	20	P
4-Nitrophenol	ND	50.0	ug/L	50.0	BLOD		10-132		20	M
Acenaphthene	36.2	10.0	ug/L	50.0	BLOD	72.3	47-145	31.2	20	P
Acenaphthylene	33.4	10.0	ug/L	50.0	BLOD	66.7	33-145	28.0	20	P
Acetophenone	29.4	20.0	ug/L	50.0	BLOD	58.8	0-200	27.6	20	P
Anthracene	33.8	10.0	ug/L	50.0	BLOD	67.7	27-133	30.2	20	P
Benzidine	ND	50.0	ug/L	50.0	BLOD		12-309		20	M
Benzo (a) anthracene	33.1	10.0	ug/L	50.0	BLOD	66.3	33-143	12.5	20	
Benzo (a) pyrene	42.2	10.0	ug/L	50.0	BLOD	84.5	17-163	13.9	20	
Benzo (b) fluoranthene	45.3	10.0	ug/L	50.0	BLOD	90.7	24-159	25.9	20	P
Benzo (g,h,i) perylene	31.8	10.0	ug/L	50.0	BLOD	63.5	10-219	1.41	20	
Benzo (k) fluoranthene	36.3	10.0	ug/L	50.0	BLOD	72.7	11-162	2.06	20	
bis (2-Chloroethoxy) methane	33.7	10.0	ug/L	50.0	BLOD	67.5	33-184	24.9	20	P
bis (2-Chloroethyl) ether	26.8	10.0	ug/L	50.0	BLOD	53.7	12-158	26.3	20	P

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike Dup (BGE0310-MSD2)	Source: 23E0452-04			Prepared & Analyzed: 05/09/2023						
2,2'-Oxybis (1-chloropropane)	27.2	10.0	ug/L	50.0	BLOD	54.3	36-166	28.2	20	P
bis (2-Ethylhexyl) phthalate	38.4	10.0	ug/L	50.0	BLOD	76.7	10-158	4.94	20	
Butyl benzyl phthalate	33.4	10.0	ug/L	50.0	BLOD	66.7	10-152	5.51	20	
Chrysene	30.1	10.0	ug/L	50.0	BLOD	60.2	17-169	11.0	20	
Dibenz (a,h) anthracene	41.1	10.0	ug/L	50.0	BLOD	82.2	10-227	7.58	20	
Diethyl phthalate	38.0	10.0	ug/L	50.0	BLOD	76.0	10-120	26.4	20	P
Dimethyl phthalate	32.6	10.0	ug/L	50.0	BLOD	65.3	10-120	35.6	20	P
Di-n-butyl phthalate	39.9	10.0	ug/L	50.0	BLOD	79.9	10-120	17.3	20	
Di-n-octyl phthalate	46.0	10.0	ug/L	50.0	BLOD	92.0	10-146	6.02	20	
Fluoranthene	35.8	10.0	ug/L	50.0	BLOD	71.7	26-137	20.9	20	P
Fluorene	38.3	10.0	ug/L	50.0	BLOD	76.5	59-121	31.9	20	P
Hexachlorobenzene	45.9	1.00	ug/L	50.0	BLOD	91.8	10-152	21.9	20	P
Hexachlorobutadiene	34.2	10.0	ug/L	50.0	BLOD	68.3	24-120	21.0	20	P
Hexachlorocyclopentadiene	15.2	10.0	ug/L	50.0	BLOD	30.5	10-90	39.0	20	P
Hexachloroethane	30.2	10.0	ug/L	50.0	BLOD	60.5	40-120	29.2	20	P
Indeno (1,2,3-cd) pyrene	39.1	10.0	ug/L	50.0	BLOD	78.2	10-171	5.98	20	
Isophorone	ND	10.0	ug/L	50.0	BLOD		21-196		20	M
Naphthalene	35.0	5.00	ug/L	50.0	BLOD	70.0	21-133	23.1	20	P
Nitrobenzene	37.6	10.0	ug/L	50.0	BLOD	75.1	35-180	18.9	20	
n-Nitrosodimethylamine	23.0	10.0	ug/L	50.0	BLOD	46.0	10-85	29.2	20	P
n-Nitrosodi-n-propylamine	34.7	10.0	ug/L	50.0	BLOD	69.4	10-230	22.7	20	P
n-Nitrosodiphenylamine	31.6	10.0	ug/L	50.0	BLOD	63.3	12-111	34.7	20	P
p-Chloro-m-cresol	31.1	10.0	ug/L	50.0	BLOD	62.2	10-127	21.0	20	P
Pentachlorophenol	19.9	20.0	ug/L	50.0	BLOD	39.9	14-176	34.9	20	P
Phenanthrene	41.6	10.0	ug/L	50.0	BLOD	83.3	54-120	28.5	20	P

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
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Batch BGE0310 - SW3510C/EPA600-MS

