August 2023
Monthly Compliance Report

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

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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 August 2023 related to Solid Waste Permit (SWP) No. 588.

1.0 GAS COLLECTION

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

1.1 SURFACE AND LEACHATE COLLECTION EMISSIONS

1.1.1 Surface Emissions

1.1.1.1 Quarterly SEM

SCS performed the Third Quarter surface emissions monitoring event on August 23, 2023. The surface emission monitoring route included the entire waste footprint of the Permit No. 588 landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint outside of the active filling area.

No exceedances were detected during this quarterly monitoring event on the serpentine route, but eight exceedances were detected at the surface cover pipe penetrations. This monitoring event also represented the weekly monitoring event for that week. A quarterly SEM report documenting corrective actions and remonitoring results will be submitted to the VDEQ as part of the Semi-Annual Report. In addition, monitoring results were presented to the VDEQ in a letter dated August 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 August 4, 2023; August 11, 2023; August 17, 2023; August 23, 2023; and August 31, 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 August 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 August monitoring events on August 9, 2023; August 16, 2023; August 23, 2023, August 30, 2023; and September 6, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the five monitoring events in August.

Table 1. Summary of August Surface Emissions Monitoring

Description	August 4, 2023	August 11, 2023	August 17, 2023	August 23, 2023	August 31, 2023
Number of Points Sampled	169	170	171	171	171
Number of Points in Serpentine Route	100	100	100	100	100
Number of Points at Surface Cover Penetrations	69	70	71	71	71
Number of Exceedances	8	10	10	8	4
Number of Serpentine Exceedances	1	1	1	0	0
Number of Pipe Penetration Exceedances	7	9	9	8	4

There were no new serpentine exceedances detected in August 2023. One ongoing exceedance (Tag #69) that was first identified on July 21, 2023, was corrected. Corrective actions included addition and compaction of low-permeability soil and wellhead vacuum adjustments at nearby collectors.

Initial exceedances were detected at pipe penetrations of 17 vertical extraction wells. Exceedances were also detected at the pipe penetration of four additional vertical extraction wells that had been documented in the previous months. Exceedances at these locations can be attributed to a variety of factors. Ongoing construction activities and connection of a new temporary flare caused periods of vacuum loss as section of the GCCS were temporarily isolated. In addition, liquid blockages in sumps following heavy rainfall events reduced vacuum to these collectors. However, by the final weekly monitoring event of the month, the majority of these issues had been resolved with only four ongoing exceedances remaining (EW-52, EW-55, EW-74, and EW-90). Additional corrective actions at these locations may include additional soil, addition of a well-bore skirt addition, installation of a foam or bentonite seal, continued and improved dewatering activities, and well tuning to increase gas extraction. Corrective actions to address these exceedances are planned for the month of September 2023.

1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on August 16, 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. 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	51.6	44.89	0.14	3.37	87.8	87.9	-12.76	-12.34	-12.34
Southern Cleanouts Gradient East	LC02	52.06	44.97	0.12	2.85	88.6	88.6	-13	-12.55	-12.55
Southern Cleanouts Leachate Center	LC03	30.65	25.05	8.6	35.7	88.6	88.6	-13.52	-13.52	-13.52
Southern Cleanouts Witness East	LC04	23	15.17	10.35	51.48	88.4	88.4	-13.32	-13.52	-13.32
Southern Cleanouts Leachate West	LC05	53.4	42.58	0.03	3.99	88.5	88.5	-12.38	-12.17	-12.17
Southern Cleanouts Gradient Center West	LC06	47.02	40.94	1.19	10.85	88.4	88.5	-13.71	-13.86	-13.71
Southern Cleanouts Leachate East	LC08	51.84	43.01	0	5.15	88.2	88.2	-12.84	-12.67	-12.67
Southern Cleanouts Gradient Center East	LC09	32.37	20.05	8.81	38.77	86.2	86.4	-12.89	-12.89	-12.89
Southern Cleanouts Leachate West	LC10	27.75	19.24	9.67	43.34	86.8	87.2	-13.52	-13.52	-13.52
Northern Cleanouts Leachate East	NC01	7.78	6.54	19.88	65.8	88.9	89.1	-0.28	-0.29	-0.28
Northern Cleanouts Leachate Center	NC02	1.4	0.89	19.92	77.79	90.7	90.8	-11.51	-11.49	-11.49
Northern Cleanouts Leachate West	NC03	1.31	0.87	20.1	77.72	89.7	90	-11.51	-11.22	-11.22
Northern Cleanouts Witness East	NC04	1.34	0.77	19.99	77.9	91.6	91.5	-11.3	-11.49	-11.3
Northern Cleanouts Witness Center	NC05	0.5	0.54	20.55	78.41	91	90.7	-11.36	-11.34	-11.34
Northern Cleanouts Witness West	NC06	0.01	0.05	20.67	79.27	88.8	88.8	-11.15	-11.15	-11.15
Northern Cleanouts Gradient East	NC07	0	0.03	20.69	79.28	87.4	87.3	-11.15	-11.17	-11.15
Northern Cleanouts Gradient Center East	NC08	41.39	21.3	1.11	36.2	86.1	86	-11.49	-11.49	-11.49
Northern Cleanouts Gradient Center West	NC09	39.86	21.63	3.79	34.72	87.1	87.2	-11.15	-11.2	-11.15
Northern Cleanouts Gradient West	NC10	41.66	21.73	0.86	35.75	88.5	88.7	-11.17	-11.15	-11.15

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:

- Cleaning header lines
- Operating stormwater de-watering pumps
- Replacing sample ports on extraction wells
- Replacing a Kanaflex on EW-53 and EW-57
- Modifications to lateral piping

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 August 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 during the monthly monitoring period of August 2023.

1.3.1 Automated Wellhead Temperature Measurements

During this monitoring period, EW-79 received an automated temperature sensor and recorded readings throughout the month.

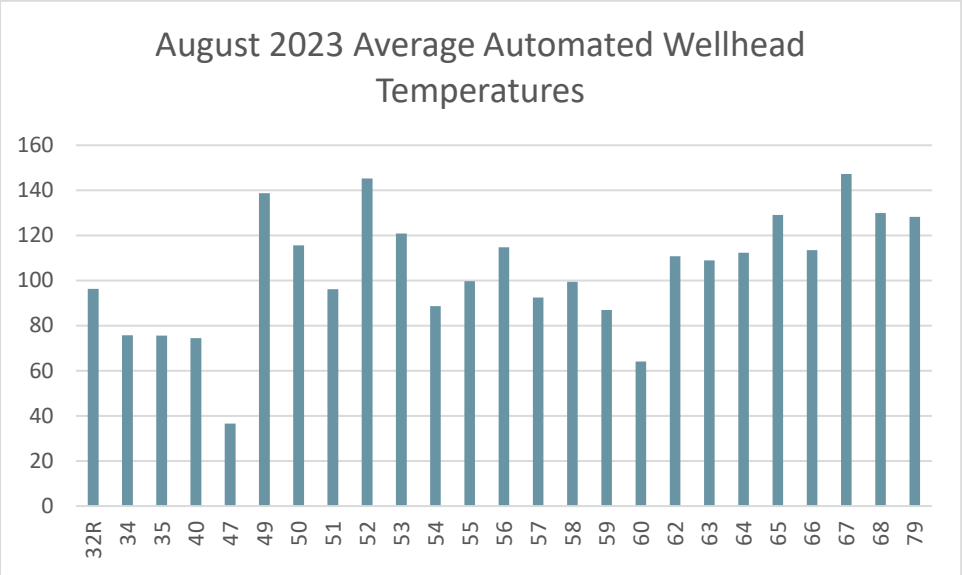
SCS reviewed the automated hourly temperature measurements from August 2023, and identified the following trends:

- **Temperatures over 145°F:** Temperatures over the NESHAP AAAA compliance threshold of 145°F were recorded consistently at EW-52, EW-53, EW-57, and EW-67 in August. Although temperatures fluctuate throughout the wellfield, SCS is continuing to see high temperatures at certain wells during these monitoring periods. The highest average temperatures were measured at EW-53 and EW-67(see Exhibit 1). 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. Removal of liquids from the well allows gas from deeper within the waste mass to be extracted. In some cases gas collected from lower elevations is hotter than gas from higher elevations and this temperature difference is reflected in the temperatures measured

by the sensors. 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 were significantly lower at EW-32R, 34, and 35 relative to other wellheads. These wellheads also exhibited low LFG flow rates (less than 7 scfm), as 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. At other wells, such as EW-47 and EW-60, average temperatures appeared more likely to be erroneous than a reflection of low LFG flow/ambient temperature (see Figure 1).
- **Erroneous Readings:** Temperature readings of zero were measured sporadically throughout the monitoring period at EW-47, EW-53, EW-57, EW-59, EW-60, and EW-67. Field staff have identified the cause as battery die-out in the sensors and are working to the batteries.

Figure 1. Average Automated Wellhead Temperatures



1.3.2 Comparison with Manual Temperature Measurements

Per the approval issued by VDEQ on August 2, 2023, the Facility ceased dedicated daily manual temperature measurements in the Permit No. 588 Landfill. In lieu of this comparison, the City has agreed to compare instantaneous hourly automated temperature measurements with temperatures measured at each wellhead with a handheld sensor during monthly compliance monitoring. The August comparisons are listed in Table 3.

Table 3. Automated vs. Manual Temperature Measurements

Point Name	Record Date	Field Measurement (°F)	Automated Measurement (°F)	Comparison
32R	8/1/2023 10:48	113.30	111.95	1%
34	8/14/2023 10:02	75.20	74.35	1%
35	8/15/2023 11:20	78.80	81.21	-3%
40	8/16/2023 13:57	79.00	81.66	-3%
47	8/16/2023 14:06	83.20	89.00	-7%
49	8/5/2023 10:14	147.00	145.14	1%
50	8/14/2023 09:41	116.90	114.38	2%
51	8/5/2023 09:42	86.20	83.22	3%
52	8/5/2023 09:16	145.90	142.89	2%
53	8/5/2023 09:25	144.70	140.90	3%
54	8/5/2023 09:39	80.30	85.22	-6%
55	8/5/2023 09:47	102.60	101.46	1%
56	8/16/2023 13:15	123.30	124.05	-1%
57	8/16/2023 13:27	149.50	NM	
58	8/16/2023 13:32	153.20	107.90	30%
59	8/16/2023 13:23	118.10	117.20	1%
60	8/15/2023 10:58	125.50	NM	
62	8/14/2023 11:04	124.20	119.70	4%
63	8/1/2023 10:18	131.80	130.94	1%
64	8/1/2023 10:12	145.60	132.84	9%
65	8/1/2023 10:03	110.10	105.46	4%
66	8/16/2023 14:32	129.20	124.56	4%
67	8/16/2023 14:02	158.70	155.53	2%
68	8/15/2023 11:34	133.00	132.46	0%
79	8/1/2023 11:06	91.00	131.31	-44%

At 21 of the 25 wells where an automated temperature sensor is installed, the temperature value was within eight percent of the temperature value recorded manually by field personnel. In the case of two wells (EW-57 and EW-60) erroneous values of zero were recorded throughout the month, likely as a result of battery die-out as documented above. At the two other locations (EW-58 and EW-79) the temperature sensor is not within the eight percent range demonstrated by the other sensors. These sensors have been identified for further investigation.

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 August 1, 2023, with follow-up monitoring several days after. Additionally, SCS typically measures wellhead temperatures at the SWP No. 588 Landfill on a weekly basis. During this monitoring period, temperature exceedances were resolved at EW-31R, EW-49, EW-52, EW-61, and EW-86. A HOV request was submitted for EW-53, EW-61, EW-84, EW-86, EW-89, EW-90, and EW-100

to VDEQ on August 8, 2023. See Table 4 for the statuses of all exceedances recorded during this monitoring period.

Table 4. August Temperature Exceedance Summary

Well ID	Initial Exceedance Date	Last date/temperature measured	Duration of Exceedance	Status as of 7/31/23
EW-31R	8/1/23	8/17/23 132.9°	16 days	Resolved, within 60-day timeline
EW-31R	8/29/23	8/31/23 132.5°	3 days	Resolved, within 15-day timeline
EW-49	8/5/23	8/14/23 144.0°	9 days	Resolved, within 15-day timeline
EW-51	8/7/23	8/9/23 99.1°	2 days	Resolved, within 15-day timeline
EW-51	8/28/23	8/31/23 193.2°	3 days	Ongoing, within 15-day timeline
EW-52	6/19/23	8/9/23 144.3°F	51 days	Resolved, within 60-day timeline
EW-52	8/15/23	8/31/23 145.1°F	16 days	Ongoing, within 60-day timeline
EW-53	6/5/23	8/5/23 144.7°F	61 days	Resolved, within 120-day timeline
EW-53	8/7/23	8/16/23 117.1°F	9 days	Resolved, within 120-day timeline
EW-53	8/28/23	8/31/23 179.9°F	3 days	Ongoing, within 15-day timeline
EW-61	6/27/23	8/29/23 140.0°F	63 days	Resolved, within 120-day timeline
EW-64	7/28/23	8/24/23 129.8°	27 days	Ongoing, within 60-day timeline
EW-64	8/24/23	8/31/23 150.1°	7 days	Ongoing, within 15-day timeline
EW-84	4/27/23	8/31/23 158.2°F	126 days	Ongoing, HOV request submitted 8/8/23
EW-86	8/5/23	8/15/23 140.6°F	10 days	Resolved, within 15-day timeline
EW-88	8/28/23	8/31/23 164.4°F	3 days	Ongoing, within 15-day timeline
EW-89	5/30/23	8/31/23 162.2°F	93 days	Ongoing, within 120-day timeline
EW-90	7/24/23	8/9/23 114.8°F	16 days	Resolved, within 60-day timeline
EW-90	8/28/23	8/31/23 159.5°F	3 days	Ongoing, within 15-day timeline
EW-97	8/28/23	8/31/23 145.7°	3 days	Ongoing, within 15-day timeline
EW-99	7/31/23	8/9/23 140.7°	10 days	Resolved, within 15-day timeline
EW-99	8/16/23	8/31/23 145.6°	15 days	Ongoing, within 60-day timeline
EW-100	4/27/23	8/31/23 160.2°	126 days	Ongoing, HOV request submitted 8/8/23

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 August 5, 2023; August 11, 2023; and August 17, 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 5.

Table 5. LFG Wellhead Sampling Summary

Sample Date		8/5/23	8/11/23	8/17/23
31R	CO (ppmv)	414	420	--
	H2 (Vol. %)	8.27	9.99	--
49	CO (ppmv)	ND	96.8	--
	H2 (Vol. %)	1.69	2.77	--
52	CO (ppmv)	ND	--	ND
	H2 (Vol. %)	3.89	--	2.50
53	CO (ppmv)	--	1160	--
	H2 (Vol. %)	--	15.8	--
58	CO (ppmv)	--	--	335
	H2 (Vol. %)	--	--	5.96
61	CO (ppmv)	202	187	308
	H2 (Vol. %)	6.77	8.29	13.8
64	CO (ppmv)	ND	ND	ND
	H2 (Vol. %)	0.76	2.10	5.72
84	CO (ppmv)	387	382	385
	H2 (Vol. %)	8.51	9.98	10.4
86	CO (ppmv)	148	198	--
	H2 (Vol. %)	2.79	4.94	--
89	CO (ppmv)	1080	1050	1160
	H2 (Vol. %)	29.4	38.2	42.2
90	CO (ppmv)	334	--	--
	H2 (Vol. %)	5.79	--	--
99	CO (ppmv)	ND	--	ND
	H2 (Vol. %)	0.83	--	0.97
100	CO (ppmv)	ND	95.2	ND
	H2 (Vol. %)	5.99	7.22	8.70

The presence of hydrogen in all the samples collected during this monitoring period indicates that combustion reactions are unlikely. A result of non-detect for three weeks in a row at EW-64 indicate that sampling may continue on a monthly basis for the remaining duration of the temperature exceedance.

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 August, work on the expansion of the GCCS focused on the installation of 12" and 8" LFG lateral piping, wellhead risers and header connections to the existing system. the first half of August, pumps were installed at 4 of the newly installed wells (EW-69, EW-90, EW-99, and EW-100). 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 and continue to install them accordingly, which has increased the number of operating dual extraction wells beyond the required minimum. SCS-CONS has received the delivery of additional stainless steel supplemental tubing materials necessary for installation. The expanded GCCS and its newly connected wells and pumps continue to increase gas and liquids extraction for the landfill. A photo of well 95 after the new pump was installed is shown in Figure 2.

Figure 2. Extraction Well 95 Pump 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 3. 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

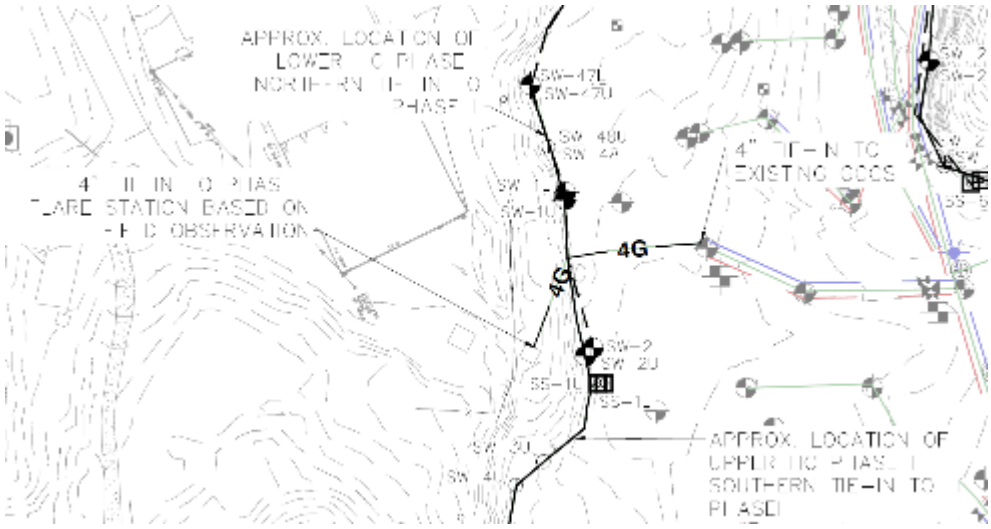
On behalf of the City and in an effort to capture emissions from the quarry sidewall, SCS designed a sidewall odor mitigation system (SOMS) during the month of October 2022. On October 20, 2022 SCS provided an overview of the proposed system to VDEQ staff. The design of this system was prepared and submitted 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. Details of Phase 1 construction progress and monitoring can be found in the monthly compliance reports for the SWP No. 588 landfill.

Figure 4 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 4. SOMS Phase I As-Built[1]



Both the upper and lower collectors of Phase 1 of the system have been connected to the substantially completed Phase 2 of the system. Collection of landfill gas by both the upper and lower collectors indicates that the system is working as intended. Based on this data, Phase 2 was constructed utilizing the same general configuration.

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

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. Cover soil placement continued throughout the month of August and will continue into September. Figure 5 shows SOMS Phase 2 wellhead installation and connections at HC wells SW-17U and SW-17L.

Figure 5. Phase 2 SOMS Wellhead Connections

During the month of August 2023, SCS-FS collected monitoring data at each wellhead under vacuum. A summary of those measurements is shown in Table 6.

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

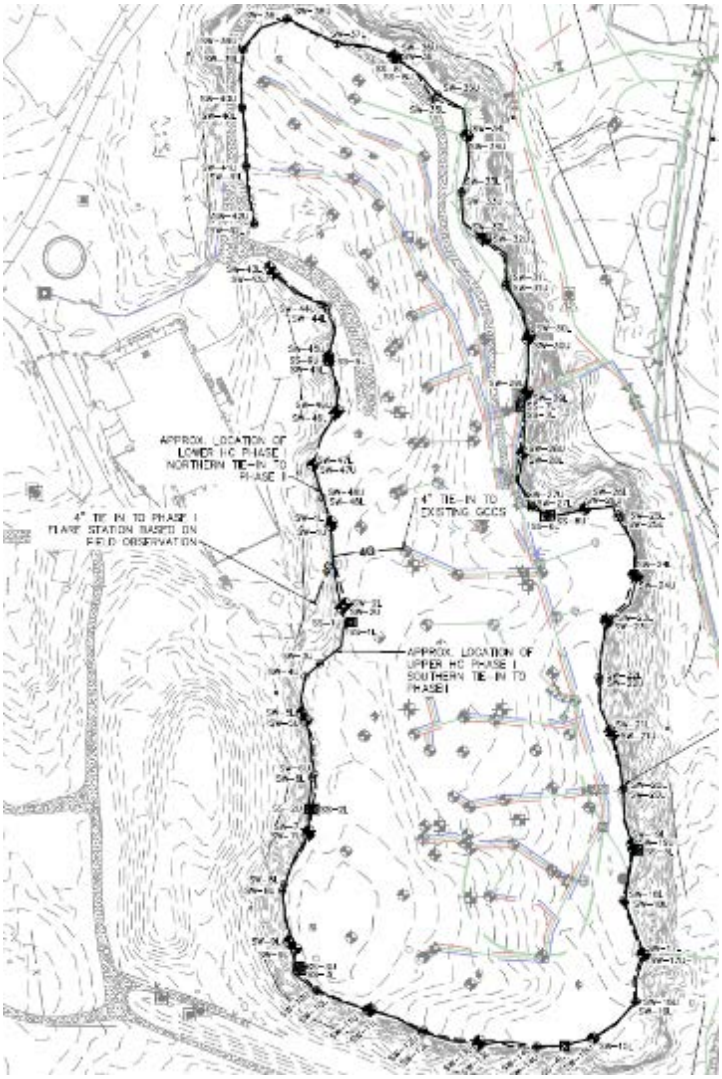
Record Date	Average CH4 [%]	Average CO2 [%]	Average O2 [%]	Average Bal Gas [%]
8/(1-2)/2023	10.5	15.1	13.1	61.3
8/15/2023	7.8	11.0	14.9	66.4
8/30/2023	9.3	14.7	14.0	62.0

The sidewall system averages indicate lower methane content than typical landfill gas collection systems. The gas quality measurement do indicate that the SOMS is functioning as designed because landfill gas is being withdrawn and oxygen intrusion is acceptable. 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. SCS-FS will adjust SOMS wellheads based on gas quality to increase flow from sections of the system with high methane content and reduce flow from sections of the system with low methane content. Phase 2

lower and upper collectors locations, including HC wellhead riser and sump locations, are shown in the as-built depicted as Figure 6[2].

During the month of August, 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 can be to some extent 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 September in order to mitigate this issue and optimize the system's fugitive gas collection.

Figure 6. 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 southeastern area of the landfill shown in Figure 7.

Figure 7. 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.

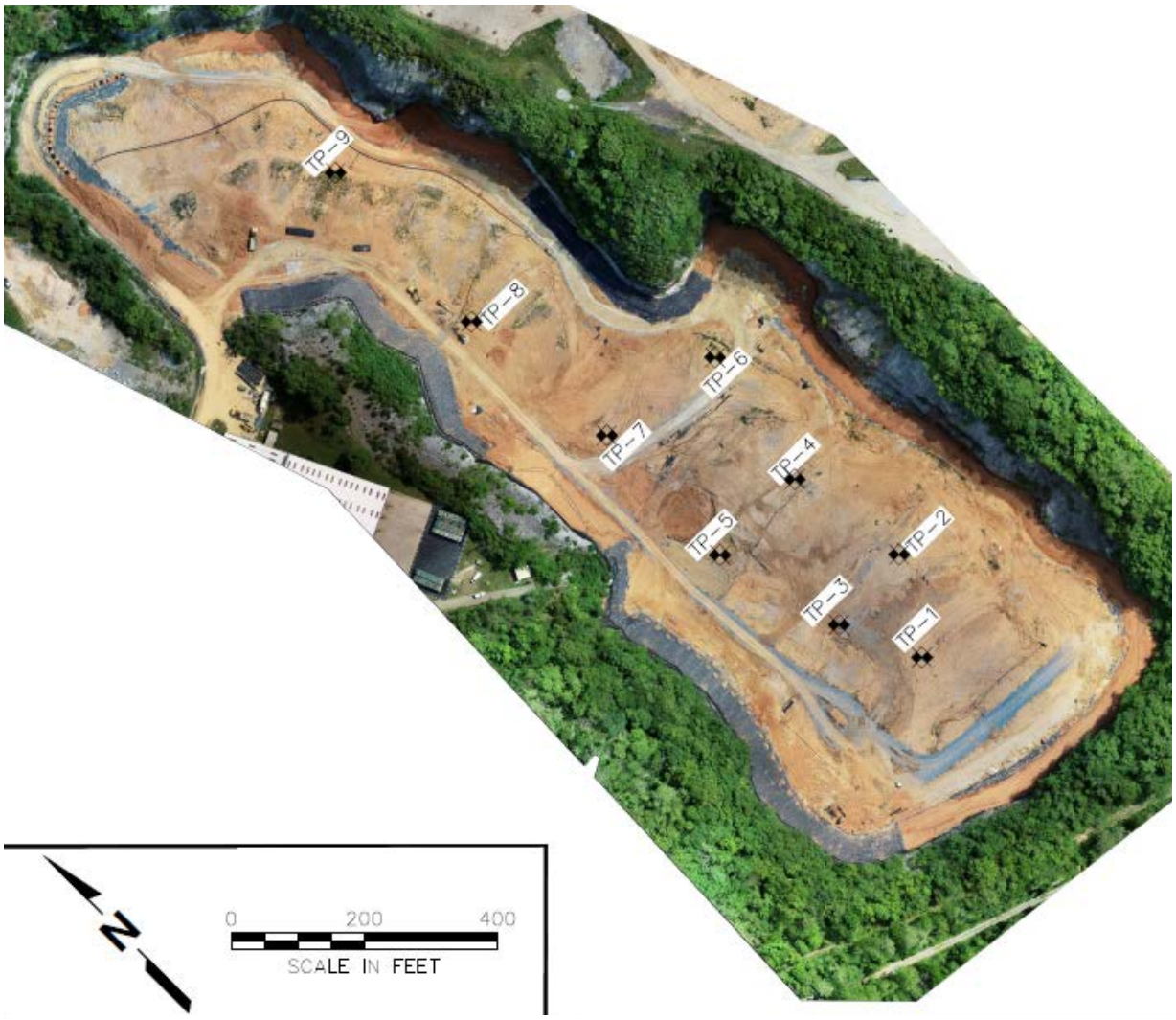
3.1 TEMPERATURE MONITORING SYSTEM DESIGN

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 8.

