July 2023
Monthly Compliance Report

Solid Waste Permit No. 588
Bristol Integrated Solid Waste Management Facility
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SCS ENGINEERS

02218208.05-30 | **August 10, 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 July 2023 related to Solid Waste Permit (SWP) No. 588.

1.0 GAS COLLECTION

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

1.1 SURFACE AND LEACHATE COLLECTION EMISSIONS

1.1.1 Surface Emissions

1.1.1.1 Quarterly SEM

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

1.1.1.2 Weekly SEM

In addition to the standard regulatory quarterly surface emissions monitoring, SCS performed additional surface emissions monitoring on July 7, 2023; July 12, 2023; July 21, 2023; and July 28, 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 July 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 July monitoring events on July 12, 2023; July 19, 2023; July 26, 2023; and August 2, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the four monitoring events in July.

Table 1. Summary of July Surface Emissions Monitoring

Description	July 7, 2023	July 12, 2023	July 21, 2023	July 28, 2023
Number of Points Sampled	169	169	168	168
Number of Points in Serpentine Route	100	100	100	100
Number of Points at Surface Cover Penetrations	69	69	68	68
Number of Exceedances	3	5	11	8
Number of Serpentine Exceedances	1	1	3	1
Number of Pipe Penetration Exceedances	2	4	8	7

Four new serpentine exceedances were detected in July 2023. Three of these four initial serpentine exceedances occurred during the July 21, 2023 monitoring event. On the date of this monitoring event, vacuum supply was reduced in the vicinity of the exceedances as a result of a sump blockage following a heavy rainfall event. The fourth exceedance occurred along an erosion rill. Corrective actions have been performed at all four locations, resulting in compliant readings at three of the four locations. Further corrective actions, including the addition and compaction of low-permeability soil, are planned at the remaining location.

Initial exceedances were detected at pipe penetrations of seven vertical extraction wells (EW-35, EW-55, EW-58, EW-67, EW-86, EW-88, and EW-99). Exceedances were also detected at the pipe penetration of four additional vertical extraction wells that had been documented in the previous months (EW-38, EW-52, EW-66, and EW-98). Several of these vertical extraction wells have been recently installed. New wellbore skirts and pump installation are anticipated at these wells to reduce fugitive emissions. For the remaining locations, anticipated corrective actions include additional soil and/or a well-bore skirt addition/modification at the well penetration, continued and improved dewatering activities, and well tuning to increase gas extraction. Corrective actions to address these exceedances are planned for the month of August 2023.

1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on July 7, 2023, and performed monitoring of the leachate, witness zone, and gradient control clean-outs at the northern and southern ends of the landfill. The results of that monitoring are included in Table 2. The monitoring data for the clean-outs at the southern end of the landfill are listed as LC01 – LC10. The monitoring data for the clean-outs at the northern end of the landfill are listed as NC01 – NC10. Table 2 also lists the cleanout pipe description based on site records and a review of correspondence.

Table 2. Leachate Cleanout Pipe Monitoring Results

Description	ID#	CH_4 (% by Vol)	CO_2 (% by Vol)	O_2 (% by Vol)	Balance Gas (% by Vol)	Initial Temp (°F)	Adj Temp (°F)	Initial Static Pressure (in H_2O)	Adj Static Pressure (in H_2O)	System Pressure (in H_2O)
Southern Cleanouts Gradient West	LC01	26.9	15.55	0.64	56.96	80.2	80.1	-17.24	-18.59	-18.5
Southern Cleanouts Gradient East	LC02	51.6	42.84	0.12	5.45	79.4	79.4	-17.32	-18.42	-17.94
Southern Cleanouts Leachate Center	LC03	29.1	30.81	11.44	28.7	79.3	79.3	-18.04	-18.18	-17.24
Southern Cleanouts Witness East	LC04	18.0	14.15	12.23	55.66	79.4	79.4	-17.91	-17.91	-17.53
Southern Cleanouts Leachate West	LC05	53.5	44.22	0.11	2.16	79.5	79.5	-17.31	-17.66	-18.4
Southern Cleanouts Gradient Center West	LC06	44.3	38.83	1.54	15.38	79.8	79.8	-18.25	-17.24	-18.54
Southern Cleanouts Leachate East	LC08	47.6	42.46	0.5	9.46	79.9	79.9	-16.56	-17.07	-17.53
Southern Cleanouts Gradient Center East	LC09	32.7	35	13.79	18.54	79.1	78.7	-15.89	-15.89	-19.64
Southern Cleanouts Leachate West	LC10	10.4	15.64	15.5	58.42	78.4	78.1	-17.62	-17.66	-20.71
Northern Cleanouts Leachate East	NC01	0.7	0.99	19.91	78.37	85.6	85.5	-0.03	-0.03	0
Northern Cleanouts Leachate Center	NC02	0.9	0.62	19.8	78.65	85.2	85.1	-16.67	-16.62	0
Northern Cleanouts Leachate West	NC03	1.4	0.66	19.71	78.28	82	82.1	-16.62	-16.6	0
Northern Cleanouts Witness East	NC04	1.4	0.73	19.62	78.27	84.8	84.9	-15.97	-15.93	0
Northern Cleanouts Witness Center	NC05	0.1	0.27	20.17	79.45	85	85	-23.94	-16.29	-0.24
Northern Cleanouts Witness West	NC06	0.02	0.03	20.23	79.72	85.1	85.1	-16.73	-16.65	0
Northern Cleanouts Gradient East	NC07	29.3	13.1	4.16	53.46	85.3	85.3	-16.9	-16.9	-0.08
Northern Cleanouts Gradient Center East	NC08	32.8	17.37	5.02	44.85	85.3	85.3	-16.88	-16.9	0
Northern Cleanouts Gradient Center West	NC09	31.8	17.86	2.51	47.82	85.3	85.3	-16.9	-16.9	0
Northern Cleanouts Gradient West	NC10	33.6	19.5	14.08	32.85	85.4	85.4	-16.9	-16.9	0

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 the following sections of this report. Additional actions taken by SCS-FS include the following:

- Applying a de-foaming agent to landfill gas liquids
- Installing stormwater de-watering pumps
- Restarting flare after power failure
- Repairing a 4-inch lateral
- Replacing a Kanaflex on EW-23

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 wellheads. 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. Average daily temperatures recorded by the remote monitoring system during the month of July are included in Appendix C. In addition, SCS previously prepared semi-monthly status updates 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 August 23, 2021. On August 2, 2023, VDEQ requested that such updates be included in the monthly compliance reports going forward. Accordingly, this section is a summary of temperature monitoring activities as well as work accomplished during the monthly monitoring period of July 2023.

1.3.1 Automated Wellhead Temperature Measurements

During July, SCS discovered that EW-32R had a faulty battery installed. The battery was replaced on July 6, 2023 and the data provided begins from that date through July 31, 2023. A loose connector wire was repaired at EW-67 on July 13, 2023. The automated temperature probe for EW-46 was repurposed for EW-34 on July 10, 2023. EW-34's automated and manual temperatures will now be shown in this report.

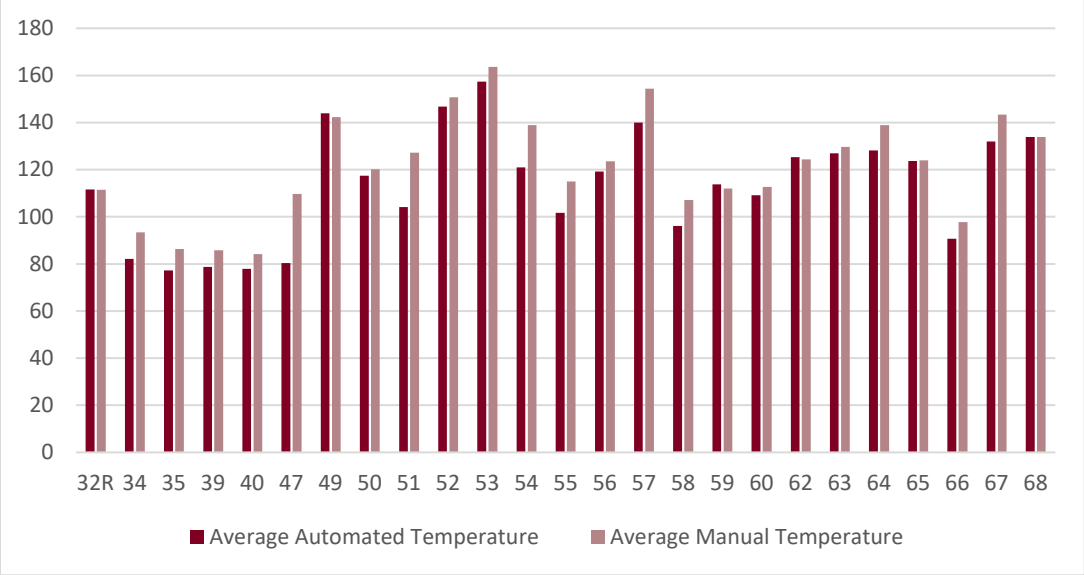
SCS reviewed the automated hourly temperature measurements from July 1, 2023 to July 31, 2023, and identified the following trends:

- **Temperatures over 145°F:** Temperatures over the NESHAP AAAA compliance threshold of 145°F were recorded at eight wells during July. 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-51, 52, 53, and 54. The highest temperatures were measured at EW-51 and EW-53 (greater than 190° at times). SCS believes that the increase in temperatures at select well heads

suggests that, with the increase of pneumatic pump operations and increased liquids removal, the collection system is being more effectively dewatered. Liquids removal in combination with the addition of new LFG collection infrastructure from the recent GCCS expansion is likely providing more pathways for extraction of the warmer landfill gas from deeper in the waste mass; thus the increased average temperatures.

- **Low temperatures at certain wells:** Average temperatures between 50°F and 80°F were noticed at three wells. This generally correlated with low LFG flow rates measured during monthly and weekly 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.

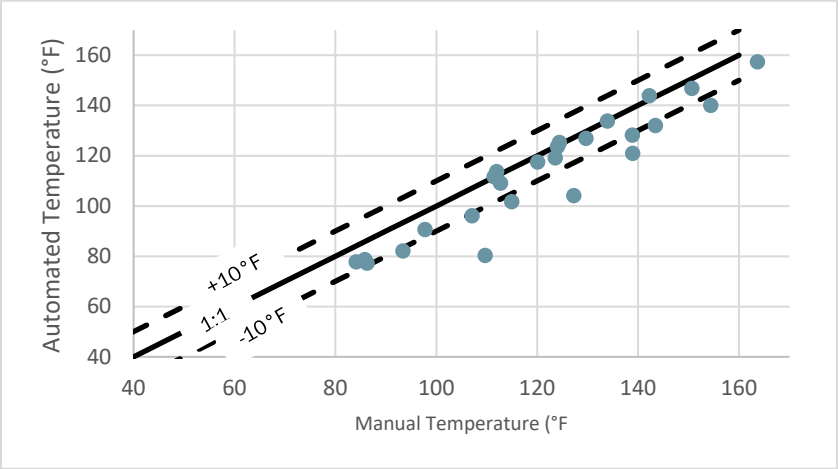
Figure 1. July Average Daily Temperatures



1.3.2 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.

Figure 2. Manual vs. Automated Temperature Comparison



During this monitoring period, the average automated temperatures generally with 10 °F of the average manual temperatures. Roughly a third of the manual temperatures show higher values than their respective automated temperatures. As shown in Figure 2, the were only 2 clear outliers (EW-47 and EW-51), with automated temperature measurements trending lower than manual measurements. SCS recommends inspecting these probes for proper function, however the cause may simply be that LFG flow is minimal at this device. During wellfield monitoring events in July, the average flow recorded by a GEM5000 at these wells was approximately 5 scfm or less.

In general, the continued correlation of manual and automated temperature measurements supports SCS' belief that the 2-inch automated sensors are measuring temperatures with sufficient accuracy for the application.

1.3.3 Monthly Regulatory Wellhead Temperature Measurements

Routine monthly temperature monitoring for purposes of complying with 40 CFR 60.36f(a)(5) was conducted July 6, 2023, with follow-up monitoring several days after. Additionally, SCS typically monitors the SWP No. 588 Landfill on a weekly basis. During this monitoring period, temperature exceedances were resolved at EW-67 and EW-88. An HOV request was submitted for EW-37, EW-57 and EW-67 to VDEQ on May 17, 2023. SCS received approval of this HOV request on July 27, 2023. See Table 3 for the statuses of all exceedances recorded during this monitoring period.

Table 3. July Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 7/31/23
EW-31R	7/24/23	7/27/23 173.2°	3 days	Ongoing, within 15-day timeline
EW-37	6/19/23	7/27/23 181.4°F	38 days	Ongoing, within 60-day timeline
EW-49	7/6/23	7/17/23 144.4°F	11 days	Resolved, within 15-day timeline
EW-49	7/24/23	7/27/23 143.4°	3 days	Resolved, within 15-day timeline
EW-49	7/31/23	7/31/23 148.9°	1 day	Ongoing, within 15-day timeline

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 7/31/23
EW-51	7/19/23	7/27/23 98.0°	8 days	Resolved, within 15-day timeline
EW-52	6/19/23	7/31/23 145.4°F	42 days	Ongoing, within 60-day timeline
EW-53	6/5/23	7/31/23 159.9°F	56 days	Ongoing, within 60-day timeline
EW-54	7/10/23	7/27/23 126.9°F	17 days	Resolved, within 60-day timeline
EW-54	7/31/23	7/31/23 153.5°	1 day	Ongoing, within 15-day timeline
EW-55	7/10/23	7/20/23 141.5°F	10 days	Resolved, within 15-day timeline
EW-55	7/31/23	7/31/23 166.9°	1 day	Ongoing, within 15-day timeline
EW-57	7/24/23	7/31/23 161.8°	7 days	Ongoing, within 15-day timeline
EW-61	6/27/23	7/31/23 146.0°F	34 days	Ongoing, within 60-day timeline
EW-64	7/6/23	7/17/23 143.9°F	11 days	Resolved, within 15-day timeline
EW-64	7/28/23	7/28/23 146.3°	1 day	Ongoing, within 15-day timeline
EW-67	7/6/23	7/7/23 133.1°F	1 day	Resolved, within 15-day timeline
EW-67	7/24/23	7/31/23 136.3°	7 days	Resolved, within 15-day timeline
EW-84	4/27/23	7/31/23 170.0°F	95 days	Ongoing, within 120-day timeline
EW-86	4/27/23	7/27/23 144.9°F	91 days	Resolved, within 120-day timeline
EW-88	7/6/23	7/7/23 144.1°F	1 day	Resolved, within 15-day timeline
EW-88	7/19/23	7/24/23 130.0°F	5 days	Resolved, within 15-day timeline
EW-89	5/30/23	7/31/23 160.0°F	62 days	Ongoing, within 120-day timeline
EW-90	4/27/23	7/20/23 138.0°F	84 days	Resolved, within 120-day timeline
EW-90	7/24/23	7/31/23 150.7°F	7 days	Ongoing, within 15-day timeline
EW-94	7/24/23	7/27/23 80.2°	3 days	Resolved, within 15-day timeline
EW-99	7/24/23	7/27/23 137.4°	3 days	Resolved, within 15-day timeline
EW-99	7/31/23	7/31/23 145.4°	1 day	Ongoing, within 15-day timeline
EW-100	4/27/23	7/31/23 158.5°	95 days	Ongoing, within 120-day timeline

1.3.4 LFG Sampling

SCS collected LFG samples from wells with temperature exceedances lasting more than 7 days using 1.5-L Summa canisters on June 29, 2023; July 7, 2023; and July 13, 2023 to fulfill the requirement in 40 CFR 63.1961(a)(5). The samples were sent to Enthalpy Analytical for lab analysis of carbon monoxide (CO) and hydrogen (H_2) content. Lab results are summarized in Table 4.

Table 4. LFG Wellhead Sampling Summary

Sample Date		6/29/2023	7/7/23	7/13/23
37	CO (ppmv)	518	--	421
	H2 (Vol. %)	16.6	--	13.2
49	CO (ppmv)	--	ND	ND
	H2 (Vol. %)	--	0.82	1.37
52	CO (ppmv)	ND	112	153
	H2 (Vol. %)	4.78	4.62	5.65
53	CO (ppmv)	632	578	1410
	H2 (Vol. %)	10.1	8.87	18.5
54	CO (ppmv)	--	--	816
	H2 (Vol. %)	--	--	26.7
55	CO (ppmv)	--	--	1040
	H2 (Vol. %)	--	--	23.2
61	CO (ppmv)	268	252	649
	H2 (Vol. %)	8.78	7.18	22.0
64	CO (ppmv)	--	--	ND
	H2 (Vol. %)	--	--	3.34
67	CO (ppmv)	--	733	--
	H2 (Vol. %)	--	11.5	--
84	CO (ppmv)	465	466	465
	H2 (Vol. %)	11.0	9.54	9.78
86	CO (ppmv)	134	131	118
	H2 (Vol. %)	2.53	2.30	2.21
89	CO (ppmv)	968	983	948
	H2 (Vol. %)	34.1	30.6	30.1
90	CO (ppmv)	259	277	178
	H2 (Vol. %)	4.70	4.41	3.04
100	CO (ppmv)	ND	ND	ND
	H2 (Vol. %)	5.12	5.13	5.43

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-49, EW-52, EW-64 and EW-100, which were non-detect.

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 July, work on the expansion of the GCCS focused on the installation of wellhead risers and leachate pumps of the deep well gas collection system and the 8" header connections to the existing system. During the first week of July, pumps were installed at six of the newly installed wells, including well 85 which was remoted. The first five pumps were installed in June 2023, satisfying item 1.iv of Appendix A of the Consent Decree between the Department and the City. The City and SCS-CONS have received the delivery of additional pumps which will increase the number of operating dual extraction wells beyond the required minimum, and are awaiting the delivery of additional stainless steel supplemental tubing materials necessary for installation. The expanded GCCS was connected to these wells with applied vacuum and began liquids extraction. A photo of the newly installed well 85 is shown in Figure 3.

Figure 3. Extraction Well 85 Installation at the SWP No. 588 Landfill

SCS-CONS installed a new stormwater sump and silt fence in the southeastern section of the quarry. This sump is intended to assist the existing sump and aid the liquids management of heavy rainfall events that have occurred, and continue to occur, on this site.

Figure 4. Stormwater Accumulation 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.

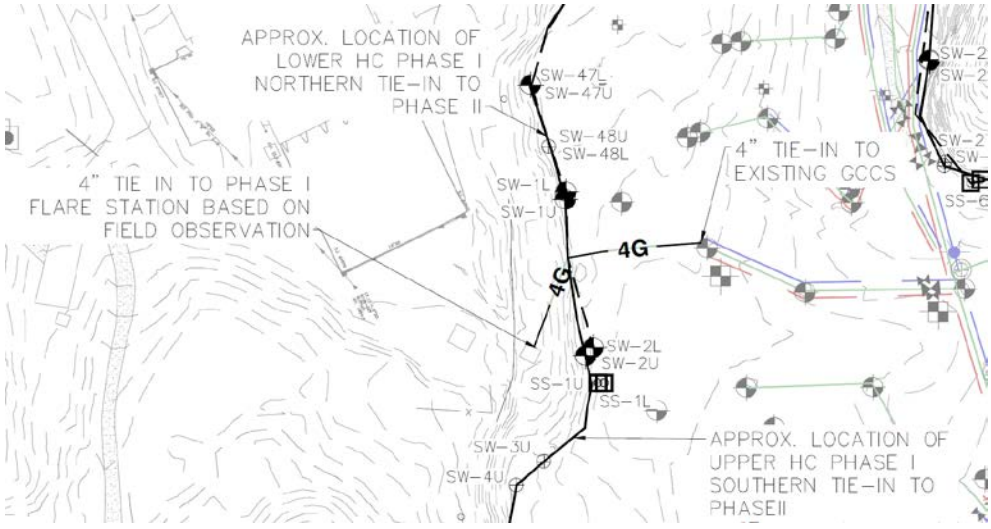
2.2 SIDEWALL ODOR MITIGATION SYSTEM

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 5 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 5. SOMS Phase I As-Built[1]



Phase 1 was initially connected to an auxiliary flare located near the system. HC wellhead measurements of gas quality continued to be taken on a weekly basis during the month of July 2023. A summary of those measurements is shown in Table 5.

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

Table 5. Sidewall HC Wellhead Gas Quality Measurements

Device ID	Date	CH_4 (%)	CO_2 (%)	O_2 (%)
SW-1L	7/7/2023	12.2	27.1	8.2
SW-1L	7/7/2023	12.2	27.1	8.2
SW-1U	7/7/2023	6.9	18.7	13.9
SW-1U	7/7/2023	6.9	18.7	13.9
SW-2L	7/7/2023	26.8	45.2	5.3
SW-2L	7/7/2023	26.8	45.2	5.3
SW-2U	7/7/2023	9.2	21.3	12.6
SW-2U	7/7/2023	9.2	21.3	12.6
SW-1L	7/17/2023	5.2	12.0	13.3
SW-1U	7/17/2023	4.2	13.3	14.7
SW-1L	7/26/2023	3.3	8.7	14.9
SW-1U	7/26/2023	3.8	8.8	16.7
SW-2L	7/26/2023	18.1	29.6	8.9

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

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

Both the upper and lower collectors of Phase 1 of the system have been connected to the substantially completed Phase 2 of the system. Because the site experienced heavy rain events during the month of July, the southern sections of the quarry are experiencing high volumes of liquid, the system is under less vacuum and therefore gas quality is expected to decrease as dewatering efforts continue in these areas of the landfill.

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

2.4 FULL SYSTEM CONSTRUCTION

SCS-CONS substantially completed construction of Phase 2 of the SOMS during the month of June 2023 as Phase 2 was connected to vacuum as of June 14, 2023. Liner, clay and cover soil

placement continued throughout the month of July and will continue into August. Figure 6 shows Phase 2 graded topsoil and wellhead connections at HC wells SW-21U and SW-21L.

Figure 6. Phase 2 SOMS Wellhead Connections

On June 14, 2023, SCS-CONS completed installation of Phase 2 lower and upper horizontal collector wellheads. During the month of July 2023, SCS-FS collected monitoring data at each connected wellhead. A summary of those measurements is shown in Table 6.

Table 6. Sidewall HC Wellhead Gas Quality Measurements – System Averages

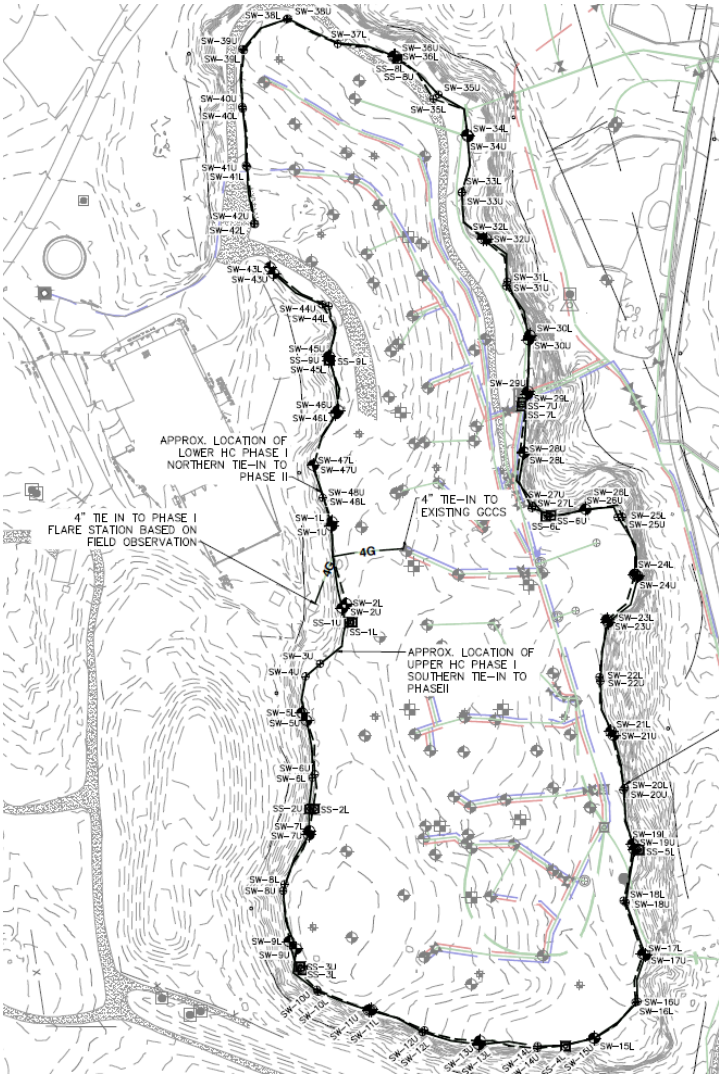
Record Date	Average CH4 [%]	Average CO2 [%]	Average O2 [%]	Average Bal Gas [%]
7/(6-7)/2023	20.4	31.1	8.7	39.8
7/11/2023	11.0	21.8	11.8	55.4
7/17-18/2023	4.7	8.6	16.3	70.4
7/26/2023	4.6	8.4	16.4	70.6

The sidewall system averages indicate lower methane content than typical landfill gas collection systems, but that the SOMS is functioning as designed because it indicates that landfill gas is being withdrawn and oxygen intrusion is acceptable.. Measurements of gas composition taken during July indicated methane content ranging from trace amounts of methane to as high as 50 percent at select individual wellheads. The wide-ranged gas composition may indicate that some areas of the landfill may be experiencing higher landfill gas concentrations than areas where methane content is

seemingly insignificant. Phase 2 lower and upper collectors locations, including HC wellhead riser and sump locations, is shown in the as-built depicted as Figure 7[2].

During the month of July, heavy rain events caused water to pool on the landfill surface and limited the effectiveness of some portions of the gas collection system. The decrease in methane concentrations are likely attributed to the decrease in landfill gas extraction within areas experiencing high volumes of liquids. SCS-CONS deployed additional dewatering pumps to address stormwater within the landfill. Dewatering efforts will continue into August in order to mitigate this issue and optimize the system's fugitive gas collection.

Figure 7. Phase 2 Sidewall Odor Mitigation System Progress As-Built[3]



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

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

At this time, not every SOMS horizontal collector riser has a wellhead installed, but HC risers may receive a wellhead at a future date as warranted by field conditions. Clay and soil placement atop of the installed liner in the southwestern area of the landfill, and wellhead connections to SW-21U and SW-21L is shown in Figure 8.

Figure 8. Phase 2 SOMS Lower and Upper Collector Construction

3.0 WASTE TEMPERATURE MONITORING

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

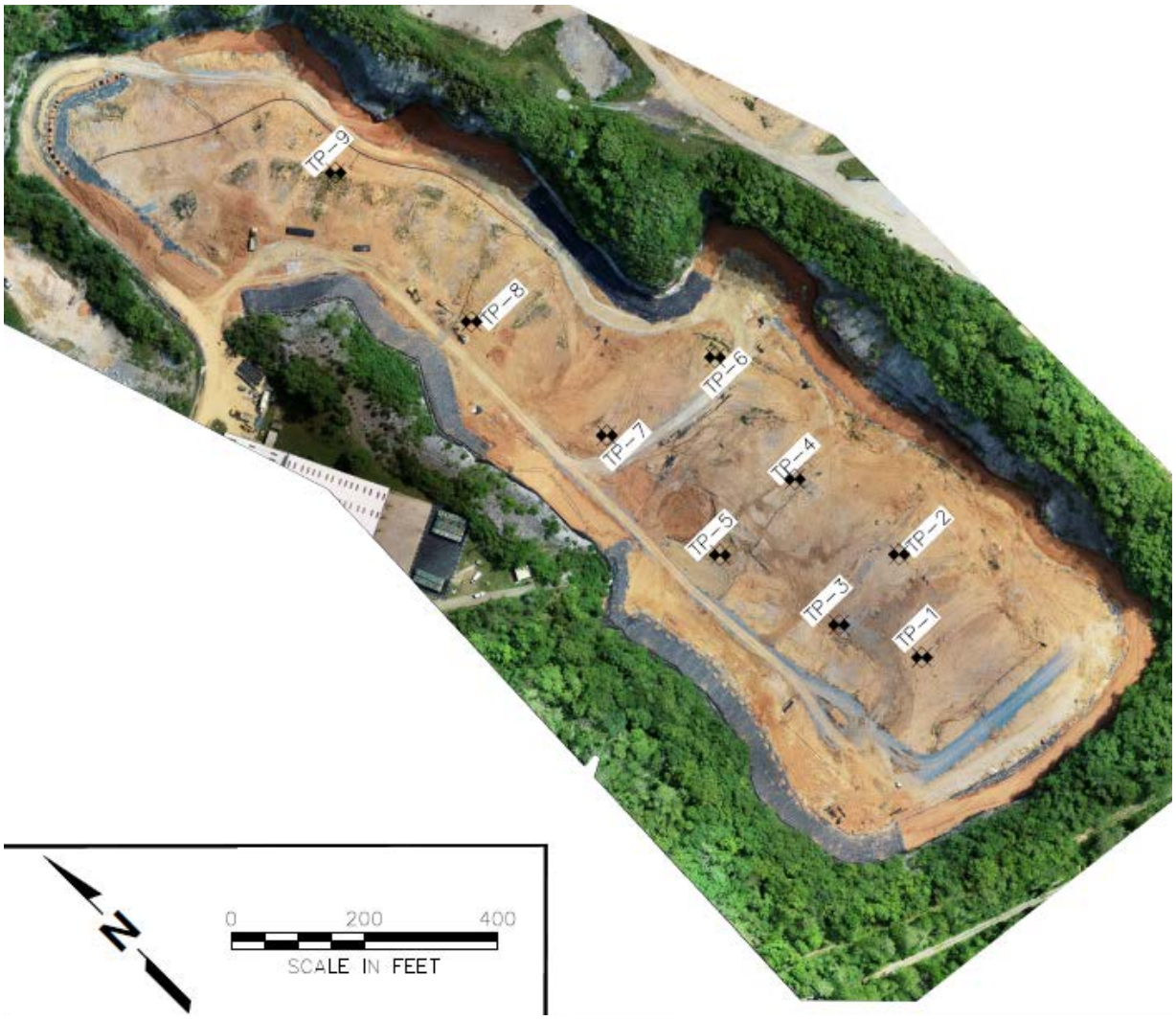
3.1 TEMPERATURE MONITORING SYSTEM DESIGN

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

3.2 TEMPERATURE MONITORING SYSTEM INSTALLATION

Installation of the in-situ Landfill Temperature Monitoring System began in October of 2022 and installation of replacement sensors was completed in February of 2023. Details of construction progress can be found in the monthly compliance reports for the SWP No. 588 Landfill. The locations of the temperature probes are shown in Figure 9.

Figure 9. Temperature Monitoring Probe Locations



SCS began collecting temperature data daily on February 15, 2023. The temperature sensors continued to transmit temperature data from all 9 casings during the month of July. Average daily temperatures recorded by the sensors for the Month of July 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 July are shown in Appendix B. The average temperatures for the month recorded during the months of March through July are shown in Figures 10 through 15 on the following pages.

Figure 10 shows daily average temperatures in Temperature Probe 1 (TP-1) during the months of March through July. Based on the data, temperatures were consistent from March through May and saw some modest increases during the months of June and July at depths or 100 feet and below.

TP-1 was originally drilled to a depth of 180 feet, but the contractor was unable to install the casing beyond a depth of 160 feet. TP-1 did not record temperatures between July 23, 2023 and July 30, 2023 due to a dead battery. The battery recharged and TP-1 began recording temperatures again on July 31, 2023.

Figure 10. Average Temperatures within TP-1 During the Months of March through July

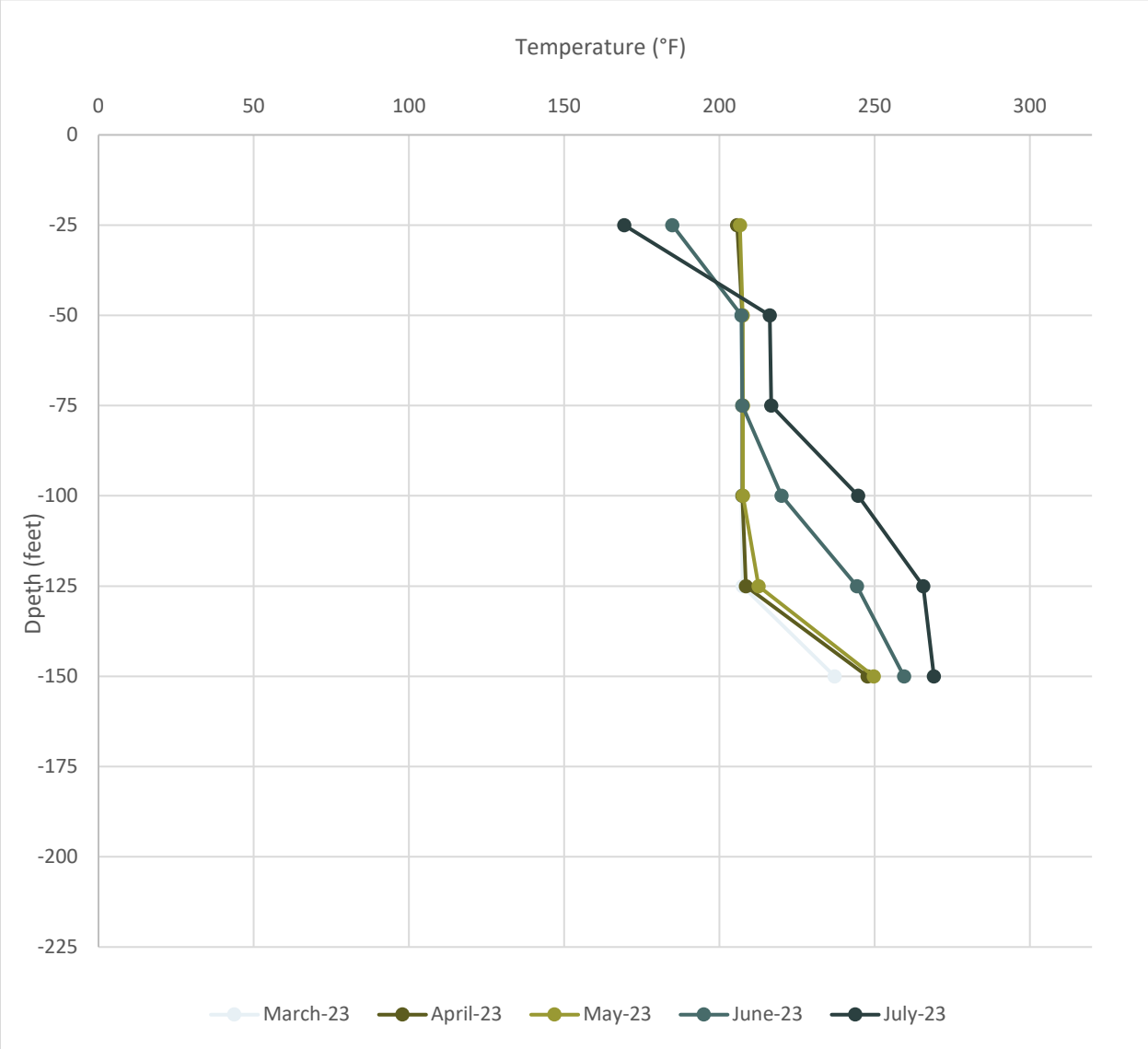


Figure 11 shows daily average temperatures in Temperature Probe 2 (TP-2) during the months of March through July. Based on the data, temperatures have been consistent during the last five months. TP-2 was originally drilled to a depth of 160 feet.

Figure 11. Average Temperatures within TP-2 During the Months of March through July

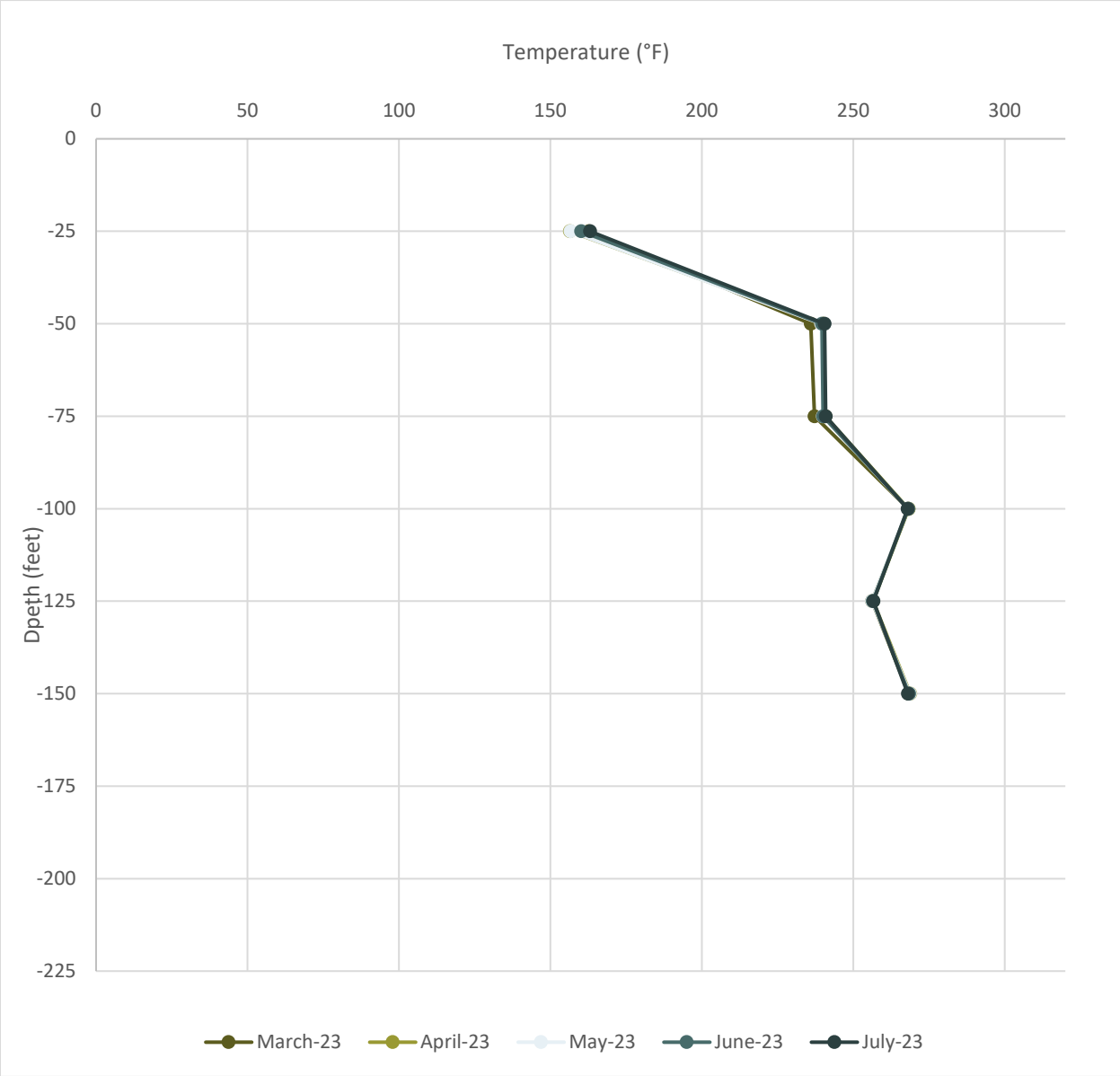


Figure 12 shows daily average temperatures in Temperature Probe 3 (TP-3) during the months of March through July. Based on the data, temperatures have been consistent during the last five months.

Figure 12. Average Temperatures within TP-3 During the Months of March through July

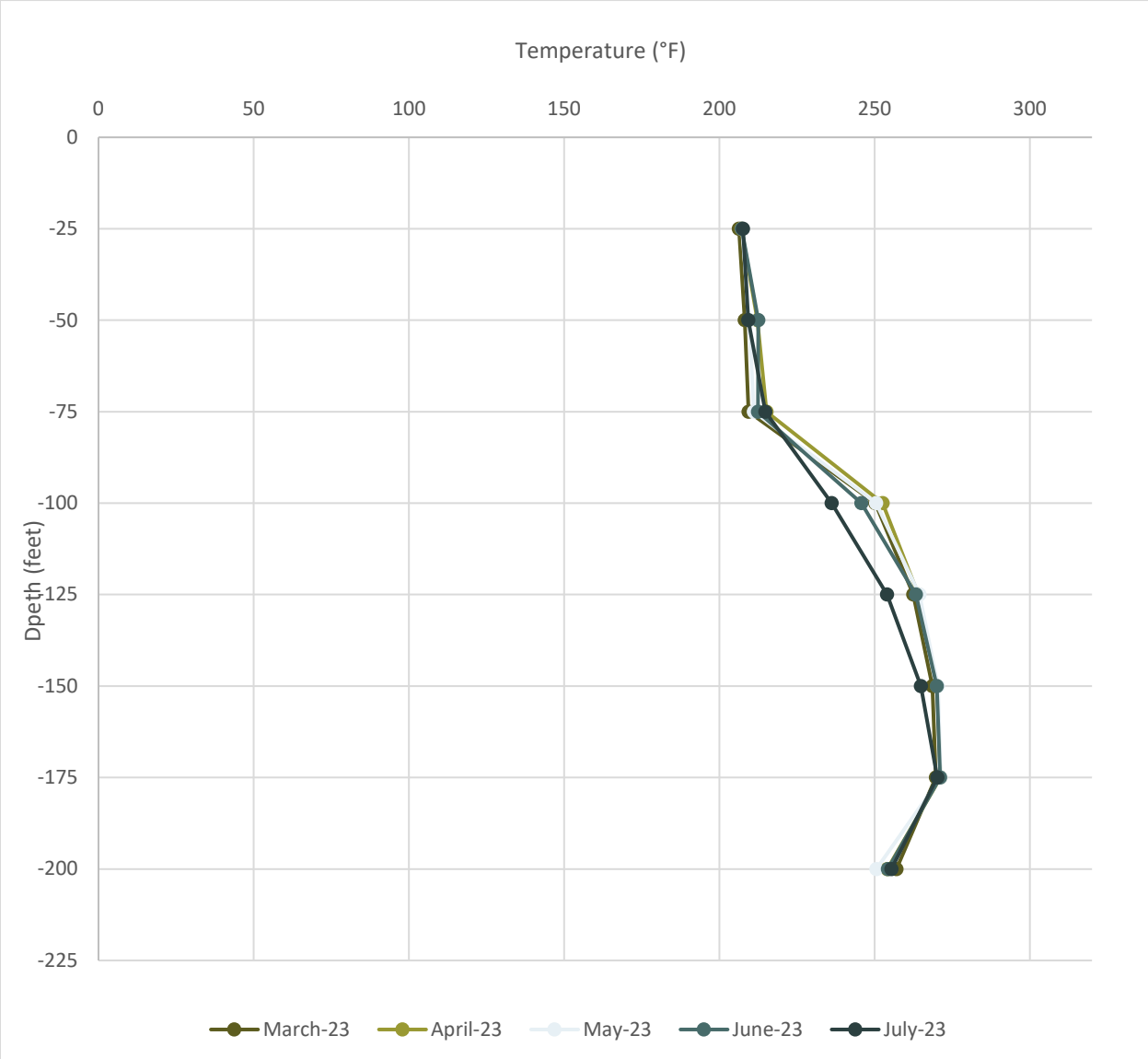


Figure 13 shows daily average temperatures in Temperature Probe 4 (TP-4) during the months of March through July. Based on the data, temperatures appeared to drop during the months of April and May, but returned to levels closer to baseline during the months of June and July.

Figure 13. Average Temperatures within TP-4 During the Months of March through July

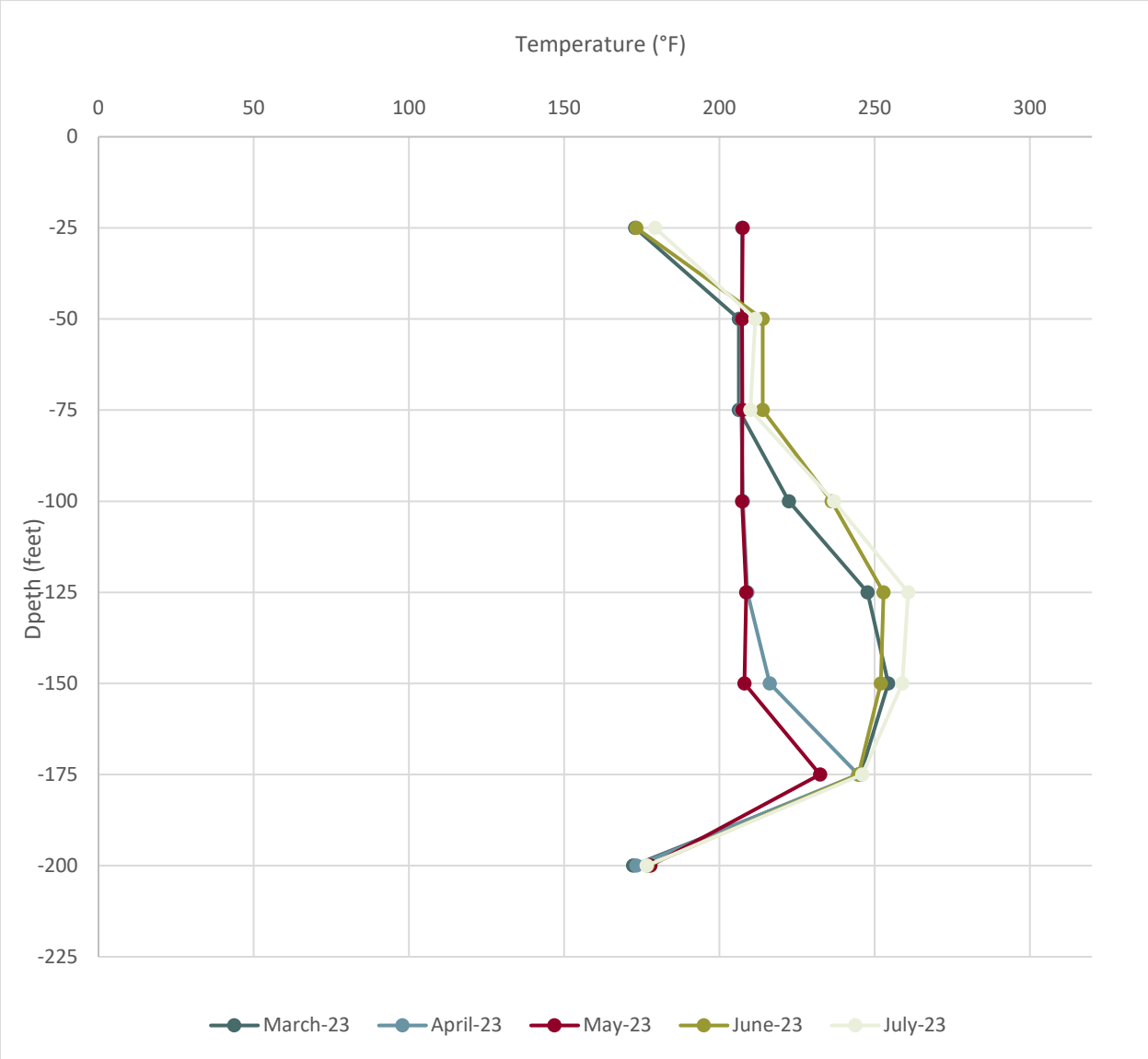


Figure 14 shows daily average temperatures in Temperature Probe 5 (TP-5) during the months of March through July. Based on the data, temperatures have been consistent during the last five months.

Figure 14. Average Temperatures within TP-5 During the Months of March through July

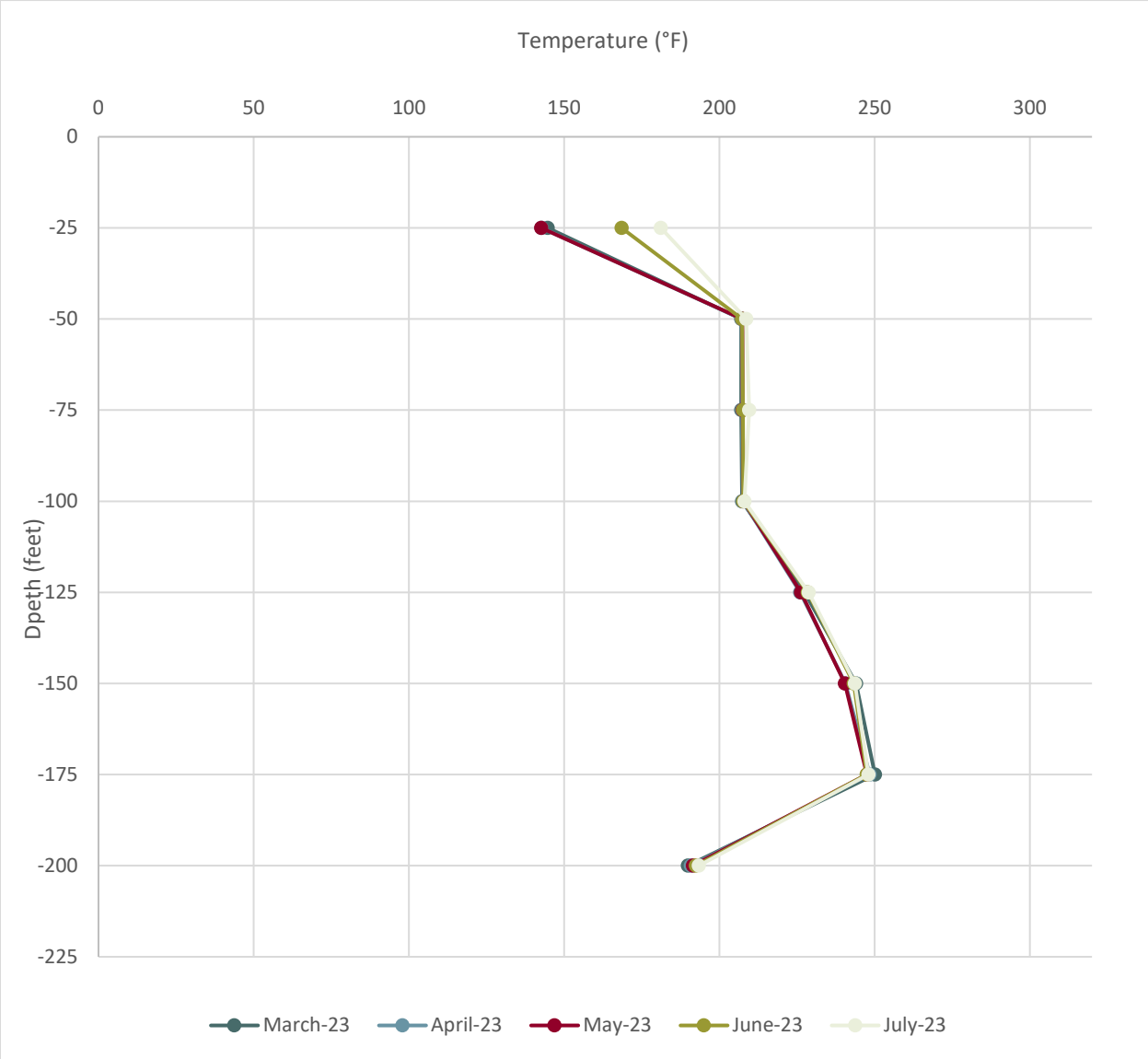


Figure 15 shows daily average temperatures in Temperature Probe 6 (TP-6) during the months of March through July. Based on the data, temperatures have been generally consistent during the last five months. A modest decrease at the 25-foot level was observed during the month of June. Temperatures returned to baseline during the month of July. 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 15. Average Temperatures within TP-6 During the Months of March through July

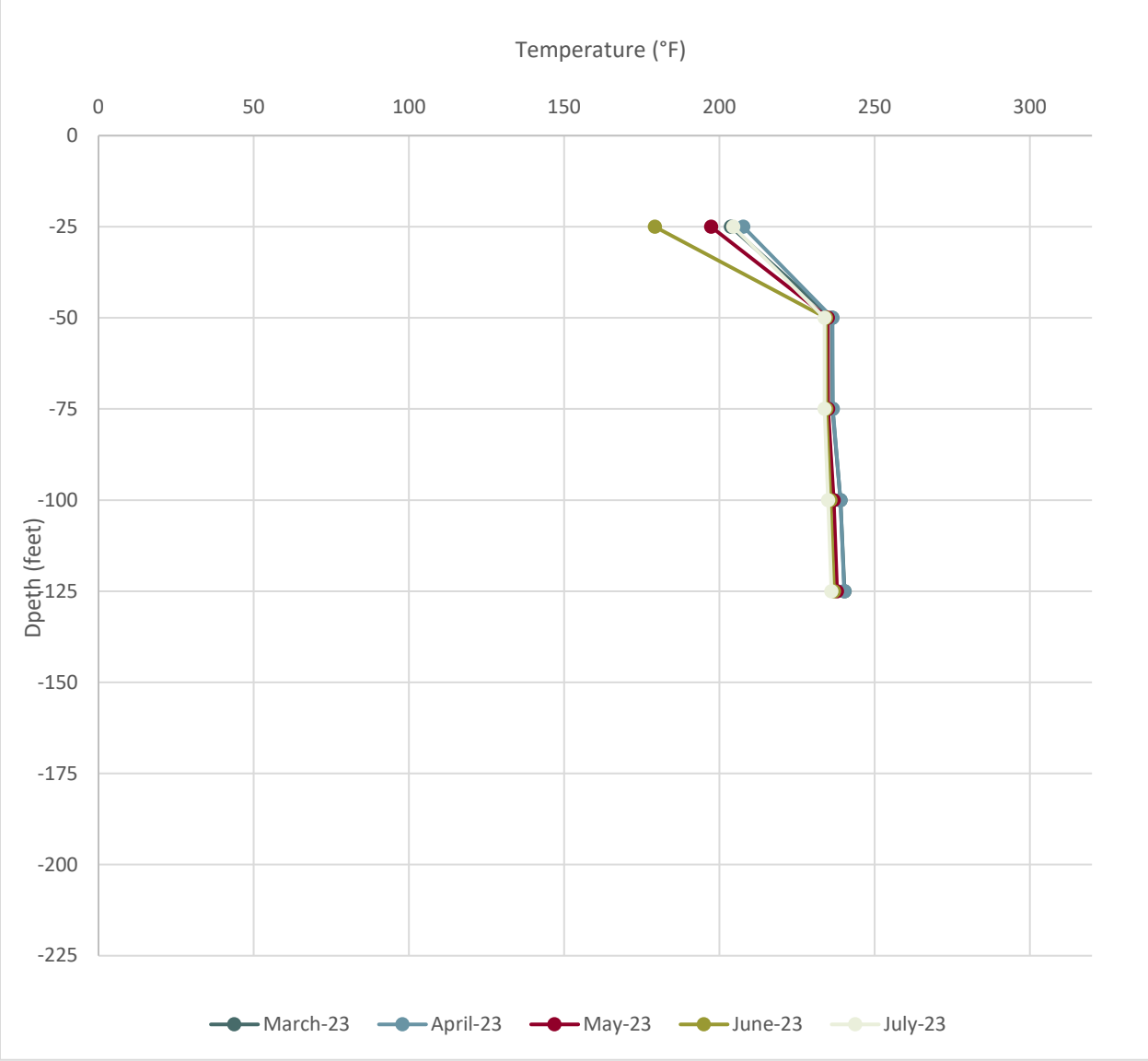


Figure 16 shows daily average temperatures in Temperature Probe 7 (TP-7) during the months of March through July. Based on the data, temperatures have been consistent during the last five months with a general downward trend.

Figure 16. Average Temperatures within TP-7 During the Months of March through July

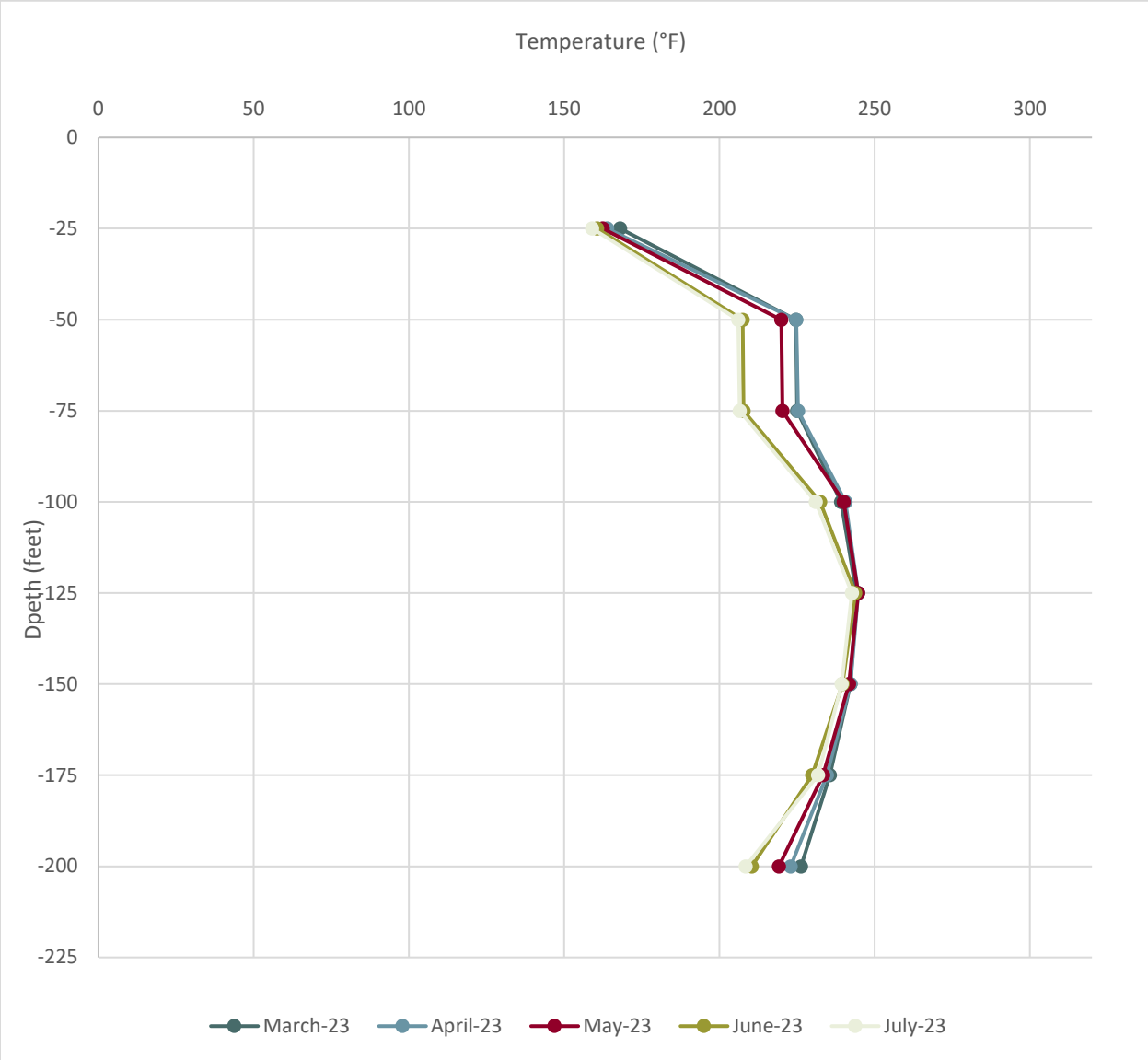


Figure 17 shows daily average temperatures in Temperature Probe 8 (TP-8) during the months of March through July. Based on the data, temperatures have slightly increased during the last five months.

Figure 17. Average Temperatures within TP-8 During the Months of March through July

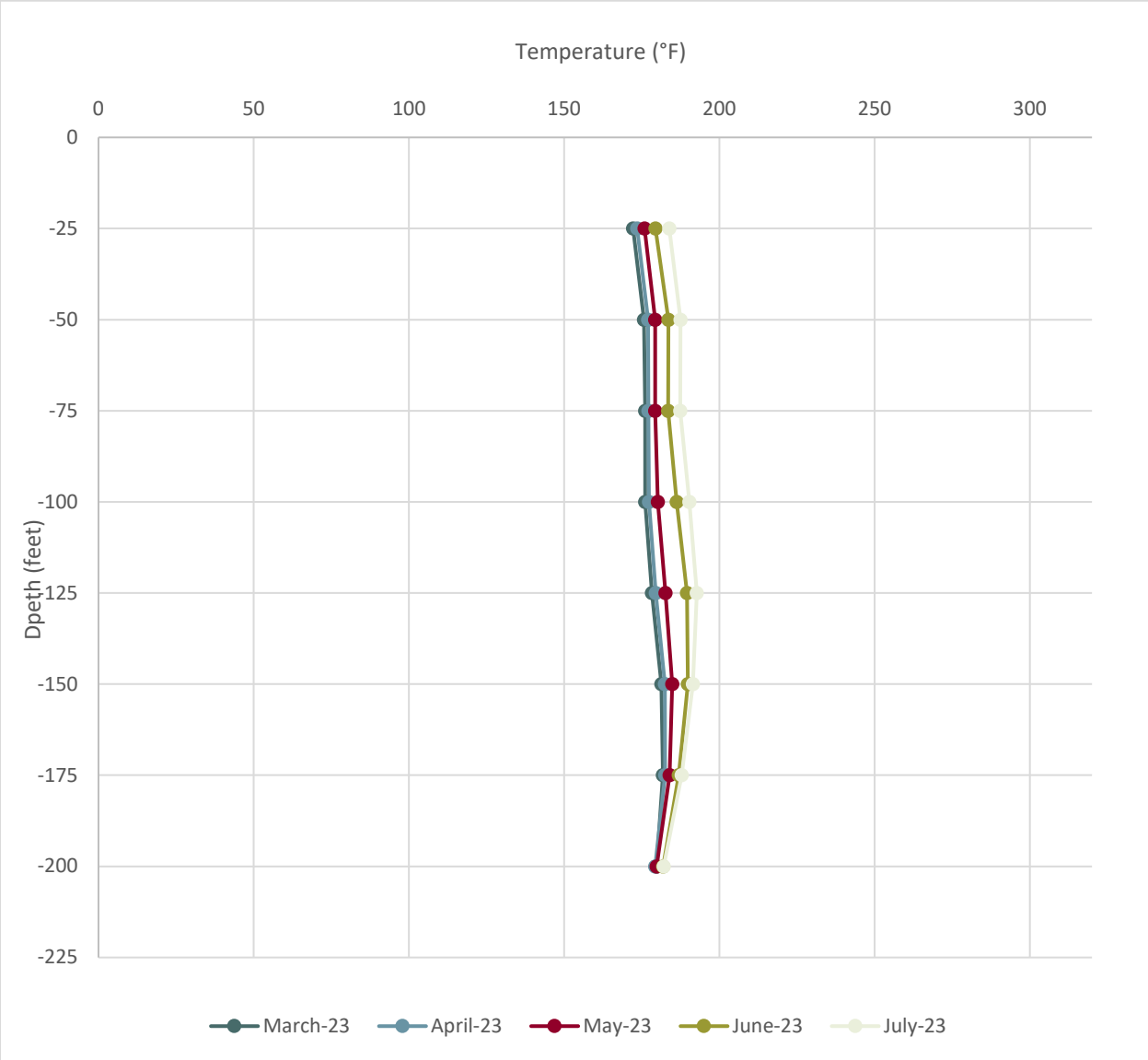
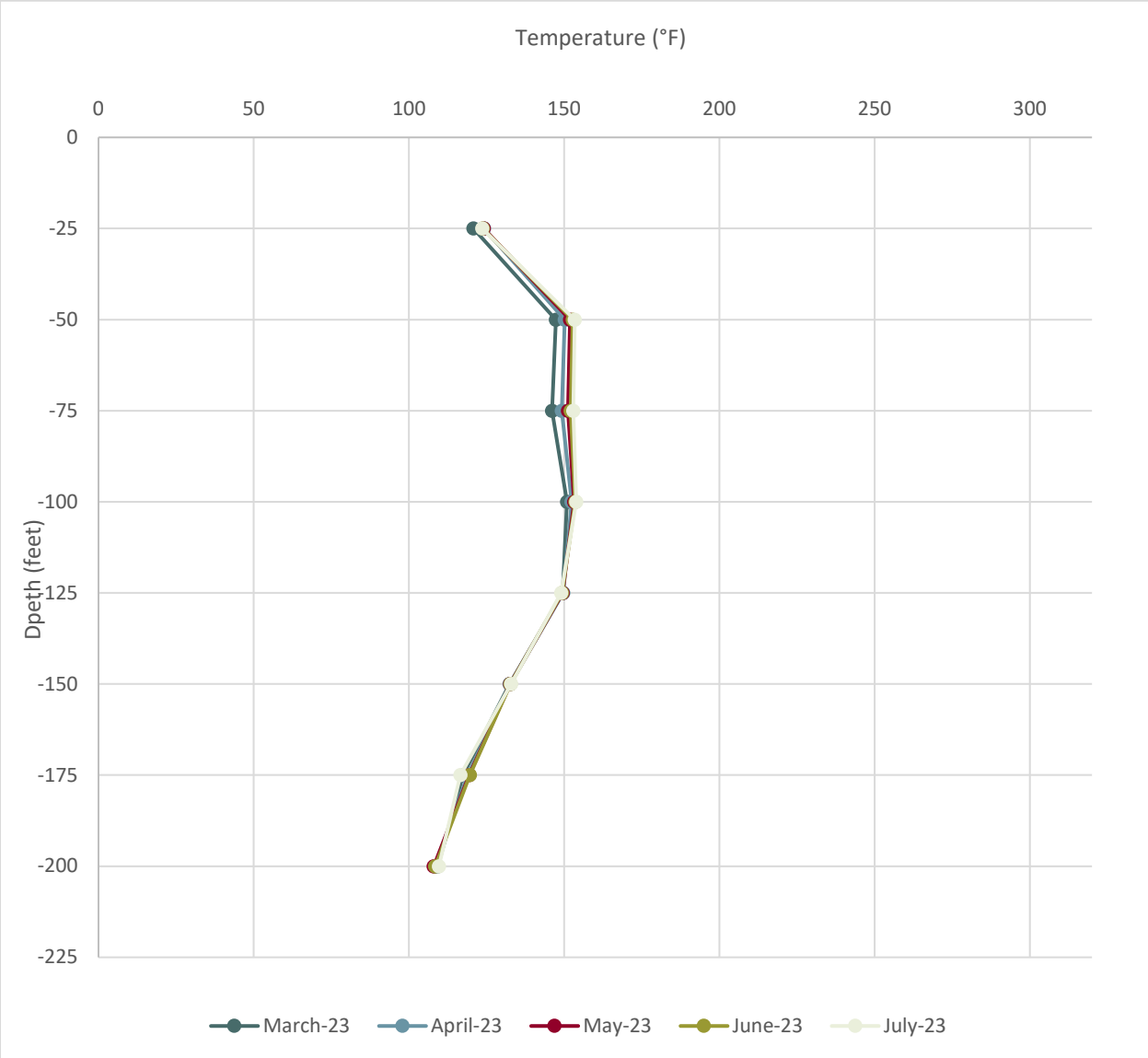


Figure 18 shows daily average temperatures in Temperature Probe 9 (TP-9) during the months of March through July. Based on the data, temperatures have been consistent during the last five months.

Figure 18. Average Temperatures within TP-9 During the Months of March through July



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

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 28 wells on July 6, 2023; July 10, 2023; July 29, 2023; and July 26, 2023. The data collected is summarized in Table 7. Cells marked with "*" represent dates when the pump was removed from the well for maintenance or had not yet been installed.

Table 7. Summary of Dual Extraction Well Pump Stroke Counter Data

Well	July 6, 2023	July 10, 2023	July 19, 2023	July 26, 2023
EW33B	8	8	12	13
EW49	692606	697752	711825	725827
EW50	1012385	1044493	1084538	1100166
EW51	10871	10871	90130	94800
EW52	118490	120705	135945	175542
EW53	2222346	2232795	2253695	2265607
EW54	401985	404030	502092	536342
EW55	181110	182560	216286	223802
EW57	425178	425180	561072	636327
EW58	1994084	1994084	1995425	2157427
EW59	2117722	2242190	2398064	2398617
EW60	320884	325147	332665	342697
EW61	238020	239883	240449	241548
EW62	149889	157038	162057	168288
EW64	132794	134177	139109	145479
EW65	3973	3973	3973	3973
EW67	558102	644366	696153	731465
EW68	2096563	2098573	2149492	2179209
EW70	0	0	13	13
EW72	26	26	27	27
EW73	10	12	13	15
EW74	14	14	16	16
EW75	9	9	9	9
EW76	8	9	10	13
EW78	126	126	1537	7569
EW88	47812	67118	131636	132069

Well	July 6, 2023	July 10, 2023	July 19, 2023	July 26, 2023
EW94	450547	451726	601604	651498
EW98	87763	130334	374723	512337

Based on this data and stroke counts taken on June 27, 2023, SCS can estimate the number of gallons of liquid pumped from each well. SCS assumed that each stroke correlates to approximately 0.3 gallons of liquid removed from the well. This data will then be used to repair or replace pumps or replace nonfunctional stroke counters. Estimates of the quantities of liquids removed between the reading dates are shown in Table 8.