Matrix Spike Dup (BGE0310-MSD2)	Source: 23E0452-04	Prepared & Analyzed: 05/09/2023								
Phenol	13.8	10.0	ug/L	50.5	BLOD	27.2	10-120	31.8	20	P
Pyrene	26.2	10.0	ug/L	50.0	BLOD	52.4	52-120	5.31	20	
Pyridine	28.5	10.0	ug/L	50.0	BLOD	57.1	10-110	25.8	20	P
<i>Surr: 2,4,6-Tribromophenol (Surr)</i>	<i>121</i>		ug/L	<i>100</i>		<i>121</i>	<i>5-136</i>			
<i>Surr: 2-Fluorobiphenyl (Surr)</i>	<i>34.8</i>		ug/L	<i>50.0</i>		<i>69.7</i>	<i>9-117</i>			
<i>Surr: 2-Fluorophenol (Surr)</i>	<i>35.5</i>		ug/L	<i>100</i>		<i>35.5</i>	<i>5-60</i>			
<i>Surr: Nitrobenzene-d5 (Surr)</i>	<i>35.2</i>		ug/L	<i>50.0</i>		<i>70.5</i>	<i>5-151</i>			
<i>Surr: Phenol-d5 (Surr)</i>	<i>24.6</i>		ug/L	<i>100</i>		<i>24.6</i>	<i>5-60</i>			
<i>Surr: p-Terphenyl-d14 (Surr)</i>	<i>30.1</i>		ug/L	<i>50.0</i>		<i>60.2</i>	<i>5-141</i>			

Certificate of Analysis

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

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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 BGE0236 - No Prep Wet Chem										
Blank (BGE0236-BLK1)				Prepared & Analyzed: 05/05/2023						
BOD	ND	2.0	mg/L							
LCS (BGE0236-BS1)				Prepared & Analyzed: 05/05/2023						
BOD	202	2	mg/L	198		102	84.6-115.4			
Duplicate (BGE0236-DUP1)				Source: 23E0307-04		Prepared & Analyzed: 05/05/2023				
BOD	9.9	2.0	mg/L		13.2			28.4	20	P
Batch BGE0276 - No Prep Wet Chem										
Blank (BGE0276-BLK1)				Prepared & Analyzed: 05/05/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGE0276-BS1)				Prepared & Analyzed: 05/05/2023						
Nitrite as N	0.09	0.05	mg/L	0.100		91.0	80-120			
Matrix Spike (BGE0276-MS1)				Source: 23E0399-01		Prepared & Analyzed: 05/05/2023				
Nitrite as N	8.10	5.00	mg/L	10.0	BLOD	81.0	80-120			
Matrix Spike Dup (BGE0276-MSD1)				Source: 23E0399-01		Prepared & Analyzed: 05/05/2023				
Nitrite as N	8.30	5.00	mg/L	10.0	BLOD	83.0	80-120	2.44	20	
Batch BGE0377 - No Prep Wet Chem										
Blank (BGE0377-BLK1)				Prepared & Analyzed: 05/09/2023						
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 BGE0377 - No Prep Wet Chem										
LCS (BGE0377-BS1)				Prepared & Analyzed: 05/09/2023						
COD	49.6	10.0	mg/L	50.0		99.1	88-119			
Matrix Spike (BGE0377-MS1)				Source: 23E0391-01 Prepared & Analyzed: 05/09/2023						
COD	82.9	10.0	mg/L	50.0	33.4	99.1	72.4-130			
Matrix Spike Dup (BGE0377-MSD1)				Source: 23E0391-01 Prepared & Analyzed: 05/09/2023						
COD	85.0	10.0	mg/L	50.0	33.4	103	72.4-130	2.55	20	
Batch BGE0440 - No Prep Wet Chem										
Blank (BGE0440-BLK1)				Prepared & Analyzed: 05/10/2023						
Ammonia as N	ND	0.10	mg/L							
LCS (BGE0440-BS1)				Prepared & Analyzed: 05/10/2023						
Ammonia as N	1.02	0.1	mg/L	1.00		102	90-110			
Matrix Spike (BGE0440-MS1)				Source: 23E0467-01 Prepared & Analyzed: 05/10/2023						
Ammonia as N	1.09	0.10	mg/L	1.00	0.09	99.8	89.3-131			
Matrix Spike (BGE0440-MS2)				Source: 23E0489-01 Prepared & Analyzed: 05/10/2023						
Ammonia as N	1.15	0.10	mg/L	1.00	0.14	100	89.3-131			
Matrix Spike Dup (BGE0440-MSD1)				Source: 23E0467-01 Prepared & Analyzed: 05/10/2023						
Ammonia as N	1.08	0.10	mg/L	1.00	0.09	98.4	89.3-131	1.29	20	
Matrix Spike Dup (BGE0440-MSD2)				Source: 23E0489-01 Prepared & Analyzed: 05/10/2023						
Ammonia as N	1.12	0.10	mg/L	1.00	0.14	98.3	89.3-131	1.94	20	