Figure 8. 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 August 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 August are shown in Appendix B. The average temperatures recorded during the months of March through August are shown in Figures 9 through 17 on the following pages.

Figure 9 shows daily average temperatures in Temperature Probe 1 (TP-1) during the months of March through August. Based on the data, temperatures were consistent from March through May and saw increases during the months of June, July and August 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 was replaced and TP-1 began recording temperatures again on July 31, 2023.

Figure 9. Average Temperatures within TP-1 During the Months of March through August

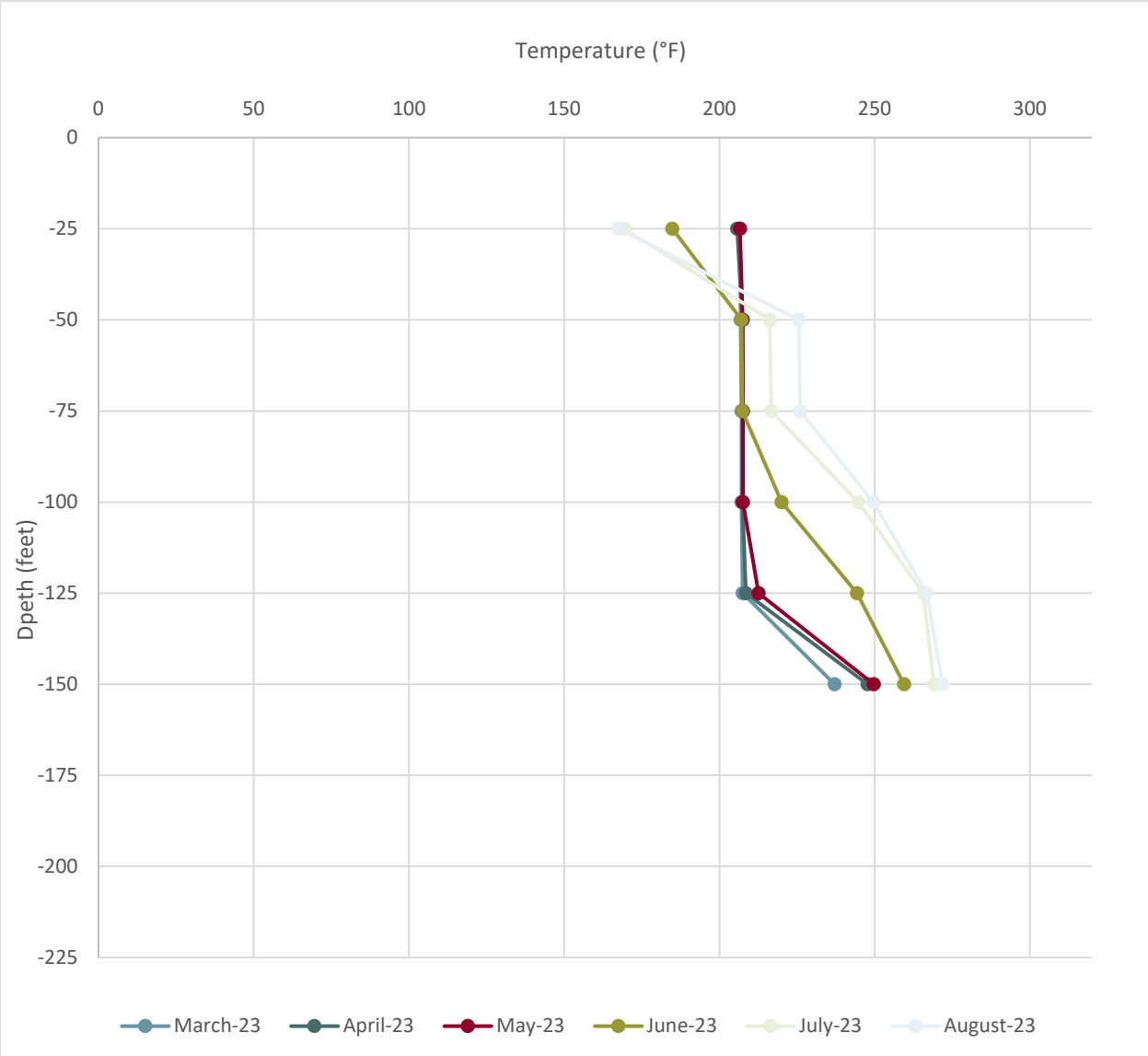


Figure 10 shows daily average temperatures in Temperature Probe 2 (TP-2) during the months of March through August. Based on the data, temperatures have been consistent during the last six months.

TP-2 was originally drilled to a depth of 160 feet. TP-2 did not record temperatures after August 15, 2023 due to a dead battery. A replacement battery has been ordered and is scheduled to be installed in September of 2023.

Figure 10. Average Temperatures within TP-2 During the Months of March through August

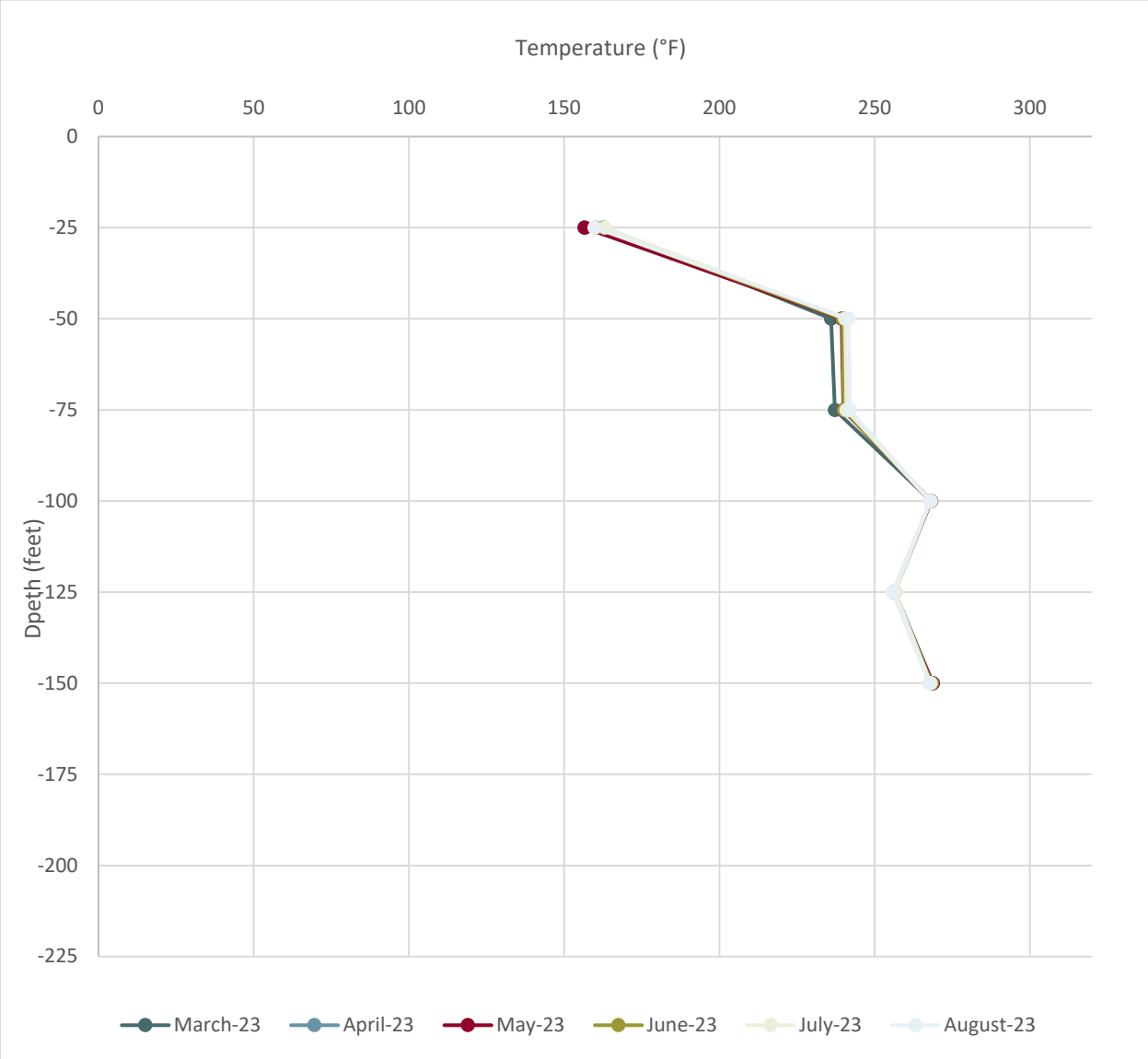


Figure 11 shows daily average temperatures in Temperature Probe 3 (TP-3) during the months of March through August. Based on the data, temperatures have been consistent during the last six months.

Figure 11. Average Temperatures within TP-3 During the Months of March through August

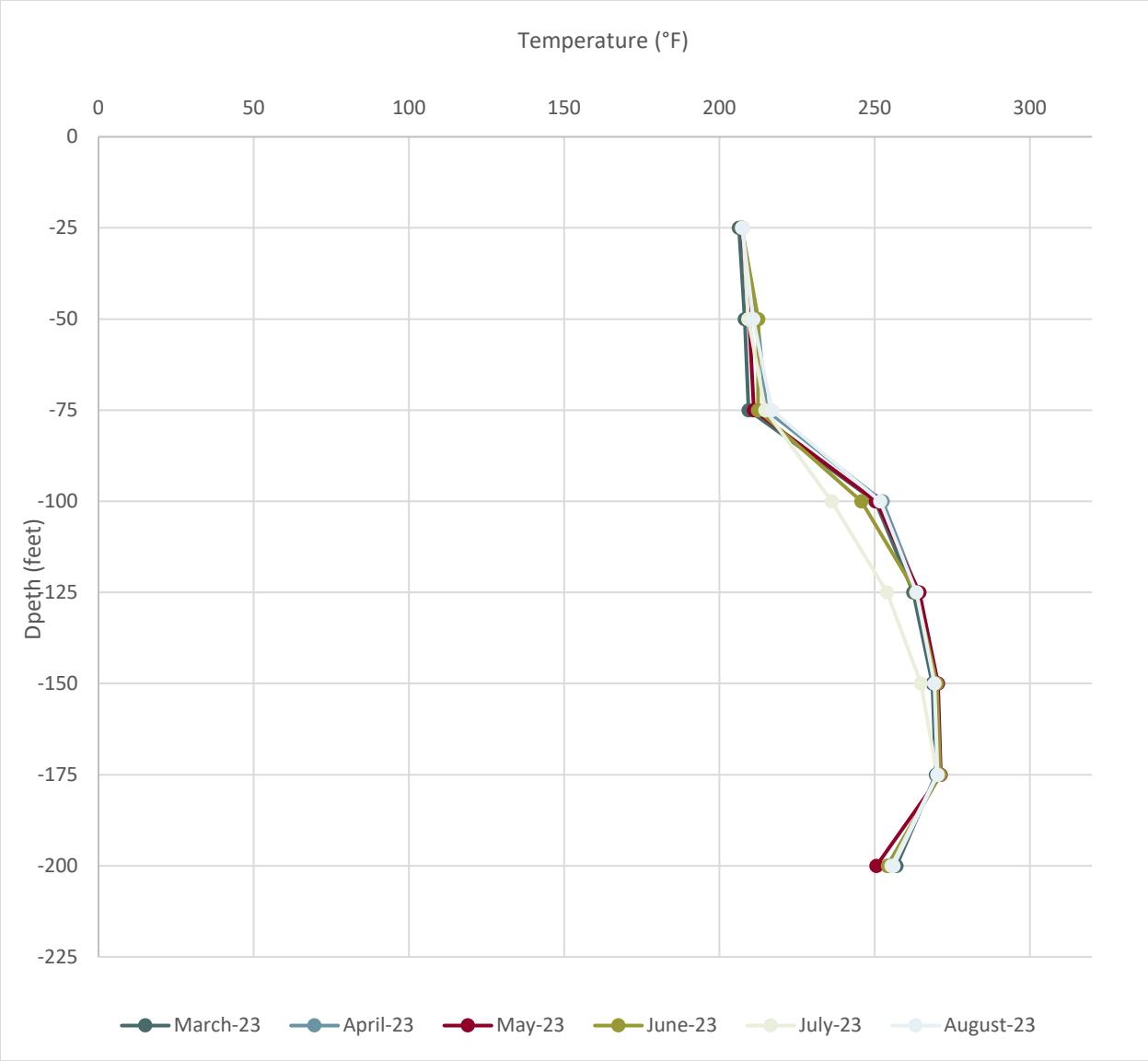


Figure 12 shows daily average temperatures in Temperature Probe 4 (TP-4) during the months of March through August. Based on the data, temperatures appeared to drop during the months of April and May, but returned to levels closer to baseline during the months of June, July and August.

Figure 12. Average Temperatures within TP-4 During the Months of March through August

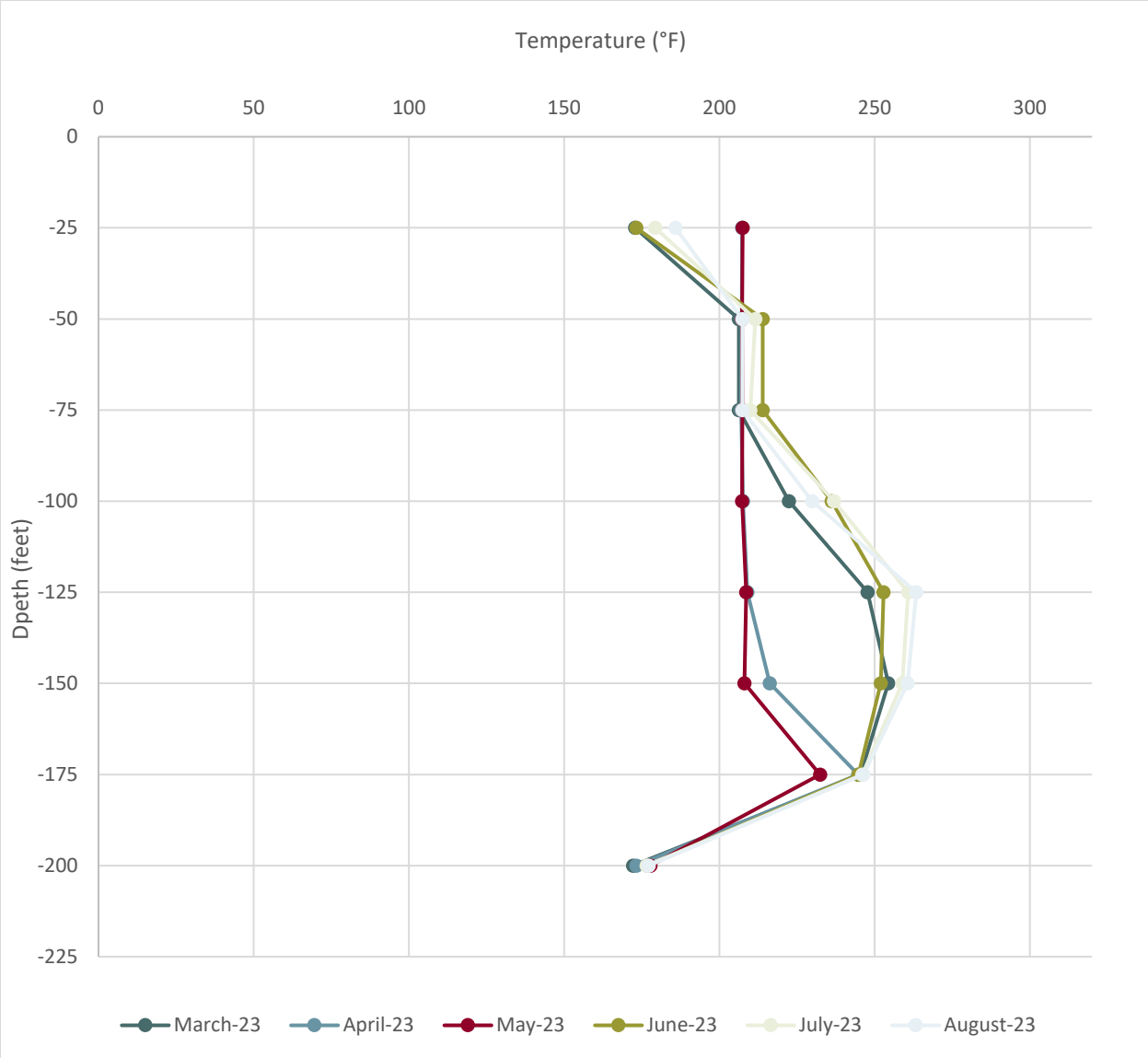


Figure 13 shows daily average temperatures in Temperature Probe 5 (TP-5) during the months of March through August. Based on the data, temperatures have been consistent during the last six months.

Figure 13. Average Temperatures within TP-5 During the Months of March through August

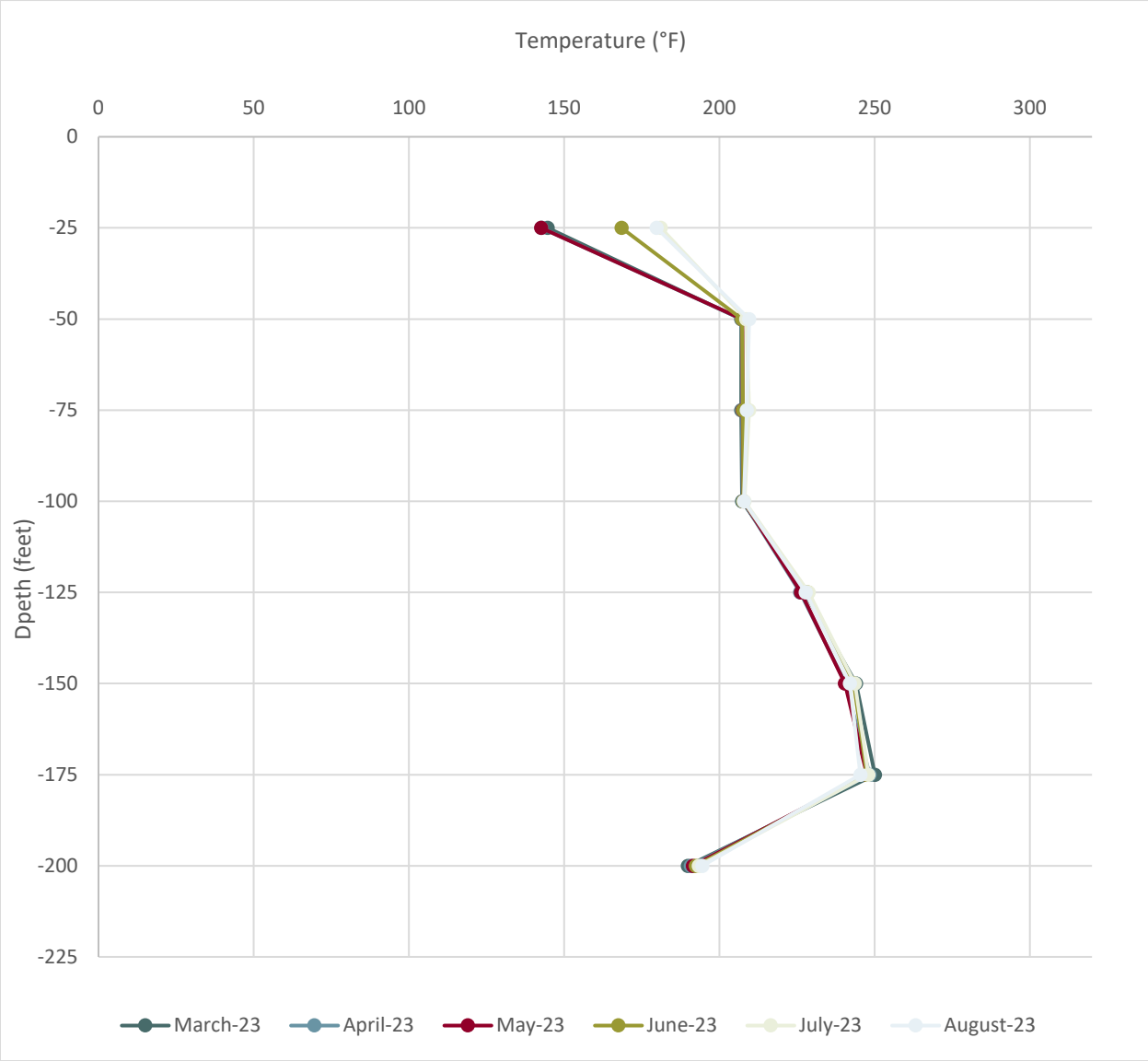


Figure 14 shows daily average temperatures in Temperature Probe 6 (TP-6) during the months of March through August. Based on the data, temperatures have been generally consistent during the last six months. A decrease at the 25-foot level was observed during the month of June. Temperatures returned to baseline during the months of July and August. 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 14. Average Temperatures within TP-6 During the Months of March through August

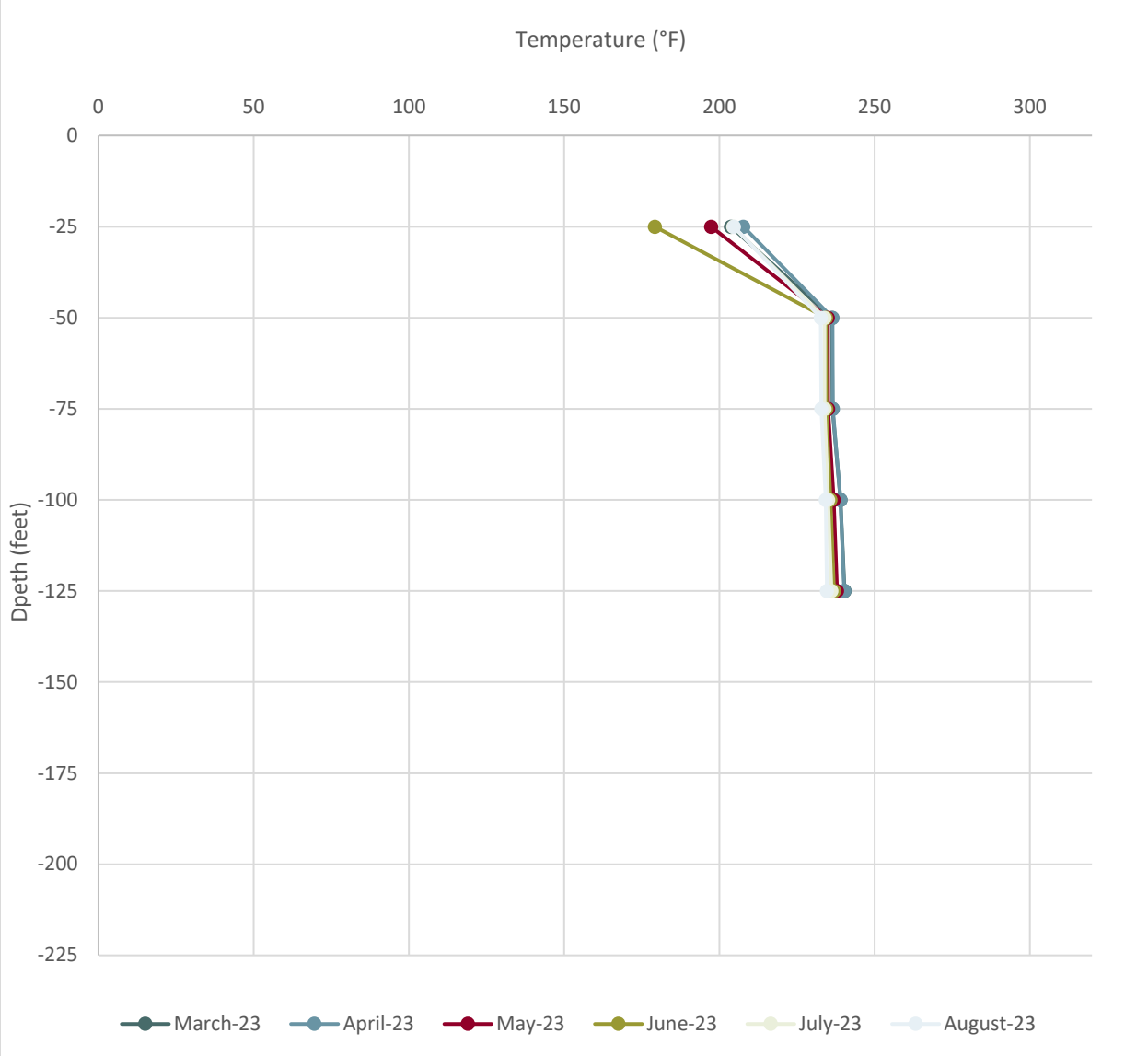


Figure 15 shows daily average temperatures in Temperature Probe 7 (TP-7) during the months of March through August. Based on the data, temperatures have been consistent during the last six months with a general downward trend. TP-7 did not record temperatures after August 12, 2023 due to a dead battery. A replacement battery has been ordered and is scheduled to be installed in September of 2023.