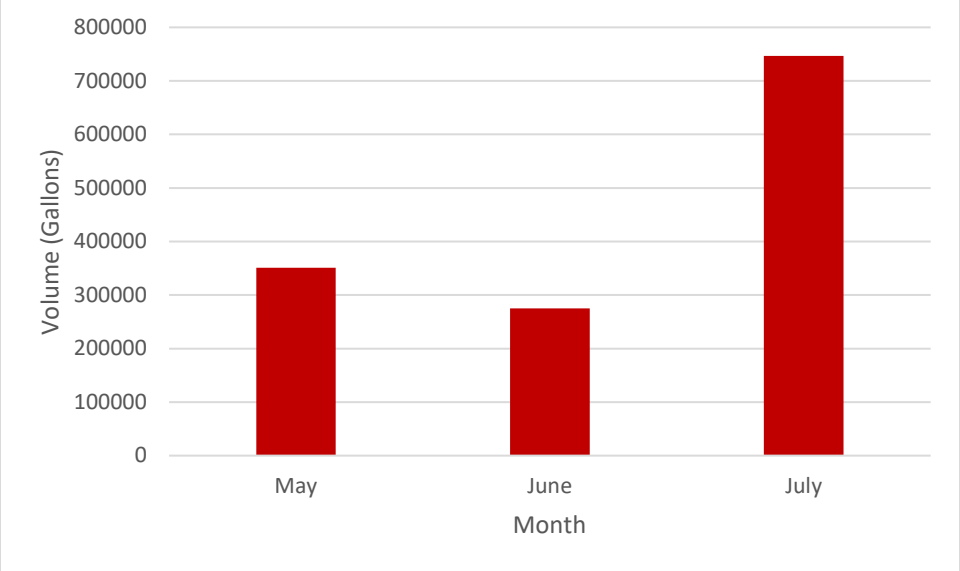
Table 8. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) June 27, 2023 to July 6, 2023	Liquids Removed (gal) July 6, 2023 to July 10, 2023	Liquids Removed (gal) July 10, 2023 to July 19, 2023	Liquids Removed (gal) July 19, 2023 to July 26, 2023
EW33B	2.4	0	1.2	1
EW49	2532.9	1543.8	4221.9	4200.6
EW50	1.5	9632.4	12013.5	4688.4
EW51	0	0	23777.7	1401
EW52	6084.9	664.5	4572	11879.1
EW53	461.7	3134.7	6270	3573.6
EW54	13157.1	613.5	29418.6	10275
EW55	0	435	10117.8	2254.8
EW57	1	1	40767.6	22576.5
EW58	0	0	402.3	48600.6
EW59	5	37340.4	46762.2	165.9
EW60	2495.7	1278.9	2255.4	3009.6
EW61	208.5	558.9	169.8	329.7
EW62	0	2144.7	1505.7	1869.3
EW64	0	414.9	1479.6	1911
EW65	0	0	0	0
EW67	617.4	25879.2	15536.1	10593.6
EW68	4076.4	603	15275.7	8915.1
EW70	0	0	3.9	0
EW72	7.8	0	1	0
EW73	3	1	1	1
EW74	4.2	0	1	0
EW75	2.7	0	0	0
EW76	2.4	1	1	1
EW78	37.8	0	423.3	1809.6

Well	Liquids Removed (gal) June 27, 2023 to July 6, 2023	Liquids Removed (gal) July 6, 2023 to July 10, 2023	Liquids Removed (gal) July 10, 2023 to July 19, 2023	Liquids Removed (gal) July 19, 2023 to July 26, 2023
EW88	14343.6	5791.8	19355.4	129.9
EW94	26181.9	353.7	44963.4	14968.2
EW98	26328.9	12771.3	73316.7	41284.2

SCS estimates that approximately 746,000 gallons of liquids were removed from the landfill gas collection and control system during the month of July. This is an increase of approximately 471,000 gallons when compared to the previous month and is also the largest amount of liquid removed since the implementation of the current dewatering plan. SCS-FS continues to implement an aggressive maintenance schedule for landfill gas liquids removal pumps. EW-98 removed the largest amount of liquids at 153,000 gallons for July. EW-94 and EW-59 together removed 170,000 gallons. The change in landfill gas liquids removal over the last three months is depicted in Figure 19.

Figure 19. 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 the month of July 2023, pump maintenance occurred on July 6, 2023; July 12, 2023; July 18, 2023; July 19, 2023; and July 25, 2023. Additionally, minor pump modifications and repairs were made throughout the month to extend pump runtimes before failure.

Pumps that were determined to be inoperative were removed from their respective extraction wells and replaced with a clean, functioning pump. In July, EW-50, EW-51, EW-53, EW-57, EW-58, EW-61, EW-67, EW-94 and EW-98 had their pumps removed and replaced. The pump tri-tubing for EW-67

and EW-51 was found to be compromised and was repaired while those pumps were being maintained. The check valve for EW-51 was also replaced during July.

Four pumps were installed during the month of July. These installs occurred at EW-76, EW-78, EW-88 and EW-95. All four installs were PumpOne pneumatic pumps or equivalent, internal float-style pneumatic pumps. These new pump's performance and liquid removal will be tracked accordingly going forward.

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

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

4.2 SAMPLING AND ANALYSIS PLAN

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

4.2.1 Sample Collection

On July 19, 2023, SCS collected leachate samples from five Dual Phase LFG-EWs (EW-50, EW-57, EW-78, EW-94, and EW-98). 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-51 – EW-55, EW-59 – EW-68, EW-70 – EW-76, EW-88, and EW-95.
- No pump was installed in well EW-36A, EW-56, EW-69, EW-77, EW-79 – EW-87, EW-89 – EW-93, EW-96, EW-97, EW-99, and EW-100.
- Liquids were too hot to sample safely in well EW-58.

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.

No method blank detects were identified for the July 2023 monitoring event. Acetone was detected at a concentration of 7.27 micrograms per liter for the July 2023 monitoring event. The laboratory analysis report for the July 2023 monitoring event trip blank is included in Appendix F. The July 2023 monitoring event laboratory QA/QC reports, including the method blank results, are included in the COAs in Appendix F.

4.2.3 Data Validation

To identify analytical data that may not represent valid results, data from the monitoring events were validated by the Laboratory and SCS in accordance with United States Environmental Protection Agency (EPA) guidance[4]. Data flagged with a "J" qualifier indicates the quantitation of the parameter is less than the laboratory's limit of quantitation but greater than the laboratory's limit of detection (LOD); thus, the concentration is considered estimated. Samples with parameter detections less than five times that of the trip blank, field blank, and/or method blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Samples with common laboratory contaminant 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 July 2023 monitoring event as no constituents were detected in the July 2023 method blanks and acetone was detected in the well samples at concentrations greater than 10 times the concentration detected in the trip blank. The constituent detection flagged with a "J" qualifier is shown on **Table 9**.

4.2.4 Laboratory Analytical Results

Chemical characteristics of leachate samples collected from extraction wells EW-50, EW-57, EW-78, EW-94, and EW-98 are summarized in **Table 9**. The associated COA is included in **Appendix F**. Parameter results from July 2023 and previous monitoring events (November 2022 – June 2023) are presented on a table in **Appendix F**.

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-57	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	July 2023 Concentration						
Ammonia as N (mg/L)	---	---	**1180**	---	---	73.1	100
	1570	**2260**	---	**2350**	**310**	146	200
Biological Oxygen Demand (mg/L)	**6820**	**32900**	**330**	**31800**	**937**	0.2	2

[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.

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-57	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	July 2023 Concentration						
Chemical Oxygen Demand (mg/L)	---	---	---	---	**2180**	500	500
	6480	---	**2460**	---	---	1000	1000
	---	---	---	**41000**	---	5000	5000
	---	**50100**	---	---	---	10000	10000
Nitrate as N (mg/L)	---	---	**0.355**	---	---	0.15	0.35
	---	---	---	---	ND	0.55	0.75
	ND	---	---	---	---	1	3
	---	ND	---	ND	---	1.5	5.5
Nitrite as N (mg/L)	---	---	ND	---	ND	0.05	0.25
	ND	---	---	---	---	0.5	2.5
	---	**1.2 J**	---	ND	---	1	5
Total Kjeldahl Nitrogen (mg/L)	**1670**	**2960**	**1670**	**2720**	**285**	40	100
Total Recoverable Phenolics (mg/L)	---	---	**0.7**	---	---	0.15	0.25
	---	---	---	---	**2.92**	0.3	0.5
	11.6	**47.9**	---	**37.3**	---	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)							
Anthracene	---	---	---	---	ND	46.7	93.5
	ND	---	---	---	---	100	200
	---	---	ND	---	---	250	500
	---	ND	---	ND	---	1000	2000
TOTAL METALS (mg/L)							
Arsenic	**0.24**	**0.23**	---	**0.19**	**0.06**	0.0005	0.001
	---	---	**0.7**	---	---	0.0025	0.005
Barium	---	---	---	---	**0.217**	0.001	0.005
	0.558	---	---	---	---	0.002	0.01
	---	**0.542**	**2.28**	**1.02**	---	0.005	0.025
Cadmium	**0.000186 J**	**0.000219 J**	**0.000156 J**	ND	ND	0.0001	0.001
Chromium	**0.231**	**0.308**	**0.535**	**0.215**	**0.0265**	0.0004	0.001
Copper	**0.00811**	**0.00124**	**0.00163**	ND	**0.0027**	0.0003	0.001
Lead	**0.0092**	**0.0014**	**0.019**	ND	**0.0017**	0.001	0.001
Mercury	ND	**0.000306**	---	---	ND	0.0002	0.0002
	---	---	**0.0107**	ND	---	0.001	0.001
Nickel	**0.1576**	**0.09872**	**0.08332**	**0.03074**	**0.01403**	0.001	0.001
Selenium	**0.00116**	**0.00101**	**0.00331**	**0.00251**	ND	0.00085	0.001
Silver	ND	ND	ND	ND	ND	0.00006	0.001

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-57	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	July 2023 Concentration						
TOTAL METAL (mg/L)							
Zinc	**0.0714**	**0.0488**	---	**0.354**	**0.0782**	0.0025	0.005
	---	---	**2.03**	---	---	0.0125	0.025
VOLATILE FATTY ACIDS mg/L							
Acetic Acid	---	---	---	---	ND	150	200
	ND	---	ND	---	---	370	500
	---	**6100**	---	**750**	---	750	1000
Butyric Acid	---	---	---	---	ND	130	200
	ND	---	ND	---	---	330	500
	---	**2800**	---	**650**	---	650	1000
Propionic Acid	---	---	---	---	ND	140	200
	ND	---	ND	---	---	340	500
	---	**3100**	---	**680**	---	680	1000
VOLATILE ORGANIC COMPOUNDS (ug/L)							
2-Butanone (MEK)	**5860**	---	ND	---	---	60	200
	---	---	---	---	**13500**	750	2500
	---	**38400**	---	**31600**	---	3000	10000
Acetone	---	---	**1180**	---	---	140	200
	9780	---	---	---	---	700	1000
	---	---	---	---	**11600**	1750	2500
	---	**77200**	---	**69700**	---	7000	10000
Benzene	**824**	---	**80.8**	---	---	8	20
	---	**4050**	---	**1420**	---	20	50
	---	---	---	---	**11800**	100	250
Ethylbenzene	---	---	---	---	**666**	4	10
	128	---	**82**	---	---	8	20
	---	**224**	---	**87.5**	---	20	50
Tetrahydrofuran	---	---	---	---	**2960**	100	100
	411	---	**616**	---	---	200	200
	---	**8380**	---	**5310**	---	500	500
Toluene	---	---	---	---	**965**	5	10
	248	---	**107**	---	---	10	20
	---	**218**	---	**118**	---	25	50

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-57	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	July 2023 Concentration						
VOLATILE ORGANIC COMPOUND (ug/L)							
Xylenes, Total	---	---	---	---	**1130**	10	30
	257	---	**74.4**	---	---	20	60
	---	**230**	---	**174**	---	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 July 12, 2023, the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 2 in Appendix E.

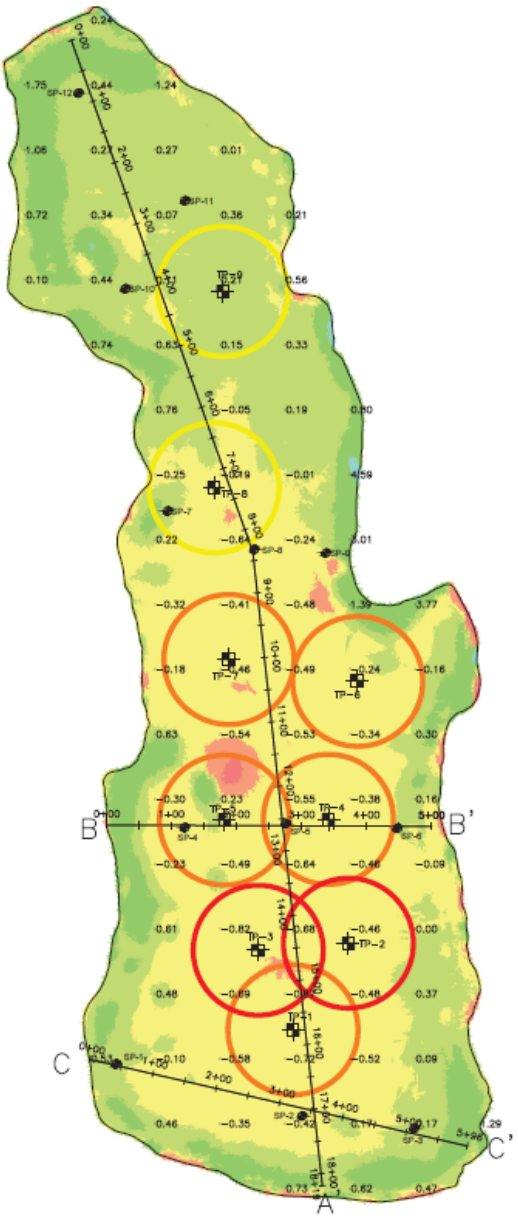
The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on June 9, 2023. A drawing depicting the June 9, 2023 topography is included as Sheet 1 in Appendix E.

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 7,350 cubic yards. During that same time period, approximately 10,800 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 increase of approximately 3,400 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 20. 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 20. 1-Month Elevation Change Color Map



The locations of in-waste temperature monitoring probes are also shown on Figure 20 and Figure 21. The circles around the probes indicate how high the average temperatures measured by the probe are. The circles shown are offset from the probes for clarity only and do not necessarily indicate temperature away from the probe. Probes with a yellow circle around them, typically measure an average temperature across the full depth of the probe of less than 200 degrees Fahrenheit. Probes

with a orange circle around them, typically measure an average temperature across the full depth of the probe greater than 200 degrees Fahrenheit and less than 250 degrees Fahrenheit. Probes with a red circle around them, typically measure an average temperature across the full depth of the probe greater than 250 degrees Fahrenheit and less than 300 degrees Fahrenheit.

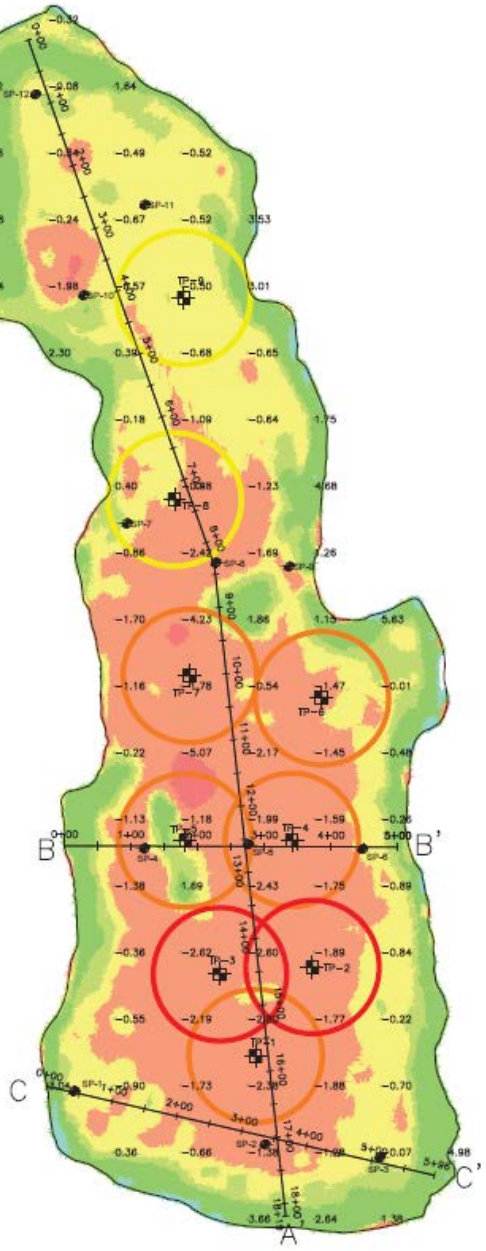
The largest settlement occurred primarily in the middle-southern end of the landfill where the waste settled by approximately 1 foot or more in some areas. Settlement in the southern end of the landfill appears to have slightly decreased relative to last month. The southern end of the landfill is the 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 offset by soil placement associated with construction activities. These changes in elevation are more representative of typical settlement at municipal landfills. The perimeter of the landfill exhibited an increase in elevation, likely due to soil placement associated with construction of the Sidewall Odor Mitigation System. Some soil stockpile locations associated with the Sidewall Odor Mitigation System showed large elevation changes due to material removal from the stockpiles.

SCS calculated the waste footprint for purposes of analysis to be 752,610 square feet. Based on that area and the net volume change, the average elevation increase was approximately 0.26 feet.

SCS also compared the topographic data collected in July to the topographic data collected on April 11, 2023. Based on a comparison of the topographic data collected on those two dates, settlement occurred that reduced the volume of waste in the landfill by approximately 28,300 cubic yards. During that same time period approximately 14,250 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 14,050 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 21. Areas in red indicate where elevations decreased and areas in green indicate areas where elevations have increased. Darker colors indicate greater changes in elevation. This drawing is also included as Sheet 4 in Appendix E.

Figure 21. 3-Month Elevation Change Color Map



The largest settlement occurred primarily in the southern end of the landfill where the waste settled by approximately 2 feet or more in some areas. The southern end of the landfill is the location of the gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions. Settlement in the northern portion of the landfill was generally less substantial or was offset by soil placement associated with construction activities. Changes in elevation in these areas are more representative of typical settlement at municipal landfills. The eastern side of the landfill exhibited an increase in elevation, likely due to

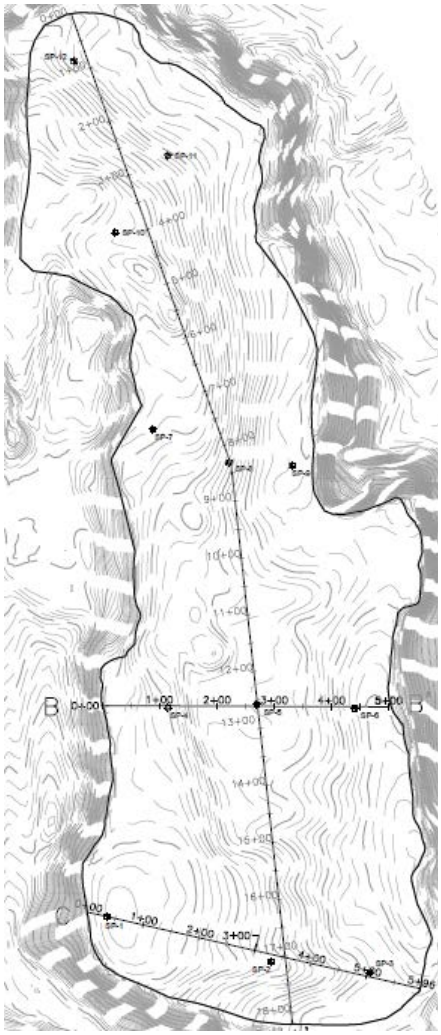
sediment deposition during storm events and waste relocation associated with construction of the Sidewall Odor Mitigation System. Increases in elevation along the western edge of the landfill are most likely due to installation of the Sidewall Odor Mitigation System. There were some large variations in elevation associated with soil stockpiling operations.

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

5.2.2 Settlement Plate Surveys

On November 7, 2022 SCS field services installed 12 settlement plates on the Solid Waste Permit No. 588 landfill. The construction and installation of the settlement plates generally conforms to the design outline in the Settlement Monitoring and Management Plan. The tops of the PVC pipes were spray painted orange to improve visibility. The settlement plate locations are depicted in Figure 22 and on Sheet 1 in Appendix E.

Figure 22. Settlement Plate Locations



The locations of the settlement plates were surveyed by the City's surveyor on November 14, 2022. The settlement plates were surveyed again on December 13, 2022; January 3, 2023; February 6, 2023; March 8, 2023; April 3, 2023; May 11, 2023; June 5, 2023; and July 10, 2023. The surveyed coordinates[5] and elevation changes of the settlement plates are shown in Table 10.

Table 10. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation on July 10, 2023	Elevation Change Since June 5, 2023	Strain[6] Since June 5, 2023	Elevation Change Since Installation	Strain Since Installation
SP-1	3,397,886.6	10,412,078.7	1,831.8	-0.4	-0.6%	-2.6	-4.0%
SP-2	3,397,808.2	10,412,365.5	1,805.3	-0.7	-0.4%	-5.3	-3.2%
SP-3	3,397,787.5	10,412,538.0	1,782.8	-0.4	-0.5%	-0.9	-1.3%
SP-4[7]	3,398,250.2	10,412,188.6	1,811.2	-0.8	-0.5%	-6.3	-4.0%
SP-5	3,398,255.9	10,412,338.8	1,796.4	-0.7	-0.3%	-4.4	-1.7%
SP-6	3,398,249.3	10,412,510.5	1,776.3	-0.2	-0.2%	-1.4	-1.0%
SP-7[8]	3,398,735.9	10,412,157.3	1,827.0	-0.3	-0.3%	-1.7	-1.5%
SP-8	3,398,678.9	10,412,290.8	1,804.0	-0.5	-0.2%	-3.4	-1.4%
SP-9	3,398,673.7	10,412,400.9	1,783.8	-0.5	-0.5%	-2.1	-2.1%
SP-10	3,399,080.6	10,412,092.2	1,839.0	-0.2	-0.1%	-1.2	-0.5%
SP-11	3,399,216.4	10,412,183.7	1,815.8	0.0	0.0%	-0.5	-0.2%
SP-12	3,399,382.0	10,412,019.5	1,810.3	0.0	0.0%	-0.4	-0.3%

Settlement Plates 1, 2, 3, 4, and 9 demonstrated larger settlements than at other locations. SCS believes that Settlement Plate 4 was disturbed by grading work on an adjacent roadway. With the exception of SP-9, the other settlement plates (1, 2, and 3) are located in the southern end of the landfill. This area is where waste was most recently placed and is expected to show the most rapid settlement. This area is also the location of the gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions.

The change in elevation at Settlement Plates 10, 11, and 12 continues to be lower and more representative of typical settlement at municipal landfills. The change in elevation at Settlement Plates 5, 6, 8 falls somewhere in between these two categories. Field observations indicate that Settlement Plate 7 may also have been damaged during construction operations.

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

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

6.0 INTERMEDIATE COVER AND EVOH COVER SYSTEM

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

6.1 INTERMEDIATE COVER INSTALLATION

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

6.2 EVOH COVER SYSTEM DESIGN

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

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

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

6.3 EVOH COVER SYSTEM PROCUREMENT

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

6.4 EVOH COVER SYSTEM INSTALLATION

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

7.0 STORMWATER MANAGEMENT

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

7.1 STORMWATER MANAGEMENT PLAN DEVELOPMENT

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

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

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

7.2 STORMWATER MANAGEMENT BASIN DESIGN AND CONSTRUCTION

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

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

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

7.3 STORMWATER MANAGEMENT PLAN IMPLEMENTATION

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

7.4 LONG-TERM STORMWATER CONTROL AND REMOVAL

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

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

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

7.5 STORMWATER MONITORING

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

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

8.0 MISCELLANEOUS

8.1 CEASE WASTE ACCEPTANCE

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

8.2 LONG-TERM PLAN

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

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

8.3 MONTHLY COMPLIANCE REPORTS

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

8.4 COMMUNITY OUTREACH PROGRAM

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

- **July – ongoing basis:** Seven posts on the BristolVALandfill.org site and the existing City of Bristol Landfill Notifications and Information page covering several important updates including:
  - Progress updates related to remediation efforts at the quarry landfill
  - Shared news articles related to third Open House hosted by the city with Craig Benson, PHD, PE, DGE, BCEE, NAE, Bob Gardner, PE, BCEE, and Deb Gray from Stantec attending as subject matter experts
  - Provided links to news articles chronicling construction updates and information on legal updates about the quarry landfill.
- **Hosted third Open House at Bristol, VA Council Chambers on July 12th. City staff, several councilmembers, and three subject matter experts directly involved in remediation efforts at the quarry landfill attended to provide progress updates and answer questions. Roughly a dozen members of the public attended.**
- **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 subsequent Open Houses 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, July 7th
    - Friday, July 14th
    - Friday, July 21st

Appendix A

Surface Emissions Monitoring Summary Letters

July 12, 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 – July 7, 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 July 7, 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	169
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	69
Number of Exceedances	3
Number of Serpentine Exceedances	1
Number of Pipe Penetration Exceedances	2

Remonitoring of Ongoing Exceedances

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

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

An alternate remedy request was submitted to VDEQ on 7/11/23 outlining proposed corrective actions at EW-38 and EW-66 which are both subject to the requirements of 40 CFR 63.1960(c)(4)(v). The Facility intends to install and/or repair well bore skirts at these two locations. Furthermore, installation of well bore skirts have successfully resulted in compliant readings at the pipe penetrations of EW-89 and EW-100 as noted in the 7/11/23 alternate remedy notification.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	7/7/23 Event	7/7/23 Event Result	Comments
EW-89	4/27/23	N/A	Passed	Exceedance Resolved
EW-100	4/27/23	N/A	Passed	Exceedance Resolved
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-86	6/6/23	30-Day Retest	Passed	Exceedance Resolved
EW-95	6/13/23	N/A	Passed	Requires 30-Day Retest
EW-99	6/13/23	N/A	Passed	Requires 30-Day Retest
EW-52	6/29/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-98	6/29/23	10-Day Retest	Passed	Requires 30-Day Retest

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

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 7, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	2.0 PPM	OK			Start Serpentine Route
2	0.8 PPM	OK			
3	0.8 PPM	OK			
4	0.9 PPM	OK			
5	1.3 PPM	OK			
6	2.3 PPM	OK			
7	2.7 PPM	OK			
8	3.1 PPM	OK			
9	3.0 PPM	OK			
10	1.9 PPM	OK			
11	5.4 PPM	OK			
12	2.4 PPM	OK			
13	2.4 PPM	OK			
14	21.6 PPM	OK			
15	9.6 PPM	OK			
16	3.9 PPM	OK			
17	3.6 PPM	OK			
18	119.0 PPM	OK			
19	8.1 PPM	OK			
20	6.1 PPM	OK			
21	4.5 PPM	OK			
22	5.9 PPM	OK			
23	3.0 PPM	OK			
24	11.7 PPM	OK			
25	115.0 PPM	OK			
26	3.2 PPM	OK			
27	9.1 PPM	OK			
28	34.0 PPM	OK			
29	8.9 PPM	OK			
30	15.7 PPM	OK			
31	11.2 PPM	OK			
32	13.4 PPM	OK			
33	15.2 PPM	OK			
34	18.4 PPM	OK			
35	28.7 PPM	OK			
36	54.8 PPM	OK			
37	36.3 PPM	OK			
38	6.7 PPM	OK			
39	9.6 PPM	OK			
40	5.6 PPM	OK			
41	11.6 PPM	OK			
42	5.4 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 7, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	1.7 PPM	OK			
44	1.1 PPM	OK			
45	23.9 PPM	OK			
46	11.5 PPM	OK			
47	2.9 PPM	OK			
48	1.5 PPM	OK			
49	1.5 PPM	OK			
50	0.7 PPM	OK			
51	0.9 PPM	OK			
52	1.2 PPM	OK			
53	1.1 PPM	OK			
54	1.1 PPM	OK			
55	1.8 PPM	OK			
56	2.5 PPM	OK			
57	1.6 PPM	OK			
58	0.6 PPM	OK			
59	0.7 PPM	OK			
60	1.0 PPM	OK			
61	2.6 PPM	OK			
62	6.5 PPM	OK			
63	12.6 PPM	OK			
64	15.4 PPM	OK			
65	70.5 PPM	OK			
66	7.5 PPM	OK			
67	5.8 PPM	OK			
68	198.0 PPM	OK			
69	52.1 PPM	OK			
70	19.8 PPM	OK			
71	35.4 PPM	OK			
72	28.4 PPM	OK			
73	3.7 PPM	OK			
74	928.0 PPM	HIGH_ALRM	36.59833	-82.14717	
75	216.0 PPM	OK			
76	85.6 PPM	OK			
77	393.0 PPM	OK			
78	7.9 PPM	OK			
79	33.9 PPM	OK			
80	131.0 PPM	OK			
81	13.5 PPM	OK			
82	5.2 PPM	OK			
83	4.2 PPM	OK			
84	337.0 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 7, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	4.0 PPM	OK			
86	3.8 PPM	OK			
87	9.1 PPM	OK			
88	125.0 PPM	OK			
89	8.2 PPM	OK			
90	6.9 PPM	OK			
91	2.0 PPM	OK			
92	41.3 PPM	OK			
93	11.8 PPM	OK			
94	310.0 PPM	OK			
95	54.1 PPM	OK			
96	299.0 PPM	OK			
97	157.0 PPM	OK			
98	2.6 PPM	OK			
99	16.4 PPM	OK			
100	24.5 PPM	OK			End Serpentine Route
101	160.0 PPM	OK			EW-35
102	312.0 PPM	OK			EW-52
103	0.7 PPM	OK			TP-4
104	87.1 PPM	OK			EW-60
105	339.0 PPM	OK			EW-48
106	165.0 PPM	OK			TP-6
107	0.1 PPM	OK			EW-61
108	119.0 PPM	OK			EW-34
109	50.3 PPM	OK			EW-50
110	451.0 PPM	OK			EW-67
111	103.0 PPM	OK			EW-47
112	145.0 PPM	OK			EW-54
113	480.0 PPM	OK			EW-55
114	186.0 PPM	OK			TP-2
115	1446.0 PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	151.0 PPM	OK			EW-58
117	107.0 PPM	OK			EW-57
118	98.5 PPM	OK			TP-1
119	132.0 PPM	OK			EW-59
120	475.0 PPM	OK			EW-56
121	242.0 PPM	OK			EW-41
122	364.0 PPM	OK			EW-53
123	148.0 PPM	OK			EW-40
124	40.5 PPM	OK			TP-3
125	133.0 PPM	OK			EW-51

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 7, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	2.3 PPM	OK			EW-39
127	2.4 PPM	OK			TP-5
128	53.7 PPM	OK			EW-68
129	887.0 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	172.0 PPM	OK			TP-7
131	0.9 PPM	OK			EW-49
132	12.7 PPM	OK			EW-31R
133	7.6 PPM	OK			EW-65
134	20.8 PPM	OK			EW-37
135	0.9 PPM	OK			TP-8
136	3.3 PPM	OK			EW-64
137	0.1 PPM	OK			EW-30R
138	0.2 PPM	OK			EW-63
139	0.0 PPM	OK			EW-42
140	33.2 PPM	OK			TP-9
141	0.2 PPM	OK			EW-33R
142	0.1 PPM	OK			EW-62
143	0.0 PPM	OK			EW-29R
144	0.0 PPM	OK			EW-74
145	2.8 PPM	OK			EW-32R
146	0.0 PPM	OK			EW-69
147	0.1 PPM	OK			EW-71
148	0.2 PPM	OK			EW-72
149	0.3 PPM	OK			EW-70
150	0.0 PPM	OK			EW-73
151	226.0 PPM	OK			EW-76
152	1.5 PPM	OK			EW-78
153	16.0 PPM	OK			EW-82
154	1.0 PPM	OK			EW-85
155	93.5 PPM	OK			EW-88
156	8.1 PPM	OK			EW-89
157	29.2 PPM	OK			EW-93
158	17.0 PPM	OK			EW-94
159	447.0 PPM	OK			EW-98
160	75.9 PPM	OK			EW-100
161	366.0 PPM	OK			EW-99
162	48.8 PPM	OK			EW-95
163	3.0 PPM	OK			EW-90
164	180.0 PPM	OK			EW-86
165	1.6 PPM	OK			EW-84
166	0.3 PPM	OK			EW-80
167	0.2 PPM	OK			EW-79

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 7, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
168	0.1 PPM	OK			EW-33B
169	0.4 PPM	OK			EW-75

Number of locations sampled:	169
Number of exceedance locations:	3

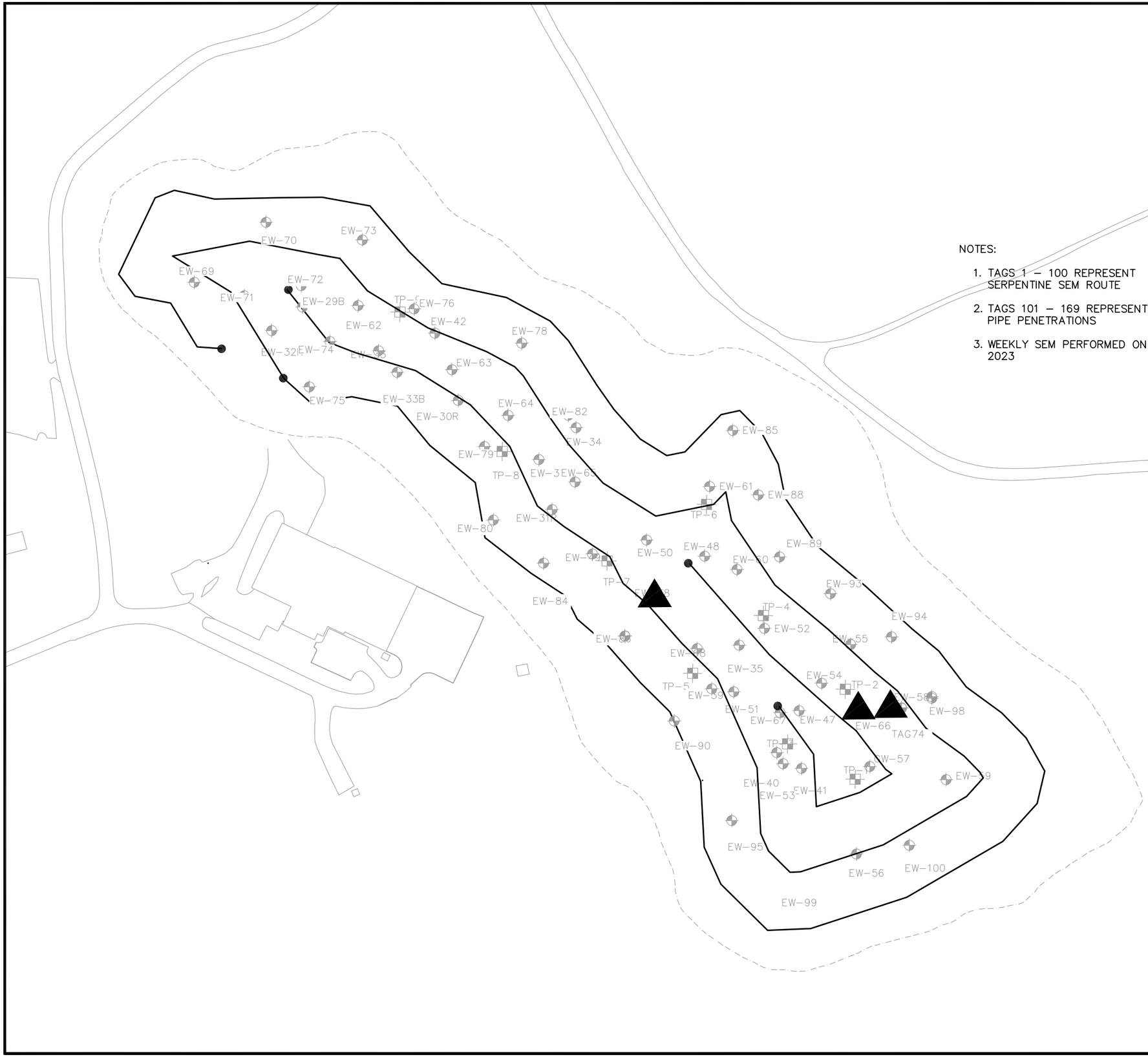
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 169 represent SEM at Pipe Penetrations
Weather Conditions: Overcast, 75°F Wind: 2.5 W

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

7/7/2023	8:01	ZERO	0.0 PPM
7/7/2023	8:08	SPAN	501.0 PPM

Background Reading:

7/7/2023	8:10	Upwind	2.2 PPM
7/7/2023	8:22	Downwind	1.5 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 169 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JULY 7, 2023

1

NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

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

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

PROJ. NO.	DWN. BY:	CHK. BY:	QA/QC BY:
02218208.04	LSN	DBK	
DSN. BY:	LSN		APP. BY:

FILE: 02218208.04
DATE: 7/12/23
SCALE: AS SHOWN
DRAWING NO.

July 19, 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 – July 12, 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 July 12, 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	169
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	69
Number of Exceedances	5
Number of Serpentine Exceedances	1
Number of Pipe Penetration Exceedances	4

Remonitoring of Ongoing Exceedances

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

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

An alternate remedy request was submitted to VDEQ on 7/11/23 outlining proposed corrective actions at EW-38 and EW-66 which are both subject to the requirements of 40 CFR 63.1960(c)(4)(v). The Facility intends to install and/or repair well bore skirts at these two locations. In addition, following the monitoring on 7/12/23, the Facility placed additional soil at Tag #74. Follow-up monitoring indicated methane concentrations below 500 ppm. Additional remonitoring serving as the second 10-day retest and the 30-day retest to confirm the exceedance is corrected will be performed in subsequent weekly monitoring events.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	7/12/23 Event	7/12/23 Event Result	Comments
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-95	6/13/23	30-Day Retest	Passed	Exceedance Resolved
EW-99	6/13/23	30-Day Retest	Passed	Exceedance Resolved
EW-52	6/29/23	N/A	Passed	Requires 30-Day Retest
EW-98	6/29/23	N/A	Passed	Requires 30-Day Retest
Tag 74	7/7/23	10-Day Retest	Failed	Requires 2nd 10-Day Retest

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

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 12, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	1.9 PPM	OK			Start Serpentine Route
2	5.3 PPM	OK			
3	1.4 PPM	OK			
4	1.4 PPM	OK			
5	1.4 PPM	OK			
6	1.3 PPM	OK			
7	1.3 PPM	OK			
8	1.5 PPM	OK			
9	6.3 PPM	OK			
10	2.0 PPM	OK			
11	3.2 PPM	OK			
12	5.6 PPM	OK			
13	3.4 PPM	OK			
14	7.2 PPM	OK			
15	35.4 PPM	OK			
16	14.6 PPM	OK			
17	6.8 PPM	OK			
18	9.5 PPM	OK			
19	3.5 PPM	OK			
20	14.1 PPM	OK			
21	11.0 PPM	OK			
22	17.3 PPM	OK			
23	15.4 PPM	OK			
24	2.1 PPM	OK			
25	6.4 PPM	OK			
26	104.0 PPM	OK			
27	12.4 PPM	OK			
28	34.2 PPM	OK			
29	41.8 PPM	OK			
30	70.2 PPM	OK			
31	138.0 PPM	OK			
32	3.5 PPM	OK			
33	17.6 PPM	OK			
34	4.6 PPM	OK			
35	4.5 PPM	OK			
36	7.1 PPM	OK			
37	13.4 PPM	OK			
38	21.8 PPM	OK			
39	8.3 PPM	OK			
40	14.5 PPM	OK			
41	5.7 PPM	OK			
42	2.4 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 12, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	2.8 PPM	OK			
44	3.5 PPM	OK			
45	2.8 PPM	OK			
46	3.6 PPM	OK			
47	4.9 PPM	OK			
48	0.8 PPM	OK			
49	2.4 PPM	OK			
50	1.1 PPM	OK			
51	0.5 PPM	OK			
52	0.6 PPM	OK			
53	0.6 PPM	OK			
54	0.6 PPM	OK			
55	0.6 PPM	OK			
56	0.6 PPM	OK			
57	0.6 PPM	OK			
58	0.6 PPM	OK			
59	0.6 PPM	OK			
60	0.8 PPM	OK			
61	5.1 PPM	OK			
62	1.2 PPM	OK			
63	2.6 PPM	OK			
64	32.3 PPM	OK			
65	16.1 PPM	OK			
66	4.8 PPM	OK			
67	12.8 PPM	OK			
68	40.9 PPM	OK			
69	9.4 PPM	OK			
70	1.0 PPM	OK			
71	99.8 PPM	OK			
72	52.9 PPM	OK			
73	10.7 PPM	OK			
74	598.0 PPM	HIGH_ALRM	36.59833	-82.14717	
75	3.4 PPM	OK			
76	51.1 PPM	OK			
77	0.2 PPM	OK			
78	7.1 PPM	OK			
79	2.4 PPM	OK			
80	6.0 PPM	OK			
81	76.9 PPM	OK			
82	109.0 PPM	OK			
83	4.3 PPM	OK			
84	0.8 PPM	OK			

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 12, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	3.8 PPM	OK			
86	5.5 PPM	OK			
87	1.0 PPM	OK			
88	0.7 PPM	OK			
89	0.5 PPM	OK			
90	1.6 PPM	OK			
91	11.4 PPM	OK			
92	10.7 PPM	OK			
93	268.0 PPM	OK			
94	31.0 PPM	OK			
95	7.9 PPM	OK			
96	58.0 PPM	OK			
97	24.8 PPM	OK			
98	0.2 PPM	OK			
99	2.4 PPM	OK			
100	6.0 PPM	OK			End Serpentine Route
101	1171.0 PPM	HIGH_ALRM	36.59870	-82.14776	EW-35
102	395.0 PPM	OK			EW-52
103	14.0 PPM	OK			TP-4
104	158.0 PPM	OK			EW-60
105	87.3 PPM	OK			EW-48
106	3.6 PPM	OK			TP-6
107	2.3 PPM	OK			EW-61
108	157.0 PPM	OK			EW-34
109	28.8 PPM	OK			EW-50
110	379.0 PPM	OK			EW-67
111	198.0 PPM	OK			EW-47
112	404.0 PPM	OK			EW-54
113	1476.0 PPM	HIGH_ALRM	36.59861	-82.14750	EW-55
114	2.5 PPM	OK			TP-2
115	8268.0 PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	370.0 PPM	OK			EW-58
117	80.6 PPM	OK			EW-57
118	15.7 PPM	OK			TP-1
119	175.0 PPM	OK			EW-59
120	26.5 PPM	OK			EW-56
121	127.0 PPM	OK			EW-41
122	38.4 PPM	OK			EW-53
123	114.0 PPM	OK			EW-40
124	16.9 PPM	OK			TP-3
125	11.9 PPM	OK			EW-51

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 12, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	11.5 PPM	OK			EW-39
127	310.0 PPM	OK			TP-5
128	6.5 PPM	OK			EW-68
129	749.0 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	194.0 PPM	OK			TP-7
131	2.6 PPM	OK			EW-49
132	6.8 PPM	OK			EW-31R
133	26.8 PPM	OK			EW-65
134	30.3 PPM	OK			EW-37
135	0.4 PPM	OK			TP-8
136	0.0 PPM	OK			EW-64
137	0.0 PPM	OK			EW-30R
138	0.4 PPM	OK			EW-63
139	3.9 PPM	OK			EW-42
140	0.3 PPM	OK			TP-9
141	0.1 PPM	OK			EW-33R
142	0.2 PPM	OK			EW-62
143	0.3 PPM	OK			EW-29R
144	0.3 PPM	OK			EW-74
145	0.4 PPM	OK			EW-32R
146	0.6 PPM	OK			EW-69
147	0.4 PPM	OK			EW-71
148	0.2 PPM	OK			EW-72
149	0.2 PPM	OK			EW-70
150	0.0 PPM	OK			EW-73
151	65.5 PPM	OK			EW-76
152	-0.5 PPM	OK			EW-78
153	19.8 PPM	OK			EW-82
154	406.0 PPM	OK			EW-85
155	118.0 PPM	OK			EW-88
156	6.0 PPM	OK			EW-89
157	4.3 PPM	OK			EW-93
158	47.2 PPM	OK			EW-94
159	4.3 PPM	OK			EW-98
160	23.4 PPM	OK			EW-100
161	108.0 PPM	OK			EW-99
162	5.4 PPM	OK			EW-95
163	37.9 PPM	OK			EW-90
164	33.7 PPM	OK			EW-86
165	3.6 PPM	OK			EW-84
166	6.0 PPM	OK			EW-80
167	1.8 PPM	OK			EW-79

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 12, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
168	1.0 PPM	OK			EW-33B
169	6.5 PPM	OK			EW-75

Number of locations sampled:	169
Number of exceedance locations:	5

NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 169 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 80°F Wind: NW - 5 MPH

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

7/12/2023	10:18	ZERO	0.1 PPM
7/12/2023	10:19	SPAN	503.0 PPM

Background Reading:

7/12/2023	10:20	Upwind	2.7 PPM
7/12/2023	10:35	Downwind	3.8 PPM

NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 169 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JULY 12, 2023

1

NO.	REVISION	DATE

SHEET TITLE: **WEEKLY SEM ROUTE**

PROJECT TITLE: **SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588**

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

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

PROJ. NO. 02218208.04
DSN. BY: LSN
CHK. BY: DBK
QA/QC BY:
APP. BY:
DSN. BY: LSN

FILE: 02218208.04
DATE: 7/19/23
SCALE: AS SHOWN
DRAWING NO.

of 1

July 26, 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 – July 21, 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 July 21, 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	168
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	68
Number of Exceedances	11
Number of Serpentine Exceedances	3
Number of Pipe Penetration Exceedances	8

REMONITORING OF ONGOING EXCEEDANCES

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

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

An alternate remedy request was submitted to VDEQ on 7/11/23 outlining proposed corrective actions at EW-38 and EW-66 which are both subject to the requirements of 40 CFR 63.1960(c)(4)(v). The Facility intends to install and/or repair well bore skirts at these two locations.

An increase in exceedances recorded during this weekly event was likely attributed to a vacuum loss associated with an extreme heavy rainfall event a few days before monitoring. The influx of liquids caused temporary losses of vacuum in portions of the landfill due to infiltration in condensate sumps. Pumping efforts by the City have been underway to restore vacuum.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	7/21/23 Event	7/21/23 Event Result	Comments
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-52	6/29/23	30-Day Retest	Failed	Requires Second 10-Day Retest
EW-98	6/29/23	N/A	Passed	Requires 30-Day Retest
Tag 66	7/7/23	Second 10-Day Retest	Passed	Requires 30-Day Retest
EW-35	7/12/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-55	7/12/23	10-Day Retest	Failed	Requires 2nd 10-Day Retest

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

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 21, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	1.0 PPM	OK			Start Serpentine Route
2	0.8 PPM	OK			
3	0.7 PPM	OK			
4	0.6 PPM	OK			
5	0.6 PPM	OK			
6	0.6 PPM	OK			
7	1.0 PPM	OK			
8	1.4 PPM	OK			
9	1.0 PPM	OK			
10	40.2 PPM	OK			
11	0.7 PPM	OK			
12	1.0 PPM	OK			
13	1.9 PPM	OK			
14	4.9 PPM	OK			
15	28.1 PPM	OK			
16	2.3 PPM	OK			
17	12.2 PPM	OK			
18	41.1 PPM	OK			
19	3.6 PPM	OK			
20	3.1 PPM	OK			
21	3.4 PPM	OK			
22	11.0 PPM	OK			
23	12.9 PPM	OK			
24	12.4 PPM	OK			
25	22.6 PPM	OK			
26	22.1 PPM	OK			
27	33.1 PPM	OK			
28	30.3 PPM	OK			
29	30.8 PPM	OK			
30	138.0 PPM	OK			
31	6.4 PPM	OK			
32	7.5 PPM	OK			
33	4.5 PPM	OK			
34	6.0 PPM	OK			
35	3.6 PPM	OK			
36	3.7 PPM	OK			
37	6.5 PPM	OK			
38	5.1 PPM	OK			
39	4.0 PPM	OK			
40	2.8 PPM	OK			
41	1.2 PPM	OK			
42	0.8 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 21, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	0.9 PPM	OK			
44	0.5 PPM	OK			
45	0.5 PPM	OK			
46	1.2 PPM	OK			
47	0.5 PPM	OK			
48	0.5 PPM	OK			
49	19.1 PPM	OK			
50	0.5 PPM	OK			
51	0.9 PPM	OK			
52	3.2 PPM	OK			
53	3.3 PPM	OK			
54	3.1 PPM	OK			
55	3.0 PPM	OK			
56	24.1 PPM	OK			
57	5.5 PPM	OK			
58	115.0 PPM	OK			
59	467.0 PPM	OK			
60	121.0 PPM	OK			
61	21.9 PPM	OK			
62	9.6 PPM	OK			
63	4.2 PPM	OK			
64	237.0 PPM	OK			
65	26.7 PPM	OK			
66	73.9 PPM	OK			
67	246.0 PPM	OK			
68	23.3 PPM	OK			
69	1085.0 PPM	HIGH_ALRM	36.59824	-82.14706	
70	15.1 PPM	OK			
71	35.2 PPM	OK			
72	140.0 PPM	OK			
73	80.4 PPM	OK			
74	136.0 PPM	OK			Location of Previous Exceedance Location #66
75	165.0 PPM	OK			
76	563.0 PPM	HIGH_ALRM	36.59866	-82.14816	
77	27.7 PPM	OK			
78	12.5 PPM	OK			
79	2.9 PPM	OK			
80	2.2 PPM	OK			
81	1.8 PPM	OK			
82	0.0 PPM	OK			
83	0.1 PPM	OK			
84	0.1 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 21, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	0.1 PPM	OK			
86	1.9 PPM	OK			
87	0.2 PPM	OK			
88	4.8 PPM	OK			
89	7.9 PPM	OK			
90	24.5 PPM	OK			
91	179.0 PPM	OK			
92	7.4 PPM	OK			
93	151.0 PPM	OK			
94	15.8 PPM	OK			
95	67.0 PPM	OK			
96	5.3 PPM	OK			
97	94.1 PPM	OK			
98	98.3 PPM	OK			
99	5.1 PPM	OK			
100	818.0 PPM	HIGH_ALRM	36.59897	-82.14759	End Serpentine Route
101	61.6 PPM	OK			EW-35
102	807.0 PPM	HIGH_ALRM	36.59899	-82.14744	EW-52
103	18.5 PPM	OK			TP-4
104	34.9 PPM	OK			EW-60
105	109.0 PPM	OK			EW-48
106	3.7 PPM	OK			TP-6
107	2.2 PPM	OK			EW-61
108	72.9 PPM	OK			EW-34
109	2.0 PPM	OK			EW-50
110	1453.0 PPM	HIGH_ALRM	36.59874	-82.14780	EW-67
111	229.0 PPM	OK			EW-47
112	134.0 PPM	OK			EW-54
113	966.0 PPM	HIGH_ALRM	36.59861	-82.14750	EW-55
114	5.0 PPM	OK			TP-2
115	1940.0 PPM	HIGH_ALRM	36.59842	-82.14736	EW-66
116	674.0 PPM	HIGH_ALRM	36.59800	-82.14720	EW-58
117	41.6 PPM	OK			EW-57
118	111.0 PPM	OK			TP-1
119	26.4 PPM	OK			EW-59
120	76.0 PPM	OK			EW-56
121	307.0 PPM	OK			EW-41
122	49.1 PPM	OK			EW-53
123	43.0 PPM	OK			EW-40
124	43.0 PPM	OK			TP-3
125	43.1 PPM	OK			EW-51

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 21, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	13.3 PPM	OK			EW-39
127	22.5 PPM	OK			TP-5
128	2.1 PPM	OK			EW-68
129	915.0 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	198.0 PPM	OK			TP-7
131	3.7 PPM	OK			EW-49
132	119.0 PPM	OK			EW-31R
133	3.1 PPM	OK			EW-65
134	15.4 PPM	OK			EW-37
135	-0.1 PPM	OK			TP-8
136	-0.1 PPM	OK			EW-64
137	-0.4 PPM	OK			EW-30R
138	-0.2 PPM	OK			EW-63
139	-0.3 PPM	OK			EW-42
140	1.5 PPM	OK			TP-9
141	0.1 PPM	OK			EW-62
142	-0.4 PPM	OK			EW-29R
143	-0.5 PPM	OK			EW-74
144	-0.5 PPM	OK			EW-32R
145	-0.7 PPM	OK			EW-69
146	0.5 PPM	OK			EW-71
147	0.2 PPM	OK			EW-72
148	0.9 PPM	OK			EW-70
149	0.4 PPM	OK			EW-73
150	22.0 PPM	OK			EW-76
151	0.5 PPM	OK			EW-78
152	4.5 PPM	OK			EW-82
153	3.1 PPM	OK			EW-85
154	617.0 PPM	HIGH_ALRM	36.5997	-82.14702	EW-88
155	8.8 PPM	OK			EW-89
156	7.8 PPM	OK			EW-93
157	62.1 PPM	OK			EW-94
158	46.8 PPM	OK			EW-98
159	47.6 PPM	OK			EW-100
160	10.6 PPM	OK			EW-99
161	36.0 PPM	OK			EW-95
162	25.9 PPM	OK			EW-90
163	940.0 PPM	HIGH_ALRM	36.59875	-82.14810	EW-86
164	4.8 PPM	OK			EW-84
165	1.8 PPM	OK			EW-80
166	1.0 PPM	OK			EW-79
167	2.1 PPM	OK			EW-33B
168	0.1 PPM	OK			EW-75

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 21, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	168
Number of exceedance locations:	11

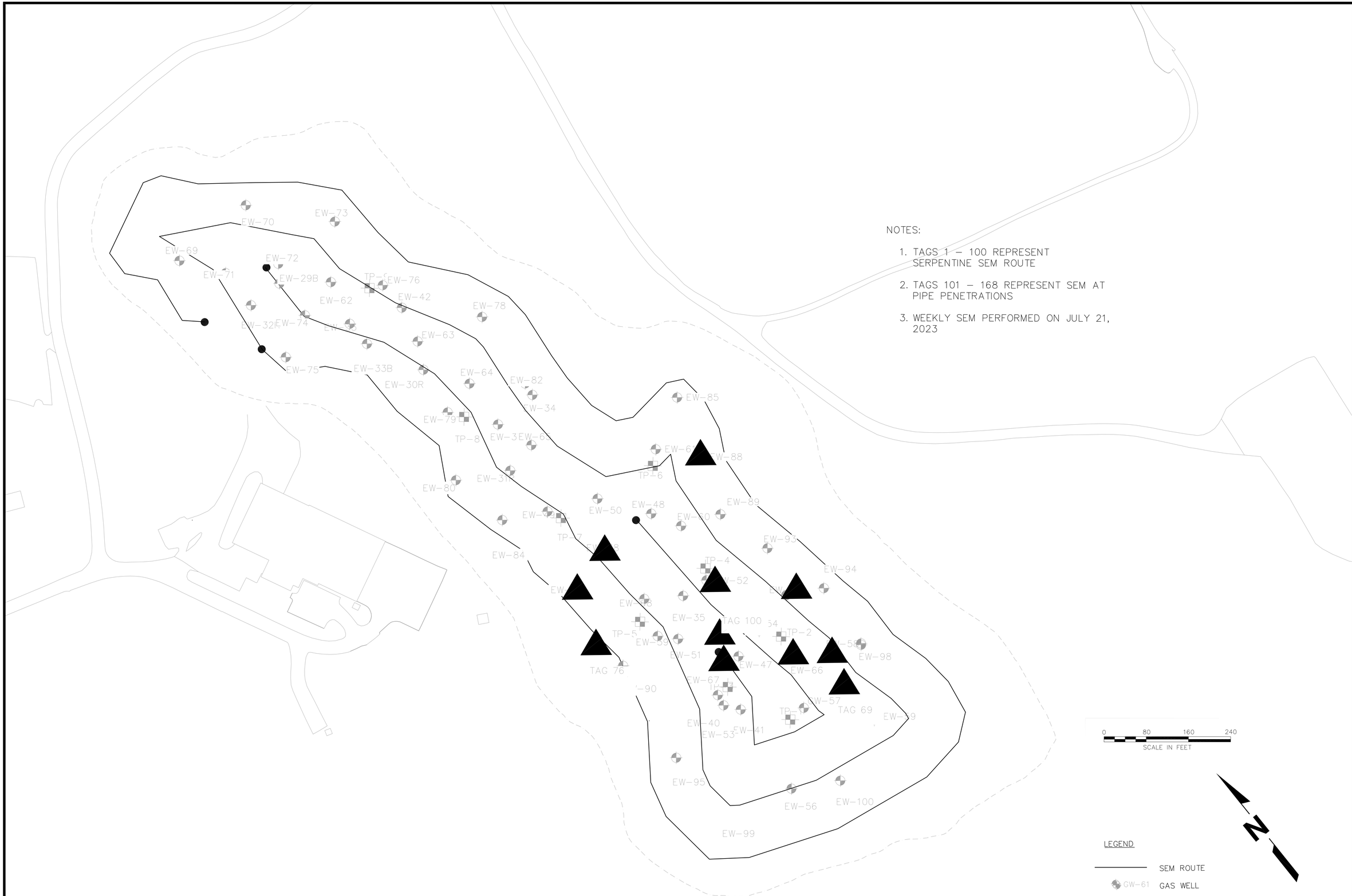
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 168 represent SEM at Pipe Penetrations
Weather Conditions: Mostly Cloudy, 72°F Wind: W - 8 MPH

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

7/21/2023	9:59	ZERO	0.2	PPM
7/21/2023	10:00	SPAN	504.0	PPM

Background Reading:

7/21/2023	10:08	Upwind	1.1	PPM
7/21/2023	10:11	Downwind	1.4	PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 168 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JULY 21, 2023

NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
1521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7453

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

FILE: 02218208.04

DATE: 7/21/23

SCALE: AS SHOWN

DRAWING NO.