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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 BGE0570 - No Prep Wet Chem										
Blank (BGE0570-BLK1)				Prepared & Analyzed: 05/12/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGE0570-BS1)				Prepared & Analyzed: 05/12/2023						
Nitrate+Nitrite as N	2.63	0.1	mg/L	2.50		105	90-110			
Matrix Spike (BGE0570-MS1)				Source: 23E0689-01 Prepared & Analyzed: 05/12/2023						
Nitrate+Nitrite as N	2.91	0.10	mg/L	2.50	0.04	115	90-110			M
Matrix Spike Dup (BGE0570-MSD1)				Source: 23E0689-01 Prepared & Analyzed: 05/12/2023						
Nitrate+Nitrite as N	2.91	0.10	mg/L	2.50	0.04	115	90-110	0.172	20	M
Batch BGE0582 - No Prep Wet Chem										
Blank (BGE0582-BLK1)				Prepared & Analyzed: 05/12/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGE0582-BS1)				Prepared & Analyzed: 05/12/2023						
TKN as N	10.3	0.50	mg/L	10.0		103	90-110			
Matrix Spike (BGE0582-MS1)				Source: 23E0640-01 Prepared & Analyzed: 05/12/2023						
TKN as N	11.5	0.50	mg/L	10.0	1.35	102	90-110			
Matrix Spike (BGE0582-MS2)				Source: 23E0689-01 Prepared & Analyzed: 05/12/2023						
TKN as N	10.1	0.50	mg/L	10.0	BLOD	101	90-110			
Matrix Spike Dup (BGE0582-MSD1)				Source: 23E0640-01 Prepared & Analyzed: 05/12/2023						
TKN as N	11.5	0.50	mg/L	10.0	1.35	102	90-110	0.278	20	

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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 BGE0582 - No Prep Wet Chem										
Matrix Spike Dup (BGE0582-MSD2) Source: 23E0689-01 Prepared & Analyzed: 05/12/2023										
TKN as N	10.1	0.50	mg/L	10.0	BLOD	101	90-110	0.504	20	
Batch BGE0795 - No Prep Wet Chem										
Blank (BGE0795-BLK1) Prepared & Analyzed: 05/18/2023										
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGE0795-BS1) Prepared & Analyzed: 05/18/2023										
Total Recoverable Phenolics	0.52	0.050	mg/L	0.500		104	80-120			
Matrix Spike (BGE0795-MS1) Source: 23E0995-04 Prepared & Analyzed: 05/18/2023										
Total Recoverable Phenolics	0.48	0.050	mg/L	0.500	0.03	89.2	70-130			
Matrix Spike Dup (BGE0795-MSD1) Source: 23E0995-04 Prepared & Analyzed: 05/18/2023										
Total Recoverable Phenolics	0.52	0.050	mg/L	0.500	0.03	97.6	70-130	8.45	20	

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Analytical Summary

23E0399-01 Subcontract
 23E0399-02 Subcontract
 23E0399-03 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		
23E0399-01	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
23E0399-01RE1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
23E0399-02	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
23E0399-02RE1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
23E0399-03	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
23E0399-03RE1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			Preparation Method: No Prep Wet Chem		
23E0399-01	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
23E0399-02	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
23E0399-03	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
23E0399-01	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
23E0399-02	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
23E0399-03	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
23E0399-01	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
23E0399-02	1.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
23E0399-03	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
23E0399-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
23E0399-01RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
23E0399-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
23E0399-02RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229

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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	
23E0399-03	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
23E0399-01	1.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-01RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-01RE2	2.50 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-02	1.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-02RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-02RE2	2.50 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-03	1.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-03RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
23E0399-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
23E0399-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
23E0399-03	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
23E0399-01	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
23E0399-02	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
23E0399-03	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			Preparation Method:	SW3510C/EPA600-MS	
23E0399-01	1070 mL / 2.00 mL	SW8270E	BGE0310	SGE0407	AL20040
23E0399-02	1070 mL / 1.00 mL	SW8270E	BGE0310	SGE0407	AL20040
23E0399-03	1070 mL / 1.00 mL	SW8270E	BGE0310	SGE0407	AL20040

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			Preparation Method:	SW5030B-MS	
23E0399-01	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
23E0399-02	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
23E0399-03	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301

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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		
23E0399-04	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
23E0399-02RE1	5.00 mL / 5.00 mL	SW8260D	BGE0314	SGE0317	AD30301
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			Preparation Method: SW7470A		
23E0399-01	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
23E0399-02	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
23E0399-03	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220

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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	
BGE0372-BLK1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-BS1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MS1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MS2	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MS3	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MSD1	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MSD2	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228
BGE0372-MSD3	50.0 mL / 50.0 mL	SW6020B	BGE0372	SGE0402	AE30228

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			Preparation Method:	No Prep Wet Chem	
BGE0236-BLK1	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
BGE0236-BS1	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
BGE0236-DUP1	300 mL / 300 mL	SM5210B-2011	BGE0236	SGE0418	
BGE0276-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
BGE0276-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
BGE0276-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
BGE0276-MS1	0.250 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
BGE0276-MSD1	0.250 mL / 25.0 mL	SM4500-NO2B-2011	BGE0276	SGE0280	AD30177
BGE0377-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
BGE0377-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
BGE0377-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
BGE0377-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264

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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	
BGE0377-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGE0377	SGE0364	AD30264
BGE0440-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-MRL1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0440-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGE0440	SGE0422	AE30229
BGE0570-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
BGE0570-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
BGE0570-MS1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
BGE0570-MSD1	50.0 mL / 50.0 mL	SM4500-NO3F-2011	BGE0570	SGE0537	AE30244
BGE0582-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0582-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0582-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0582-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0582-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0582-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGE0582	SGE0550	AE30245
BGE0795-BLK1	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
BGE0795-BS1	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
BGE0795-MS1	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
BGE0795-MSD1	5.00 mL / 10.0 mL	SW9065	BGE0795	SGE0749	AL20103
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			Preparation Method:	SW3510C/EPA600-MS	
BGE0310-BLK1	1000 mL / 1.00 mL	SW8270E	BGE0310	SGE0365	AD30296
BGE0310-BS1	1000 mL / 1.00 mL	SW8270E	BGE0310	SGE0365	AD30296
BGE0310-MRL1		SW8270E	BGE0310		