Figure 15. Average Temperatures within TP-7 During the Months of March through August

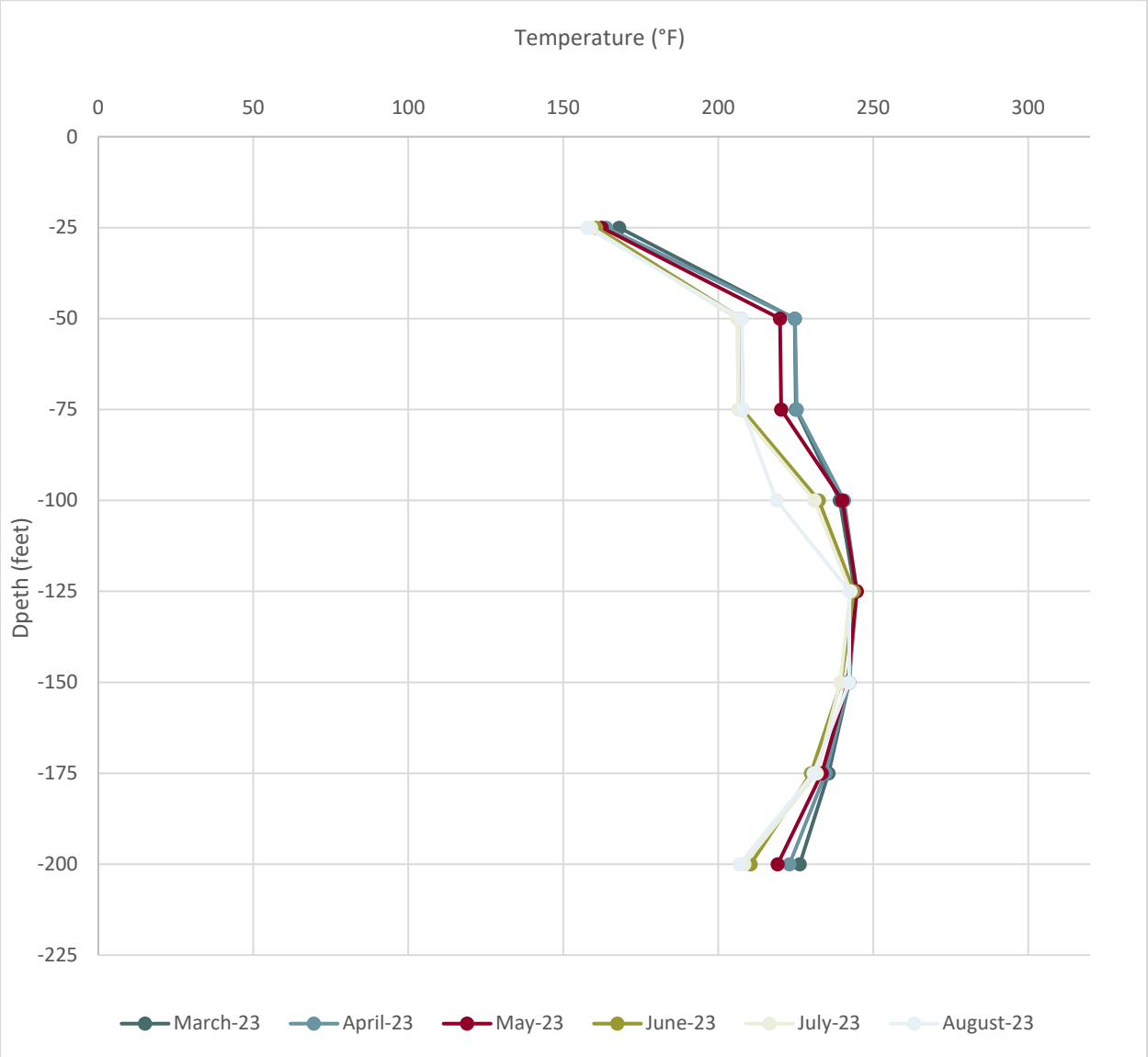


Figure 16 shows daily average temperatures in Temperature Probe 8 (TP-8) during the months of March through August. Based on the data, temperatures have increased during the last six months.

Figure 16. Average Temperatures within TP-8 During the Months of March through August

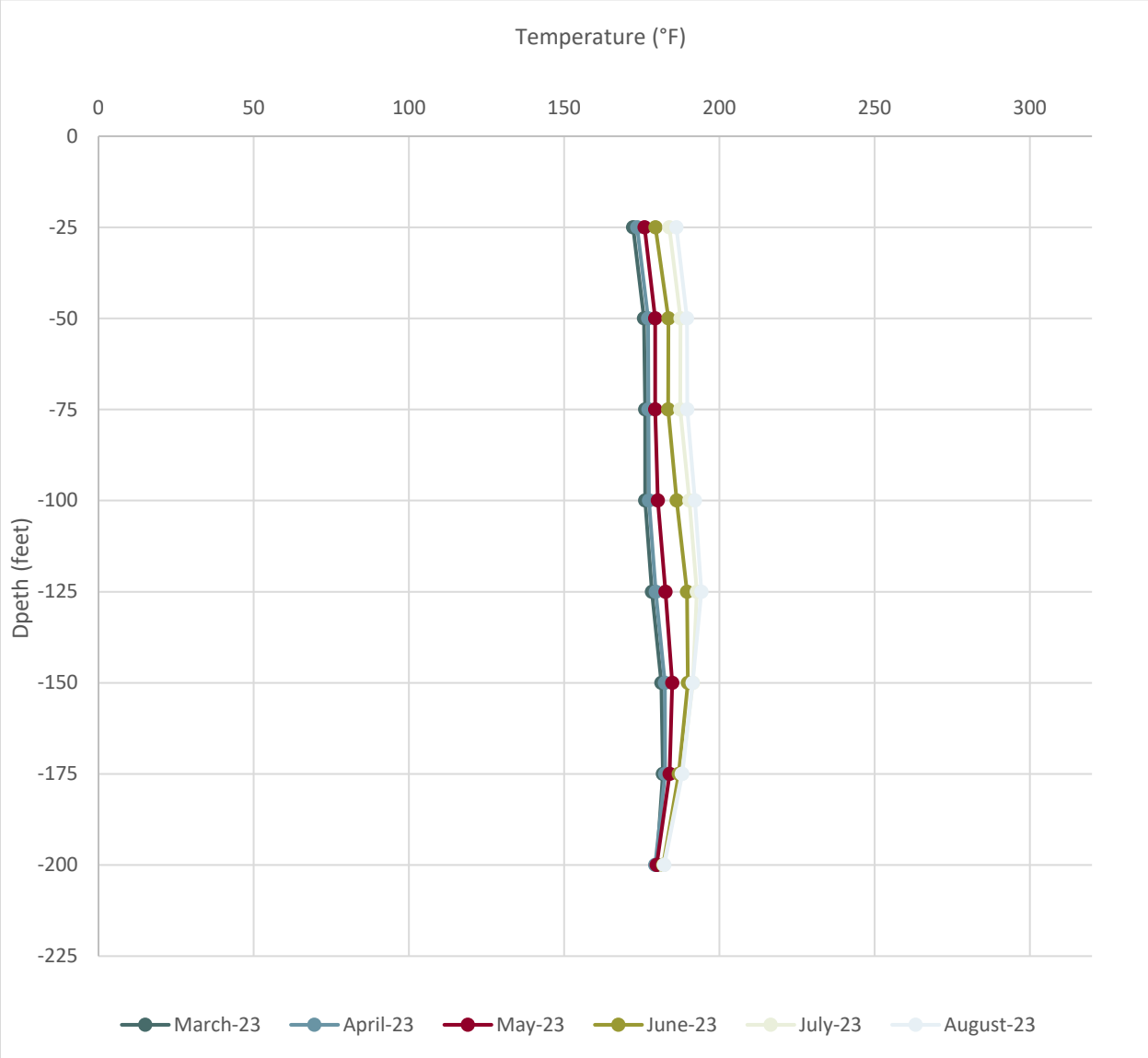
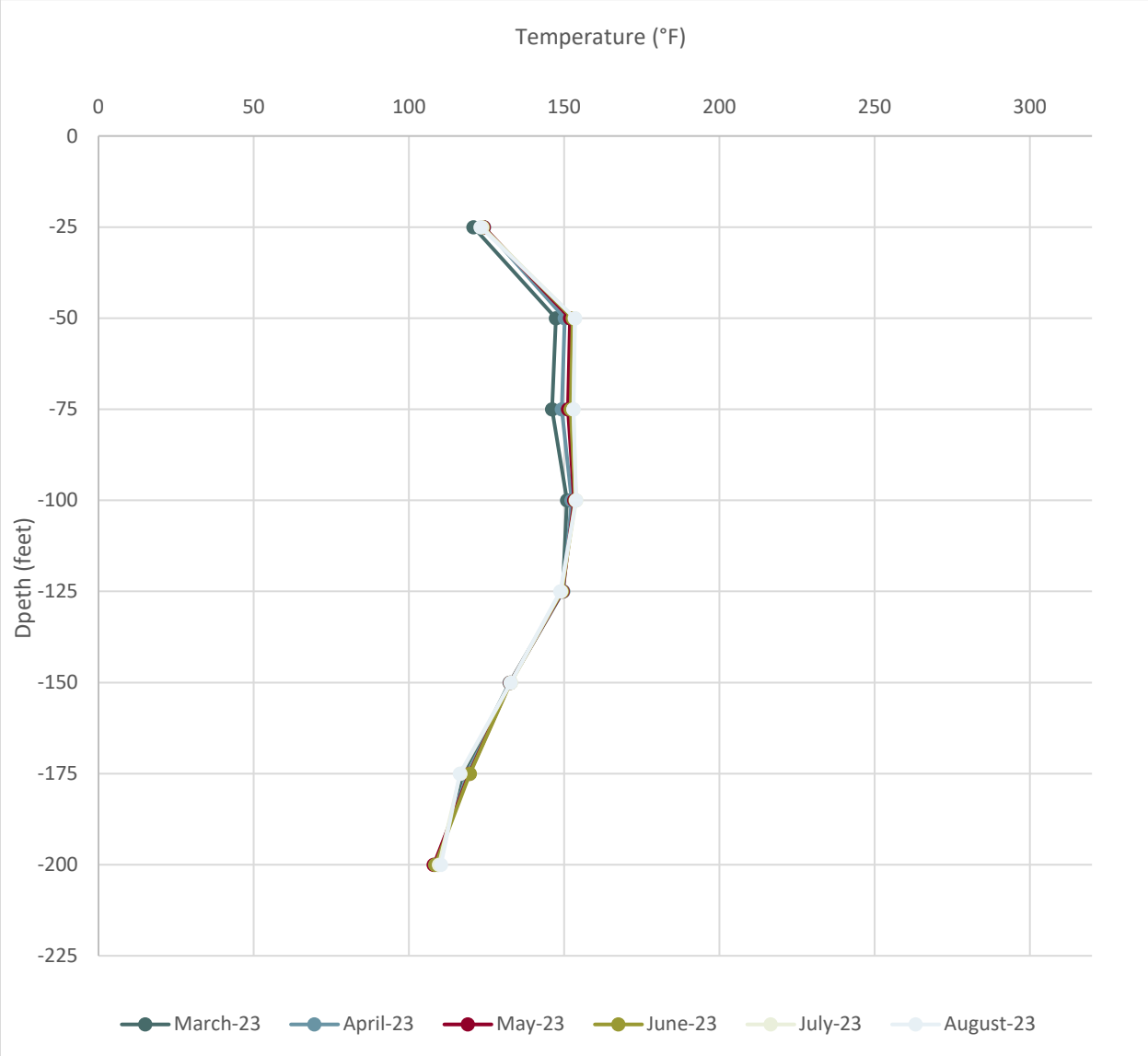


Figure 17 shows daily average temperatures in Temperature Probe 9 (TP-9) during the months of March through August. Based on the data, temperatures have been consistent during the last six months.

TP-9 did not record temperatures after August 18, 2023 due to a dead battery. A replacement battery has been ordered and is scheduled to be installed in September of 2023.

Figure 17. Average Temperatures within TP-9 During the Months of March through August



The data indicates that temperatures within the landfill are generally stable and are typical of those observe at elevated temperature landfills (ETLFs). During the months of May through August, 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 29 wells on August 1, 2023; August 8, 2023; August 14, 2023; August 21, 2023; and August 31, 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	August 1, 2023	August 8, 2023	August 14, 2023	August 21, 2023	August 31, 2023
EW33B					
EW49	737993	761775	770812	777824	777837
EW50	1117888	1135751	1147061	1153480	1193962
EW51	95851	102418	102427	106003	121020
EW52	179107	188325	190952	194313	194700
EW53	2267602	2276068	2295294	2296783	2324772
EW54	537366	549351	553429	577316	584330
EW55	225829	233428	235337	444094	444240
EW57	636359	664162	664450	664508	669677
EW58	2157427	2157427	2316487	2350255	2437320
EW59	2398645	2398726	2398790	2398820	2400181
EW60	343872	359789	409370	462096	484790
EW61	241775	242265	242918	243691	244061
EW62	168288	168288	177544	181389	186410
EW64	152343	153085	155787	162209	174249
EW65	*	*	*	*	*
EW67	731490	758504	772584	845870	957147
EW68	2188254	2203868	2214150	2215523	2215809
EW70	13	13	13	13	13
EW72	27	27	27	27	27
EW73	15	15	15	15	15
EW74	16	16	16	16	16

Well	August 1, 2023	August 8, 2023	August 14, 2023	August 21, 2023	August 31, 2023
EW75	9	9	9	9	9
EW76	13	13	13	13	13
EW78	10843	15997	16506	18506	27509
EW88	132073	132077	132085	132093	158781
EW94	656308	658526	751199	817504	827545
EW98	622400	690507	775325	817504	965879

Based on this data and stroke counts taken on August 31, 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.

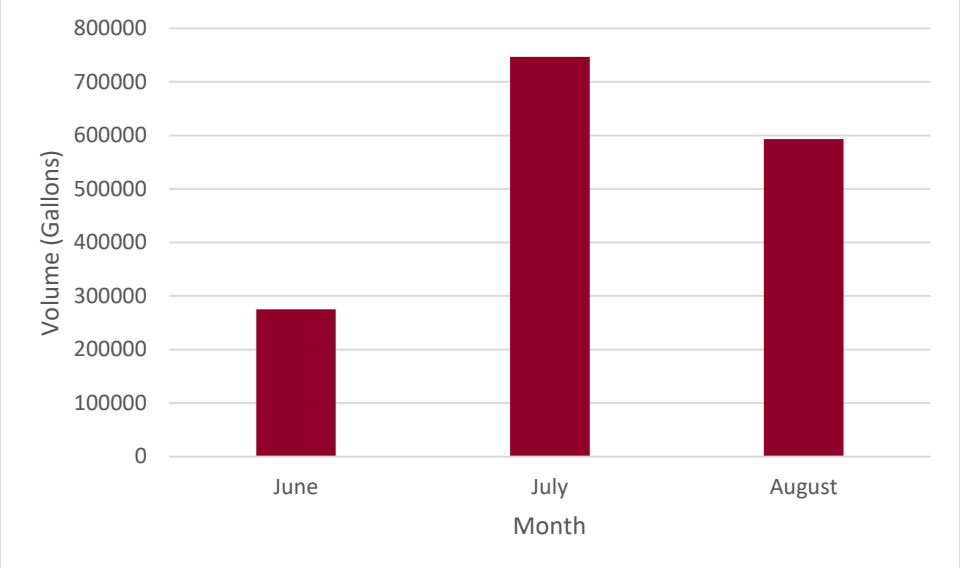
Table 8. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) July 26, 2023 to August 1, 2023	Liquids Removed (gal) August 1, 2023 to August 8, 2023	Liquids Removed (gal) August 8, 2023 to August 14, 2023	Liquids Removed (gal) August 14, 2023 to August 21, 2023	Liquids Removed (gal) August 21, 2023 to August 31, 2023
EW33B	0	0	0	0	
EW49	3649.8	7134.6	2711.1	2107.5	3.9
EW50	5316.6	5358.9	3393	14070.3	12144.6
EW51	315.3	1970.1	2.7	5577.9	4505.1
EW52	1069.5	2765.4	788.1	1124.4	116.1
EW53	598.5	2539.8	5767.8	8843.4	8396.7
EW54	307.2	3595.5	1223.4	9270.3	2104.2
EW55	608.1	2279.7	572.7	62670.9	43.8
EW57	9.6	8340.9	86.4	1568.1	1550.7
EW58	0	0	47718	36249.9	26119.5
EW59	8.4	24.3	19.2	417.3	408.3
EW60	352.5	4775.1	14874.3	22626	6808.2
EW61	68.1	147	195.9	342.9	111
EW62	0	0	2776.8	2659.8	1506.3
EW64	2059.2	222.6	810.6	5538.6	3612
EW65	0	0	0	0	0
EW67	7.5	8104.2	4224	55368.9	33383.1
EW68	2713.5	4684.2	3084.6	497.7	85.8
EW70	0	0	0	0	0
EW72	0	0	0	0	0
EW73	0	0	0	0	0

Well	Liquids Removed (gal) July 26, 2023 to August 1, 2023	Liquids Removed (gal) August 1, 2023 to August 8, 2023	Liquids Removed (gal) August 8, 2023 to August 14, 2023	Liquids Removed (gal) August 14, 2023 to August 21, 2023	Liquids Removed (gal) August 21, 2023 to August 31, 2023
EW74	0	0	0	0	0
EW75	0	0	0	0	0
EW76	0	0	0	0	0
EW78	982.2	1546.2	152.7	3300.9	2700.9
EW88	1.2	1.2	2.4	8008.8	8006.4
EW94	1443	665.4	27801.9	22903.8	3012.3
EW98	33018.9	20432.1	25445.4	57166.2	44512.5
EW100	*	*	*	4007.7	4003.8

SCS estimates that approximately 593,000 gallons of liquids were removed from the landfill gas collection and control system during the month of August. Although there is a decrease from July, the liquids removed represents a continued trend of high volumes of liquid removed for 2023. SCS-FS continues to implement an aggressive maintenance schedule for landfill gas liquids removal pumps. EW-98 removed the largest amount of liquids at 136,000 gallons for August. EW-58 and EW-67 together removed 151,000 gallons. The change in landfill gas liquids removal over the last three months is depicted in Figure 18.

Figure 18. 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 August 2023, pump maintenance occurred on August 3, 2023; August

10, 2023; August 15, 2023; August 22, 2023; and August 29, 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 August, CPS-2, EW-51, EW-52, EW-53, EW-55, EW-67, EW-94, had their pumps removed and replaced. The pump tri-tubing for EW-51, EW-53, EW-55 and EW-67 was found to be compromised and was repaired while those pumps were being maintained. The forcemain HDPE transition fittings were also repaired at EW-54 and EW-55.

Two additional dewatering pumps were installed during the month of August. These installs occurred at EW-85 and EW-100. The two 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 August 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 August 15, 2023, SCS collected leachate samples from four Dual Phase LFG-EWs (EW-54, EW-57, 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 following wells for the following reasons:

- Pumps were not running at the time of sample collection for the following wells: EW-33B, EW-49, EW-50, EW-52, EW-53, EW-55, EW-57, EW-59, EW-60, EW-62, EW-64, EW-65, EW-67, EW-68, EW-70, EW-72, EW-73, EW-74, EW-75, EW-76, and EW-78.
- The air hose was disconnected from EW-51.
- Pump was disconnected for EW-56.
- No sample port for EW-58

- There is no sample port and pumps were not running at the time of sample collection for the following wells: EW-61, EW-71, EW-84, EW-88, and EW-95

- No pump was installed in well EW-36A, EW-63, EW-69, EW-77, EW-79 – EW-83, EW-86, EW-87, EW-89 – EW-93, EW-96, EW-97, EW-99, and EW-100.

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 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 like 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 or trip blank detects were identified for the August 2023 monitoring event. The laboratory analysis report for the August 2023 monitoring event trip blank is included in **Appendix F**. The August 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 August 2023 monitoring event as no constituents were detected in the August 2023 method or trip blanks. The constituent detections flagged with a "J" qualifier are shown on **Table 9**.

4.2.4 Laboratory Analytical Results

Chemical characteristics of the August 2023 leachate samples collected from extraction wells EW-54, EW-57, EW-94, and EW-98 are summarized in **Table 9**. The associated COA is included in **Appendix F**. Parameter results from August 2023 and previous monitoring events (November 2022 – July 2023) are presented on a table in **Appendix F**.

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-54	EW-57	EW-94	EW-98	LOD	LOQ
Parameter	August 2023 Concentration					
Ammonia as N (mg/L)	**1600**	**1890**	**2140**	**222**	146	200
Biological Oxygen Demand (mg/L)	**>33045**	**>33225**	**>32805**	**506**	0.2	2
Chemical Oxygen Demand (mg/L)	---	---	---	**1750**	500	500
	59000	**58600**	**60600**	---	5000	5000
Nitrate as N (mg/L)	---	---	---	ND	0.15	0.35

[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-54	EW-57	EW-94	EW-98	LOD	LOQ
Parameter	August 2023 Concentration					
	ND	ND	ND	---	1.5	3.5
Nitrite as N (mg/L)	---	---	---	ND	0.05	0.25
	ND	ND	ND	---	0.5	2.5
Total Kjeldahl Nitrogen (mg/L)	---	---	---	**279**	10	25
	2240	**2820**	**2850**	---	100	250
Total Recoverable Phenolics (mg/L)	---	---	---	**1.46**	0.15	0.25
	28.6	**31.4**	**40.4**	---	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)						
Anthracene	---	---	---	ND	19.6	39.2
	ND	ND	ND	---	1000	2000
TOTAL METALS (mg/L)						
Arsenic	---	---	---	**0.15**	0.0025	0.005
	0.32	**0.43**	**0.29**	---	0.005	0.01
Barium	---	---	---	**0.218**	0.005	0.025
	1.61	**1.58**	**1.48**	---	0.01	0.05
Cadmium	---	---	---	ND	0.0005	0.005
	ND	ND	ND	---	0.001	0.01
Chromium	---	---	---	**0.0276**	0.002	0.005
	0.606	**0.449**	**0.259**	---	0.004	0.01
Copper	---	---	---	ND	0.0015	0.005
	0.00343 J	**0.0176**	ND	---	0.003	0.01
Lead	---	---	---	ND	0.005	0.005
	0.014	ND	**0.013**	---	0.01	0.01
Mercury	---	---	---	ND	0.001	0.001
	0.00312	**0.00397**	ND	---	0.002	0.002
Nickel	---	---	---	**0.02029**	0.005	0.005
	0.1457	**0.09673**	**0.0513**	---	0.01	0.01
Selenium	---	---	---	ND	0.00425	0.005
	ND	ND	ND	---	0.0085	0.01
Silver	---	---	---	ND	0.0003	0.005
	ND	ND	ND	---	0.0006	0.01
Zinc	---	---	---	**0.112**	0.0125	0.025
	---	**1.71**	**0.914**	---	0.025	0.05
	5.92	---	---	---	0.05	0.1
VOLATILE ORGANIC COMPOUNDS (ug/L)						
2-Butanone (MEK)	---	---	---	**5950**	60	200

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-54	EW-57	EW-94	EW-98	LOD	LOQ
Parameter	August 2023 Concentration					
	---	---	**7350**	---	150	500
	---	**3000**	---	---	750	2500
	25600	---	---	---	1500	5000
Acetone	---	---	---	**20900**	700	1000
	---	**18700**	---	---	1750	2500
	72500	---	**87700**	---	3500	5000
Benzene	---	---	---	**379**	8	20
	2320	**168**	ND	---	20	50
Ethylbenzene	---	---	---	**16.8 J**	8	20
	80	ND	ND	---	20	50
Tetrahydrofuran	---	---	---	**2880**	200	200
	7370	**3210**	**1200**	---	500	500
Toluene	---	---	---	**36.6**	10	20
	105	ND	ND	---	25	50
Xylenes, Total	---	---	---	**48.4 J**	20	60
	180	ND	ND	---	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

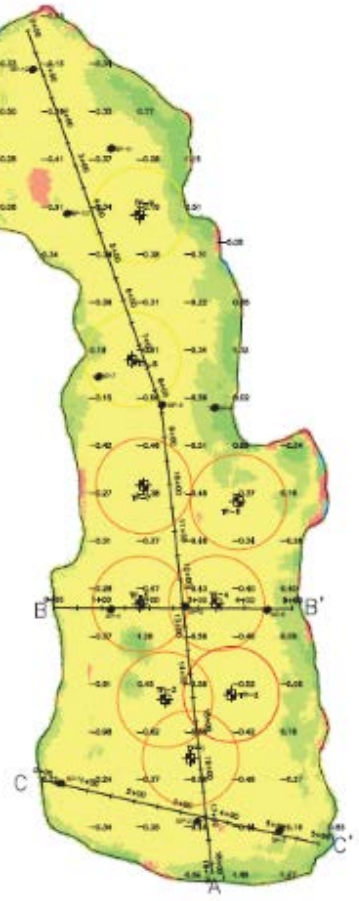
The City, through SCS, collected topographic data of the Solid Waste Permit No. 588 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On August 2, 2023, the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 2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

The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on July 12, 2023. A drawing depicting the July 12, 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 9,900 cubic yards. During that same time period, approximately 4,100 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 5,800 cubic yards.