1

August 2, 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 – July 28, 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 July 28, 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	168
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	68
Number of Exceedances	8
Number of Serpentine Exceedances	1
Number of Pipe Penetration Exceedances	7

REMONITORING OF ONGOING EXCEEDANCES

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

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

An alternate remedy request was submitted to VDEQ on 7/11/23 outlining proposed corrective actions at EW-38 and EW-66 which are both subject to the requirements of 40 CFR 63.1960(c)(4)(v). The Facility intends to install and/or repair well bore skirts at these two locations.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	7/28/23 Event	7/28/23 Event Result	Comments
EW-66	5/25/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-52	6/29/23	30-Day Retest	Passed	Exceedance Resolved
EW-98	6/29/23	30-Day Retest	Failed	Requires Additional 10-Day Retest
Tag 66	7/7/23	N/A	Passed	Requires 30-Day Retest
EW-35	7/12/23	N/A	Passed	Requires 30-Day Retest
EW-55	7/12/23	2nd 10-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/21/23	10-Day Retest	Failed	Requires Second 10-Day Retest
Tag 76	7/21/23	10-Day Retest	Passed	Requires 30-Day Retest
Tag 100	7/21/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-58	7/21/23	10-Day Retest	Failed	Requires Second 10-Day Retest
EW-67	7/21/23	10-Day Retest	Failed	Requires Second 10-Day Retest
EW-86	7/21/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-88	7/21/23	10-Day Retest	Passed	Requires 30-Day Retest

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

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 28, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	5.1 PPM	OK			Start Serpentine Route
2	2.6 PPM	OK			
3	1 PPM	OK			
4	1 PPM	OK			
5	1.1 PPM	OK			
6	1.5 PPM	OK			
7	1.9 PPM	OK			
8	1 PPM	OK			
9	2.5 PPM	OK			
10	14.4 PPM	OK			
11	1.5 PPM	OK			
12	2 PPM	OK			
13	4.4 PPM	OK			
14	2.9 PPM	OK			
15	98.4 PPM	OK			
16	108 PPM	OK			
17	37.1 PPM	OK			
18	0.4 PPM	OK			
19	7.5 PPM	OK			
20	9.6 PPM	OK			
21	45.4 PPM	OK			
22	52.5 PPM	OK			
23	78.7 PPM	OK			
24	5.9 PPM	OK			
25	29.9 PPM	OK			
26	43.9 PPM	OK			
27	3.5 PPM	OK			
28	7.8 PPM	OK			
29	10.6 PPM	OK			
30	6.7 PPM	OK			
31	2.8 PPM	OK			
32	0.6 PPM	OK			
33	0.3 PPM	OK			
34	2.3 PPM	OK			
35	0.8 PPM	OK			
36	0 PPM	OK			
37	0.3 PPM	OK			
38	4.6 PPM	OK			
39	0.2 PPM	OK			
40	0.2 PPM	OK			
41	0.1 PPM	OK			
42	0 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 28, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	3 PPM	OK			
44	0.4 PPM	OK			
45	0.2 PPM	OK			
46	6.7 PPM	OK			
47	8.5 PPM	OK			
48	15.4 PPM	OK			
49	5.1 PPM	OK			
50	11.2 PPM	OK			
51	12 PPM	OK			
52	138 PPM	OK			
53	15.7 PPM	OK			
54	69.1 PPM	OK			
55	6.6 PPM	OK			
56	87.8 PPM	OK			Location of 7/7/23 Tag #66
57	16.1 PPM	OK			
58	12.1 PPM	OK			
59	15.6 PPM	OK			
60	3386 PPM	HIGH_ALRM	36.59822	-82.14713	Location of 7/21/23 Tag #69
61	5.9 PPM	OK			
62	13.6 PPM	OK			
63	17.2 PPM	OK			
64	16.8 PPM	OK			
65	48.9 PPM	OK			
66	99.8 PPM	OK			
67	41.2 PPM	OK			
68	4 PPM	OK			
69	0.5 PPM	OK			
70	1.1 PPM	OK			
71	0 PPM	OK			
72	0.1 PPM	OK			
73	0.3 PPM	OK			
74	3.7 PPM	OK			
75	1.3 PPM	OK			
76	0.4 PPM	OK			Location of 7/21/23 Tag #86
77	1.4 PPM	OK			
78	0 PPM	OK			
79	0 PPM	OK			
80	0.1 PPM	OK			
81	0 PPM	OK			
82	5 PPM	OK			
83	5.6 PPM	OK			
84	10.1 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 28, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	4.6 PPM	OK			
86	39 PPM	OK			
87	24.6 PPM	OK			
88	109 PPM	OK			
89	95.7 PPM	OK			
90	454 PPM	OK			
91	8.8 PPM	OK			
92	14.1 PPM	OK			
93	91.4 PPM	OK			
94	299 PPM	OK			
95	94.1 PPM	OK			
96	183 PPM	OK			
97	13.4 PPM	OK			
98	6.8 PPM	OK			Location of 7/21/23 Tag #100
99	174 PPM	OK			
100	45.9 PPM	OK			End Serpentine Route
101	83.3 PPM	OK			EW-60
102	444 PPM	OK			EW-35
103	209 PPM	OK			EW-52
104	18.5 PPM	OK			TP-4
105	6873 PPM	HIGH_ALRM	36.59885	-82.14712	EW-55
106	234 PPM	OK			EW-54
107	0 PPM	OK			EW-71
108	0 PPM	OK			EW-69
109	0.8 PPM	OK			EW-70
110	0.1 PPM	OK			EW-73
111	0 PPM	OK			EW-62
112	1.5 PPM	OK			TP-9
113	20.5 PPM	OK			EW-76
114	2.7 PPM	OK			EW-42
115	0.8 PPM	OK			EW-63
116	3.2 PPM	OK			EW-30R
117	0.4 PPM	OK			EW-64
118	1.1 PPM	OK			EW-78
119	27.5 PPM	OK			EW-82
120	15.4 PPM	OK			EW-34
121	159 PPM	OK			EW-37
122	13.7 PPM	OK			EW-31R
123	177 PPM	OK			EW-65
124	1.3 PPM	OK			EW-85
125	147 PPM	OK			EW-88

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 28, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	47.8 PPM	OK			EW-89
127	1.9 PPM	OK			EW-93
128	237 PPM	OK			EW-94
129	5555 PPM	HIGH_ALRM	36.59847	-82.14698	EW-98
130	3002 PPM	HIGH_ALRM	36.59847	-82.14698	EW-58
131	18.2 PPM	OK			EW-100
132	19.2 PPM	OK			TP-1
133	10.7 PPM	OK			EW-57
134	29.3 PPM	OK			EW-59
135	3250 PPM	HIGH_ALRM	36.59828	-82.14735	EW-66
136	0.6 PPM	OK			TP-2
137	166 PPM	OK			EW-48
138	16.1 PPM	OK			TP-6
139	37.4 PPM	OK			EW-61
140	11 PPM	OK			EW-50
141	0.6 PPM	OK			EW-49
142	119 PPM	OK			TP-7
143	850 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
144	3.9 PPM	OK			EW-68
145	3.2 PPM	OK			TP-5
146	45.6 PPM	OK			EW-39
147	52.5 PPM	OK			EW-51
148	881 PPM	HIGH_ALRM	36.5989	-82.14778	EW-67
149	49.9 PPM	OK			EW-47
150	159 PPM	OK			TP-3
151	25.6 PPM	OK			EW-40
152	151 PPM	OK			EW-53
153	389 PPM	OK			EW-41
154	104 PPM	OK			EW-56
155	1157 PPM	HIGH_ALRM	36.59788	-82.14811	EW-99
156	122 PPM	OK			EW-95
157	1.9 PPM	OK			EW-90
158	1.5 PPM	OK			EW-86
159	2.2 PPM	OK			EW-84
160	1.7 PPM	OK			EW-80
161	0 PPM	OK			TP-8
162	0.6 PPM	OK			EW-79
163	0.8 PPM	OK			EW-33R
164	0 PPM	OK			EW-75
165	0.3 PPM	OK			EW-74
166	0 PPM	OK			EW-32R
167	0.3 PPM	OK			EW-29R
168	2 PPM	OK			EW-72

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JULY 28, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	168
Number of exceedance locatio	8

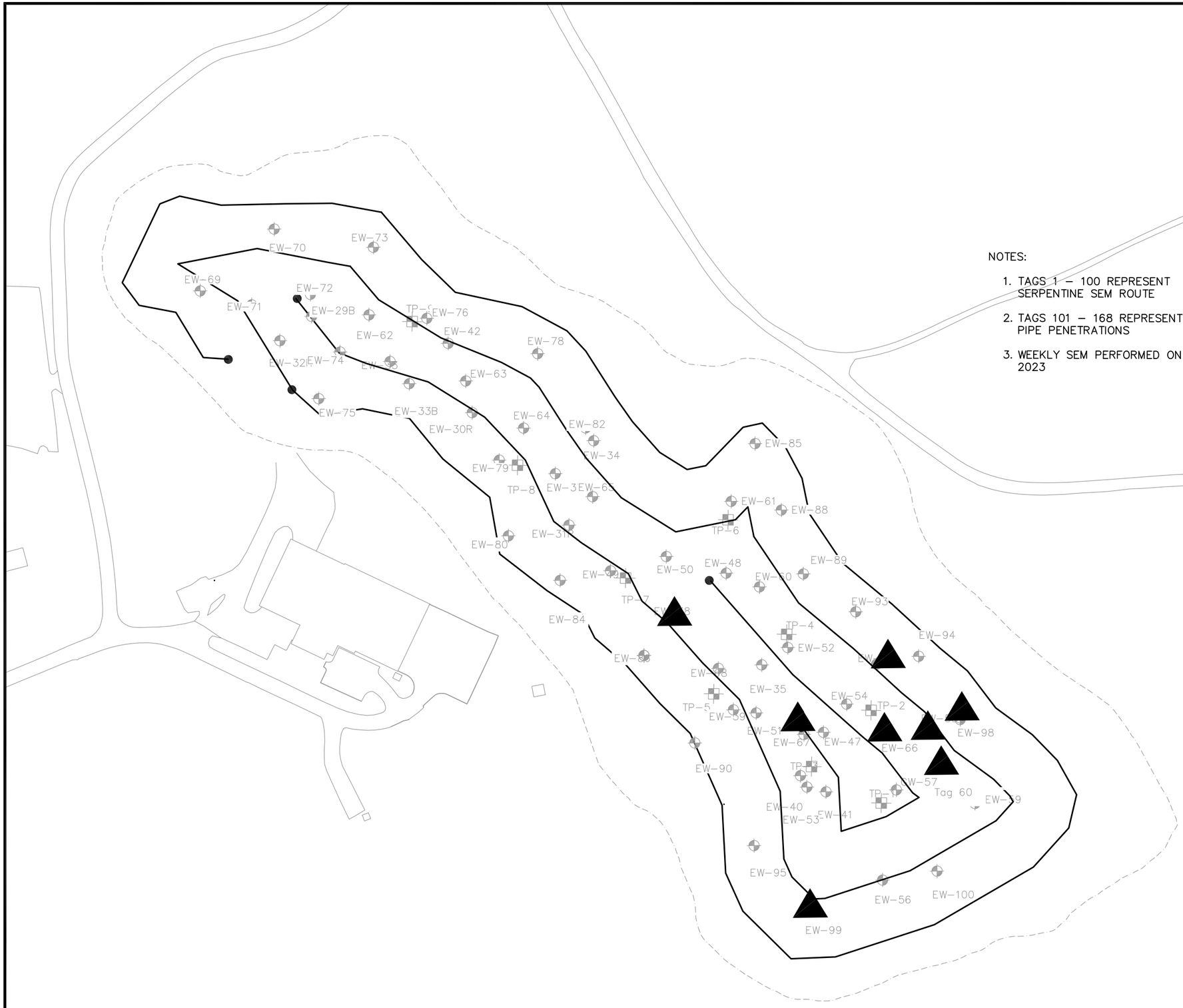
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 168 represent SEM at Pipe Penetrations
Weather Conditions: Mostly Cloudy, 85˚F Wind: SW - 3 MPH

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

7/28/2023	9:51	ZERO	0.1	PPM
7/28/2023	9:51	SPAN	501.0	PPM

Background Reading:

7/28/2023	9:57	Upwind	1.5	PPM
7/28/2023	10:00	Downwind	1.9	PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 168 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JULY 28, 2023

0 80 160 240
SCALE IN FEET

N

LEGEND

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

1

NO.	REVISION	DATE

SHEET TITLE: **WEEKLY SEM ROUTE**

PROJECT TITLE: **SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588**

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

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

PROJ. NO. 02218208.04
DSN. BY: LSN
CHK. BY: DBK
DSK. BY: LSN
Q/A R/W BY:
APP. BY:

FILE: 02218208.04
DATE: 7/28/23
SCALE: AS SHOWN
DRAWING NO.