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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			Preparation Method:	SW3510C/EPA600-MS	
BGE0310-MS1	100 mL / 1.00 mL	SW8270E	BGE0310	SGE0365	AD30296
BGE0310-MS2	1000 mL / 1.00 mL	SW8270E	BGE0310	SGE0407	AL20040
BGE0310-MSD1	100 mL / 1.00 mL	SW8270E	BGE0310	SGE0365	AD30296
BGE0310-MSD2	1000 mL / 1.00 mL	SW8270E	BGE0310	SGE0407	AL20040
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			Preparation Method:	SW5030B-MS	
BGE0279-BLK1	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0279-BLK2	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0279-BS1	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0279-BS2	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0279-MS1	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0279-MSD1	5.00 mL / 5.00 mL	SW8260D	BGE0279	SGE0274	AD30301
BGE0314-BLK1	5.00 mL / 5.00 mL	SW8260D	BGE0314	SGE0317	AD30301
BGE0314-BS1	5.00 mL / 5.00 mL	SW8260D	BGE0314	SGE0317	AD30301
BGE0314-MS1	5.00 mL / 5.00 mL	SW8260D	BGE0314	SGE0317	AD30301
BGE0314-MSD1	5.00 mL / 5.00 mL	SW8260D	BGE0314	SGE0317	AD30301
Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			Preparation Method:	SW7470A	
BGE0300-BLK1	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
BGE0300-BS1	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
BGE0300-MS1	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
BGE0300-MS2	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
BGE0300-MSD1	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220
BGE0300-MSD2	20.0 mL / 20.0 mL	SW7470A	BGE0300	SGE0361	AE30220

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Certified Analyses included in this Report

Analyte	Certifications
<i>EPA350.1 R2.0 in Non-Potable Water</i>	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
<i>EPA351.2 R2.0 in Non-Potable Water</i>	
TKN as N	VELAP,NCDEQ,WVDEP
<i>SM4500-NO2B-2011 in Non-Potable Water</i>	
Nitrite as N	VELAP,WVDEP,NCDEQ
<i>SM4500-NO3F-2011 in Non-Potable Water</i>	
Nitrate+Nitrite as N	VELAP,WVDEP
<i>SM5210B-2011 in Non-Potable Water</i>	
BOD	VELAP,NCDEQ,WVDEP
<i>SM5220D-2011 in Non-Potable Water</i>	
COD	VELAP,NCDEQ,PADEP,WVDEP
<i>SW6020B in Non-Potable Water</i>	
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
<i>SW7470A in Non-Potable Water</i>	
Mercury	VELAP,NCDEQ,WVDEP

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Certified Analyses included in this Report

Analyte	Certifications
<i>SW8260D in Non-Potable Water</i>	
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
<i>SW8270E in Non-Potable Water</i>	
Anthracene	VELAP,PADEP,NCDEQ,WVDEP
<i>SW9065 in Non-Potable Water</i>	
Total Recoverable Phenolics	VELAP,WVDEP

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

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	06/14/2023
TXCEQ	Texas Comm on Environmental Quality #T104704576-23-1	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12333	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Qualifiers and Definitions

DS	Surrogate concentration reflects a dilution factor.
E	Estimated concentration, outside calibration range
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	Qualifiers
-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.



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

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, Ste. 300, Reston VA 20190	INVOICE ADDRESS:	PROJECT NUMBER: 02218208.15 Task 1
PHONE #: 703-471-6150	EMAIL: jrobb@scsengineers.com	P.O. #:
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): **A. Minnick, L. Nelson** SAMPLER SIGNATURE: *[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)										COMMENTS		
											Ammonia - EPA 350.1	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011 (report separately 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) EW58	X					050423	816		GW	1	X	X	X	X	X	X	X	X	X	X	X	<p>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</p> <p>Note VOC 8260 no HCl</p> <p>PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)</p> <p>277 27°C on ice sealed</p>	
2) EW59	X					050423	800		GW	1	X	X	X	X	X	X	X	X	X	X	X		
3) EW-50	X					050423	735		GW	1	X	X	X	X	X	X	X	X	X	X	X		
4)									GW														
5)									GW														
6)									GW														
7)									GW														
8)									GW														
9)									GW														
10) Trip Blank						030423	115		DI												X		

RELINQUISHED: <i>[Signature]</i> DATE / TIME: 050423/1100	RECEIVED: <i>[Signature]</i> DATE / TIME: 5/4/23 1710	QC Data Package	LAB USE ONLY Therm ID: 23E0399	COOLER TEMP 27°C
RELINQUISHED: LCN DATE / TIME:	RECEIVED: DATE / TIME:	Level III	Custody Seals used and intact? (Y / N) Received on ice? (Y / N)	
RELINQUISHED: DATE / TIME:	RECEIVED: DATE / TIME:	Level IV		

SCS-W 23E0399
2023 City of Bristol Landfill Leach:
Recd: 05/04/2023 Due: 05/18/2023