A visual depiction of settlement and filling at the landfill during this time is depicted in Figure 19. 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 19. 1-Month Elevation Change Color Map



The locations of in-waste temperature monitoring probes are also shown on Figure 19 and Figure 20. 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 temperatures measured at locations 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 an 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 0.5 feet 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 generally lower. The changes in elevation observed in the northern end of the landfill 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 0.21 feet.

SCS also compared the topographic data collected in August to the topographic data collected on May 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 25,200 cubic yards. During that same time period approximately 13,500 cubic yards of construction-related fill were placed on the landfill. This fill was primarily soil placed as part of the sidewall odor mitigation system construction. This resulted in a net volume decrease of approximately 11,700 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 4 in Appendix E.

Figure 20. 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

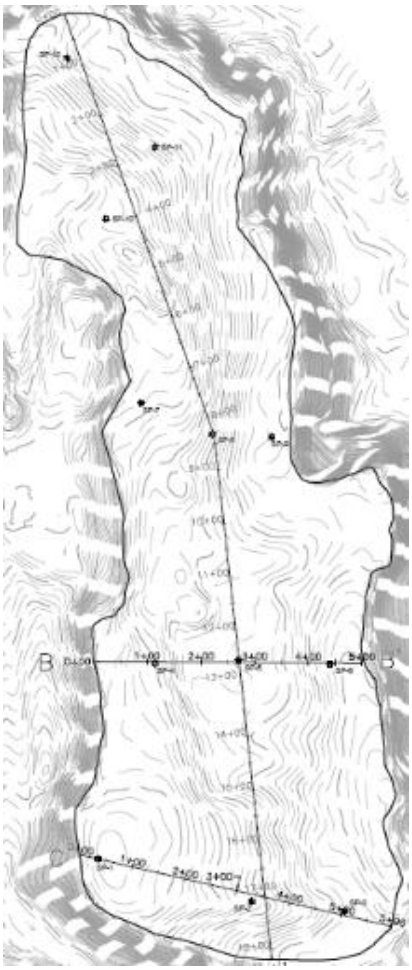
gas wells and temperature probes exhibiting higher temperatures. These higher settlement values are typical of elevated temperature landfill conditions. Settlement in the northern portion of the landfill was generally less substantial or was offset by soil placement associated with construction activities. Changes in elevation in these areas are more representative of typical settlement at municipal landfills. The perimeter of the landfill exhibited an increase in elevation, likely due to sediment deposition during storm events and soil placement associated with construction 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 September using photogrammetric methods via UAV. This data will be compared to the data collected in August and June.

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 21 and on Sheet 1 in Appendix E.

Figure 21. 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; July 10, 2023; and August 17, 2023. The surveyed coordinates[5] and elevation changes of the settlement plates are shown in Table 10.

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

Table 10. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation on August 17, 2023	Elevation Change Since July 10, 2023	Strain[6] Since July 10, 2023	Elevation Change Since Installation	Strain Since Installation
SP-1	3,397,886.9	10,412,078.9	1,831.4	-0.4	-0.5%	-3.0	-4.5%
SP-2	3,397,808.9	10,412,365.3	1,804.7	-0.5	-0.3%	-5.8	-3.6%
SP-3[7]	3,397,787.5	10,412,537.9	1,783.0	0.2	0.3%	-0.7	-1.0%
SP-4[8]	3,398,248.4	10,412,187.5	1,810.6	-0.6	-0.4%	-6.9	-4.4%
SP-5	3,398,255.9	10,412,339.1	1,795.8	-0.6	-0.2%	-5.0	-2.0%
SP-6	3,398,249.1	10,412,510.5	1,776.1	-0.2	-0.1%	-1.6	-1.2%
SP-7[9]	3,398,735.5	10,412,157.6	1,826.7	-0.3	-0.3%	-2.0	-1.7%
SP-8	3,398,678.5	10,412,290.8	1,803.6	-0.4	-0.2%	-3.8	-1.5%
SP-9	3,398,673.7	10,412,400.9	1,783.5	-0.4	-0.4%	-2.4	-2.4%
SP-10	3,399,080.5	10,412,092.1	1,838.8	-0.1	-0.1%	-1.4	-0.5%
SP-11	3,399,216.2	10,412,183.6	1,815.6	-0.2	-0.1%	-0.7	-0.3%
SP-12	3,399,381.8	10,412,019.5	1,810.2	-0.1	-0.1%	-0.4	-0.4%

Settlement Plates 1, 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. Settlement Plate 1is 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 6, 10, 11, and 12 was lower and more representative of typical settlement at municipal landfills. The change in elevation at Settlement Plates 2, 5, and 8 falls somewhere in between these two categories. Field observations indicate that Settlement Plates 3 and 7 may also have been damaged during construction operations.

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

6.0 INTERMEDIATE COVER AND EVOH COVER SYSTEM

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

[6] Strain is defined as the change in elevation divided by the estimated waste depth.
[7] SCS suspects that SP-3 was damaged as a result of construction activities.
[8] Based on field observations SP-4 appears to have been disturbed during grading on an adjacent roadway.
[9] Based on field observations SP-7 appears to have been disturbed during grading on an adjacent stockpile.

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 held a call with VDEQ personnel on August 31, 2023 to discuss potential changes to the EVOH Cover System design. The modifications include installing three separate stormwater basins within the quarry rather than one single basin. The proposed stormwater pumping infrastructure will be expanded to meet the requirements of the three basins. SCS is preparing a revised stormwater management plan to submit to VDEQ.

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. A follow-up discussion was held with VDEQ on August 31, 2023 to discuss modifications to the stormwater management plan. The new modifications include increasing the number of stormwater basins within the quarry and reducing required earthwork.

The revised plan will propose 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 collection basins in the quarry and the installation of pairs of mobile stormwater pumps. The stormwater will be conveyed by a force main pipe or pipes 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 basins 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 may affect some existing landfill gas infrastructure. The

Attention is being given to settlement concerns in the vicinity of the stormwater basin or basins. 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 for each basin, 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 pumps to allow for continued operation in the

event of a temporary power loss. The pumps have been selected to include additional pumping 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 or basins 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 August, those actions include:

- **August – ongoing basis**: Nine 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 article about Bristol, TN and Bristol, VA asking the court to approve the final landfill order
  - Released joint statement from Bristol, TN and Bristol, VA about the EPA and U.S. Department of Justice's non-intervention on the federal consent order
  - Notice that the Landfill Consent Order has been entered in federal court
  - Provided links to news articles chronicling construction updates and information on legal updates about the quarry landfill.
- **Created new landing page on Bristolvalandfill.org titled "Air Sampling and Air Monitoring" that includes a summary of the air sampling and monitoring being conducted by Bristol, VA around the quarry landfill.** The page explaining the process the city is taking and includes reports from the sampling and monitoring that has occurred already. This page and the weekly perimeter monitoring reports will be updated as new information is collected.
- **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, August 4th
    - Friday, August 11th
    - Monday, August 21st
    - Friday, August 25th
    - Tuesday, August 29th
    - Thursday, August 31st

Appendix A

Surface Emissions Monitoring Summary Letters

August 9, 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 – August 4, 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 August 4, 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	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	8/4/23 Event	8/4/23 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-98	6/29/23	30-Day Retest Follow-Up	Passed	Exceedance Resolved
Tag 66	7/7/23	30-Day Retest	Passed	Exceedance Resolved
EW-35	7/12/23	N/A	Passed	Requires 30-Day Retest
EW-55	7/12/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/21/23	2nd 10-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 76	7/21/23	N/A	Passed	Requires 30-Day Retest
Tag 100	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-58	7/21/23	2nd 10-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-67	7/21/23	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-86	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-88	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-99	7/28/23	10-Day Retest	Passed	Requires 30-Day Retest

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

Sincerely,

Wylie Hicklin

Lucas S. Nachman

Wylie R Hicklin
Associate Staff Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WRH/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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 4, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	2.6 PPM	OK			Start Serpentine Route
2	55.3 PPM	OK			
3	1.1 PPM	OK			
4	1.0 PPM	OK			
5	1.0 PPM	OK			
6	1.0 PPM	OK			
7	1.1 PPM	OK			
8	1.0 PPM	OK			
9	0.9 PPM	OK			
10	2.2 PPM	OK			
11	2.8 PPM	OK			
12	1.0 PPM	OK			
13	5.2 PPM	OK			
14	1.3 PPM	OK			
15	11.6 PPM	OK			
16	7.1 PPM	OK			
17	6.0 PPM	OK			
18	2.7 PPM	OK			
19	2.4 PPM	OK			
20	30.2 PPM	OK			
21	27.3 PPM	OK			
22	33.7 PPM	OK			
23	129.0 PPM	OK			
24	55.4 PPM	OK			
25	54.7 PPM	OK			
26	294.0 PPM	OK			
27	26.8 PPM	OK			
28	39.0 PPM	OK			
29	93.5 PPM	OK			
30	4.2 PPM	OK			
31	12.7 PPM	OK			
32	3.8 PPM	OK			
33	5.5 PPM	OK			
34	4.5 PPM	OK			
35	10.6 PPM	OK			
36	36.2 PPM	OK			
37	4.3 PPM	OK			
38	11.6 PPM	OK			
39	163.0 PPM	OK			
40	4.8 PPM	OK			
41	46.3 PPM	OK			
42	0.9 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 4, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	89.6 PPM	OK			
44	3.2 PPM	OK			
45	2.0 PPM	OK			
46	0.5 PPM	OK			
47	0.4 PPM	OK			
48	0.3 PPM	OK			
49	1.4 PPM	OK			
50	0.3 PPM	OK			
51	0.5 PPM	OK			
52	0.2 PPM	OK			
53	0.2 PPM	OK			
54	0.3 PPM	OK			
55	0.1 PPM	OK			
56	0.0 PPM	OK			
57	0.1 PPM	OK			
58	0.1 PPM	OK			
59	0.1 PPM	OK			
60	1.3 PPM	OK			
61	28.6 PPM	OK			
62	92.2 PPM	OK			
63	13.1 PPM	OK			
64	19.9 PPM	OK			
65	62.2 PPM	OK			
66	43.8 PPM	OK			
67	44.5 PPM	OK			
68	203.0 PPM	OK			
69	6280.0 PPM	HIGH_ALRM	36.59799	-82.14730	
70	16.6 PPM	OK			
71	31.9 PPM	OK			
72	76.5 PPM	OK			
73	66.8 PPM	OK			
74	308.0 PPM	OK			
75	91.1 PPM	OK			
76	304.0 PPM	OK			
77	2.0 PPM	OK			
78	0.7 PPM	OK			
79	1.0 PPM	OK			
80	0.3 PPM	OK			
81	0.0 PPM	OK			
82	0.0 PPM	OK			
83	0.0 PPM	OK			
84	0.0 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 4, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	0.0 PPM	OK			
86	0.0 PPM	OK			
87	2.0 PPM	OK			
88	0.9 PPM	OK			
89	0.0 PPM	OK			
90	0.0 PPM	OK			
91	10.5 PPM	OK			
92	349.0 PPM	OK			
93	23.6 PPM	OK			
94	49.7 PPM	OK			
95	313.0 PPM	OK			
96	24.4 PPM	OK			
97	52.8 PPM	OK			
98	31.1 PPM	OK			
99	11.5 PPM	OK			
100	2.0 PPM	OK			End Serpentine Route
101	244.0 PPM	OK			EW-35
102	609.0 PPM	HIGH_ALRM	36.59894	-82.14754	EW-52
103	34.1 PPM	OK			TP-4
104	167.0 PPM	OK			EW-60
105	234.0 PPM	OK			EW-48
106	25.0 PPM	OK			TP-6
107	20.1 PPM	OK			EW-61
108	4.1 PPM	OK			EW-34
109	18.3 PPM	OK			EW-50
110	156.0 PPM	OK			EW-67
111	885.0 PPM	HIGH_ALRM	36.59854	-82.14772	EW-47
112	369.0 PPM	OK			EW-54
113	3348.0 PPM	HIGH_ALRM	36.69865	-82.14741	EW-55
114	12.9 PPM	OK			TP-2
115	591.0 PPM	HIGH_ALRM	36.59857	-82.14760	EW-66
116	3438.0 PPM	HIGH_ALRM	36.59831	-82.14724	EW-58
117	451.0 PPM	OK			EW-57
118	72.4 PPM	OK			TP-1
119	238.0 PPM	OK			EW-59
120	95.2 PPM	OK			EW-56
121	1415.0 PPM	HIGH_ALRM	36.59835	-82.14782	EW-41
122	123.0 PPM	OK			EW-53
123	11.5 PPM	OK			EW-40
124	9.4 PPM	OK			TP-3
125	130.0 PPM	OK			EW-51

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 4, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	4.2 PPM	OK			EW-39
127	16.8 PPM	OK			TP-5
128	2.1 PPM	OK			EW-68
129	824.0 PPM	HIGH_ALRM	36.59926	-82.14802	EW-38
130	169.0 PPM	OK			TP-7
131	3.0 PPM	OK			EW-49
132	2.5 PPM	OK			EW-31R
133	4.6 PPM	OK			EW-65
134	1.2 PPM	OK			EW-37
135	0.2 PPM	OK			TP-8
136	11.1 PPM	OK			EW-64
137	0.0 PPM	OK			EW-30R
138	0.0 PPM	OK			EW-63
139	0.0 PPM	OK			EW-42
140	3.5 PPM	OK			TP-9
141	0.0 PPM	OK			EW-33R
142	0.0 PPM	OK			EW-62
143	0.0 PPM	OK			EW-29R
144	0.0 PPM	OK			EW-74
145	0.0 PPM	OK			EW-32R
146	0.0 PPM	OK			EW-69
147	0.0 PPM	OK			EW-71
148	0.0 PPM	OK			EW-72
149	10.2 PPM	OK			EW-70
150	0.0 PPM	OK			EW-73
151	98.6 PPM	OK			EW-76
152	0.0 PPM	OK			EW-78
153	16.5 PPM	OK			EW-82
154	0.0 PPM	OK			EW-85
155	78.0 PPM	OK			EW-88
156	13.6 PPM	OK			EW-89
157	14.7 PPM	OK			EW-93
158	21.8 PPM	OK			EW-94
159	284.0 PPM	OK			EW-98
160	12.4 PPM	OK			EW-100
161	216.0 PPM	OK			EW-99
162	34.2 PPM	OK			EW-95
163	11.0 PPM	OK			EW-90
164	41.1 PPM	OK			EW-86
165	0.9 PPM	OK			EW-84
166	2.9 PPM	OK			EW-80
167	0.3 PPM	OK			EW-79
168	0.0 PPM	OK			EW-33B
169	0.0 PPM	OK			EW-75

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 4, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	169
Number of exceedance locatio	8

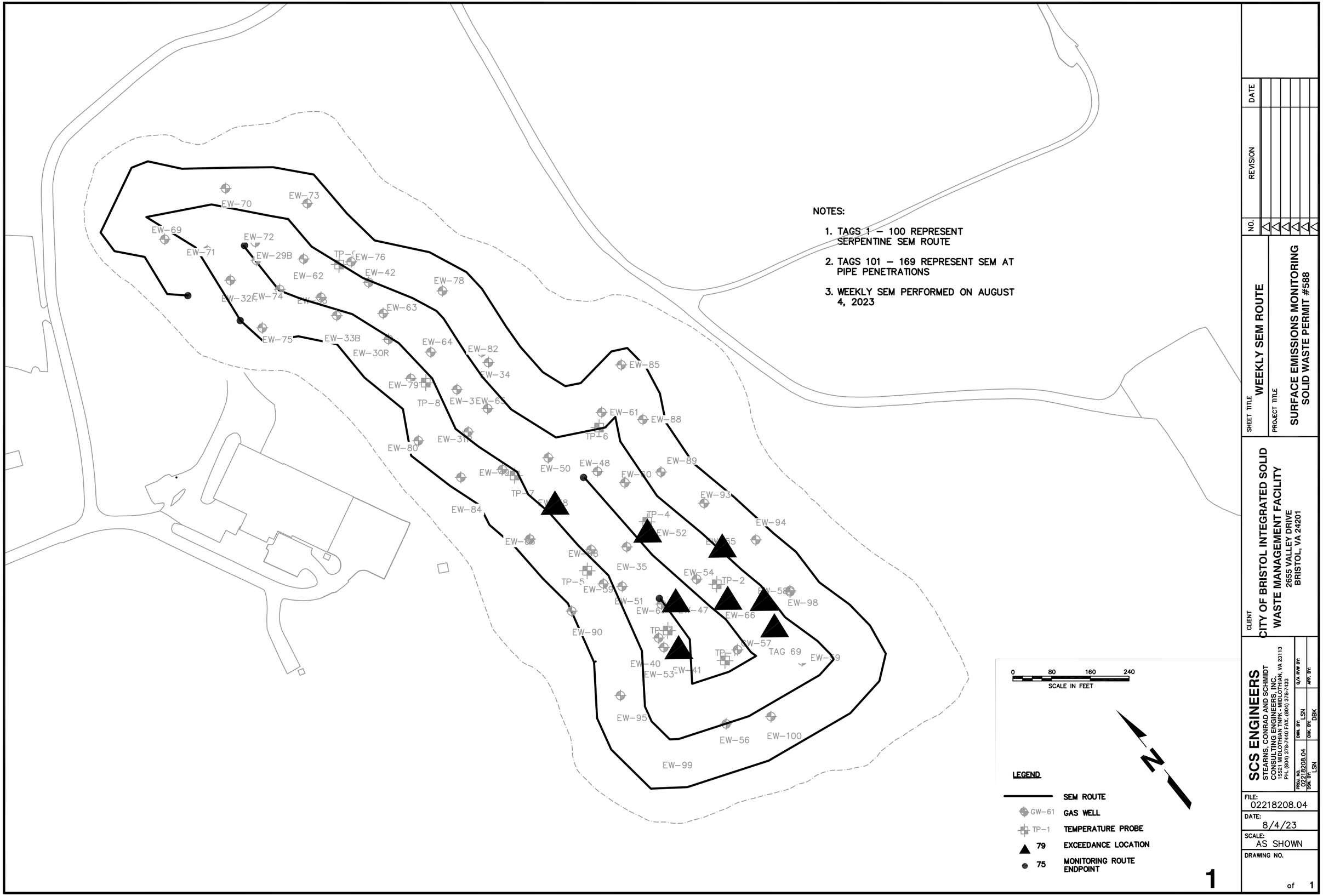
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 168 represent SEM at Pipe Penetrations
Weather Conditions: Partly Sunny, 74°F Wind: SW - 5 MPH

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

8/4/2023	9:22	ZERO	0.1	PPM
8/4/2023	9:23	SPAN	502.0	PPM

Background Reading:

8/4/2023	9:25	Upwind	3.6	PPM
8/4/2023	9:29	Downwind	5.9	PPM



1

NO.	REVISION	DATE

SHEET TITLE: WEEKLY SEM ROUTE

PROJECT TITLE: SURFACE EMISSIONS MONITORING SOLID WASTE PERMIT #588

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

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

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

FILE: 02218208.04

DATE: 8/4/23

SCALE: AS SHOWN

DRAWING NO.

of 1

August 16, 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 – August 11, 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 August 11, 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	170
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	70
Number of Exceedances	10
Number of Serpentine Exceedances	1
Number of Pipe Penetration Exceedances	9

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	8/11/23 Event	8/11/23 Event Result	Comments
EW-66	5/25/23	N/A	Passed	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-35	7/12/23	30-Day Retest	Passed	Exceedance Resolved
EW-55	7/12/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/21/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 76	7/21/23	N/A	Passed	Requires 30-Day Retest
Tag 100	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-58	7/21/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-67	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-86	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-88	7/21/23	N/A	Passed	Requires 30-Day Retest
EW-99	7/28/23	N/A	Passed	Requires 30-Day Retest
EW-52	8/4/23	10-Day Retest	Failed	Requires 2nd 10-Day Retest
EW-47	8/4/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-41	8/4/23	10-Day Retest	Passed	Requires 30-Day Retest

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

Sincerely,

Wylie Hicklin

Lucas S. Nachman

Wylie R Hicklin
Associate Staff Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WRH/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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 11, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	2.7 PPM	OK			Start Serpentine Route
2	1.3 PPM	OK			
3	1.0 PPM	OK			
4	0.8 PPM	OK			
5	0.8 PPM	OK			
6	0.7 PPM	OK			
7	0.7 PPM	OK			
8	1.6 PPM	OK			
9	0.7 PPM	OK			
10	1.0 PPM	OK			
11	0.7 PPM	OK			
12	0.6 PPM	OK			
13	0.8 PPM	OK			
14	15.0 PPM	OK			
15	1.3 PPM	OK			
16	1.5 PPM	OK			
17	5.6 PPM	OK			
18	14.0 PPM	OK			
19	28.0 PPM	OK			
20	167.0 PPM	OK			
21	70.3 PPM	OK			
22	41.9 PPM	OK			
23	2.5 PPM	OK			
24	11.4 PPM	OK			
25	57.3 PPM	OK			
26	61.1 PPM	OK			
27	7.2 PPM	OK			
28	3.3 PPM	OK			
29	2.6 PPM	OK			
30	50.4 PPM	OK			
31	11.0 PPM	OK			
32	204.0 PPM	OK			
33	3.5 PPM	OK			
34	13.0 PPM	OK			
35	35.7 PPM	OK			
36	2.3 PPM	OK			
37	188.0 PPM	OK			
38	7.7 PPM	OK			
39	2.7 PPM	OK			
40	1.5 PPM	OK			
41	1.8 PPM	OK			
42	5.2 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 11, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	1.7 PPM	OK			
44	0.5 PPM	OK			
45	0.7 PPM	OK			
46	2.2 PPM	OK			
47	0.4 PPM	OK			
48	0.3 PPM	OK			
49	0.4 PPM	OK			
50	0.5 PPM	OK			
51	0.3 PPM	OK			
52	0.2 PPM	OK			
53	0.2 PPM	OK			
54	1.6 PPM	OK			
55	0.2 PPM	OK			
56	0.4 PPM	OK			
57	0.2 PPM	OK			
58	8.2 PPM	OK			
59	2.5 PPM	OK			
60	2.3 PPM	OK			
61	12.0 PPM	OK			
62	10.7 PPM	OK			
63	21.2 PPM	OK			
64	7.5 PPM	OK			
65	62.1 PPM	OK			
66	32.5 PPM	OK			
67	300.0 PPM	OK			
68	316.0 PPM	OK			
69	9985.0 PPM	HIGH_ALRM	36.59788	-82.14721	
70	19.4 PPM	OK			
71	68.5 PPM	OK			
72	53.0 PPM	OK			
73	9.4 PPM	OK			
74	31.5 PPM	OK			
75	4.2 PPM	OK			
76	2.1 PPM	OK			
77	0.6 PPM	OK			
78	0.5 PPM	OK			
79	6.1 PPM	OK			
80	2.3 PPM	OK			
81	2.0 PPM	OK			
82	1.4 PPM	OK			
83	0.3 PPM	OK			
84	0.9 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 11, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	0.1 PPM	OK			
86	0.1 PPM	OK			
87	0.1 PPM	OK			
88	0.0 PPM	OK			
89	0.0 PPM	OK			
90	2.0 PPM	OK			
91	7.7 PPM	OK			
92	85.1 PPM	OK			
93	0.2 PPM	OK			
94	90.8 PPM	OK			
95	6.9 PPM	OK			
96	15.7 PPM	OK			
97	61.9 PPM	OK			
98	3.4 PPM	OK			
99	67.8 PPM	OK			
100	5.5 PPM	OK			End Serpentine Route
101	64.1 PPM	OK			EW-35
102	696.0 PPM	HIGH_ALRM	36.59885	-82.14728	EW-52
103	3.2 PPM	OK			TP-4
104	165.0 PPM	OK			EW-60
105	430.0 PPM	OK			EW-48
106	13.8 PPM	OK			TP-6
107	10.1 PPM	OK			EW-61
108	11.2 PPM	OK			EW-34
109	22.1 PPM	OK			EW-50
110	65.0 PPM	OK			EW-67
111	103.0 PPM	OK			EW-47
112	834.0 PPM	HIGH_ALRM	36.59838	-82.14763	EW-54
113	1492.0 PPM	HIGH_ALRM	36.59861	-82.14718	EW-55
114	11.8 PPM	OK			TP-2
115	63.1 PPM	OK			EW-96
116	145.0 PPM	OK			EW-66
117	1057.0 PPM	HIGH_ALRM	36.59814	-82.14701	EW-58
118	435.0 PPM	OK			EW-57
119	162.0 PPM	OK			TP-1
120	453.0 PPM	OK			EW-59
121	113.0 PPM	OK			EW-56
122	179.0 PPM	OK			EW-41
123	108.0 PPM	OK			EW-53
124	146.0 PPM	OK			EW-40
125	3.7 PPM	OK			TP-3