of 1

Appendix B

In-Waste Temperatures on Select Days in July

Appendix B Figures

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

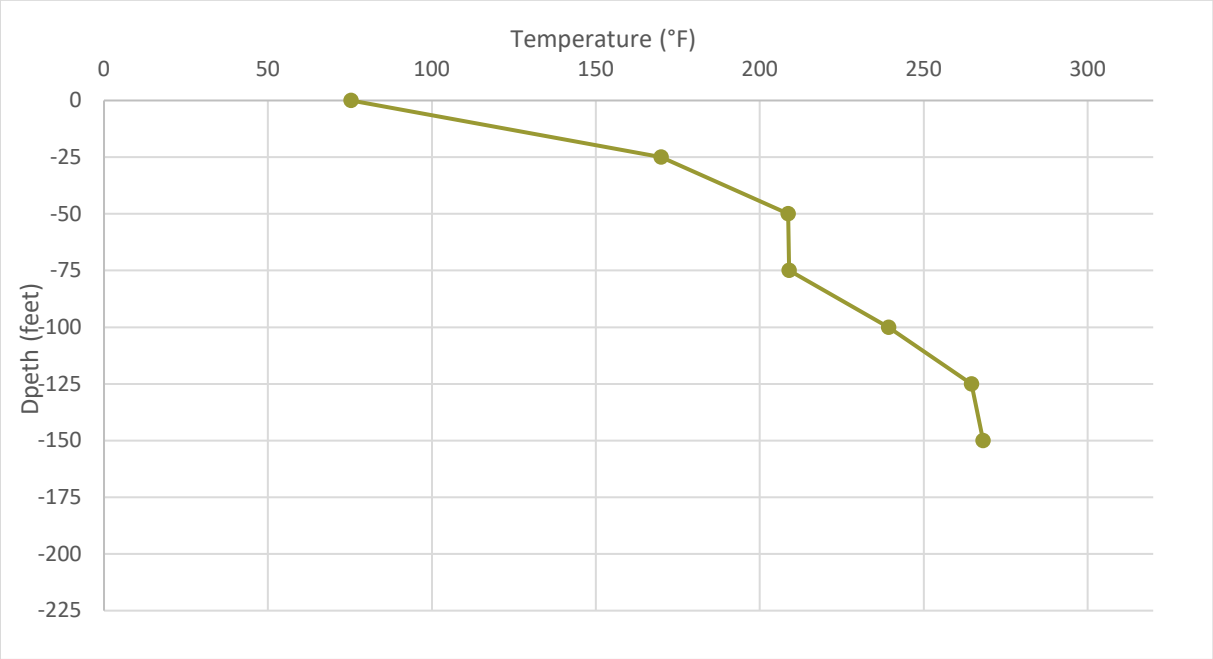


Figure B- 2. Average Temperatures Recorded by TP-1 on July 12, 2023

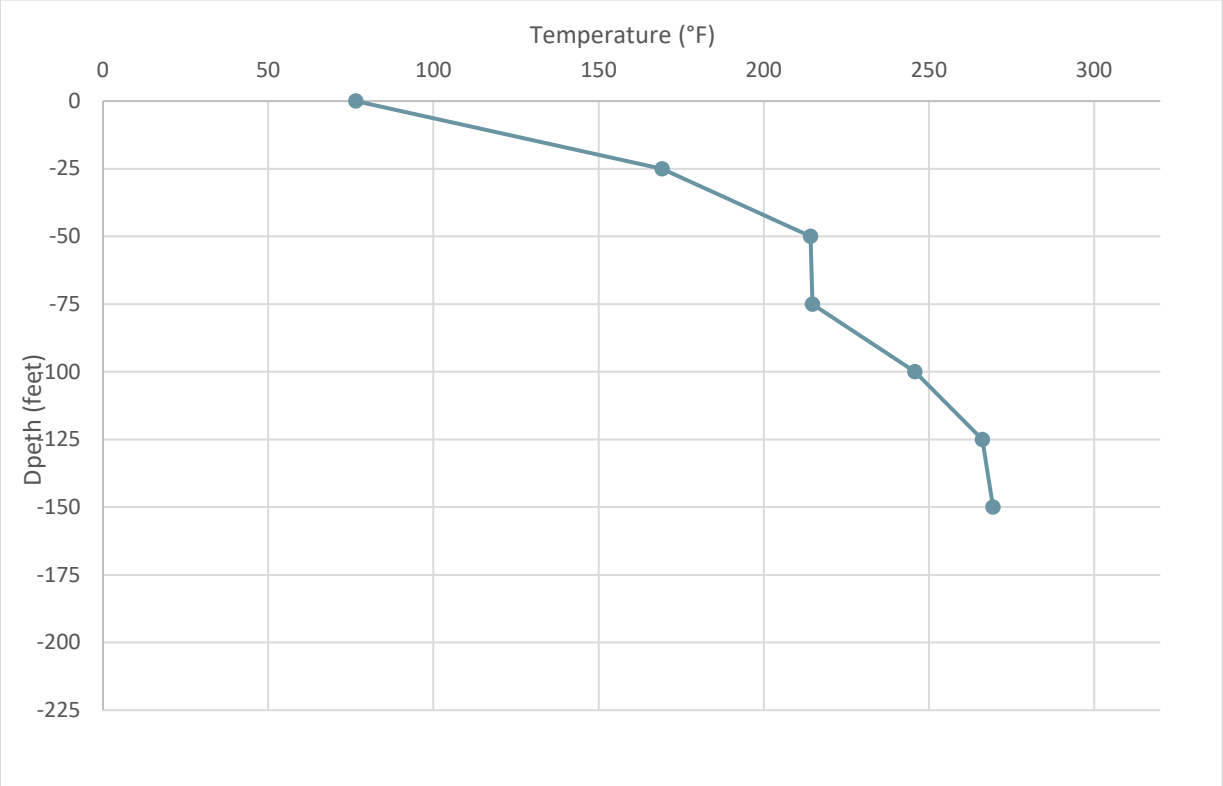


Figure B- 3. Average Temperatures Recorded by TP-1 on July 19, 2023

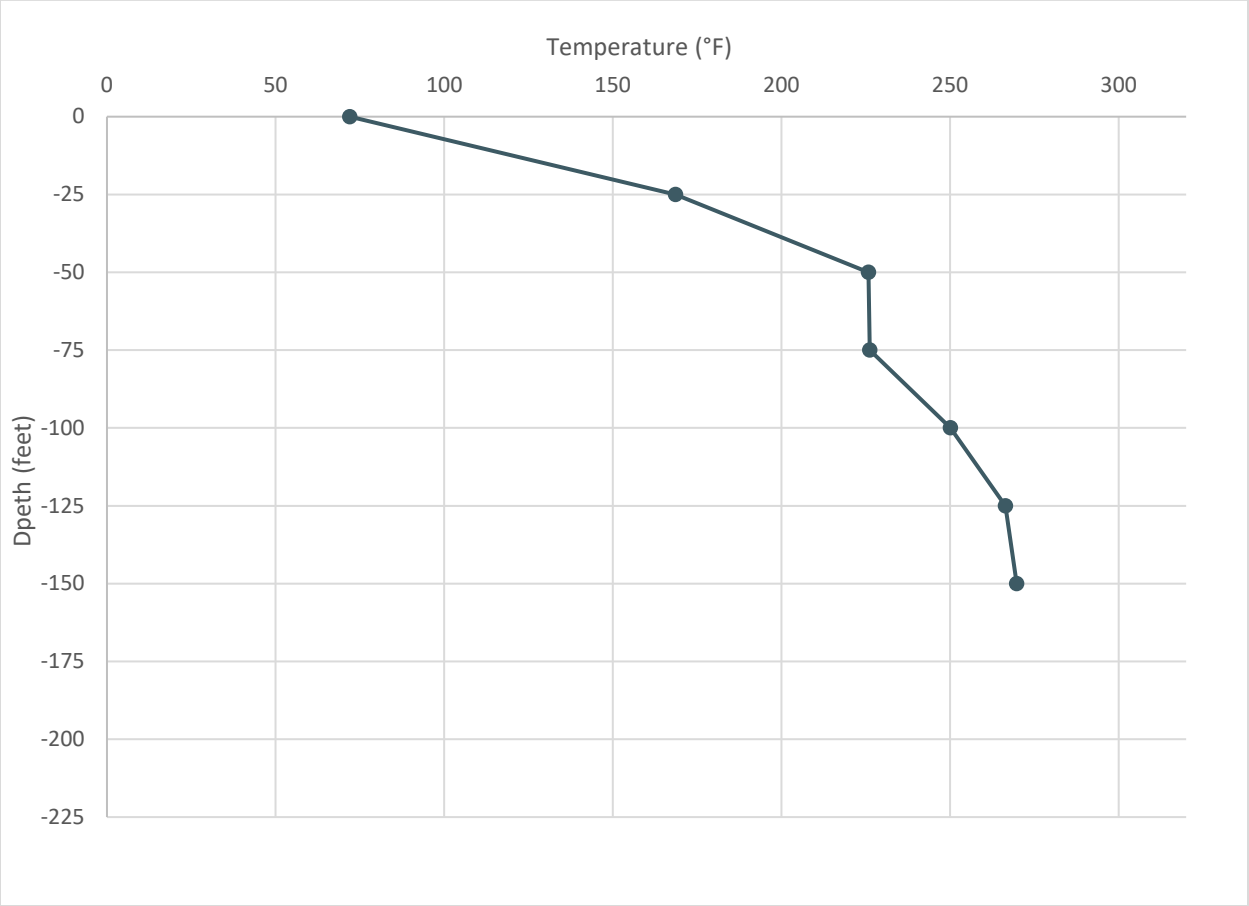


Figure B- 4. Average Temperatures Recorded by TP-2 on July 5, 2023

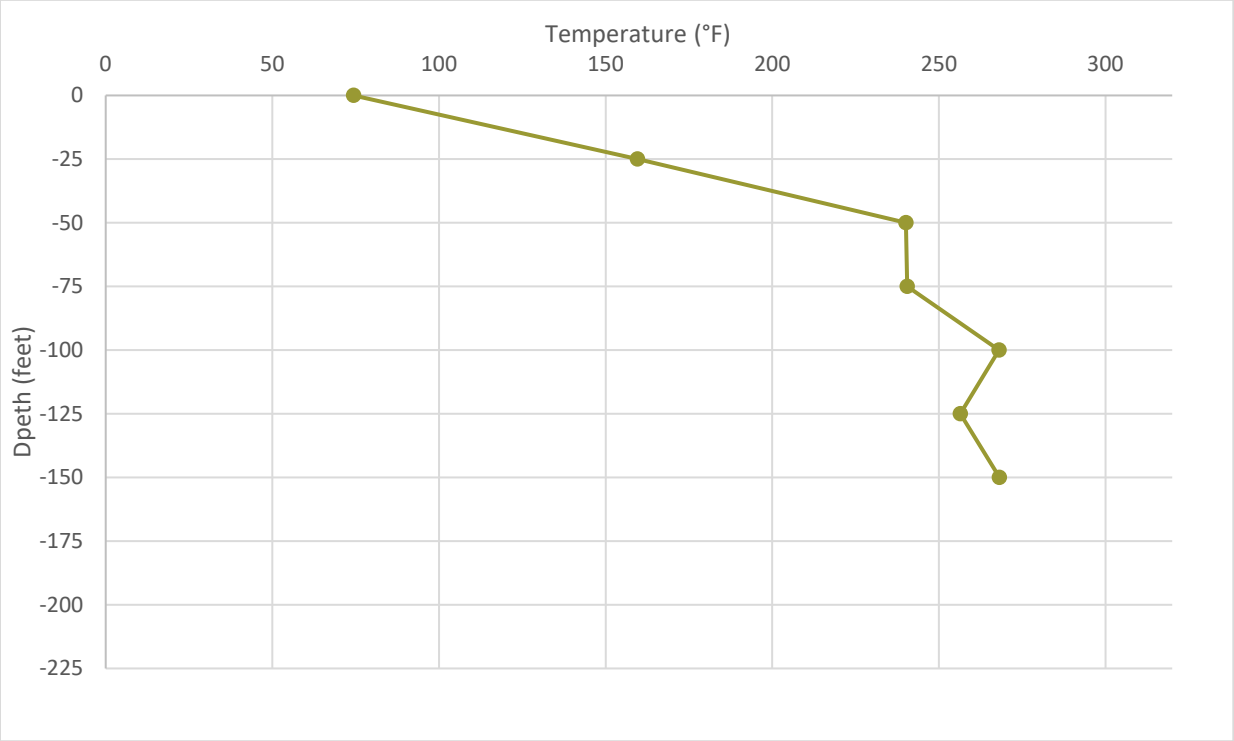


Figure B- 5. Average Temperatures Recorded by TP-2 on July 12, 2023

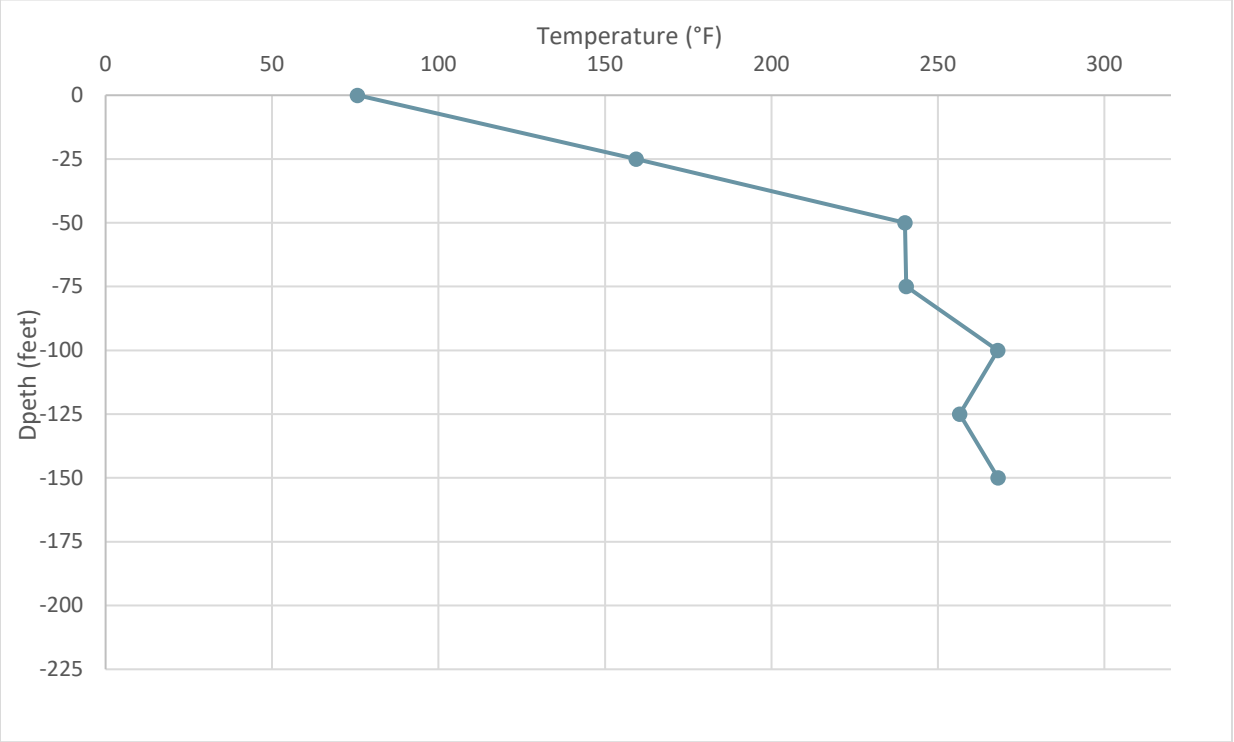


Figure B- 6. Average Temperatures Recorded by TP-2 on July 19, 2023

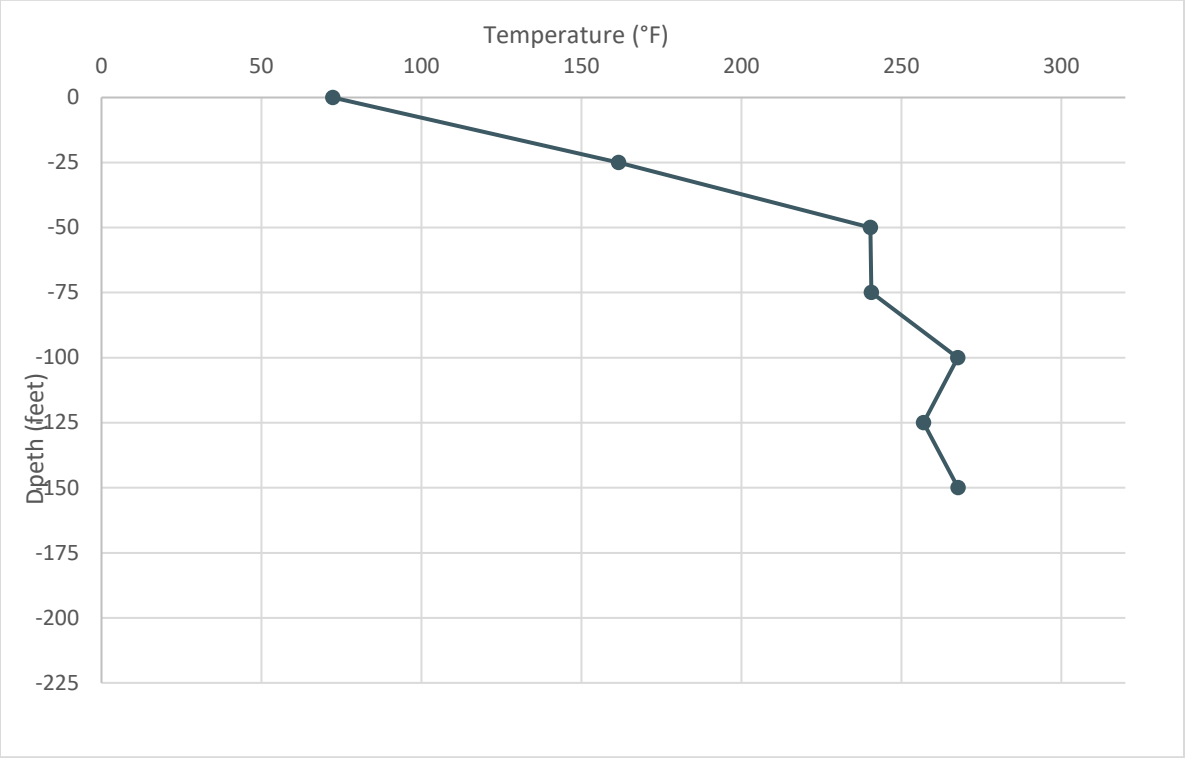


Figure B- 7. Average Temperatures Recorded by TP-2 on July 24, 2023

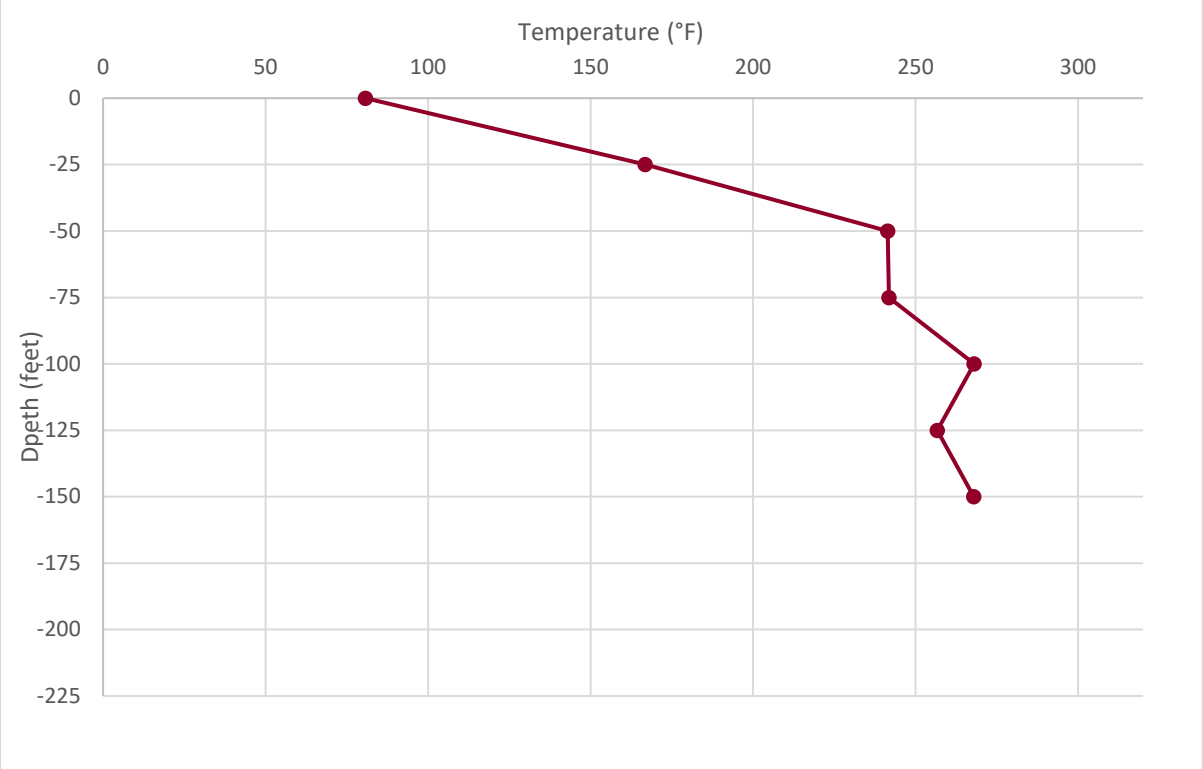


Figure B- 8. Average Temperatures Recorded by TP-3 on July 5, 2023

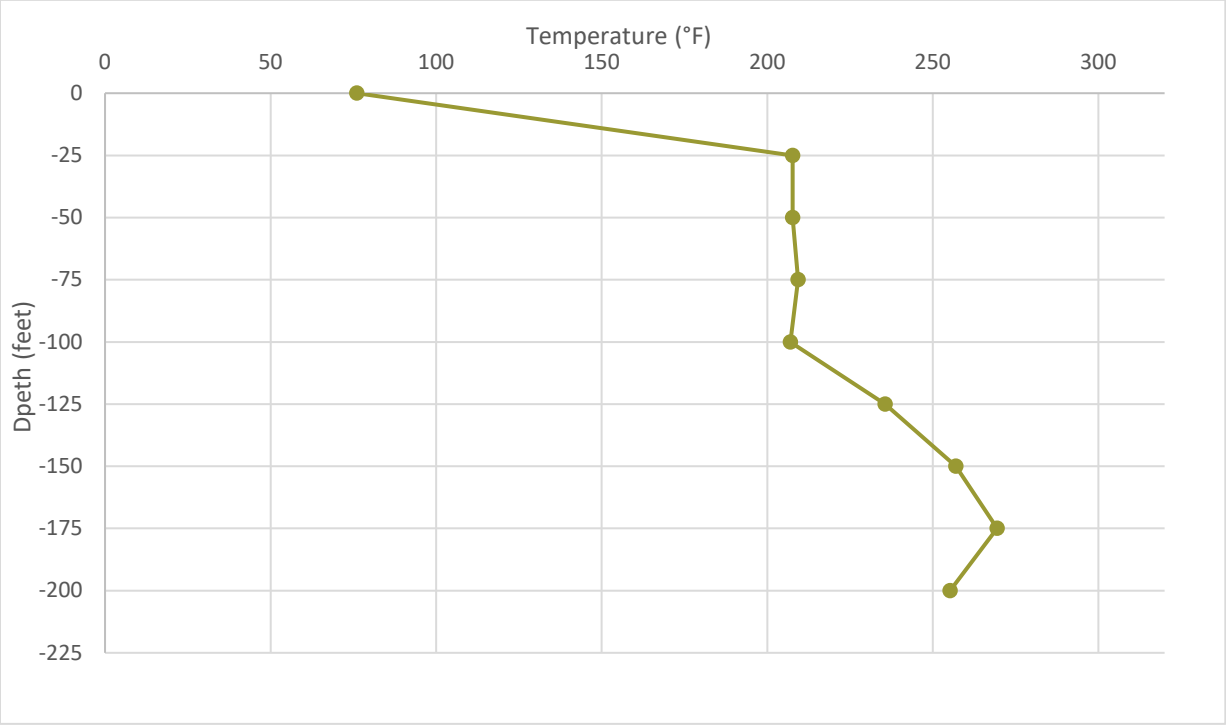


Figure B- 9. Average Temperatures Recorded by TP-3 on July 12, 2023

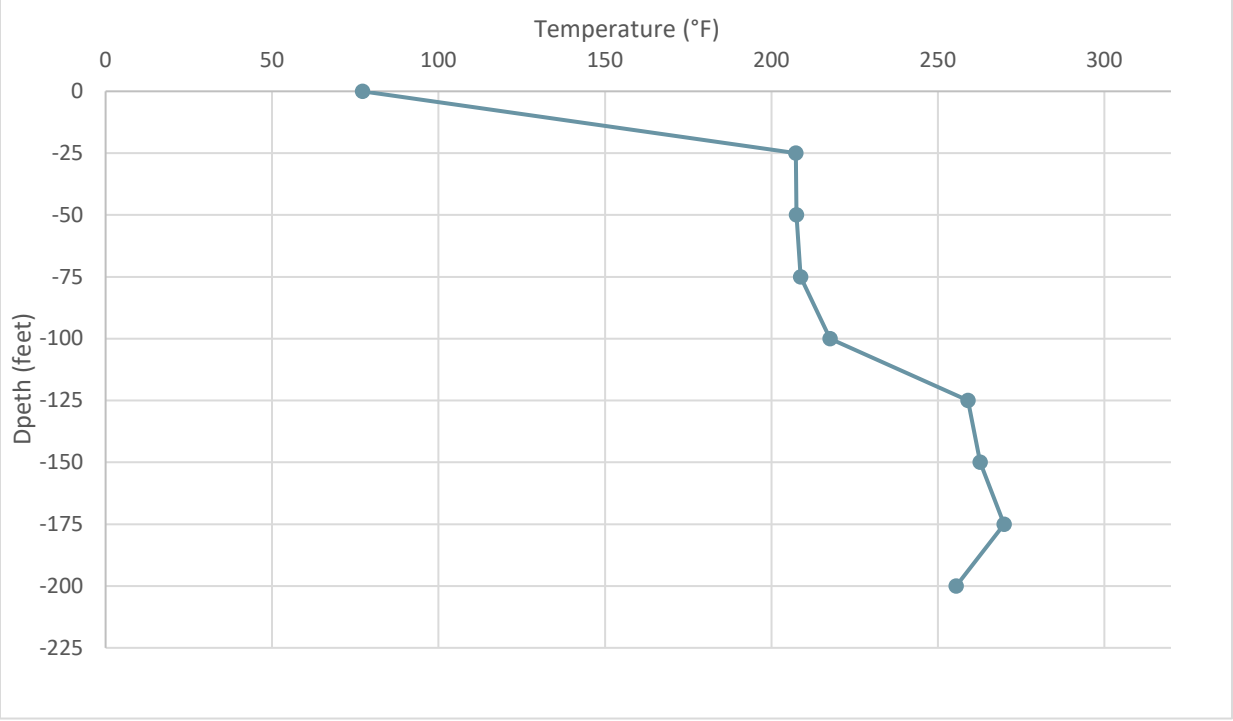


Figure B- 10. Average Temperatures Recorded by TP-3 on July 19, 2023

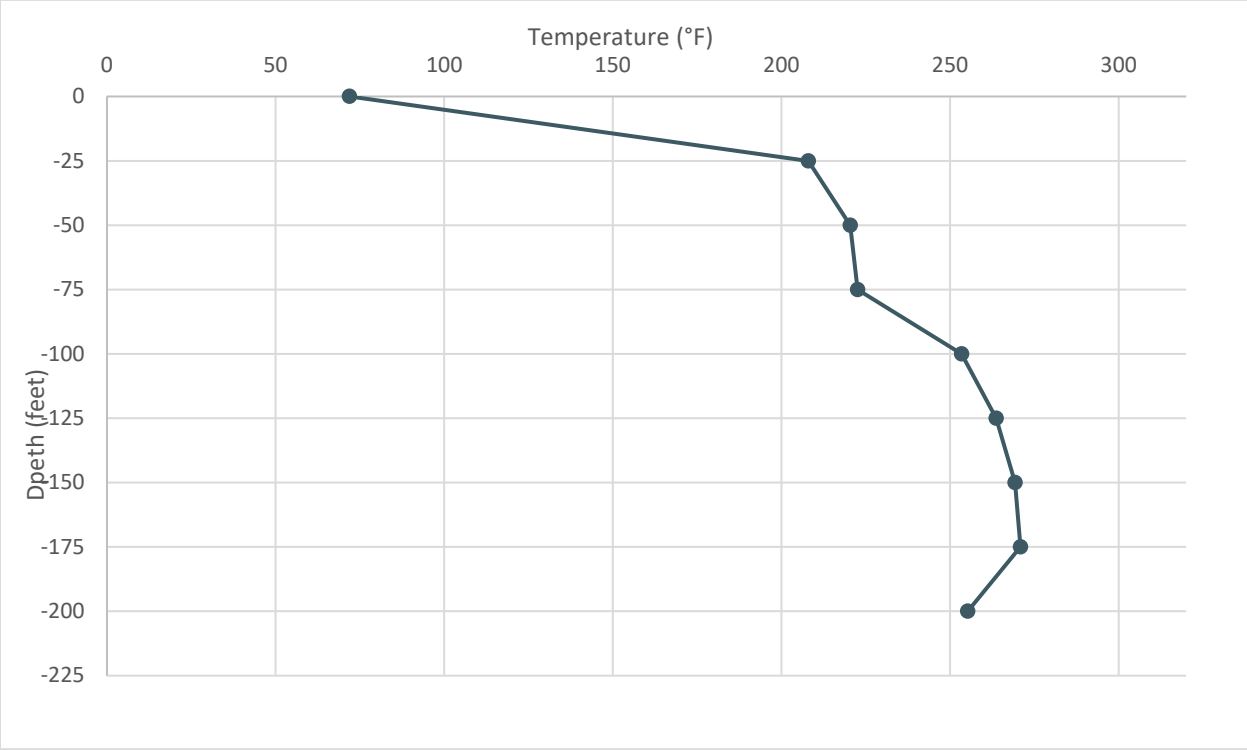


Figure B- 11. Average Temperatures Recorded by TP-3 on July 24, 2023

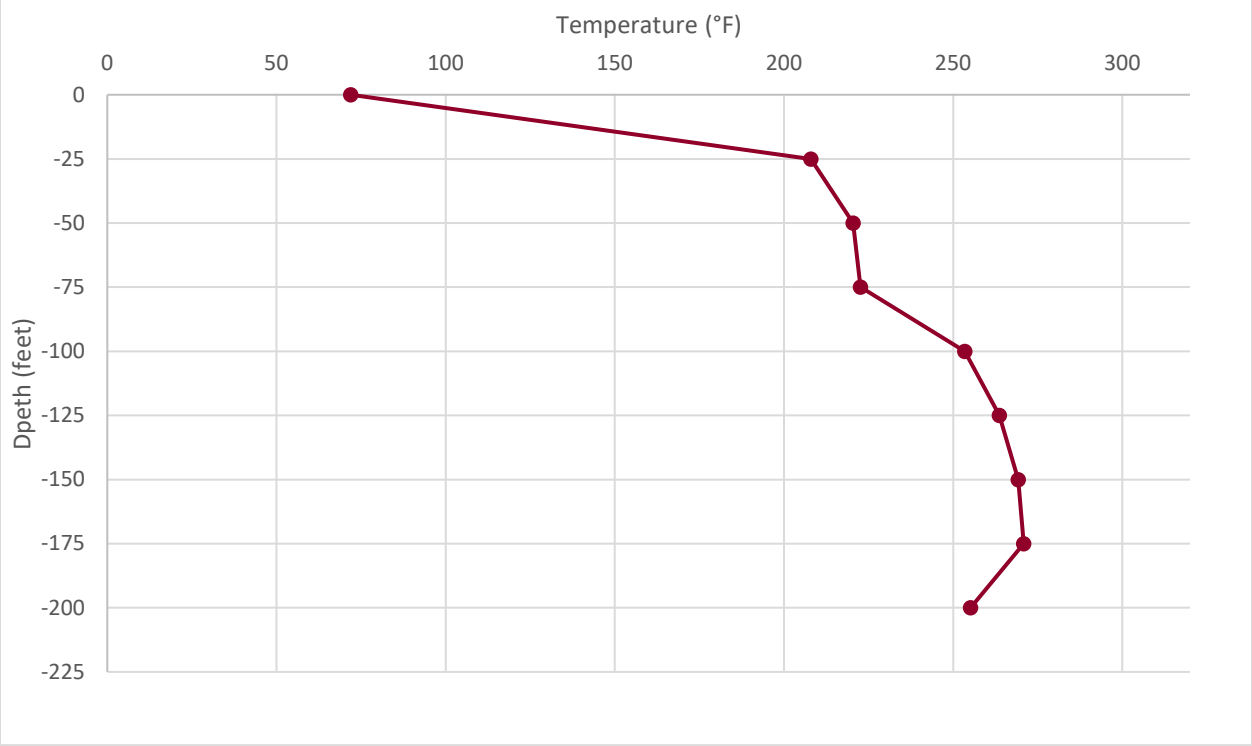


Figure B- 12. Average Temperatures Recorded by TP-4 on July 5, 2023

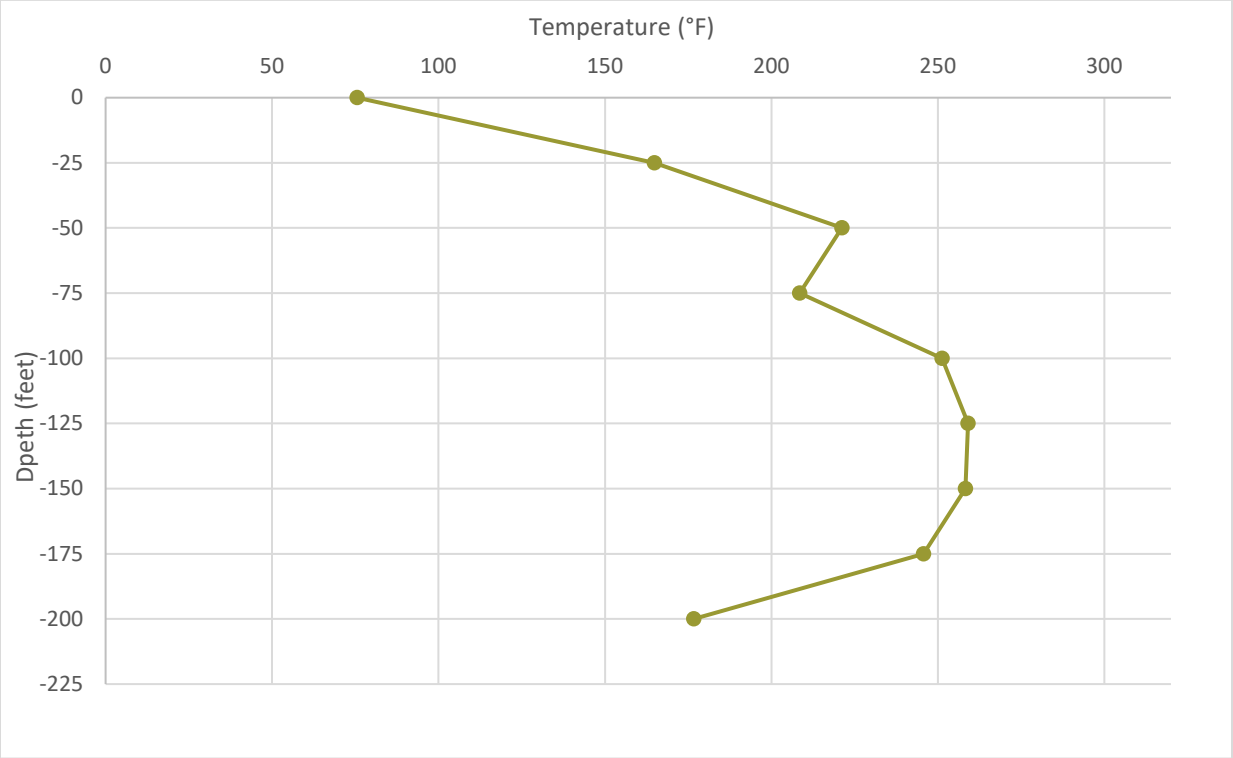


Figure B- 13. Average Temperatures Recorded by TP-4 on July 12, 2023

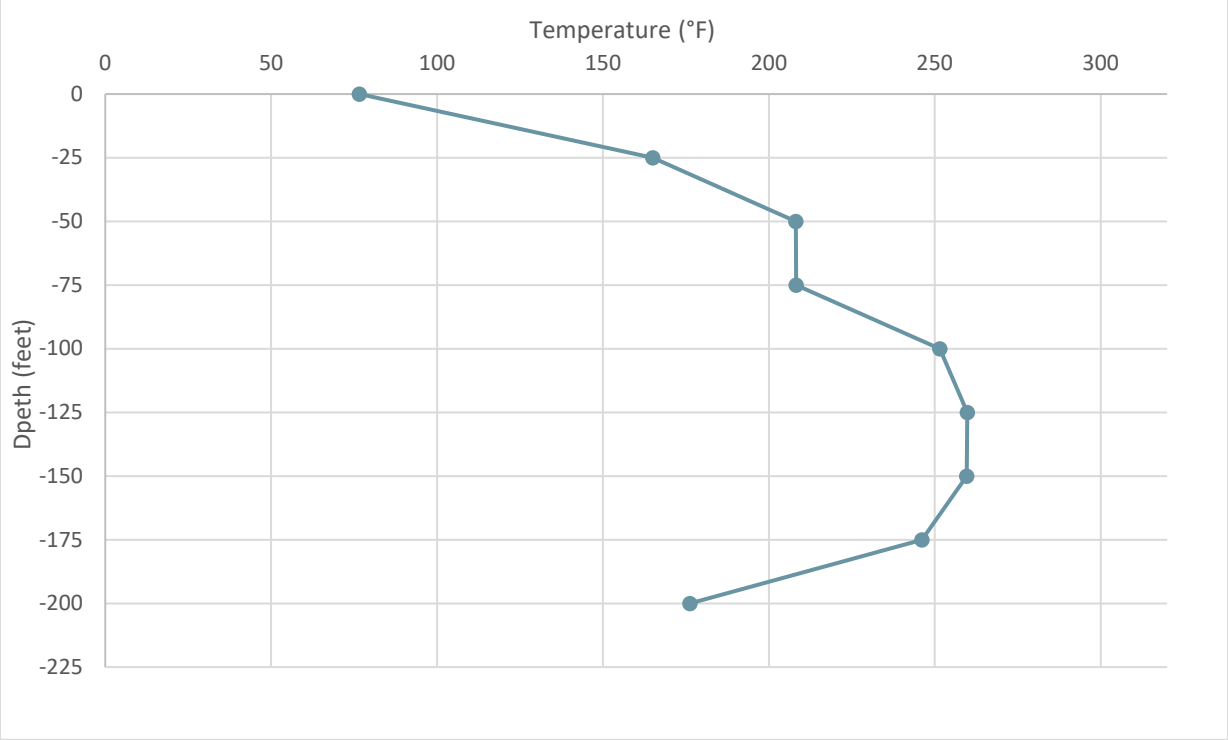


Figure B- 14. Average Temperatures Recorded by TP-4 on July 19, 2023

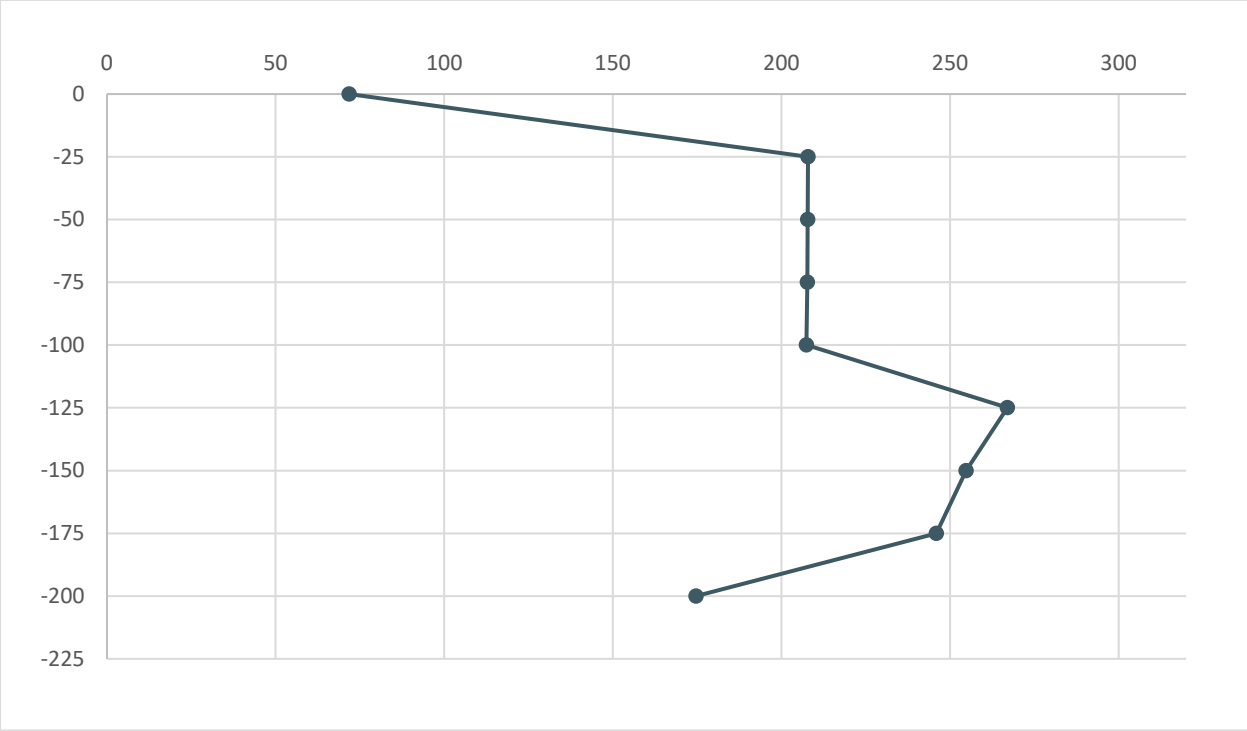


Figure B- 15. Average Temperatures Recorded by TP-4 on July 24, 2023

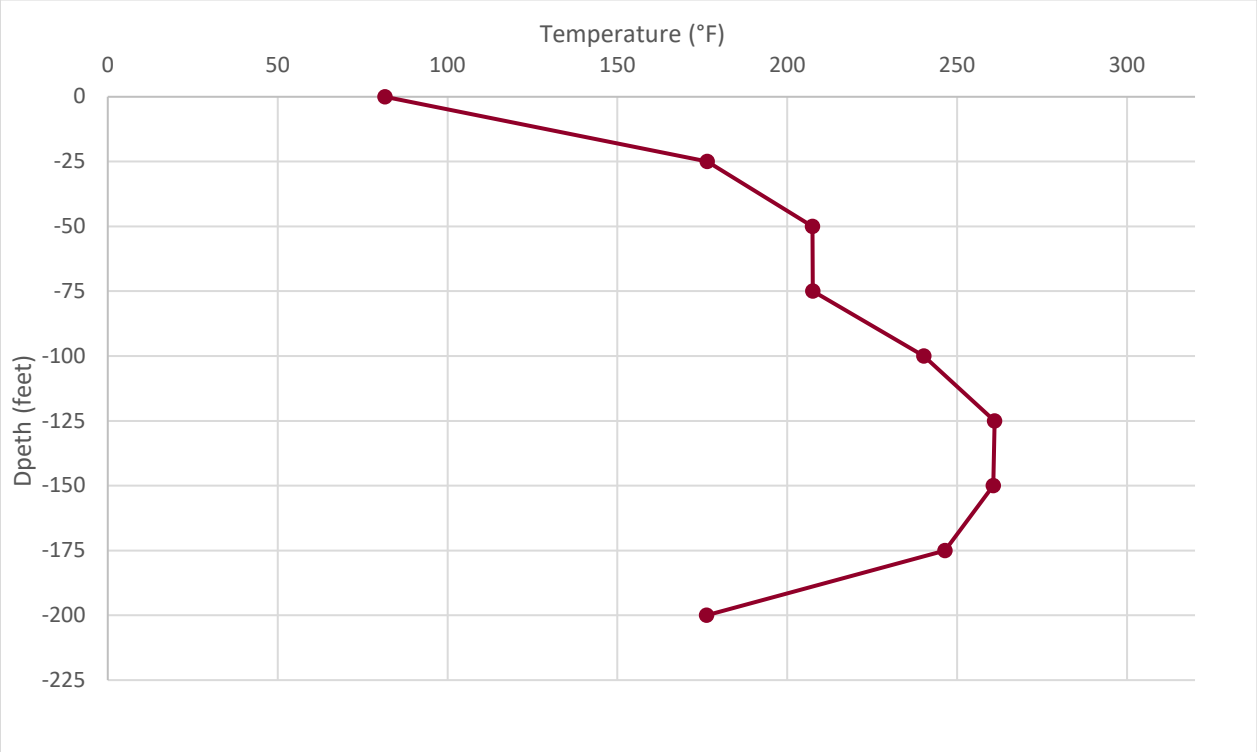


Figure B- 16. Average Temperatures Recorded by TP-5 on July 5, 2023

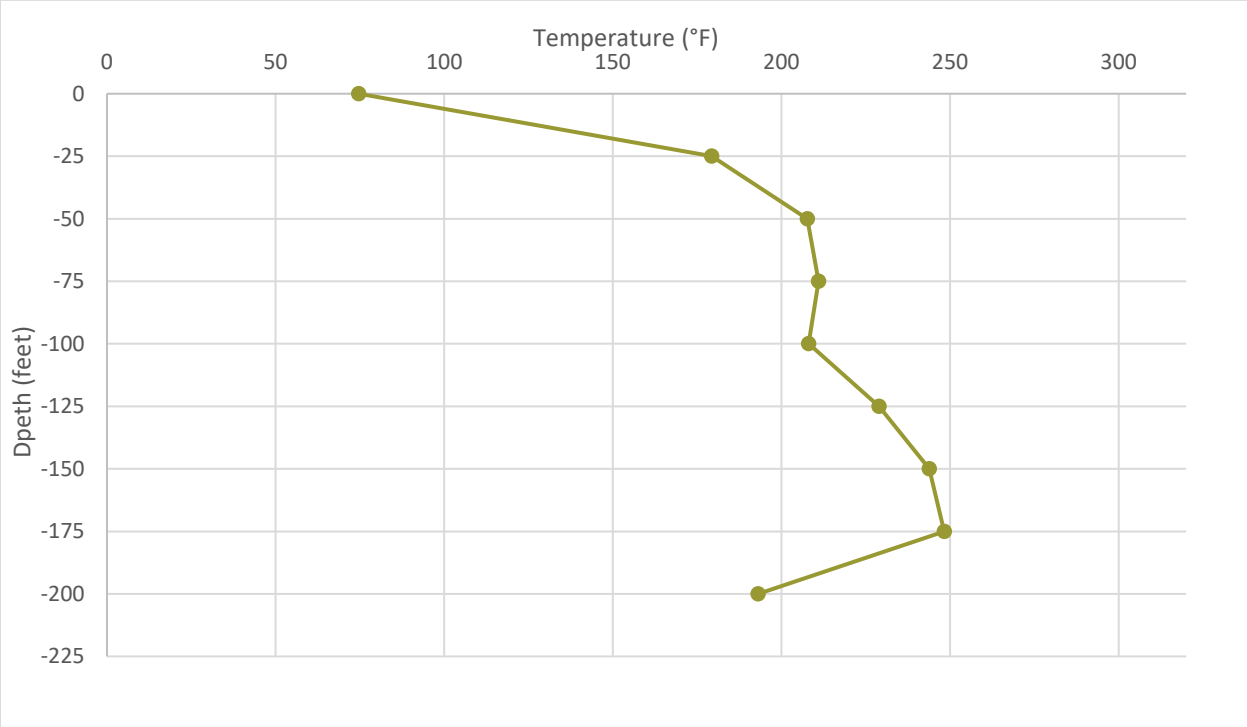


Figure B- 17. Average Temperatures Recorded by TP-5 on July 12, 2023

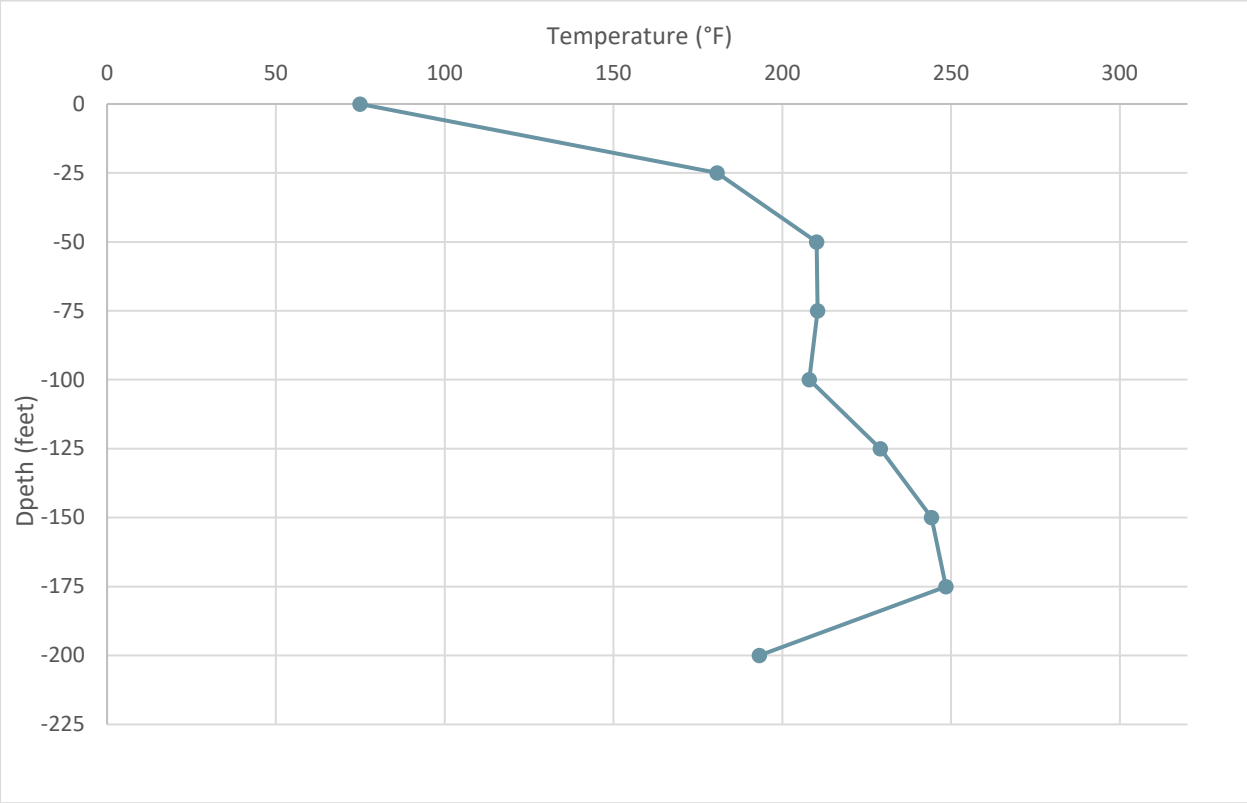


Figure B- 18. Average Temperatures Recorded by TP-5 on July 19, 2023

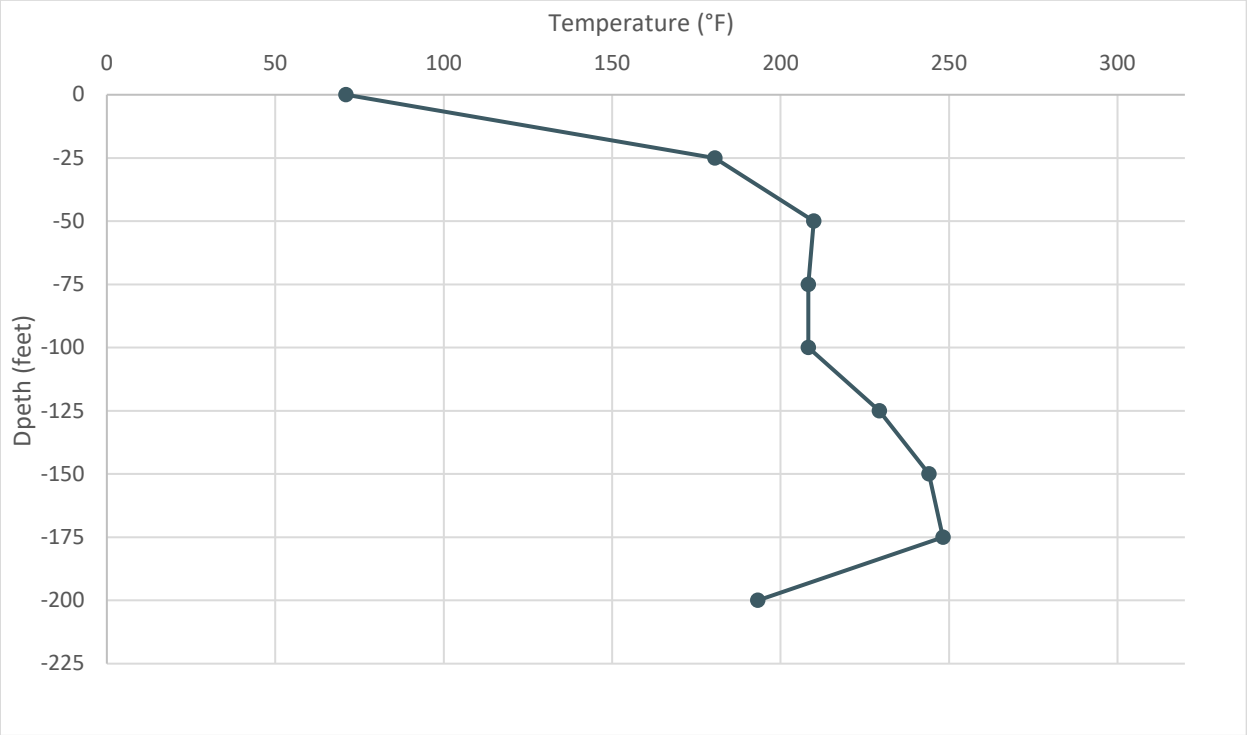


Figure B- 19. Average Temperatures Recorded by TP-5 on July 24, 2023

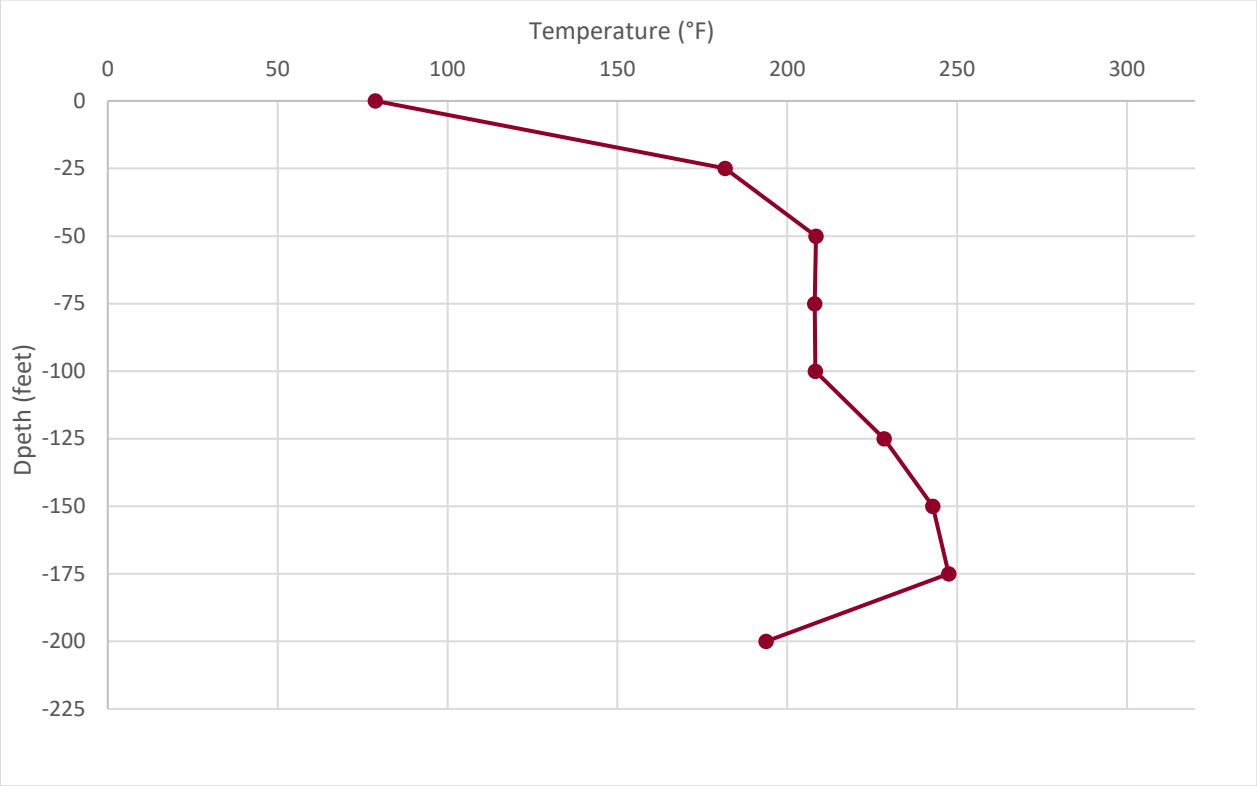


Figure B- 20. Average Temperatures Recorded by TP-6 on July 5, 2023

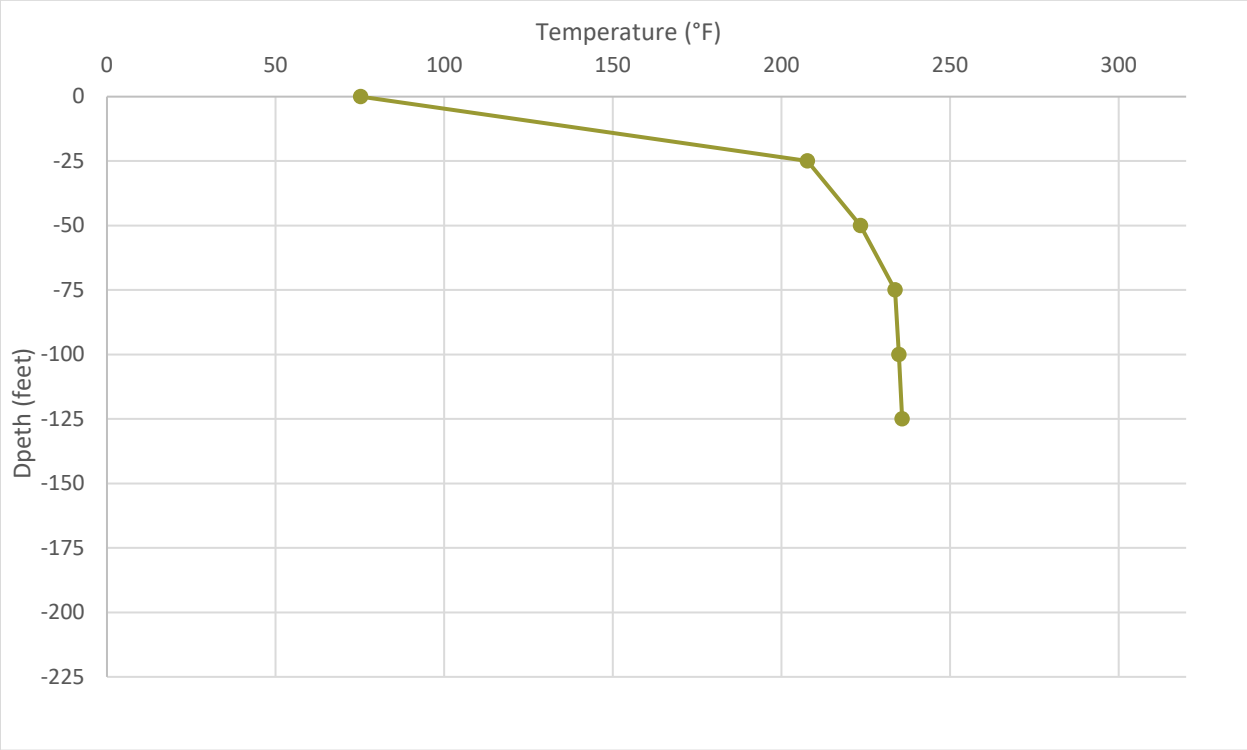


Figure B- 21. Average Temperatures Recorded by TP-6 on July 12, 2023

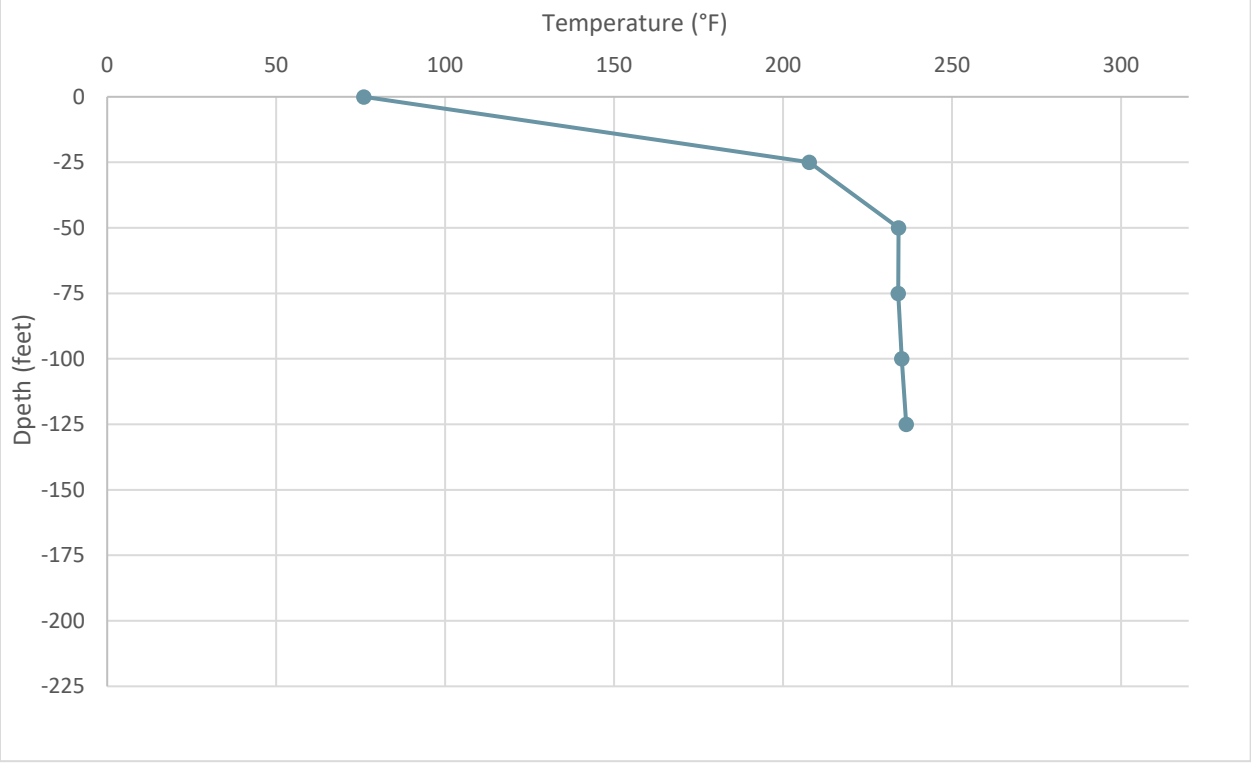


Figure B- 22. Average Temperatures Recorded by TP-6 on July 19, 2023

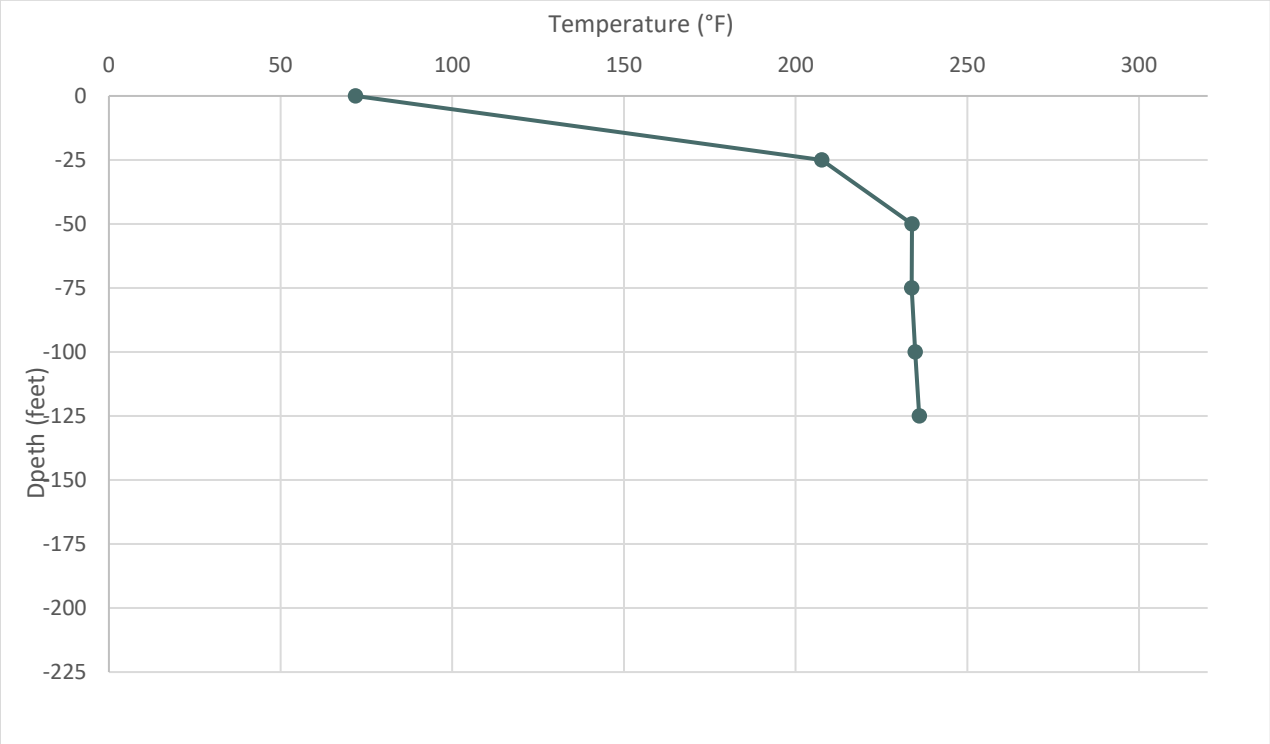


Figure B- 23. Average Temperatures Recorded by TP-6 on July 24, 2023

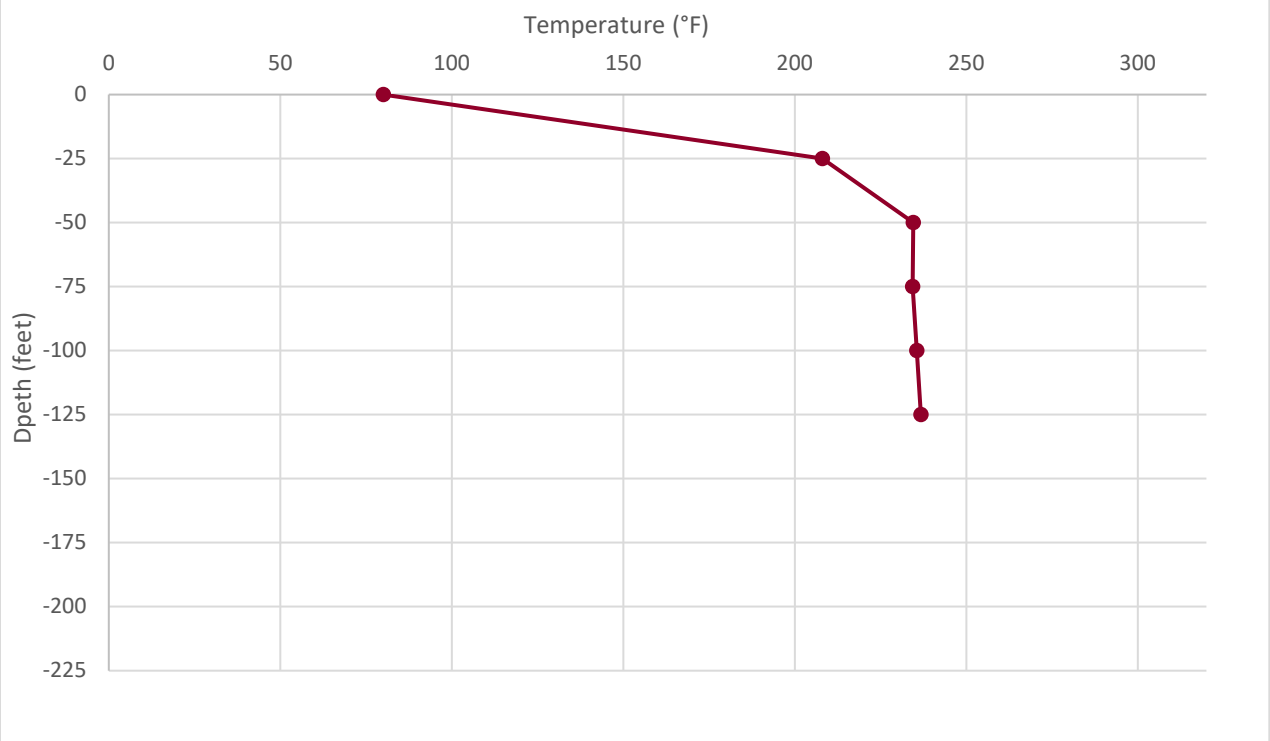


Figure B- 24. Average Temperatures Recorded by TP-7 on July 5, 2023

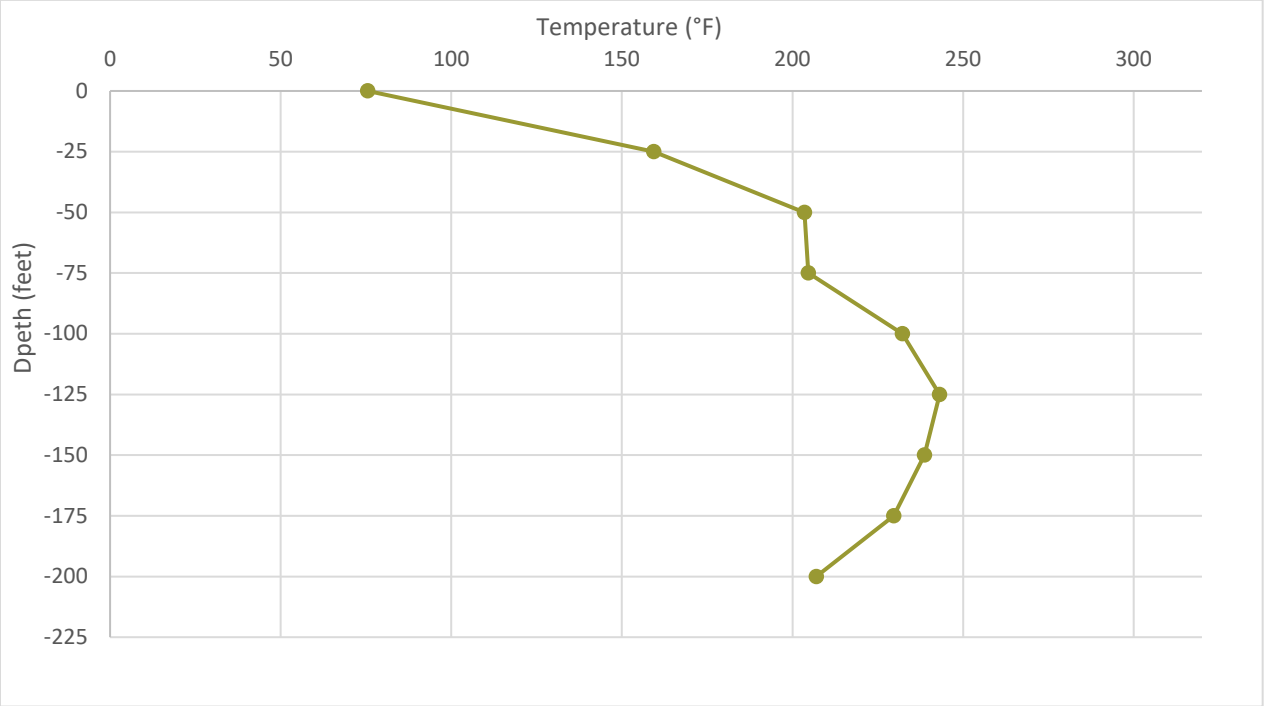


Figure B- 25. Average Temperatures Recorded by TP-7 on July 12, 2023

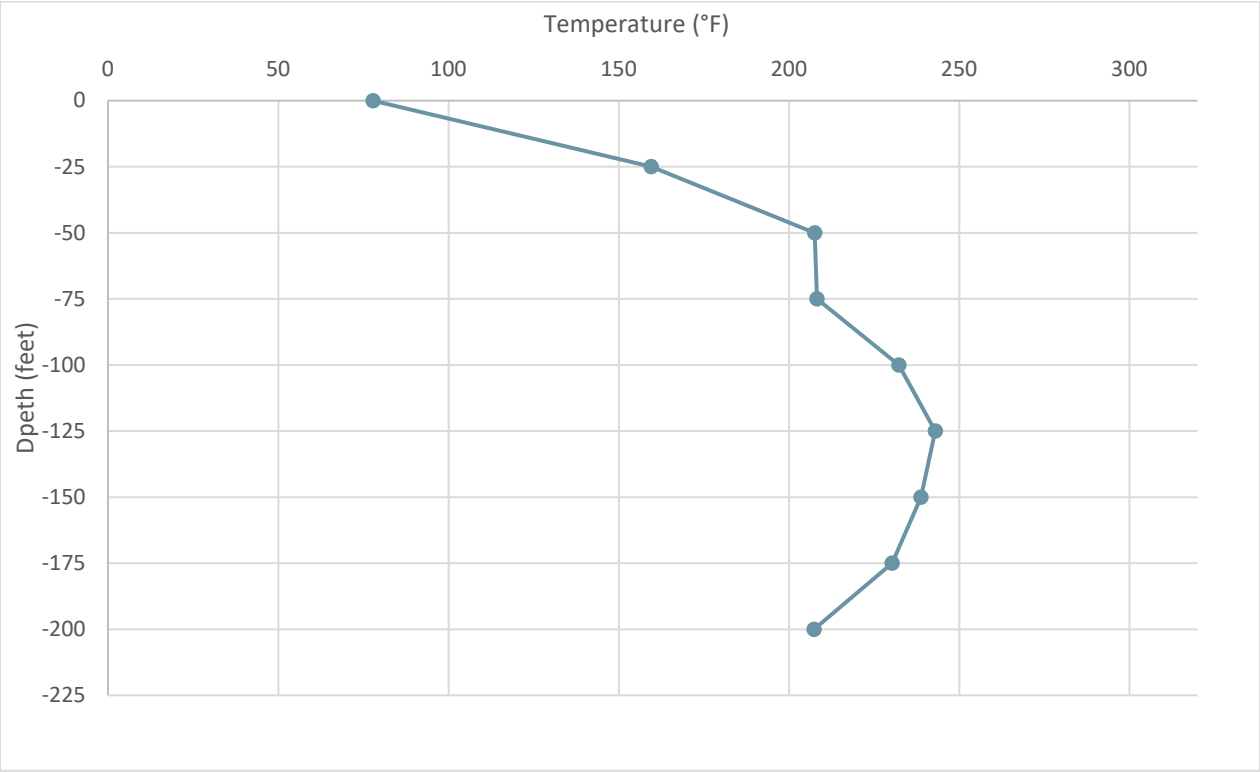


Figure B- 26. Average Temperatures Recorded by TP-7 on July 19, 2023

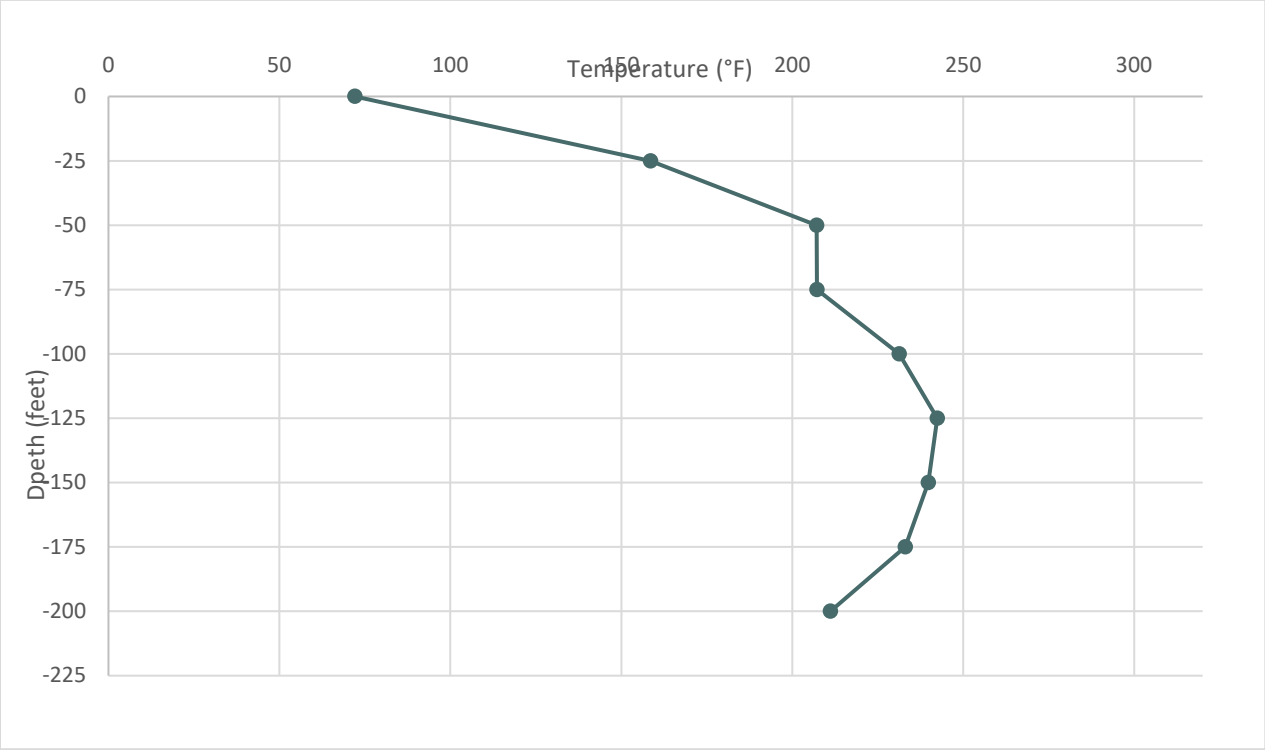


Figure B- 27. Average Temperatures Recorded by TP-7 on July 24, 2023

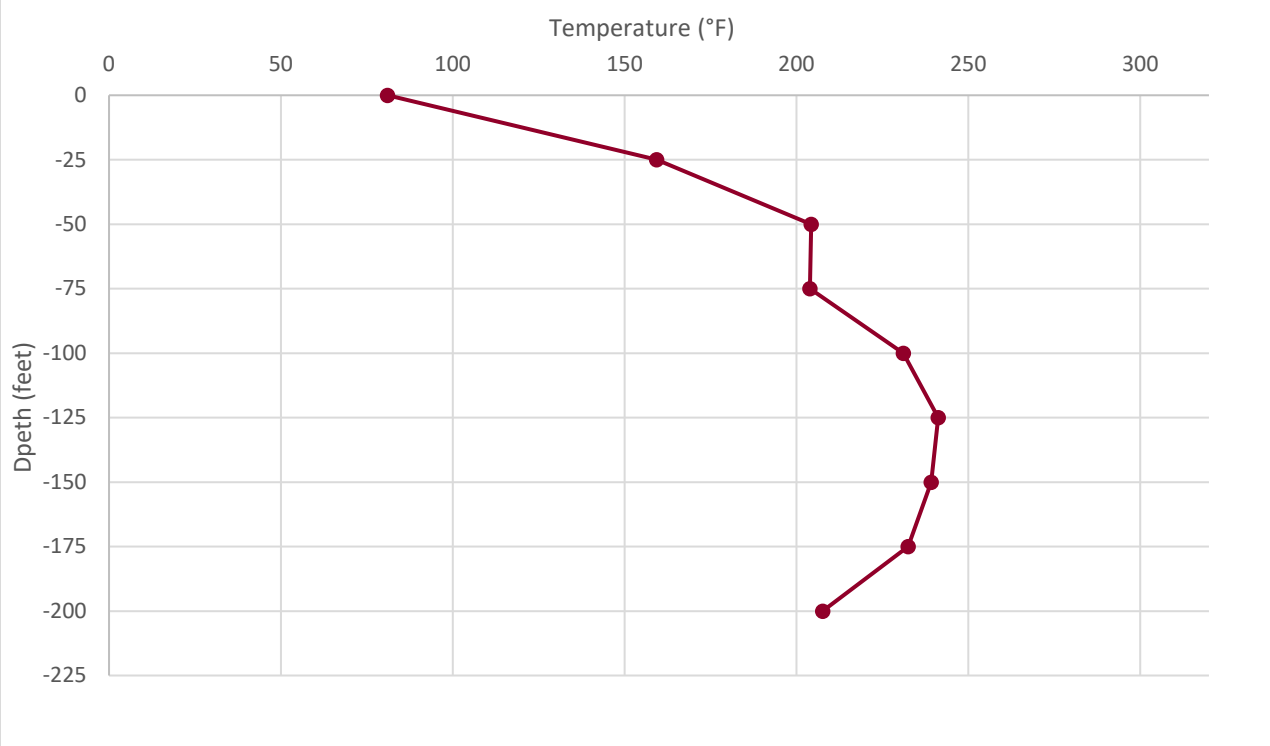


Figure B- 28. Average Temperatures Recorded by TP-8 on July 5, 2023

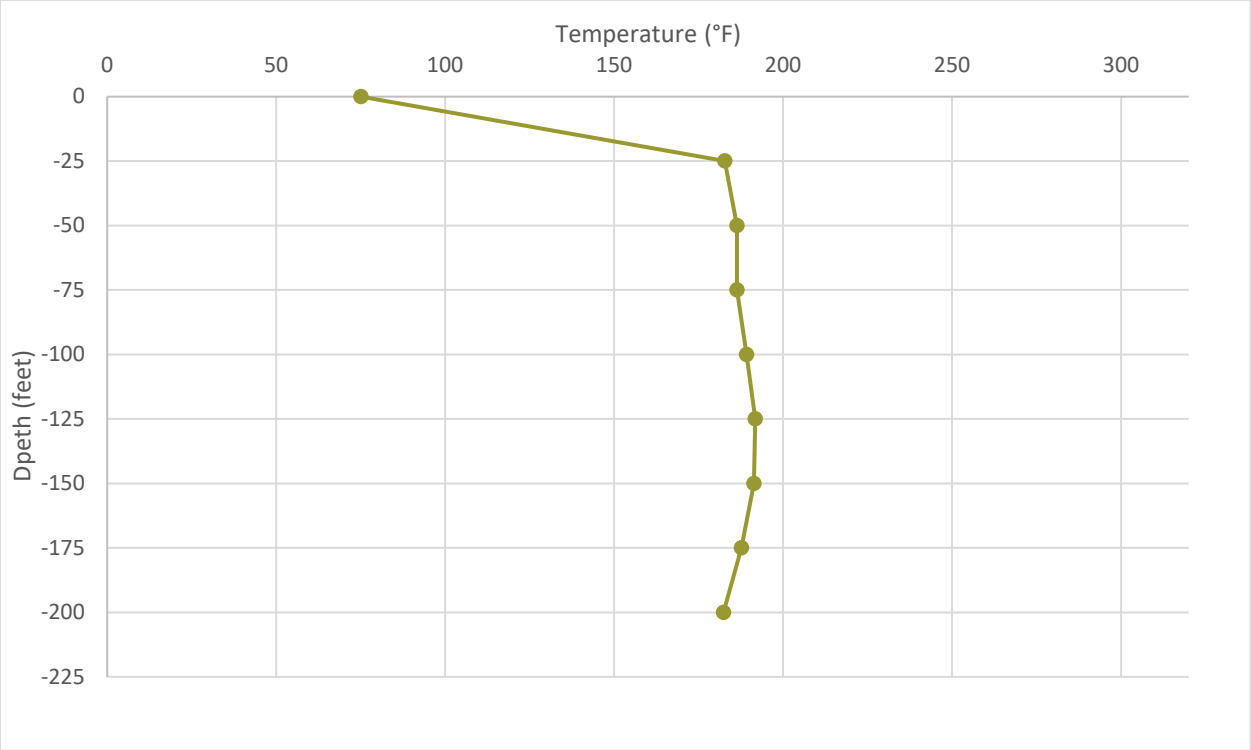


Figure B- 29. Average Temperatures Recorded by TP-8 on July 12, 2023

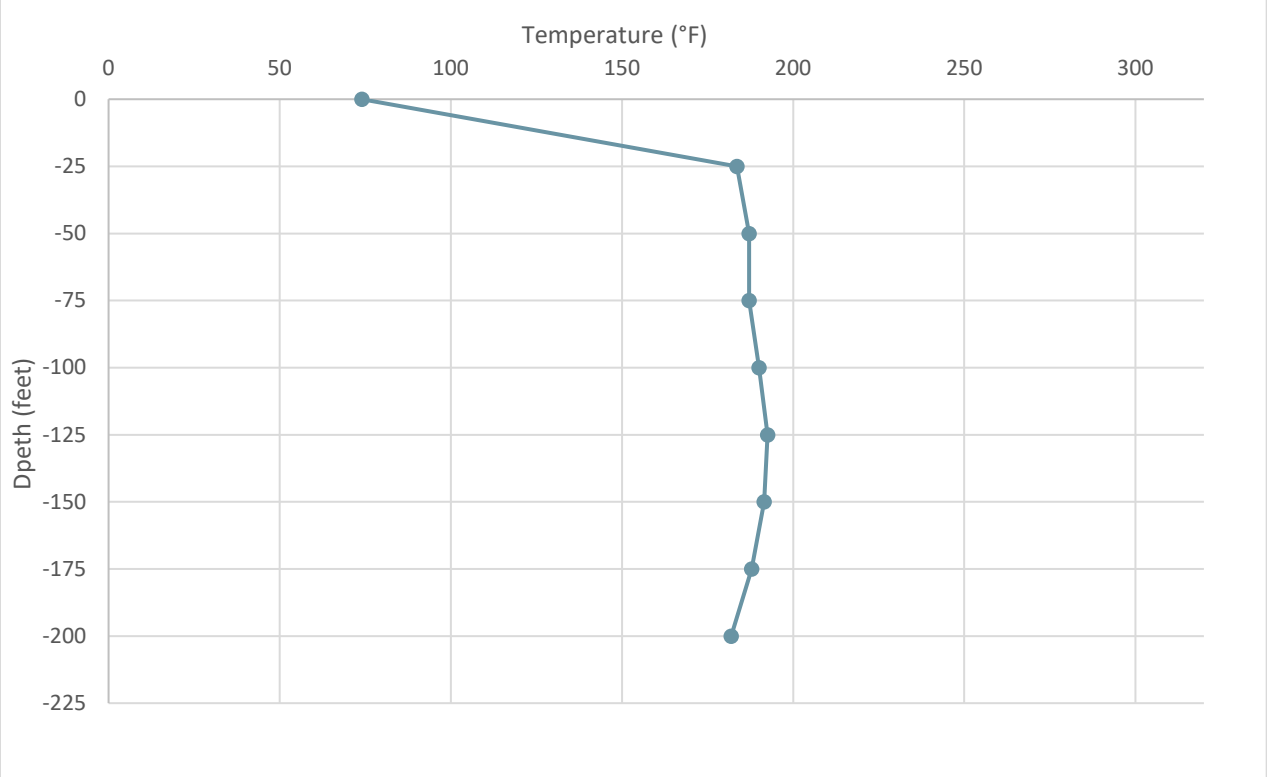


Figure B- 30. Average Temperatures Recorded by TP-8 on July 19, 2023

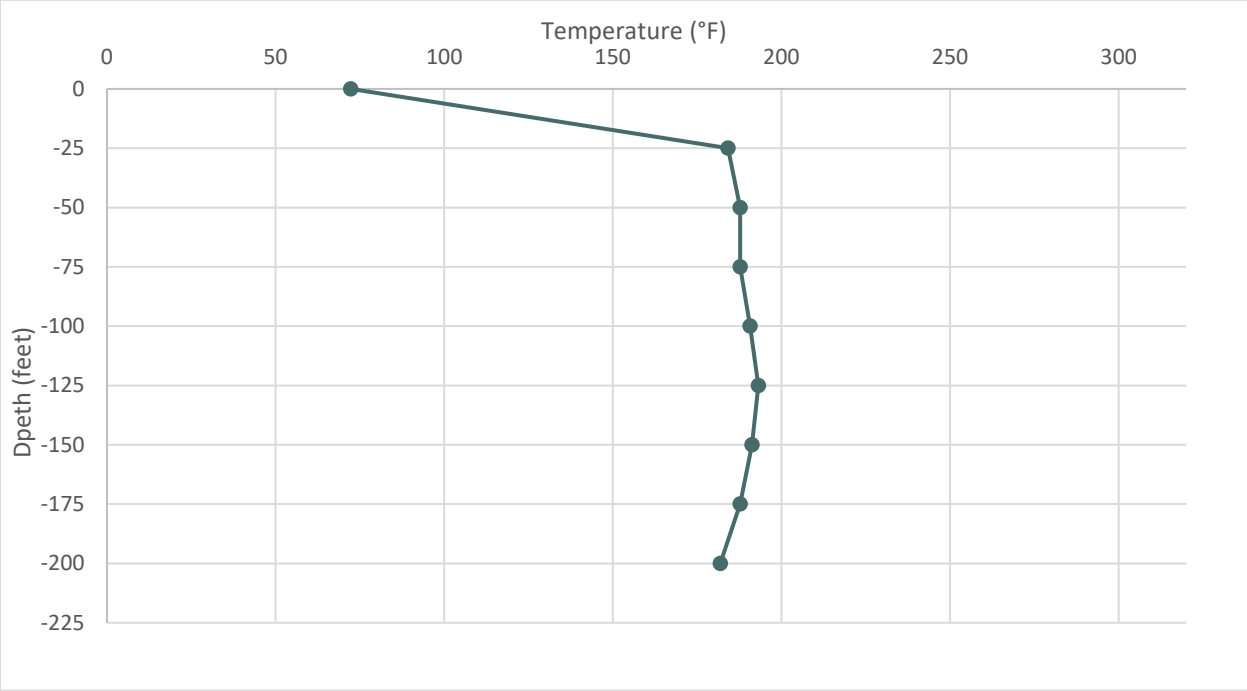


Figure B- 31. Average Temperatures Recorded by TP-8 on July 24, 2023

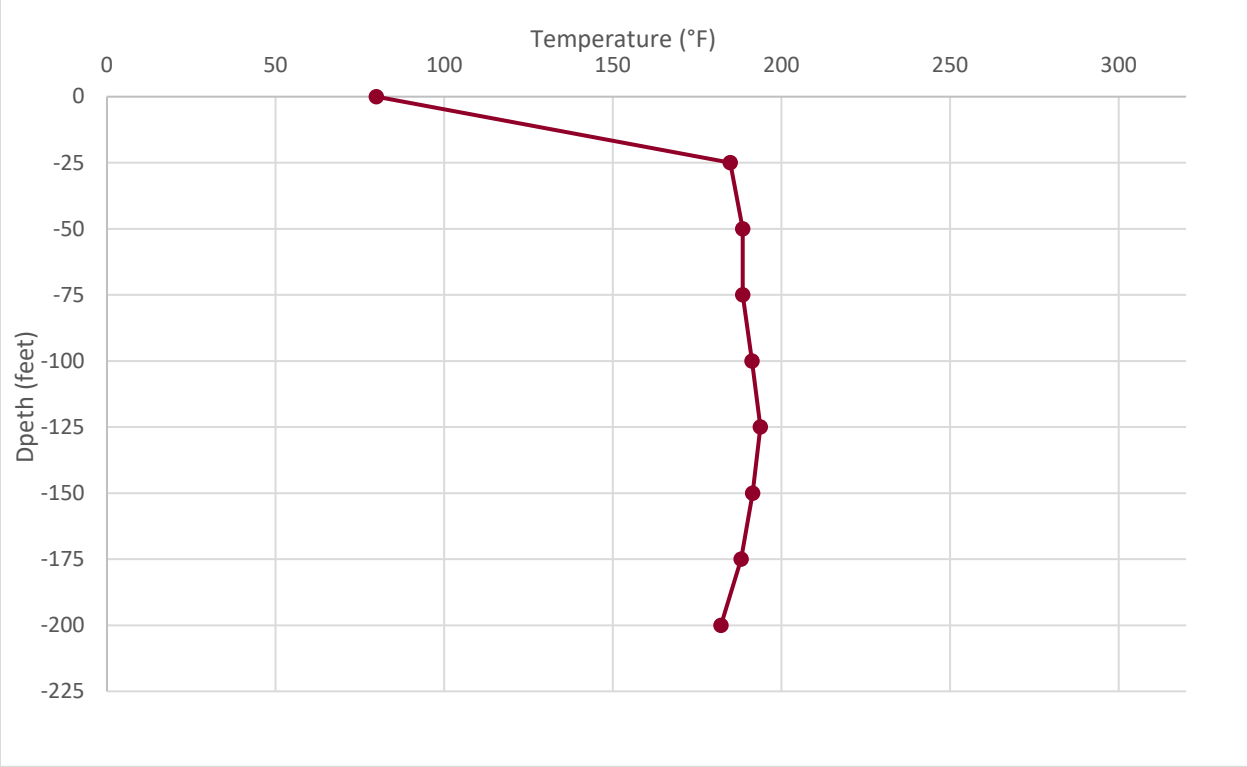


Figure B- 32. Average Temperatures Recorded by TP-9 on July 5, 2023

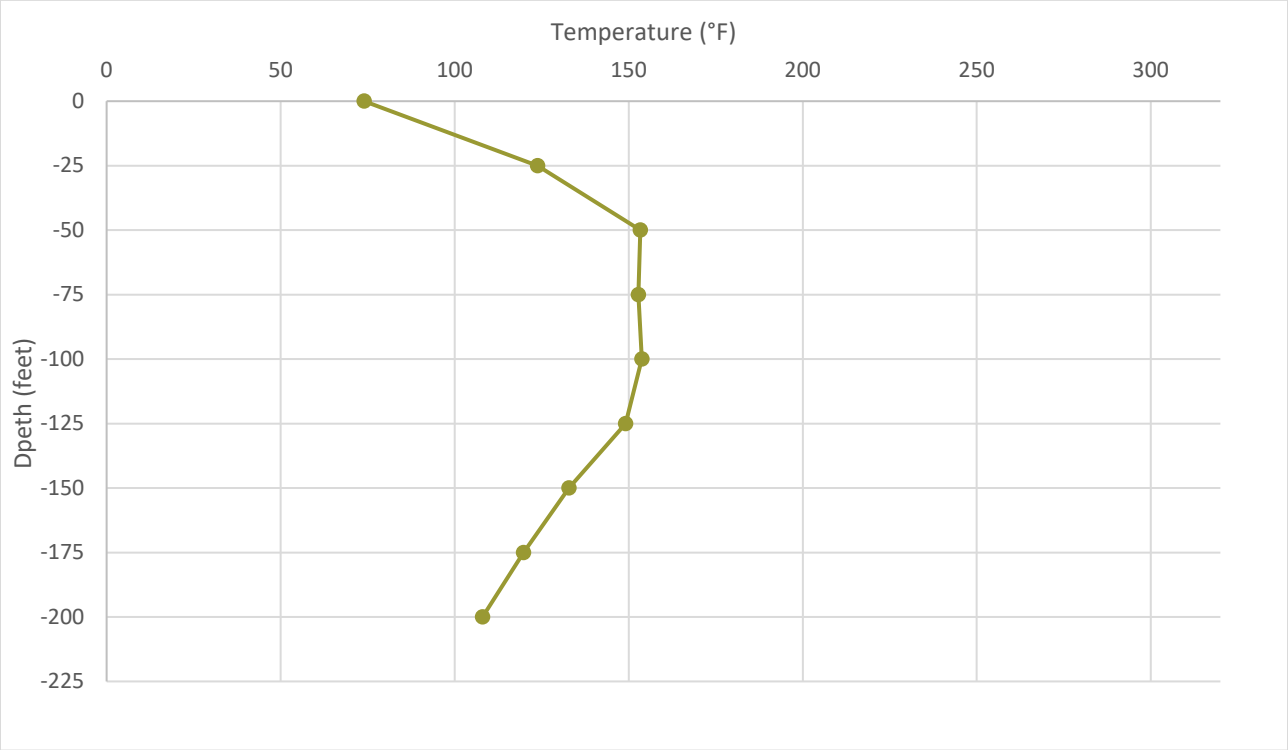


Figure B- 33. Average Temperatures Recorded by TP-9 on July 12, 2023

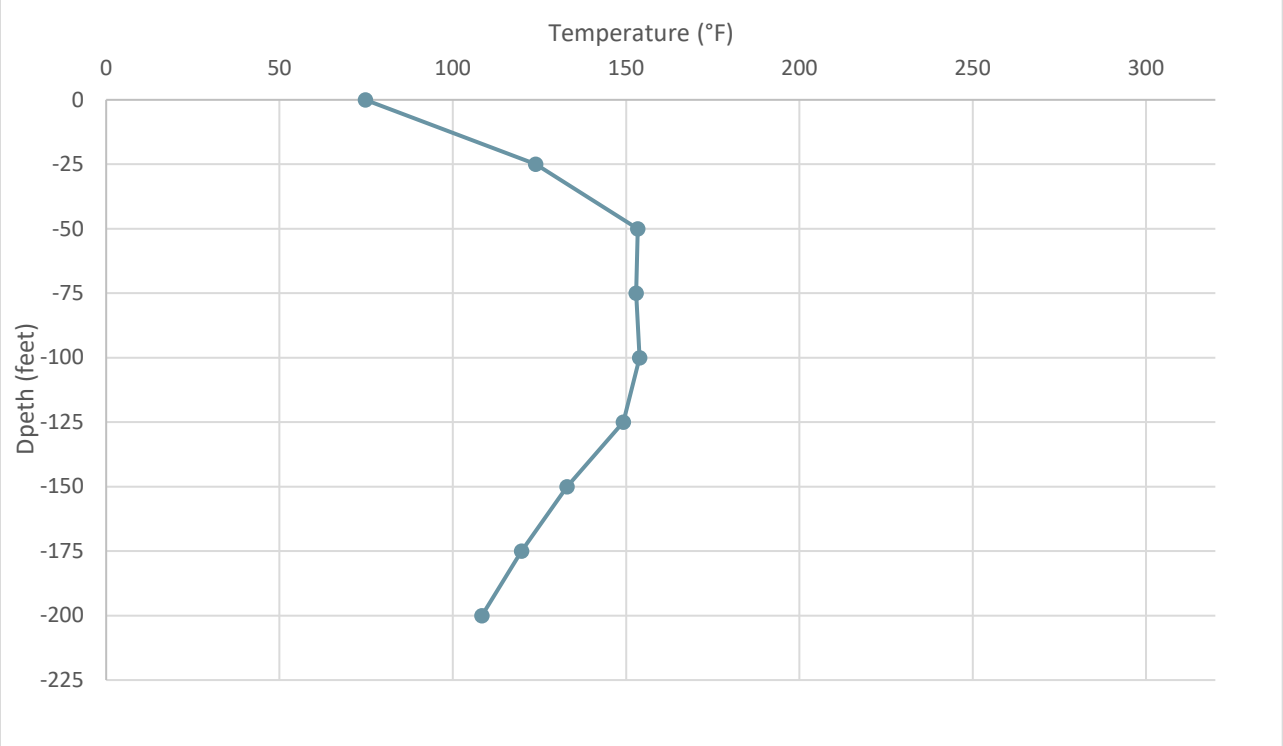


Figure B- 34. Average Temperatures Recorded by TP-9 on July 19, 2023

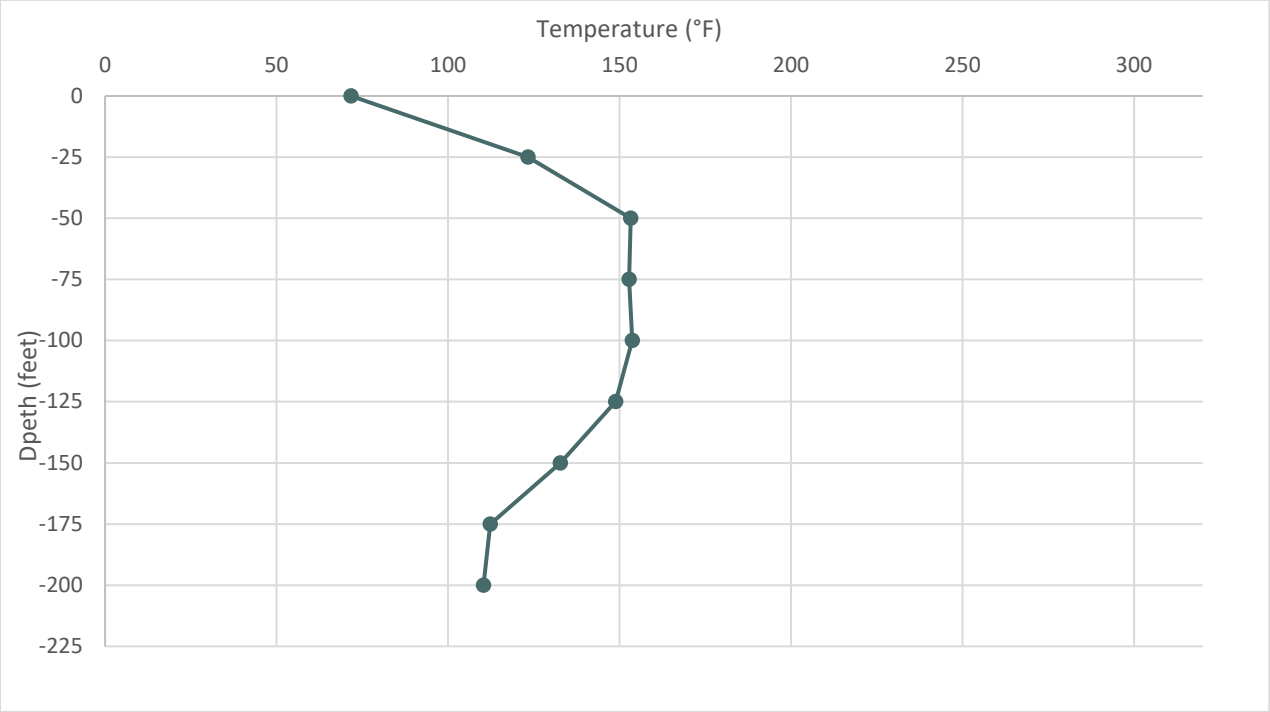
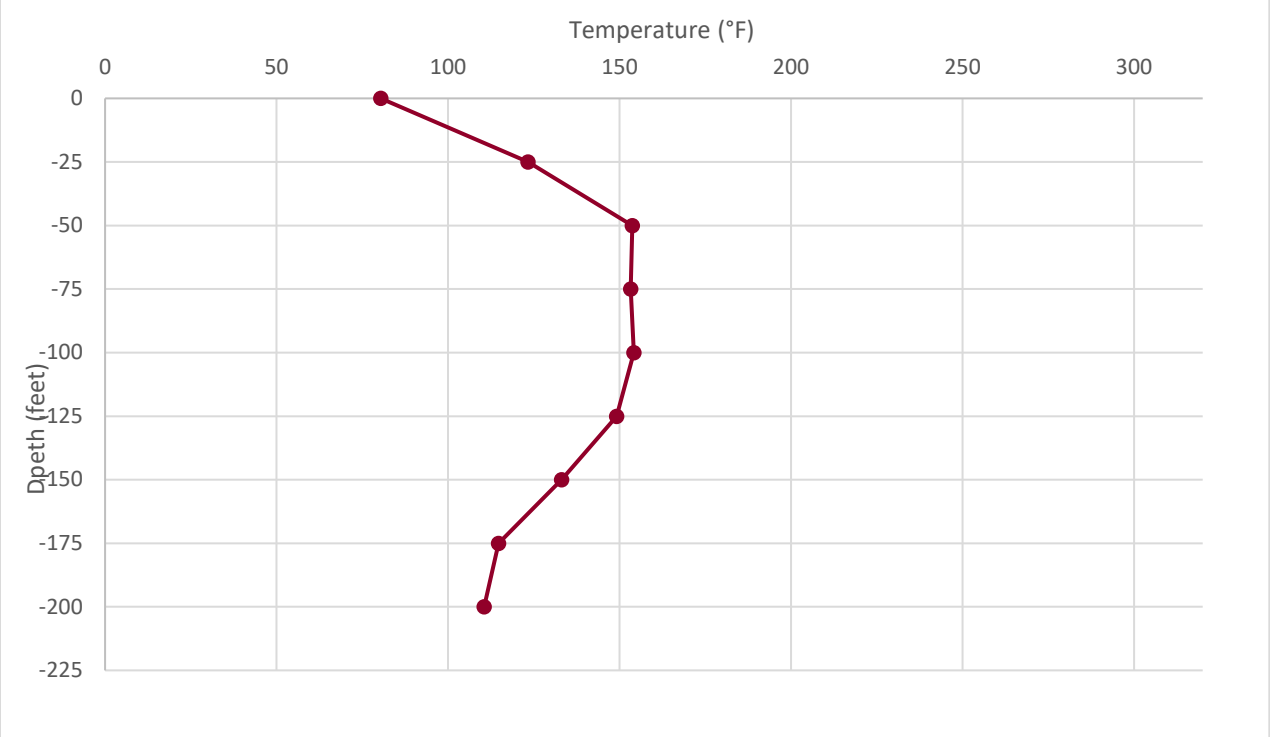


Figure B- 35. Average Temperatures Recorded by TP-9 on July 24, 2023



Appendix C

Daily Wellhead Temperature Averages

Solid Waste Permit 588 Daily Wellhead Temperature Averages

The data provided in this report represent initial readings provided by field instrumentation without Validation, analysis, quality assurance review, or context based on operating conditions. This report is subject to revision following quality assurance review and an analysis of operating conditions. SCS will continue to provide a supplemental report with additional information and further analysis on a bi-monthly basis at a minimum.

As of the date of this report, the system is still undergoing commissioning and SCS staff is still conducting verification testing and making minor field modifications to this system. Some values reported may differ from recordings made by other field instrumentation. SCS may elect to report values gathered from other data sources (GEM, field thermometer) for regulatory purposes until commissioning is complete.

SCS ENGINEERS

07222143.00 | August 7, 2023

3160 Oregon Pike
Leola, PA 17540
717-550-6330

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 32R

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	0.0	116.0	116.0
Jul 2	0.0	0.0	0.0
Jul 3	0.0	0.0	0.0
Jul 4	0.0	0.0	0.0
Jul 5	0.0	0.0	0.0
Jul 6	112.9	109.7	115.7
Jul 7	111.3	105.2	115.7
Jul 8	112.3	109.0	115.8
Jul 9	110.3	107.9	113.3
Jul 10	110.5	107.5	113.6
Jul 11	111.4	107.9	115.3
Jul 12	112.4	108.8	116.4
Jul 13	112.9	110.1	116.7
Jul 14	101.5	68.0	117.5
Jul 15	112.5	110.0	116.0
Jul 16	111.7	109.7	114.7
Jul 17	111.8	109.0	115.3
Jul 18	112.7	109.1	116.8
Jul 19	111.6	109.7	113.3
Jul 20	112.6	110.1	115.1
Jul 21	113.2	111.4	116.5
Jul 22	112.8	111.3	115.4
Jul 23	113.0	110.4	116.2
Jul 24	113.0	110.3	116.1
Jul 25	113.3	111.4	115.9
Jul 26	113.9	111.6	116.6
Jul 27	112.9	103.9	119.0
Jul 28	113.1	109.5	117.5
Jul 29	111.2	105.5	117.3
Jul 30	109.2	105.9	113.4
Jul 31	108.5	105.9	112.6
Summary	**93.6**	**0.0**	**113.9**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 35

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	74.8	66.0	95.4
Jul 2	76.1	64.2	92.6
Jul 3	76.2	68.3	89.7
Jul 4	77.6	65.5	93.8
Jul 5	76.9	65.3	91.6
Jul 6	78.8	65.7	95.9
Jul 7	79.3	68.9	96.0
Jul 8	79.2	64.5	96.7
Jul 9	74.4	67.7	86.1
Jul 10	76.3	63.8	93.2
Jul 11	76.7	57.6	97.5
Jul 12	79.6	60.5	99.6
Jul 13	78.7	63.9	95.4
Jul 14	77.8	68.6	96.2
Jul 15	76.3	65.7	95.1
Jul 16	78.2	69.4	91.7
Jul 17	76.4	61.8	92.4
Jul 18	77.7	66.9	93.7
Jul 19	74.1	69.3	82.7
Jul 20	73.8	65.6	83.6
Jul 21	76.6	68.1	93.9
Jul 22	74.6	67.5	90.6
Jul 23	77.6	63.1	96.1
Jul 24	78.5	61.2	98.0
Jul 25	77.3	64.6	97.2
Jul 26	82.1	66.0	100.9
Jul 27	82.4	68.0	101.5
Jul 28	83.6	68.0	104.4
Jul 29	78.1	68.4	100.6
Jul 30	72.9	67.6	91.6
Jul 31	72.0	63.2	91.6
Summary	**77.2**	**72.0**	**83.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 39

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	74.3	66.3	94.8
Jul 2	75.9	63.8	91.9
Jul 3	75.4	68.1	88.9
Jul 4	77.1	65.0	93.5
Jul 5	76.7	65.2	92.0
Jul 6	78.2	65.4	94.6
Jul 7	78.4	68.4	95.3
Jul 8	78.3	64.0	93.6
Jul 9	74.1	67.6	85.4
Jul 10	74.5	62.9	89.3
Jul 11	74.5	56.7	94.6
Jul 12	77.0	59.5	96.1
Jul 13	78.0	63.1	94.7
Jul 14	76.5	68.1	93.7
Jul 15	75.5	64.9	94.8
Jul 16	77.4	68.2	90.5
Jul 17	75.3	60.8	90.9
Jul 18	93.5	65.9	133.1
Jul 19	132.0	131.7	132.3
Jul 20	0.0	131.9	131.9
Jul 21	0.0	131.9	131.9
Jul 22	0.0	131.9	131.9
Jul 23	0.0	131.9	131.9
Jul 24	0.0	131.9	131.9
Jul 25	0.0	131.9	131.9
Jul 26	0.0	131.9	131.9
Jul 27	0.0	131.9	131.9
Jul 28	0.0	131.9	131.9
Jul 29	0.0	131.9	131.9
Jul 30	0.0	131.9	131.9
Jul 31	0.0	131.9	131.9
Summary	**49.1**	**0.0**	**132.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 40

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	74.7	66.3	96.8
Jul 2	76.3	63.7	93.5
Jul 3	75.8	68.1	88.1
Jul 4	78.0	65.2	99.0
Jul 5	78.0	65.3	97.3
Jul 6	79.5	65.3	99.7
Jul 7	79.5	68.6	100.2
Jul 8	80.0	64.5	97.6
Jul 9	75.4	67.5	87.0
Jul 10	76.7	65.6	95.6
Jul 11	79.3	33.2	100.3
Jul 12	90.2	72.5	101.6
Jul 13	79.8	66.4	96.9
Jul 14	77.1	67.9	95.4
Jul 15	78.0	67.3	97.5
Jul 16	77.9	69.0	91.7
Jul 17	81.9	66.9	96.6
Jul 18	78.7	67.0	95.3
Jul 19	74.3	68.5	85.7
Jul 20	75.6	68.3	84.4
Jul 21	76.3	68.0	94.4
Jul 22	79.4	67.7	91.0
Jul 23	82.1	67.2	98.2
Jul 24	82.7	67.9	99.4
Jul 25	73.2	69.2	69.2
Jul 26	0.0	85.0	85.0
Jul 27	0.0	93.1	93.1
Jul 28	93.4	83.0	106.0
Jul 29	79.9	68.9	99.5
Jul 30	72.1	67.2	85.1
Jul 31	74.9	66.0	88.2
Summary	**73.6**	**0.0**	**93.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 46

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	76.8	68.0	94.4
Jul 2	76.7	65.5	89.3
Jul 3	76.2	69.7	88.5
Jul 4	78.6	66.4	94.9
Jul 5	78.1	67.5	89.6
Jul 6	80.0	67.9	95.5
Jul 7	79.9	70.8	94.9
Jul 8	79.6	66.1	96.1
Jul 9	76.0	70.1	86.4
Jul 10	79.2	67.2	95.8
Jul 11	79.2	63.6	98.1
Jul 12	79.9	65.1	97.1
Jul 13	80.2	67.9	95.9
Jul 14	78.5	69.4	95.3
Jul 15	76.4	66.1	96.7
Jul 16	79.7	71.2	93.7
Jul 17	79.5	66.6	94.5
Jul 18	83.5	74.5	97.2
Jul 19	80.5	76.2	86.2
Jul 20	0.0	81.5	81.5
Jul 21	0.0	81.5	81.5
Jul 22	0.0	81.5	81.5
Jul 23	0.0	81.5	81.5
Jul 24	0.0	81.5	81.5
Jul 25	0.0	81.5	81.5
Jul 26	0.0	81.5	81.5
Jul 27	0.0	81.5	81.5
Jul 28	0.0	81.5	81.5
Jul 29	0.0	81.5	81.5
Jul 30	0.0	81.5	81.5
Jul 31	0.0	81.5	81.5
Summary	**48.3**	**0.0**	**83.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 47

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	77.2	68.0	99.0
Jul 2	79.7	66.5	95.7
Jul 3	78.5	71.1	91.1
Jul 4	80.5	67.7	99.1
Jul 5	80.3	67.6	98.7
Jul 6	82.5	68.1	102.7
Jul 7	81.8	71.4	97.5
Jul 8	82.6	67.4	100.4
Jul 9	77.1	69.7	89.8
Jul 10	79.3	66.4	94.9
Jul 11	79.4	59.6	101.1
Jul 12	81.5	62.8	102.6
Jul 13	82.2	66.2	99.0
Jul 14	80.9	69.5	99.9
Jul 15	78.5	67.4	97.9
Jul 16	80.1	70.1	91.0
Jul 17	76.7	61.3	93.3
Jul 18	80.0	66.2	94.9
Jul 19	94.6	71.9	140.1
Jul 20	76.6	69.0	87.3
Jul 21	79.1	70.0	96.5
Jul 22	80.5	71.6	97.7
Jul 23	78.1	63.3	95.1
Jul 24	81.9	61.1	131.0
Jul 25	81.4	69.3	98.8
Jul 26	88.0	71.7	104.7
Jul 27	86.3	74.1	101.8
Jul 28	85.3	69.2	105.3
Jul 29	80.5	69.4	99.8
Jul 30	77.0	70.7	90.8
Jul 31	75.0	65.0	93.5
Summary	**80.7**	**75.0**	**94.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 49

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	143.4	137.8	146.2
Jul 2	143.8	139.7	145.1
Jul 3	144.9	141.5	148.6
Jul 4	145.7	143.2	147.7
Jul 5	145.6	143.7	147.7
Jul 6	145.6	142.7	149.2
Jul 7	144.1	135.7	146.4
Jul 8	144.4	142.6	145.9
Jul 9	142.6	140.4	143.8
Jul 10	143.9	142.3	146.2
Jul 11	144.2	141.6	148.0
Jul 12	144.0	141.8	145.8
Jul 13	144.7	142.3	146.6
Jul 14	139.4	116.3	148.0
Jul 15	143.3	140.1	145.0
Jul 16	143.1	142.4	144.0
Jul 17	143.9	142.0	145.3
Jul 18	144.2	140.3	146.8
Jul 19	143.8	142.2	146.0
Jul 20	144.4	142.8	146.6
Jul 21	143.4	142.4	145.0
Jul 22	143.6	142.9	144.7
Jul 23	143.6	142.3	144.6
Jul 24	143.4	141.7	144.6
Jul 25	144.3	141.5	146.3
Jul 26	144.8	140.8	146.4
Jul 27	144.8	133.3	149.7
Jul 28	146.1	143.1	147.8
Jul 29	141.1	136.6	144.5
Jul 30	100.1	90.5	100.1
Jul 31	0.0	100.1	100.1
Summary	**137.9**	**0.0**	**146.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 50

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	114.4	112.6	117.1
Jul 2	114.6	113.1	116.5
Jul 3	114.5	113.2	115.9
Jul 4	114.7	113.5	116.7
Jul 5	114.7	113.2	116.6
Jul 6	117.0	112.9	123.7
Jul 7	121.6	119.9	124.4
Jul 8	121.7	120.5	123.3
Jul 9	120.0	118.7	121.0
Jul 10	119.8	118.2	121.5
Jul 11	119.1	117.2	121.4
Jul 12	119.2	117.1	121.3
Jul 13	119.2	117.7	121.0
Jul 14	112.0	74.0	121.5
Jul 15	117.8	114.7	120.1
Jul 16	115.7	114.7	117.1
Jul 17	116.9	113.8	120.2
Jul 18	119.1	116.9	120.9
Jul 19	118.5	117.6	119.1
Jul 20	118.6	117.6	119.8
Jul 21	116.4	115.3	118.1
Jul 22	115.6	114.9	117.1
Jul 23	115.6	114.3	117.3
Jul 24	117.2	114.3	120.3
Jul 25	118.2	117.2	120.0
Jul 26	118.5	117.3	120.2
Jul 27	118.8	115.9	121.4
Jul 28	119.6	118.0	122.2
Jul 29	118.9	116.9	121.8
Jul 30	117.4	115.4	118.6
Jul 31	115.1	113.5	117.3
Summary	**117.4**	**112.0**	**121.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 51

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	76.0	67.2	97.2
Jul 2	78.9	66.3	98.6
Jul 3	78.4	70.9	94.4
Jul 4	82.8	69.6	102.1
Jul 5	81.6	71.3	95.3
Jul 6	81.7	68.8	101.4
Jul 7	83.6	75.0	95.2
Jul 8	82.4	69.4	98.8
Jul 9	77.4	70.8	88.7
Jul 10	80.4	70.2	94.5
Jul 11	124.6	68.3	173.0
Jul 12	134.3	61.0	191.6
Jul 13	162.1	101.2	194.3
Jul 14	131.8	77.3	194.7
Jul 15	101.1	70.1	191.6
Jul 16	95.9	68.1	189.8
Jul 17	103.7	60.6	192.9
Jul 18	98.5	66.2	191.2
Jul 19	123.3	69.1	193.6
Jul 20	129.3	89.2	193.9
Jul 21	94.3	83.3	135.6
Jul 22	160.8	80.3	184.0
Jul 23	150.5	85.8	175.0
Jul 24	147.5	77.3	190.5
Jul 25	126.9	67.5	195.0
Jul 26	102.8	68.8	189.3
Jul 27	95.9	69.5	189.7
Jul 28	86.3	69.1	113.0
Jul 29	83.3	71.0	109.1
Jul 30	77.3	70.5	98.7
Jul 31	81.7	66.2	171.3
Summary	**103.7**	**76.0**	**162.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 52

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	143.8	139.7	146.5
Jul 2	139.1	52.7	144.5
Jul 3	142.2	139.6	144.4
Jul 4	142.0	140.4	143.9
Jul 5	155.0	140.4	173.1
Jul 6	149.6	146.6	153.4
Jul 7	145.6	142.3	147.6
Jul 8	144.6	143.3	146.0
Jul 9	142.5	140.2	143.5
Jul 10	152.3	142.0	171.1
Jul 11	156.5	144.2	170.9
Jul 12	149.5	146.4	152.5
Jul 13	144.5	141.7	147.6
Jul 14	139.6	129.6	145.5
Jul 15	142.9	122.9	147.3
Jul 16	142.4	137.0	145.2
Jul 17	139.9	137.7	141.8
Jul 18	138.8	135.1	142.1
Jul 19	153.6	135.5	173.7
Jul 20	165.2	153.1	174.9
Jul 21	153.8	151.4	155.7
Jul 22	148.2	55.6	152.3
Jul 23	134.6	72.6	147.8
Jul 24	124.9	62.7	177.5
Jul 25	160.5	153.2	174.9
Jul 26	158.9	151.5	175.7
Jul 27	158.1	150.5	173.3
Jul 28	150.1	146.7	152.3
Jul 29	145.4	137.7	148.2
Jul 30	143.5	140.9	146.4
Jul 31	142.7	139.0	145.6
Summary	**146.8**	**124.9**	**165.2**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 53

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	150.3	143.0	156.9
Jul 2	149.1	142.0	155.0
Jul 3	148.2	142.0	153.3
Jul 4	148.0	144.5	154.5
Jul 5	148.3	143.9	153.9
Jul 6	166.0	141.7	191.8
Jul 7	157.0	151.3	161.8
Jul 8	152.7	149.9	157.4
Jul 9	148.9	144.1	152.8
Jul 10	164.3	145.9	191.4
Jul 11	165.2	154.6	190.4
Jul 12	158.6	155.3	162.8
Jul 13	164.5	154.0	187.9
Jul 14	159.5	144.2	182.6
Jul 15	153.5	144.5	159.1
Jul 16	152.2	149.3	156.5
Jul 17	158.9	147.5	188.0
Jul 18	157.7	143.5	186.2
Jul 19	160.2	155.6	181.6
Jul 20	159.6	84.7	183.3
Jul 21	155.1	75.6	162.5
Jul 22	156.6	153.2	161.1
Jul 23	156.1	152.7	161.2
Jul 24	159.0	151.8	174.2
Jul 25	163.3	150.9	193.2
Jul 26	171.2	86.9	194.2
Jul 27	165.4	90.1	189.2
Jul 28	162.0	77.0	186.2
Jul 29	155.5	77.8	167.7
Jul 30	151.5	75.9	163.2
Jul 31	156.7	152.7	163.1
Summary	**157.3**	**148.0**	**171.2**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 54

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	152.7	136.2	171.0
Jul 2	140.2	130.7	147.2
Jul 3	142.3	125.2	171.1
Jul 4	139.0	130.0	146.0
Jul 5	141.1	119.2	171.2
Jul 6	126.5	106.3	134.8
Jul 7	105.7	91.4	117.7
Jul 8	96.2	84.8	112.0
Jul 9	84.1	75.3	95.8
Jul 10	125.7	77.1	172.6
Jul 11	148.9	109.4	174.7
Jul 12	142.4	124.7	173.2
Jul 13	137.3	111.4	172.8
Jul 14	140.3	96.3	174.1
Jul 15	133.2	95.3	177.8
Jul 16	116.5	81.9	175.8
Jul 17	109.3	71.5	174.9
Jul 18	122.4	76.8	182.3
Jul 19	120.1	72.4	177.5
Jul 20	157.4	128.1	180.9
Jul 21	140.3	130.4	172.2
Jul 22	115.5	91.7	134.1
Jul 23	86.6	75.7	162.9
Jul 24	112.2	62.6	177.1
Jul 25	114.6	85.3	172.2
Jul 26	114.4	79.6	174.6
Jul 27	107.5	82.1	135.5
Jul 28	107.3	93.2	127.4
Jul 29	91.7	79.1	111.3
Jul 30	83.7	76.2	99.9
Jul 31	95.3	74.9	165.2
Summary	**121.0**	**83.7**	**157.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 55

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	84.6	71.6	104.7
Jul 2	91.7	82.2	104.1
Jul 3	93.0	85.9	104.0
Jul 4	94.3	84.0	108.1
Jul 5	93.3	83.7	107.3
Jul 6	93.1	81.1	107.7
Jul 7	94.3	85.6	109.3
Jul 8	93.5	82.2	109.4
Jul 9	85.2	76.4	94.7
Jul 10	137.3	81.4	183.5
Jul 11	156.7	125.3	183.4
Jul 12	139.9	123.1	176.9
Jul 13	133.8	118.1	168.3
Jul 14	119.8	84.9	171.4
Jul 15	76.5	64.8	94.3
Jul 16	78.5	69.0	89.8
Jul 17	95.3	70.6	137.6
Jul 18	86.4	75.6	111.3
Jul 19	79.1	68.9	108.9
Jul 20	111.3	91.2	152.6
Jul 21	96.8	84.4	111.0
Jul 22	95.3	68.0	114.6
Jul 23	79.1	62.3	99.7
Jul 24	107.3	66.2	175.6
Jul 25	109.5	93.7	153.0
Jul 26	116.7	95.8	167.0
Jul 27	114.2	100.9	154.1
Jul 28	106.8	94.9	125.4
Jul 29	99.4	83.4	114.8
Jul 30	94.6	82.5	107.6
Jul 31	104.8	87.0	166.7
Summary	**102.0**	**76.5**	**156.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 56

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	123.5	116.9	131.5
Jul 2	125.1	116.9	131.4
Jul 3	124.8	120.5	130.4
Jul 4	124.9	121.5	132.5
Jul 5	125.1	119.0	131.3
Jul 6	125.9	119.6	133.4
Jul 7	125.9	123.2	131.3
Jul 8	126.8	122.3	133.8
Jul 9	123.4	117.1	128.9
Jul 10	124.8	120.0	131.0
Jul 11	123.7	116.9	132.1
Jul 12	124.6	117.8	133.1
Jul 13	125.4	119.9	132.0
Jul 14	114.7	100.6	128.1
Jul 15	111.9	97.5	123.2
Jul 16	110.2	101.0	121.4
Jul 17	107.2	93.9	122.1
Jul 18	106.3	90.7	122.9
Jul 19	109.8	103.3	116.4
Jul 20	116.8	111.6	125.0
Jul 21	117.4	111.7	127.4
Jul 22	112.4	104.5	122.0
Jul 23	111.5	100.9	124.7
Jul 24	113.6	100.4	127.7
Jul 25	118.5	112.1	125.5
Jul 26	123.8	117.2	131.9
Jul 27	123.6	117.9	130.8
Jul 28	121.0	113.8	131.1
Jul 29	118.3	107.4	129.4
Jul 30	115.9	106.9	125.7
Jul 31	117.3	112.3	127.4
Summary	**119.2**	**106.3**	**126.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 57

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	77.1	67.5	93.2
Jul 2	77.0	66.1	89.7
Jul 3	78.7	70.6	91.2
Jul 4	79.7	66.7	97.0
Jul 5	82.7	67.5	95.5
Jul 6	86.9	68.9	114.7
Jul 7	83.5	67.8	115.0
Jul 8	83.9	62.7	112.7
Jul 9	78.2	67.7	101.0
Jul 10	111.9	63.9	150.7
Jul 11	148.2	130.6	170.8
Jul 12	172.2	169.7	173.5
Jul 13	174.7	173.4	175.8
Jul 14	168.3	157.0	181.8
Jul 15	182.6	180.8	184.2
Jul 16	184.5	183.9	185.2
Jul 17	182.1	179.0	185.1
Jul 18	178.8	160.5	181.8
Jul 19	180.4	175.6	182.3
Jul 20	180.7	175.4	182.5
Jul 21	178.4	162.0	184.8
Jul 22	158.1	150.9	162.3
Jul 23	149.1	141.3	154.6
Jul 24	160.0	131.1	177.3
Jul 25	177.8	166.5	180.8
Jul 26	166.7	161.9	169.9
Jul 27	160.8	157.5	164.7
Jul 28	159.3	156.0	163.7
Jul 29	154.3	146.0	159.6
Jul 30	150.5	141.7	156.8
Jul 31	158.8	147.1	173.7
Summary	**140.8**	**77.0**	**184.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 58

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	87.6	80.6	101.1
Jul 2	89.6	81.6	101.0
Jul 3	90.0	84.1	97.7
Jul 4	91.1	83.4	101.3
Jul 5	90.8	82.9	101.4
Jul 6	91.6	83.4	104.2
Jul 7	91.4	85.6	100.5
Jul 8	91.6	82.8	102.4
Jul 9	88.1	82.6	94.6
Jul 10	89.6	80.8	100.6
Jul 11	89.2	76.0	104.3
Jul 12	94.1	80.7	110.0
Jul 13	117.2	76.4	136.7
Jul 14	95.1	77.7	133.8
Jul 15	81.6	70.9	95.6
Jul 16	82.1	72.7	95.4
Jul 17	85.9	65.0	140.0
Jul 18	127.8	79.2	156.6
Jul 19	79.4	71.4	88.5
Jul 20	93.0	82.9	104.1
Jul 21	103.0	88.2	116.0
Jul 22	110.1	104.4	120.0
Jul 23	112.7	105.7	120.9
Jul 24	89.4	63.0	115.6
Jul 25	106.5	101.4	115.4
Jul 26	109.2	101.6	118.1
Jul 27	105.8	99.4	116.3
Jul 28	103.4	94.9	117.1
Jul 29	99.5	92.2	111.5
Jul 30	97.8	93.7	105.4
Jul 31	96.1	91.5	105.0
Summary	**96.1**	**79.4**	**127.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 59

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	119.0	117.5	121.2
Jul 2	118.0	116.6	119.6
Jul 3	117.6	116.4	119.0
Jul 4	117.3	116.3	118.7
Jul 5	117.4	115.9	119.3
Jul 6	117.7	116.2	125.0
Jul 7	120.1	98.9	134.5
Jul 8	129.7	126.6	131.1
Jul 9	122.3	115.7	130.9
Jul 10	119.1	115.0	124.9
Jul 11	125.9	123.6	127.4
Jul 12	126.7	122.4	129.2
Jul 13	120.1	114.8	126.1
Jul 14	113.9	101.0	125.5
Jul 15	79.6	65.1	93.9
Jul 16	96.9	85.4	108.3
Jul 17	104.0	97.7	112.5
Jul 18	104.4	91.0	116.6
Jul 19	91.2	83.5	105.7
Jul 20	118.2	111.1	120.9
Jul 21	113.6	97.0	119.9
Jul 22	97.0	82.8	95.1
Jul 23	87.8	80.8	95.5
Jul 24	95.9	79.7	119.5
Jul 25	118.8	118.4	119.0
Jul 26	118.3	117.5	118.6
Jul 27	116.2	105.9	118.8
Jul 28	117.9	116.5	119.8
Jul 29	117.3	115.7	118.7
Jul 30	117.4	117.2	117.6
Jul 31	116.2	115.8	117.2
Summary	**112.8**	**79.6**	**129.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 60

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	107.4	103.6	111.2
Jul 2	108.0	104.6	111.3
Jul 3	114.3	105.9	138.0
Jul 4	109.5	105.7	112.8
Jul 5	111.5	106.0	133.7
Jul 6	109.1	106.4	112.3
Jul 7	108.5	104.1	112.0
Jul 8	109.1	105.6	112.8
Jul 9	110.5	106.0	133.4
Jul 10	110.5	105.2	129.7
Jul 11	109.6	105.6	118.0
Jul 12	109.7	106.7	112.7
Jul 13	112.4	107.2	133.4
Jul 14	107.8	86.3	128.0
Jul 15	110.4	106.5	113.0
Jul 16	110.1	108.0	112.0
Jul 17	111.9	107.9	130.2
Jul 18	110.9	104.0	124.9
Jul 19	108.9	101.7	112.3
Jul 20	109.5	103.8	129.4
Jul 21	104.3	92.1	111.4
Jul 22	109.6	107.7	111.5
Jul 23	108.4	92.5	112.4
Jul 24	100.5	65.8	139.1
Jul 25	112.5	108.8	125.9
Jul 26	113.8	106.8	130.4
Jul 27	110.6	105.1	114.2
Jul 28	108.8	103.6	114.9
Jul 29	106.5	101.8	112.8
Jul 30	106.5	103.6	110.5
Jul 31	109.5	103.1	132.0
Summary	**109.4**	**100.5**	**114.3**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 62

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	124.6	122.4	126.7
Jul 2	125.0	122.3	127.1
Jul 3	125.2	123.4	126.6
Jul 4	125.4	124.2	126.8
Jul 5	125.4	123.8	127.1
Jul 6	125.9	124.3	128.1
Jul 7	126.2	124.9	127.7
Jul 8	126.3	124.9	128.3
Jul 9	125.3	123.3	126.8
Jul 10	125.7	124.4	127.7
Jul 11	126.0	124.0	128.3
Jul 12	126.5	124.3	128.8
Jul 13	126.8	124.7	128.7
Jul 14	113.4	69.1	128.5
Jul 15	125.1	121.4	127.0
Jul 16	124.9	124.1	126.5
Jul 17	124.8	123.2	126.6
Jul 18	125.1	122.4	126.8
Jul 19	124.7	123.7	125.5
Jul 20	124.7	123.4	126.0
Jul 21	125.5	124.4	127.4
Jul 22	125.8	124.9	127.3
Jul 23	126.3	124.9	127.8
Jul 24	126.6	124.7	128.7
Jul 25	126.6	125.1	128.0
Jul 26	127.0	122.3	128.9
Jul 27	125.2	100.4	129.1
Jul 28	127.2	125.6	129.6
Jul 29	125.9	121.1	128.4
Jul 30	125.2	122.1	127.2
Jul 31	125.2	121.4	127.6
Summary	**125.3**	**113.4**	**127.2**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 63