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



Sample Preservation Log

Order ID: 23E0399

Date Performed: 5/5/23

Analyst Performing Check: CSB/RCT

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	Received Res. Cl	final + or -	Received Res. Cl	final + or -	Received pH	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		
01	E																																			7	<2	
01	F																																					
01	M									7	<2		7	<2																						7	<2	
01	N									7	<2		7	<2																						7	<2	
01	O									7	<2		7	<2																						7	<2	
02	A	7	<2																																			
02	B									5	<2		5	<2																						5	<2	
02	E																																				7	<2
02	F																																					
02	M										7	<2		7	<2																					7	<2	
02	N										5	<2		5	<2																					5	<2	
02	O										7	<2		7	<2																					7	<2	
03	A	7	<2																																			

NaOH ID: _____ HNO₃ ID: 3003613 CrVI preserved date/time: _____ Analyst Initials: _____
 H₂SO₄ ID: 3301580 Na₂S₂O₃ ID: _____ Buffer Sol'n ID: _____
 HCL ID: _____ Na₂SO₃ ID: _____ 1N NaOH ID: _____ 5N NaOH: _____

* pH must be adjusted between 9.3 - 9.7

Metals were received with pH = 7. HNO₃ was added at 1215 on 05 May 2023 by RCT 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.



Sample Preservation Log

Order ID 23E0399

Date Performed: 5/5/23

Analyst Performing Check: CSB/RCT

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		pH as Received		pH as Received		pH as Received		pH as Received		pH as Received		pH as Received		pH as Received		pH as Received		Res. Cl		Res. Cl		Received pH		pH as Received		pH as Received		pH as Received	
		<2	Other	Final pH	>12	Other	Final pH	>9	Other	Final pH	<2	Other	Final pH	<2	Other	Final pH	<2	Other	Final pH	+	-	+	-	Final pH	Final pH	<2	Other	Final pH	<2	Other	Final pH
03	B								7	<2		7	<2															7	<2		
03	E																													7	<2
03	F																														
03	M								7	<2		7	<2															7	<2		
03	N								7	<2		7	<2															7	<2		
03	O								7	<2		7	<2															7	<2		

NaOH ID: _____ HNO₃ ID: 3003613 CrVI preserved date/time: _____ Analyst Initials: _____
 *pH must be adjusted between 9.3 - 9.7
 H₂SO₄ ID: 3301580 Na₂S₂O₃ ID: _____ Buffer Sol'n ID: _____
 HCL ID: _____ Na₂SO₃ ID: _____ 1N NaOH ID: _____ 5N NaOH: _____

Metals were received with pH = 7. HNO₃ was added at 1215 on 05 May 2023 by RCT in the Log-In room to bring pH= <2.

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Certificate of Analysis

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

Date Issued: 6/5/2023 4:26:49PM

Laboratory Order ID: 23E0399

Sample Conditions Checklist

Samples Received at:	2.70°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?	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 logged for analysis by 6020 per project history, which differs from COC (6010).
 *H2SO4-preserved bottles received with pH >2; H2SO4 added to bring pH to <2.
 Jennifer Robb notified via email. MRS 05/05/23 1406

Work Orders: 3E09070

Project: 23E0399

Attn: JP Verheul

Client: Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Report Date: 6/05/2023

Received Date: 5/9/2023

Turnaround Time: Normal

Phones: (804) 358-8295

Fax:

P.O. #: 045338

Billing Code:

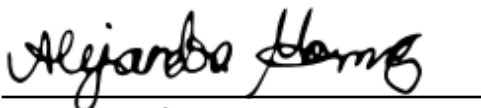
DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • ISO17025 ANAB #L2457.01 • LACSD #10143

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear JP Verheul,

Enclosed are the results of analyses for samples received 5/09/23 with the Chain-of-Custody document. The samples were received in good condition, at 3.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:



Alejandra D. Gomez
Project Manager



Enthalpy Analytical - Richmond VA
 1941 Reymet Road
 Richmond, VA 23237

Project Number: 23E0399

Project Manager: JP Verheul

Reported:
 06/05/2023 10:46

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
23E099-01: EW-58	Client	3E09070-01	Water	05/04/23 08:16	
23E099-02: EW-59	Client	3E09070-02	Water	05/04/23 08:00	
23E099-03: EW-50	Client	3E09070-03	Water	05/04/23 07:35	

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23E0399
Project Manager: JP Verheul

Reported:
06/05/2023 10:46

Sample Results

Sample: 23E099-01: EW-58
3E09070-01RE1 (Water) Sampled: 05/04/23 8:16 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		Instr: GC09				
Batch ID: W3E2265	Preparation: _NONE (SVOC)	Prepared: 05/25/23 11:26		Analyst: ecs		
Acetic acid	1800	500	mg/l	50	05/25/23	M-05
Butyric acid	ND	500	mg/l	50	05/25/23	M-05
Heptanoic acid	ND	500	mg/l	50	05/25/23	M-05
Hexanoic acid	ND	500	mg/l	50	05/25/23	M-05
Isobutyric acid	ND	500	mg/l	50	05/25/23	M-05
Isocaproic acid	ND	500	mg/l	50	05/25/23	M-05
Isovaleric acid	ND	500	mg/l	50	05/25/23	M-05
Propionic acid	800	500	mg/l	50	05/25/23	M-05
Valeric acid	ND	500	mg/l	50	05/25/23	M-05