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 11, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	170.0 PPM	OK			EW-51
127	637.0 PPM	HIGH_ALRM	36.59895	-82.14801	EW-39
128	14.8 PPM	OK			TP-5
129	17.0 PPM	OK			EW-68
130	1233.0 PPM	HIGH_ALRM	36.59934	-82.14798	EW-38
131	155.0 PPM	OK			TP-7
132	72.6 PPM	OK			EW-49
133	14.3 PPM	OK			EW-31R
134	11.4 PPM	OK			EW-65
135	10.0 PPM	OK			EW-37
136	3.9 PPM	OK			TP-8
137	1.9 PPM	OK			EW-64
138	2.5 PPM	OK			EW-30R
139	2.4 PPM	OK			EW-63
140	3.3 PPM	OK			EW-42
141	6.5 PPM	OK			TP-9
142	0.5 PPM	OK			EW-33R
143	0.7 PPM	OK			EW-62
144	0.7 PPM	OK			EW-29R
145	0.5 PPM	OK			EW-74
146	0.4 PPM	OK			EW-32R
147	0.2 PPM	OK			EW-69
148	1.2 PPM	OK			EW-71
149	0.4 PPM	OK			EW-72
150	0.3 PPM	OK			EW-70
151	0.3 PPM	OK			EW-73
152	203.0 PPM	OK			EW-76
153	9.0 PPM	OK			EW-78
154	406.0 PPM	OK			EW-82
155	16.2 PPM	OK			EW-85
156	244.0 PPM	OK			EW-88
157	2.8 PPM	OK			EW-89
158	2.7 PPM	OK			EW-93
159	3.6 PPM	OK			EW-94
160	632.0 PPM	HIGH_ALRM	36.59842	-82.14692	EW-98
161	36.5 PPM	OK			EW-100
162	308.0 PPM	OK			EW-99
163	954.0 PPM	HIGH_ALRM	36.59828	-82.14833	EW-95
164	3233.0 PPM	HIGH_ALRM	36.5988	-82.14826	EW-90
165	13.8 PPM	OK			EW-86
166	3.1 PPM	OK			EW-84
167	3.6 PPM	OK			EW-80
168	1.1 PPM	OK			EW-79
169	1.8 PPM	OK			EW-33B
170	2.0 PPM	OK			EW-75

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 11, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	170
Number of exceedance locatio	10

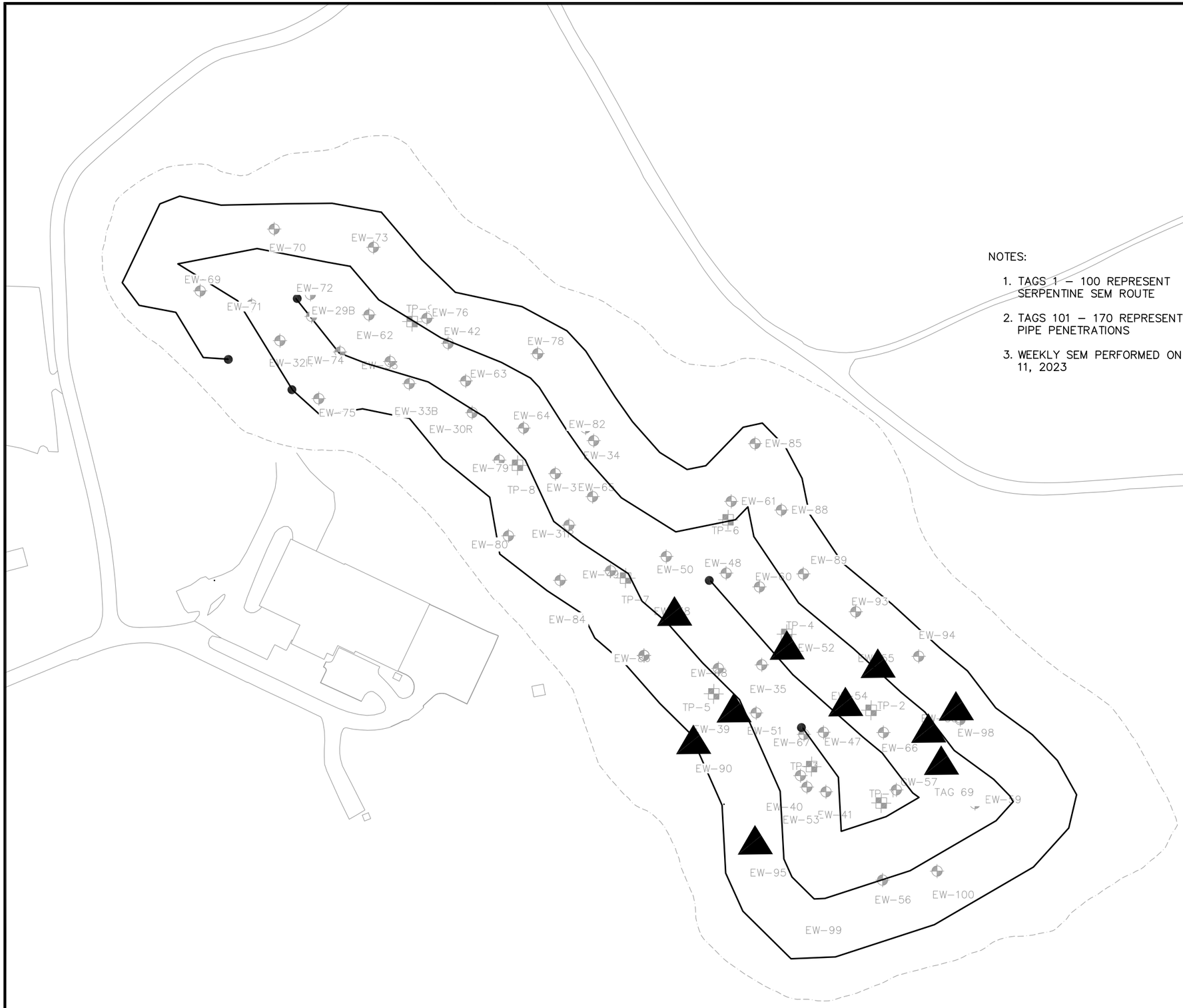
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 170 represent SEM at Pipe Penetrations
Weather Conditions: Mostly cloudy, 75°F Wind: SE - 5 MPH

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

8/11/2023	10:51	ZERO	0.0	PPM
8/11/2023	10:53	SPAN	501.0	PPM

Background Reading:

8/11/2023	10:59	Upwind	1.7	PPM
8/11/2023	11:03	Downwind	1.4	PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 170 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON AUGUST 11, 2023

NO.	REVISION	DATE

SHEET TITLE: **WEEKLY SEM ROUTE**

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

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

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

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

FILE: 02218208.04

DATE: 8/11/23

SCALE: AS SHOWN

DRAWING NO.

August 23, 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 – August 17, 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 August 17, 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	171
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	71
Number of Exceedances	10
Number of Serpentine Exceedances	1
Number of Pipe Penetration Exceedances	9

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). A bentonite seal was installed around EW-66 and subsequent remonitoring events indicated methane concentrations had been reduced below the compliance threshold. Therefore, the exceedance at EW-66 is considered to be resolved. The Facility intends to install and/or repair well bore skirts at EW-38.

An increase in exceedances, particularly at cover penetrations has been observed over the past several events. A variety of factors may be causing these exceedances; however, it is believed that vacuum losses to sections of the Facility due to ongoing construction activities, including header piping upgrades, and start-up procedures surrounding the new temporary flare is likely the cause of the majority of these exceedances. As construction activities are completed, and the new temporary flare is activated, more vacuum will be available to these locations and therefore more gas collection will occur at these points.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	8/17/23 Event	8/17/23 Event Result	Comments
EW-66	5/25/23	N/A	Passed	Exceedance Resolved
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-55	7/12/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/12/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 76	7/21/23	30-Day Retest	Passed	Exceedance Resolved
Tag 100	7/21/23	30-Day Retest	Passed	Exceedance Resolved
EW-58	7/21/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-67	7/21/23	30-Day Retest	Passed	Exceedance Resolved
EW-86	7/21/23	30-Day Retest	Passed	Exceedance Resolved
EW-88	7/21/23	30-Day Retest	Passed	Exceedance Resolved
EW-99	7/28/23	N/A	Passed	Requires 30-Day Retest
EW-52	8/4/23	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-47	8/4/23	N/A	Passed	Requires 30-Day Retest
EW-41	8/4/23	N/A	Passed	Requires 30-Day Retest
EW-54	8/11/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-39	8/11/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-95	8/11/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-98	8/11/23	10-Day Retest	Passed	Requires 30-Day Retest
EW-90	8/11/23	10-Day Retest	Failed	Requires 2nd 10-Day Retest

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

Sincerely,

Wylie Hicklin

Lucas S. Nachman

Wylie R Hicklin
Associate Staff Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WRH/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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 17, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	7.7 PPM	OK			Start Serpentine Route
2	30.6 PPM	OK			
3	4.3 PPM	OK			
4	4.1 PPM	OK			
5	2.3 PPM	OK			
6	2.5 PPM	OK			
7	2.3 PPM	OK			
8	3.1 PPM	OK			
9	2.8 PPM	OK			
10	2.8 PPM	OK			
11	1.4 PPM	OK			
12	1.5 PPM	OK			
13	1.3 PPM	OK			
14	10.2 PPM	OK			
15	3.2 PPM	OK			
16	22.7 PPM	OK			
17	27.1 PPM	OK			
18	53.2 PPM	OK			
19	14.1 PPM	OK			
20	56.8 PPM	OK			
21	4.3 PPM	OK			
22	3.4 PPM	OK			
23	2.3 PPM	OK			
24	60.8 PPM	OK			
25	16.4 PPM	OK			
26	6.2 PPM	OK			
27	2.3 PPM	OK			
28	2.0 PPM	OK			
29	2.4 PPM	OK			
30	9.5 PPM	OK			
31	12.0 PPM	OK			
32	11.4 PPM	OK			
33	12.3 PPM	OK			
34	8.2 PPM	OK			
35	10.7 PPM	OK			
36	86.6 PPM	OK			
37	216.0 PPM	OK			
38	19.4 PPM	OK			
39	123.0 PPM	OK			
40	163.0 PPM	OK			
41	4.2 PPM	OK			
42	5.2 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 17, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	1.9 PPM	OK			
44	8.2 PPM	OK			
45	6.6 PPM	OK			
46	99.6 PPM	OK			
47	4.7 PPM	OK			
48	12.1 PPM	OK			
49	1.8 PPM	OK			
50	1.1 PPM	OK			
51	1.0 PPM	OK			
52	1.2 PPM	OK			
53	0.7 PPM	OK			
54	0.6 PPM	OK			
55	0.8 PPM	OK			
56	0.6 PPM	OK			
57	1.5 PPM	OK			
58	14.6 PPM	OK			
59	95.4 PPM	OK			
60	0.6 PPM	OK			
61	0.7 PPM	OK			
62	5.0 PPM	OK			
63	8.7 PPM	OK			
64	27.3 PPM	OK			
65	17.5 PPM	OK			
66	10.7 PPM	OK			
67	2.1 PPM	OK			
68	57.5 PPM	OK			
69	3672.0 PPM	HIGH_ALRM	36.59788	-82.14721	
70	87.6 PPM	OK			
71	42.3 PPM	OK			
72	78.1 PPM	OK			
73	63.0 PPM	OK			
74	120.0 PPM	OK			
75	12.8 PPM	OK			
76	1.9 PPM	OK			
77	15.7 PPM	OK			
78	46.5 PPM	OK			
79	29.3 PPM	OK			
80	8.7 PPM	OK			
81	1.9 PPM	OK			
82	1.9 PPM	OK			
83	4.3 PPM	OK			
84	2.1 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 17, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	3.2 PPM	OK			
86	2.3 PPM	OK			
87	5.3 PPM	OK			
88	3.0 PPM	OK			
89	41.4 PPM	OK			
90	1.3 PPM	OK			
91	3.9 PPM	OK			
92	4.2 PPM	OK			
93	10.7 PPM	OK			
94	53.1 PPM	OK			
95	10.4 PPM	OK			
96	6.3 PPM	OK			
97	57.5 PPM	OK			
98	39.4 PPM	OK			
99	66.2 PPM	OK			
100	2.5 PPM	OK			End Serpentine Route
101	421.0 PPM	OK			EW-35
102	347.0 PPM	OK			EW-52
103	26.4 PPM	OK			TP-4
104	164.0 PPM	OK			EW-60
105	316.0 PPM	OK			EW-48
106	69.2 PPM	OK			TP-6
107	4.5 PPM	OK			EW-61
108	34.2 PPM	OK			EW-34
109	2.6 PPM	OK			EW-50
110	363.0 PPM	OK			EW-67
111	72.1 PPM	OK			EW-47
112	84.5 PPM	OK			EW-54
113	745.0 PPM	HIGH_ALRM	36.59838	-82.14763	EW-55
114	4.0 PPM	OK			TP-2
115	2.2 PPM	OK			EW-96
116	409.0 PPM	OK			EW-66
117	159.0 PPM	OK			EW-58
118	142.0 PPM	OK			EW-57
119	89.6 PPM	OK			TP-1
120	80.1 PPM	OK			EW-59
121	95.2 PPM	OK			EW-56
122	13.4 PPM	OK			EW-97
123	370.0 PPM	OK			EW-41
124	1115.0 PPM	HIGH_ALRM	36.59823	-82.14792	EW-53
125	34.7 PPM	OK			EW-40

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 17, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	14.1 PPM	OK			TP-3
127	13.8 PPM	OK			EW-51
128	220.0 PPM	OK			EW-39
129	79.9 PPM	OK			TP-5
130	17.0 PPM	OK			EW-68
131	1556.0 PPM	HIGH_ALRM	36.59934	-82.14798	EW-38
132	200.0 PPM	OK			TP-7
133	3.3 PPM	OK			EW-49
134	12.2 PPM	OK			EW-31R
135	9.3 PPM	OK			EW-65
136	38.8 PPM	OK			EW-37
137	7.6 PPM	OK			TP-8
138	6.2 PPM	OK			EW-64
139	3932.0 PPM	HIGH_ALRM	36.60057	-82.14782	EW-30R
140	897.0 PPM	HIGH_ALRM	36.60086	-82.14808	EW-63
141	1505.0 PPM	HIGH_ALRM	36.60121	-82.14804	EW-42
142	3.6 PPM	OK			TP-9
143	1431.0 PPM	HIGH_ALRM	36.60125	-82.14798	EW-33R
144	993.0 PPM	HIGH_ALRM	36.60144	-82.14829	EW-62
145	56.8 PPM	OK			EW-29R
146	22.6 PPM	OK			EW-74
147	2.3 PPM	OK			EW-32R
148	0.8 PPM	OK			EW-69
149	34.4 PPM	OK			EW-71
150	33.3 PPM	OK			EW-72
151	2.7 PPM	OK			EW-70
152	6.2 PPM	OK			EW-73
153	60.8 PPM	OK			EW-76
154	1.2 PPM	OK			EW-78
155	1.2 PPM	OK			EW-82
156	0.6 PPM	OK			EW-85
157	33.5 PPM	OK			EW-88
158	14.9 PPM	OK			EW-89
159	15.3 PPM	OK			EW-93
160	3.8 PPM	OK			EW-94
161	2.3 PPM	OK			EW-98
162	7.5 PPM	OK			EW-100
163	62.9 PPM	OK			EW-99
164	61.0 PPM	OK			EW-95
165	4012.0 PPM	HIGH_ALRM	36.59879	-82.14811	EW-90
166	30.5 PPM	OK			EW-86
167	4.6 PPM	OK			EW-84
168	3.0 PPM	OK			EW-80
169	73.3 PPM	OK			EW-79
170	30.9 PPM	OK			EW-33B
171	4.6 PPM	OK			EW-75

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 17, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	171
Number of exceedance locatio	10

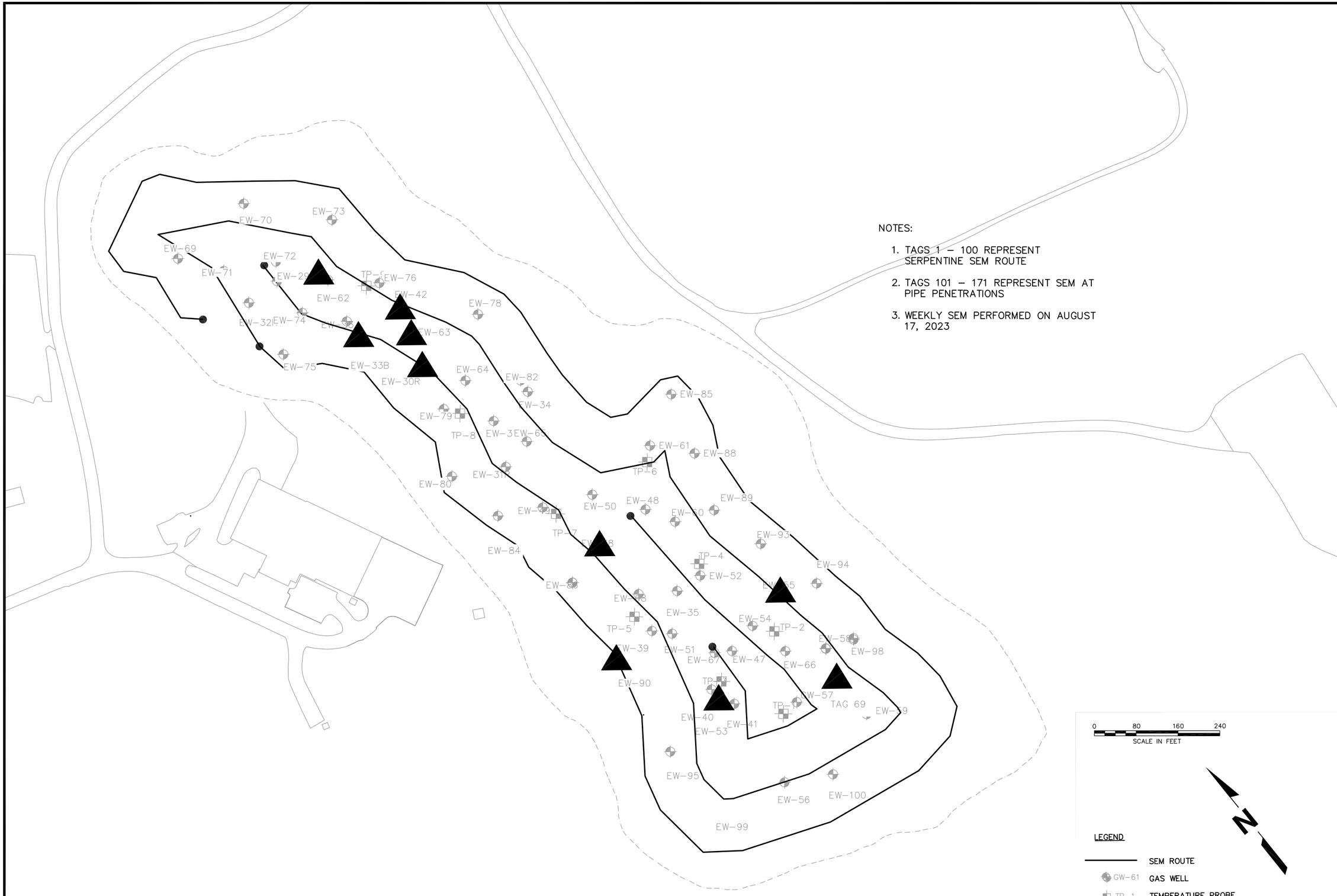
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 171 represent SEM at Pipe Penetrations
Weather Conditions: Clear, 84˚F Wind: NW - 4 MPH

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

8/17/2023	10:11	ZERO	0.0	PPM
8/17/2023	10:13	SPAN	501.0	PPM

Background Reading:

8/17/2023	10:14	Upwind	2.2	PPM
8/17/2023	10:21	Downwind	1.6	PPM



1

NO.	REVISION	DATE

SHEET TITLE: **WEEKLY SEM ROUTE**

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

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

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

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

FILE: 02218208.04

DATE: 8/17/23

SCALE: AS SHOWN

DRAWING NO.

August 30, 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 – August 23, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on August 17, 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	171
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	71
Number of Exceedances	8
Number of Serpentine Exceedances	0
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). A bentonite seal was installed around EW-66 and subsequent remonitoring events indicated methane concentrations had been reduced below the compliance threshold. Therefore, the exceedance at EW-66 is considered to be resolved. The Facility intends to install and/or repair a well bore skirt at EW-38.

An increase in exceedances, particularly at cover penetrations has been observed over the past several events. A variety of factors may be causing these exceedances; however, it is believed that vacuum losses to sections of the Facility due to ongoing construction activities, including header piping upgrades, and start-up procedures surrounding the new temporary flare is likely the cause of the majority of these exceedances. As construction activities are completed, and the new temporary flare is activated, more vacuum will be available to these locations and therefore more gas collection will occur at these points.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	8/23/23 Event	8/23/23 Event Result	Comments
EW-38	6/6/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v); Alt. remedy submitted 7/11/23
EW-55	7/12/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/12/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-58	7/21/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-99	7/28/23	30-Day retest	Passed	Exceedance Resolved
EW-52	8/4/23	N/A	Passed	Requires 30-Day Retest
EW-41	8/4/23	N/A	Passed	Requires 30-Day Retest
EW-47	8/4/23	N/A	Passed	Requires 30-Day Retest
EW-39	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-54	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-95	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-98	8/11/23	10-Day Retest	Failed	Requires 2nd 10-Day Retest
EW-90	8/11/23	2nd 10-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-53	8/17/2023	10-Day Retest	Passed	Requires 30-Day Retest
EW-30R	8/17/2023	10-Day Retest	Failed	Requires 2nd 10-Day Retest
EW-33R	8/17/2023	10-Day Retest	Failed	Requires 2nd 10-Day Retest
EW-42	8/17/2023	10-Day Retest	Passed	Requires 30-Day Retest
EW-62	8/17/2023	10-Day Retest	Failed	Requires 2nd 10-Day Retest
EW-63	8/17/2023	10-Day Retest	Failed	Requires 2nd 10-Day Retest

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

Sincerely,

Wylie Hicklin

Lucas S. Nachman

Wylie R Hicklin
Associate Staff Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WRH/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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	7.8 PPM	OK			Start Serpentine Route
2	4.5 PPM	OK			
3	2.4 PPM	OK			
4	2.8 PPM	OK			
5	4.7 PPM	OK			
6	6.5 PPM	OK			
7	4.7 PPM	OK			
8	4.9 PPM	OK			
9	5.9 PPM	OK			
10	3.1 PPM	OK			
11	3.0 PPM	OK			
12	2.4 PPM	OK			
13	1.5 PPM	OK			
14	4.5 PPM	OK			
15	11.0 PPM	OK			
16	1.3 PPM	OK			
17	1.3 PPM	OK			
18	10.7 PPM	OK			
19	38.5 PPM	OK			
20	25.4 PPM	OK			
21	13.5 PPM	OK			
22	15.6 PPM	OK			
23	12.9 PPM	OK			
24	10.4 PPM	OK			
25	2.1 PPM	OK			
26	1.2 PPM	OK			
27	1.3 PPM	OK			
28	1.1 PPM	OK			
29	8.6 PPM	OK			
30	4.4 PPM	OK			
31	21.6 PPM	OK			
32	11.3 PPM	OK			
33	6.2 PPM	OK			
34	4.3 PPM	OK			
35	5.9 PPM	OK			
36	24.4 PPM	OK			
37	3.6 PPM	OK			
38	5.7 PPM	OK			
39	124.0 PPM	OK			
40	22.3 PPM	OK			
41	12.7 PPM	OK			
42	10.2 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	6.0 PPM	OK			
44	2.5 PPM	OK			
45	348.0 PPM	OK			
46	4.8 PPM	OK			
47	20.4 PPM	OK			
48	7.9 PPM	OK			
49	3.5 PPM	OK			
50	3.5 PPM	OK			
51	2.9 PPM	OK			
52	4.8 PPM	OK			
53	7.7 PPM	OK			
54	2.6 PPM	OK			
55	13.6 PPM	OK			
56	96.1 PPM	OK			
57	91.2 PPM	OK			
58	63.4 PPM	OK			
59	52.6 PPM	OK			
60	11.1 PPM	OK			
61	162.0 PPM	OK			
62	20.4 PPM	OK			
63	31.7 PPM	OK			
64	1.1 PPM	OK			
65	7.1 PPM	OK			
66	16.3 PPM	OK			
67	299.0 PPM	OK			
68	18.0 PPM	OK			
69	341.0 PPM	OK			
70	78.3 PPM	OK			
71	4.8 PPM	OK			
72	5.5 PPM	OK			
73	13.9 PPM	OK			
74	1.5 PPM	OK			
75	11.2 PPM	OK			
76	6.1 PPM	OK			
77	96.3 PPM	OK			
78	1.5 PPM	OK			
79	2.8 PPM	OK			
80	1.7 PPM	OK			
81	1.0 PPM	OK			
82	28.9 PPM	OK			
83	2.2 PPM	OK			
84	10.4 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	7.6 PPM	OK			
86	25.0 PPM	OK			
87	456.0 PPM	OK			
88	34.0 PPM	OK			
89	9.7 PPM	OK			
90	41.3 PPM	OK			
91	41.8 PPM	OK			
92	36.5 PPM	OK			
93	14.9 PPM	OK			
94	345.0 PPM	OK			
95	4.3 PPM	OK			
96	162.0 PPM	OK			
97	112.0 PPM	OK			
98	19.1 PPM	OK			
99	7.1 PPM	OK			
100	75.0 PPM	OK			End Serpentine Route
101	52.0 PPM	OK			EW-35
102	176.0 PPM	OK			EW-52
103	60.5 PPM	OK			TP-4
104	78.5 PPM	OK			EW-60
105	304.0 PPM	OK			EW-48
106	7.3 PPM	OK			TP-6
107	82.2 PPM	OK			EW-61
108	11.3 PPM	OK			EW-34
109	5.2 PPM	OK			EW-50
110	32.3 PPM	OK			EW-67
111	186.0 PPM	OK			EW-47
112	168.0 PPM	OK			EW-54
113	441.0 PPM	OK			EW-55
114	68.1 PPM	OK			TP-2
115	38.6 PPM	OK			EW-96
116	158.0 PPM	OK			EW-66
117	76.1 PPM	OK			EW-58
118	22.2 PPM	OK			EW-57
119	16.8 PPM	OK			TP-1
120	25.5 PPM	OK			EW-59
121	27.4 PPM	OK			EW-56
122	59.9 PPM	OK			EW-97
123	61.8 PPM	OK			EW-41
124	384.0 PPM	OK			EW-53
125	47.6 PPM	OK			EW-40