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	125.4	116.9	130.2
Jul 2	126.0	119.3	128.9
Jul 3	126.3	122.8	128.8
Jul 4	127.0	124.7	131.1
Jul 5	127.0	124.4	130.1
Jul 6	127.0	122.6	130.5
Jul 7	127.7	125.7	131.2
Jul 8	128.1	125.1	131.0
Jul 9	125.7	120.7	128.1
Jul 10	126.9	124.2	130.2
Jul 11	127.7	123.7	131.4
Jul 12	128.3	124.3	132.0
Jul 13	128.4	124.9	131.1
Jul 14	112.9	68.5	131.5
Jul 15	127.9	123.5	132.0
Jul 16	128.0	126.3	131.0
Jul 17	128.3	125.5	130.6
Jul 18	128.4	123.9	131.6
Jul 19	127.7	126.1	129.3
Jul 20	127.2	125.0	129.4
Jul 21	128.0	126.2	131.1
Jul 22	128.3	126.7	130.6
Jul 23	128.9	126.0	131.6
Jul 24	127.6	63.0	133.4
Jul 25	130.6	128.6	133.0
Jul 26	131.5	128.9	134.5
Jul 27	126.0	96.6	132.9
Jul 28	129.0	125.7	133.2
Jul 29	126.4	119.9	131.1
Jul 30	124.8	120.8	129.6
Jul 31	125.0	122.7	129.5
Summary	**127.0**	**112.9**	**131.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 64

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	124.2	115.9	129.6
Jul 2	124.8	119.1	128.3
Jul 3	124.5	119.3	126.6
Jul 4	126.0	123.1	129.1
Jul 5	125.4	119.2	129.1
Jul 6	126.0	122.8	129.7
Jul 7	126.4	123.4	130.6
Jul 8	126.6	122.5	130.3
Jul 9	123.6	118.6	127.8
Jul 10	126.4	122.4	130.3
Jul 11	126.9	121.3	131.5
Jul 12	126.8	121.3	133.0
Jul 13	127.3	123.0	130.8
Jul 14	112.5	68.6	130.3
Jul 15	127.4	121.8	130.8
Jul 16	127.5	125.4	129.8
Jul 17	126.8	124.0	129.1
Jul 18	129.2	123.3	133.3
Jul 19	130.8	128.5	134.5
Jul 20	130.1	128.4	132.1
Jul 21	131.5	128.4	134.4
Jul 22	131.0	126.1	133.4
Jul 23	131.8	128.9	134.1
Jul 24	133.8	130.1	137.8
Jul 25	134.5	133.0	136.3
Jul 26	134.6	131.9	136.7
Jul 27	132.2	108.7	135.9
Jul 28	132.6	129.7	136.3
Jul 29	132.4	127.8	135.7
Jul 30	130.2	126.6	132.0
Jul 31	129.6	125.3	132.6
Summary	**128.2**	**112.5**	**134.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 65

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	135.8	132.3	138.0
Jul 2	135.8	134.4	137.5
Jul 3	135.5	133.7	136.9
Jul 4	135.6	134.6	137.2
Jul 5	134.9	133.6	136.9
Jul 6	134.1	132.8	136.5
Jul 7	133.4	132.1	135.4
Jul 8	132.7	130.6	135.7
Jul 9	130.8	127.8	132.8
Jul 10	131.1	128.2	133.7
Jul 11	130.3	126.4	134.6
Jul 12	130.4	126.7	133.8
Jul 13	130.1	126.5	133.6
Jul 14	114.6	68.5	133.7
Jul 15	128.1	121.3	132.2
Jul 16	126.6	124.1	128.9
Jul 17	124.5	120.7	127.8
Jul 18	124.3	117.4	129.6
Jul 19	121.6	117.9	125.2
Jul 20	119.3	115.5	123.3
Jul 21	120.0	117.1	125.8
Jul 22	119.6	116.6	125.4
Jul 23	119.8	113.8	125.6
Jul 24	120.0	114.2	126.4
Jul 25	116.7	111.2	124.5
Jul 26	116.1	108.6	124.4
Jul 27	110.6	100.0	121.1
Jul 28	109.7	100.9	121.6
Jul 29	103.5	91.1	118.0
Jul 30	99.4	91.1	110.4
Jul 31	98.8	91.8	110.4
Summary	**123.4**	**98.8**	**135.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 66

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	85.4	77.9	95.9
Jul 2	87.1	80.2	95.8
Jul 3	87.2	80.7	93.4
Jul 4	87.7	80.9	95.0
Jul 5	88.3	80.8	97.3
Jul 6	89.6	82.6	99.2
Jul 7	89.8	84.9	97.2
Jul 8	89.7	81.7	98.7
Jul 9	85.6	80.2	91.8
Jul 10	86.7	78.4	94.1
Jul 11	85.8	74.0	99.6
Jul 12	88.4	77.4	100.0
Jul 13	90.5	80.2	100.5
Jul 14	80.3	68.4	92.5
Jul 15	78.7	68.5	90.5
Jul 16	81.9	77.4	90.1
Jul 17	80.7	70.8	93.0
Jul 18	92.8	82.8	98.9
Jul 19	81.7	76.7	96.2
Jul 20	89.7	83.1	99.7
Jul 21	91.3	77.7	101.2
Jul 22	81.1	76.6	89.8
Jul 23	82.8	73.6	94.0
Jul 24	93.9	67.9	133.7
Jul 25	122.2	116.4	129.3
Jul 26	129.0	121.5	135.9
Jul 27	112.5	89.4	133.2
Jul 28	97.7	87.9	111.1
Jul 29	93.9	84.6	105.8
Jul 30	90.0	82.2	100.4
Jul 31	86.9	82.6	95.8
Summary	**90.6**	**78.7**	**129.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 67

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	132.2	103.9	149.2
Jul 2	141.8	125.2	155.0
Jul 3	141.9	122.9	152.8
Jul 4	140.5	129.9	156.3
Jul 5	138.9	128.0	149.2
Jul 6	145.2	126.2	168.5
Jul 7	127.2	107.8	148.0
Jul 8	112.8	101.8	128.7
Jul 9	103.6	92.6	112.8
Jul 10	113.5	102.3	127.8
Jul 11	57.3	-12.7	122.6
Jul 12	-12.7	-12.7	-12.7
Jul 13	88.5	-12.7	172.8
Jul 14	159.7	121.6	177.8
Jul 15	143.3	116.8	158.2
Jul 16	138.2	132.0	143.7
Jul 17	129.1	123.2	138.5
Jul 18	120.3	111.5	126.1
Jul 19	150.7	110.2	183.5
Jul 20	171.3	155.3	180.0
Jul 21	166.1	151.7	173.5
Jul 22	144.7	117.4	165.9
Jul 23	146.0	137.3	156.1
Jul 24	160.7	137.6	182.3
Jul 25	169.2	160.6	182.2
Jul 26	158.6	152.2	163.7
Jul 27	149.3	142.7	157.9
Jul 28	143.5	136.9	154.3
Jul 29	133.1	110.9	145.1
Jul 30	128.6	117.9	140.8
Jul 31	126.1	113.2	137.2
Summary	**131.3**	**-12.7**	**171.3**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 68

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jul 1	127.1	122.5	129.5
Jul 2	127.5	125.6	129.2
Jul 3	129.5	125.4	142.1
Jul 4	130.3	127.9	136.2
Jul 5	128.3	125.5	132.9
Jul 6	128.0	124.3	132.0
Jul 7	129.5	126.2	132.1
Jul 8	130.3	129.3	131.5
Jul 9	128.7	127.3	129.8
Jul 10	129.5	127.4	132.1
Jul 11	133.4	125.6	146.5
Jul 12	130.9	129.2	132.8
Jul 13	129.6	127.9	131.5
Jul 14	129.3	111.6	138.2
Jul 15	138.8	135.8	141.1
Jul 16	139.2	137.4	140.6
Jul 17	138.6	135.6	140.5
Jul 18	138.9	137.5	140.6
Jul 19	137.1	132.2	139.5
Jul 20	136.5	132.8	139.4
Jul 21	138.5	131.6	141.8
Jul 22	138.2	136.3	139.7
Jul 23	136.5	135.2	137.9
Jul 24	138.0	135.8	141.0
Jul 25	137.3	135.1	138.9
Jul 26	137.7	135.9	139.1
Jul 27	136.7	135.1	138.5
Jul 28	136.8	134.6	138.8
Jul 29	136.5	133.0	139.2
Jul 30	136.2	135.2	137.1
Jul 31	135.3	131.9	137.1
Summary	**133.8**	**127.1**	**139.2**

Appendix D

Solid Waste Permit 588 Daily Borehole Temperature Averages

Appendix D Table of Contents

Section Page

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 1

	Depth from Surface					
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Jul	170.9	209.1	209.5	239.9	264.6	267.4
2-Jul	170.5	208.8	209.3	239.6	264.5	267.5
3-Jul	170.2	208.8	209.2	239.6	264.6	267.7
4-Jul	170.2	208.8	209.3	239.6	264.7	267.9
5-Jul	170.0	208.6	209.0	239.4	264.6	268.1
6-Jul	170.0	208.6	209.1	239.4	264.8	268.3
7-Jul	169.8	208.6	209.0	239.4	264.9	268.5
8-Jul	169.6	208.3	208.8	239.3	265.0	268.6
9-Jul	169.5	208.4	208.8	239.2	264.9	268.6
10-Jul	169.4	208.9	209.3	239.8	265.2	268.9
11-Jul	169.3	209.8	210.3	241.2	265.5	269.2
12-Jul	169.3	214.0	214.6	245.7	266.2	269.4
13-Jul	169.2	218.8	219.6	248.2	266.4	269.3
14-Jul	169.1	220.7	221.3	248.5	266.4	269.4
15-Jul	169.1	221.8	222.3	249.1	266.4	269.5
16-Jul	169.0	222.3	222.9	249.4	266.5	269.6
17-Jul	168.8	222.3	222.9	249.4	266.4	269.6
18-Jul	168.8	225.8	226.1	250.2	266.6	269.8
19-Jul	168.6	225.8	226.2	250.1	266.4	269.8
20-Jul	168.6	226.2	226.6	250.3	266.6	270.3
21-Jul	168.6	226.9	227.2	250.5	266.6	270.5
22-Jul	168.5	225.7	226.3	250.4	266.6	270.4
23-Jul	*	*	*	*	*	*
24-Jul	*	*	*	*	*	*
25-Jul	*	*	*	*	*	*
26-Jul	*	*	*	*	*	*
27-Jul	*	*	*	*	*	*
28-Jul	*	*	*	*	*	*
29-Jul	*	*	*	*	*	*
30-Jul	*	*	*	*	*	*
31-Jul	167.8	226.8	227.3	250.0	266.4	270.8
Average	**169.3**	**216.3**	**216.7**	**244.7**	**265.7**	**269.1**

* Indicates days that the sensors were not operational due to low battery

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 2

	Depth from Surface					
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft
1-Jul	159.1	240.1	240.4	267.9	256.5	268.2
2-Jul	159.3	240.1	240.5	268.1	256.6	268.3
3-Jul	160.0	240.2	240.6	268.1	256.7	268.3
4-Jul	160.0	240.2	240.5	268.1	256.6	268.3
5-Jul	159.5	240.1	240.5	268.1	256.5	268.2
6-Jul	159.7	240.1	240.5	268.2	256.6	268.4
7-Jul	159.9	240.3	240.7	268.2	256.5	268.3
8-Jul	159.9	240.1	240.5	268.1	256.4	268.3
9-Jul	159.6	239.8	240.1	267.9	256.3	268.1
10-Jul	159.7	239.9	240.3	268.0	256.4	268.2
11-Jul	159.7	240.2	240.6	268.0	256.5	268.2
12-Jul	159.4	240.1	240.5	268.0	256.6	268.1
13-Jul	159.5	239.9	240.3	267.9	256.6	268.0
14-Jul	159.8	239.9	240.3	268.0	256.7	268.1
15-Jul	159.7	239.8	240.2	267.9	256.5	267.9
16-Jul	160.5	239.9	240.4	268.0	256.7	268.0
17-Jul	160.8	240.1	240.5	268.0	256.8	268.0
18-Jul	161.0	240.3	240.6	267.9	257.0	267.9
19-Jul	161.6	240.3	240.7	267.7	256.9	267.7
20-Jul	164.1	240.3	240.7	267.7	256.9	267.8
21-Jul	171.7	240.5	240.9	267.9	257.1	267.9
22-Jul	176.9	240.4	240.8	267.8	256.8	267.7
23-Jul	176.3	240.9	241.2	267.9	256.9	267.8
24-Jul	174.3	241.0	241.4	267.9	256.8	267.8
25-Jul	170.0	241.1	241.5	267.8	256.5	267.7
26-Jul	166.8	241.4	241.8	268.1	256.7	267.9
27-Jul	165.4	241.6	241.9	268.1	256.7	267.8
28-Jul	164.2	241.7	242.1	268.2	256.7	267.9
29-Jul	162.9	241.5	241.9	268.0	256.3	267.6
30-Jul	162.2	241.5	241.8	267.9	256.2	267.5
31-Jul	161.6	241.4	241.8	268.0	256.1	267.6
Average	**163.1**	**240.5**	**240.9**	**268.0**	**256.6**	**268.0**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 3

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jul	207.7	207.9	209.6	208.7	253.4	267.0	270.0	255.2
2-Jul	208.0	207.7	209.9	206.7	209.3	243.3	269.2	255.2
3-Jul	207.6	207.5	209.3	206.8	208.9	253.3	269.4	255.1
4-Jul	207.8	207.7	209.4	207.1	214.5	255.0	269.5	255.2
5-Jul	207.7	207.7	209.4	207.0	235.4	257.0	269.4	255.2
6-Jul	207.6	207.8	209.3	207.2	245.9	258.9	269.8	255.3
7-Jul	207.4	207.6	209.1	207.3	256.0	261.0	269.8	255.3
8-Jul	207.2	207.3	208.7	236.2	260.5	263.4	269.8	255.4
9-Jul	207.6	207.6	208.3	227.9	256.4	265.4	270.1	255.2
10-Jul	207.6	207.7	209.3	206.9	229.7	261.8	269.3	255.4
11-Jul	207.4	207.6	208.9	207.5	248.1	260.7	269.8	255.4
12-Jul	207.4	207.5	208.8	216.4	259.0	262.7	269.9	255.5
13-Jul	207.1	207.1	208.1	250.5	261.9	265.3	270.0	255.3
14-Jul	207.9	207.7	207.9	249.0	263.2	267.4	270.7	255.3
15-Jul	207.9	207.7	207.8	253.3	263.4	268.3	270.7	255.2
16-Jul	207.9	207.8	207.9	253.0	263.7	268.9	270.9	255.3
17-Jul	208.0	208.2	208.8	253.3	263.7	269.2	270.9	255.3
18-Jul	208.0	208.8	214.6	253.4	263.8	269.3	271.0	255.4
19-Jul	208.0	219.6	221.9	253.4	263.7	269.3	270.9	255.2
20-Jul	207.8	220.3	224.8	252.9	263.6	269.1	270.6	255.3
21-Jul	206.9	207.2	208.3	251.4	263.3	268.5	269.8	255.4
22-Jul	206.7	207.0	208.3	251.4	263.1	268.4	269.8	255.5
23-Jul	207.1	207.4	208.7	251.5	263.4	268.8	270.0	255.6
24-Jul	207.3	207.9	213.3	251.7	263.4	268.9	270.1	255.6
25-Jul	207.3	208.0	227.4	251.7	263.2	268.8	270.1	255.6
26-Jul	207.5	208.1	228.1	252.1	263.5	269.0	270.4	255.8
27-Jul	207.7	207.9	234.8	252.3	263.6	269.2	270.6	255.8
28-Jul	208.0	208.3	235.8	253.0	264.1	269.8	271.1	255.9
29-Jul	207.9	229.8	238.7	252.8	263.7	269.5	270.8	255.1
30-Jul	*	*	*	*	*	*	*	*
31-Jul	207.6	207.9	229.3	252.7	263.5	269.1	270.5	255.2
Average	**207.6**	**209.3**	**214.8**	**236.2**	**254.0**	**264.9**	**270.2**	**255.4**

* Indicates days that the sensors were not operational

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 4

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jul	166.0	226.6	226.6	250.2	258.4	257.4	245.6	176.3
2-Jul	165.2	227.2	227.2	250.5	258.7	257.8	245.7	176.5
3-Jul	164.4	228.0	228.1	250.8	258.9	258.1	245.8	176.7
4-Jul	164.6	226.7	219.4	251.0	258.9	258.3	245.7	176.7
5-Jul	164.9	221.2	208.5	251.3	259.1	258.3	245.7	176.7
6-Jul	165.1	218.0	208.4	251.4	259.3	258.5	245.9	176.9
7-Jul	165.0	218.8	208.4	251.5	259.3	258.7	245.9	176.7
8-Jul	164.9	215.2	208.1	251.5	259.9	258.4	245.8	176.7
9-Jul	164.9	209.7	207.8	251.3	259.9	258.6	245.8	177.5
10-Jul	165.0	208.7	207.9	251.3	259.9	258.9	246.0	177.0
11-Jul	164.8	208.7	208.1	251.4	259.9	258.9	246.1	177.3
12-Jul	165.0	208.2	208.2	251.5	259.8	259.6	246.1	176.2
13-Jul	165.1	208.0	208.1	251.6	260.2	259.6	246.0	176.0
14-Jul	165.4	207.9	208.0	251.1	261.0	260.3	246.1	177.3
15-Jul	172.8	207.7	207.8	238.5	260.8	260.3	246.0	176.9
16-Jul	200.2	207.8	207.8	217.5	261.0	260.2	246.1	177.5
17-Jul	206.3	207.9	207.9	212.4	261.0	260.1	246.1	178.0
18-Jul	207.7	207.9	207.9	208.7	262.6	258.5	246.1	177.4
19-Jul	207.9	207.8	207.7	207.4	267.1	254.7	245.9	174.7
20-Jul	207.8	207.8	207.6	207.8	264.4	256.4	245.9	175.8
21-Jul	207.8	207.6	207.7	207.6	263.5	257.2	246.1	175.4
22-Jul	207.6	207.5	207.4	207.5	262.7	257.3	246.0	175.7
23-Jul	207.9	207.7	207.7	207.7	261.7	257.8	246.2	175.9
24-Jul	206.1	208.1	208.1	208.2	260.0	258.5	246.3	176.0
25-Jul	182.8	208.0	207.9	229.6	261.4	259.4	246.2	175.7
26-Jul	176.5	207.4	207.6	240.2	261.1	260.6	246.4	176.2
27-Jul	174.5	207.3	207.3	244.3	261.1	260.4	246.6	176.9
28-Jul	172.6	207.1	207.2	246.3	260.6	261.0	246.4	177.2
29-Jul	170.9	206.7	206.8	247.4	260.6	261.0	246.2	177.1
30-Jul	169.2	206.2	206.3	248.1	260.9	261.0	246.1	176.9
31-Jul	168.9	205.9	206.0	248.7	261.1	261.0	246.1	176.7
Average	**179.3**	**211.6**	**210.0**	**236.9**	**260.8**	**258.9**	**246.0**	**176.6**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 5

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jul	179.4	207.6	211.9	208.0	228.8	243.8	248.0	192.9
2-Jul	182.3	207.6	211.9	207.9	228.8	243.9	248.1	192.9
3-Jul	181.8	207.5	211.5	207.9	228.6	243.7	248.1	192.9
4-Jul	179.8	207.7	211.7	208.0	228.8	243.6	248.1	192.9
5-Jul	179.3	207.7	211.1	208.1	228.9	243.9	248.3	193.0
6-Jul	180.6	207.5	211.3	207.9	228.9	243.8	248.2	193.0
7-Jul	180.5	207.5	210.9	207.8	228.8	244.0	248.2	193.0
8-Jul	181.1	207.5	211.2	207.8	228.9	244.1	248.4	193.1
9-Jul	181.4	207.4	211.1	207.7	228.8	244.0	248.3	193.0
10-Jul	181.9	207.8	210.7	207.8	228.8	243.9	248.3	193.0
11-Jul	180.9	209.8	210.4	207.9	228.9	244.1	248.4	193.1
12-Jul	180.7	210.2	210.5	208.0	229.0	244.2	248.5	193.2
13-Jul	180.6	210.3	210.5	207.9	229.0	244.2	248.6	193.3
14-Jul	180.6	210.4	210.7	207.9	229.1	244.2	248.6	193.3
15-Jul	179.9	210.1	210.4	207.8	229.0	244.1	248.6	193.2
16-Jul	180.0	210.1	210.3	208.0	229.2	244.2	248.5	193.3
17-Jul	180.6	210.3	210.5	208.1	229.2	244.0	248.3	193.1
18-Jul	180.2	210.1	208.8	208.4	229.3	244.0	248.3	193.2
19-Jul	180.5	209.8	208.2	208.2	229.3	244.0	248.2	193.2
20-Jul	180.1	209.7	207.9	208.3	229.4	244.1	248.1	193.3
21-Jul	182.0	209.9	208.2	209.1	228.7	243.6	247.9	193.4
22-Jul	182.3	209.2	207.6	207.8	228.8	243.4	247.9	193.5
23-Jul	182.1	208.3	207.8	207.9	228.6	243.1	247.7	193.5
24-Jul	181.8	208.5	207.9	208.1	228.7	243.0	247.7	193.6
25-Jul	181.3	208.0	207.9	208.2	228.5	242.9	247.6	193.7
26-Jul	181.8	208.4	208.0	208.3	228.5	242.9	247.5	193.8
27-Jul	182.0	208.0	208.0	208.3	228.5	242.9	247.4	193.9
28-Jul	182.6	208.0	208.1	208.3	228.5	242.9	247.3	194.0
29-Jul	182.5	207.8	207.9	208.1	228.4	242.6	247.0	193.9
30-Jul	182.4	207.6	207.6	207.9	228.0	242.3	246.7	193.7
31-Jul	182.1	208.3	207.6	207.9	227.9	242.2	246.5	193.8
Average	**181.1**	**208.7**	**209.6**	**208.0**	**228.8**	**243.6**	**248.0**	**193.3**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 6

	Depth from Surface				
Date	25 ft	50 ft	75 ft	100 ft	125 ft
1-Jul	172.7	233.9	234.1	235.3	236.2
2-Jul	176.2	233.8	234.0	235.3	236.0
3-Jul	176.7	233.7	233.8	235.1	235.9
4-Jul	205.4	233.6	233.7	234.9	235.8
5-Jul	207.7	233.6	233.7	234.9	235.8
6-Jul	207.7	233.7	233.7	234.9	235.9
7-Jul	207.6	233.7	233.7	234.9	235.9
8-Jul	207.5	233.8	233.8	234.9	236.0
9-Jul	207.3	233.7	233.7	234.8	236.1
10-Jul	207.6	233.9	233.9	235.0	236.2
11-Jul	207.6	233.9	233.8	234.8	236.2
12-Jul	207.7	234.2	234.1	235.1	236.4
13-Jul	207.6	234.3	234.2	235.1	236.4
14-Jul	207.5	234.1	233.9	235.1	236.3
15-Jul	207.3	234.1	234.0	234.9	236.2
16-Jul	207.4	234.1	233.9	235.0	236.1
17-Jul	207.7	234.0	233.8	235.0	236.1
18-Jul	207.7	234.0	233.9	235.0	236.1
19-Jul	207.6	233.9	233.8	234.8	236.0
20-Jul	207.5	233.7	233.6	234.8	235.9
21-Jul	207.5	233.8	233.7	234.8	235.9
22-Jul	207.4	233.7	233.6	234.7	235.9
23-Jul	207.6	233.7	233.6	234.8	235.9
24-Jul	207.8	233.9	233.8	235.0	236.1
25-Jul	207.9	234.0	233.9	235.1	236.2
26-Jul	208.1	234.5	234.4	235.6	236.8
27-Jul	208.2	234.5	234.4	235.6	236.7
28-Jul	208.1	234.3	234.2	235.4	236.5
29-Jul	207.8	234.1	234.0	235.2	236.3
30-Jul	207.6	233.4	233.3	234.5	235.6
31-Jul	207.5	233.1	233.0	234.2	235.3
Average	**204.4**	**233.9**	**233.8**	**235.0**	**236.1**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 7

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jul	159.7	209.5	210.3	232.6	243.1	238.7	229.6	207.4
2-Jul	159.6	209.2	210.1	232.7	243.2	238.8	229.7	207.3
3-Jul	159.8	207.8	208.7	232.8	243.2	238.8	229.9	207.3
4-Jul	159.7	203.8	204.9	232.9	243.1	238.7	229.7	207.2
5-Jul	159.4	203.5	204.6	232.2	243.1	238.7	229.6	207.0
6-Jul	159.5	203.3	204.5	231.9	243.1	238.7	229.8	207.1
7-Jul	159.6	203.6	204.6	231.6	243.0	238.6	229.7	207.1
8-Jul	159.3	205.6	206.3	231.7	243.0	238.7	229.9	207.2
9-Jul	159.8	206.5	207.2	231.6	242.9	238.5	229.9	206.9
10-Jul	159.5	207.3	208.0	231.8	242.9	238.6	230.0	207.2
11-Jul	159.3	207.3	208.0	232.0	243.0	238.8	230.2	207.3
12-Jul	159.6	207.6	208.3	232.3	243.0	238.8	230.3	207.4
13-Jul	159.6	207.4	208.2	232.1	242.9	238.6	230.2	207.1
14-Jul	159.1	206.8	207.7	232.4	243.0	239.9	232.1	207.5
15-Jul	158.8	205.1	205.3	232.6	243.9	245.5	239.5	212.3
16-Jul	158.8	207.2	207.1	231.5	243.6	242.8	235.1	214.0
17-Jul	158.7	207.0	207.1	231.6	242.7	241.8	234.2	212.4
18-Jul	158.7	207.1	207.2	231.3	242.7	240.4	233.8	212.4
19-Jul	158.6	207.1	207.3	231.3	242.4	239.8	233.1	211.2
20-Jul	158.5	206.6	207.0	231.2	242.3	239.5	232.8	210.2
21-Jul	158.5	206.4	207.0	231.8	242.4	238.8	232.9	209.5
22-Jul	158.4	206.6	207.0	231.7	242.4	238.4	232.8	209.3
23-Jul	158.7	206.7	207.1	231.6	242.7	238.0	233.1	208.9
24-Jul	158.5	206.5	207.1	231.5	242.6	238.3	232.7	208.1
25-Jul	158.9	205.9	206.3	231.3	242.1	238.7	232.6	207.9
26-Jul	159.3	204.4	203.9	231.1	241.2	239.2	232.5	207.7
27-Jul	158.5	203.5	203.3	231.1	241.6	239.3	232.0	207.1
28-Jul	158.4	201.7	202.1	230.3	241.9	239.6	231.7	206.8
29-Jul	158.5	201.7	201.9	229.4	241.7	239.4	231.1	206.6
30-Jul	158.7	206.0	206.5	228.4	242.2	238.9	231.3	206.9
31-Jul	158.6	208.1	208.1	214.8	242.4	239.3	231.9	208.2
Average	**159.0**	**206.0**	**206.5**	**231.1**	**242.7**	**239.4**	**231.7**	**208.4**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 8

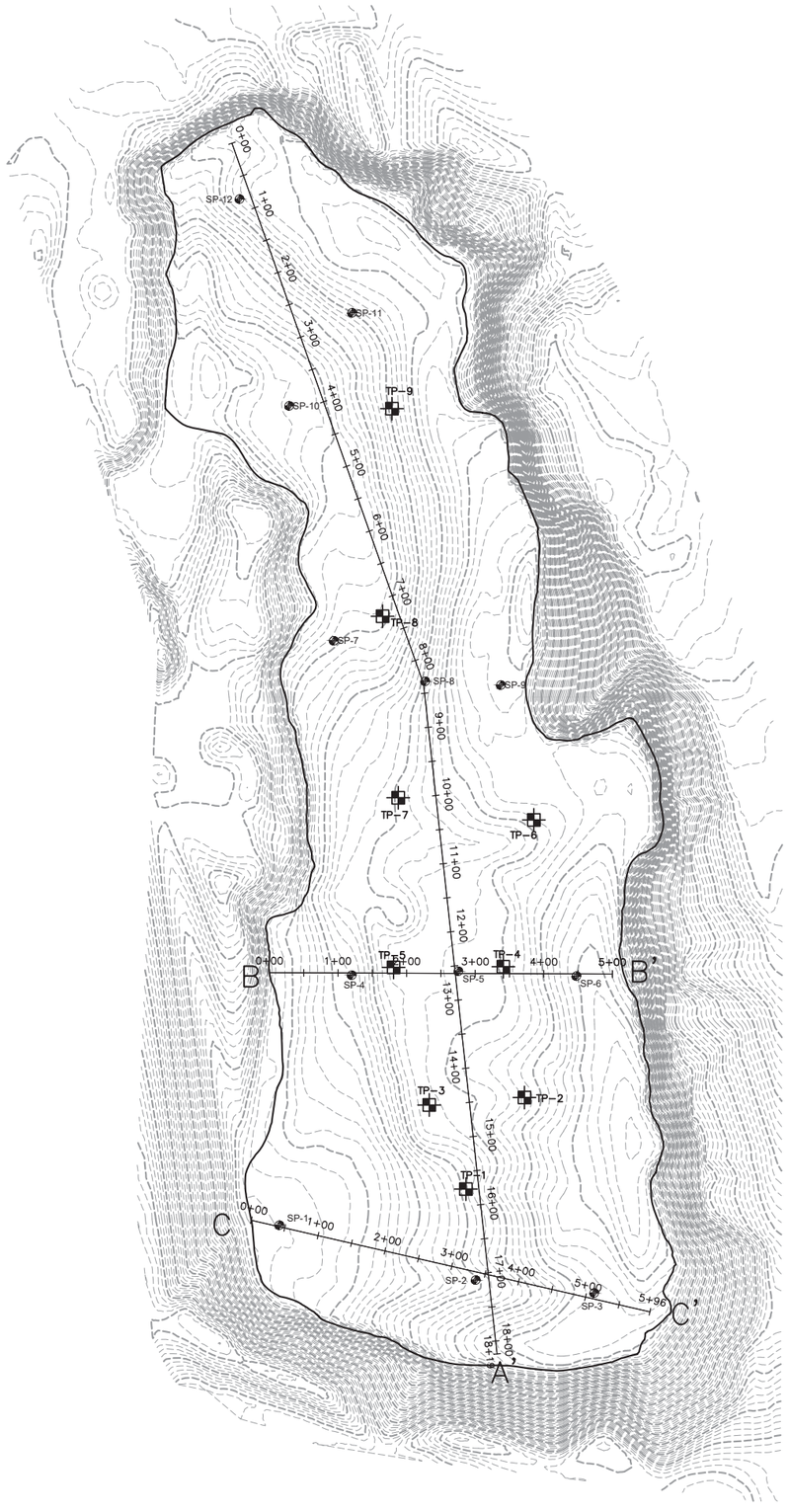
	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Jul	182.1	185.8	185.7	188.7	191.1	191.0	187.4	182.0
2-Jul	182.3	185.9	185.9	188.7	191.3	191.2	187.6	182.2
3-Jul	182.6	186.1	186.0	188.8	191.4	191.3	187.7	182.3
4-Jul	182.7	186.2	186.1	189.0	191.6	191.3	187.6	182.3
5-Jul	182.8	186.3	186.3	189.2	191.8	191.3	187.7	182.3
6-Jul	183.0	186.5	186.4	189.3	191.9	191.4	187.8	182.3
7-Jul	183.1	186.5	186.4	189.2	191.9	191.4	187.7	182.3
8-Jul	183.1	186.6	186.6	189.4	192.0	191.5	187.8	182.3
9-Jul	183.3	186.6	186.6	189.6	192.0	191.4	187.8	182.2
10-Jul	183.4	186.8	186.8	189.6	192.2	191.5	187.8	182.1
11-Jul	183.5	186.9	186.9	189.8	192.4	191.6	187.9	181.9
12-Jul	183.6	187.1	187.1	190.0	192.5	191.6	187.9	181.9
13-Jul	183.9	187.3	187.3	190.1	192.6	191.7	188.0	182.1
14-Jul	183.5	187.4	187.4	190.5	192.7	191.7	188.0	182.1
15-Jul	183.6	187.4	187.4	190.3	192.7	191.5	187.9	182.0
16-Jul	184.0	187.6	187.6	190.5	193.0	191.7	188.0	182.2
17-Jul	184.0	187.7	187.6	190.5	193.1	191.4	187.8	182.0
18-Jul	184.1	187.7	187.7	190.6	193.2	191.4	187.8	181.9
19-Jul	184.2	187.8	187.8	190.7	193.2	191.3	187.8	181.8
20-Jul	184.2	187.8	187.8	190.7	193.2	191.3	187.7	181.8
21-Jul	184.3	187.9	187.9	190.7	193.2	191.5	187.9	181.9
22-Jul	184.3	187.9	187.8	190.6	193.1	191.4	187.8	181.7
23-Jul	184.5	188.1	188.0	190.9	193.3	191.5	187.9	181.9
24-Jul	184.6	188.2	188.2	191.0	193.6	191.5	188.0	182.1
25-Jul	184.7	188.3	188.3	191.1	193.6	191.4	187.9	181.9
26-Jul	184.9	188.5	188.5	191.3	193.8	191.5	188.0	182.1
27-Jul	185.0	188.7	188.7	191.4	193.9	191.6	188.1	182.1
28-Jul	185.1	188.7	188.7	191.5	193.8	191.5	188.0	182.0
29-Jul	185.2	188.6	188.6	191.6	193.6	191.4	187.9	181.9
30-Jul	185.0	188.6	188.6	191.4	193.6	191.4	187.9	181.9
31-Jul	185.3	188.7	188.8	191.6	193.7	191.4	187.9	181.9
Average	**183.9**	**187.4**	**187.4**	**190.3**	**192.7**	**191.4**	**187.8**	**182.1**

Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 9

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

Appendix E

Monthly Topography Analysis



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- SP-9 SETTLEMENT PLATE
- TP-3 TEMPERATURE MONITORING PROBE

NOTES:

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

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

NO.	REVISION	DATE

SHEET TITLE
JUNE 2023 LANDFILL TOPO

PROJECT TITLE
MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

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

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

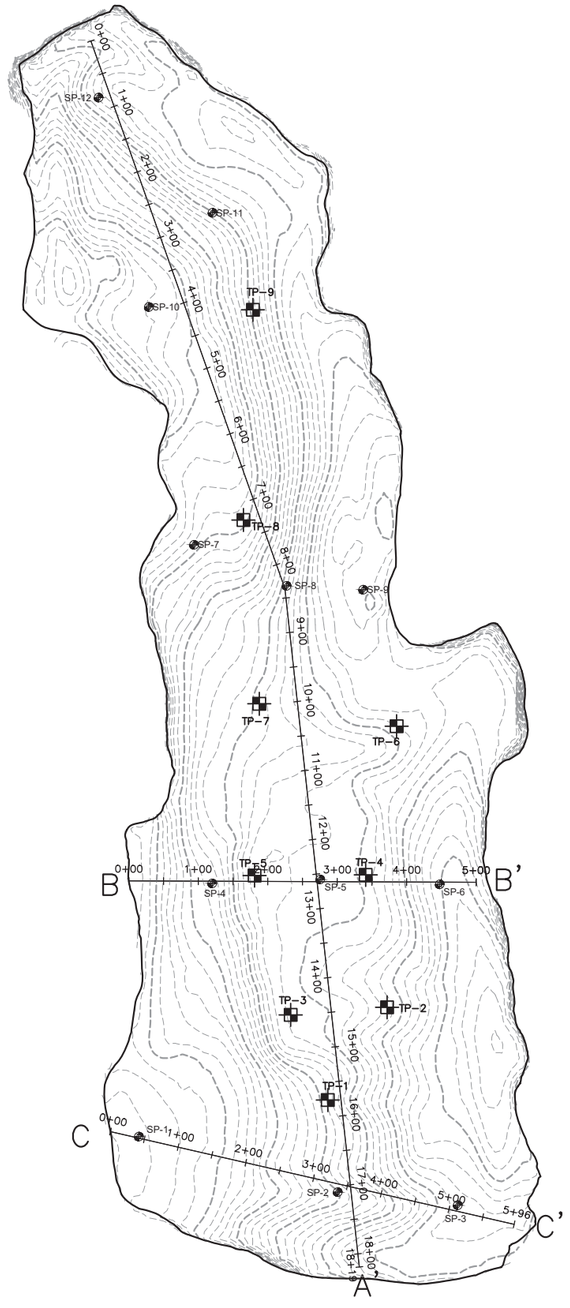
PROJ. NO. 01272208.05
DSN. BY: CMW
DWN. BY: CMW
CHK. BY: CJW
QA REVIEW BY:
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 8/7/2023

SCALE: 1" = 100'

DRAWING NO.
1 of **5**



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROXIMATE SIDEWALL LOCATION
- SP-9 SETTLEMENT PLATE
- TP-3 TEMPERATURE MONITORING PROBE

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENT THE TOPOGRAPHY CAPTURED ON JULY 12, 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 FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD–83 (2011).
4. THE VERTICAL DATUM IS BASED UPON NAVD–88.

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

NO.	REVISION	DATE

SHEET TITLE
JULY 2023 LANDFILL TOPOGRAPHY

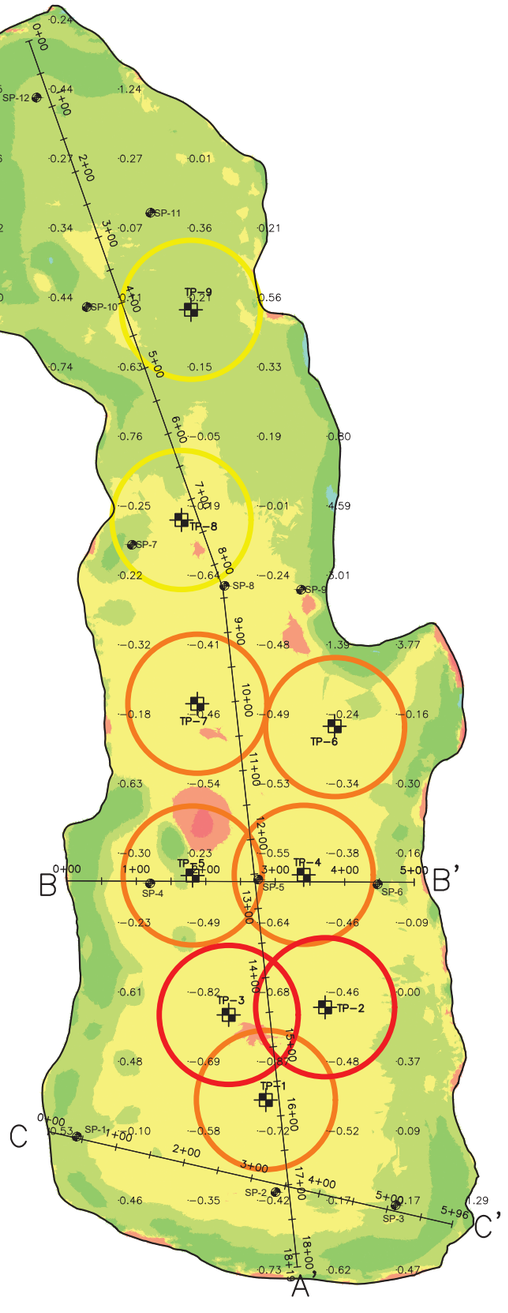
PROJECT TITLE
MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

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

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

PROJ. NO. 228.05
DOC. NO.
DSN. BY: CMW
DRN. BY: CMW
CHK. BY: CJW
Q/A RVW. BY: CMW
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 8/7/2023
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
- TP-8 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH LESS THAN 200 °F
- TP-1 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH BETWEEN 200 °F AND 250 °F
- TP-2 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH BETWEEN 250 °F AND 300 °F

Volume

Base Surface TOPO – JUNE 9, 2023
Comparison Surface TOPO – JULY 12, 2023

Cut Volume	7,354 Cu. Yd.
Fill Volume	10,783 Cu. Yd.
Net Fill	3,428 Cu. Yd.

Elevations Table

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

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON JUNE 9, 2023 AND JULY 12, 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.

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

NO.	REVISION	DATE

SHEET TITLE: JUNE VOLUME CHANGE JUNE 2023 TO JULY 2023

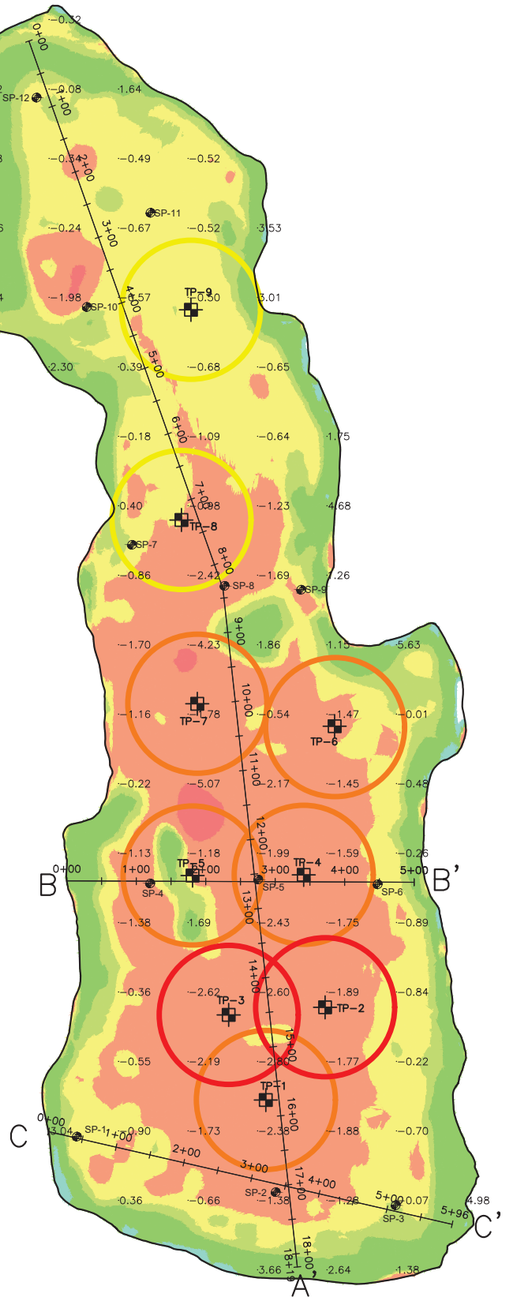
PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

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

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

PROJ. NO. 02202208.05
DSN. BY: CMW
DWN. BY: HGW
CHK. BY: CJW
QA/QC BY: CJW
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 8/7/2023
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
- TP−8 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH LESS THAN 200 °F
- TP−1 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH BETWEEN 200 °F AND 250 °F
- TP−2 TEMPERATURE MONITORING PROBE WITH AVERAGE TEMPERATURES AT DEPTH BETWEEN 250 °F AND 300 °F

Volume

Base Surface TOPO – APRIL 11, 2023
Comparison Surface TOPO – JULY 12, 2023

Cut Volume	28,311 Cu. Yd.
Fill Volume	14,254 Cu. Yd.
Net Cut	14,056 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−11.500	−5.000	
2	−5.000	−1.000	
3	−1.000	0.000	
4	0.000	1.000	
5	1.000	5.000	
6	5.000	10.000	

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON MARCH 9, 2023 AND JUNE 9, 2023 BY SCS ENGINEERS. POSITIVE VALUES (+) INDICATE AREAS OF FILL AND NEGATIVE VALUES (−) INDICATE AREAS OF CUT (SETTLEMENT). VALUES ARE ROUNDED TO THE NEAREST FOOT
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4. THE VERTICAL DATUM IS BASED UPON NAVD−88.

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

NO.	REVISION	DATE

SHEET TITLE: JUNE VOLUME CHANGE APRIL 2023 TO JULY 2023

PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

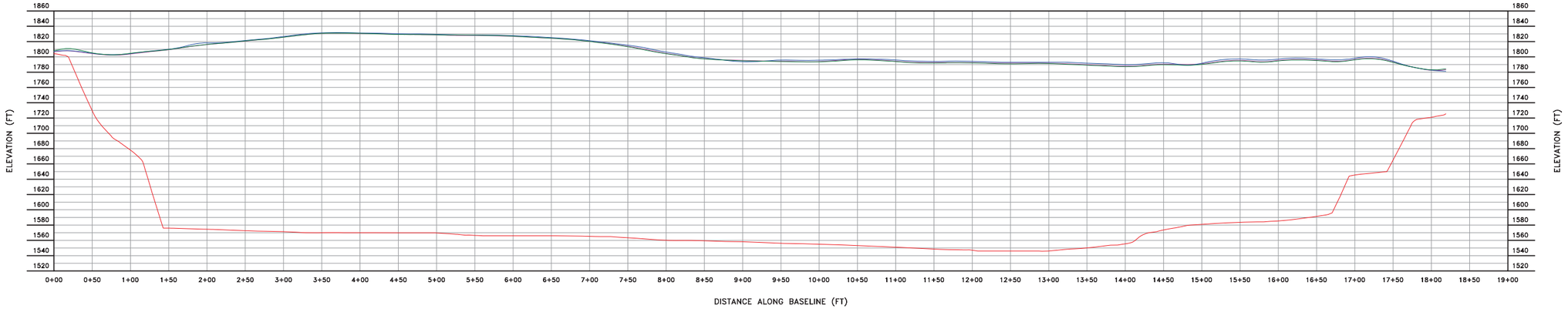
CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

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

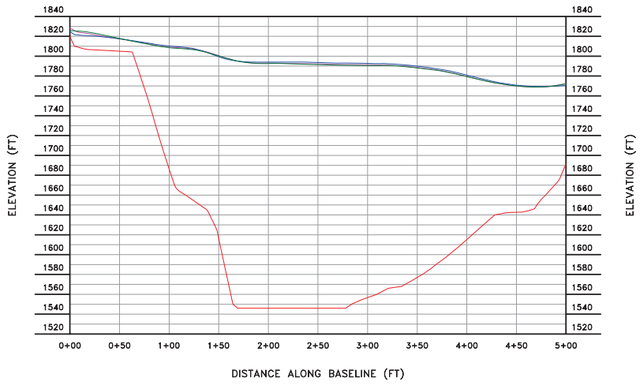
PROJ. NO. 02210208.05
DSN. BY: CMW
DWN. BY: CMW
CHK. BY: CJW
QA/A RVW BY: CJW
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 8/7/2023
SCALE: 1" = 100'
DRAWING NO. 4 of 5

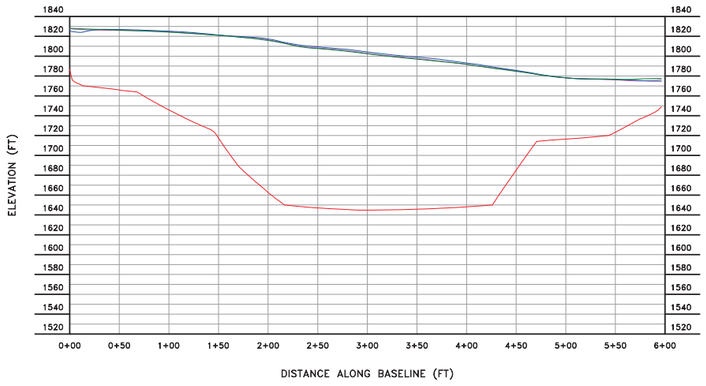
LONGITUDINAL PROFILE A ALIGN



LONGITUDINAL PROFILE B ALIGN



LONGITUDINAL PROFILE C ALIGN



LEGEND

- BOTTOM LINER ELEVATION
- APRIL 2023 TOPO
- JUNE 2023 TOPO
- JULY 2023 TOPO

NO.	REVISION	DATE

SHEET TITLE: **PROFILES**

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

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

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

PROJ. NO. 218208.05
DSN. BY: C.M.W
DRN. BY: C.M.W
CHK. BY: C.J.W
Q/A RVW. BY: C.M.W
APP. BY: C.J.W

CADD FILE: SURF COMP

DATE: 8/7/2023

SCALE: AS NOTED

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

Appendix F

Sample Collection Log and Lab Report

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

Date	06/20-21/2023										
Personnel	L. Nelson, T. Smith										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-33B	7/19/2023				x		13	147.03	5.5		
EW-36A	7/19/2023							113.24	5.00		
EW-49	7/18/2023		96.15	12/20-21/2022	x	90		57.38		38.77	
EW-50	7/18/2023		77.70	12/20-21/2022	x	83	1071696	46.12		31.58	pumping
EW-51	7/18/2023		92.80	12/20-21/2022	x	95	84768	41.05		51.75	
EW-52	7/19/2023		98.70	12/20-21/2022	x	93	135942	39.78	3.10	58.92	
EW-53	7/18/2023		100.70	12/20-21/2022	x	---	2251552	46.54		54.16	
EW-54	7/18/2023		82.70	12/20-21/2022	x	75	483737	34.92		47.78	
EW-55	7/18/2023		90.40	12/20-21/2022	x	90	213890	34.04		56.36	
EW-56	7/18/2023		58.50	12/20-21/2022		58		43.36		---	
EW-57	7/18/2023		107.40	12/20-21/2022	x	425173	541658	36.42		70.98	pumping
EW-58	7/18/2023		84.50	12/20-21/2022	x	82	1995422	n/a		n/a	leachate boiling over
EW-59	7/18/2023		73.40	12/20-21/2022	x	64	2397980	32.75		---	
EW-60	7/18/2023		81.80	12/20-21/2022	x	70	331391	35.06	3.65	46.74	
EW-61	7/18/2023		87.80	12/20-21/2022	x	66	240578	47.24		---	
EW-62	7/19/2023		110.60	12/20-21/2022	x	80	163875	90.53	3.50	20.07	
EW-63	7/18/2023		62.10	12/20-21/2022	x	64		60.93	4.75	1.17	
EW-64	7/19/2023		109.00	12/20-21/2022	x	113	139902	77.4	4.50	---	
EW-65	7/18/2023		88.40	12/20-21/2022	x	50		48.6		39.80	
EW-67	7/18/2023		107.75	12/20-21/2022	x	62.5	1681720	39.08		68.67	
EW-68	7/18/2023		73.57	12/20-21/2022	x	68	2145223	45.11		28.46	
EW-69	7/18/2023	93	98.00	5/3/2023				93.53	3.90	4.47	
EW-70	7/18/2023	66	71.00	5/3/2023	x		13	41.73	2.10	29.27	
EW-71	7/18/2023	180	185.80	7/18/2023	x			132.28	3.63	53.52	
EW-72	7/18/2023	180	141.28	7/18/2023	x			106.83	3.55	34.45	

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

Date	06/20-21/2023										
Personnel	L. Nelson, T. Smith										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-73	7/18/2023	111	116.00	5/3/2023	x		15	94.53	3.80	21.47	
EW-74	7/18/2023	180	184.15	7/18/2023	x		16	n/a	5.42	n/a	well may be dry
EW-75	7/18/2023	179			x		9	66.08	4.75		
EW-76	7/18/2023	122	127.00	5/3/2023	x		13	110.29	4.10	16.71	
EW-77	7/18/2023	180						134.17	4.00		
EW-78	7/18/2023	52	57.00	5/3/2023	x		2654	34.46	3.00	22.54	pumping
EW-79	7/18/2023	180						147.1	4.25		
EW-80	7/19/2023	144	149.00	5/3/2023				133.1	5.00	15.90	
EW-81	7/19/2023	180						106.87	4.25		
EW-82	7/19/2023	180						84.11	4.25		
EW-83	7/18/2023	180						95.32	5.88		
EW-84	7/19/2023	137	142.00	5/3/2023				105.64	4.50	36.36	
EW-85	7/18/2023	86	91.00	5/3/2023				39.7	4.45	51.30	
EW-86	7/19/2023	148	153.00	5/3/2023				66.27	4.75	86.73	
EW-87	7/18/2023	180	147.95	7/18/2023				49.28	4.75		
EW-88	7/18/2023	95	100.00	5/3/2023	x		110526	19.4	3.14	80.60	
EW-89	7/18/2023	121	126.00	5/3/2023				29.1		96.90	
EW-90	7/18/2023	109	114.00	5/3/2023				61.14		52.86	
EW-91	7/18/2023	180	138.21	7/18/2023				39.21	5.00	99.00	
EW-92	7/19/2023	140						36.83	5.50		
EW-93	7/18/2023	106	111.00	5/3/2023				21.95		89.05	
EW-94	7/19/2023	45	50.00	5/3/2023	x		571772	24.82	4.50	25.18	pumping
EW-95	7/18/2023	63	68.00	5/3/2023	x			57.62		10.38	
EW-96	7/18/2023	180	163.36	7/18/2023				41.2	4.75	122.16	
EW-97	7/18/2023	180						67.75	4.00		

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

Date	06/20-21/2023										
Personnel	L. Nelson, T. Smith										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Sickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-98	7/18/2023	51	56.00	5/3/2023	x		315515	25.45		30.55	pumping
EW-99	7/19/2023	60	65.00	5/3/2023				60.62	3.50	4.38	
EW-100	7/18/2023	130	135.00	5/3/2023				55.37	3.54	79.63	

Log Checked By: J. Robb

--- = not applicable/available

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

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

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

Note: Depth to liquid is subtracted 1.5 ft due to missing line on probe

City of Bristol SWP 588 Landfill
Dual Phase LFG-EW Sample Collection Log

Location ID	Sample Date	Sample Time	Temperature (°C)	pH (s.u.)	Specific Conductance (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Observations
EW-50	7/19/2023	8:15	47.6	7.57	22.05	0.3	-277	39.92	grey
EW-57	7/19/2023	10:00	65.9	5.22	38.89	0.17	-65.9	22.56	grey
EW-78	7/19/2023	14:55	45.1	7.7	16.157	0.35	-226.8	36.58	grey
EW-94	7/19/2023	9:35	61.3	5.53	33.09	0.14	-116	>1000	grey
EW-98	7/19/2023	8:50	39.5	6.4	4.888	1.17	-122.7	35.85	grey

Sampler: L. Nelson, T. Smith

Samples Shipped By: Courier

Log Checked By: J. Robb

Laboratory: Enthalpy Analytical

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
Ammonia as N (mg/L)	November-2022	---	---	---	---	**1560**	---	**1400**	---	**1380**	---	---	---	---	---	50	50
	December-2022	**1700**	**2280**	**2110**	---	**1410**	**1310**	---	---	---	**1150**	**1780**	---	---	---	100	100
	January-2023	**1520**	---	---	**1500**	---	---	---	---	**1330**	---	---	---	---	---	50	50
		---	---	---	---	**2440**	---	---	---	---	---	---	---	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**1490**	---	---	---	100	100
	March-2023	---	---	---	**667**	**1480**	---	---	---	---	---	---	---	---	---	73.1	100
	April-2023	---	---	---	**1410**	---	**1220**	---	---	---	---	---	---	---	---	73.1	100
	May-2023	**1390**	---	---	**1860**	**2380**	---	---	---	---	---	---	---	---	---	146	200
	June-2023	---	---	---	---	**2740**	---	**2370**	**2170**	---	---	---	---	---	---	146	200
	July-2023	---	---	---	---	---	---	---	---	---	---	---	**1180**	---	---	73.1	100
		1570	---	**2260**	---	---	---	---	---	---	---	---	---	**2350**	**310**	146	200
Biological Oxygen Demand (mg/L)	November-2022	---	---	---	---	**15700**	---	**5860**	---	**5140**	---	---	---	---	---	0.2	2
	December-2022	**6440**	**12500**	**11400**	---	**9240**	**3330**	---	---	---	**8360**	**6770**	---	---	---	0.2	2
	January-2023	**9920**	---	---	**999**	**28100**	---	---	---	**7060**	---	---	---	---	---	0.2	2
	February-2023	---	---	---	---	---	---	---	---	---	---	**7230**	---	---	---	0.2	2
	March-2023	---	---	---	**1570**	**9190**	---	---	---	---	---	---	---	---	---	0.2	2
	April-2023	---	---	---	**8430**	---	**2860**	---	---	---	---	---	---	---	---	0.2	2
	May-2023	**7350**	---	---	**11900**	**35300**	---	---	---	---	---	---	---	---	---	0.2	2
	June-2023	---	---	---	---	**20000**	---	**27400**	**23100**	---	---	---	---	---	---	0.2	2
	July-2023	**6820**	---	**32900**	---	---	---	---	---	---	---	---	**330**	**31800**	**937**	0.2	2
Chemical Oxygen Demand (mg/L)	November-2022	---	---	---	---	---	---	**9790**	---	**10800**	---	---	---	---	---	1000	1000
		---	---	---	---	**23500**	---	---	---	---	---	---	---	---	---	2000	2000
	December-2022	**7440**	---	---	---	---	---	---	---	---	---	---	---	---	---	1000	1000
		---	---	---	---	**13200**	**8000**	---	---	---	**20300**	**14100**	---	---	---	2000	2000
		---	---	**22400**	---	---	---	---	---	---	---	---	---	---	---	5000	5000
		---	**86800**	---	---	---	---	---	---	---	---	---	---	---	---	10000	10000
	January-2023	---	---	---	**3630**	---	---	---	---	---	---	---	---	---	---	500	500
		14900	---	---	---	---	---	---	---	**8430**	---	---	---	---	---	2000	2000
		---	---	---	---	**47600**	---	---	---	---	---	---	---	---	---	5000	5000
	February-2023	---	---	---	---	---	---	---	---	---	---	**9210**	---	---	---	1000	1000
	March-2023	---	---	---	**1690**	---	---	---	---	---	---	---	---	---	---	500	500
		---	---	---	---	**10600**	---	---	---	---	---	---	---	---	---	2000	2000
	April-2023	---	---	---	---	---	**7370**	---	---	---	---	---	---	---	---	1000	1000
		---	---	---	**16800**	---	---	---	---	---	---	---	---	---	---	2000	2000
	May-2023	**7590**	---	---	**18700**	---	---	---	---	---	---	---	---	---	---	2000	2000
		---	---	---	---	**44700**	---	---	---	---	---	---	---	---	---	4000	4000
	June-2023	---	---	---	---	---	---	**44800**	---	---	---	---	---	---	---	5000	5000
		---	---	---	---	**41300**	---	---	**55000**	---	---	---	---	---	---	10000	10000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**2180**	500	500
		6480	---	---	---	---	---	---	---	---	---	---	**2460**	---	---	1000	1000
		---	---	---	---	---	---	---	---	---	---	---	---	**41000**	---	5000	5000
		---	---	**50100**	---	---	---	---	---	---	---	---	---	---	---	10000	10000
Nitrate+Nitrite as N (mg/L)	November-2022	---	---	---	---	**2.91**	---	**0.16**	---	**0.33**	---	---	---	---	---	0.1	0.1

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
Nitrate as N (mg/L)	December-2022	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	0.2	0.2
		---	---	---	---	---	ND	---	---	---	---	---	---	---	---	0.2	0.6
		ND	ND	ND	---	ND	---	---	---	---	---	---	---	---	---	1.1	5.1
		---	---	---	---	---	---	---	---	---	---	ND	---	---	---	1.5	5.5
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.35	1.35
		---	---	---	---	---	---	---	---	ND	---	---	---	---	---	1.1	1.1
		3.9	---	---	---	---	---	---	---	---	---	---	---	---	---	2.1	2.1
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	2.2	2.2
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	0.35	1.35
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	1.04	5.1
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	---	---	---	0.6	2.6
	May-2023	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	1.1	5.1
		---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	1.2	5.2
	June-2023	---	---	---	---	ND	---	---	ND	---	---	---	---	---	---	1.1	5.1
		---	---	---	---	---	---	ND	---	---	---	---	---	---	---	1.2	5.2
	July-2023	---	---	---	---	---	---	---	---	---	---	---	**0.355**	---	---	0.15	0.35
		---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.55	0.75
		ND	---	---	---	---	---	---	---	---	---	---	---	---	---	1	3
		---	---	ND	---	---	---	---	---	---	---	---	---	ND	---	1.5	5.5
Nitrite as N (mg/L)	December-2022	---	---	---	---	---	**0.12 J**	---	---	---	---	---	---	---	---	0.1	0.5
		ND	ND	ND	---	ND	---	---	---	---	ND	ND	---	---	---	1	5
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.25	1.25
		---	---	---	---	---	---	---	---	ND	---	---	---	---	---	1	1
		ND	---	---	---	ND	---	---	---	---	---	---	---	---	---	2	2
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.48 J**	---	---	---	0.25	1.25
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	1	5
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	---	---	---	0.5	2.5
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	---	---	---	1	5
	June-2023	---	---	---	---	**2 J**	---	ND	ND	---	---	---	---	---	---	1	5
	July-2023	---	---	---	---	---	---	---	---	---	---	---	ND	---	ND	0.05	0.25
		ND	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5	2.5
		---	---	**1.2 J**	---	---	---	---	---	---	---	---	---	ND	---	1	5
Total Kjeldahl Nitrogen (mg/L)	November-2022	---	---	---	---	---	---	**1290**	---	**1470**	---	---	---	---	---	20	50
		---	---	---	---	**2110**	---	---	---	---	---	---	---	---	---	50	125
	December-2022	**1510**	**3570**	**1790**	---	**1830**	**1490**	---	---	---	**1340**	**1940**	---	---	---	200	500
	January-2023	**1840**	---	---	**881**	---	---	---	---	**1410**	---	---	---	---	---	20	50
		---	---	---	---	**2970**	---	---	---	---	---	---	---	---	---	40	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**1870**	---	---	---	16.8	50
	March-2023	---	---	---	**879**	**1920**	---	---	---	---	---	---	---	---	---	33.6	100
	April-2023	---	---	---	**1820**	---	**1510**	---	---	---	---	---	---	---	---	16.8	50
	May-2023	**1590**	---	---	**1950**	**2910**	---	---	---	---	---	---	---	---	---	40	100
	June-2023	---	---	---	---	**3080**	---	---	**2750**	---	---	---	---	---	---	100	250
		---	---	---	---	---	---	**2650**	---	---	---	---	---	---	---	200	500
	July-2023	**1670**	---	**2960**	---	---	---	---	---	---	---	---	**1670**	**2720**	**285**	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-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
Total Recoverable Phenolics (mg/L)	November-2022	---	---	---	---	---	---	**5.68**	---	**3**	---	---	---	---	---	0.3	0.5
		---	---	---	---	**28.8**	---	---	---	---	---	---	---	---	---	0.75	1.25
	December-2022	---	---	---	---	---	**8.94**	---	---	---	---	---	---	---	---	0.3	0.5
		24.9	**54.6**	**28.3**	---	**32**	---	---	---	---	**20.2**	**36**	---	---	---	1.5	2.5
	January-2023	**27.2**	---	---	**1.3**	---	---	---	---	**20.2**	---	---	---	---	---	0.75	1.25
		---	---	---	---	**56.5**	---	---	---	---	---	---	---	---	---	1.5	2.5
	February-2023	---	---	---	---	---	---	---	---	---	---	**22.4**	---	---	---	1.5	2.5
	March-2023	---	---	---	**0.4**	---	---	---	---	---	---	---	---	---	---	0.03	0.05
		---	---	---	---	**13.9**	---	---	---	---	---	---	---	---	---	0.3	0.5
	April-2023	---	---	---	**18.7**	---	**5.1**	---	---	---	---	---	---	---	---	0.3	0.5
	May-2023	**18.6**	---	---	**20**	**50**	---	---	---	---	---	---	---	---	---	1.5	2.5
	June-2023	---	---	---	---	**39.1**	---	**45.6**	**80.6**	---	---	---	---	---	---	1.5	2.5
	July-2023	---	---	---	---	---	---	---	---	---	---	---	**0.7**	---	---	0.15	0.25
		---	---	---	---	---	---	---	---	---	---	---	---	---	**2.92**	0.3	0.5
		11.6	---	**47.9**	---	---	---	---	---	---	---	---	---	**37.3**	---	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)																	
Anthracene	November-2022	---	---	---	---	---	---	ND	---	ND	---	---	---	---	---	46.7	93.5
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	93.5	187
	December-2022	---	---	---	---	ND	ND	---	---	---	---	ND	---	---	---	9.35	9.35
		---	---	ND	---	---	---	---	---	---	ND	---	---	---	---	11.7	11.7
		---	ND	---	---	---	---	---	---	---	---	---	---	---	---	23.4	23.4
		ND	---	---	---	---	---	---	---	---	---	---	---	---	---	485	971
	January-2023	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	243	485
		---	---	---	---	---	---	---	---	ND	---	---	---	---	---	253	505
		ND	---	---	---	---	---	---	---	---	---	---	---	---	---	490	980
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	500	1000
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	187	374
	March-2023	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	51	102
		---	---	---	ND	---	---	---	---	---	---	---	---	---	---	117	234
	April-2023	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	37.4	74.8
		---	---	---	---	---	ND	---	---	---	---	---	---	---	---	38.8	77.7
	May-2023	ND	---	---	---	ND	---	---	---	---	---	---	---	---	---	93.5	187
		---	---	---	ND	---	---	---	---	---	---	---	---	---	---	467	935
	June-2023	---	---	---	---	ND	---	---	ND	---	---	---	---	---	---	485	971
		---	---	---	---	---	---	ND	---	---	---	---	---	---	---	490	980
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	46.7	93.5
		ND	---	---	---	---	---	---	---	---	---	---	---	---	---	100	200
		---	---	---	---	---	---	---	---	---	---	---	ND	---	---	250	500
		---	---	ND	---	---	---	---	---	---	---	---	---	ND	---	1000	2000

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
TOTAL METALS (mg/L)																	
Arsenic	November-2022	---	---	---	---	**0.863**	---	**0.464**	---	**1.3**	---	---	---	---	---	0.02	0.04
	December-2022	**1.02**	**0.406**	**0.174**	---	**1.69**	**0.49**	---	---	---	**0.159**	**0.574**	---	---	---	0.02	0.04
	January-2023	**0.285**	---	---	**0.596**	**0.225**	---	---	---	**0.846**	---	---	---	---	---	0.01	0.02
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.29**	---	---	---	0.005	0.01
	March-2023	---	---	---	**1.07**	**1**	---	---	---	---	---	---	---	---	---	0.01	0.02
	April-2023	---	---	---	---	---	**0.11**	---	---	---	---	---	---	---	---	0.0005	0.001
		---	---	---	**0.36**	---	---	---	---	---	---	---	---	---	---	0.005	0.01
	May-2023	**0.26**	---	---	**0.3**	**0.27**	---	---	---	---	---	---	---	---	---	0.0025	0.005
	June-2023	---	---	---	---	**0.26**	---	**0.5**	**0.14**	---	---	---	---	---	---	0.0025	0.005
	July-2023	**0.23**	---	---	---	---	---	---	---	---	---	---	**0.24**	**0.19**	**0.06**	0.0005	0.001
		---	---	**0.7**	---	---	---	---	---	---	---	---	---	---	---	0.0025	0.005
Barium	November-2022	---	---	---	---	**0.871**	---	**0.485**	---	**0.36**	---	---	---	---	---	0.01	0.02
	December-2022	**0.566**	**0.803**	**0.978**	---	**0.438**	**0.214**	---	---	---	**0.856**	**0.793**	---	---	---	0.01	0.02
	January-2023	**0.643**	---	---	**0.683**	**1.92**	---	---	---	**0.554**	---	---	---	---	---	0.005	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**1.04**	---	---	---	0.01	0.05
	March-2023	---	---	---	**0.406**	**0.683**	---	---	---	---	---	---	---	---	---	0.005	0.01
	April-2023	---	---	---	**1.21**	---	**0.326**	---	---	---	---	---	---	---	---	0.01	0.05
	May-2023	**0.636**	---	---	---	---	---	---	---	---	---	---	---	---	---	0.005	0.025
		---	---	---	**1.2**	**1.83**	---	---	---	---	---	---	---	---	---	0.01	0.05
	June-2023	---	---	---	---	**1.69**	---	---	**1.65**	---	---	---	---	---	---	0.005	0.025
		---	---	---	---	---	---	**3.01**	---	---	---	---	---	---	---	0.01	0.05
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.217**	0.001	0.005
		0.542	---	**2.28**	---	---	---	---	---	---	---	---	---	**1.02**	---	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
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.0005	0.005
	July-2023	**0.000219 J**	---	**0.000156 J**	---	---	---	---	---	---	---	---	**0.000186 J**	ND	ND	0.0001	0.001
Chromium	November-2022	---	---	---	---	**0.208**	---	**0.112**	---	**0.354**	---	---	---	---	---	0.016	0.02
	December-2022	**0.503**	**1.08**	**1.76**	---	**0.274**	**0.319**	---	---	---	**0.499**	**0.822**	---	---	---	0.016	0.02
	January-2023	**0.31**	---	---	**0.488**	**0.178**	---	---	---	**0.155**	---	---	---	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.277**	---	---	---	0.004	0.01
	March-2023	---	---	---	**0.213**	**0.188**	---	---	---	---	---	---	---	---	---	0.008	0.01
	April-2023	---	---	---	---	---	**0.142**	---	---	---	---	---	---	---	---	0.0004	0.001
		---	---	---	**0.306**	---	---	---	---	---	---	---	---	---	---	0.004	0.01
	May-2023	**0.422**	---	---	**0.281**	**0.237**	---	---	---	---	---	---	---	---	---	0.002	0.005
	June-2023	---	---	---	---	**0.251**	---	**0.191**	**0.272**	---	---	---	---	---	---	0.002	0.005
	July-2023	**0.308**	---	**0.535**	---	---	---	---	---	---	---	---	**0.231**	**0.215**	**0.0265**	0.0004	0.001