Sample Results

Sample: 23E099-02: EW-59
3E09070-02RE1 (Water) Sampled: 05/04/23 8:00 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		Instr: GC09				
Batch ID: W3E2265	Preparation: _NONE (SVOC)	Prepared: 05/25/23 11:26		Analyst: ecs		
Acetic acid	3000	500	mg/l	50	05/25/23	M-05
Butyric acid	1200	500	mg/l	50	05/25/23	M-05
Heptanoic acid	ND	500	mg/l	50	05/25/23	M-05
Hexanoic acid	ND	500	mg/l	50	05/25/23	M-05
Isobutyric acid	ND	500	mg/l	50	05/25/23	M-05
Isocaproic acid	ND	500	mg/l	50	05/25/23	M-05
Isovaleric acid	500	500	mg/l	50	05/25/23	M-05
Propionic acid	1400	500	mg/l	50	05/25/23	M-05
Valeric acid	ND	500	mg/l	50	05/25/23	M-05

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23E0399
Project Manager: JP Verheul

Reported:
06/05/2023 10:46

Sample Results

(Continued)

Sample: 23E099-03: EW-50
3E09070-03RE1 (Water) Sampled: 05/04/23 7:35 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		Instr: GC09				
Batch ID: W3E2265		Preparation: _NONE (SVOC)			Prepared: 05/25/23 11:26	
		Analyst: ecs				
Acetic acid	990	500	mg/l	50	05/25/23	M-05
Butyric acid	ND	500	mg/l	50	05/25/23	M-05
Heptanoic acid	ND	500	mg/l	50	05/25/23	M-05
Hexanoic acid	ND	500	mg/l	50	05/25/23	M-05
Isobutyric acid	ND	500	mg/l	50	05/25/23	M-05
Isocaproic acid	ND	500	mg/l	50	05/25/23	M-05
Isovaleric acid	ND	500	mg/l	50	05/25/23	M-05
Propionic acid	520	500	mg/l	50	05/25/23	M-05
Valeric acid	ND	500	mg/l	50	05/25/23	M-05

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23E0399
Project Manager: JP Verheul

Reported:
06/05/2023 10:46

Quality Control Results

Alcohols by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	Limits	RPD	RPD Limit	Qualifier
Batch: W3E2265 - EPA 8015M										
Blank (W3E2265-BLK1)				Prepared & Analyzed: 05/25/23						
Acetic acid	ND	10	mg/l							
Butyric acid	ND	10	mg/l							
Heptanoic acid	ND	10	mg/l							
Hexanoic acid	ND	10	mg/l							
Isobutyric acid	ND	10	mg/l							
Isocaproic acid	ND	10	mg/l							
Isovaleric acid	ND	10	mg/l							
Propionic acid	ND	10	mg/l							
Valeric acid	ND	10	mg/l							
LCS (W3E2265-BS1)				Prepared & Analyzed: 05/25/23						
Acetic acid	43.3	10	mg/l	50.0		87	50-150			
Butyric acid	45.5	10	mg/l	50.0		91	50-150			
Heptanoic acid	49.2	10	mg/l	50.0		98	50-150			
Hexanoic acid	53.8	10	mg/l	50.0		108	50-150			
Isobutyric acid	51.1	10	mg/l	50.0		102	50-150			
Isocaproic acid	56.1	10	mg/l	50.0		112	50-150			
Isovaleric acid	45.0	10	mg/l	50.0		90	50-150			
Propionic acid	45.0	10	mg/l	50.0		90	50-150			
Valeric acid	53.2	10	mg/l	50.0		106	50-150			
Matrix Spike (W3E2265-MS1)				Source: 3E24056-01		Prepared & Analyzed: 05/25/23				
Acetic acid	73.4	10	mg/l	50.0	24.4	98	50-150			
Butyric acid	50.6	10	mg/l	50.0	ND	101	50-150			
Heptanoic acid	54.6	10	mg/l	50.0	ND	109	50-150			
Hexanoic acid	58.7	10	mg/l	50.0	ND	117	50-150			
Isobutyric acid	56.4	10	mg/l	50.0	4.07	105	50-150			
Isocaproic acid	61.7	10	mg/l	50.0	10.3	103	50-150			
Isovaleric acid	48.8	10	mg/l	50.0	4.73	88	50-150			
Propionic acid	51.6	10	mg/l	50.0	9.68	84	50-150			
Valeric acid	57.8	10	mg/l	50.0	6.31	103	50-150			
Matrix Spike Dup (W3E2265-MSD1)				Source: 3E24056-01		Prepared & Analyzed: 05/25/23				
Acetic acid	75.0	10	mg/l	50.0	24.4	101	50-150	2	25	
Butyric acid	50.7	10	mg/l	50.0	ND	101	50-150	0.2	25	
Heptanoic acid	55.6	10	mg/l	50.0	ND	111	50-150	2	25	
Hexanoic acid	59.2	10	mg/l	50.0	ND	118	50-150	0.8	25	
Isobutyric acid	56.3	10	mg/l	50.0	4.07	104	50-150	0.3	25	
Isocaproic acid	63.2	10	mg/l	50.0	10.3	106	50-150	2	25	
Isovaleric acid	49.1	10	mg/l	50.0	4.73	89	50-150	0.5	25	
Propionic acid	51.5	10	mg/l	50.0	9.68	84	50-150	0.1	25	
Valeric acid	58.1	10	mg/l	50.0	6.31	104	50-150	0.5	25	