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	14.0 PPM	OK			TP-3
127	58.8 PPM	OK			EW-51
128	6.7 PPM	OK			EW-39
129	8.8 PPM	OK			TP-5
130	53.1 PPM	OK			EW-68
131	1944.0 PPM	HIGH_ALRM	36.59944	-82.14794	EW-38
132	450.0 PPM	OK			TP-7
133	7.2 PPM	OK			EW-49
134	3.6 PPM	OK			EW-31R
135	7.8 PPM	OK			EW-65
136	82.3 PPM	OK			EW-37
137	8.0 PPM	OK			TP-8
138	1081.0 PPM	HIGH_ALRM	36.60051	-82.14800	EW-64
139	1659.0 PPM	HIGH_ALRM	36.60056	-82.14787	EW-30R
140	1097.0 PPM	HIGH_ALRM	36.60087	-82.14808	EW-63
141	61.6 PPM	OK			EW-42
142	3.7 PPM	OK			TP-9
143	1594.0 PPM	HIGH_ALRM	36.60127	-82.14825	EW-33R
144	1142.0 PPM	HIGH_ALRM	36.60146	-82.14828	EW-62
145	221.0 PPM	OK			EW-29R
146	56.6 PPM	OK			EW-74
147	9.1 PPM	OK			EW-32R
148	1.1 PPM	OK			EW-69
149	1.4 PPM	OK			EW-71
150	1.8 PPM	OK			EW-72
151	0.4 PPM	OK			EW-70
152	3.0 PPM	OK			EW-73
153	69.5 PPM	OK			EW-76
154	1.3 PPM	OK			EW-78
155	9.8 PPM	OK			EW-82
156	0.7 PPM	OK			EW-85
157	100.0 PPM	OK			EW-88
158	21.9 PPM	OK			EW-89
159	65.2 PPM	OK			EW-93
160	112.0 PPM	OK			EW-94
161	3375.0 PPM	HIGH_ALRM	36.59824	-82.14684	EW-98
162	276.0 PPM	OK			EW-100
163	136.0 PPM	OK			EW-99
164	66.2 PPM	OK			EW-95
165	1801.0 PPM	HIGH_ALRM	36.59886	-82.14824	EW-90
166	2.7 PPM	OK			EW-86
167	1.9 PPM	OK			EW-84
168	1.9 PPM	OK			EW-80
169	9.6 PPM	OK			EW-79
170	41.4 PPM	OK			EW-33B
171	12.4 PPM	OK			EW-75

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

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

Number of locations sampled:	171
Number of exceedance locatio	8

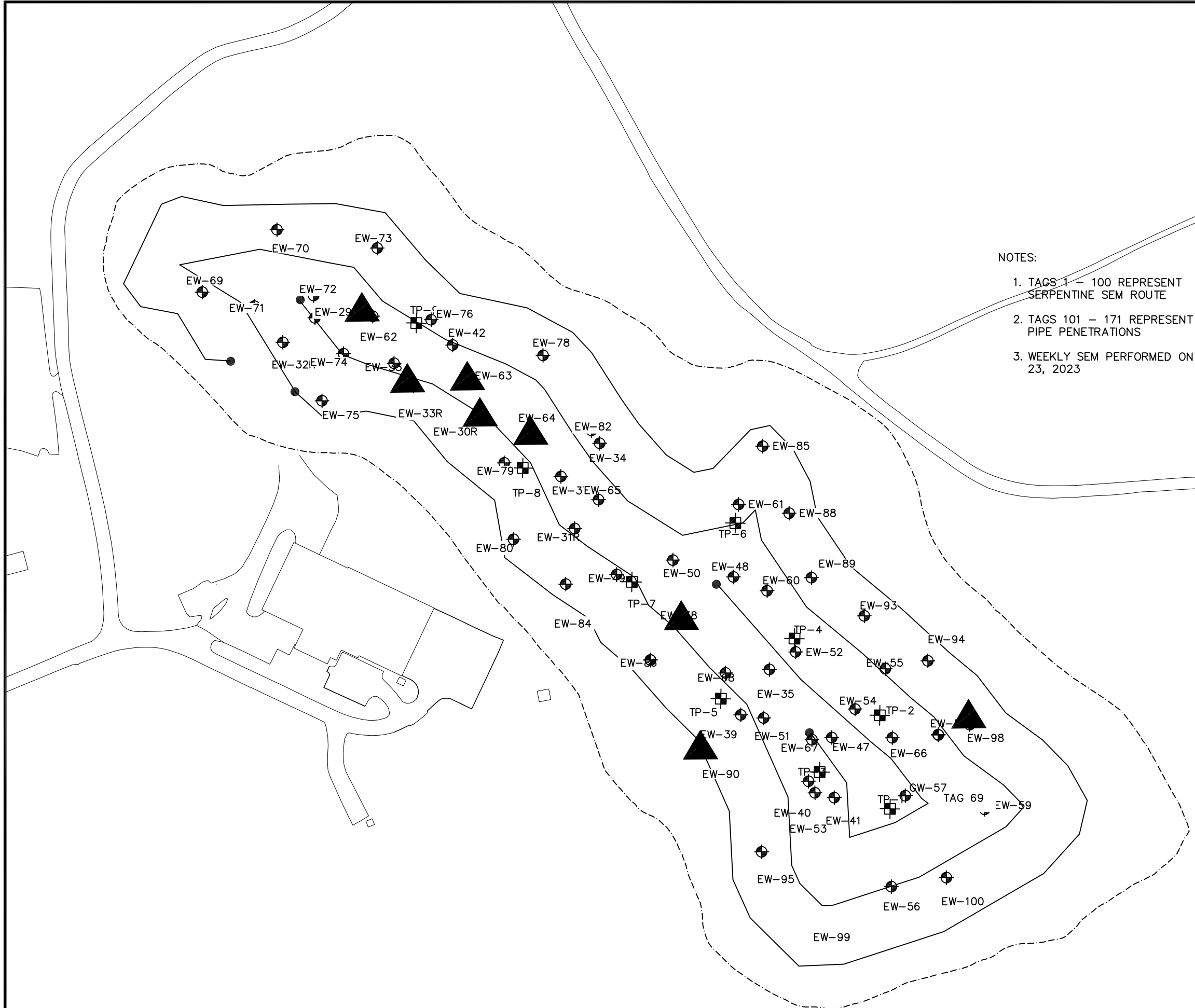
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 171 represent SEM at Pipe Penetrations
Weather Conditions: Clear and Sunny, 77°F Wind: None

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

8/23/2023	10:35	ZERO	0.3	PPM
8/23/2023	10:37	SPAN	503.0	PPM

Background Reading:

8/23/2023	10:40	Upwind	2.9	PPM
8/23/2023	10:46	Downwind	1.7	PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 171 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON AUGUST 23, 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.	DWN. BY:	Q/A REVIEW BY:
02218208.04	LSN	APP. BY:
DSN. BY:	CHK. BY:	
LSN	DBK	

FILE: 02218208.04
DATE: 8/23/23
SCALE: AS SHOWN
DRAWING NO.

September 6, 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 – August 31, 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 August 31, 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	171
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	71
Number of Exceedances	4
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	4

REMONITORING OF ONGOING EXCEEDANCES

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

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

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). A bentonite seal was installed around EW-66 and subsequent remonitoring events indicated methane concentrations had been reduced below the compliance threshold. Therefore, the exceedance at EW-66 is considered to be resolved. In addition, a new vacuum lateral was installed at EW-38, restoring sufficient vacuum and gas collection to this area of the landfill. Remonitoring at EW-38 indicated methane concentration below the compliance threshold.

An increase in exceedances, particularly at cover penetrations has been observed over the past several events. A variety of factors may be causing these exceedances; however, it is believed that vacuum losses to sections of the Facility due to ongoing construction activities, including header piping upgrades, and start-up procedures surrounding the new temporary flare is likely the cause of the majority of these exceedances. As construction activities are completed, and the new temporary flare is activated, more vacuum will be available to these locations and therefore more gas collection will occur at these points. This was observed during this weekly event when the number of exceedances decreased by over 50 percent compared with the previous event.

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

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	8/31/23 Event	8/31/23 Event Result	Comments
EW-55	7/12/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
Tag 69	7/12/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-58	7/21/23	N/A	Passed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-52	8/4/23	30-Day Retest	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-90	8/11/23	N/A	Failed	Subject to 40 CFR 63.1960(c)(4)(v)
EW-47	8/4/23	30-Day Retest	Passed	Exceedance Resolved
EW-41	8/4/23	30-Day Retest	Passed	Exceedance Resolved
EW-54	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-39	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-95	8/11/23	N/A	Passed	Requires 30-Day Retest
EW-98	8/11/23	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-53	8/17/2023	N/A	Passed	Requires 30-Day Retest
EW-30R	8/17/2023	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-63	8/17/2023	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-42	8/17/2023	N/A	Passed	Requires 30-Day Retest
EW-33R	8/17/2023	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-62	8/17/2023	2nd 10-Day Retest	Passed	Requires 30-Day Retest
EW-64	8/23/2023	10-Day Retest	Passed	Requires 30-Day Retest

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

Sincerely,

Wylie Hicklin

Lucas S. Nachman

Wylie R Hicklin
Associate Staff Professional
SCS Engineers

Lucas S. Nachman
Senior Project Professional
SCS Engineers

LSN/WRH/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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 31, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	7.8 PPM	OK			Start Serpentine Route
2	1.4 PPM	OK			
3	0.6 PPM	OK			
4	0.6 PPM	OK			
5	0.6 PPM	OK			
6	1.9 PPM	OK			
7	0.8 PPM	OK			
8	0.6 PPM	OK			
9	0.6 PPM	OK			
10	1.7 PPM	OK			
11	0.8 PPM	OK			
12	36.5 PPM	OK			
13	2.2 PPM	OK			
14	11.5 PPM	OK			
15	46.3 PPM	OK			
16	3.1 PPM	OK			
17	1.8 PPM	OK			
18	1.9 PPM	OK			
19	12.8 PPM	OK			
20	104.0 PPM	OK			
21	58.9 PPM	OK			
22	13.8 PPM	OK			
23	3.0 PPM	OK			
24	4.0 PPM	OK			
25	3.2 PPM	OK			
26	1.5 PPM	OK			
27	5.0 PPM	OK			
28	6.0 PPM	OK			
29	28.5 PPM	OK			
30	53.9 PPM	OK			
31	252.0 PPM	OK			
32	85.7 PPM	OK			
33	167.0 PPM	OK			
34	12.8 PPM	OK			
35	4.7 PPM	OK			
36	6.6 PPM	OK			
37	4.1 PPM	OK			
38	3.5 PPM	OK			
39	1.1 PPM	OK			
40	0.7 PPM	OK			
41	1.6 PPM	OK			
42	0.4 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 31, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	0.4 PPM	OK			
44	4.3 PPM	OK			
45	0.4 PPM	OK			
46	0.4 PPM	OK			
47	0.2 PPM	OK			
48	0.2 PPM	OK			
49	0.1 PPM	OK			
50	0.2 PPM	OK			
51	0.3 PPM	OK			
52	0.4 PPM	OK			
53	11.7 PPM	OK			
54	0.4 PPM	OK			
55	0.2 PPM	OK			
56	0.1 PPM	OK			
57	1.8 PPM	OK			
58	0.5 PPM	OK			
59	0.3 PPM	OK			
60	8.0 PPM	OK			
61	87.5 PPM	OK			
62	11.7 PPM	OK			
63	2.4 PPM	OK			
64	3.9 PPM	OK			
65	88.1 PPM	OK			
66	18.0 PPM	OK			
67	24.8 PPM	OK			
68	10.7 PPM	OK			
69	117.0 PPM	OK			
70	216.0 PPM	OK			
71	18.2 PPM	OK			
72	10.8 PPM	OK			
73	12.7 PPM	OK			
74	124.0 PPM	OK			
75	12.0 PPM	OK			
76	12.1 PPM	OK			
77	2.5 PPM	OK			
78	9.4 PPM	OK			
79	0.8 PPM	OK			
80	7.2 PPM	OK			
81	0.2 PPM	OK			
82	0.2 PPM	OK			
83	0.2 PPM	OK			
84	0.1 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 31, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	0.1 PPM	OK			
86	0.6 PPM	OK			
87	0.0 PPM	OK			
88	0.0 PPM	OK			
89	0.2 PPM	OK			
90	0.0 PPM	OK			
91	3.6 PPM	OK			
92	61.7 PPM	OK			
93	37.7 PPM	OK			
94	473.0 PPM	OK			
95	62.7 PPM	OK			
96	57.9 PPM	OK			
97	74.0 PPM	OK			
98	173.0 PPM	OK			
99	6.7 PPM	OK			
100	9.1 PPM	OK			End Serpentine Route
101	196.0 PPM	OK			EW-35
102	1363.0 PPM	HIGH_ALRM	36.59901	-82.14754	EW-52
103	2.5 PPM	OK			TP-4
104	412.0 PPM	OK			EW-60
105	61.3 PPM	OK			EW-48
106	5.3 PPM	OK			TP-6
107	0.2 PPM	OK			EW-61
108	40.6 PPM	OK			EW-34
109	0.2 PPM	OK			EW-50
110	14.4 PPM	OK			EW-67
111	187.0 PPM	OK			EW-47
112	323.0 PPM	OK			EW-54
113	904.0 PPM	HIGH_ALRM	36.59865	-82.14730	EW-55
114	53.3 PPM	OK			TP-2
115	16.3 PPM	OK			EW-96
116	76.4 PPM	OK			EW-66
117	2.3 PPM	OK			EW-58
118	38.5 PPM	OK			EW-57
119	67.0 PPM	OK			TP-1
120	23.1 PPM	OK			EW-59
121	9.4 PPM	OK			EW-56
122	13.8 PPM	OK			EW-97
123	11.7 PPM	OK			EW-41
124	59.4 PPM	OK			EW-53
125	14.9 PPM	OK			EW-40

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 31, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	30.6 PPM	OK			TP-3
127	65.3 PPM	OK			EW-51
128	19.9 PPM	OK			EW-39
129	32.0 PPM	OK			TP-5
130	8.2 PPM	OK			EW-68
131	1.9 PPM	OK			EW-38
132	120.0 PPM	OK			TP-7
133	2.9 PPM	OK			EW-49
134	3.2 PPM	OK			EW-31R
135	0.9 PPM	OK			EW-65
136	2.6 PPM	OK			EW-37
137	1.5 PPM	OK			TP-8
138	2.1 PPM	OK			EW-64
139	3.5 PPM	OK			EW-30R
140	0.2 PPM	OK			EW-63
141	0.1 PPM	OK			EW-42
142	0.2 PPM	OK			TP-9
143	0.0 PPM	OK			EW-33R
144	0.0 PPM	OK			EW-62
145	1.7 PPM	OK			EW-29R
146	829.0 PPM	HIGH_ALRM	36.60136	-82.14855	EW-74
147	0.6 PPM	OK			EW-32R
148	0.1 PPM	OK			EW-69
149	0.4 PPM	OK			EW-71
150	0.3 PPM	OK			EW-72
151	0.3 PPM	OK			EW-70
152	0.2 PPM	OK			EW-73
153	128.0 PPM	OK			EW-76
154	0.2 PPM	OK			EW-78
155	4.7 PPM	OK			EW-82
156	0.4 PPM	OK			EW-85
157	5.7 PPM	OK			EW-88
158	24.8 PPM	OK			EW-89
159	12.1 PPM	OK			EW-93
160	1.5 PPM	OK			EW-94
161	0.7 PPM	OK			EW-98
162	0.8 PPM	OK			EW-100
163	1.4 PPM	OK			EW-99
164	40.6 PPM	OK			EW-95
165	926.0 PPM	HIGH_ALRM	36.59886	-82.14824	EW-90
166	24.8 PPM	OK			EW-86
167	2.8 PPM	OK			EW-84
168	2.1 PPM	OK			EW-80
169	0.4 PPM	OK			EW-79
170	5.2 PPM	OK			EW-33B
171	0.7 PPM	OK			EW-75

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - AUGUST 31, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

Number of locations sampled:	171
Number of exceedance locatio	4

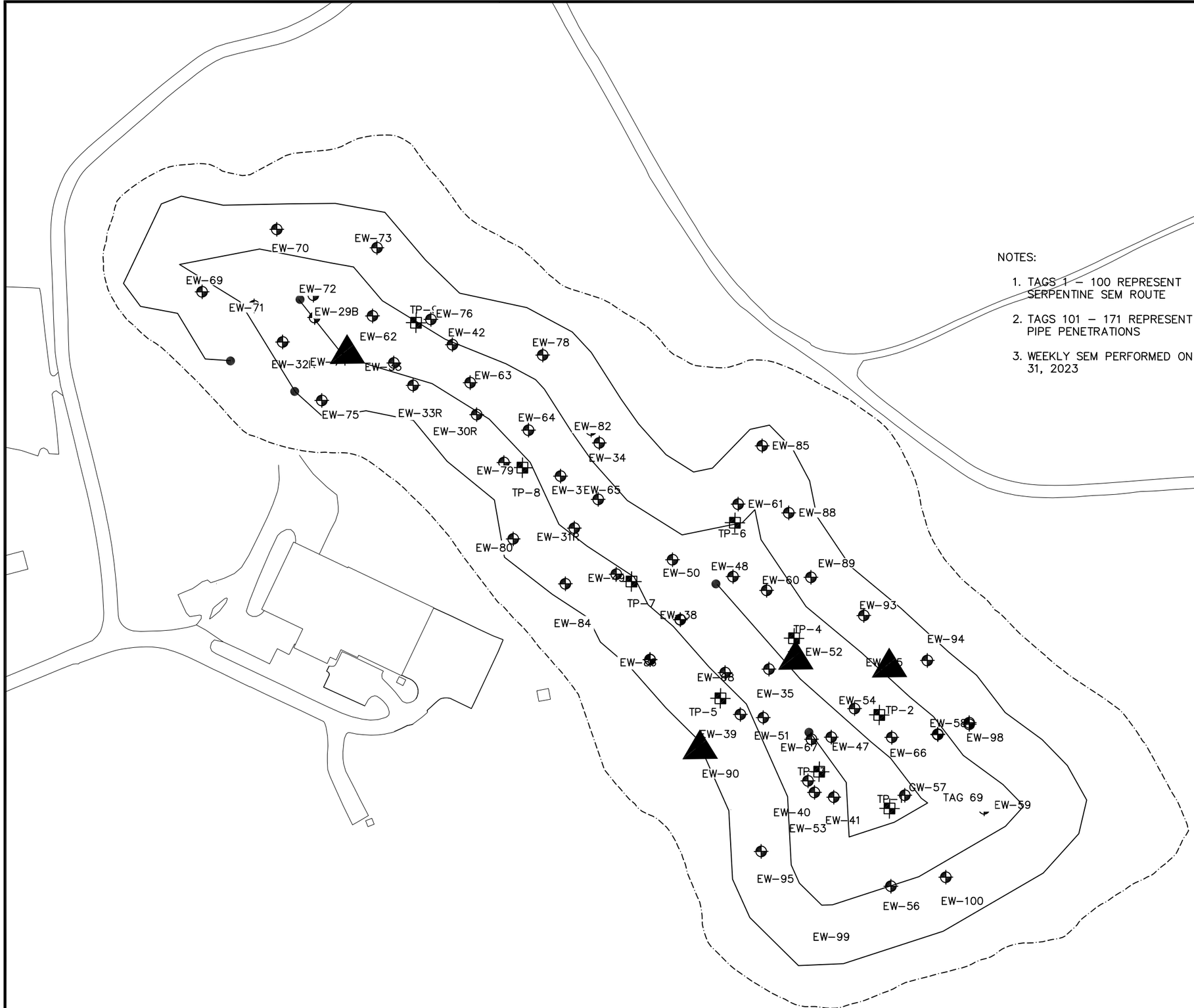
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 171 represent SEM at Pipe Penetrations
Weather Conditions: Overcast, 64°F Wind: E - 2 MPH

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

8/31/2023	10:15	ZERO	0.0	PPM
8/31/2023	10:17	SPAN	500.0	PPM

Background Reading:

8/31/2023	10:26	Upwind	2.5	PPM
8/31/2023	10:28	Downwind	12.4	PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 171 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON AUGUST 31, 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.	DWN. BY:	Q/A RVW BY:
02218208.04	LSN	
DSN. BY:	**CHK. BY:**	**APP. BY:**
LSN	DBK	

FILE: 02218208.04

DATE: 8/31/23

SCALE: AS SHOWN

DRAWING NO.