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
TOTAL METALS (mg/L)																	
Copper	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	---	---	---	0.016	0.02
	December-2022	ND	ND	ND	---	ND	ND	---	---	---	ND	ND	---	---	---	0.016	0.02
	January-2023	ND	---	---	**0.0127**	**0.0256**	---	---	---	ND	---	---	---	---	---	0.008	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.00365**	---	---	---	0.0003	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.008	0.01
	April-2023	---	---	---	**0.00664**	---	**0.00767**	---	---	---	---	---	---	---	---	0.0003	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.0015	0.005
	June-2023	---	---	---	---	**0.00154 J**	---	**0.00362 J**	**0.00269 J**	---	---	---	---	---	---	0.0015	0.005
	July-2023	**0.00124**	---	**0.00163**	---	---	---	---	---	---	---	---	**0.00811**	ND	**0.0027**	0.0003	0.001
Lead	November-2022	---	---	---	---	ND	---	ND	---	**0.017 J**	---	---	---	---	---	0.012	0.02
	December-2022	ND	**0.0381**	ND	---	ND	ND	---	---	---	ND	ND	---	---	---	0.012	0.02
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	---	---	---	0.006	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.006**	---	---	---	0.001	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.006	0.01
	April-2023	---	---	---	**0.0022**	---	**0.0067**	---	---	---	---	---	---	---	---	0.001	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.005	0.005
	June-2023	---	---	---	---	ND	---	ND	**0.0069**	---	---	---	---	---	---	0.005	0.005
	July-2023	**0.0014**	---	**0.019**	---	---	---	---	---	---	---	---	**0.0092**	ND	**0.0017**	0.001	0.001
Mercury	November-2022	---	---	---	---	---	---	**0.00169**	---	**0.00053**	---	---	---	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.0008	0.0008
	December-2022	**0.00051**	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
		---	ND	---	---	---	---	---	---	---	---	---	---	---	---	0.004	0.004
	January-2023	ND	---	---	ND	---	---	---	---	ND	---	---	---	---	---	0.0004	0.0004
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.004	0.004
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	0.0004	0.0004
	March-2023	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.0002	0.0002
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	April-2023	---	---	---	---	---	**0.00128**	---	---	---	---	---	---	---	---	0.0002	0.0002
		---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.0002	0.0002
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.004	0.004
	July-2023	**0.000306**	---	---	---	---	---	---	---	---	---	---	ND	---	ND	0.0002	0.0002
		---	---	**0.0107**	---	---	---	---	---	---	---	---	---	ND	---	0.001	0.001
Nickel	November-2022	---	---	---	---	**0.0866**	---	**0.1344**	---	**0.173**	---	---	---	---	---	0.014	0.02
	December-2022	**0.1722**	**0.5025**	**0.2989**	---	**0.1299**	**0.287**	---	---	---	**0.1853**	**0.346**	---	---	---	0.014	0.02
	January-2023	**0.1074**	---	---	**0.1442**	**0.0407**	---	---	---	**0.0769**	---	---	---	---	---	0.007	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.1726**	---	---	---	0.001	0.001
	March-2023	---	---	---	**0.1254**	**0.1033**	---	---	---	---	---	---	---	---	---	0.007	0.01
	April-2023	---	---	---	**0.1143**	---	**0.1732**	---	---	---	---	---	---	---	---	0.001	0.001
	May-2023	**0.113**	---	---	**0.09726**	**0.05657**	---	---	---	---	---	---	---	---	---	0.005	0.005
	June-2023	---	---	---	---	**0.05978**	---	**0.05892**	**0.07161**	---	---	---	---	---	---	0.005	0.005
	July-2023	**0.09872**	---	**0.08332**	---	---	---	---	---	---	---	---	**0.1576**	**0.03074**	**0.01403**	0.001	0.001

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
TOTAL METALS (mg/L)																	
Selenium	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	---	---	---	0.08	0.1
	December-2022	ND	ND	ND	---	ND	ND	---	---	---	ND	ND	---	---	---	0.08	0.1
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	---	---	---	0.04	0.05
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.00199**	---	---	---	0.00085	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.04	0.05
	April-2023	---	---	---	**0.00189**	---	**0.00185**	---	---	---	---	---	---	---	---	0.00085	0.001
	May-2023	ND	---	---	ND	**0.00569**	---	---	---	---	---	---	---	---	---	0.00425	0.005
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.00425	0.005
	July-2023	**0.00101**	---	**0.00331**	---	---	---	---	---	---	---	---	**0.00116**	**0.00251**	ND	0.00085	0.001
Silver	November-2022	---	---	---	---	ND	---	ND	---	ND	---	---	---	---	---	0.01	0.02
	December-2022	ND	**0.0187 J**	ND	---	ND	ND	---	---	---	ND	ND	---	---	---	0.01	0.02
	January-2023	ND	---	---	ND	ND	---	---	---	ND	---	---	---	---	---	0.005	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	0.00006	0.001
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.005	0.01
	April-2023	---	---	---	ND	---	**0.00011 J**	---	---	---	---	---	---	---	---	0.00006	0.001
	May-2023	ND	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.0003	0.005
	June-2023	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.0003	0.005
	July-2023	ND	---	ND	---	---	---	---	---	---	---	---	ND	ND	ND	0.00006	0.001
Zinc	November-2022	---	---	---	---	ND	---	**0.032**	---	**0.694**	---	---	---	---	---	0.02	0.02
	December-2022	**0.208**	**29.7**	**0.162**	---	**0.0686**	**0.75**	---	---	---	**0.364**	**0.286**	---	---	---	0.02	0.02
	January-2023	**0.133**	---	---	**0.15**	**0.074**	---	---	---	**0.0752**	---	---	---	---	---	0.01	0.01
	February-2023	---	---	---	---	---	---	---	---	---	---	**0.0851**	---	---	---	0.0025	0.005
	March-2023	---	---	---	**0.0689**	**0.0538**	---	---	---	---	---	---	---	---	---	0.01	0.01
	April-2023	---	---	---	**0.0539**	---	---	---	---	---	---	---	---	---	---	0.0025	0.005
		---	---	---	---	---	**0.414**	---	---	---	---	---	---	---	---	0.025	0.05
	May-2023	**0.079**	---	---	**0.0635**	**0.0519**	---	---	---	---	---	---	---	---	---	0.0125	0.025
	June-2023	---	---	---	---	**0.0538**	---	**0.0253**	**0.945**	---	---	---	---	---	---	0.0125	0.025
	July-2023	**0.0488**	---	---	---	---	---	---	---	---	---	---	**0.0714**	**0.354**	**0.0782**	0.0025	0.005
		---	---	**2.03**	---	---	---	---	---	---	---	---	---	---	---	0.0125	0.025
VOLATILE FATTY ACIDS mg/L																	
Acetic Acid	November-2022	---	---	---	---	---	---	**1600**	---	---	---	---	---	---	---	25	100
		---	---	---	---	**3500**	---	---	---	**150 J**	---	---	---	---	---	62	250
	December-2022	**1800**	---	---	---	---	---	---	---	---	---	---	---	---	---	62	250
	January-2023	ND	---	---	ND	**4400**	---	---	---	ND	---	---	---	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	500
	March-2023	---	---	---	ND	**640**	---	---	---	---	---	---	---	---	---	---	500
	April-2023	---	---	---	**1200**	---	**520**	---	---	---	---	---	---	---	---	370	500
	May-2023	**990**	---	---	**1800**	**3000**	---	---	---	---	---	---	---	---	---	370	500
	June-2023	---	---	---	---	**5900**	---	**4100**	**5000**	---	---	---	---	---	---	750	1000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	150	200
		ND	---	---	---	---	---	---	---	---	---	---	ND	---	---	370	500
		---	---	**6100**	---	---	---	---	---	---	---	---	---	**750**	---	750	1000

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
VOLATILE FATTY ACIDS mg/L																	
Butyric Acid	November-2022	---	---	---	---	---	---	**430**	---	---	---	---	---	---	---	12	100
		---	---	---	---	**830**	---	---	---	ND	---	---	---	---	---	29	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	29	250
	January-2023	ND	---	---	ND	**1800**	---	---	---	ND	---	---	---	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	500
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	500
	April-2023	---	---	---	ND	---	ND	---	---	---	---	---	---	---	---	330	500
	May-2023	ND	---	---	ND	**1200**	---	---	---	---	---	---	---	---	---	330	500
	June-2023	---	---	---	---	**2500**	---	**1500**	**2900**	---	---	---	---	---	---	650	1000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	130	200
		ND	---	---	---	---	---	---	---	---	---	---	ND	---	---	330	500
		---	---	**2800**	---	---	---	---	---	---	---	---	---	**650**	---	650	1000
Lactic Acid	November-2022	---	---	---	---	---	---	ND	---	---	---	---	---	---	---	11	100
		---	---	---	---	ND	---	---	---	ND	---	---	---	---	---	27	250
	December-2022	**90 J**	---	---	---	---	---	---	---	---	---	---	---	---	---	27	250
Propionic Acid	November-2022	---	---	---	---	---	---	**620**	---	---	---	---	---	---	---	11	100
		---	---	---	---	**1600**	---	---	---	**73 J**	---	---	---	---	---	27	250
	December-2022	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	27	250
	January-2023	ND	---	---	ND	**2000**	---	---	---	ND	---	---	---	---	---	---	500
	February-2023	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	---	500
	March-2023	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	---	500
	April-2023	---	---	---	**600**	---	ND	---	---	---	---	---	---	---	---	340	500
	May-2023	**520**	---	---	**800**	**1400**	---	---	---	---	---	---	---	---	---	340	500
	June-2023	---	---	---	---	**2900**	---	**2000**	**2900**	---	---	---	---	---	---	680	1000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	140	200
		ND	---	---	---	---	---	---	---	---	---	---	ND	---	---	340	500
		---	---	**3100**	---	---	---	---	---	---	---	---	---	**680**	---	680	1000
Pyruvic Acid	November-2022	---	---	---	---	---	---	**46 J**	---	---	---	---	---	---	---	12	100
		---	---	---	---	**98 J**	---	---	---	ND	---	---	---	---	---	30	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	30	250
VOLATILE ORGANIC COMPOUNDS (ug/L)																	
2-Butanone (MEK)	November-2022	---	---	---	---	**3510**	---	---	---	**1140**	---	---	---	---	---	30	100
		---	---	---	---	---	---	**15600**	---	---	---	---	---	---	---	300	1000
	December-2022	**3140**	---	---	---	---	**3390**	---	---	---	---	---	---	---	---	30	100
		---	**26800**	**27700**	---	**5670**	---	---	---	---	**21700**	**7150**	---	---	---	300	1000
	January-2023	**3480**	---	---	**632**	---	---	---	---	---	---	---	---	---	---	30	100
		---	---	---	---	**7840**	---	---	---	**5470**	---	---	---	---	---	300	1000
	February-2023	---	---	---	---	---	---	---	---	---	---	**14400**	---	---	---	600	2000
	March-2023	---	---	---	**257**	**2770**	---	---	---	---	---	---	---	---	---	30	100
	April-2023	---	---	---	**3420**	---	**5530**	---	---	---	---	---	---	---	---	750	2500
	May-2023	**5360**	---	---	**5970**	---	---	---	---	---	---	---	---	---	---	150	500
		---	---	---	---	**13600**	---	---	---	---	---	---	---	---	---	750	2500
	June-2023	---	---	---	---	**13800**	---	---	---	---	---	---	---	---	---	750	2500
		---	---	---	---	---	---	**20100**	**22600**	---	---	---	---	---	---	1500	5000
	July-2023	**5860**	---	---	---	---	---	---	---	---	---	---	ND	---	---	60	200
		---	---	---	---	---	---	---	---	---	---	---	---	---	**13500**	750	2500
		---	---	**38400**	---	---	---	---	---	---	---	---	---	**31600**	---	3000	10000

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
VOLATILE ORGANIC COMPOUNDS (ug/L)																	
Acetone	November-2022	---	---	---	---	---	---	---	---	**4420**	---	---	---	---	---	70	100
		---	---	---	---	**16100**	---	**38300**	---	---	---	---	---	---	---	700	1000
	December-2022	---	---	---	---	**15600**	**5170**	---	---	---	---	**9800**	---	---	---	700	1000
		8500	---	---	---	---	---	---	---	---	---	---	---	---	---	1750	2500
		---	**53100**	**49900**	---	---	---	---	---	---	**45600**	---	---	---	---	3500	5000
	January-2023	---	---	---	**1530**	---	---	---	---	---	---	---	---	---	---	70	100
		---	---	---	---	**22200**	---	---	---	**14000**	---	---	---	---	---	700	1000
		8130	---	---	---	---	---	---	---	---	---	---	---	---	---	1750	2500
	February-2023	---	---	---	---	---	---	---	---	---	---	**23900**	---	---	---	1400	2000
	March-2023	---	---	---	**375**	---	---	---	---	---	---	---	---	---	---	70	100
		---	---	---	---	**6810**	---	---	---	---	---	---	---	---	---	700	1000
	April-2023	---	---	---	**8290**	---	**7560**	---	---	---	---	---	---	---	---	1750	2500
	May-2023	**10700**	---	---	**11700**	---	---	---	---	---	---	---	---	---	---	350	500
		---	---	---	---	**29600**	---	---	---	---	---	---	---	---	---	1750	2500
	June-2023	---	---	---	---	**29600**	---	---	---	---	---	---	---	---	---	1750	2500
		---	---	---	---	---	---	**61800**	**50800**	---	---	---	---	---	---	3500	5000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	**1180**	---	---	140	200
		9780	---	---	---	---	---	---	---	---	---	---	---	---	---	700	1000
		---	---	---	---	---	---	---	---	---	---	---	---	---	**11600**	1750	2500
		---	---	**77200**	---	---	---	---	---	---	---	---	---	**69700**	---	7000	10000
Benzene	November-2022	---	---	---	---	**7.4 J**	---	**2860**	---	**50.4**	---	---	---	---	---	4	10
	December-2022	**301**	**2960**	---	---	**6.3 J**	**622**	---	---	---	**1750**	**179**	---	---	---	4	10
		---	---	**6550**	---	---	---	---	---	---	---	---	---	---	---	40	100
	January-2023	**240**	---	---	**28.7**	**1620**	---	---	---	**167**	---	---	---	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**1370**	---	---	---	4	10
	March-2023	---	---	---	**1540**	**727**	---	---	---	---	---	---	---	---	---	4	10
	April-2023	---	---	---	**3740**	---	**320**	---	---	---	---	---	---	---	---	4	10
	May-2023	**814**	---	---	**4890**	**3370**	---	---	---	---	---	---	---	---	---	20	50
	June-2023	---	---	---	---	**2630**	---	---	---	---	---	---	---	---	---	8	20
		---	---	---	---	---	---	**1400**	**1590**	---	---	---	---	---	---	20	50
	July-2023	**824**	---	---	---	---	---	---	---	---	---	---	**80.8**	---	---	8	20
		---	---	**4050**	---	---	---	---	---	---	---	---	---	**1420**	---	20	50
		---	---	---	---	---	---	---	---	---	---	---	---	---	**11800**	100	250
Ethylbenzene	December-2022	**67.3**	**172**	**287**	---	ND	**48.5**	---	---	---	**108**	**27.4**	---	---	---	4	10
	November-2022	---	---	---	---	ND	---	**194**	---	**16.2**	---	---	---	---	---	4	10
	January-2023	**65.1**	---	---	ND	**93.9**	---	---	---	**20.8**	---	---	---	---	---	4	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**151**	---	---	---	4	10
	March-2023	---	---	---	**131**	**71.5**	---	---	---	---	---	---	---	---	---	4	10
	April-2023	---	---	---	**186**	---	**43.4**	---	---	---	---	---	---	---	---	4	10
	May-2023	**124**	---	---	**276**	**144**	---	---	---	---	---	---	---	---	---	20	50
	June-2023	---	---	---	---	**104**	---	---	---	---	---	---	---	---	---	8	20
		---	---	---	---	---	---	**98**	**116**	---	---	---	---	---	---	20	50
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**666**	4	10
		128	---	---	---	---	---	---	---	---	---	---	**82**	---	---	8	20
		---	---	**224**	---	---	---	---	---	---	---	---	---	**87.5**	---	20	50

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-64	EW-65	EW-67	EW-68	EW-78	EW-94	EW-98	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**															
VOLATILE ORGANIC COMPOUNDS (ug/L)																	
Tetrahydrofuran	November-2022	---	---	---	---	**309**	---	---	---	**176**	---	---	---	---	---	100	100
		---	---	---	---	---	---	**8530**	---	---	---	---	---	---	---	1000	1000
	December-2022	**151**	---	---	---	**170**	**1120**	---	---	---	---	**663**	---	---	---	100	100
		---	**5210**	**19800**	---	---	---	---	---	---	**6130**	---	---	---	---	1000	1000
	January-2023	**183**	---	---	**566**	**1810**	---	---	---	**352**	---	---	---	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	**3760**	---	---	---	2000	2000
	March-2023	---	---	---	**353**	**464**	---	---	---	---	---	---	---	---	---	100	100
	April-2023	---	---	---	**2410**	---	**4790**	---	---	---	---	---	---	---	---	100	100
	May-2023	ND	---	---	**2740**	**2380**	---	---	---	---	---	---	---	---	---	500	500
	June-2023	---	---	---	---	**2100**	---	---	---	---	---	---	---	---	---	200	200
		---	---	---	---	---	---	**7320**	**6670**	---	---	---	---	---	---	500	500
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**2960**	100	100
		411	---	---	---	---	---	---	---	---	---	---	**616**	---	---	200	200
		---	---	**8380**	---	---	---	---	---	---	---	---	---	**5310**	---	500	500
Toluene	November-2022	---	---	---	---	ND	---	**214**	---	**32.8**	---	---	---	---	---	5	10
	December-2022	**122**	**175**	**195**	---	ND	**113**	---	---	---	**113**	**48.3**	---	---	---	5	10
	January-2023	**122**	---	---	**8 J**	**139**	---	---	---	**35.3**	---	---	---	---	---	5	10
	February-2023	---	---	---	---	---	---	---	---	---	---	**224**	---	---	---	5	10
	March-2023	---	---	---	**182**	**98.1**	---	---	---	---	---	---	---	---	---	5	10
	April-2023	---	---	---	**303**	---	**94.4**	---	---	---	---	---	---	---	---	5	10
	May-2023	**258**	---	---	**371**	**239**	---	---	---	---	---	---	---	---	---	25	50
	June-2023	---	---	---	---	**165**	---	---	---	---	---	---	---	---	---	10	20
		---	---	---	---	---	---	**67**	**212**	---	---	---	---	---	---	25	50
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**965**	5	10
		248	---	---	---	---	---	---	---	---	---	---	**107**	---	---	10	20
		---	---	**218**	---	---	---	---	---	---	---	---	---	**118**	---	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
	June-2023	---	---	---	---	**177**	---	---	---	---	---	---	---	---	---	20	60
		---	---	---	---	---	---	**92 J**	**136 J**	---	---	---	---	---	---	50	150
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	**1130**	10	30
		257	---	---	---	---	---	---	---	---	---	---	**74.4**	---	---	20	60
		---	---	**230**	---	---	---	---	---	---	---	---	---	**174**	---	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

TNI Accredited
VELAP ID 460021

ENTHALPY ANALYTICAL

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

Certificate of Analysis

Final Report

Laboratory Order ID 23G0895

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	July 20, 2023 8:00
		Date Issued:	August 8, 2023 9:17
		Project Number:	2023 City of Bristol Landfill Le
Submitted To:	Logan Howard	Purchase Order:	
Client Site I.D.:	Bristol LF		

Enclosed are the results of analyses for samples received by the laboratory on 07/20/2023 08:00. 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.

Enthalpy Analytical
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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Laboratory Sample ID: **23G0895-01** **Client Sample ID:** **EW-50**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6020B	230		0.50	1.0	1	ug/L
Barium	01	SW6020B	542		5.00	25.0	5	ug/L
Cadmium	01	SW6020B	0.219	J	0.100	1.00	1	ug/L
Chromium	01	SW6020B	308		0.400	1.00	1	ug/L
Copper	01	SW6020B	1.24		0.300	1.00	1	ug/L
Lead	01	SW6020B	1.4		1.0	1.0	1	ug/L
Mercury	01	SW6020B	0.306		0.200	0.200	1	ug/L
Nickel	01	SW6020B	98.72		1.000	1.000	1	ug/L
Selenium	01	SW6020B	1.01		0.850	1.00	1	ug/L
Zinc	01	SW6020B	48.8		2.50	5.00	1	ug/L
2-Butanone (MEK)	01	SW8260D	5860		60.0	200	20	ug/L
Acetone	01RE1	SW8260D	9780		700	1000	100	ug/L
Benzene	01	SW8260D	824		8.00	20.0	20	ug/L
Ethylbenzene	01	SW8260D	128		8.00	20.0	20	ug/L
Tetrahydrofuran	01	SW8260D	411		200	200	20	ug/L
Toluene	01	SW8260D	248		10.0	20.0	20	ug/L
Xylenes, Total	01	SW8260D	257		20.0	60.0	20	ug/L
Ammonia as N	01	EPA350.1 R2.0	1570		146	200	2000	mg/L
BOD	01	SM5210B-2016	6820		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	6480		1000	1000	100	mg/L
TKN as N	01	EPA351.2 R2.0	1670		40.0	100	200	mg/L
Total Recoverable Phenolics	01	SW9065	11.6		1.50	2.50	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Laboratory Sample ID: **23G0895-02** **Client Sample ID:** **EW-98**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02	SW6020B	60		0.50	1.0	1	ug/L
Barium	02	SW6020B	217		1.00	5.00	1	ug/L
Chromium	02	SW6020B	26.5		0.400	1.00	1	ug/L
Copper	02	SW6020B	2.70		0.300	1.00	1	ug/L
Lead	02	SW6020B	1.7		1.0	1.0	1	ug/L
Nickel	02	SW6020B	14.03		1.000	1.000	1	ug/L
Zinc	02	SW6020B	78.2		2.50	5.00	1	ug/L
2-Butanone (MEK)	02RE1	SW8260D	13500		750	2500	250	ug/L
Acetone	02RE1	SW8260D	11600		1750	2500	250	ug/L
Benzene	02RE1	SW8260D	11800		100	250	250	ug/L
Ethylbenzene	02	SW8260D	666		4.00	10.0	10	ug/L
Tetrahydrofuran	02	SW8260D	2960		100	100	10	ug/L
Toluene	02	SW8260D	965		5.00	10.0	10	ug/L
Xylenes, Total	02	SW8260D	1130		10.0	30.0	10	ug/L
Ammonia as N	02	EPA350.1 R2.0	310		146	200	2000	mg/L
BOD	02	SM5210B-2016	937		0.2	2.0	1	mg/L
COD	02	SM5220D-2011	2180		500	500	1	mg/L
TKN as N	02	EPA351.2 R2.0	285		40.0	100	200	mg/L
Total Recoverable Phenolics	02	SW9065	2.92		0.300	0.500	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Laboratory Sample ID: **23G0895-03** **Client Sample ID:** **EW-94**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	03	SW6020B	190		0.50	1.0	1	ug/L
Barium	03	SW6020B	1020		5.00	25.0	5	ug/L
Chromium	03	SW6020B	215		0.400	1.00	1	ug/L
Nickel	03	SW6020B	30.74		1.000	1.000	1	ug/L
Selenium	03	SW6020B	2.51		0.850	1.00	1	ug/L
Zinc	03	SW6020B	354		2.50	5.00	1	ug/L
2-Butanone (MEK)	03RE1	SW8260D	31600		3000	10000	1000	ug/L
Acetone	03RE1	SW8260D	69700		7000	10000	1000	ug/L
Benzene	03	SW8260D	1420		20.0	50.0	50	ug/L
Ethylbenzene	03	SW8260D	87.5		20.0	50.0	50	ug/L
Tetrahydrofuran	03	SW8260D	5310		500	500	50	ug/L
Toluene	03	SW8260D	118		25.0	50.0	50	ug/L
Xylenes, Total	03	SW8260D	174		50.0	150	50	ug/L
Ammonia as N	03	EPA350.1 R2.0	2350		146	200	2000	mg/L
BOD	03	SM5210B-2016	31800		0.2	2.0	1	mg/L
COD	03	SM5220D-2011	41000		5000	5000	100	mg/L
TKN as N	03	EPA351.2 R2.0	2720		40.0	100	200	mg/L
Total Recoverable Phenolics	03	SW9065	37.3		1.50	2.50	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Laboratory Sample ID: **23G0895-04** **Client Sample ID:** **EW-57**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	04	SW6020B	700		2.5	5.0	5	ug/L
Barium	04	SW6020B	2280		5.00	25.0	5	ug/L
Cadmium	04	SW6020B	0.156	J	0.100	1.00	1	ug/L
Chromium	04	SW6020B	535		0.400	1.00	1	ug/L
Copper	04	SW6020B	1.63		0.300	1.00	1	ug/L
Lead	04	SW6020B	19		1.0	1.0	1	ug/L
Mercury	04	SW6020B	10.7		1.00	1.00	5	ug/L
Nickel	04	SW6020B	83.32		1.000	1.000	1	ug/L
Selenium	04	SW6020B	3.31		0.850	1.00	1	ug/L
Zinc	04	SW6020B	2030		12.5	25.0	5	ug/L
2-Butanone (MEK)	04RE1	SW8260D	38400		3000	10000	1000	ug/L
Acetone	04RE1	SW8260D	77200		7000	10000	1000	ug/L
Benzene	04	SW8260D	4050		20.0	50.0	50	ug/L
Ethylbenzene	04	SW8260D	224		20.0	50.0	50	ug/L
Tetrahydrofuran	04	SW8260D	8380		500	500	50	ug/L
Toluene	04	SW8260D	218		25.0	50.0	50	ug/L
Xylenes, Total	04	SW8260D	230		50.0	150	50	ug/L
Ammonia as N	04	EPA350.1 R2.0	2260		146	200	2000	mg/L
BOD	04	SM5210B-2016	32900		0.2	2.0	1	mg/L
COD	04	SM5220D-2011	50100		10000	10000	100	mg/L
Nitrite as N	04	SM4500-NO2B-2011	1.20	J	1.00	5.00	100	mg/L
TKN as N	04	EPA351.2 R2.0	2960		40.0	100	200	mg/L
Total Recoverable Phenolics	04	SW9065	47.9		1.50	2.50	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Laboratory Sample ID: **23G0895-05** **Client Sample ID:** **Trip Blank**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Acetone	05	SW8260D	7.27	J	7.00	10.0	1	ug/L

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

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-50	23G0895-01	Ground Water	07/19/2023 08:15	07/20/2023 08:00
EW-98	23G0895-02	Ground Water	07/19/2023 08:50	07/20/2023 08:00
EW-94	23G0895-03	Ground Water	07/19/2023 09:35	07/20/2023 08:00
EW-57	23G0895-04	Ground Water	07/19/2023 10:00	07/20/2023 08:00
Trip Blank	23G0895-05	Ground Water	04/25/2023 15:20	07/20/2023 08:00

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/8/2023 9:17:33AM
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23G0895-01**

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	01	7440-22-4	SW6020B	07/21/2023 17:00	07/24/2023 11:53	BLOD		0.0600	1.00	1	ug/L	AB
Arsenic	01	7440-38-2	SW6020B	07/21/2023 17:00	07/24/2023 11:53	230		0.50	1.0	1	ug/L	AB
Barium	01	7440-39-3	SW6020B	07/21/2023 17:00	07/24/2023 13:07	542		5.00	25.0	5	ug/L	AB
Cadmium	01	7440-43-9	SW6020B	07/21/2023 17:00	07/24/2023 11:53	0.219	J	0.100	1.00	1	ug/L	AB
Chromium	01	7440-47-3	SW6020B	07/21/2023 17:00	07/24/2023 11:53	308		0.400	1.00	1	ug/L	AB
Copper	01	7440-50-8	SW6020B	07/21/2023 17:00	07/24/2023 11:53	1.24		0.300	1.00	1	ug/L	AB
Mercury	01	7439-97-6	SW6020B	07/21/2023 17:00	07/24/2023 11:53	0.306		0.200	0.200	1	ug/L	AB
Nickel	01	7440-02-0	SW6020B	07/21/2023 17:00	07/24/2023 11:53	98.72		1.000	1.000	1	ug/L	AB
Lead	01	7439-92-1	SW6020B	07/21/2023 17:00	07/24/2023 11:53	1.4		1.0	1.0	1	ug/L	AB
Selenium	01	7782-49-2	SW6020B	07/21/2023 17:00	07/24/2023 11:53	1.01		0.850	1.00	1	ug/L	AB
Zinc	01	7440-66-6	SW6020B	07/21/2023 17:00	07/24/2023 11:53	48.8		2.50	5.00	1	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	07/21/2023 17:12	07/21/2023 17:12	5860		60.0	200	20	ug/L	ZDR
Acetone	01RE1	67-64-1	SW8260D	07/24/2023 15:02	07/24/2023 15:02	9780		700	1000	100	ug/L	ZDR
Benzene	01	71-43-2	SW8260D	07/21/2023 17:12	07/21/2023 17:12	824		8.00	20.0	20	ug/L	ZDR
Ethylbenzene	01	100-41-4	SW8260D	07/21/2023 17:12	07/21/2023 17:12	128		8.00	20.0	20	ug/L	ZDR
Toluene	01	108-88-3	SW8260D	07/21/2023 17:12	07/21/2023 17:12	248		10.0	20.0	20	ug/L	ZDR
Xylenes, Total	01	1330-20-7	SW8260D	07/21/2023 17:12	07/21/2023 17:12	257		20.0	60.0	20	ug/L	ZDR
Tetrahydrofuran	01	109-99-9	SW8260D	07/21/2023 17:12	07/21/2023 17:12	411		200	200	20	ug/L	ZDR
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*		*107 %*	*70-120*	*07/21/2023 17:12*	*07/21/2023 17:12*						
Surr: 4-Bromofluorobenzene (Surr)	*01*		*100 %*	*75-120*	*07/21/2023 17:12*	*07/21/2023 17:12*						
Surr: Dibromofluoromethane (Surr)	*01*		*97.9 %*	*70-130*	*07/21/2023 17:12*	*07/21/2023 17:12*						
Surr: Toluene-d8 (Surr)	*01*		*95.4 %*	*70-130*	*07/21/2023 17:12*	*07/21/2023 17:12*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*		*112 %*	*70-120*	*07/24/2023 15:02*	*07/24/2023 15:02*						
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*		*101 %*	*75-120*	*07/24/2023 15:02*	*07/24/2023 15:02*						

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/8/2023 9:17:33AM
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23G0895-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*01RE1*	*102 %*	*70-130*	*07/24/2023 15:02*	*07/24/2023 15:02*							
Surr: Toluene-d8 (Surr)	*01RE1*	*97.3 %*	*70-130*	*07/24/2023 15:02*	*07/24/2023 15:02*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	07/21/2023 09:00	07/24/2023 20:43	BLOD		100	200	20	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*46.9 %*	*5-136*	*07/21/2023 09:00*	*07/24/2023 20:43*							
Surr: 2-Fluorobiphenyl (Surr)	*01*	*42.2 %*	*9-117*	*07/21/2023 09:00*	*07/24/2023 20:43*							
Surr: 2-Fluorophenol (Surr)	*01*	*25.2 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 20:43*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*50.8 %*	*5-151*	*07/21/2023 09:00*	*07/24/2023 20:43*							
Surr: Phenol-d5 (Surr)	*01*	*24.0 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 20:43*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*12.6 %*	*5-141*	*07/21/2023 09:00*	*07/24/2023 20:43*							

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/8/2023 9:17:33AM
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23G0895-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Ammonia as N	01	7664-41-7	EPA350.1 R2.0	07/21/2023 14:31	07/21/2023 14:31	1570		146	200	2000	mg/L	MGC
BOD	01	E1640606	SM5210B-2016	07/20/2023 10:31	07/20/2023 10:31	6820		0.2	2.0	1	mg/L	LAM
COD	01	NA	SM5220D-2011	07/27/2023 14:28	07/27/2023 14:28	6480		1000	1000	100	mg/L	LTN
Nitrate as N	01	14797-55-8	Calc.	07/31/2023 13:32	07/31/2023 13:32	BLOD		1.00	3.00	50	mg/L	MGC
Nitrate+Nitrite as N	01	E701177	SM4500-NO3F-2016	07/31/2023 13:32	07/31/2023 13:32	BLOD		0.50	0.50	1	mg/L	MGC
Nitrite as N	01	14797-65-0	SM4500-NO2B-2011	07/20/2023 16:31	07/20/2023 16:31	BLOD		0.50	2.50	50	mg/L	MGC
Total Recoverable Phenolics	01	NA	SW9065	07/28/2023 08:33	07/28/2023 08:33	11.6		1.50	2.50	1	mg/L	AAL
TKN as N	01	E17148461	EPA351.2 R2.0	07/24/2023 16:56	07/24/2023 16:56	1670		40.0	100	200	mg/L	SPH

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/8/2023 9:17:33AM
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW-98** **Laboratory Sample ID:** **23G0895-02**

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	02	7440-22-4	SW6020B	07/21/2023 17:00	07/24/2023 11:56	BLOD		0.0600	1.00	1	ug/L	AB
Arsenic	02	7440-38-2	SW6020B	07/21/2023 17:00	07/24/2023 11:56	60		0.50	1.0	1	ug/L	AB
Barium	02	7440-39-3	SW6020B	07/21/2023 17:00	07/24/2023 11:56	217		1.00	5.00	1	ug/L	AB
Cadmium	02	7440-43-9	SW6020B	07/21/2023 17:00	07/24/2023 11:56	BLOD		0.100	1.00	1	ug/L	AB
Chromium	02	7440-47-3	SW6020B	07/21/2023 17:00	07/24/2023 11:56	26.5		0.400	1.00	1	ug/L	AB
Copper	02	7440-50-8	SW6020B	07/21/2023 17:00	07/24/2023 11:56	2.70		0.300	1.00	1	ug/L	AB
Mercury	02	7439-97-6	SW6020B	07/21/2023 17:00	07/24/2023 11:56	BLOD		0.200	0.200	1	ug/L	AB
Nickel	02	7440-02-0	SW6020B	07/21/2023 17:00	07/24/2023 11:56	14.03		1.000	1.000	1	ug/L	AB
Lead	02	7439-92-1	SW6020B	07/21/2023 17:00	07/24/2023 11:56	1.7		1.0	1.0	1	ug/L	AB
Selenium	02	7782-49-2	SW6020B	07/21/2023 17:00	07/24/2023 11:56	BLOD		0.850	1.00	1	ug/L	AB
Zinc	02	7440-66-6	SW6020B	07/21/2023 17:00	07/24/2023 11:56	78.2		2.50	5.00	1	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	02RE1	78-93-3	SW8260D	07/24/2023 15:28	07/24/2023 15:28	13500		750	2500	250	ug/L	ZDR
Acetone	02RE1	67-64-1	SW8260D	07/24/2023 15:28	07/24/2023 15:28	11600		1750	2500	250	ug/L	ZDR
Benzene	02RE1	71-43-2	SW8260D	07/24/2023 15:28	07/24/2023 15:28	11800		100	250	250	ug/L	ZDR
Ethylbenzene	02	100-41-4	SW8260D	07/21/2023 16:47	07/21/2023 16:47	666		4.00	10.0	10	ug/L	ZDR
Toluene	02	108-88-3	SW8260D	07/21/2023 16:47	07/21/2023 16:47	965		5.00	10.0	10	ug/L	ZDR
Xylenes, Total	02	1330-20-7	SW8260D	07/21/2023 16:47	07/21/2023 16:47	1130		10.0	30.0	10	ug/L	ZDR
Tetrahydrofuran	02	109-99-9	SW8260D	07/21/2023 16:47	07/21/2023 16:47	2960		100	100	10	ug/L	ZDR
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*		*110 %*	*70-120*	*07/21/2023 16:47*	*07/21/2023 16:47*						
Surr: 4-Bromofluorobenzene (Surr)	*02*		*100 %*	*75-120*	*07/21/2023 16:47*	*07/21/2023 16:47*						
Surr: Dibromofluoromethane (Surr)	*02*		*97.7 %*	*70-130*	*07/21/2023 16:47*	*07/21/2023 16:47*						
Surr: Toluene-d8 (Surr)	*02*		*95.9 %*	*70-130*	*07/21/2023 16:47*	*07/21/2023 16:47*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*02RE1*		*108 %*	*70-120*	*07/24/2023 15:28*	*07/24/2023 15:28*						
Surr: 4-Bromofluorobenzene (Surr)	*02RE1*		*101 %*	*75-120*	*07/24/2023 15:28*	*07/24/2023 15:28*						

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Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW-98** **Laboratory Sample ID:** **23G0895-02**

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												
Surr: Dibromofluoromethane (Surr)	*02RE1*	*102 %*	*70-130*	*07/24/2023 15:28*	*07/24/2023 15:28*							
Surr: Toluene-d8 (Surr)	*02RE1*	*97.1 %*	*70-130*	*07/24/2023 15:28*	*07/24/2023 15:28*							
Semivolatile Organic Compounds by GCMS												
Anthracene	02	120-12-7	SW8270E	07/21/2023 09:00	07/24/2023 21:12	BLOD		46.7	93.5	10	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*02*	*33.1 %*	*5-136*	*07/21/2023 09:00*	*07/24/2023 21:12*							
Surr: 2-Fluorobiphenyl (Surr)	*02*	*28.8 %*	*9-117*	*07/21/2023 09:00*	*07/24/2023 21:12*							
Surr: 2-Fluorophenol (Surr)	*02*	*19.0 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 21:12*							
Surr: Nitrobenzene-d5 (Surr)	*02*	*38.6 %*	*5-151*	*07/21/2023 09:00*	*07/24/2023 21:12*							
Surr: Phenol-d5 (Surr)	*02*	*12.7 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 21:12*							
Surr: p-Terphenyl-d14 (Surr)	*02*	*20.0 %*	*5-141*	*07/21/2023 09:00*	*07/24/2023 21:12*							

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Client Sample ID: **EW-98** **Laboratory Sample ID:** **23G0895-02**

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	02	7664-41-7	EPA350.1 R2.0	07/21/2023 14:31	07/21/2023 14:31	310		146	200	2000	mg/L	MGC
BOD	02	E1640606	SM5210B-2016	07/20/2023 10:28	07/20/2023 10:28	937		0.2	2.0	1	mg/L	LAM
COD	02	NA	SM5220D-2011	08/02/2023 10:30	08/02/2023 10:30	2180		500	500	1	mg/L	MGC
Nitrate as N	02	14797-55-8	Calc.	07/31/2023 13:32	07/31/2023 13:32	BLOD		0.550	0.750	1	mg/L	MGC
Nitrate+Nitrite as N	02	E701177	SM4500-NO3F-2016	07/31/2023 13:32	07/31/2023 13:32	BLOD		0.50	0.50	1	mg/L	MGC
Nitrite as N	02	14797-65-0	SM4500-NO2B-2011	07/20/2023 16:31	07/20/2023 16:31	BLOD		0.05	0.25	1	mg/L	MGC
Total Recoverable Phenolics	02	NA	SW9065	08/02/2023 13:40	08/02/2023 13:40	2.92		0.300	0.500	1	mg/L	AAL
TKN as N	02	E17148461	EPA351.2 R2.0	07/24/2023 16:56	07/24/2023 16:56	285		40.0	100	200	mg/L	SPH

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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23G0895-03**

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	03	7440-22-4	SW6020B	07/21/2023 17:00	07/24/2023 12:01	BLOD		0.0600	1.00	1	ug/L	AB
Arsenic	03	7440-38-2	SW6020B	07/21/2023 17:00	07/24/2023 12:01	190		0.50	1.0	1	ug/L	AB
Barium	03	7440-39-3	SW6020B	07/21/2023 17:00	07/24/2023 13:10	1020		5.00	25.0	5	ug/L	AB
Cadmium	03	7440-43-9	SW6020B	07/21/2023 17:00	07/24/2023 12:01	BLOD		0.100	1.00	1	ug/L	AB
Chromium	03	7440-47-3	SW6020B	07/21/2023 17:00	07/24/2023 12:01	215		0.400	1.00	1	ug/L	AB
Copper	03	7440-50-8	SW6020B	07/21/2023 17:00	07/24/2023 12:01	BLOD		0.300	1.00	1	ug/L	AB
Mercury	03	7439-97-6	SW6020B	07/21/2023 17:00	07/24/2023 13:10	BLOD		1.00	1.00	5	ug/L	AB
Nickel	03	7440-02-0	SW6020B	07/21/2023 17:00	07/24/2023 12:01	30.74		1.000	1.000	1	ug/L	AB
Lead	03	7439-92-1	SW6020B	07/21/2023 17:00	07/24/2023 12:01	BLOD		1.0	1.0	1	ug/L	AB
Selenium	03	7782-49-2	SW6020B	07/21/2023 17:00	07/24/2023 12:01	2.51		0.850	1.00	1	ug/L	AB
Zinc	03	7440-66-6	SW6020B	07/21/2023 17:00	07/24/2023 12:01	354		2.50	5.00	1	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	03RE1	78-93-3	SW8260D	07/24/2023 15:53	07/24/2023 15:53	31600		3000	10000	1000	ug/L	ZDR
Acetone	03RE1	67-64-1	SW8260D	07/24/2023 15:53	07/24/2023 15:53	69700		7000	10000	1000	ug/L	ZDR
Benzene	03	71-43-2	SW8260D	07/21/2023 17:37	07/21/2023 17:37	1420		20.0	50.0	50	ug/L	ZDR
Ethylbenzene	03	100-41-4	SW8260D	07/21/2023 17:37	07/21/2023 17:37	87.5		20.0	50.0	50	ug/L	ZDR
Toluene	03	108-88-3	SW8260D	07/21/2023 17:37	07/21/2023 17:37	118		25.0	50.0	50	ug/L	ZDR
Xylenes, Total	03	1330-20-7	SW8260D	07/21/2023 17:37	07/21/2023 17:37	174		50.0	150	50	ug/L	ZDR
Tetrahydrofuran	03	109-99-9	SW8260D	07/21/2023 17:37	07/21/2023 17:37	5310		500	500	50	ug/L	ZDR
Surr: 1,2-Dichloroethane-d4 (Surr)	*03*		*106 %*	*70-120*	*07/21/2023 17:37*	*07/21/2023 17:37*						
Surr: 4-Bromofluorobenzene (Surr)	*03*		*100 %*	*75-120*	*07/21/2023 17:37*	*07/21/2023 17:37*						
Surr: Dibromofluoromethane (Surr)	*03*		*98.0 %*	*70-130*	*07/21/2023 17:37*	*07/21/2023 17:37*						
Surr: Toluene-d8 (Surr)	*03*		*95.6 %*	*70-130*	*07/21/2023 17:37*	*07/21/2023 17:37*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*03RE1*		*112 %*	*70-120*	*07/24/2023 15:53*	*07/24/2023 15:53*						
Surr: 4-Bromofluorobenzene (Surr)	*03RE1*		*102 %*	*75-120*	*07/24/2023 15:53*	*07/24/2023 15:53*						

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Client Site I.D.: Bristol LF
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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23G0895-03**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*03RE1*	*102 %*	*70-130*	*07/24/2023 15:53*	*07/24/2023 15:53*							
Surr: Toluene-d8 (Surr)	*03RE1*	*97.1 %*	*70-130*	*07/24/2023 15:53*	*07/24/2023 15:53*							
Semivolatile Organic Compounds by GCMS												
Anthracene	03	120-12-7	SW8270E	07/21/2023 09:00	07/24/2023 21:42	BLOD		1000	2000	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*03*	*%*	*5-136*	*07/21/2023 09:00*	*07/24/2023 21:42*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*03*	*64.0 %*	*9-117*	*07/21/2023 09:00*	*07/24/2023 21:42*							
Surr: 2-Fluorophenol (Surr)	*03*	*50.0 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 21:42*							
Surr: Nitrobenzene-d5 (Surr)	*03*	*98.0 %*	*5-151*	*07/21/2023 09:00*	*07/24/2023 21:42*							
Surr: Phenol-d5 (Surr)	*03*	*37.0 %*	*5-60*	*07/21/2023 09:00*	*07/24/2023 21:42*							
Surr: p-Terphenyl-d14 (Surr)	*03*	*26.0 %*	*5-141*	*07/21/2023 09:00*	*07/24/2023 21:42*							

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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23G0895-03**

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	07/21/2023 14:31	07/21/2023 14:31	2350		146	200	2000	mg/L	MGC
BOD	03	E1640606	SM5210B-2016	07/20/2023 10:40	07/20/2023 10:40	31800		0.2	2.0	1	mg/L	LAM
COD	03	NA	SM5220D-2011	07/27/2023 14:28	07/27/2023 14:28	41000		5000	5000	100	mg/L	LTN
Nitrate as N	03	14797-55-8	Calc.	07/31/2023 13:32	07/31/2023 13:32	BLOD		1.50	5.50	100	mg/L	MGC
Nitrate+Nitrite as N	03	E701177	SM4500-NO3F-2016	07/31/2023 13:32	07/31/2023 13:32	BLOD		0.50	0.50	1	mg/L	MGC
Nitrite as N	03	14797-65-0	SM4500-NO2B-2011	07/21/2023 08:40	07/21/2023 08:40	BLOD		1.00	5.00	100	mg/L	MGC
Total Recoverable Phenolics	03	NA	SW9065	07/28/2023 08:33	07/28/2023 08:33	37.3		1.50	2.50	1	mg/L	AAL
TKN as N	03	E17148461	EPA351.2 R2.0	07/24/2023 16:56	07/24/2023 16:56	2720		40.0	100	200	mg/L	SPH

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Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Client Sample ID: **EW-57** **Laboratory Sample ID:** **23G0895-04**

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	04	7440-22-4	SW6020B	07/21/2023 17:00	07/24/2023 12:04	BLOD		0.0600	1.00	1	ug/L	AB
Arsenic	04	7440-38-2	SW6020B	07/21/2023 17:00	07/24/2023 13:13	700		2.5	5.0	5	ug/L	AB
Barium	04	7440-39-3	SW6020B	07/21/2023 17:00	07/24/2023 13:13	2280		5.00	25.0	5	ug/L	AB
Cadmium	04	7440-43-9	SW6020B	07/21/2023 17:00	07/24/2023 12:04	0.156	J	0.100	1.00	1	ug/L	AB
Chromium	04	7440-47-3	SW6020B	07/21/2023 17:00	07/24/2023 12:04	535		0.400	1.00	1	ug/L	AB
Copper	04	7440-50-8	SW6020B	07/21/2023 17:00	07/24/2023 12:04	1.63		0.300	1.00	1	ug/L	AB
Mercury	04	7439-97-6	SW6020B	07/21/2023 17:00	07/24/2023 13:13	10.7		1.00	1.00	5	ug/L	AB
Nickel	04	7440-02-0	SW6020B	07/21/2023 17:00	07/24/2023 12:04	83.32		1.000	1.000	1	ug/L	AB
Lead	04	7439-92-1	SW6020B	07/21/2023 17:00	07/24/2023 12:04	19		1.0	1.0	1	ug/L	AB
Selenium	04	7782-49-2	SW6020B	07/21/2023 17:00	07/24/2023 12:04	3.31		0.850	1.00	1	ug/L	AB
Zinc	04	7440-66-6	SW6020B	07/21/2023 17:00	07/24/2023 13:13	2030		12.5	25.0	5	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	04RE1	78-93-3	SW8260D	07/24/2023 16:18	07/24/2023 16:18	38400		3000	10000	1000	ug/L	ZDR
Acetone	04RE1	67-64-1	SW8260D	07/24/2023 16:18	07/24/2023 16:18	77200		7000	10000	1000	ug/L	ZDR
Benzene	04	71-43-2	SW8260D	07/21/2023 18:03	07/21/2023 18:03	4050		20.0	50.0	50	ug/L	ZDR
Ethylbenzene	04	100-41-4	SW8260D	07/21/2023 18:03	07/21/2023 18:03	224		20.0	50.0	50	ug/L	ZDR
Toluene	04	108-88-3	SW8260D	07/21/2023 18:03	07/21/2023 18:03	218		25.0	50.0	50	ug/L	ZDR
Xylenes, Total	04	1330-20-7	SW8260D	07/21/2023 18:03	07/21/2023 18:03	230		50.0	150	50	ug/L	ZDR
Tetrahydrofuran	04	109-99-9	SW8260D	07/21/2023 18:03	07/21/2023 18:03	8380		500	500	50	ug/L	ZDR
Surr: 1,2-Dichloroethane-d4 (Surr)	*04*		*104 %*	*70-120*	*07/21/2023 18:03*	*07/21/2023 18:03*						
Surr: 4-Bromofluorobenzene (Surr)	*04*		*100 %*	*75-120*	*07/21/2023 18:03*	*07/21/2023 18:03*						
Surr: Dibromofluoromethane (Surr)	*04*		*96.7 %*	*70-130*	*07/21/2023 18:03*	*07/21/2023 18:03*						
Surr: Toluene-d8 (Surr)	*04*		*95.3 %*	*70-130*	*07/21/2023 18:03*	*07/21/2023 18:03*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*04RE1*		*111 %*	*70-120*	*07/24/2023 16:18*	*07/24/2023 16:18*						
Surr: 4-Bromofluorobenzene (Surr)	*04RE1*		*101 %*	*75-120*	*07/24/2023 16:18*	*07/24/2023 16:18*						

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Client Site I.D.: Bristol LF
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Client Sample ID: **EW-57** **Laboratory Sample ID:** **23G0895-04**

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												
Surr: Dibromofluoromethane (Surr)	*04RE1*		*104 %*	*70-130*	*07/24/2023 16:18*	*07/24/2023 16:18*						
Surr: Toluene-d8 (Surr)	*04RE1*		*96.9 %*	*70-130*	*07/24/2023 16:18*	*07/24/2023 16:18*						
Semivolatile Organic Compounds by GCMS												
Anthracene	04	120-12-7	SW8270E	07/21/2023 09:00	07/25/2023 18:22	BLOD		1000	2000	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*04*		*%*	*5-136*	*07/21/2023 09:00*	*07/25/2023 18:22*						*DS*
Surr: 2-Fluorobiphenyl (Surr)	*04*		*54.0 %*	*9-117*	*07/21/2023 09:00*	*07/25/2023 18:22*						
Surr: 2-Fluorophenol (Surr)	*04*		*%*	*5-60*	*07/21/2023 09:00*	*07/25/2023 18:22*						*DS*
Surr: Nitrobenzene-d5 (Surr)	*04*		*794 %*	*5-151*	*07/21/2023 09:00*	*07/25/2023 18:22*						*DS*
Surr: Phenol-d5 (Surr)	*04*		*2.00 %*	*5-60*	*07/21/2023 09:00*	*07/25/2023 18:22*						*DS*
Surr: p-Terphenyl-d14 (Surr)	*04*		*20.0 %*	*5-141*	*07/21/2023 09:00*	*07/25/2023 18:22*						

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Client Sample ID: **EW-57** **Laboratory Sample ID:** **23G0895-04**

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	04	7664-41-7	EPA350.1 R2.0	07/21/2023 14:31	07/21/2023 14:31	2260		146	200	2000	mg/L	MGC
BOD	04	E1640606	SM5210B-2016	07/21/2023 09:58	07/21/2023 09:58	32900		0.2	2.0	1	mg/L	MJRL
COD	04	NA	SM5220D-2011	07/27/2023 14:28	07/27/2023 14:28	50100		10000	10000	100	mg/L	LTN
Nitrate as N	04	14797-55-8	Calc.	07/31/2023 13:32	07/31/2023 13:32	BLOD		1.50	5.50	100	mg/L	MGC
Nitrate+Nitrite as N	04	E701177	SM4500-NO3F-2016	07/31/2023 13:32	07/31/2023 13:32	BLOD		0.50	0.50	1	mg/L	MGC
Nitrite as N	04	14797-65-0	SM4500-NO2B-2011	07/21/2023 08:40	07/21/2023 08:40	1.20	J	1.00	5.00	100	mg/L	MGC
Total Recoverable Phenolics	04	NA	SW9065	07/28/2023 08:33	07/28/2023 08:33	47.9		1.50	2.50	1	mg/L	AAL
TKN as N	04	E17148461	EPA351.2 R2.0	07/24/2023 16:56	07/24/2023 16:56	2960		40.0	100	200	mg/L	SPH

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Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **23G0895-05**

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)	05	78-93-3	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		3.00	10.0	1	ug/L	ZDR
Acetone	05	67-64-1	SW8260D	07/21/2023 13:25	07/21/2023 13:25	7.27	J	7.00	10.0	1	ug/L	ZDR
Benzene	05	71-43-2	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		0.40	1.00	1	ug/L	ZDR
Ethylbenzene	05	100-41-4	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		0.40	1.00	1	ug/L	ZDR
Toluene	05	108-88-3	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		0.50	1.00	1	ug/L	ZDR
Xylenes, Total	05	1330-20-7	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		1.00	3.00	1	ug/L	ZDR
Tetrahydrofuran	05	109-99-9	SW8260D	07/21/2023 13:25	07/21/2023 13:25	BLOD		10.0	10.0	1	ug/L	ZDR
Surr: 1,2-Dichloroethane-d4 (Surr)	*05*	*108 %*	*70-120*	*07/21/2023 13:25*	*07/21/2023 13:25*							
Surr: 4-Bromofluorobenzene (Surr)	*05*	*100 %*	*75-120*	*07/21/2023 13:25*	*07/21/2023 13:25*							
Surr: Dibromofluoromethane (Surr)	*05*	*98.3 %*	*70-130*	*07/21/2023 13:25*	*07/21/2023 13:25*							
Surr: Toluene-d8 (Surr)	*05*	*95.7 %*	*70-130*	*07/21/2023 13:25*	*07/21/2023 13:25*							

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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 BGG0742 - EPA200.8 R5.4										
Blank (BGG0742-BLK1)				Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	ND	0.200	ug/L							
Arsenic	ND	1.0	ug/L							
Barium	ND	5.00	ug/L							
Cadmium	ND	1.00	ug/L							
Chromium	ND	1.00	ug/L							
Copper	ND	1.00	ug/L							
Lead	ND	1.0	ug/L							
Nickel	ND	1.000	ug/L							
Selenium	ND	1.00	ug/L							
Silver	ND	1.00	ug/L							
Zinc	ND	5.00	ug/L							
LCS (BGG0742-BS1)				Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	1.01	0.200	ug/L	1.00		101	85-115			
Arsenic	50	1.0	ug/L	50.0		101	80-120			
Barium	49.7	5.00	ug/L	50.0		99.5	80-120			
Cadmium	50.8	1.00	ug/L	50.0		102	80-120			
Chromium	50.7	1.00	ug/L	50.0		101	80-120			
Copper	49.7	1.00	ug/L	50.0		99.4	80-120			
Lead	52	1.0	ug/L	50.0		104	80-120			
Nickel	49.33	1.000	ug/L	50.0		98.7	80-120			
Selenium	49.4	1.00	ug/L	50.0		98.9	80-120			
Silver	9.43	1.00	ug/L	10.0		94.3	80-120			
Zinc	51.2	5.00	ug/L	50.0		102	80-120			
Matrix Spike (BGG0742-MS1)	**Source: 23G0986-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						

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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 BGG0742 - EPA200.8 R5.4										
Matrix Spike (BGG0742-MS1)	**Source: 23G0986-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	1.31	0.200	ug/L	1.00	0.344	96.3	70-130			
Arsenic	50	1.0	ug/L	50.0	BLOD	99.5	75-125			
Barium	311	5.00	ug/L	50.0	262	97.8	75-125			E
Cadmium	49.1	1.00	ug/L	50.0	BLOD	98.1	75-125			
Chromium	49.6	1.00	ug/L	50.0	BLOD	99.2	75-125			
Copper	256	1.00	ug/L	50.0	210	92.8	75-125			E
Lead	60	1.0	ug/L	50.0	9.4	102	75-125			
Nickel	49.58	1.000	ug/L	50.0	1.094	97.0	75-125			
Selenium	47.7	1.00	ug/L	50.0	BLOD	95.4	75-125			
Silver	9.32	1.00	ug/L	10.0	0.174	91.5	75-125			
Zinc	588	5.00	ug/L	50.0	544	87.6	75-125			E
Matrix Spike (BGG0742-MS2)	**Source: 23G1004-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	1.21	0.200	ug/L	1.00	0.231	97.6	70-130			
Arsenic	49	1.0	ug/L	50.0	BLOD	97.6	75-125			
Barium	75.8	5.00	ug/L	50.0	26.4	98.8	75-125			
Cadmium	49.5	1.00	ug/L	50.0	BLOD	99.0	75-125			
Chromium	50.0	1.00	ug/L	50.0	BLOD	100	75-125			
Copper	49.1	1.00	ug/L	50.0	0.729	96.7	75-125			
Lead	52	1.0	ug/L	50.0	BLOD	103	75-125			
Nickel	50.50	1.000	ug/L	50.0	1.952	97.1	75-125			
Selenium	47.4	1.00	ug/L	50.0	BLOD	94.9	75-125			
Silver	9.19	1.00	ug/L	10.0	BLOD	91.9	75-125			
Zinc	51.9	5.00	ug/L	50.0	45.7	12.3	75-125			M
Matrix Spike Dup (BGG0742-MSD1)	**Source: 23G0986-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						

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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 BGG0742 - EPA200.8 R5.4										
Matrix Spike Dup (BGG0742-MSD1)	**Source: 23G0986-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	1.34	0.200	ug/L	1.00	0.344	99.1	70-130	2.12	20	
Arsenic	50	1.0	ug/L	50.0	BLOD	100	75-125	0.722	20	
Barium	317	5.00	ug/L	50.0	262	111	75-125	2.07	20	E
Cadmium	49.7	1.00	ug/L	50.0	BLOD	99.4	75-125	1.31	20	
Chromium	49.7	1.00	ug/L	50.0	BLOD	99.4	75-125	0.172	20	
Copper	257	1.00	ug/L	50.0	210	94.9	75-125	0.409	20	E
Lead	61	1.0	ug/L	50.0	9.4	103	75-125	1.30	20	
Nickel	49.63	1.000	ug/L	50.0	1.094	97.1	75-125	0.0851	20	
Selenium	47.7	1.00	ug/L	50.0	BLOD	95.3	75-125	0.0295	20	
Silver	9.44	1.00	ug/L	10.0	0.174	92.7	75-125	1.29	20	
Zinc	595	5.00	ug/L	50.0	544	102	75-125	1.25	20	E
Matrix Spike Dup (BGG0742-MSD2)	**Source: 23G1004-01**			Prepared: 07/21/2023 Analyzed: 07/24/2023						
Mercury	1.23	0.200	ug/L	1.00	0.231	100	70-130	2.12	20	
Arsenic	50	1.0	ug/L	50.0	BLOD	99.3	75-125	1.72	20	
Barium	75.9	5.00	ug/L	50.0	26.4	99.0	75-125	0.126	20	
Cadmium	49.5	1.00	ug/L	50.0	BLOD	99.0	75-125	0.0340	20	
Chromium	50.5	1.00	ug/L	50.0	BLOD	101	75-125	1.00	20	
Copper	50.3	1.00	ug/L	50.0	0.729	99.0	75-125	2.31	20	
Lead	52	1.0	ug/L	50.0	BLOD	104	75-125	0.902	20	
Nickel	51.67	1.000	ug/L	50.0	1.952	99.4	75-125	2.30	20	
Selenium	48.3	1.00	ug/L	50.0	BLOD	96.6	75-125	1.85	20	
Silver	9.23	1.00	ug/L	10.0	BLOD	92.3	75-125	0.476	20	
Zinc	52.7	5.00	ug/L	50.0	45.7	13.9	75-125	1.53	20	M