Enthalpy Analytical - Richmond VA
 1941 Reymet Road
 Richmond, VA 23237

Project Number: 23E0399

Reported:

06/05/2023 10:46

Project Manager: JP Verheul

(Continued)

Quality Control Results

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Batch: W3E2265 - EPA 8015M (Continued)

Matrix Spike Dup (W3E2265-MSD1)

Source: 3E24056-01

Prepared & Analyzed: 05/25/23

Enthalpy Analytical - Richmond VA
 1941 Reymet Road
 Richmond, VA 23237

Project Number: 23E0399

Project Manager: JP Verheul

Reported:
 06/05/2023 10:46

Notes and Definitions

Item	Definition
M-05	Due to the nature of matrix interferences, sample was diluted prior to analysis. The MDL and MRL were raised due to the dilution.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration										LOD	LOQ	
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	
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	
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
	January-2023	---	86800	---	---	---	---	---	---	---	---	---	10000	10000
		---	---	---	3630	---	---	---	---	---	---	---	500	500
	February-2023	14900	---	---	---	---	---	---	8430	---	---	---	2000	2000
		---	---	---	---	47600	---	---	---	---	---	---	5000	5000
	March-2023	---	---	---	1690	---	---	---	---	---	9210	1000	1000	
	April-2023	---	---	---	---	10600	---	---	---	---	---	---	500	500
		---	---	---	---	---	10600	---	---	---	---	---	2000	2000
		---	---	---	---	---	---	7370	---	---	---	---	1000	1000
May-2023	---	---	---	16800	---	---	---	---	---	---	---	2000	2000	
	7590	---	---	18700	---	---	---	---	---	---	---	2000	2000	
November-2022	---	---	---	---	44700	---	---	---	---	---	4000	4000		
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-65	EW-67	EW-68	LOD	LOQ	
Parameter	Monitoring Event	Concentration										LOD	LOQ	
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		
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		
---	---	---	---	---	---	---	---	---	---	---	---	---	---	
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		

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
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	
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)													
Anthracene	November-2022	---	---	---	---	---	---	ND	ND	---	---	46.7	93.5
		---	---	---	---	ND	---	---	---	---	---	93.5	187
	December-2022	---	---	---	---	ND	---	---	---	---	ND	9.35	9.35
		---	ND	---	---	---	---	---	---	---	---	11.7	11.7
		ND	---	---	---	---	---	---	---	---	---	23.4	23.4
	January-2023	---	---	---	ND	---	---	---	---	---	---	485	971
		---	---	---	---	---	---	---	---	ND	---	243	485
		ND	---	---	---	---	---	---	---	---	---	253	505
	February-2023	---	---	---	---	---	---	---	---	---	---	490	980
		---	---	---	---	ND	---	---	---	---	---	500	1000
	March-2023	---	---	---	---	---	---	---	---	---	ND	187	374
	April-2023	---	---	---	---	ND	---	---	---	---	---	51	102
		---	---	---	ND	---	---	---	---	---	---	117	234
	May-2023	---	---	---	ND	---	---	---	---	---	---	37.4	74.8
		ND	---	---	---	---	ND	---	---	---	---	38.8	77.7
	---	---	---	---	ND	---	---	---	---	---	---	93.5	187
---	---	---	---	---	---	---	---	---	---	---	467	935	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
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
	May-2023	0.26	---	---	0.3	0.27	---	---	---	---	---	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
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
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
	May-2023	0.422	---	---	0.281	0.237	---	---	---	---	---	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-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration										LOD	LOQ
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
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
Mercury	November-2022	---	---	---	---	---	---	0.00169	0.00053	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	0.0008	0.0008
		0.00051	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	December-2022	---	---	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
	February-2023	---	---	---	---	---	---	---	---	---	ND	0.0004	0.0004
	March-2023	---	---	---	ND	---	---	---	---	---	---	0.0002	0.0002
	April-2023	---	---	---	---	---	0.00128	---	---	---	---	0.0002	0.0002
May-2023	ND	---	---	ND	ND	---	---	---	---	---	0.0002	0.0002	
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

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	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
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
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
	May-2023	0.079	---	---	0.0635	0.0519	---	---	---	---	---	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-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
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
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
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-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
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
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	

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	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
Tetrahydrofuran	November-2022	---	---	---	---	309	---	---	176	---	---	100	100
	December-2022	151	---	---	---	170	1120	---	---	---	663	100	100
	January-2023	---	5210	19800	---	---	---	---	---	6130	---	1000	1000
	February-2023	---	---	---	---	---	---	---	---	---	3760	2000	2000
	March-2023	---	---	---	353	464	---	---	---	---	---	100	100
	April-2023	---	---	---	2410	---	4790	---	---	---	---	100	100
	May-2023	ND	---	---	2740	2380	---	---	---	---	---	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
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