Appendix B

In-Waste Temperatures on Select Days in August

Appendix B Figures

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

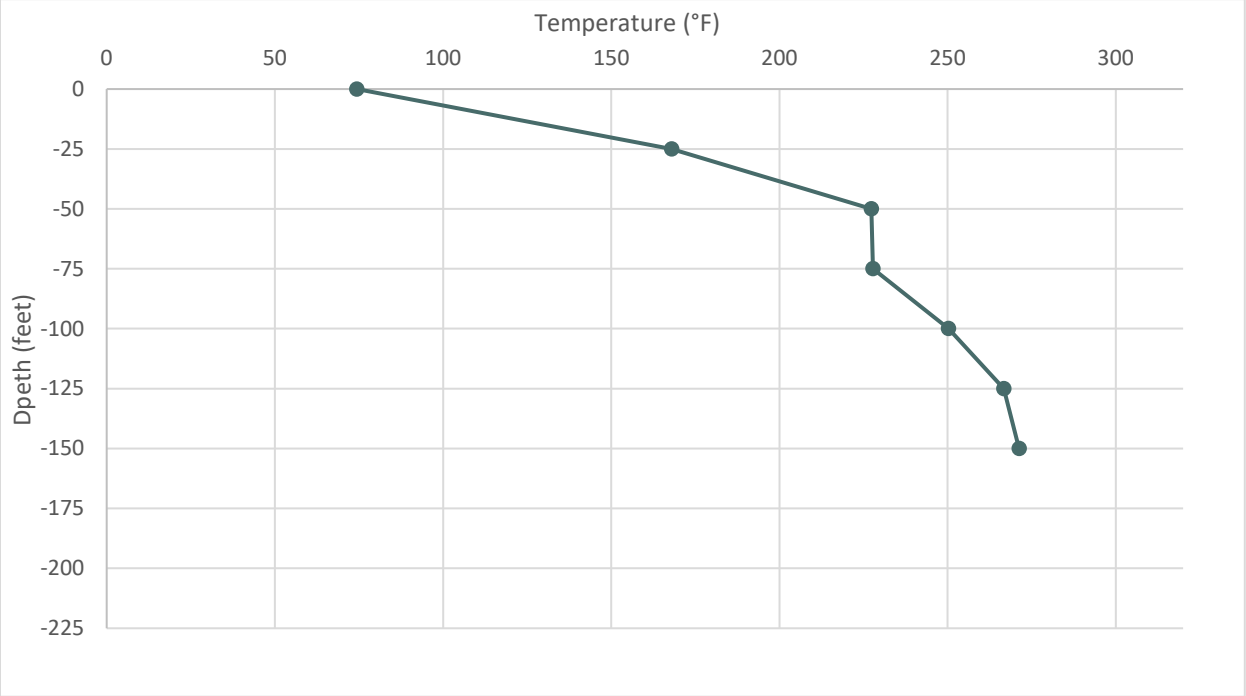


Figure B- 2. Average Temperatures Recorded by TP-1 on August 9, 2023

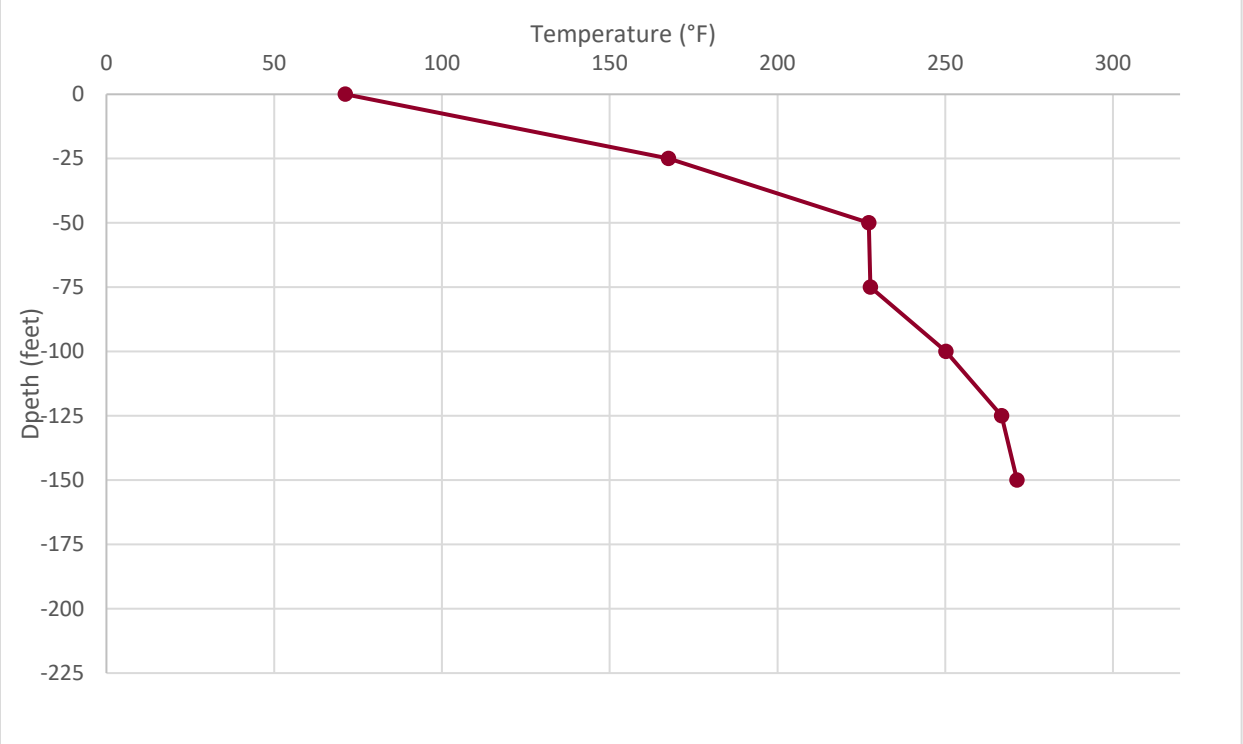


Figure B- 3. Average Temperatures Recorded by TP-1 on August 16, 2023

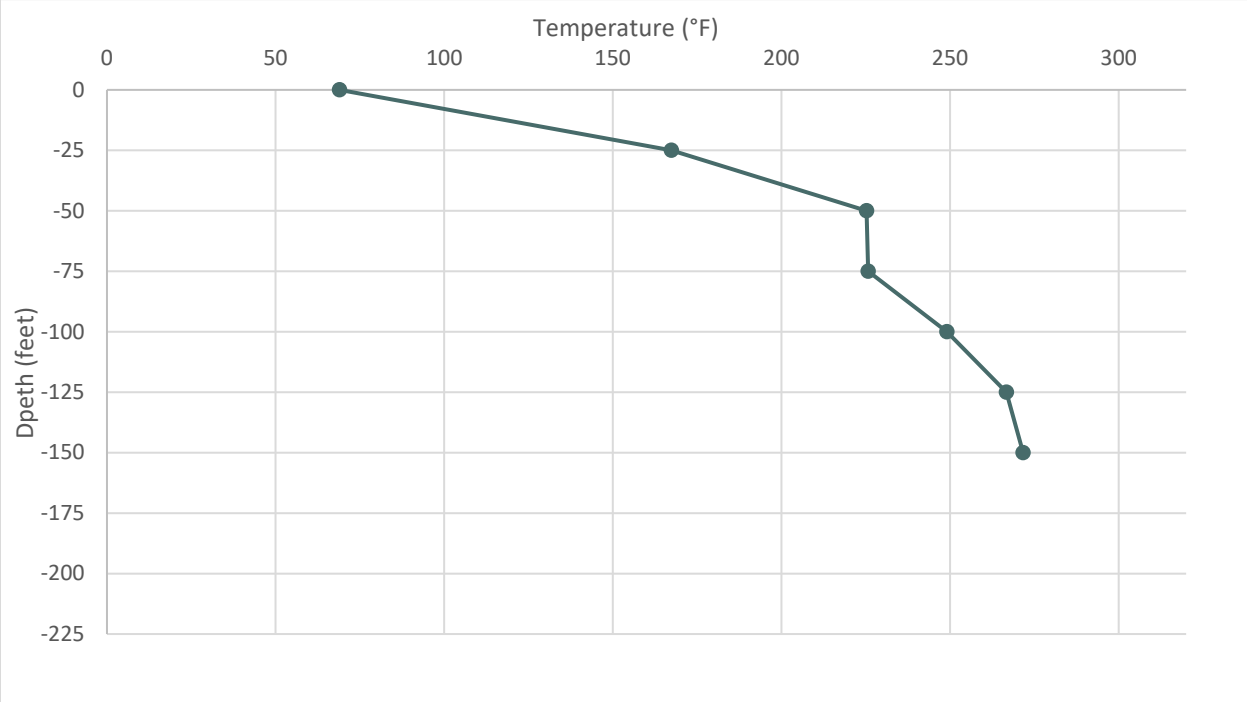


Figure B- 4. Average Temperatures Recorded by TP-1 on August 23, 2023

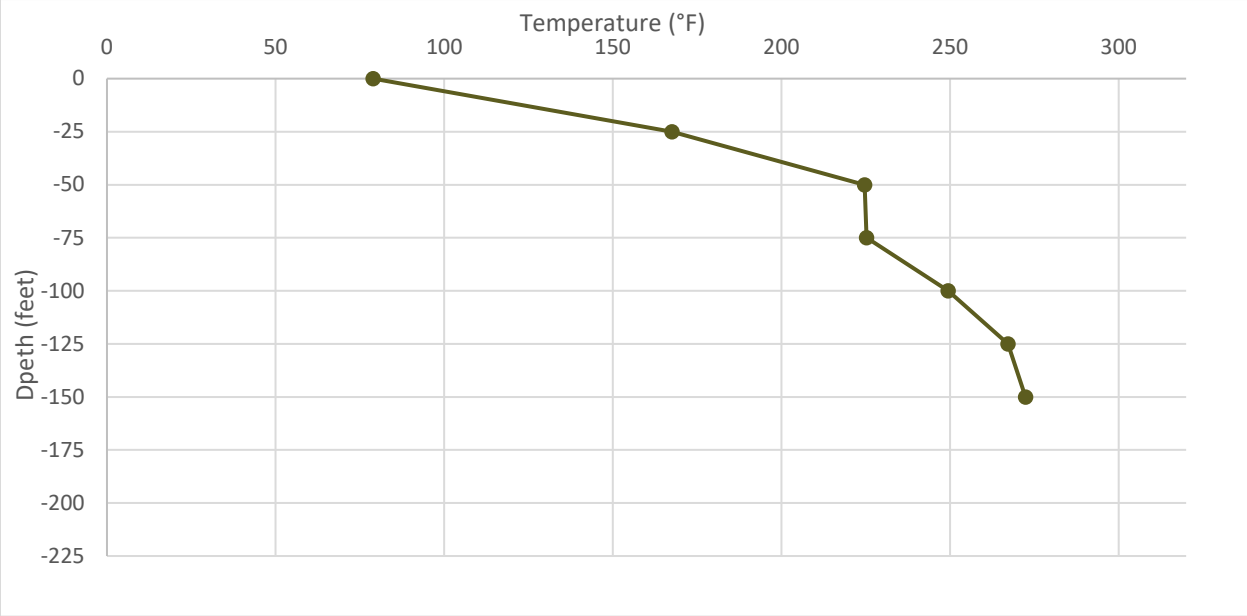


Figure B- 5. Average Temperatures Recorded by TP-1 on August 30, 2023

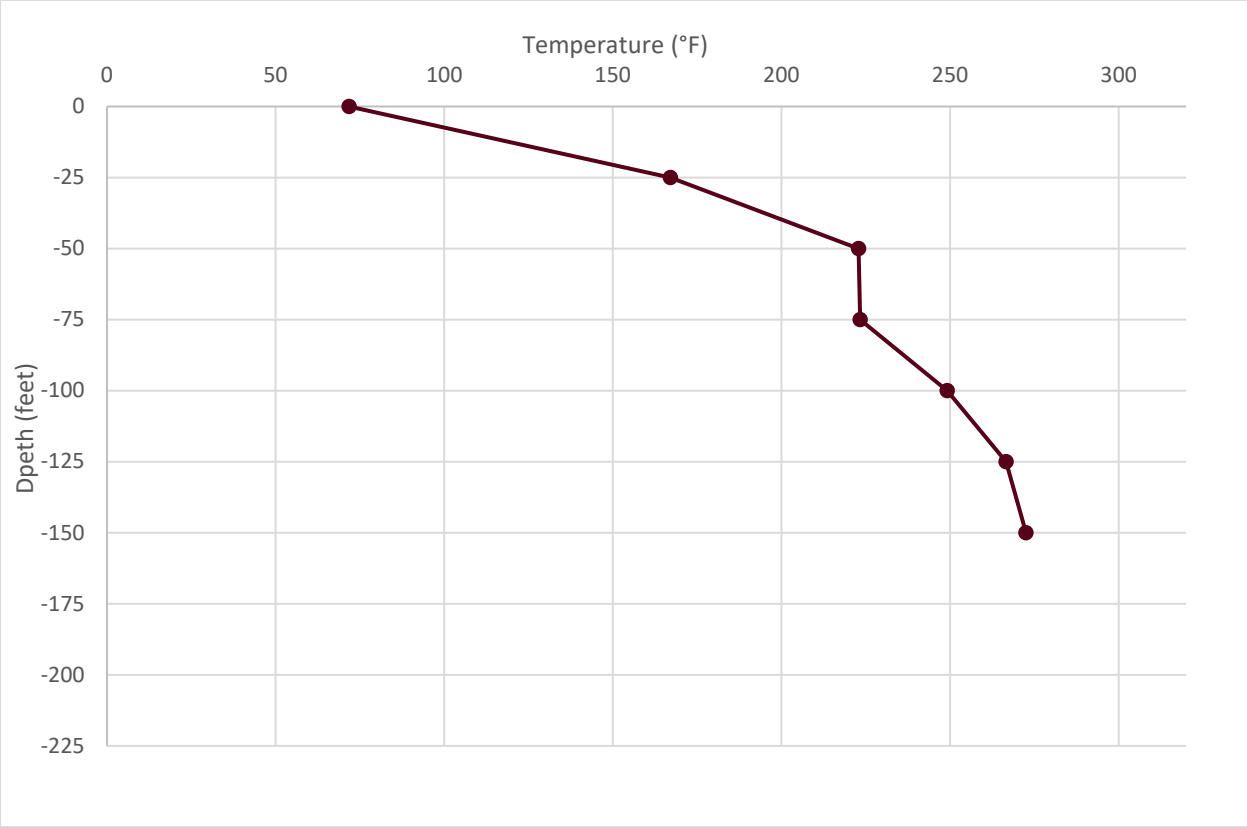


Figure B- 6. Average Temperatures Recorded by TP-2 on August 2, 2023

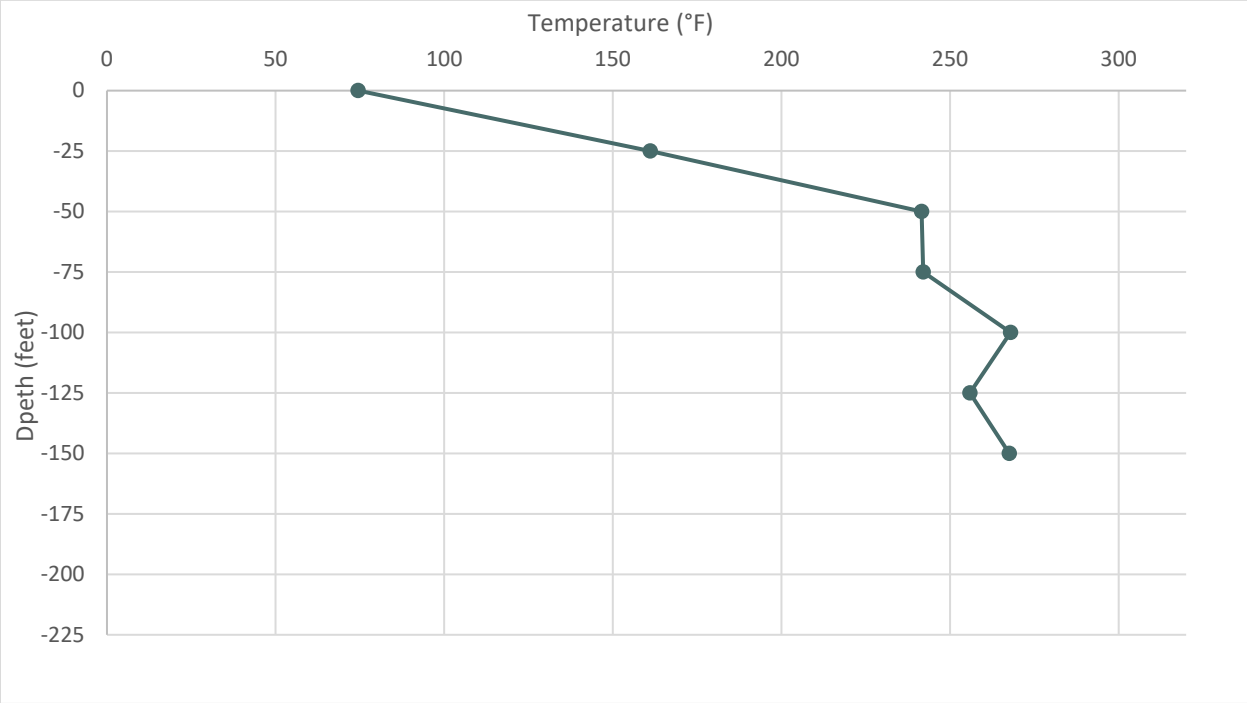


Figure B- 7. Average Temperatures Recorded by TP-2 on August 9, 2023

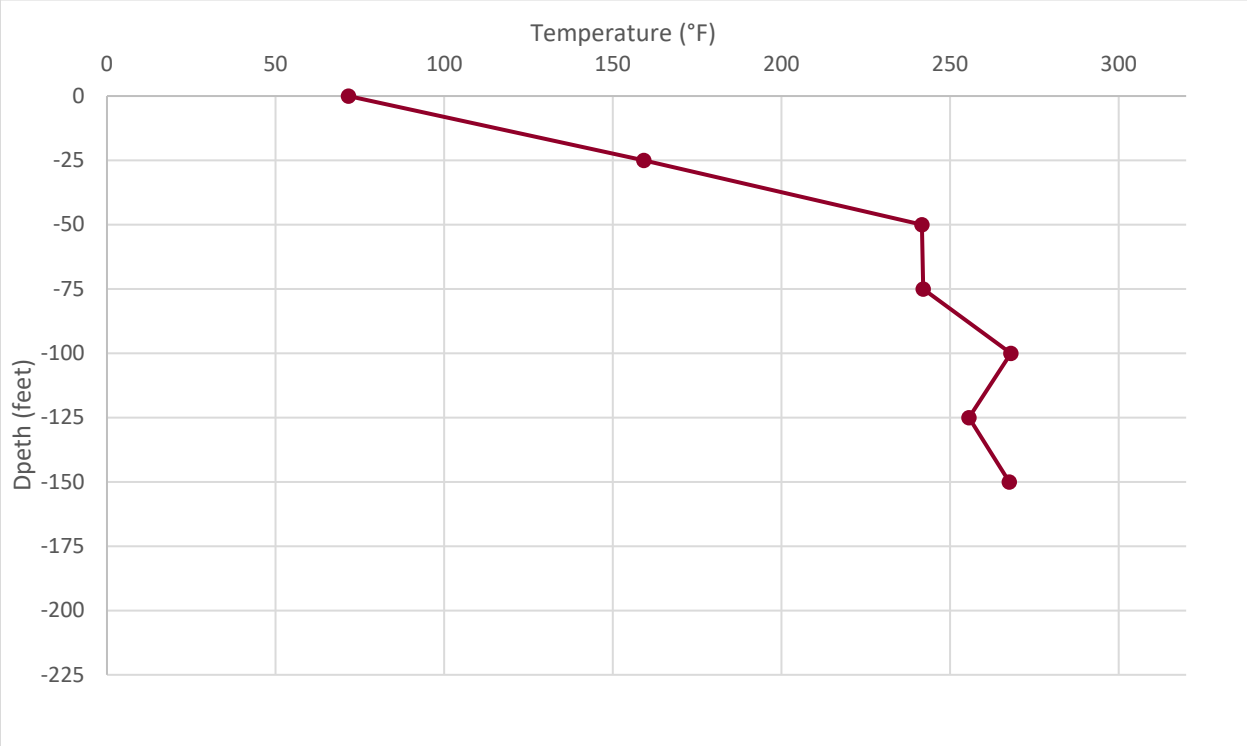


Figure B- 8. Average Temperatures Recorded by TP-3 on August 2, 2023

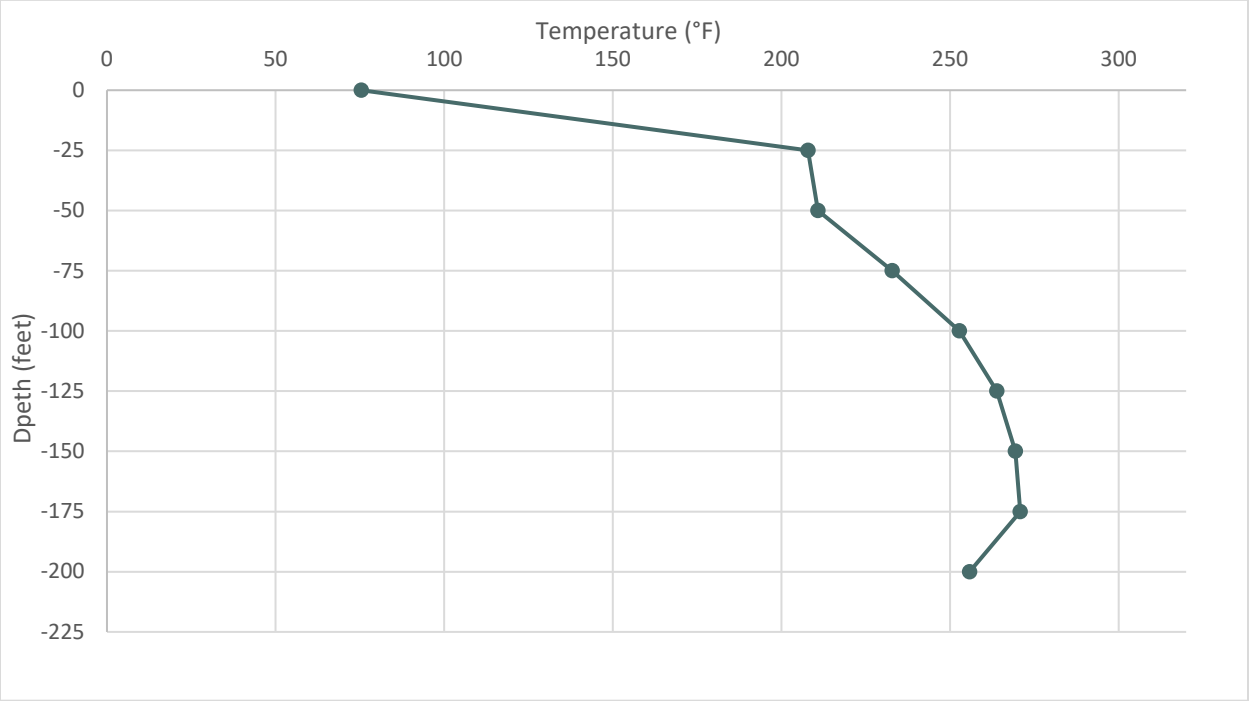


Figure B- 9. Average Temperatures Recorded by TP-3 on August 9, 2023

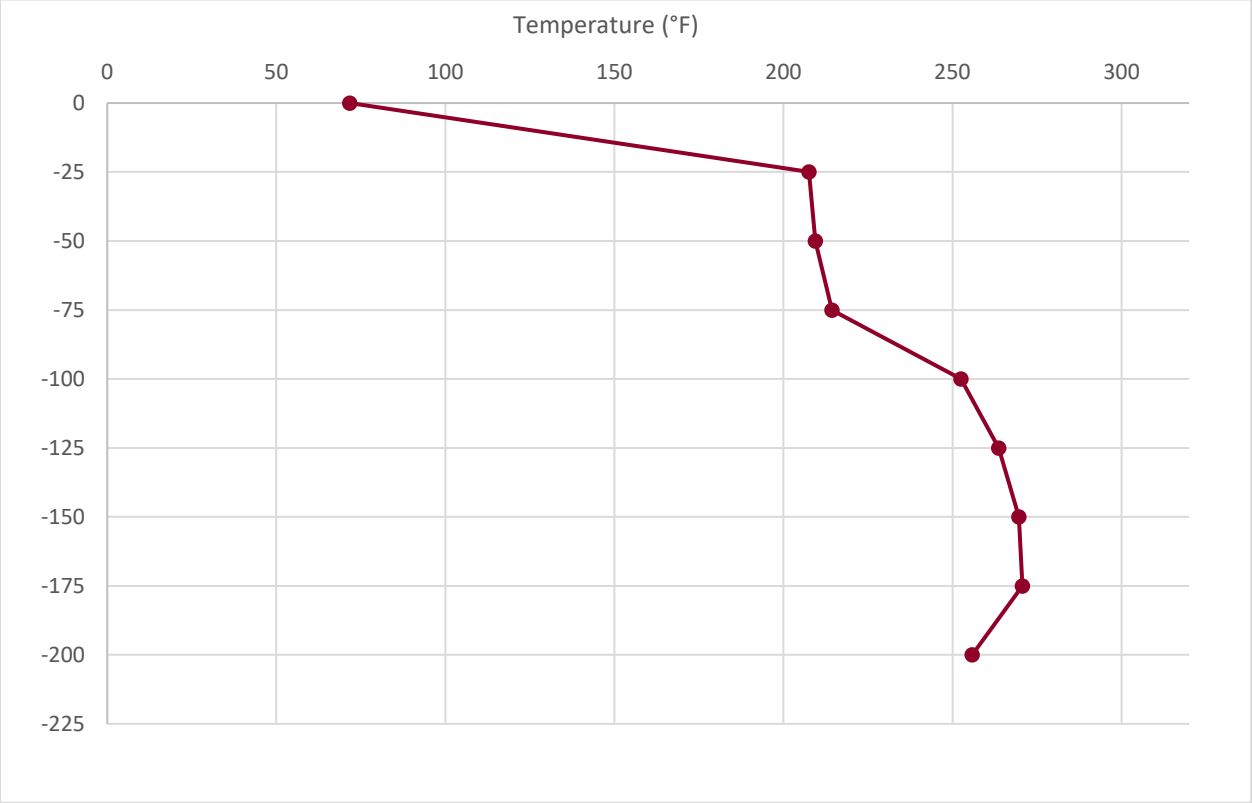