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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 BGG0746 - SW5030B-MS										
Blank (BGG0746-BLK1)				Prepared & Analyzed: 07/21/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*52.6*		ug/L	*50.0*		*105*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.1*		ug/L	*50.0*		*100*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.4*		ug/L	*50.0*		*96.8*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.1*		ug/L	*50.0*		*96.3*	*70-130*			
LCS (BGG0746-BS1)				Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	44.7	0.4	ug/L	50.0		89.4	80-130			
1,1,1-Trichloroethane	41.2	1	ug/L	50.0		82.4	65-130			
1,1,2,2-Tetrachloroethane	44.0	0.4	ug/L	50.0		88.1	65-130			
1,1,2-Trichloroethane	49.1	1	ug/L	50.0		98.2	75-125			
1,1-Dichloroethane	44.6	1	ug/L	50.0		89.3	70-135			
1,1-Dichloroethylene	47.2	1	ug/L	50.0		94.5	70-130			
1,1-Dichloropropene	41.2	1	ug/L	50.0		82.3	75-135			
1,2,3-Trichlorobenzene	44.5	1	ug/L	50.0		89.0	55-140			
1,2,3-Trichloropropane	46.7	1	ug/L	50.0		93.3	75-125			
1,2,4-Trichlorobenzene	50.2	1	ug/L	50.0		100	65-135			
1,2,4-Trimethylbenzene	46.9	1	ug/L	50.0		93.7	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	37.4	1	ug/L	50.0		74.7	50-130			
1,2-Dibromoethane (EDB)	47.1	1	ug/L	50.0		94.2	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
LCS (BGG0746-BS1)				Prepared & Analyzed: 07/21/2023						
1,2-Dichlorobenzene	51.7	0.5	ug/L	50.0		103	70-120			
1,2-Dichloroethane	40.1	1	ug/L	50.0		80.2	70-130			
1,2-Dichloropropane	48.4	0.5	ug/L	50.0		96.7	75-125			
1,3,5-Trimethylbenzene	43.6	1	ug/L	50.0		87.3	75-125			
1,3-Dichlorobenzene	51.4	1	ug/L	50.0		103	75-125			
1,3-Dichloropropane	48.5	1	ug/L	50.0		97.0	75-125			
1,4-Dichlorobenzene	51.2	1	ug/L	50.0		102	75-125			
2,2-Dichloropropane	42.6	1	ug/L	50.0		85.1	70-135			
2-Butanone (MEK)	41.6	10	ug/L	50.0		83.3	30-150			
2-Chlorotoluene	46.8	1	ug/L	50.0		93.6	75-125			
2-Hexanone (MBK)	40.0	5	ug/L	50.0		80.1	55-130			
4-Chlorotoluene	47.8	1	ug/L	50.0		95.6	75-130			
4-Isopropyltoluene	50.5	1	ug/L	50.0		101	75-130			
4-Methyl-2-pentanone (MIBK)	44.0	5	ug/L	50.0		88.0	60-135			
Acetone	36.8	10	ug/L	50.0		73.7	40-140			
Benzene	44.6	1	ug/L	50.0		89.3	80-120			
Bromobenzene	52.0	1	ug/L	50.0		104	75-125			
Bromochloromethane	49.6	1	ug/L	50.0		99.3	65-130			
Bromodichloromethane	40.8	0.5	ug/L	50.0		81.7	75-120			
Bromoform	33.6	1	ug/L	50.0		67.3	70-130			L
Bromomethane	49.5	1	ug/L	50.0		99.1	30-145			
Carbon disulfide	35.6	10	ug/L	50.0		71.1	35-160			
Carbon tetrachloride	10.6	1	ug/L	50.0		21.2	65-140			L
Chlorobenzene	48.1	1	ug/L	50.0		96.3	80-120			
Chloroethane	36.1	1	ug/L	50.0		72.2	60-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
LCS (BGG0746-BS1)				Prepared & Analyzed: 07/21/2023						
Chloroform	49.0	0.5	ug/L	50.0		98.1	65-135			
Chloromethane	39.8	1	ug/L	50.0		79.5	40-125			
cis-1,2-Dichloroethylene	44.1	1	ug/L	50.0		88.3	70-125			
cis-1,3-Dichloropropene	49.2	1	ug/L	50.0		98.5	70-130			
Dibromochloromethane	37.0	0.5	ug/L	50.0		74.0	60-135			
Dibromomethane	51.3	1	ug/L	50.0		103	75-125			
Dichlorodifluoromethane	55.2	1	ug/L	50.0		110	30-155			
Ethylbenzene	45.3	1	ug/L	50.0		90.7	75-125			
Hexachlorobutadiene	50.9	0.8	ug/L	50.0		102	50-140			
Isopropylbenzene	45.2	1	ug/L	50.0		90.4	75-125			
m+p-Xylenes	89.1	2	ug/L	100		89.1	75-130			
Methylene chloride	46.8	4	ug/L	50.0		93.6	55-140			
Methyl-t-butyl ether (MTBE)	41.9	1	ug/L	50.0		83.7	65-125			
Naphthalene	45.2	1	ug/L	50.0		90.4	55-140			
n-Butylbenzene	50.2	1	ug/L	50.0		100	70-135			
n-Propylbenzene	46.6	1	ug/L	50.0		93.2	70-130			
o-Xylene	46.4	1	ug/L	50.0		92.7	80-120			
sec-Butylbenzene	49.7	1	ug/L	50.0		99.5	70-125			
Styrene	48.5	1	ug/L	50.0		96.9	65-135			
tert-Butylbenzene	46.6	1	ug/L	50.0		93.3	70-130			
Tetrachloroethylene (PCE)	46.2	1	ug/L	50.0		92.4	45-150			
Toluene	45.4	1	ug/L	50.0		90.8	75-120			
trans-1,2-Dichloroethylene	42.1	1	ug/L	50.0		84.1	60-140			
trans-1,3-Dichloropropene	54.1	1	ug/L	50.0		108	55-140			
Trichloroethylene	51.2	1	ug/L	50.0		102	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
LCS (BGG0746-BS1)				Prepared & Analyzed: 07/21/2023						
Trichlorofluoromethane	41.6	1	ug/L	50.0		83.1	60-145			
Vinyl chloride	34.5	0.5	ug/L	50.0		69.1	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*55.4*		ug/L	*50.0*		*111*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.8*		ug/L	*50.0*		*99.6*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.0*		ug/L	*50.0*		*93.9*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.3*		ug/L	*50.0*		*96.5*	*70-130*			
Duplicate (BGG0746-DUP1)	**Source: 23G0933-03**			Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	0.50	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	0.50	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Duplicate (BGG0746-DUP1)	**Source: 23G0933-03**			Prepared & Analyzed: 07/21/2023						
1,3-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
2,2-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	10.0	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	5.00	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	5.00	ug/L		BLOD			NA	30	
Acetone	9.36	10.0	ug/L		9.94			NA	30	
Benzene	ND	1.00	ug/L		BLOD			NA	30	
Bromobenzene	ND	1.00	ug/L		BLOD			NA	30	
Bromochloromethane	ND	1.00	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	0.50	ug/L		BLOD			NA	30	
Bromoform	ND	1.00	ug/L		BLOD			NA	30	
Bromomethane	ND	1.00	ug/L		BLOD			NA	30	
Carbon disulfide	ND	10.0	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	1.00	ug/L		BLOD			NA	30	
Chlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
Chloroethane	ND	1.00	ug/L		BLOD			NA	30	
Chloroform	ND	0.50	ug/L		0.50			NA	30	
Chloromethane	ND	1.00	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	120	1.00	ug/L		122			1.07	30	
cis-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Duplicate (BGG0746-DUP1)		**Source: 23G0933-03**		Prepared & Analyzed: 07/21/2023						
Dibromochloromethane	ND	0.50	ug/L		BLOD			NA	30	
Dibromomethane	ND	1.00	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	5.00	ug/L		BLOD			NA	30	
Ethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	0.80	ug/L		BLOD			NA	30	
Iodomethane	ND	10.0	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	1.00	ug/L		BLOD			NA	30	
m+p-Xylenes	ND	2.00	ug/L		BLOD			NA	30	
Methylene chloride	ND	4.00	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	1.00	ug/L		BLOD			NA	30	
Naphthalene	ND	1.00	ug/L		BLOD			NA	30	
n-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
n-Propylbenzene	ND	1.00	ug/L		BLOD			NA	30	
o-Xylene	ND	1.00	ug/L		BLOD			NA	30	
sec-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Styrene	ND	1.00	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	6.39	1.00	ug/L		6.48			1.40	30	
Toluene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	2.95	1.00	ug/L		3.24			9.37	30	
trans-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
Trichloroethylene	67.3	1.00	ug/L		67.6			0.386	30	
Trichlorofluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Vinyl acetate	ND	10.0	ug/L		BLOD			NA	30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Duplicate (BGG0746-DUP1)		**Source: 23G0933-03**		Prepared & Analyzed: 07/21/2023						
Vinyl chloride	0.70	0.50	ug/L		0.69			1.44	30	
Xylenes, Total	ND	3.00	ug/L		BLOD			NA	30	
Tetrahydrofuran	ND	10.0	ug/L		BLOD			NA	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*52.9*		ug/L	*50.0*		*106*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.6*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.8*		ug/L	*50.0*		*97.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.0*		ug/L	*50.0*		*96.0*	*70-130*			
Matrix Spike (BGG0746-MS1)		**Source: 23G0926-01**		Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	42.3	0.4	ug/L	50.0	BLOD	84.7	80-130			
1,1,1-Trichloroethane	44.0	1	ug/L	50.0	BLOD	87.9	65-130			
1,1,2,2-Tetrachloroethane	44.4	0.4	ug/L	50.0	BLOD	88.9	65-130			
1,1,2-Trichloroethane	50.2	1	ug/L	50.0	BLOD	100	75-125			
1,1-Dichloroethane	45.7	1	ug/L	50.0	BLOD	91.4	70-135			
1,1-Dichloroethylene	54.3	1	ug/L	50.0	BLOD	109	50-145			
1,1-Dichloropropene	44.3	1	ug/L	50.0	BLOD	88.6	75-135			
1,2,3-Trichlorobenzene	51.1	1	ug/L	50.0	BLOD	102	55-140			
1,2,3-Trichloropropane	46.9	1	ug/L	50.0	BLOD	93.7	75-125			
1,2,4-Trichlorobenzene	54.9	1	ug/L	50.0	BLOD	110	65-135			
1,2,4-Trimethylbenzene	47.4	1	ug/L	50.0	BLOD	94.8	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	40.3	1	ug/L	50.0	BLOD	80.6	50-130			
1,2-Dibromoethane (EDB)	47.9	1	ug/L	50.0	BLOD	95.7	80-120			
1,2-Dichlorobenzene	51.9	0.5	ug/L	50.0	BLOD	104	70-120			
1,2-Dichloroethane	47.2	1	ug/L	50.0	BLOD	94.4	70-130			
1,2-Dichloropropane	48.3	0.5	ug/L	50.0	BLOD	96.5	75-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Matrix Spike (BGG0746-MS1)	**Source: 23G0926-01**			Prepared & Analyzed: 07/21/2023						
1,3,5-Trimethylbenzene	45.2	1	ug/L	50.0	BLOD	90.4	75-124			
1,3-Dichlorobenzene	51.1	1	ug/L	50.0	BLOD	102	75-125			
1,3-Dichloropropane	49.0	1	ug/L	50.0	BLOD	97.9	75-125			
1,4-Dichlorobenzene	50.7	1	ug/L	50.0	BLOD	101	75-125			
2,2-Dichloropropane	41.6	1	ug/L	50.0	BLOD	83.3	70-135			
2-Butanone (MEK)	41.8	10	ug/L	50.0	BLOD	83.5	30-150			
2-Chlorotoluene	48.4	1	ug/L	50.0	BLOD	96.7	75-125			
2-Hexanone (MBK)	39.4	5	ug/L	50.0	BLOD	78.9	55-130			
4-Chlorotoluene	48.4	1	ug/L	50.0	BLOD	96.8	75-130			
4-Isopropyltoluene	52.7	1	ug/L	50.0	BLOD	105	75-130			
4-Methyl-2-pentanone (MIBK)	42.3	5	ug/L	50.0	BLOD	84.6	60-135			
Acetone	34.6	10	ug/L	50.0	BLOD	64.6	40-140			
Benzene	44.2	1	ug/L	50.0	BLOD	88.4	80-120			
Bromobenzene	52.6	1	ug/L	50.0	BLOD	105	75-125			
Bromochloromethane	48.6	1	ug/L	50.0	BLOD	97.2	65-130			
Bromodichloromethane	40.8	0.5	ug/L	50.0	BLOD	81.5	75-136			
Bromoform	27.1	1	ug/L	50.0	BLOD	54.2	70-130			M
Bromomethane	48.6	1	ug/L	50.0	BLOD	97.2	30-145			
Carbon disulfide	37.5	10	ug/L	50.0	BLOD	75.1	35-160			
Carbon tetrachloride	22.0	1	ug/L	50.0	BLOD	44.0	65-140			M
Chlorobenzene	50.4	1	ug/L	50.0	BLOD	101	80-120			
Chloroethane	38.3	1	ug/L	50.0	BLOD	76.6	60-135			
Chloroform	55.8	0.5	ug/L	50.0	7.64	96.2	65-135			
Chloromethane	41.1	1	ug/L	50.0	BLOD	82.2	40-125			
cis-1,2-Dichloroethylene	44.9	1	ug/L	50.0	BLOD	89.8	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Matrix Spike (BGG0746-MS1)	**Source: 23G0926-01**			Prepared & Analyzed: 07/21/2023						
cis-1,3-Dichloropropene	47.9	1	ug/L	50.0	BLOD	95.9	47-136			
Dibromochloromethane	30.0	0.5	ug/L	50.0	BLOD	60.0	60-135			
Dibromomethane	50.9	1	ug/L	50.0	BLOD	102	75-125			
Dichlorodifluoromethane	63.9	1	ug/L	50.0	BLOD	128	30-155			
Ethylbenzene	47.2	1	ug/L	50.0	BLOD	94.3	75-125			
Hexachlorobutadiene	55.9	0.8	ug/L	50.0	BLOD	112	50-140			
Isopropylbenzene	47.5	1	ug/L	50.0	BLOD	95.0	75-125			
m+p-Xylenes	92.4	2	ug/L	100	BLOD	92.4	75-130			
Methylene chloride	46.4	4	ug/L	50.0	BLOD	92.9	55-140			
Methyl-t-butyl ether (MTBE)	41.8	1	ug/L	50.0	BLOD	83.6	65-125			
Naphthalene	54.8	1	ug/L	50.0	BLOD	110	55-140			
n-Butylbenzene	53.1	1	ug/L	50.0	BLOD	106	70-135			
n-Propylbenzene	49.4	1	ug/L	50.0	BLOD	98.7	70-130			
o-Xylene	47.9	1	ug/L	50.0	BLOD	95.7	80-120			
sec-Butylbenzene	51.4	1	ug/L	50.0	BLOD	103	70-125			
Styrene	49.1	1	ug/L	50.0	BLOD	98.3	65-135			
tert-Butylbenzene	48.7	1	ug/L	50.0	BLOD	97.3	70-130			
Tetrachloroethylene (PCE)	49.6	1	ug/L	50.0	BLOD	99.2	51-231			
Toluene	46.3	1	ug/L	50.0	BLOD	92.5	75-120			
trans-1,2-Dichloroethylene	43.8	1	ug/L	50.0	BLOD	87.6	60-140			
trans-1,3-Dichloropropene	52.7	1	ug/L	50.0	BLOD	105	55-140			
Trichloroethylene	52.8	1	ug/L	50.0	BLOD	106	70-125			
Trichlorofluoromethane	47.3	1	ug/L	50.0	BLOD	94.5	60-145			
Vinyl chloride	38.9	0.5	ug/L	50.0	BLOD	77.8	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*54.6*		ug/L	*50.0*		*109*	*70-120*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0746 - SW5030B-MS										
Matrix Spike (BGG0746-MS1)	**Source: 23G0926-01**			Prepared & Analyzed: 07/21/2023						
Surr: 4-Bromofluorobenzene (Surr)	*50.4*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.9*		ug/L	*50.0*		*95.9*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.0*		ug/L	*50.0*		*98.0*	*70-130*			
Batch BGG0808 - SW5030B-MS										
Blank (BGG0808-BLK1)				Prepared & Analyzed: 07/24/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*51.3*		ug/L	*50.0*		*103*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*51.2*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.7*		ug/L	*50.0*		*99.4*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.0*		ug/L	*50.0*		*96.0*	*70-130*			
LCS (BGG0808-BS1)				Prepared & Analyzed: 07/24/2023						
1,1,1,2-Tetrachloroethane	51.3	0.4	ug/L	50.0		103	80-130			
1,1,1-Trichloroethane	50.5	1	ug/L	50.0		101	65-130			
1,1,2,2-Tetrachloroethane	47.2	0.4	ug/L	50.0		94.3	65-130			
1,1,2-Trichloroethane	53.4	1	ug/L	50.0		107	75-125			
1,1-Dichloroethane	51.0	1	ug/L	50.0		102	70-135			
1,1-Dichloroethylene	60.2	1	ug/L	50.0		120	70-130			
1,1-Dichloropropene	52.4	1	ug/L	50.0		105	75-135			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
LCS (BGG0808-BS1)				Prepared & Analyzed: 07/24/2023						
1,2,3-Trichlorobenzene	46.9	1	ug/L	50.0		93.8	55-140			
1,2,3-Trichloropropane	50.4	1	ug/L	50.0		101	75-125			
1,2,4-Trichlorobenzene	56.4	1	ug/L	50.0		113	65-135			
1,2,4-Trimethylbenzene	50.3	1	ug/L	50.0		101	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	43.1	1	ug/L	50.0		86.1	50-130			
1,2-Dibromoethane (EDB)	52.9	1	ug/L	50.0		106	80-120			
1,2-Dichlorobenzene	54.2	0.5	ug/L	50.0		108	70-120			
1,2-Dichloroethane	52.6	1	ug/L	50.0		105	70-130			
1,2-Dichloropropane	53.9	0.5	ug/L	50.0		108	75-125			
1,3,5-Trimethylbenzene	48.3	1	ug/L	50.0		96.5	75-125			
1,3-Dichlorobenzene	53.9	1	ug/L	50.0		108	75-125			
1,3-Dichloropropane	51.8	1	ug/L	50.0		104	75-125			
1,4-Dichlorobenzene	54.0	1	ug/L	50.0		108	75-125			
2,2-Dichloropropane	51.2	1	ug/L	50.0		102	70-135			
2-Butanone (MEK)	49.6	10	ug/L	50.0		99.3	30-150			
2-Chlorotoluene	52.1	1	ug/L	50.0		104	75-125			
2-Hexanone (MBK)	45.2	5	ug/L	50.0		90.5	55-130			
4-Chlorotoluene	52.5	1	ug/L	50.0		105	75-130			
4-Isopropyltoluene	55.4	1	ug/L	50.0		111	75-130			
4-Methyl-2-pentanone (MIBK)	48.3	5	ug/L	50.0		96.7	60-135			
Acetone	46.8	10	ug/L	50.0		93.6	40-140			
Benzene	52.4	1	ug/L	50.0		105	80-120			
Bromobenzene	57.4	1	ug/L	50.0		115	75-125			
Bromochloromethane	56.1	1	ug/L	50.0		112	65-130			
Bromodichloromethane	50.1	0.5	ug/L	50.0		100	75-120			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
LCS (BGG0808-BS1)				Prepared & Analyzed: 07/24/2023						
Bromoform	44.2	1	ug/L	50.0		88.3	70-130			
Bromomethane	68.7	1	ug/L	50.0		137	30-145			
Carbon disulfide	52.6	10	ug/L	50.0		105	35-160			
Carbon tetrachloride	34.8	1	ug/L	50.0		69.6	65-140			
Chlorobenzene	53.7	1	ug/L	50.0		107	80-120			
Chloroethane	46.8	1	ug/L	50.0		93.5	60-135			
Chloroform	52.2	0.5	ug/L	50.0		104	65-135			
Chloromethane	59.6	1	ug/L	50.0		119	40-125			
cis-1,2-Dichloroethylene	50.2	1	ug/L	50.0		100	70-125			
cis-1,3-Dichloropropene	56.2	1	ug/L	50.0		112	70-130			
Dibromochloromethane	47.9	0.5	ug/L	50.0		95.7	60-135			
Dibromomethane	57.2	1	ug/L	50.0		114	75-125			
Dichlorodifluoromethane	96.6	1	ug/L	50.0		193	30-155			L
Ethylbenzene	50.6	1	ug/L	50.0		101	75-125			
Hexachlorobutadiene	56.2	0.8	ug/L	50.0		112	50-140			
Isopropylbenzene	49.6	1	ug/L	50.0		99.1	75-125			
m+p-Xylenes	100	2	ug/L	100		100	75-130			
Methylene chloride	54.0	4	ug/L	50.0		108	55-140			
Methyl-t-butyl ether (MTBE)	45.4	1	ug/L	50.0		90.9	65-125			
Naphthalene	51.7	1	ug/L	50.0		103	55-140			
n-Butylbenzene	55.9	1	ug/L	50.0		112	70-135			
n-Propylbenzene	52.8	1	ug/L	50.0		106	70-130			
o-Xylene	51.3	1	ug/L	50.0		103	80-120			
sec-Butylbenzene	52.6	1	ug/L	50.0		105	70-125			
Styrene	53.7	1	ug/L	50.0		107	65-135			

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Submitted To: Logan Howard

Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
LCS (BGG0808-BS1)				Prepared & Analyzed: 07/24/2023						
tert-Butylbenzene	51.2	1	ug/L	50.0		102	70-130			
Tetrachloroethylene (PCE)	55.9	1	ug/L	50.0		112	45-150			
Toluene	52.3	1	ug/L	50.0		105	75-120			
trans-1,2-Dichloroethylene	53.1	1	ug/L	50.0		106	60-140			
trans-1,3-Dichloropropene	60.8	1	ug/L	50.0		122	55-140			
Trichloroethylene	56.0	1	ug/L	50.0		112	70-125			
Trichlorofluoromethane	54.8	1	ug/L	50.0		110	60-145			
Vinyl chloride	58.0	0.5	ug/L	50.0		116	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*55.6*		ug/L	*50.0*		*111*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.3*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.2*		ug/L	*50.0*		*94.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*47.8*		ug/L	*50.0*		*95.7*	*70-130*			
Matrix Spike (BGG0808-MS1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
1,1,1,2-Tetrachloroethane	35.4	0.4	ug/L	50.0	BLOD	70.8	80-130			M
1,1,1-Trichloroethane	47.6	1	ug/L	50.0	BLOD	95.3	65-130			
1,1,2,2-Tetrachloroethane	38.8	0.4	ug/L	50.0	BLOD	77.6	65-130			
1,1,2-Trichloroethane	51.8	1	ug/L	50.0	BLOD	104	75-125			
1,1-Dichloroethane	50.2	1	ug/L	50.0	BLOD	100	70-135			
1,1-Dichloroethylene	62.7	1	ug/L	50.0	BLOD	125	50-145			
1,1-Dichloropropene	49.4	1	ug/L	50.0	BLOD	98.7	75-135			
1,2,3-Trichlorobenzene	39.4	1	ug/L	50.0	BLOD	78.8	55-140			
1,2,3-Trichloropropane	41.3	1	ug/L	50.0	BLOD	82.6	75-125			
1,2,4-Trichlorobenzene	48.2	1	ug/L	50.0	BLOD	96.4	65-135			
1,2,4-Trimethylbenzene	48.0	1	ug/L	50.0	BLOD	96.1	75-130			

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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 BGG0808 - SW5030B-MS										
Matrix Spike (BGG0808-MS1)		**Source: 23G0895-01RE1**		Prepared & Analyzed: 07/24/2023						
1,2-Dibromo-3-chloropropane (DBCP)	39.0	1	ug/L	50.0	BLOD	78.1	50-130			
1,2-Dibromoethane (EDB)	43.3	1	ug/L	50.0	BLOD	86.6	80-120			
1,2-Dichlorobenzene	51.3	0.5	ug/L	50.0	BLOD	103	70-120			
1,2-Dichloroethane	52.0	1	ug/L	50.0	BLOD	104	70-130			
1,2-Dichloropropane	50.2	0.5	ug/L	50.0	BLOD	100	75-125			
1,3,5-Trimethylbenzene	46.4	1	ug/L	50.0	BLOD	92.8	75-124			
1,3-Dichlorobenzene	50.3	1	ug/L	50.0	BLOD	101	75-125			
1,3-Dichloropropane	50.2	1	ug/L	50.0	BLOD	100	75-125			
1,4-Dichlorobenzene	50.8	1	ug/L	50.0	BLOD	102	75-125			
2,2-Dichloropropane	43.2	1	ug/L	50.0	BLOD	86.4	70-135			
2-Butanone (MEK)	97.6	10	ug/L	50.0	53.5	88.3	30-150			
2-Chlorotoluene	48.4	1	ug/L	50.0	BLOD	96.8	75-125			
2-Hexanone (MBK)	40.9	5	ug/L	50.0	BLOD	81.7	55-130			
4-Chlorotoluene	48.4	1	ug/L	50.0	BLOD	96.9	75-130			
4-Isopropyltoluene	51.6	1	ug/L	50.0	BLOD	103	75-130			
4-Methyl-2-pentanone (MIBK)	55.2	5	ug/L	50.0	3.88	103	60-135			
Acetone	143	10	ug/L	50.0	97.8	90.5	40-140			
Benzene	57.7	1	ug/L	50.0	9.65	96.0	80-120			
Bromobenzene	46.3	1	ug/L	50.0	BLOD	92.5	75-125			
Bromochloromethane	55.1	1	ug/L	50.0	BLOD	110	65-130			
Bromodichloromethane	37.2	0.5	ug/L	50.0	BLOD	74.4	75-136			M
Bromoform	23.1	1	ug/L	50.0	BLOD	46.2	70-130			M
Bromomethane	63.1	1	ug/L	50.0	BLOD	126	30-145			
Carbon disulfide	57.4	10	ug/L	50.0	BLOD	115	35-160			
Carbon tetrachloride	19.0	1	ug/L	50.0	BLOD	38.0	65-140			M

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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 BGG0808 - SW5030B-MS										
Matrix Spike (BGG0808-MS1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
Chlorobenzene	44.2	1	ug/L	50.0	BLOD	88.4	80-120			
Chloroethane	46.3	1	ug/L	50.0	BLOD	92.7	60-135			
Chloroform	53.3	0.5	ug/L	50.0	BLOD	107	65-135			
Chloromethane	55.8	1	ug/L	50.0	BLOD	112	40-125			
cis-1,2-Dichloroethylene	50.1	1	ug/L	50.0	BLOD	100	70-125			
cis-1,3-Dichloropropene	50.0	1	ug/L	50.0	BLOD	99.9	47-136			
Dibromochloromethane	27.3	0.5	ug/L	50.0	BLOD	54.7	60-135			M
Dibromomethane	53.6	1	ug/L	50.0	BLOD	107	75-125			
Dichlorodifluoromethane	90.1	1	ug/L	50.0	BLOD	180	30-155			M
Ethylbenzene	42.6	1	ug/L	50.0	1.35	82.6	75-125			
Hexachlorobutadiene	48.1	0.8	ug/L	50.0	BLOD	96.2	50-140			
Isopropylbenzene	41.7	1	ug/L	50.0	BLOD	83.3	75-125			
m+p-Xylenes	82.7	2	ug/L	100	1.96	80.7	75-130			
Methylene chloride	53.7	4	ug/L	50.0	BLOD	107	55-140			
Methyl-t-butyl ether (MTBE)	44.2	1	ug/L	50.0	BLOD	88.4	65-125			
Naphthalene	44.5	1	ug/L	50.0	BLOD	88.9	55-140			
n-Butylbenzene	49.7	1	ug/L	50.0	BLOD	99.4	70-135			
n-Propylbenzene	49.1	1	ug/L	50.0	BLOD	98.2	70-130			
o-Xylene	43.4	1	ug/L	50.0	0.80	85.2	80-120			
sec-Butylbenzene	49.6	1	ug/L	50.0	BLOD	99.2	70-125			
Styrene	43.6	1	ug/L	50.0	BLOD	87.2	65-135			
tert-Butylbenzene	47.3	1	ug/L	50.0	BLOD	94.7	70-130			
Tetrachloroethylene (PCE)	47.8	1	ug/L	50.0	BLOD	95.5	51-231			
Toluene	51.8	1	ug/L	50.0	2.86	97.9	75-120			
trans-1,2-Dichloroethylene	51.3	1	ug/L	50.0	BLOD	103	60-140			

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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 BGG0808 - SW5030B-MS										
Matrix Spike (BGG0808-MS1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
trans-1,3-Dichloropropene	54.4	1	ug/L	50.0	BLOD	109	55-140			
Trichloroethylene	54.8	1	ug/L	50.0	BLOD	110	70-125			
Trichlorofluoromethane	52.6	1	ug/L	50.0	BLOD	105	60-145			
Vinyl chloride	53.1	0.5	ug/L	50.0	BLOD	106	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.0*		ug/L	*50.0*		*98.1*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*43.9*		ug/L	*50.0*		*87.7*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.0*		ug/L	*50.0*		*100*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.6*		ug/L	*50.0*		*97.3*	*70-130*			
Matrix Spike Dup (BGG0808-MSD1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
1,1,1,2-Tetrachloroethane	39.7	0.4	ug/L	50.0	BLOD	79.3	80-130		30	M
1,1,1-Trichloroethane	50.4	1	ug/L	50.0	BLOD	101	65-130		30	
1,1,2,2-Tetrachloroethane	41.0	0.4	ug/L	50.0	BLOD	82.0	65-130	5.51	30	
1,1,2-Trichloroethane	55.0	1	ug/L	50.0	BLOD	110	75-125	6.03	30	
1,1-Dichloroethane	53.2	1	ug/L	50.0	BLOD	106	70-135		30	
1,1-Dichloroethylene	64.2	1	ug/L	50.0	BLOD	128	50-145		30	
1,1-Dichloropropene	52.6	1	ug/L	50.0	BLOD	105	75-135		30	
1,2,3-Trichlorobenzene	49.6	1	ug/L	50.0	BLOD	99.1	55-140		30	
1,2,3-Trichloropropane	44.3	1	ug/L	50.0	BLOD	88.6	75-125	7.03	30	
1,2,4-Trichlorobenzene	54.3	1	ug/L	50.0	BLOD	109	65-135		30	
1,2,4-Trimethylbenzene	50.3	1	ug/L	50.0	BLOD	101	75-130	4.58	30	
1,2-Dibromo-3-chloropropane (DBCP)	47.2	1	ug/L	50.0	BLOD	94.5	50-130		30	
1,2-Dibromoethane (EDB)	46.1	1	ug/L	50.0	BLOD	92.2	80-120	6.27	30	
1,2-Dichlorobenzene	54.3	0.5	ug/L	50.0	BLOD	109	70-120	5.64	30	
1,2-Dichloroethane	47.1	1	ug/L	50.0	BLOD	94.3	70-130		30	

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
Matrix Spike Dup (BGG0808-MSD1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
1,2-Dichloropropane	54.0	0.5	ug/L	50.0	BLOD	108	75-125	7.35	30	
1,3,5-Trimethylbenzene	47.9	1	ug/L	50.0	BLOD	95.8	75-124		30	
1,3-Dichlorobenzene	53.1	1	ug/L	50.0	BLOD	106	75-125	5.42	30	
1,3-Dichloropropane	53.8	1	ug/L	50.0	BLOD	108	75-125		30	
1,4-Dichlorobenzene	53.8	1	ug/L	50.0	BLOD	108	75-125	5.64	30	
2,2-Dichloropropane	46.0	1	ug/L	50.0	BLOD	92.0	70-135		30	
2-Butanone (MEK)	98.6	10	ug/L	50.0	53.5	90.1	30-150		30	
2-Chlorotoluene	50.9	1	ug/L	50.0	BLOD	102	75-125		30	
2-Hexanone (MBK)	40.4	5	ug/L	50.0	BLOD	80.8	55-130		30	
4-Chlorotoluene	52.6	1	ug/L	50.0	BLOD	105	75-130		30	
4-Isopropyltoluene	53.9	1	ug/L	50.0	BLOD	108	75-130	4.34	30	
4-Methyl-2-pentanone (MIBK)	53.5	5	ug/L	50.0	3.88	99.3	60-135		30	
Acetone	143	10	ug/L	50.0	97.8	91.2	40-140		30	
Benzene	59.9	1	ug/L	50.0	9.65	101	80-120	3.84	30	
Bromobenzene	49.6	1	ug/L	50.0	BLOD	99.2	75-125		30	
Bromochloromethane	58.5	1	ug/L	50.0	BLOD	117	65-130	6.00	30	
Bromodichloromethane	43.6	0.5	ug/L	50.0	BLOD	87.1	75-136		30	
Bromoform	28.6	1	ug/L	50.0	BLOD	57.3	70-130		30	M
Bromomethane	65.3	1	ug/L	50.0	BLOD	131	30-145		30	
Carbon disulfide	44.7	10	ug/L	50.0	BLOD	89.4	35-160		30	
Carbon tetrachloride	25.8	1	ug/L	50.0	BLOD	51.6	65-140		30	M
Chlorobenzene	46.9	1	ug/L	50.0	BLOD	93.8	80-120	5.93	30	
Chloroethane	48.4	1	ug/L	50.0	BLOD	96.9	60-135		30	
Chloroform	56.2	0.5	ug/L	50.0	BLOD	112	65-135	5.19	30	
Chloromethane	59.4	1	ug/L	50.0	BLOD	119	40-125		30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
Matrix Spike Dup (BGG0808-MSD1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
cis-1,2-Dichloroethylene	52.8	1	ug/L	50.0	BLOD	106	70-125	5.23	30	
cis-1,3-Dichloropropene	53.3	1	ug/L	50.0	BLOD	107	47-136	6.52	30	
Dibromochloromethane	36.1	0.5	ug/L	50.0	BLOD	72.2	60-135		30	
Dibromomethane	58.0	1	ug/L	50.0	BLOD	116	75-125	7.93	30	
Dichlorodifluoromethane	93.1	1	ug/L	50.0	BLOD	186	30-155		30	M
Ethylbenzene	44.8	1	ug/L	50.0	1.35	87.0	75-125	5.05	30	
Hexachlorobutadiene	54.1	0.8	ug/L	50.0	BLOD	108	50-140		30	
Isopropylbenzene	43.1	1	ug/L	50.0	BLOD	86.2	75-125		30	
m+p-Xylenes	86.1	2	ug/L	100	1.96	84.1	75-130	4.01	30	
Methylene chloride	56.7	4	ug/L	50.0	BLOD	113	55-140		30	
Methyl-t-butyl ether (MTBE)	48.2	1	ug/L	50.0	BLOD	96.4	65-125		30	
Naphthalene	57.6	1	ug/L	50.0	BLOD	115	55-140		30	
n-Butylbenzene	52.0	1	ug/L	50.0	BLOD	104	70-135	4.46	30	
n-Propylbenzene	50.9	1	ug/L	50.0	BLOD	102	70-130	3.66	30	
o-Xylene	45.1	1	ug/L	50.0	0.80	88.7	80-120	3.93	30	
sec-Butylbenzene	51.6	1	ug/L	50.0	BLOD	103	70-125	3.99	30	
Styrene	45.8	1	ug/L	50.0	BLOD	91.7	65-135	4.94	30	
tert-Butylbenzene	50.2	1	ug/L	50.0	BLOD	100	70-130	5.89	30	
Tetrachloroethylene (PCE)	50.4	1	ug/L	50.0	BLOD	101	51-231	5.40	30	
Toluene	54.8	1	ug/L	50.0	2.86	104	75-120	5.59	30	
trans-1,2-Dichloroethylene	54.8	1	ug/L	50.0	BLOD	110	60-140		30	
trans-1,3-Dichloropropene	59.1	1	ug/L	50.0	BLOD	118	55-140	8.21	30	
Trichloroethylene	58.3	1	ug/L	50.0	BLOD	117	70-125	6.28	30	
Trichlorofluoromethane	54.6	1	ug/L	50.0	BLOD	109	60-145		30	
Vinyl chloride	54.7	0.5	ug/L	50.0	BLOD	109	50-145	3.04	30	

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Volatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0808 - SW5030B-MS										
Matrix Spike Dup (BGG0808-MSD1)	**Source: 23G0895-01RE1**			Prepared & Analyzed: 07/24/2023						
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.5*		ug/L	*50.0*		*93.1*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*43.2*		ug/L	*50.0*		*86.3*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.7*		ug/L	*50.0*		*99.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.4*		ug/L	*50.0*		*96.8*	*70-130*			

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Semivolatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Blank (BGG0669-BLK1)				Prepared & Analyzed: 07/20/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*53.0*		ug/L	*100*		*53.0*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*33.3*		ug/L	*50.0*		*66.6*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*42.1*		ug/L	*100*		*42.1*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*37.2*		ug/L	*50.0*		*74.3*	*5-151*			
Surr: Phenol-d5 (Surr)	*34.3*		ug/L	*100*		*34.3*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*25.4*		ug/L	*50.0*		*50.8*	*5-141*			
LCS (BGG0669-BS1)				Prepared & Analyzed: 07/20/2023						
1,2,4-Trichlorobenzene	28.3	10.0	ug/L	50.0		56.6	57-130			L
1,2-Dichlorobenzene	27.0	10.0	ug/L	50.0		54.1	22-115			
1,3-Dichlorobenzene	25.0	10.0	ug/L	50.0		50.0	22-112			
1,4-Dichlorobenzene	29.9	10.0	ug/L	50.0		59.8	13-112			
2,4,6-Trichlorophenol	34.9	10.0	ug/L	50.0		69.7	52-129			
2,4-Dichlorophenol	37.2	10.0	ug/L	50.0		74.3	53-122			
2,4-Dimethylphenol	41.1	5.00	ug/L	50.0		82.3	42-120			
2,4-Dinitrophenol	25.4	50.0	ug/L	50.0		50.8	48-127			
2,4-Dinitrotoluene	44.5	10.0	ug/L	50.0		89.0	10-173			
2,6-Dinitrotoluene	43.2	10.0	ug/L	50.0		86.3	68-137			
2-Chloronaphthalene	32.9	10.0	ug/L	50.0		65.7	65-120			
2-Chlorophenol	37.1	10.0	ug/L	50.0		74.3	36-120			
2-Nitrophenol	36.4	10.0	ug/L	50.0		72.8	45-167			
3,3'-Dichlorobenzidine	38.7	10.0	ug/L	50.0		77.3	10-213			
4,6-Dinitro-2-methylphenol	37.4	50.0	ug/L	50.0		74.8	53-130			
4-Bromophenyl phenyl ether	38.6	10.0	ug/L	50.0		77.2	65-120			

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Certificate of Analysis

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Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
LCS (BGG0669-BS1)				Prepared & Analyzed: 07/20/2023						
4-Chlorophenyl phenyl ether	33.6	10.0	ug/L	50.0		67.3	38-145			
4-Nitrophenol	16.6	50.0	ug/L	50.0		33.3	13-129			
Acenaphthene	38.2	10.0	ug/L	50.0		76.5	60-132			
Acenaphthylene	39.8	10.0	ug/L	50.0		79.5	54-126			
Acetophenone	40.6	20.0	ug/L	50.0		81.2	0-200			
Anthracene	42.0	10.0	ug/L	50.0		84.1	43-120			
Benzo (a) anthracene	46.7	10.0	ug/L	50.0		93.4	42-133			
Benzo (a) pyrene	49.8	10.0	ug/L	50.0		99.6	32-148			
Benzo (b) fluoranthene	52.6	10.0	ug/L	50.0		105	42-140			
Benzo (g,h,i) perylene	43.7	10.0	ug/L	50.0		87.3	10-195			
Benzo (k) fluoranthene	40.9	10.0	ug/L	50.0		81.7	25-146			
bis (2-Chloroethoxy) methane	40.9	10.0	ug/L	50.0		81.8	49-165			
bis (2-Chloroethyl) ether	34.6	10.0	ug/L	50.0		69.1	43-126			
2,2'-Oxybis (1-chloropropane)	33.0	10.0	ug/L	50.0		65.9	63-139			
bis (2-Ethylhexyl) phthalate	52.4	10.0	ug/L	50.0		105	29-137			
Butyl benzyl phthalate	54.2	10.0	ug/L	50.0		108	10-140			
Chrysene	49.2	10.0	ug/L	50.0		98.4	44-140			
Dibenz (a,h) anthracene	46.1	10.0	ug/L	50.0		92.3	10-200			
Diethyl phthalate	46.5	10.0	ug/L	50.0		93.0	10-120			
Dimethyl phthalate	42.5	10.0	ug/L	50.0		85.0	10-120			
Di-n-butyl phthalate	47.3	10.0	ug/L	50.0		94.6	10-120			
Di-n-octyl phthalate	48.9	10.0	ug/L	50.0		97.7	19-132			
Fluoranthene	46.6	10.0	ug/L	50.0		93.1	43-121			
Fluorene	38.8	10.0	ug/L	50.0		77.6	70-120			
Hexachlorobenzene	26.4	1.00	ug/L	50.0		52.8	10-142			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
LCS (BGG0669-BS1)				Prepared & Analyzed: 07/20/2023						
Hexachlorobutadiene	29.6	10.0	ug/L	50.0		59.2	38-120			
Hexachlorocyclopentadiene	16.4	10.0	ug/L	50.0		32.8	10-76			
Hexachloroethane	26.3	10.0	ug/L	50.0		52.7	55-120			L
Indeno (1,2,3-cd) pyrene	45.5	10.0	ug/L	50.0		91.0	10-151			
Isophorone	33.7	10.0	ug/L	50.0		67.4	47-180			
Naphthalene	33.6	5.00	ug/L	50.0		67.1	36-120			
Nitrobenzene	38.1	10.0	ug/L	50.0		76.2	54-158			
n-Nitrosodimethylamine	19.1	10.0	ug/L	50.0		38.2	10-85			
n-Nitrosodi-n-propylamine	41.7	10.0	ug/L	50.0		83.4	14-198			
n-Nitrosodiphenylamine	36.3	10.0	ug/L	50.0		72.6	12-97			
p-Chloro-m-cresol	41.9	10.0	ug/L	50.0		83.8	10-142			
Pentachlorophenol	29.0	20.0	ug/L	50.0		58.1	38-152			
Phenanthrene	51.2	10.0	ug/L	50.0		102	65-120			
Phenol	16.2	10.0	ug/L	50.5		32.0	17-120			
Pyrene	46.8	10.0	ug/L	50.0		93.6	70-120			
Pyridine	24.3	10.0	ug/L	50.0		48.5	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*72.8*		ug/L	*100*		*72.8*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*37.4*		ug/L	*50.0*		*74.8*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*46.7*		ug/L	*100*		*46.7*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*41.4*		ug/L	*50.0*		*82.8*	*5-151*			
Surr: Phenol-d5 (Surr)	*37.5*		ug/L	*100*		*37.5*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*28.0*		ug/L	*50.0*		*56.0*	*5-141*			
Matrix Spike (BGG0669-MS1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
1,2,4-Trichlorobenzene	27.8	10.0	ug/L	48.5	BLOD	57.2	44-142			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike (BGG0669-MS1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
1,2-Dichlorobenzene	26.4	10.0	ug/L	48.5	BLOD	54.3	22-115			
1,3-Dichlorobenzene	26.2	10.0	ug/L	48.5	BLOD	53.9	22-112			
1,4-Dichlorobenzene	29.8	10.0	ug/L	48.5	BLOD	61.4	13-112			
2,4,6-Trichlorophenol	43.0	10.0	ug/L	48.5	BLOD	88.5	37-144			
2,4-Dichlorophenol	38.8	10.0	ug/L	48.5	BLOD	80.0	39-135			
2,4-Dimethylphenol	41.0	5.00	ug/L	48.5	BLOD	84.4	32-120			
2,4-Dinitrophenol	39.5	50.0	ug/L	48.5	BLOD	81.5	39-139			
2,4-Dinitrotoluene	46.0	10.0	ug/L	48.5	BLOD	94.8	10-191			
2,6-Dinitrotoluene	46.8	10.0	ug/L	48.5	BLOD	96.5	50-158			
2-Chloronaphthalene	36.4	10.0	ug/L	48.5	BLOD	74.9	60-120			
2-Chlorophenol	32.7	10.0	ug/L	48.5	BLOD	67.3	23-134			
2-Nitrophenol	38.3	10.0	ug/L	48.5	BLOD	78.8	29-182			
4,6-Dinitro-2-methylphenol	41.6	50.0	ug/L	48.5	BLOD	85.6	10-181			
4-Bromophenyl phenyl ether	40.1	10.0	ug/L	48.5	BLOD	82.7	53-127			
4-Chlorophenyl phenyl ether	36.6	10.0	ug/L	48.5	BLOD	75.4	25-158			
4-Nitrophenol	31.9	50.0	ug/L	48.5	BLOD	65.6	10-132			
Acenaphthene	51.6	10.0	ug/L	48.5	10.4	85.0	47-145			
Acenaphthylene	42.6	10.0	ug/L	48.5	BLOD	87.8	33-145			
Acetophenone	37.4	20.0	ug/L	48.5	BLOD	77.1	0-200			
Anthracene	46.8	10.0	ug/L	48.5	BLOD	96.3	27-133			
Benzo (a) anthracene	34.3	10.0	ug/L	48.5	BLOD	70.7	33-143			
Benzo (a) pyrene	36.5	10.0	ug/L	48.5	BLOD	75.1	17-163			
Benzo (b) fluoranthene	39.2	10.0	ug/L	48.5	BLOD	80.7	24-159			
Benzo (g,h,i) perylene	24.0	10.0	ug/L	48.5	BLOD	49.5	10-219			
Benzo (k) fluoranthene	33.9	10.0	ug/L	48.5	BLOD	69.9	11-162			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike (BGG0669-MS1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
bis (2-Chloroethoxy) methane	36.7	10.0	ug/L	48.5	BLOD	75.7	33-184			
bis (2-Chloroethyl) ether	32.4	10.0	ug/L	48.5	BLOD	66.7	12-158			
2,2'-Oxybis (1-chloropropane)	30.3	10.0	ug/L	48.5	BLOD	62.5	36-166			
bis (2-Ethylhexyl) phthalate	43.4	10.0	ug/L	48.5	BLOD	89.3	10-158			
Butyl benzyl phthalate	43.4	10.0	ug/L	48.5	BLOD	89.4	10-152			
Chrysene	36.4	10.0	ug/L	48.5	BLOD	75.0	17-169			
Dibenz (a,h) anthracene	27.0	10.0	ug/L	48.5	BLOD	55.6	10-227			
Diethyl phthalate	48.9	10.0	ug/L	48.5	BLOD	101	10-120			
Dimethyl phthalate	43.1	10.0	ug/L	48.5	BLOD	88.8	10-120			
Di-n-butyl phthalate	42.1	10.0	ug/L	48.5	BLOD	86.8	10-120			
Di-n-octyl phthalate	49.8	10.0	ug/L	48.5	BLOD	102	10-146			
Fluoranthene	36.5	10.0	ug/L	48.5	BLOD	75.3	26-137			
Fluorene	47.4	10.0	ug/L	48.5	4.87	87.7	59-121			
Hexachlorobenzene	23.0	1.00	ug/L	48.5	BLOD	47.5	10-152			
Hexachlorobutadiene	29.1	10.0	ug/L	48.5	BLOD	59.9	24-120			
Hexachlorocyclopentadiene	13.0	10.0	ug/L	48.5	BLOD	26.9	10-90			
Hexachloroethane	27.3	10.0	ug/L	48.5	BLOD	56.3	40-120			
Indeno (1,2,3-cd) pyrene	26.3	10.0	ug/L	48.5	BLOD	54.1	10-171			
Isophorone	30.4	10.0	ug/L	48.5	BLOD	62.6	21-196			
Naphthalene	32.9	5.00	ug/L	48.5	BLOD	67.7	21-133			
Nitrobenzene	35.5	10.0	ug/L	48.5	BLOD	73.2	35-180			
n-Nitrosodimethylamine	17.8	10.0	ug/L	48.5	BLOD	36.6	10-85			
n-Nitrosodi-n-propylamine	37.4	10.0	ug/L	48.5	BLOD	77.0	10-230			
n-Nitrosodiphenylamine	46.5	10.0	ug/L	48.5	7.66	79.9	12-111			
p-Chloro-m-cresol	43.6	10.0	ug/L	48.5	BLOD	89.8	10-127			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike (BGG0669-MS1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
Pentachlorophenol	53.6	20.0	ug/L	48.5	BLOD	110	14-176			
Phenanthrene	58.3	10.0	ug/L	48.5	10.0	99.4	54-120			
Phenol	12.3	10.0	ug/L	49.0	BLOD	25.1	10-120			
Pyrene	38.6	10.0	ug/L	48.5	BLOD	79.5	52-120			
Pyridine	23.2	10.0	ug/L	48.5	BLOD	47.7	10-110			
Surr: 2,4,6-Tribromophenol (Surr)	*95.4*		ug/L	*97.1*		*98.3*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*36.5*		ug/L	*48.5*		*75.2*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*42.3*		ug/L	*97.1*		*43.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*37.0*		ug/L	*48.5*		*76.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*31.2*		ug/L	*97.1*		*32.2*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*11.9*		ug/L	*48.5*		*24.5*	*5-141*			
Matrix Spike Dup (BGG0669-MSD1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
1,2,4-Trichlorobenzene	22.0	10.0	ug/L	46.7	BLOD	47.0	44-142	23.3	20	P
1,2-Dichlorobenzene	20.6	10.0	ug/L	46.7	BLOD	44.1	22-115	24.6	20	P
1,3-Dichlorobenzene	20.0	10.0	ug/L	46.7	BLOD	42.8	22-112	26.7	20	P
1,4-Dichlorobenzene	26.0	10.0	ug/L	46.7	BLOD	55.7	13-112	13.7	20	
2,4,6-Trichlorophenol	35.6	10.0	ug/L	46.7	BLOD	76.2	37-144	18.8	20	
2,4-Dichlorophenol	31.9	10.0	ug/L	46.7	BLOD	68.3	39-135	19.6	20	
2,4-Dimethylphenol	34.9	5.00	ug/L	46.7	BLOD	74.7	32-120	16.0	20	
2,4-Dinitrophenol	32.4	50.0	ug/L	46.7	BLOD	69.3	39-139	20.0	20	
2,4-Dinitrotoluene	36.8	10.0	ug/L	46.7	BLOD	78.7	10-191	22.3	20	P
2,6-Dinitrotoluene	37.3	10.0	ug/L	46.7	BLOD	79.9	50-158	22.6	20	P
2-Chloronaphthalene	29.7	10.0	ug/L	46.7	BLOD	63.6	60-120	20.2	20	P
2-Chlorophenol	27.7	10.0	ug/L	46.7	BLOD	59.2	23-134	16.5	20	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike Dup (BGG0669-MSD1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
2-Nitrophenol	28.4	10.0	ug/L	46.7	BLOD	60.7	29-182	29.7	20	P
4,6-Dinitro-2-methylphenol	34.1	50.0	ug/L	46.7	BLOD	72.9	10-181	19.8	20	
4-Bromophenyl phenyl ether	30.2	10.0	ug/L	46.7	BLOD	64.6	53-127	28.3	20	P
4-Chlorophenyl phenyl ether	28.3	10.0	ug/L	46.7	BLOD	60.5	25-158	25.6	20	P
4-Nitrophenol	27.6	50.0	ug/L	46.7	BLOD	59.0	10-132	14.4	20	
Acenaphthene	42.3	10.0	ug/L	46.7	10.4	68.3	47-145	19.9	20	
Acenaphthylene	34.6	10.0	ug/L	46.7	BLOD	73.9	33-145	20.9	20	P
Acetophenone	33.3	20.0	ug/L	46.7	BLOD	71.3	0-200	11.6	20	
Anthracene	35.8	10.0	ug/L	46.7	BLOD	76.6	27-133	26.6	20	P
Benzo (a) anthracene	26.5	10.0	ug/L	46.7	BLOD	56.8	33-143	25.6	20	P
Benzo (a) pyrene	28.1	10.0	ug/L	46.7	BLOD	60.1	17-163	26.0	20	P
Benzo (b) fluoranthene	30.9	10.0	ug/L	46.7	BLOD	66.1	24-159	23.7	20	P
Benzo (g,h,i) perylene	15.1	10.0	ug/L	46.7	BLOD	32.4	10-219	45.3	20	P
Benzo (k) fluoranthene	26.6	10.0	ug/L	46.7	BLOD	57.0	11-162	24.1	20	P
bis (2-Chloroethoxy) methane	29.8	10.0	ug/L	46.7	BLOD	63.9	33-184	20.7	20	P
bis (2-Chloroethyl) ether	24.4	10.0	ug/L	46.7	BLOD	52.2	12-158	28.0	20	P
2,2'-Oxybis (1-chloropropane)	27.5	10.0	ug/L	46.7	BLOD	58.8	36-166	9.91	20	
bis (2-Ethylhexyl) phthalate	34.6	10.0	ug/L	46.7	BLOD	74.1	10-158	22.4	20	P
Butyl benzyl phthalate	34.0	10.0	ug/L	46.7	BLOD	72.8	10-152	24.3	20	P
Chrysene	28.5	10.0	ug/L	46.7	BLOD	61.0	17-169	24.4	20	P
Dibenz (a,h) anthracene	17.2	10.0	ug/L	46.7	BLOD	36.8	10-227	44.3	20	P
Diethyl phthalate	38.4	10.0	ug/L	46.7	BLOD	82.2	10-120	24.0	20	P
Dimethyl phthalate	35.4	10.0	ug/L	46.7	BLOD	75.8	10-120	19.5	20	
Di-n-butyl phthalate	32.5	10.0	ug/L	46.7	BLOD	69.5	10-120	25.9	20	P
Di-n-octyl phthalate	41.2	10.0	ug/L	46.7	BLOD	88.1	10-146	18.9	20	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike Dup (BGG0669-MSD1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						
Fluoranthene	28.5	10.0	ug/L	46.7	BLOD	61.0	26-137	24.7	20	P
Fluorene	37.3	10.0	ug/L	46.7	4.87	69.5	59-121	23.8	20	P
Hexachlorobenzene	17.9	1.00	ug/L	46.7	BLOD	38.3	10-152	25.2	20	P
Hexachlorobutadiene	22.3	10.0	ug/L	46.7	BLOD	47.6	24-120	26.6	20	P
Hexachlorocyclopentadiene	10.6	10.0	ug/L	46.7	BLOD	22.6	10-90	21.0	20	P
Hexachloroethane	23.4	10.0	ug/L	46.7	BLOD	50.1	40-120	15.4	20	
Indeno (1,2,3-cd) pyrene	16.9	10.0	ug/L	46.7	BLOD	36.1	10-171	43.6	20	P
Isophorone	24.2	10.0	ug/L	46.7	BLOD	51.9	21-196	22.5	20	P
Naphthalene	28.6	5.00	ug/L	46.7	BLOD	61.1	21-133	14.0	20	
Nitrobenzene	30.6	10.0	ug/L	46.7	BLOD	65.5	35-180	14.9	20	
n-Nitrosodimethylamine	16.6	10.0	ug/L	46.7	BLOD	35.5	10-85	6.92	20	
n-Nitrosodi-n-propylamine	33.3	10.0	ug/L	46.7	BLOD	71.3	10-230	11.5	20	
n-Nitrosodiphenylamine	38.3	10.0	ug/L	46.7	7.66	65.6	12-111	19.2	20	
p-Chloro-m-cresol	35.0	10.0	ug/L	46.7	BLOD	74.8	10-127	22.0	20	P
Pentachlorophenol	41.4	20.0	ug/L	46.7	BLOD	88.6	14-176	25.7	20	P
Phenanthrene	46.5	10.0	ug/L	46.7	10.0	78.0	54-120	22.5	20	P
Phenol	13.6	10.0	ug/L	47.2	BLOD	28.9	10-120	10.2	20	
Pyrene	29.6	10.0	ug/L	46.7	BLOD	63.4	52-120	26.3	20	P
Pyridine	20.3	10.0	ug/L	46.7	BLOD	43.3	10-110	13.4	20	
Surr: 2,4,6-Tribromophenol (Surr)	*72.9*		ug/L	*93.5*		*78.0*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*30.6*		ug/L	*46.7*		*65.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*33.2*		ug/L	*93.5*		*35.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*31.8*		ug/L	*46.7*		*68.0*	*5-151*			
Surr: Phenol-d5 (Surr)	*25.3*		ug/L	*93.5*		*27.0*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*9.35*		ug/L	*46.7*		*20.0*	*5-141*			

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Semivolatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0669 - SW3510C/EPA600-MS										
Matrix Spike Dup (BGG0669-MSD1)	**Source: 23G0805-05**			Prepared & Analyzed: 07/20/2023						

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0675 - No Prep Wet Chem										
Blank (BGG0675-BLK1)				Prepared & Analyzed: 07/20/2023						
BOD	ND	2.0	mg/L							
LCS (BGG0675-BS1)				Prepared & Analyzed: 07/20/2023						
BOD	199	2	mg/L	198		101	84.6-115.4			
Duplicate (BGG0675-DUP1)	**Source: 23G0815-02**			Prepared & Analyzed: 07/20/2023						
BOD	13.9	2.0	mg/L		14.0			0.717	20	
Batch BGG0706 - No Prep Wet Chem										
Blank (BGG0706-BLK1)				Prepared & Analyzed: 07/20/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGG0706-BS1)				Prepared & Analyzed: 07/20/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		99.0	80-120			
Matrix Spike (BGG0706-MS1)	**Source: 23G0908-02**			Prepared & Analyzed: 07/20/2023						
Nitrite as N	0.12	0.05	mg/L	0.100	0.04	87.0	80-120			
Matrix Spike Dup (BGG0706-MSD1)	**Source: 23G0908-02**			Prepared & Analyzed: 07/20/2023						
Nitrite as N	0.12	0.05	mg/L	0.100	0.04	87.0	80-120	0.00	20	

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0724 - No Prep Wet Chem										
Blank (BGG0724-BLK1)				Prepared & Analyzed: 07/21/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGG0724-BS1)				Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		101	80-120			
Matrix Spike (BGG0724-MS1)	**Source: 23G0833-01**			Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.12	0.05	mg/L	0.100	BLOD	115	80-120			
Matrix Spike Dup (BGG0724-MSD1)	**Source: 23G0833-01**			Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.11	0.05	mg/L	0.100	BLOD	109	80-120	5.36	20	
Batch BGG0732 - No Prep Wet Chem										
Blank (BGG0732-BLK1)				Prepared & Analyzed: 07/21/2023						
BOD	ND	2.0	mg/L							
LCS (BGG0732-BS1)				Prepared & Analyzed: 07/21/2023						
BOD	198	2	mg/L	198		100	84.6-115.4			
Duplicate (BGG0732-DUP1)	**Source: 23G0930-03**			Prepared & Analyzed: 07/21/2023						
BOD	2.7	2.0	mg/L		2.4			12.7	20	
Batch BGG0750 - No Prep Wet Chem										
Blank (BGG0750-BLK1)				Prepared & Analyzed: 07/21/2023						
Ammonia as N	ND	0.10	mg/L							

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0750 - No Prep Wet Chem										
LCS (BGG0750-BS1)				Prepared & Analyzed: 07/21/2023						
Ammonia as N	1.02	0.1	mg/L	1.00		102	90-110			
Matrix Spike (BGG0750-MS1)	**Source: 23G0806-03**			Prepared & Analyzed: 07/21/2023						
Ammonia as N	0.99	0.1	mg/L	1.00	BLOD	97.0	89.3-131			
Matrix Spike (BGG0750-MS2)	**Source: 23G0816-02**			Prepared & Analyzed: 07/21/2023						
Ammonia as N	1.06	0.1	mg/L	1.00	BLOD	100	89.3-131			
Matrix Spike Dup (BGG0750-MSD1)	**Source: 23G0806-03**			Prepared & Analyzed: 07/21/2023						
Ammonia as N	1.02	0.1	mg/L	1.00	BLOD	101	89.3-131	3.59	20	
Matrix Spike Dup (BGG0750-MSD2)	**Source: 23G0816-02**			Prepared & Analyzed: 07/21/2023						
Ammonia as N	1.13	0.1	mg/L	1.00	BLOD	107	89.3-131	6.22	20	
Batch BGG0824 - No Prep Wet Chem										
Blank (BGG0824-BLK1)				Prepared & Analyzed: 07/24/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGG0824-BS1)				Prepared & Analyzed: 07/24/2023						
TKN as N	10.7	0.50	mg/L	10.0		107	90-110			
Matrix Spike (BGG0824-MS1)	**Source: 23G1076-02**			Prepared & Analyzed: 07/24/2023						
TKN as N	11.5	0.50	mg/L	10.0	0.69	108	90-110			
Matrix Spike (BGG0824-MS2)	**Source: 23G0861-01**			Prepared & Analyzed: 07/24/2023						
TKN as N	7.46	0.50	mg/L	10.0	BLOD	74.6	90-110			M

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0824 - No Prep Wet Chem										
Matrix Spike Dup (BGG0824-MSD1)	**Source: 23G1076-02**			Prepared & Analyzed: 07/24/2023						
TKN as N	11.6	0.50	mg/L	10.0	0.69	109	90-110	0.364	20	
Matrix Spike Dup (BGG0824-MSD2)	**Source: 23G0861-01**			Prepared & Analyzed: 07/24/2023						
TKN as N	6.57	0.50	mg/L	10.0	BLOD	65.7	90-110	12.6	20	M
Batch BGG0929 - No Prep Wet Chem										
Blank (BGG0929-BLK1)				Prepared & Analyzed: 07/27/2023						
COD	ND	10.0	mg/L							
LCS (BGG0929-BS1)				Prepared & Analyzed: 07/27/2023						
COD	50.1	10.0	mg/L	50.0		100	88-119			
Matrix Spike (BGG0929-MS1)	**Source: 23G1189-01**			Prepared & Analyzed: 07/27/2023						
COD	49.1	10.0	mg/L	50.0	BLOD	98.2	72.4-130			
Matrix Spike Dup (BGG0929-MSD1)	**Source: 23G1189-01**			Prepared & Analyzed: 07/27/2023						
COD	48.4	10.0	mg/L	50.0	BLOD	96.9	72.4-130	1.33	20	
Batch BGG0983 - No Prep Wet Chem										
Blank (BGG0983-BLK1)				Prepared & Analyzed: 07/28/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGG0983-BS1)				Prepared & Analyzed: 07/28/2023						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.505		89.9	80-120			

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0983 - No Prep Wet Chem										
Matrix Spike (BGG0983-MS1)		**Source: 23G0990-01**		Prepared & Analyzed: 07/28/2023						
Total Recoverable Phenolics	0.46	0.050	mg/L	0.500	0.06	80.4	70-130			
Matrix Spike Dup (BGG0983-MSD1)		**Source: 23G0990-01**		Prepared & Analyzed: 07/28/2023						
Total Recoverable Phenolics	0.47	0.050	mg/L	0.500	0.06	82.0	70-130	1.72	20	
Batch BGG1066 - No Prep Wet Chem										
Blank (BGG1066-BLK1)				Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGG1066-BS1)				Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	2.53	0.1	mg/L	2.50		101	90-110			
Matrix Spike (BGG1066-MS1)		**Source: 23G1193-01**		Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	2.69	0.1	mg/L	2.50	BLOD	108	90-120			
Matrix Spike Dup (BGG1066-MSD1)		**Source: 23G1193-01**		Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	2.70	0.1	mg/L	2.50	BLOD	108	90-120	0.260	20	
Batch BGH0064 - No Prep Wet Chem										
Blank (BGH0064-BLK1)				Prepared & Analyzed: 08/02/2023						
COD	ND	10.0	mg/L							
LCS (BGH0064-BS1)				Prepared & Analyzed: 08/02/2023						
COD	47.8	10.0	mg/L	50.0		95.6	88-119			

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0064 - No Prep Wet Chem										
Matrix Spike (BGH0064-MS1)	**Source: 23G1359-01**			Prepared & Analyzed: 08/02/2023						
COD	50.1	10.0	mg/L	50.0	BLOD	100	72.4-130			
Matrix Spike Dup (BGH0064-MSD1)	**Source: 23G1359-01**			Prepared & Analyzed: 08/02/2023						
COD	46.5	10.0	mg/L	50.0	BLOD	93.0	72.4-130	7.44	20	
Batch BGH0067 - No Prep Wet Chem										
Blank (BGH0067-BLK1)				Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGH0067-BS1)				Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.47	0.050	mg/L	0.505		93.1	80-120			
Matrix Spike (BGH0067-MS1)	**Source: 23G0990-04**			Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.61	0.050	mg/L	0.500	0.19	84.0	70-130			
Matrix Spike Dup (BGH0067-MSD1)	**Source: 23G0990-04**			Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.63	0.050	mg/L	0.500	0.19	88.4	70-130	3.54	20	

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Analytical Summary

23G0895-01	Subcontract
23G0895-02	Subcontract
23G0895-03	Subcontract
23G0895-04	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**	
23G0895-01	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
23G0895-02	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
23G0895-03	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
23G0895-04	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23G0895-01	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
23G0895-02	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
23G0895-03	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
23G0895-01	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
23G0895-02	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
23G0895-03	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
23G0895-04	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
23G0895-04	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
23G0895-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
23G0895-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
23G0895-03	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
23G0895-04	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
23G0895-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303

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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**	
23G0895-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
23G0895-03	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
23G0895-04	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
23G0895-01	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
23G0895-03	0.400 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
23G0895-04	0.200 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
23G0895-01	0.100 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
23G0895-03	0.100 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
23G0895-04	0.100 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
23G0895-01	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-01RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-02	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-02RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-03	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-03RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-03RE2	2.50 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-04	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-04RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-04RE2	2.50 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
23G0895-02	0.0400 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
23G0895-02	0.500 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23G0895-01	500 mL / 0.500 mL	SW8270E	BGG0669	SGG0817	AE30336
23G0895-02	1070 mL / 1.00 mL	SW8270E	BGG0669	SGG0817	AE30336
23G0895-03	500 mL / 2.00 mL	SW8270E	BGG0669	SGG0817	AE30336
23G0895-04	500 mL / 2.00 mL	SW8270E	BGG0669	SGG0965	AG30261

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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**	

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23G0895-01	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
23G0895-02	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
23G0895-03	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
23G0895-04	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
23G0895-05	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
23G0895-01RE1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265
23G0895-02RE1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265
23G0895-03RE1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265
23G0895-04RE1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265

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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**	
BGG0742-BLK1	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
BGG0742-BS1	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
BGG0742-MS1	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
BGG0742-MS2	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
BGG0742-MSD1	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291
BGG0742-MSD2	50.0 mL / 50.0 mL	SW6020B	BGG0742	SGG0774	AG30291

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGG0675-BLK1	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
BGG0675-BS1	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
BGG0675-DUP1	300 mL / 300 mL	SM5210B-2016	BGG0675	SGG0838	
BGG0706-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
BGG0706-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
BGG0706-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
BGG0706-MS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
BGG0706-MSD1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0706	SGG0690	AD30177
BGG0724-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MSD1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0732-BLK1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/8/2023 9:17:33AM
Client Site I.D.: Bristol LF
Submitted To: Logan Howard

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGG0732-BS1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
BGG0732-DUP1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
BGG0750-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0750-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0750-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0750-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0750-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0750-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG0750	SGG0738	AG30288
BGG0824-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0929-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0983-BLK1	5.00 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
BGG0983-BS1	5.00 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
BGG0983-MRL1	5.00 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
BGG0983-MS1	5.00 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
BGG0983-MSD1	5.00 mL / 10.0 mL	SW9065	BGG0983	SGG0961	AG30323
BGG1066-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
BGG1066-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
BGG1066-MRL1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
BGG1066-MS1	50.0 mL / 50.0 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343
BGG1066-MSD1	50.0 mL / 50.0 mL	SM4500-NO3F-2016	BGG1066	SGG1049	AG30343

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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**	
BGH0064-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
BGH0064-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
BGH0064-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
BGH0064-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
BGH0064-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0064	SGH0077	AF30270
BGH0067-BLK1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-BS1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MRL1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MS1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MSD1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGG0669-BLK1	1000 mL / 1.00 mL	SW8270E	BGG0669	SGG0723	AG30261
BGG0669-BS1	1000 mL / 1.00 mL	SW8270E	BGG0669	SGG0723	AG30261
BGG0669-MS1	1030 mL / 1.00 mL	SW8270E	BGG0669	SGG0723	AG30261
BGG0669-MSD1	1070 mL / 1.00 mL	SW8270E	BGG0669	SGG0723	AG30261

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BGG0746-BLK1	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
BGG0746-BS1	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
BGG0746-DUP1	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
BGG0746-MS1	5.00 mL / 5.00 mL	SW8260D	BGG0746	SGG0732	AE30265
BGG0808-BLK1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265
BGG0808-BS1	5.00 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265
BGG0808-MS1	0.0500 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265

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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**	
BGG0808-MSD1	0.0500 mL / 5.00 mL	SW8260D	BGG0808	SGG0785	AE30265

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Certified Analyses included in this Report

Analyte	Certifications
EPA350.1 R2.0 in Non-Potable Water	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
EPA351.2 R2.0 in Non-Potable Water	
TKN as N	VELAP,NCDEQ,WVDEP
SM4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP,NCDEQ
SM4500-NO3F-2016 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM5210B-2016 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6020B in Non-Potable Water	
Mercury	VELAP
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
SW8260D in Non-Potable Water	

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Submitted To: Logan Howard

Certified Analyses included in this Report

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

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Submitted To: Logan Howard

Date Issued: 8/8/2023 9:17:33AM

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	06/14/2024
TXCEQ	Texas Comm on Environmental Quality #T104704576-23-1	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12569	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

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

ENTHALPY ANALYTICAL

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

Chain of Custody
Effective: Mar 10, 2021

CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SCS Reston	PROJECT NAME/Quote #: City of Bristol LF
CONTACT: Jennifer Robb	INVOICE CONTACT: Jennifer Robb	SITE NAME: Bristol LF
ADDRESS: 296 Victory Road, Winchester, VA 22602	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #: (703)471-6150	INVOICE PHONE #:	P.O. #:
FAX #: (703) 471-6676	EMAIL: Jrobb@scsengineers.com	Pretreatment Program:
Is sample for compliance reporting? YES (NO)	Regulatory State:	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): Logan Nelson / Ty Smith	SAMPLER SIGNATURE: Logan Nelson / Ty Smith	Turn Around Time: Circle (10) 5 Days or _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
											Bod - SM 5210B	VOCs - 8260 (See list)	VFAs - 8015 (See list)	COD - SM 5220D	Nitrate (report separately from Nitrite)	Ammonia EPA 350.1, Nitrite SM22 4500-NO3F, TKN EPA 351.2	Metals SW6020 (As, As, Ba, Cd, Cr, Cu, Ni, Pb, Se, Zn) SW7470 (Hg)	SVOCs (Anthracene) SW 8270	Phenolics SW9065	
1) EW-50	X					7/19	815		GW	11	X	X	X	X	X	X	X	X	X	
2) EW-98	X					7/19	850		GW	11	X	X	X	X	X	X	X	X	X	
3) EW-94	X					7/19	935		GW	12	X	X	X	X	X	X	X	X	X	
4) EW-57	X					7/19	1000		GW	12	X	X	X	X	X	X	X	X	X	
5)																				
6)																				
7)																				
8)																				
9)																				
10) Trip Blank						7/25/23	1520					X								

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

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

RELINQUISHED:	DATE / TIME	RECEIVED: 7/20/23 LCN	DATE / TIME
Logan Nelson	7/19/23 1100		
RELINQUISHED: LCW	DATE / TIME	RECEIVED:	DATE / TIME 7/20/23 0800
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐

LAB USE ONLY Therm ID: 576
Custody Seals used and intact? (Y/N)
COOLER TEMP 1.2 °C
Received on ice? (Y/N)

SCS-W 23G0895
2023 City of Bristol Landfill Leach:
Recd: 07/20/2023 Due: 08/03/2023

ENTHALPY ANALYTICAL

Sample Preservation Log

Order ID 23G0895 Date Performed: 7/20/23 Analyst Performing Check CSB

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)			Phenolics			COD		
		pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	Received Res.Cl		final + or -	Received Res.Cl		final + or -	Received pH	Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH
		<2	Other		>12	Other		>9	Other		<2	Other		<2	Other		<2	Other		<2	Other		<2	Other		+	-		+	-				<2	Other		<2	Other		<2	Other	
1	A		7	<2																																					
1	D																																							
1	E																												—											
1	L										7	<2		7	<2					7	<2																	7	<2	
2	A		6	<2																																				
2	D																																				5	<2			
2	E																												—											
2	L										5	<2		5	<2					5	<2																	5	<2	
3	A		5	<2																																				
3	D																																				5	<2			
3	E																												—											
3	L										5	<2		5	<2					5	<2																	5	<2	
4	A		6	<2																																				
4	D																																				5	<2			
4	E																												—											

NaOH ID: _____ HNO3 ID: 3F04262

H2SO4 ID: 3D04310 Na2S2O3 ID: _____

HCL ID: _____ Na2SO3 ID: _____

CrVI preserved date/time: _____ Analyst Initials: _____

* pH must be adjusted between 9.3 - 9.7

Buffer Sol'n ID: _____

Metals were received with pH = 5,6,7
HNO3 was added on 20 Jul 2023 at 1005
by CSB in the Log-In room to bring pH=
<2.

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

ENTHALPY ANALYTICAL

Sample Preservation Log

Order ID 23G0895 Date Performed: 7/20/23 Analyst Performing Check: CSB

Sample ID	Container ID	Metals			Cyanide			Sulfide			Ammonia			TKN			Phos, Tot			NO3+NO2			DRO			Pesticide (8081/608/508) PCB DW only			SVOC (525/8270/825)			CrVI * **		Pest/PCB (508) / SVOC(525)			COD					
		pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	Received Res.Cl		final + or -	Received Res.Cl		final + or -	Received pH	Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH
		<2	Other		>12	Other		>9	Other		<2	Other		<2	Other		<2	Other		<2	Other		<2	Other		+	-		+	-				<2	Other		<2	Other			Other	
4	L											5	<2		5	<2					5	<2															<2	5	<2			

NaOH ID: _____ HNO3 ID: 3F04262

H2SO4 ID: 3D04310 Na2S2O3 ID: _____

HCL ID: _____ Na2SO3 ID: _____

CrVI preserved date/time: _____ Analyst Initials: _____

*pH must be adjusted between 9.3 - 9.7

Buffer Sol'n ID: _____

Metals were received with pH = 5,6,7
HNO3 was added on 20 Jul 2023 at 1005
by CSB in the Log-In room to bring pH=
<2.