--- = 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

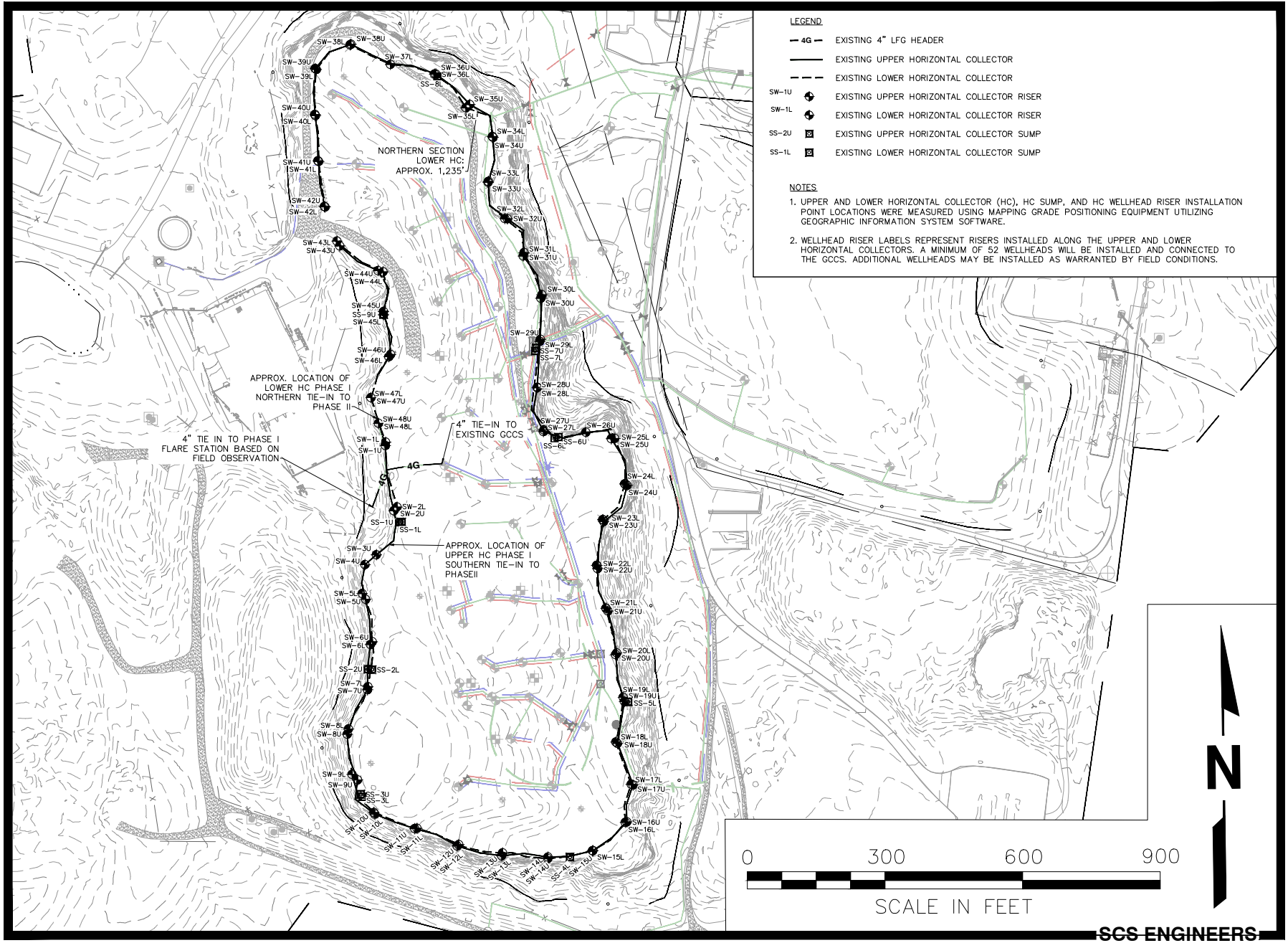
mg/L = milligrams per liter

ND = Not Detected

ug/L = micrograms per liter



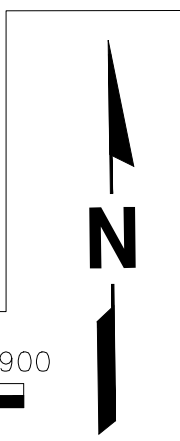
Appendix G
Sidewall Odor Mitigation System Progress Drawings



LEGEND

- 4G — EXISTING 4" LFG HEADER
- EXISTING UPPER HORIZONTAL COLLECTOR
- - - EXISTING LOWER HORIZONTAL COLLECTOR
- SW-1U ● EXISTING UPPER HORIZONTAL COLLECTOR RISER
- SW-1L ● EXISTING LOWER HORIZONTAL COLLECTOR RISER
- SS-2U ■ EXISTING UPPER HORIZONTAL COLLECTOR SUMP
- SS-1L ■ EXISTING LOWER HORIZONTAL COLLECTOR SUMP

- NOTES**
1. UPPER AND LOWER HORIZONTAL COLLECTOR (HC), HC SUMP, AND HC WELLHEAD RISER INSTALLATION POINT LOCATIONS WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.
 2. WELLHEAD RISER LABELS REPRESENT RISERS INSTALLED ALONG THE UPPER AND LOWER HORIZONTAL COLLECTORS. A MINIMUM OF 52 WELLHEADS WILL BE INSTALLED AND CONNECTED TO THE GCCS. ADDITIONAL WELLHEADS MAY BE INSTALLED AS WARRANTED BY FIELD CONDITIONS.



SCS ENGINEERS

SIDEWALL ODOR MITIGATION SYSTEM APPROXIMATE AS-BUILT LOCATIONS