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

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Submitted To: Logan Howard

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Date Issued: 8/8/2023 9:17:33AM

Laboratory Order ID: 23G0895

Sample Conditions Checklist

Samples Received at:	**1.20°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	No
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	No
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

Work Order Comments

*H2SO4-preserved containers for all samples were received with a pH greater than 2, and H2SO4 was added to bring the pH to less than 2.
*2 of 3 VOAC40mL for sample -03: EW-94 were received with headspace. The lab is able to proceed with analysis without a deviation for this sample; however, should

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reanalysis be required, it would constitute a deviation for headspace.
*All VOAC40mL for sample -04: EW-57 were received with headspace.
Analysis to proceed per Jennifer Robb via email. MRS 07/20/23 1120

Hg was logged by 6020 for all samples per the project on file, which differs from the chain of custody (7470). Jennifer Robb notified via email. MRS 07/20/23 1206

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	3G21083	**Report Date:**	8/07/2023
		Received Date:	7/21/2023
Project:	23G0895	**Turnaround Time:**	Normal
		Phones:	(804) 358-8295
		Fax:	
Attn:	Enthalpy VA	**P.O. #:**	PO-049317
Client:	Enthalpy Analytical - Richmond VA 1941 Reymet Road Richmond, VA 23237	**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 Enthalpy VA,

Enclosed are the results of analyses for samples received 7/21/23 with the Chain-of-Custody document. The samples were received in good condition, at 5.2 °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:

Ryan J. Gasio
Project Manager

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www.wecklabs.com

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
23G0895-01: EW-50	Client	3G21083-01	Water	07/19/23 08:15	
23G0895-02: EW-98	Client	3G21083-02	Water	07/19/23 08:50	
23G0895-03: EW-94	Client	3G21083-03	Water	07/19/23 09:35	
23G0895-04: EW-57	Client	3G21083-04	Water	07/19/23 10:00	

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Sample Results

Sample: 23G0895-01: EW-50
3G21083-01 (Water)

Sampled: 07/19/23 8:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		**Instr:** GC09				
Batch ID: W3G2112	**Preparation:** _NONE (SVOC)	**Prepared:** 07/27/23 11:16				**Analyst:** alf
Acetic acid	ND	500	mg/l	50	07/29/23	M-05
Butyric acid	ND	500	mg/l	50	07/29/23	M-05
Heptanoic acid	ND	500	mg/l	50	07/29/23	M-05
Hexanoic acid	ND	500	mg/l	50	07/29/23	M-05
Isobutyric acid	ND	500	mg/l	50	07/29/23	M-05
Isocaproic acid	ND	500	mg/l	50	07/29/23	M-05
Isovaleric acid	ND	500	mg/l	50	07/29/23	M-05
Propionic acid	ND	500	mg/l	50	07/29/23	M-05
Valeric acid	ND	500	mg/l	50	07/29/23	M-05

Sample Results

Sample: 23G0895-02: EW-98
3G21083-02 (Water)

Sampled: 07/19/23 8:50 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		**Instr:** GC09				
Batch ID: W3G2112	**Preparation:** _NONE (SVOC)	**Prepared:** 07/27/23 11:16				**Analyst:** alf
Acetic acid	ND	200	mg/l	20	07/29/23	M-05
Butyric acid	ND	200	mg/l	20	07/29/23	M-05
Heptanoic acid	ND	200	mg/l	20	07/29/23	M-05
Hexanoic acid	ND	200	mg/l	20	07/29/23	M-05
Isobutyric acid	ND	200	mg/l	20	07/29/23	M-05
Isocaproic acid	ND	200	mg/l	20	07/29/23	M-05
Isovaleric acid	ND	200	mg/l	20	07/29/23	M-05
Propionic acid	ND	200	mg/l	20	07/29/23	M-05
Valeric acid	ND	200	mg/l	20	07/29/23	M-05

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Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Sample Results

(Continued)

Sample: 23G0895-03: EW-94

Sampled: 07/19/23 9:35 by Client

3G21083-03RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		**Instr:** GC09				
Batch ID: W3G2112 **Preparation:** _NONE (SVOC)		**Prepared:** 07/31/23 12:00				**Analyst:** alf
Acetic acid	**4300**	1000	mg/l	100	07/31/23	A-01, M-05
Butyric acid	**2200**	1000	mg/l	100	07/31/23	M-05
Heptanoic acid	ND	1000	mg/l	100	07/31/23	M-05
Hexanoic acid	ND	1000	mg/l	100	07/31/23	M-05
Isobutyric acid	ND	1000	mg/l	100	07/31/23	M-05
Isocaproic acid	ND	1000	mg/l	100	07/31/23	M-05
Isovaleric acid	ND	1000	mg/l	100	07/31/23	M-05
Propionic acid	**2100**	1000	mg/l	100	07/31/23	M-05
Valeric acid	ND	1000	mg/l	100	07/31/23	M-05

Sample Results

(Continued)

Sample: 23G0895-04: EW-57

Sampled: 07/19/23 10:00 by Client

3G21083-04RE1 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		**Instr:** GC09				
Batch ID: W3G2112 **Preparation:** _NONE (SVOC)		**Prepared:** 07/31/23 12:00				**Analyst:** alf
Acetic acid	**6100**	1000	mg/l	100	07/31/23	A-01, M-05
Butyric acid	**2800**	1000	mg/l	100	07/31/23	M-05
Heptanoic acid	ND	1000	mg/l	100	07/31/23	M-05
Hexanoic acid	ND	1000	mg/l	100	07/31/23	M-05
Isobutyric acid	ND	1000	mg/l	100	07/31/23	M-05
Isocaproic acid	**1200**	1000	mg/l	100	07/31/23	M-05
Isovaleric acid	ND	1000	mg/l	100	07/31/23	M-05
Propionic acid	**3100**	1000	mg/l	100	07/31/23	M-05
Valeric acid	ND	1000	mg/l	100	07/31/23	M-05

Enthalpy Analytical - Richmond VA
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Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Quality Control Results

Alcohols by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M										
Blank (W3G2112-BLK1)				**Prepared: 07/27/23 Analyzed: 07/28/23**						
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							
Blank (W3G2112-BLK2)				**Prepared & Analyzed: 07/31/23**						
Acetic acid	ND	10	mg/l							QC-2
Butyric acid	ND	10	mg/l							QC-2
Heptanoic acid	ND	10	mg/l							QC-2
Hexanoic acid	ND	10	mg/l							QC-2
Isobutyric acid	ND	10	mg/l							QC-2
Isocaproic acid	ND	10	mg/l							QC-2
Isovaleric acid	ND	10	mg/l							QC-2
Propionic acid	ND	10	mg/l							QC-2
Valeric acid	ND	10	mg/l							QC-2
LCS (W3G2112-BS1)				**Prepared: 07/27/23 Analyzed: 07/28/23**						
Acetic acid	51.2	10	mg/l	50.0		102	50-150			
Butyric acid	54.5	10	mg/l	50.0		109	50-150			
Heptanoic acid	58.1	10	mg/l	50.0		116	50-150			
Hexanoic acid	62.8	10	mg/l	50.0		126	50-150			
Isobutyric acid	64.7	10	mg/l	50.0		129	50-150			
Isocaproic acid	64.9	10	mg/l	50.0		130	50-150			
Isovaleric acid	55.0	10	mg/l	50.0		110	50-150			
Propionic acid	53.5	10	mg/l	50.0		107	50-150			
Valeric acid	64.9	10	mg/l	50.0		130	50-150			
LCS (W3G2112-BS6)				**Prepared & Analyzed: 07/31/23**						
Acetic acid	46.7	10	mg/l	50.0		93	50-150			QC-2
Butyric acid	53.6	10	mg/l	50.0		107	50-150			QC-2
Heptanoic acid	60.2	10	mg/l	50.0		120	50-150			QC-2
Hexanoic acid	63.0	10	mg/l	50.0		126	50-150			QC-2
Isobutyric acid	63.8	10	mg/l	50.0		128	50-150			QC-2
Isocaproic acid	65.8	10	mg/l	50.0		132	50-150			QC-2
Isovaleric acid	55.5	10	mg/l	50.0		111	50-150			QC-2
Propionic acid	52.6	10	mg/l	50.0		105	50-150			QC-2
Valeric acid	65.0	10	mg/l	50.0		130	50-150			QC-2

Enthalpy Analytical - Richmond VA
1941 Reymet Road
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Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Quality Control Results

(Continued)

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M (Continued)										
LCS (W3G2112-BS6)				**Prepared & Analyzed: 07/31/23**						
Matrix Spike (W3G2112-MS1)	**Source: 3G21083-02**			**Prepared: 07/27/23 Analyzed: 07/29/23**						
Acetic acid	1160	200	mg/l	1000	ND	116	50-150			M-05
Butyric acid	1110	200	mg/l	1000	ND	111	50-150			M-05
Heptanoic acid	1270	200	mg/l	1000	ND	127	50-150			M-05
Hexanoic acid	1260	200	mg/l	1000	ND	126	50-150			M-05
Isobutyric acid	1290	200	mg/l	1000	ND	129	50-150			M-05
Isocaproic acid	1360	200	mg/l	1000	ND	136	50-150			M-05
Isovaleric acid	1120	200	mg/l	1000	ND	112	50-150			M-05
Propionic acid	1150	200	mg/l	1000	ND	115	50-150			M-05
Valeric acid	1330	200	mg/l	1000	ND	133	50-150			M-05
Matrix Spike (W3G2112-MS2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Acetic acid	11900	1000	mg/l	5000	5950	119	50-150			M-05
Butyric acid	8280	1000	mg/l	5000	2480	116	50-150			M-05
Heptanoic acid	7920	1000	mg/l	5000	ND	158	50-150			M-05, MS-01
Hexanoic acid	8020	1000	mg/l	5000	ND	160	50-150			M-05, MS-01
Isobutyric acid	7990	1000	mg/l	5000	549	149	50-150			M-05
Isocaproic acid	9040	1000	mg/l	5000	1080	159	50-150			M-05, MS-01
Isovaleric acid	7390	1000	mg/l	5000	971	128	50-150			M-05
Propionic acid	8350	1000	mg/l	5000	2890	109	50-150			M-05
Valeric acid	8110	1000	mg/l	5000	ND	162	50-150			M-05, MS-01
Matrix Spike Dup (W3G2112-MSD1)	**Source: 3G21083-02**			**Prepared: 07/27/23 Analyzed: 07/29/23**						
Acetic acid	1130	200	mg/l	1000	ND	113	50-150	2	25	M-05
Butyric acid	1080	200	mg/l	1000	ND	108	50-150	3	25	M-05
Heptanoic acid	1290	200	mg/l	1000	ND	129	50-150	2	25	M-05
Hexanoic acid	1210	200	mg/l	1000	ND	121	50-150	4	25	M-05
Isobutyric acid	1230	200	mg/l	1000	ND	123	50-150	5	25	M-05
Isocaproic acid	1390	200	mg/l	1000	ND	139	50-150	2	25	M-05
Isovaleric acid	1130	200	mg/l	1000	ND	113	50-150	0.9	25	M-05
Propionic acid	1120	200	mg/l	1000	ND	112	50-150	3	25	M-05
Valeric acid	1290	200	mg/l	1000	ND	129	50-150	3	25	M-05
Matrix Spike Dup (W3G2112-MSD2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Acetic acid	12400	1000	mg/l	5000	5950	128	50-150	4	25	M-05
Butyric acid	7760	1000	mg/l	5000	2480	106	50-150	6	25	M-05
Heptanoic acid	6930	1000	mg/l	5000	ND	139	50-150	13	25	M-05
Hexanoic acid	7270	1000	mg/l	5000	ND	145	50-150	10	25	M-05
Isobutyric acid	7330	1000	mg/l	5000	549	136	50-150	9	25	M-05
Isocaproic acid	8140	1000	mg/l	5000	1080	141	50-150	10	25	M-05

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Quality Control Results

(Continued)

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M (Continued)										
Matrix Spike Dup (W3G2112-MSD2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Isovaleric acid	6670	1000	mg/l	5000	971	114	50-150	10	25	M-05
Propionic acid	8300	1000	mg/l	5000	2890	108	50-150	0.7	25	M-05
Valeric acid	7120	1000	mg/l	5000	ND	142	50-150	13	25	M-05

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Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0895

Project Manager: Enthalpy VA

Reported:
08/07/2023 16:52

Notes and Definitions

Item	Definition
A-01	The recovery of this analyte in end CCV is outside acceptance limits due to sample matrix interference. Result might be affected by matrix.
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.
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
QC-2	This QC sample was reanalyzed to complement samples that require re-analysis on different date. See analysis date.
%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.

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ENTHALPY ANALYTICAL

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

Certificate of Analysis

Final Report

Laboratory Order ID 23G0978

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	July 21, 2023 8:00
		Date Issued:	August 4, 2023 14:55
		Project Number:	2023 City of Bristol Landfill Le
Submitted To:	Logan Howard	Purchase Order:	
Client Site I.D.:	City of Bristol LF		

Enclosed are the results of analyses for samples received by the laboratory on 07/21/2023 08:00. 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.

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

Analysis Detects Report

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

Date Issued: 8/4/2023 2:55:00PM

Laboratory Sample ID: **23G0978-01** **Client Sample ID:** **EW 78**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6020B	240		0.50	1.0	1	ug/L
Barium	01RE1	SW6020B	558		2.00	10.0	2	ug/L
Cadmium	01	SW6020B	0.186	J	0.100	1.00	1	ug/L
Chromium	01	SW6020B	231		0.400	1.00	1	ug/L
Copper	01	SW6020B	8.11		0.300	1.00	1	ug/L
Lead	01	SW6020B	9.2		1.0	1.0	1	ug/L
Nickel	01	SW6020B	157.6		1.000	1.000	1	ug/L
Selenium	01	SW6020B	1.16		0.850	1.00	1	ug/L
Zinc	01	SW6020B	71.4		2.50	5.00	1	ug/L
2-Butanone (MEK)	01	SW8260D	682		60.0	200	20	ug/L
Acetone	01	SW8260D	1180		140	200	20	ug/L
Benzene	01	SW8260D	80.8		8.00	20.0	20	ug/L
Ethylbenzene	01	SW8260D	82.0		8.00	20.0	20	ug/L
Tetrahydrofuran	01	SW8260D	616		200	200	20	ug/L
Toluene	01	SW8260D	107		10.0	20.0	20	ug/L
Xylenes, Total	01	SW8260D	74.4		20.0	60.0	20	ug/L
Ammonia as N	01	EPA350.1 R2.0	1180		73.1	100	1000	mg/L
BOD	01	SM5210B-2016	330		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	2460		1000	1000	100	mg/L
Nitrate as N	01	Calc.	0.355		0.150	0.350	1	mg/L
Nitrate+Nitrite as N	01RE1	SM4500-NO3F-2016	0.36		0.10	0.10	1	mg/L
TKN as N	01	EPA351.2 R2.0	1670		40.0	100	200	mg/L
Total Recoverable Phenolics	01	SW9065	0.700		0.150	0.250	1	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".

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Date Issued: 8/4/2023 2:55:00PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW 78	23G0978-01	Ground Water	07/19/2023 14:55	07/21/2023 08:00

Analysis for Volatile Fatty Acids was subcontracted to Weck. The subcontracted results are attached at the end of this Certificate of Analysis.

Enthalpy Analytical
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Richmond, Virginia 23237
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Date Issued: 8/4/2023 2:55:00PM

Client Sample ID: **EW 78** **Laboratory Sample ID:** **23G0978-01**

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	01	7440-22-4	SW6020B	07/24/2023 10:30	07/25/2023 12:59	BLOD		0.0600	1.00	1	ug/L	AB
Arsenic	01	7440-38-2	SW6020B	07/24/2023 10:30	07/25/2023 12:59	240		0.50	1.0	1	ug/L	AB
Barium	01RE1	7440-39-3	SW6020B	07/24/2023 10:30	07/25/2023 13:52	558		2.00	10.0	2	ug/L	AB
Cadmium	01	7440-43-9	SW6020B	07/24/2023 10:30	07/25/2023 12:59	0.186	J	0.100	1.00	1	ug/L	AB
Chromium	01	7440-47-3	SW6020B	07/24/2023 10:30	07/25/2023 12:59	231		0.400	1.00	1	ug/L	AB
Copper	01	7440-50-8	SW6020B	07/24/2023 10:30	07/25/2023 12:59	8.11		0.300	1.00	1	ug/L	AB
Mercury	01	7439-97-6	SW6020B	07/24/2023 10:30	07/25/2023 12:59	BLOD		0.200	0.200	1	ug/L	AB
Nickel	01	7440-02-0	SW6020B	07/24/2023 10:30	07/25/2023 12:59	157.6		1.000	1.000	1	ug/L	AB
Lead	01	7439-92-1	SW6020B	07/24/2023 10:30	07/25/2023 12:59	9.2		1.0	1.0	1	ug/L	AB
Selenium	01	7782-49-2	SW6020B	07/24/2023 10:30	07/25/2023 12:59	1.16		0.850	1.00	1	ug/L	AB
Zinc	01	7440-66-6	SW6020B	07/24/2023 10:30	07/25/2023 12:59	71.4		2.50	5.00	1	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	07/21/2023 19:59	07/21/2023 19:59	682		60.0	200	20	ug/L	RJB
Acetone	01	67-64-1	SW8260D	07/21/2023 19:59	07/21/2023 19:59	1180		140	200	20	ug/L	RJB
Benzene	01	71-43-2	SW8260D	07/21/2023 19:59	07/21/2023 19:59	80.8		8.00	20.0	20	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	07/21/2023 19:59	07/21/2023 19:59	82.0		8.00	20.0	20	ug/L	RJB
Toluene	01	108-88-3	SW8260D	07/21/2023 19:59	07/21/2023 19:59	107		10.0	20.0	20	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	07/21/2023 19:59	07/21/2023 19:59	74.4		20.0	60.0	20	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	07/21/2023 19:59	07/21/2023 19:59	616		200	200	20	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*94.8 %*	*70-120*	*07/21/2023 19:59*	*07/21/2023 19:59*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*99.9 %*	*75-120*	*07/21/2023 19:59*	*07/21/2023 19:59*							
Surr: Dibromofluoromethane (Surr)	*01*	*94.8 %*	*70-130*	*07/21/2023 19:59*	*07/21/2023 19:59*							
Surr: Toluene-d8 (Surr)	*01*	*97.6 %*	*70-130*	*07/21/2023 19:59*	*07/21/2023 19:59*							

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/4/2023 2:55:00PM
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Client Sample ID: **EW 78** **Laboratory Sample ID:** **23G0978-01**

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	01	120-12-7	SW8270E	07/24/2023 09:15	07/24/2023 15:34	BLOD		250	500	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*138 %*	*5-136*	*07/24/2023 09:15*	*07/24/2023 15:34*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*	*41.0 %*	*9-117*	*07/24/2023 09:15*	*07/24/2023 15:34*							
Surr: 2-Fluorophenol (Surr)	*01*	*%*	*5-60*	*07/24/2023 09:15*	*07/24/2023 15:34*							*DS*
Surr: Nitrobenzene-d5 (Surr)	*01*	*55.5 %*	*5-151*	*07/24/2023 09:15*	*07/24/2023 15:34*							
Surr: Phenol-d5 (Surr)	*01*	*%*	*5-60*	*07/24/2023 09:15*	*07/24/2023 15:34*							*DS*
Surr: p-Terphenyl-d14 (Surr)	*01*	*11.0 %*	*5-141*	*07/24/2023 09:15*	*07/24/2023 15:34*							

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Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Ammonia as N	01	7664-41-7	EPA350.1 R2.0	07/28/2023 12:57	07/28/2023 12:57	1180		73.1	100	1000	mg/L	SPH
BOD	01	E1640606	SM5210B-2016	07/21/2023 11:32	07/21/2023 11:32	330		0.2	2.0	1	mg/L	MJRL
COD	01	NA	SM5220D-2011	07/27/2023 14:28	07/27/2023 14:28	2460		1000	1000	100	mg/L	LTN
Nitrate as N	01	14797-55-8	Calc.	07/31/2023 13:35	07/31/2023 13:35	0.355		0.150	0.350	1	mg/L	MGC
Nitrate+Nitrite as N	01RE1	E701177	SM4500-NO3F-2016	07/31/2023 13:35	07/31/2023 13:35	0.36		0.10	0.10	1	mg/L	MGC
Nitrite as N	01	14797-65-0	SM4500-NO2B-2011	07/21/2023 08:40	07/21/2023 08:40	BLOD		0.05	0.25	1	mg/L	MGC
Total Recoverable Phenolics	01	NA	SW9065	08/02/2023 13:40	08/02/2023 13:40	0.700		0.150	0.250	1	mg/L	AAL
TKN as N	01	E17148461	EPA351.2 R2.0	07/24/2023 16:56	07/24/2023 16:56	1670		40.0	100	200	mg/L	SPH

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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 BGG0789 - EPA200.8 R5.4										
Blank (BGG0789-BLK1)				Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	ND	0.200	ug/L							
Arsenic	ND	1.0	ug/L							
Barium	ND	5.00	ug/L							
Cadmium	ND	1.00	ug/L							
Chromium	ND	1.00	ug/L							
Copper	ND	1.00	ug/L							
Lead	ND	1.0	ug/L							
Nickel	ND	1.000	ug/L							
Selenium	ND	1.00	ug/L							
Silver	ND	1.00	ug/L							
Zinc	ND	5.00	ug/L							
LCS (BGG0789-BS1)				Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	1.00	0.200	ug/L	1.00		100	85-115			
Arsenic	51	1.0	ug/L	50.0		101	80-120			
Barium	51.3	5.00	ug/L	50.0		103	80-120			
Cadmium	51.9	1.00	ug/L	50.0		104	80-120			
Chromium	51.8	1.00	ug/L	50.0		104	80-120			
Copper	50.3	1.00	ug/L	50.0		101	80-120			
Lead	54	1.0	ug/L	50.0		107	80-120			
Nickel	50.89	1.000	ug/L	50.0		102	80-120			
Selenium	49.3	1.00	ug/L	50.0		98.6	80-120			
Silver	9.59	1.00	ug/L	10.0		95.9	80-120			
Zinc	52.3	5.00	ug/L	50.0		105	80-120			
Matrix Spike (BGG0789-MS1)	**Source: 23G0990-01**			Prepared: 07/24/2023 Analyzed: 07/25/2023						

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0789 - EPA200.8 R5.4										
Matrix Spike (BGG0789-MS1)	**Source: 23G0990-01**			Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	1.15	0.200	ug/L	1.00	BLOD	115	70-130			
Arsenic	91	1.0	ug/L	50.0	43	95.5	75-125			
Barium	393	5.00	ug/L	50.0	339	108	75-125			E
Cadmium	49.3	1.00	ug/L	50.0	BLOD	98.7	75-125			
Chromium	54.3	1.00	ug/L	50.0	3.55	102	75-125			
Copper	54.1	1.00	ug/L	50.0	7.67	92.8	75-125			
Lead	53	1.0	ug/L	50.0	4.3	96.7	75-125			
Nickel	63.62	1.000	ug/L	50.0	15.98	95.3	75-125			
Selenium	39.9	1.00	ug/L	50.0	BLOD	79.9	75-125			
Silver	9.23	1.00	ug/L	10.0	BLOD	92.3	75-125			
Zinc	74.5	5.00	ug/L	50.0	30.1	88.7	75-125			
Matrix Spike (BGG0789-MS2)	**Source: 23G0990-04**			Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	0.984	0.200	ug/L	1.00	BLOD	98.4	70-130			
Arsenic	160	1.0	ug/L	50.0	110	103	75-125			
Cadmium	47.9	1.00	ug/L	50.0	BLOD	95.7	75-125			
Chromium	95.2	1.00	ug/L	50.0	41.5	107	75-125			
Copper	101	1.00	ug/L	50.0	51.4	98.8	75-125			
Lead	48	1.0	ug/L	50.0	BLOD	97.0	75-125			
Nickel	56.32	1.000	ug/L	50.0	8.063	96.5	75-125			
Selenium	40.0	1.00	ug/L	50.0	BLOD	79.9	75-125			
Silver	9.09	1.00	ug/L	10.0	BLOD	90.9	75-125			
Zinc	129	5.00	ug/L	50.0	85.2	87.0	75-125			
Matrix Spike Dup (BGG0789-MSD1)	**Source: 23G0990-01**			Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	1.18	0.200	ug/L	1.00	BLOD	118	70-130	2.52	20	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0789 - EPA200.8 R5.4										
Matrix Spike Dup (BGG0789-MSD1)	**Source: 23G0990-01**			Prepared: 07/24/2023 Analyzed: 07/25/2023						
Arsenic	90	1.0	ug/L	50.0	43	94.2	75-125	0.731	20	
Barium	397	5.00	ug/L	50.0	339	116	75-125	1.02	20	E
Cadmium	49.3	1.00	ug/L	50.0	BLOD	98.7	75-125	0.00170	20	
Chromium	54.5	1.00	ug/L	50.0	3.55	102	75-125	0.229	20	
Copper	54.4	1.00	ug/L	50.0	7.67	93.4	75-125	0.539	20	
Lead	53	1.0	ug/L	50.0	4.3	97.7	75-125	0.861	20	
Nickel	64.09	1.000	ug/L	50.0	15.98	96.2	75-125	0.743	20	
Selenium	39.1	1.00	ug/L	50.0	BLOD	78.2	75-125	2.14	20	
Silver	9.33	1.00	ug/L	10.0	BLOD	93.3	75-125	1.04	20	
Zinc	74.3	5.00	ug/L	50.0	30.1	88.3	75-125	0.231	20	
Matrix Spike Dup (BGG0789-MSD2)	**Source: 23G0990-04**			Prepared: 07/24/2023 Analyzed: 07/25/2023						
Mercury	1.04	0.200	ug/L	1.00	BLOD	104	70-130	5.09	20	
Arsenic	160	1.0	ug/L	50.0	110	102	75-125	0.301	20	
Cadmium	47.8	1.00	ug/L	50.0	BLOD	95.5	75-125	0.195	20	
Chromium	94.9	1.00	ug/L	50.0	41.5	107	75-125	0.366	20	
Copper	97.8	1.00	ug/L	50.0	51.4	92.8	75-125	3.00	20	
Lead	48	1.0	ug/L	50.0	BLOD	96.5	75-125	0.500	20	
Nickel	55.56	1.000	ug/L	50.0	8.063	95.0	75-125	1.36	20	
Selenium	39.2	1.00	ug/L	50.0	BLOD	78.4	75-125	1.95	20	
Silver	9.02	1.00	ug/L	10.0	BLOD	90.2	75-125	0.730	20	
Zinc	128	5.00	ug/L	50.0	85.2	86.3	75-125	0.267	20	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Blank (BGG0755-BLK1)				Prepared & Analyzed: 07/21/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.8*		ug/L	*50.0*		*97.5*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.2*		ug/L	*50.0*		*98.4*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.8*		ug/L	*50.0*		*97.7*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.2*		ug/L	*50.0*		*98.4*	*70-130*			
LCS (BGG0755-BS1)				Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	53.2	0.4	ug/L	50.0		106	80-130			
1,1,1-Trichloroethane	51.2	1	ug/L	50.0		102	65-130			
1,1,2,2-Tetrachloroethane	45.8	0.4	ug/L	50.0		91.6	65-130			
1,1,2-Trichloroethane	48.7	1	ug/L	50.0		97.3	75-125			
1,1-Dichloroethane	45.3	1	ug/L	50.0		90.7	70-135			
1,1-Dichloroethylene	66.9	1	ug/L	50.0		134	70-130			L
1,1-Dichloropropene	46.5	1	ug/L	50.0		93.0	75-135			
1,2,3-Trichlorobenzene	54.1	1	ug/L	50.0		108	55-140			
1,2,3-Trichloropropane	47.1	1	ug/L	50.0		94.2	75-125			
1,2,4-Trichlorobenzene	55.7	1	ug/L	50.0		111	65-135			
1,2,4-Trimethylbenzene	54.2	1	ug/L	50.0		108	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	55.6	1	ug/L	50.0		111	50-130			
1,2-Dibromoethane (EDB)	49.0	1	ug/L	50.0		98.0	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
LCS (BGG0755-BS1)				Prepared & Analyzed: 07/21/2023						
1,2-Dichlorobenzene	52.2	0.5	ug/L	50.0		104	70-120			
1,2-Dichloroethane	47.2	1	ug/L	50.0		94.5	70-130			
1,2-Dichloropropane	45.7	0.5	ug/L	50.0		91.4	75-125			
1,3,5-Trimethylbenzene	51.9	1	ug/L	50.0		104	75-125			
1,3-Dichlorobenzene	52.7	1	ug/L	50.0		105	75-125			
1,3-Dichloropropane	45.7	1	ug/L	50.0		91.4	75-125			
1,4-Dichlorobenzene	50.6	1	ug/L	50.0		101	75-125			
2,2-Dichloropropane	53.8	1	ug/L	50.0		108	70-135			
2-Butanone (MEK)	42.4	10	ug/L	50.0		84.9	30-150			
2-Chlorotoluene	51.6	1	ug/L	50.0		103	75-125			
2-Hexanone (MBK)	42.5	5	ug/L	50.0		85.0	55-130			
4-Chlorotoluene	52.5	1	ug/L	50.0		105	75-130			
4-Isopropyltoluene	55.8	1	ug/L	50.0		112	75-130			
4-Methyl-2-pentanone (MIBK)	41.8	5	ug/L	50.0		83.5	60-135			
Acetone	50.6	10	ug/L	50.0		101	40-140			
Benzene	45.7	1	ug/L	50.0		91.4	80-120			
Bromobenzene	51.8	1	ug/L	50.0		104	75-125			
Bromochloromethane	46.0	1	ug/L	50.0		92.1	65-130			
Bromodichloromethane	52.3	0.5	ug/L	50.0		105	75-120			
Bromoform	56.4	1	ug/L	50.0		113	70-130			
Bromomethane	53.7	1	ug/L	50.0		107	30-145			
Carbon disulfide	77.2	10	ug/L	50.0		154	35-160			
Carbon tetrachloride	54.3	1	ug/L	50.0		109	65-140			
Chlorobenzene	49.6	1	ug/L	50.0		99.2	80-120			
Chloroethane	63.7	1	ug/L	50.0		127	60-135			

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Volatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
LCS (BGG0755-BS1)				Prepared & Analyzed: 07/21/2023						
Chloroform	45.5	0.5	ug/L	50.0		91.1	65-135			
Chloromethane	32.2	1	ug/L	50.0		64.3	40-125			
cis-1,2-Dichloroethylene	45.0	1	ug/L	50.0		90.1	70-125			
cis-1,3-Dichloropropene	50.2	1	ug/L	50.0		100	70-130			
Dibromochloromethane	54.3	0.5	ug/L	50.0		109	60-135			
Dibromomethane	48.5	1	ug/L	50.0		97.0	75-125			
Dichlorodifluoromethane	43.7	1	ug/L	50.0		87.5	30-155			
Ethylbenzene	50.1	1	ug/L	50.0		100	75-125			
Hexachlorobutadiene	59.1	0.8	ug/L	50.0		118	50-140			
Isopropylbenzene	50.0	1	ug/L	50.0		100	75-125			
m+p-Xylenes	97.5	2	ug/L	100		97.5	75-130			
Methylene chloride	59.4	4	ug/L	50.0		119	55-140			
Methyl-t-butyl ether (MTBE)	46.1	1	ug/L	50.0		92.3	65-125			
Naphthalene	52.9	1	ug/L	50.0		106	55-140			
n-Butylbenzene	54.3	1	ug/L	50.0		109	70-135			
n-Propylbenzene	52.7	1	ug/L	50.0		105	70-130			
o-Xylene	52.2	1	ug/L	50.0		104	80-120			
sec-Butylbenzene	54.8	1	ug/L	50.0		110	70-125			
Styrene	50.8	1	ug/L	50.0		102	65-135			
tert-Butylbenzene	54.2	1	ug/L	50.0		108	70-130			
Tetrachloroethylene (PCE)	52.7	1	ug/L	50.0		105	45-150			
Toluene	47.5	1	ug/L	50.0		95.0	75-120			
trans-1,2-Dichloroethylene	42.5	1	ug/L	50.0		85.0	60-140			
trans-1,3-Dichloropropene	56.2	1	ug/L	50.0		112	55-140			
Trichloroethylene	48.9	1	ug/L	50.0		97.7	70-125			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
LCS (BGG0755-BS1)				Prepared & Analyzed: 07/21/2023						
Trichlorofluoromethane	67.6	1	ug/L	50.0		135	60-145			
Vinyl chloride	45.8	0.5	ug/L	50.0		91.6	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.9*		ug/L	*50.0*		*93.8*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*48.6*		ug/L	*50.0*		*97.3*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.3*		ug/L	*50.0*		*96.6*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.4*		ug/L	*50.0*		*96.9*	*70-130*			
Duplicate (BGG0755-DUP1)	**Source: 23G0996-01**			Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	0.40	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
1,1-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	0.50	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	1.00	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	0.50	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	1.00	ug/L		BLOD			NA	30	

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Client Name: SCS Engineers-Winchester
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Date Issued: 8/4/2023 2:55:00PM

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 BGG0755 - SW5030B-MS										
Duplicate (BGG0755-DUP1)		**Source: 23G0996-01**		Prepared & Analyzed: 07/21/2023						
1,3-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	4.67	1.00	ug/L		4.83			3.37	30	
2,2-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	10.0	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	5.00	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	5.00	ug/L		BLOD			NA	30	
Acetone	21.2	10.0	ug/L		21.3			0.611	30	
Benzene	7.16	1.00	ug/L		7.38			3.03	30	
Bromobenzene	ND	1.00	ug/L		BLOD			NA	30	
Bromochloromethane	ND	1.00	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	0.50	ug/L		BLOD			NA	30	
Bromoform	ND	1.00	ug/L		BLOD			NA	30	
Bromomethane	ND	1.00	ug/L		BLOD			NA	30	
Carbon disulfide	ND	10.0	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	1.00	ug/L		BLOD			NA	30	
Chlorobenzene	0.77	1.00	ug/L		0.78			NA	30	
Chloroethane	ND	1.00	ug/L		BLOD			NA	30	
Chloroform	ND	0.50	ug/L		BLOD			NA	30	
Chloromethane	ND	1.00	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	0.48	1.00	ug/L		0.43			NA	30	
cis-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Duplicate (BGG0755-DUP1)	**Source: 23G0996-01**			Prepared & Analyzed: 07/21/2023						
Dibromochloromethane	ND	0.50	ug/L		BLOD			NA	30	
Dibromomethane	ND	1.00	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	5.00	ug/L		BLOD			NA	30	
Ethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	0.80	ug/L		BLOD			NA	30	
Iodomethane	ND	10.0	ug/L		BLOD			NA	30	
Isopropylbenzene	1.68	1.00	ug/L		1.76			4.65	30	
m+p-Xylenes	ND	2.00	ug/L		BLOD			NA	30	
Methylene chloride	ND	4.00	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	2.43	1.00	ug/L		3.32			31.0	30	P
Naphthalene	0.85	1.00	ug/L		0.89			NA	30	
n-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
n-Propylbenzene	ND	1.00	ug/L		BLOD			NA	30	
o-Xylene	0.89	1.00	ug/L		0.98			NA	30	
sec-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Styrene	ND	1.00	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	1.00	ug/L		BLOD			NA	30	
Toluene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
Trichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
Trichlorofluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Vinyl acetate	ND	10.0	ug/L		BLOD			NA	30	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Duplicate (BGG0755-DUP1)	**Source: 23G0996-01**			Prepared & Analyzed: 07/21/2023						
Vinyl chloride	ND	0.50	ug/L		BLOD			NA	30	
Xylenes, Total	ND	3.00	ug/L		BLOD			NA	30	
Tetrahydrofuran	24.1	10.0	ug/L		27.9			14.5	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*47.9*		ug/L	*50.0*		*95.8*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.8*		ug/L	*50.0*		*99.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.0*		ug/L	*50.0*		*98.0*	*70-130*			
Surr: Toluene-d8 (Surr)	*47.6*		ug/L	*50.0*		*95.2*	*70-130*			
Matrix Spike (BGG0755-MS1)	**Source: 23G0997-01**			Prepared & Analyzed: 07/21/2023						
1,1,1,2-Tetrachloroethane	52.1	0.4	ug/L	50.0	BLOD	104	80-130			
1,1,1-Trichloroethane	49.6	1	ug/L	50.0	BLOD	99.3	65-130			
1,1,2,2-Tetrachloroethane	46.2	0.4	ug/L	50.0	BLOD	92.3	65-130			
1,1,2-Trichloroethane	47.8	1	ug/L	50.0	BLOD	95.6	75-125			
1,1-Dichloroethane	44.5	1	ug/L	50.0	BLOD	88.9	70-135			
1,1-Dichloroethylene	63.3	1	ug/L	50.0	BLOD	127	50-145			
1,1-Dichloropropene	45.6	1	ug/L	50.0	BLOD	91.2	75-135			
1,2,3-Trichlorobenzene	53.6	1	ug/L	50.0	BLOD	107	55-140			
1,2,3-Trichloropropane	46.4	1	ug/L	50.0	BLOD	92.8	75-125			
1,2,4-Trichlorobenzene	52.9	1	ug/L	50.0	BLOD	106	65-135			
1,2,4-Trimethylbenzene	51.6	1	ug/L	50.0	BLOD	103	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	53.6	1	ug/L	50.0	BLOD	107	50-130			
1,2-Dibromoethane (EDB)	49.0	1	ug/L	50.0	BLOD	97.9	80-120			
1,2-Dichlorobenzene	50.6	0.5	ug/L	50.0	BLOD	101	70-120			
1,2-Dichloroethane	46.1	1	ug/L	50.0	BLOD	92.3	70-130			
1,2-Dichloropropane	45.6	0.5	ug/L	50.0	BLOD	91.3	75-125			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Matrix Spike (BGG0755-MS1)	**Source: 23G0997-01**			Prepared & Analyzed: 07/21/2023						
1,3,5-Trimethylbenzene	50.5	1	ug/L	50.0	BLOD	101	75-124			
1,3-Dichlorobenzene	51.9	1	ug/L	50.0	BLOD	104	75-125			
1,3-Dichloropropane	46.0	1	ug/L	50.0	BLOD	91.9	75-125			
1,4-Dichlorobenzene	50.5	1	ug/L	50.0	2.28	96.5	75-125			
2,2-Dichloropropane	52.5	1	ug/L	50.0	BLOD	105	70-135			
2-Butanone (MEK)	39.5	10	ug/L	50.0	BLOD	79.0	30-150			
2-Chlorotoluene	50.2	1	ug/L	50.0	BLOD	100	75-125			
2-Hexanone (MBK)	43.3	5	ug/L	50.0	BLOD	86.6	55-130			
4-Chlorotoluene	50.1	1	ug/L	50.0	BLOD	100	75-130			
4-Isopropyltoluene	52.8	1	ug/L	50.0	BLOD	106	75-130			
4-Methyl-2-pentanone (MIBK)	42.3	5	ug/L	50.0	BLOD	84.6	60-135			
Acetone	64.6	10	ug/L	50.0	BLOD	129	40-140			
Benzene	48.4	1	ug/L	50.0	3.95	88.9	80-120			
Bromobenzene	51.1	1	ug/L	50.0	BLOD	102	75-125			
Bromochloromethane	45.6	1	ug/L	50.0	BLOD	91.2	65-130			
Bromodichloromethane	52.7	0.5	ug/L	50.0	BLOD	105	75-136			
Bromoform	55.2	1	ug/L	50.0	BLOD	110	70-130			
Bromomethane	48.8	1	ug/L	50.0	BLOD	97.6	30-145			
Carbon disulfide	66.1	10	ug/L	50.0	BLOD	132	35-160			
Carbon tetrachloride	53.5	1	ug/L	50.0	BLOD	107	65-140			
Chlorobenzene	49.1	1	ug/L	50.0	0.66	96.9	80-120			
Chloroethane	59.0	1	ug/L	50.0	BLOD	117	60-135			
Chloroform	44.1	0.5	ug/L	50.0	BLOD	88.1	65-135			
Chloromethane	30.9	1	ug/L	50.0	BLOD	61.8	40-125			
cis-1,2-Dichloroethylene	45.7	1	ug/L	50.0	3.11	85.2	70-125			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Matrix Spike (BGG0755-MS1)	**Source: 23G0997-01**			Prepared & Analyzed: 07/21/2023						
cis-1,3-Dichloropropene	50.0	1	ug/L	50.0	BLOD	100	47-136			
Dibromochloromethane	54.6	0.5	ug/L	50.0	BLOD	109	60-135			
Dibromomethane	47.2	1	ug/L	50.0	BLOD	94.5	75-125			
Dichlorodifluoromethane	40.6	1	ug/L	50.0	BLOD	81.2	30-155			
Ethylbenzene	49.6	1	ug/L	50.0	BLOD	99.2	75-125			
Hexachlorobutadiene	63.6	0.8	ug/L	50.0	BLOD	127	50-140			
Isopropylbenzene	48.7	1	ug/L	50.0	BLOD	97.4	75-125			
m+p-Xylenes	96.6	2	ug/L	100	BLOD	96.6	75-130			
Methylene chloride	63.4	4	ug/L	50.0	BLOD	127	55-140			
Methyl-t-butyl ether (MTBE)	46.3	1	ug/L	50.0	BLOD	92.5	65-125			
Naphthalene	51.3	1	ug/L	50.0	BLOD	103	55-140			
n-Butylbenzene	52.0	1	ug/L	50.0	BLOD	104	70-135			
n-Propylbenzene	51.7	1	ug/L	50.0	BLOD	103	70-130			
o-Xylene	51.7	1	ug/L	50.0	BLOD	103	80-120			
sec-Butylbenzene	53.1	1	ug/L	50.0	BLOD	106	70-125			
Styrene	50.3	1	ug/L	50.0	BLOD	101	65-135			
tert-Butylbenzene	51.7	1	ug/L	50.0	BLOD	103	70-130			
Tetrachloroethylene (PCE)	52.0	1	ug/L	50.0	BLOD	104	51-231			
Toluene	47.0	1	ug/L	50.0	BLOD	94.0	75-120			
trans-1,2-Dichloroethylene	43.4	1	ug/L	50.0	BLOD	85.9	60-140			
trans-1,3-Dichloropropene	56.5	1	ug/L	50.0	BLOD	113	55-140			
Trichloroethylene	48.1	1	ug/L	50.0	BLOD	96.3	70-125			
Trichlorofluoromethane	70.2	1	ug/L	50.0	BLOD	140	60-145			
Vinyl chloride	44.3	0.5	ug/L	50.0	3.40	81.9	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*47.3*		ug/L	*50.0*		*94.6*	*70-120*			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0755 - SW5030B-MS										
Matrix Spike (BGG0755-MS1)	**Source: 23G0997-01**			Prepared & Analyzed: 07/21/2023						
Surr: 4-Bromofluorobenzene (Surr)	*50.3*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.5*		ug/L	*50.0*		*96.9*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.4*		ug/L	*50.0*		*96.9*	*70-130*			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0786 - SW3510C/EPA600-MS										
Blank (BGG0786-BLK1)				Prepared & Analyzed: 07/24/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*79.6*		ug/L	*100*		*79.6*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*45.1*		ug/L	*50.0*		*90.2*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*51.8*		ug/L	*100*		*51.8*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*49.2*		ug/L	*50.0*		*98.4*	*5-151*			
Surr: Phenol-d5 (Surr)	*41.2*		ug/L	*100*		*41.2*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*28.9*		ug/L	*50.0*		*57.9*	*5-141*			
LCS (BGG0786-BS1)				Prepared & Analyzed: 07/24/2023						
1,2,4-Trichlorobenzene	32.4	10.0	ug/L	50.0		64.7	57-130			
1,2-Dichlorobenzene	32.3	10.0	ug/L	50.0		64.7	22-115			
1,3-Dichlorobenzene	28.4	10.0	ug/L	50.0		56.9	22-112			
1,4-Dichlorobenzene	31.6	10.0	ug/L	50.0		63.2	13-112			
2,4,6-Trichlorophenol	41.4	10.0	ug/L	50.0		82.9	52-129			
2,4-Dichlorophenol	42.1	10.0	ug/L	50.0		84.1	53-122			
2,4-Dimethylphenol	43.4	5.00	ug/L	50.0		86.8	42-120			
2,4-Dinitrophenol	20.1	50.0	ug/L	50.0		40.2	48-127			L
2,4-Dinitrotoluene	49.0	10.0	ug/L	50.0		98.0	10-173			
2,6-Dinitrotoluene	52.2	10.0	ug/L	50.0		104	68-137			
2-Chloronaphthalene	41.8	10.0	ug/L	50.0		83.7	65-120			
2-Chlorophenol	40.0	10.0	ug/L	50.0		79.9	36-120			
2-Nitrophenol	43.1	10.0	ug/L	50.0		86.1	45-167			
3,3'-Dichlorobenzidine	39.6	10.0	ug/L	50.0		79.3	10-213			
4,6-Dinitro-2-methylphenol	46.8	50.0	ug/L	50.0		93.5	53-130			
4-Bromophenyl phenyl ether	47.0	10.0	ug/L	50.0		94.1	65-120			

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Batch BGG0786 - SW3510C/EPA600-MS										
LCS (BGG0786-BS1)				Prepared & Analyzed: 07/24/2023						
4-Chlorophenyl phenyl ether	42.1	10.0	ug/L	50.0		84.1	38-145			
4-Nitrophenol	20.8	50.0	ug/L	50.0		41.6	13-129			
Acenaphthene	47.9	10.0	ug/L	50.0		95.8	60-132			
Acenaphthylene	48.0	10.0	ug/L	50.0		95.9	54-126			
Acetophenone	48.1	20.0	ug/L	50.0		96.2	0-200			
Anthracene	48.4	10.0	ug/L	50.0		96.7	43-120			
Benzo (a) anthracene	49.7	10.0	ug/L	50.0		99.3	42-133			
Benzo (a) pyrene	50.8	10.0	ug/L	50.0		102	32-148			
Benzo (b) fluoranthene	54.0	10.0	ug/L	50.0		108	42-140			
Benzo (g,h,i) perylene	48.9	10.0	ug/L	50.0		97.9	10-195			
Benzo (k) fluoranthene	42.8	10.0	ug/L	50.0		85.7	25-146			
bis (2-Chloroethoxy) methane	42.3	10.0	ug/L	50.0		84.7	49-165			
bis (2-Chloroethyl) ether	36.2	10.0	ug/L	50.0		72.5	43-126			
2,2'-Oxybis (1-chloropropane)	37.7	10.0	ug/L	50.0		75.3	63-139			
bis (2-Ethylhexyl) phthalate	57.8	10.0	ug/L	50.0		116	29-137			
Butyl benzyl phthalate	58.5	10.0	ug/L	50.0		117	10-140			
Chrysene	48.2	10.0	ug/L	50.0		96.4	44-140			
Dibenz (a,h) anthracene	54.1	10.0	ug/L	50.0		108	10-200			
Diethyl phthalate	59.1	10.0	ug/L	50.0		118	10-120			
Dimethyl phthalate	47.9	10.0	ug/L	50.0		95.8	10-120			
Di-n-butyl phthalate	57.9	10.0	ug/L	50.0		116	10-120			
Di-n-octyl phthalate	53.9	10.0	ug/L	50.0		108	19-132			
Fluoranthene	52.7	10.0	ug/L	50.0		105	43-121			
Fluorene	49.1	10.0	ug/L	50.0		98.2	70-120			
Hexachlorobenzene	31.8	1.00	ug/L	50.0		63.6	10-142			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0786 - SW3510C/EPA600-MS										
LCS (BGG0786-BS1)				Prepared & Analyzed: 07/24/2023						
Hexachlorobutadiene	37.0	10.0	ug/L	50.0		74.0	38-120			
Hexachlorocyclopentadiene	15.5	10.0	ug/L	50.0		30.9	10-76			
Hexachloroethane	32.1	10.0	ug/L	50.0		64.3	55-120			
Indeno (1,2,3-cd) pyrene	52.8	10.0	ug/L	50.0		106	10-151			
Isophorone	33.8	10.0	ug/L	50.0		67.6	47-180			
Naphthalene	37.5	5.00	ug/L	50.0		74.9	36-120			
Nitrobenzene	45.6	10.0	ug/L	50.0		91.1	54-158			
n-Nitrosodimethylamine	21.3	10.0	ug/L	50.0		42.6	10-85			
n-Nitrosodi-n-propylamine	46.1	10.0	ug/L	50.0		92.2	14-198			
n-Nitrosodiphenylamine	40.8	10.0	ug/L	50.0		81.6	12-97			
p-Chloro-m-cresol	43.1	10.0	ug/L	50.0		86.2	10-142			
Pentachlorophenol	31.6	20.0	ug/L	50.0		63.2	38-152			
Phenanthrene	61.6	10.0	ug/L	50.0		123	65-120			L
Phenol	17.9	10.0	ug/L	50.5		35.5	17-120			
Pyrene	50.6	10.0	ug/L	50.0		101	70-120			
Pyridine	27.7	10.0	ug/L	50.0		55.3	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*83.7*		ug/L	*100*		*83.7*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*44.7*		ug/L	*50.0*		*89.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*50.9*		ug/L	*100*		*50.9*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*48.1*		ug/L	*50.0*		*96.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*41.8*		ug/L	*100*		*41.8*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*27.6*		ug/L	*50.0*		*55.1*	*5-141*			

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
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Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG0724 - No Prep Wet Chem										
Blank (BGG0724-BLK1)				Prepared & Analyzed: 07/21/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGG0724-BS1)				Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		101	80-120			
Matrix Spike (BGG0724-MS1)	**Source: 23G0833-01**			Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.12	0.05	mg/L	0.100	BLOD	115	80-120			
Matrix Spike Dup (BGG0724-MSD1)	**Source: 23G0833-01**			Prepared & Analyzed: 07/21/2023						
Nitrite as N	0.11	0.05	mg/L	0.100	BLOD	109	80-120	5.36	20	
Batch BGG0732 - No Prep Wet Chem										
Blank (BGG0732-BLK1)				Prepared & Analyzed: 07/21/2023						
BOD	ND	2.0	mg/L							
LCS (BGG0732-BS1)				Prepared & Analyzed: 07/21/2023						
BOD	198	2	mg/L	198		100	84.6-115.4			
Duplicate (BGG0732-DUP1)	**Source: 23G0930-03**			Prepared & Analyzed: 07/21/2023						
BOD	2.7	2.0	mg/L		2.4			12.7	20	
Batch BGG0824 - No Prep Wet Chem										
Blank (BGG0824-BLK1)				Prepared & Analyzed: 07/24/2023						
TKN as N	ND	0.50	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 BGG0824 - No Prep Wet Chem										
LCS (BGG0824-BS1)				Prepared & Analyzed: 07/24/2023						
TKN as N	10.7	0.50	mg/L	10.0		107	90-110			
Matrix Spike (BGG0824-MS1)	**Source: 23G1076-02**			Prepared & Analyzed: 07/24/2023						
TKN as N	11.5	0.50	mg/L	10.0	0.69	108	90-110			
Matrix Spike (BGG0824-MS2)	**Source: 23G0861-01**			Prepared & Analyzed: 07/24/2023						
TKN as N	7.46	0.50	mg/L	10.0	BLOD	74.6	90-110			M
Matrix Spike Dup (BGG0824-MSD1)	**Source: 23G1076-02**			Prepared & Analyzed: 07/24/2023						
TKN as N	11.6	0.50	mg/L	10.0	0.69	109	90-110	0.364	20	
Matrix Spike Dup (BGG0824-MSD2)	**Source: 23G0861-01**			Prepared & Analyzed: 07/24/2023						
TKN as N	6.57	0.50	mg/L	10.0	BLOD	65.7	90-110	12.6	20	M
Batch BGG0929 - No Prep Wet Chem										
Blank (BGG0929-BLK1)				Prepared & Analyzed: 07/27/2023						
COD	ND	10.0	mg/L							
LCS (BGG0929-BS1)				Prepared & Analyzed: 07/27/2023						
COD	50.1	10.0	mg/L	50.0		100	88-119			
Matrix Spike (BGG0929-MS1)	**Source: 23G1189-01**			Prepared & Analyzed: 07/27/2023						
COD	49.1	10.0	mg/L	50.0	BLOD	98.2	72.4-130			
Matrix Spike Dup (BGG0929-MSD1)	**Source: 23G1189-01**			Prepared & Analyzed: 07/27/2023						
COD	48.4	10.0	mg/L	50.0	BLOD	96.9	72.4-130	1.33	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 BGG1012 - No Prep Wet Chem										
Blank (BGG1012-BLK1)				Prepared & Analyzed: 07/28/2023						
Ammonia as N	ND	0.10	mg/L							
LCS (BGG1012-BS1)				Prepared & Analyzed: 07/28/2023						
Ammonia as N	1.03	0.1	mg/L	1.00		103	90-110			
Matrix Spike (BGG1012-MS1)		**Source: 23G1124-01**		Prepared & Analyzed: 07/28/2023						
Ammonia as N	1.23	0.10	mg/L	1.00	0.30	93.1	89.3-131			
Matrix Spike (BGG1012-MS2)		**Source: 23G1281-04**		Prepared & Analyzed: 07/28/2023						
Ammonia as N	1.05	0.10	mg/L	1.00	BLOD	105	89.3-131			
Matrix Spike Dup (BGG1012-MSD1)		**Source: 23G1124-01**		Prepared & Analyzed: 07/28/2023						
Ammonia as N	1.29	0.10	mg/L	1.00	0.30	99.2	89.3-131	4.83	20	
Matrix Spike Dup (BGG1012-MSD2)		**Source: 23G1281-04**		Prepared & Analyzed: 07/28/2023						
Ammonia as N	1.04	0.10	mg/L	1.00	BLOD	104	89.3-131	0.960	20	
Batch BGG1067 - No Prep Wet Chem										
Blank (BGG1067-BLK1)				Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGG1067-BS1)				Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	2.55	0.1	mg/L	2.50		102	90-110			
Duplicate (BGG1067-DUP1)		**Source: 23G1006-12**		Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	4.36	0.50	mg/L		4.28			1.62	20	

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGG1067 - No Prep Wet Chem										
Matrix Spike (BGG1067-MS1)	**Source: 23G1256-02**			Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	3.00	0.1	mg/L	2.50	0.37	105	90-120			
Matrix Spike Dup (BGG1067-MSD1)	**Source: 23G1256-02**			Prepared & Analyzed: 07/31/2023						
Nitrate+Nitrite as N	3.04	0.1	mg/L	2.50	0.37	107	90-120	1.06	20	
Batch BGH0067 - No Prep Wet Chem										
Blank (BGH0067-BLK1)				Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGH0067-BS1)				Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.47	0.050	mg/L	0.505		93.1	80-120			
Matrix Spike (BGH0067-MS1)	**Source: 23G0990-04**			Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.61	0.050	mg/L	0.500	0.19	84.0	70-130			
Matrix Spike Dup (BGH0067-MSD1)	**Source: 23G0990-04**			Prepared & Analyzed: 08/02/2023						
Total Recoverable Phenolics	0.63	0.050	mg/L	0.500	0.19	88.4	70-130	3.54	20	

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Analytical Summary

23G0978-01 Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.8 R5.4**	
23G0978-01	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
23G0978-01RE1	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23G0978-01	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
23G0978-01	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
23G0978-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
23G0978-01	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
23G0978-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
23G0978-01	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
23G0978-01RE1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
23G0978-01	1.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23G0978-01	500 mL / 0.500 mL	SW8270E	BGG0786	SGG0815	AG30261

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23G0978-01	5.00 mL / 5.00 mL	SW8260D	BGG0755	SGG0734	AF30236

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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**	
BGG0789-BLK1	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
BGG0789-BS1	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
BGG0789-MS1	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
BGG0789-MS2	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
BGG0789-MSD1	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299
BGG0789-MSD2	50.0 mL / 50.0 mL	SW6020B	BGG0789	SGG0822	AG30299

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGG0724-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0724-MSD1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGG0724	SGG0761	AD30177
BGG0732-BLK1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
BGG0732-BS1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
BGG0732-DUP1	300 mL / 300 mL	SM5210B-2016	BGG0732	SGG0880	
BGG0824-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303
BGG0824-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGG0824	SGG0845	AG30303

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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**	
BGG0929-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MRL1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG0929-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGG0929	SGG0917	AF30270
BGG1012-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-MRL1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1012-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGG1012	SGG0984	AG30332
BGG1067-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
BGG1067-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
BGG1067-DUP1	1.00 mL / 5.00 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
BGG1067-MS1	50.0 mL / 50.0 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
BGG1067-MSD1	50.0 mL / 50.0 mL	SM4500-NO3F-2016	BGG1067	SGG1049	AG30343
BGH0067-BLK1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-BS1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MRL1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MS1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175
BGH0067-MSD1	5.00 mL / 10.0 mL	SW9065	BGH0067	SGH0079	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGG0786-BLK1	1000 mL / 1.00 mL	SW8270E	BGG0786	SGG0815	AG30261
BGG0786-BLK2		SW8270E	BGG0786	SGG0776	AG30261
BGG0786-BS1	1000 mL / 1.00 mL	SW8270E	BGG0786	SGG0815	AG30261

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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**	
BGG0755-BLK1	5.00 mL / 5.00 mL	SW8260D	BGG0755	SGG0734	AF30236
BGG0755-BS1	5.00 mL / 5.00 mL	SW8260D	BGG0755	SGG0734	AF30236
BGG0755-DUP1	5.00 mL / 5.00 mL	SW8260D	BGG0755	SGG0734	AF30236
BGG0755-MS1	5.00 mL / 5.00 mL	SW8260D	BGG0755	SGG0734	AF30236

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Certified Analyses included in this Report

Analyte	Certifications
EPA350.1 R2.0 in Non-Potable Water	
Ammonia as N	VELAP,NCDEQ,PADEP,WVDEP
EPA351.2 R2.0 in Non-Potable Water	
TKN as N	VELAP,NCDEQ,WVDEP
SM4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP,NCDEQ
SM4500-NO3F-2016 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM5210B-2016 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6020B in Non-Potable Water	
Mercury	VELAP
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
SW8260D in Non-Potable Water	

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Certified Analyses included in this Report

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

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Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	12/31/2023
NCDEQ	North Carolina DEQ	495	12/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12069	04/01/2024
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
SCDHEC	South Carolina Dept of Health and Environmental Control Certificate 93016001	93016	06/14/2024
TXCEQ	Texas Comm on Environmental Quality #T104704576-23-1	T104704576	05/31/2024
VELAP	NELAP-Virginia Certificate #12569	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

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

ENTHALPY ANALYTICAL

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

Chain of Custody
Effective: Mar 10, 2021

CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SCS Reston	PROJECT NAME/Quote #: City of Bristol LF
CONTACT: Jennifer Robb	INVOICE CONTACT: Jennifer Robb	SITE NAME:
ADDRESS: 296 Victory Road Winchester, VA 22603	INVOICE ADDRESS:	PROJECT NUMBER:
PHONE #: (703) 471-6150	INVOICE PHONE #:	P.O. #:
FAX #: (703) 471-6676 EMAIL: Jrobb@scsengineers.com		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State:	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): Logan Nelson / Ty Smith	SAMPLER SIGNATURE:	Turn Around Time: Circle (10) 5 Days or _Day(s)

PWS I.D. #:

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
											Bod - SM 5210B	VOCs - 8260 (see list #2)	VFAs - 8015 (see list #2)	COD - SM 5220D	Nitrate (report separately from Nitrite)	Ammonia EPA 350.1, Nitrite SM22 4500-NO3F, TKN EPA 351.2	Metals SW6020 (Ag, As, Ba, Cd, Cr, Cu, Ni, Pb, Se, Zn)	SVOCs (Anthracene) SW8270	phenolics SW9065	
1) EW 78	X					7/19	1455			13	X	X	X	X	X	X	X	X	X	
2)																				
3)																				
4)																				
5)																				
6)																				
7)																				
8)																				
9)																				
10)																				

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

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

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
Logan Nelson	7/20/23 1100	LCN	
LCN		Mary Sue	7/21/23 0820

QC Data Package
Level III ☐
Level IV ☐

LAB USE ONLY Therm ID: 339
Custody Seals used and intact? (Y / N)
COOLER TEMP 0.6 °C
Received on ice? (Y / N)

SCS-W **23G0978**
2023 City of Bristol Landfill Leach
Recd: 07/21/2023 Due: 08/04/2023

ENTHALPY ANALYTICAL

Sample Preservation Log

Order ID: 23G0978 Date Performed: 7-21-23 Analyst Performing Check: RCJ

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

NaOH ID: _____ HNO3 ID: 3F04262

H2SO4 ID: 3B04316 Na2S2O3 ID: _____

HCL ID: _____ Na2SO3 ID: _____

CrVI preserved date/time: _____ Analyst Initials: _____

*pH must be adjusted between 9.3 - 9.7

Buffer Soln ID: _____

Metals were received with pH = 7 HNO3 was added on 21 Jul 2023 at 1000 by RCJ in the Log-in room to bring pH= <2.

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

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Date Issued: 8/4/2023 2:55:00PM

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

Date Issued: 8/4/2023 2:55:00PM

Laboratory Order ID: 23G0978

Sample Conditions Checklist

Samples Received at:	**0.80°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	No
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	Yes
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

Work Order Comments

*H2SO4-preserved containers were received with a pH greater than 2, and H2SO4 was added to bring the pH to less than 2.
*Hg was logged by 6020 per the project on file, which differs from the chain of custody (7470).

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/4/2023 2:55:00PM
Client Site I.D.: City of Bristol LF
Submitted To: Logan Howard

*The sample was logged as groundwater per project history, as no matrix is indicated on the chain of custody.
Jennifer Robb notified via email. MRS 07/21/23 1127

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders: 3G25050

Project: 23G0978

Attn: Enthalpy VA

Client: Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Report Date: 8/03/2023

Received Date: 7/25/2023

Turnaround Time: Normal

Phones: (804) 358-8295

Fax:

P.O. #: PO-049400

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 Enthalpy VA,

Enclosed are the results of analyses for samples received 7/25/23 with the Chain-of-Custody document. The samples were received in good condition, at 1.6 °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:

Ryan J. Gasio
Project Manager

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www.wecklabs.com

Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
23G0978-01: EW-78	Client	3G25050-01	Water	07/19/23 14:55	

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Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

Sample Results

Sample: 23G0978-01: EW-78
3G25050-01 (Water)

Sampled: 07/19/23 14:55 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Alcohols by GC/FID						
Method: EPA 8015M		**Instr:** GC09				
Batch ID: W3G2112 **Preparation:** _NONE (SVOC)		**Prepared:** 07/27/23 11:16				**Analyst:** alf
Acetic acid	ND	500	mg/l	50	07/29/23	M-05
Butyric acid	ND	500	mg/l	50	07/29/23	M-05
Heptanoic acid	ND	500	mg/l	50	07/29/23	M-05
Hexanoic acid	ND	500	mg/l	50	07/29/23	M-05
Isobutyric acid	ND	500	mg/l	50	07/29/23	M-05
Isocaproic acid	ND	500	mg/l	50	07/29/23	M-05
Isovaleric acid	ND	500	mg/l	50	07/29/23	M-05
Propionic acid	ND	500	mg/l	50	07/29/23	M-05
Valeric acid	ND	500	mg/l	50	07/29/23	M-05

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Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

Quality Control Results

Alcohols by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M										
Blank (W3G2112-BLK1)				**Prepared: 07/27/23 Analyzed: 07/28/23**						
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							
Blank (W3G2112-BLK2)				**Prepared & Analyzed: 07/31/23**						
Acetic acid	ND	10	mg/l							QC-2
Butyric acid	ND	10	mg/l							QC-2
Heptanoic acid	ND	10	mg/l							QC-2
Hexanoic acid	ND	10	mg/l							QC-2
Isobutyric acid	ND	10	mg/l							QC-2
Isocaproic acid	ND	10	mg/l							QC-2
Isovaleric acid	ND	10	mg/l							QC-2
Propionic acid	ND	10	mg/l							QC-2
Valeric acid	ND	10	mg/l							QC-2
LCS (W3G2112-BS1)				**Prepared: 07/27/23 Analyzed: 07/28/23**						
Acetic acid	51.2	10	mg/l	50.0		102	50-150			
Butyric acid	54.5	10	mg/l	50.0		109	50-150			
Heptanoic acid	58.1	10	mg/l	50.0		116	50-150			
Hexanoic acid	62.8	10	mg/l	50.0		126	50-150			
Isobutyric acid	64.7	10	mg/l	50.0		129	50-150			
Isocaproic acid	64.9	10	mg/l	50.0		130	50-150			
Isovaleric acid	55.0	10	mg/l	50.0		110	50-150			
Propionic acid	53.5	10	mg/l	50.0		107	50-150			
Valeric acid	64.9	10	mg/l	50.0		130	50-150			
LCS (W3G2112-BS6)				**Prepared & Analyzed: 07/31/23**						
Acetic acid	46.7	10	mg/l	50.0		93	50-150			QC-2
Butyric acid	53.6	10	mg/l	50.0		107	50-150			QC-2
Heptanoic acid	60.2	10	mg/l	50.0		120	50-150			QC-2
Hexanoic acid	63.0	10	mg/l	50.0		126	50-150			QC-2
Isobutyric acid	63.8	10	mg/l	50.0		128	50-150			QC-2
Isocaproic acid	65.8	10	mg/l	50.0		132	50-150			QC-2
Isovaleric acid	55.5	10	mg/l	50.0		111	50-150			QC-2
Propionic acid	52.6	10	mg/l	50.0		105	50-150			QC-2
Valeric acid	65.0	10	mg/l	50.0		130	50-150			QC-2

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1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

Quality Control Results

(Continued)

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M (Continued)										
LCS (W3G2112-BS6)				**Prepared & Analyzed: 07/31/23**						
Matrix Spike (W3G2112-MS1)	**Source: 3G21083-02**			**Prepared: 07/27/23 Analyzed: 07/29/23**						
Acetic acid	1160	200	mg/l	1000	ND	116	50-150			M-05
Butyric acid	1110	200	mg/l	1000	ND	111	50-150			M-05
Heptanoic acid	1270	200	mg/l	1000	ND	127	50-150			M-05
Hexanoic acid	1260	200	mg/l	1000	ND	126	50-150			M-05
Isobutyric acid	1290	200	mg/l	1000	ND	129	50-150			M-05
Isocaproic acid	1360	200	mg/l	1000	ND	136	50-150			M-05
Isovaleric acid	1120	200	mg/l	1000	ND	112	50-150			M-05
Propionic acid	1150	200	mg/l	1000	ND	115	50-150			M-05
Valeric acid	1330	200	mg/l	1000	ND	133	50-150			M-05
Matrix Spike (W3G2112-MS2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Acetic acid	11900	1000	mg/l	5000	5950	119	50-150			M-05
Butyric acid	8280	1000	mg/l	5000	2480	116	50-150			M-05
Heptanoic acid	7920	1000	mg/l	5000	ND	158	50-150			M-05, MS-01
Hexanoic acid	8020	1000	mg/l	5000	ND	160	50-150			M-05, MS-01
Isobutyric acid	7990	1000	mg/l	5000	549	149	50-150			M-05
Isocaproic acid	9040	1000	mg/l	5000	1080	159	50-150			M-05, MS-01
Isovaleric acid	7390	1000	mg/l	5000	971	128	50-150			M-05
Propionic acid	8350	1000	mg/l	5000	2890	109	50-150			M-05
Valeric acid	8110	1000	mg/l	5000	ND	162	50-150			M-05, MS-01
Matrix Spike Dup (W3G2112-MSD1)	**Source: 3G21083-02**			**Prepared: 07/27/23 Analyzed: 07/29/23**						
Acetic acid	1130	200	mg/l	1000	ND	113	50-150	2	25	M-05
Butyric acid	1080	200	mg/l	1000	ND	108	50-150	3	25	M-05
Heptanoic acid	1290	200	mg/l	1000	ND	129	50-150	2	25	M-05
Hexanoic acid	1210	200	mg/l	1000	ND	121	50-150	4	25	M-05
Isobutyric acid	1230	200	mg/l	1000	ND	123	50-150	5	25	M-05
Isocaproic acid	1390	200	mg/l	1000	ND	139	50-150	2	25	M-05
Isovaleric acid	1130	200	mg/l	1000	ND	113	50-150	0.9	25	M-05
Propionic acid	1120	200	mg/l	1000	ND	112	50-150	3	25	M-05
Valeric acid	1290	200	mg/l	1000	ND	129	50-150	3	25	M-05
Matrix Spike Dup (W3G2112-MSD2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Acetic acid	12400	1000	mg/l	5000	5950	128	50-150	4	25	M-05
Butyric acid	7760	1000	mg/l	5000	2480	106	50-150	6	25	M-05
Heptanoic acid	6930	1000	mg/l	5000	ND	139	50-150	13	25	M-05
Hexanoic acid	7270	1000	mg/l	5000	ND	145	50-150	10	25	M-05
Isobutyric acid	7330	1000	mg/l	5000	549	136	50-150	9	25	M-05
Isocaproic acid	8140	1000	mg/l	5000	1080	141	50-150	10	25	M-05

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Enthalpy Analytical - Richmond VA
1941 Reymet Road
Richmond, VA 23237

Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

Quality Control Results

(Continued)

Alcohols by GC/FID (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W3G2112 - EPA 8015M (Continued)										
Matrix Spike Dup (W3G2112-MSD2)	**Source: 3F22052-01RE2**			**Prepared & Analyzed: 07/31/23**						
Isovaleric acid	6670	1000	mg/l	5000	971	114	50-150	10	25	M-05
Propionic acid	8300	1000	mg/l	5000	2890	108	50-150	0.7	25	M-05
Valeric acid	7120	1000	mg/l	5000	ND	142	50-150	13	25	M-05

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1941 Reymet Road
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Project Number: 23G0978

Project Manager: Enthalpy VA

Reported:
08/03/2023 12:50

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.
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
QC-2	This QC sample was reanalyzed to complement samples that require re-analysis on different date. See analysis date.
%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.

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