Figure B- 10. Average Temperatures Recorded by TP-3 on August 16, 2023

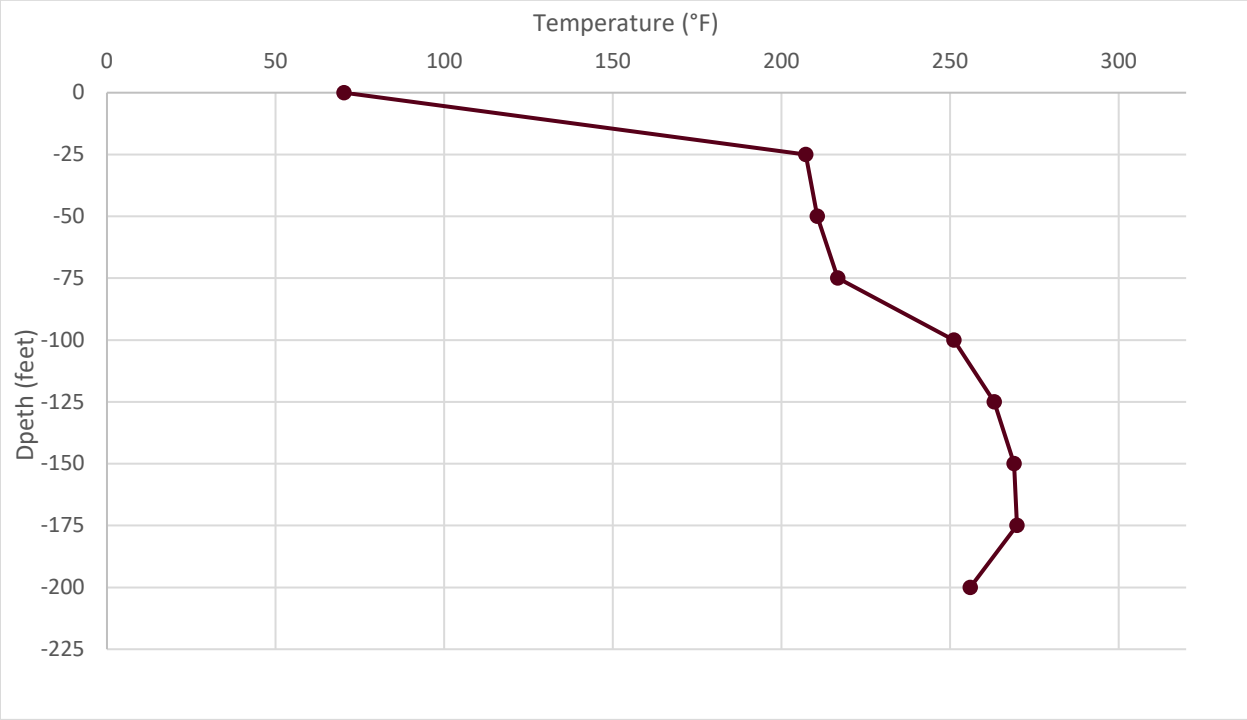


Figure B- 11. Average Temperatures Recorded by TP-3 on August 23, 2023

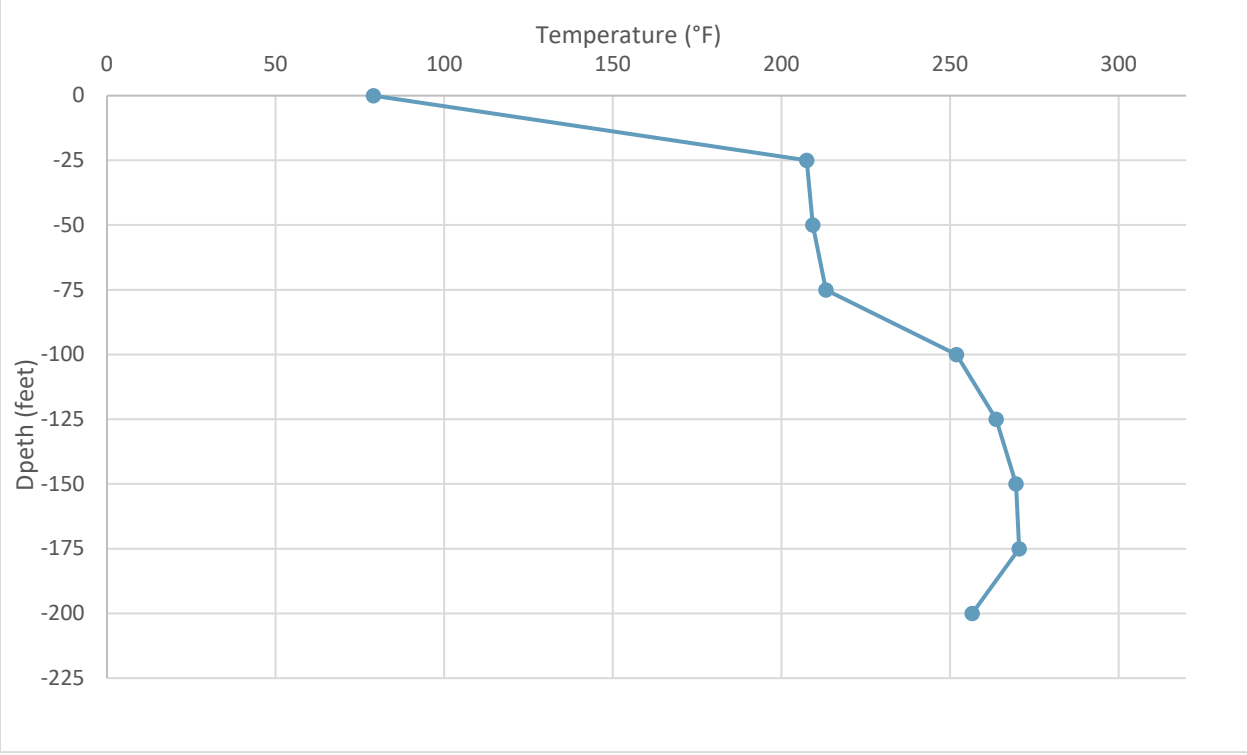


Figure B- 12. Average Temperatures Recorded by TP-3 on August 30, 2023

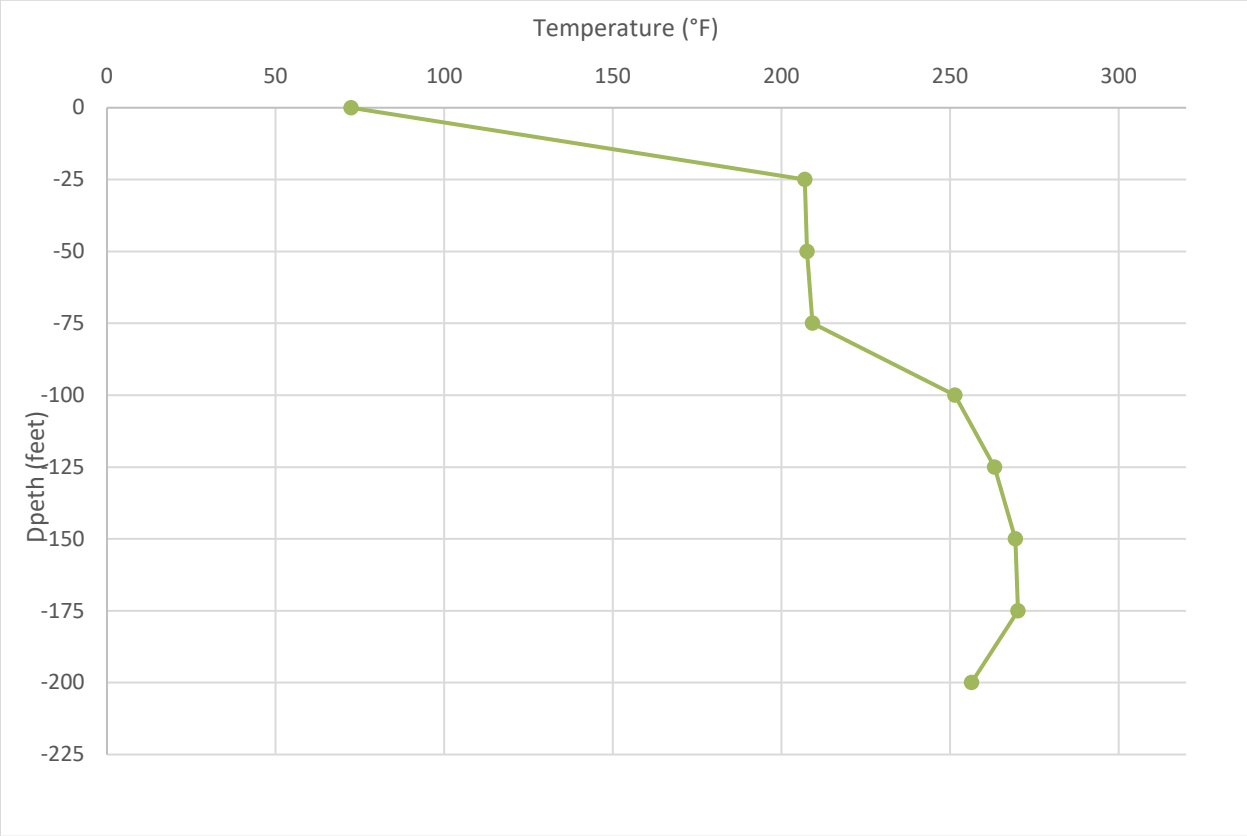


Figure B- 13. Average Temperatures Recorded by TP-4 on August 2, 2023

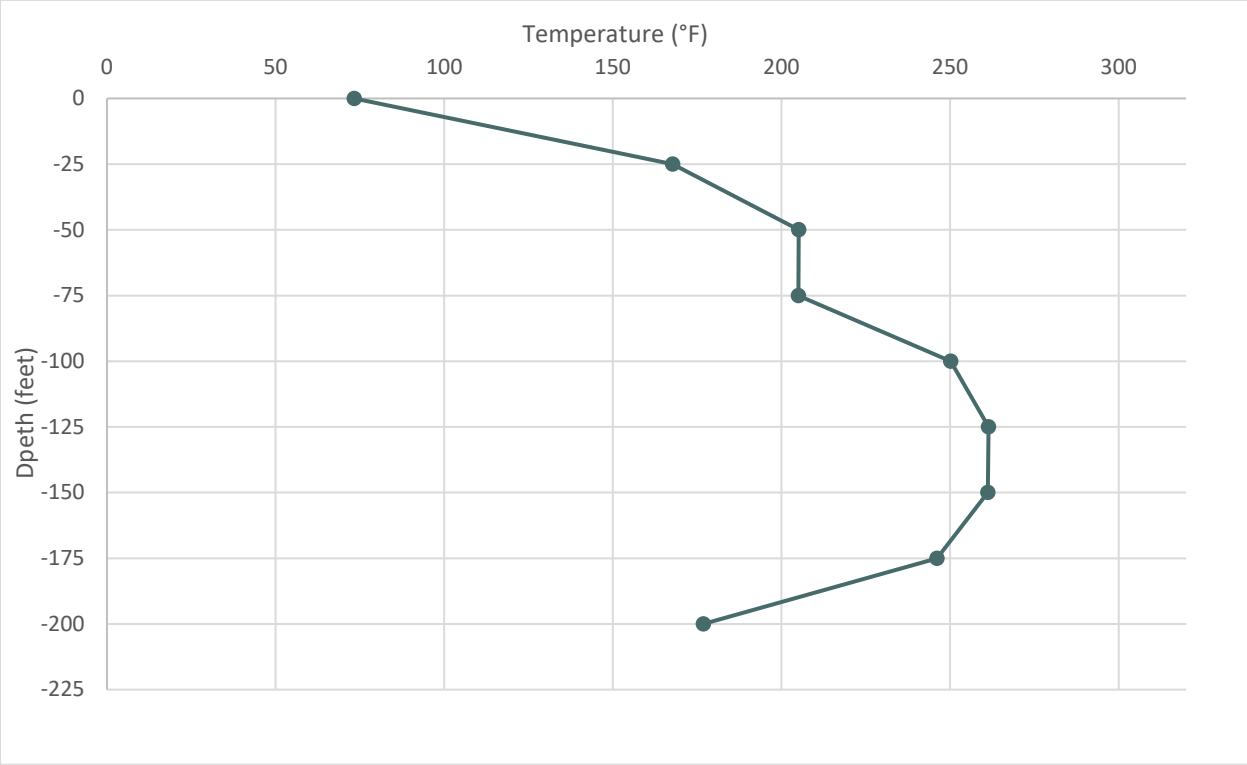


Figure B- 14. Average Temperatures Recorded by TP-4 on August 9, 2023

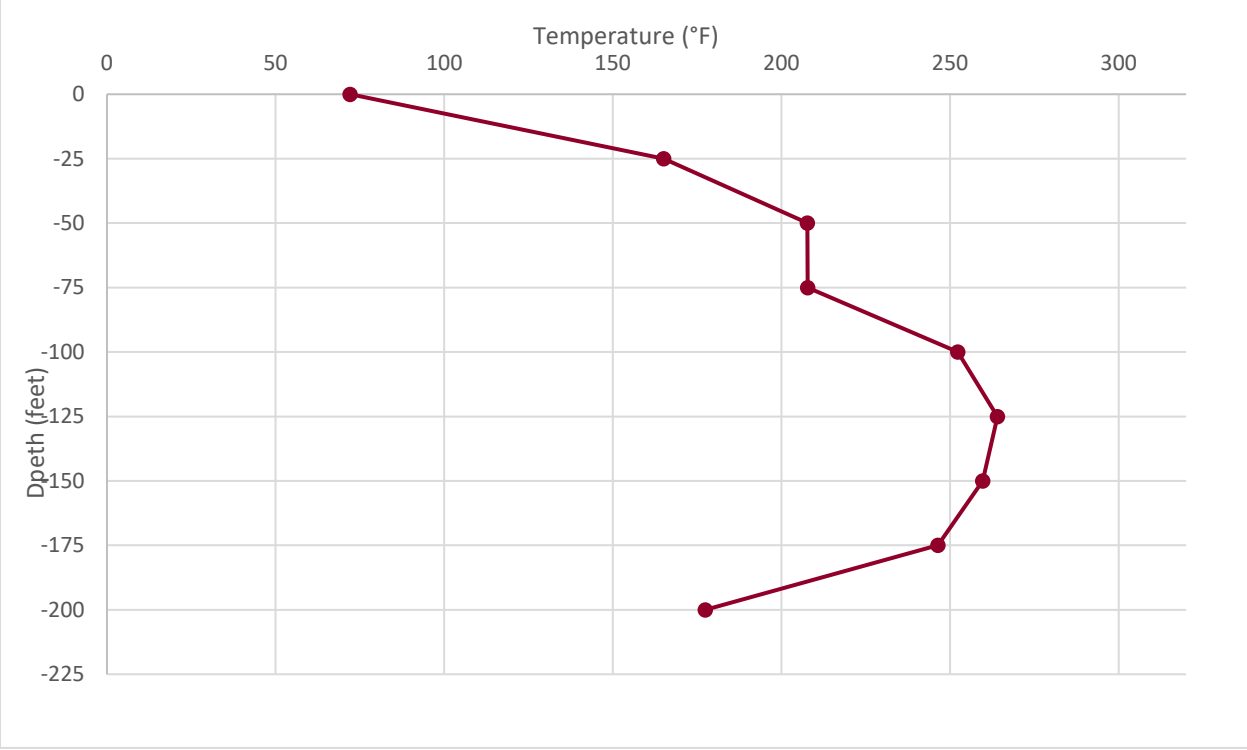


Figure B- 15. Average Temperatures Recorded by TP-4 on August 16, 2023

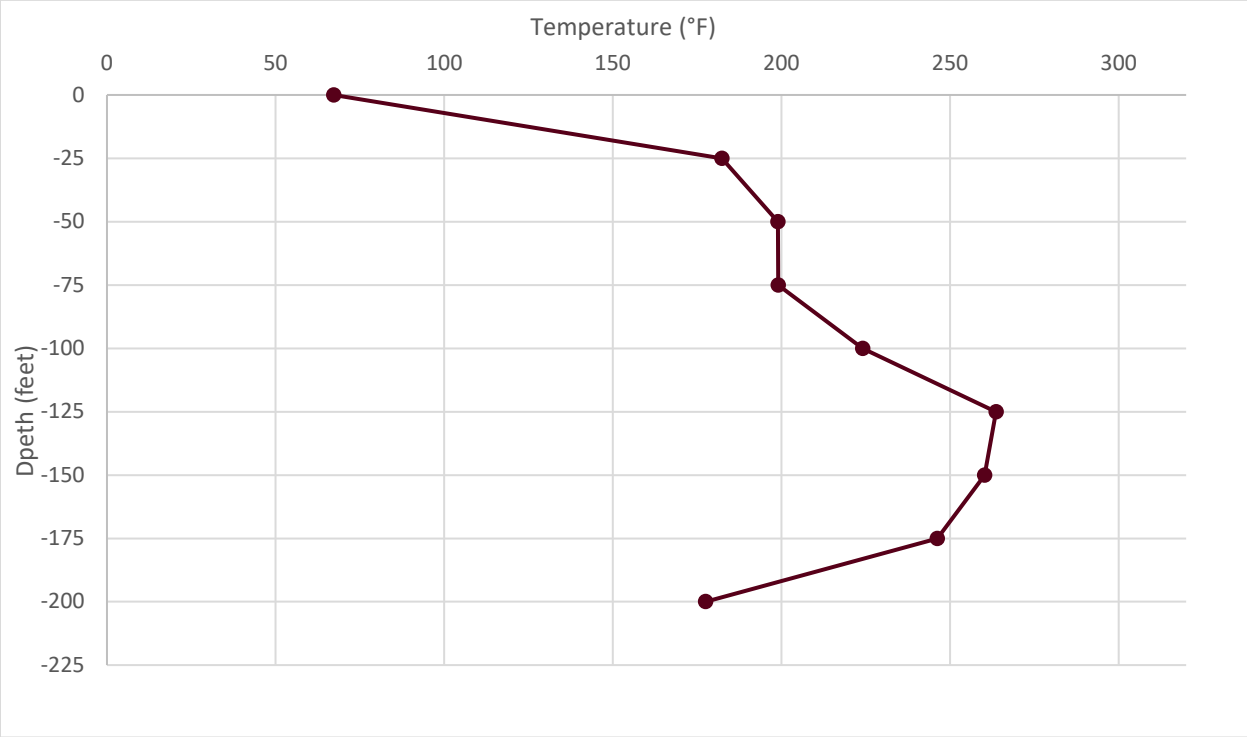


Figure B- 16. Average Temperatures Recorded by TP-4 on August 23, 2023

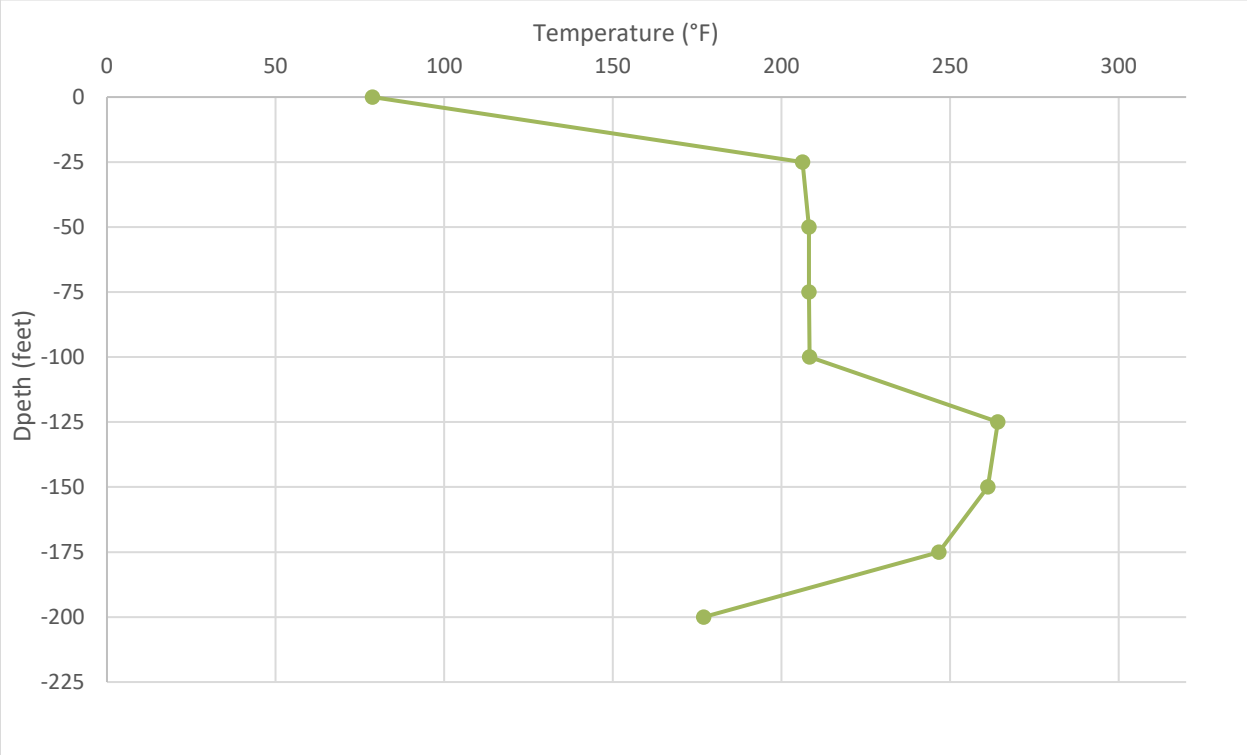


Figure B- 17. Average Temperatures Recorded by TP-4 on August 30, 2023

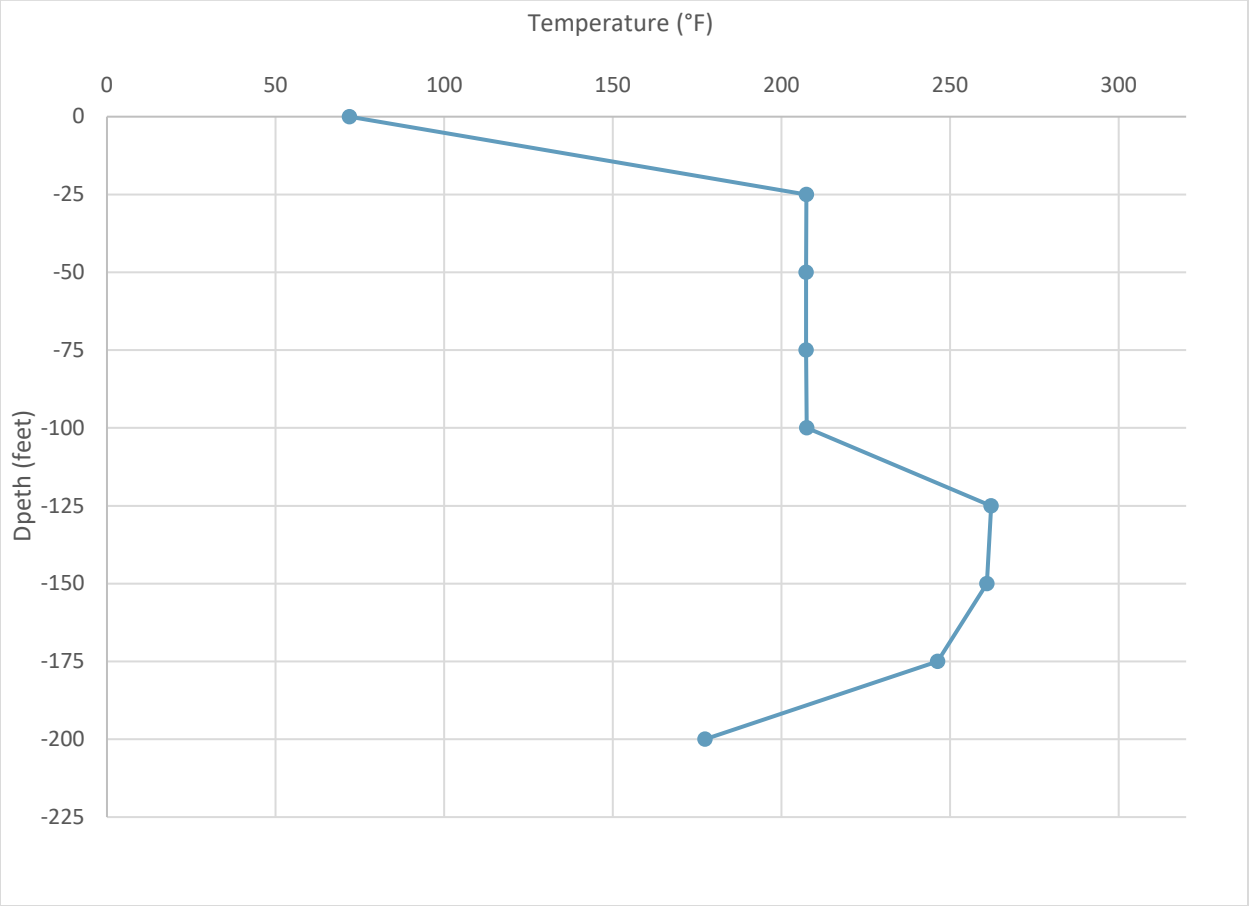


Figure B- 18. Average Temperatures Recorded by TP-5 on August 2, 2023

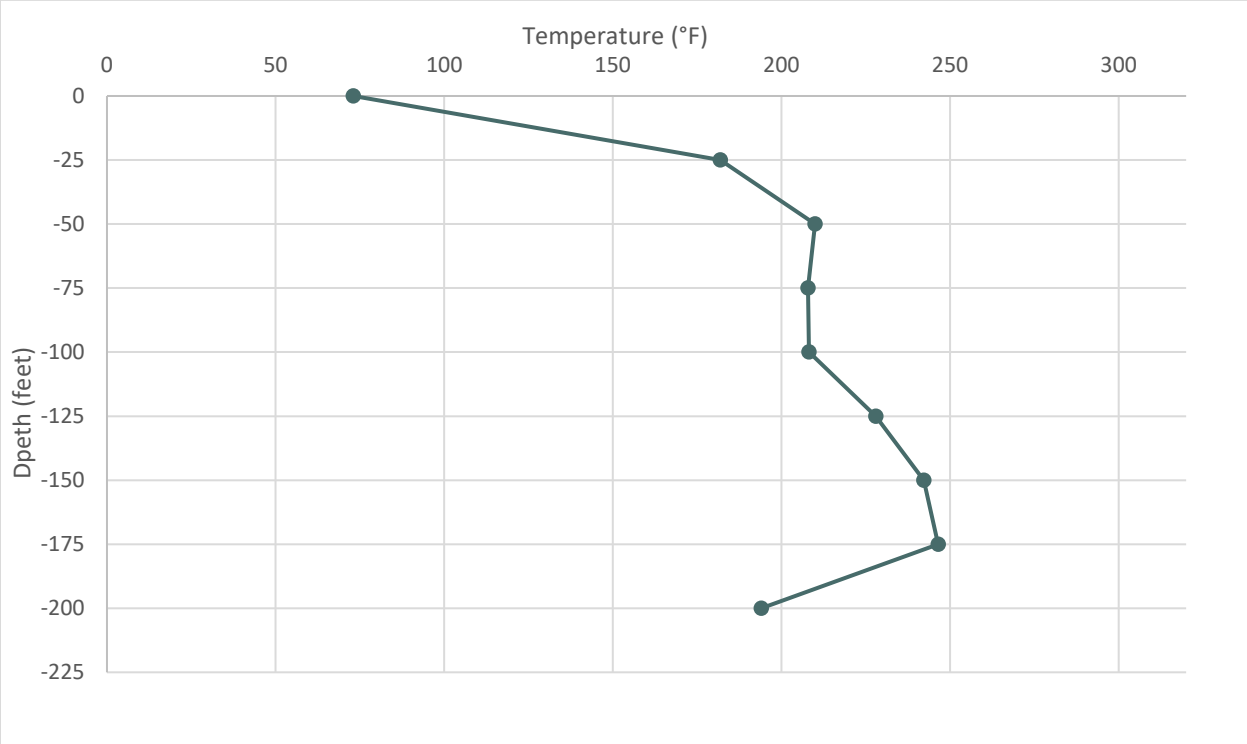


Figure B- 19. Average Temperatures Recorded by TP-5 on August 9, 2023

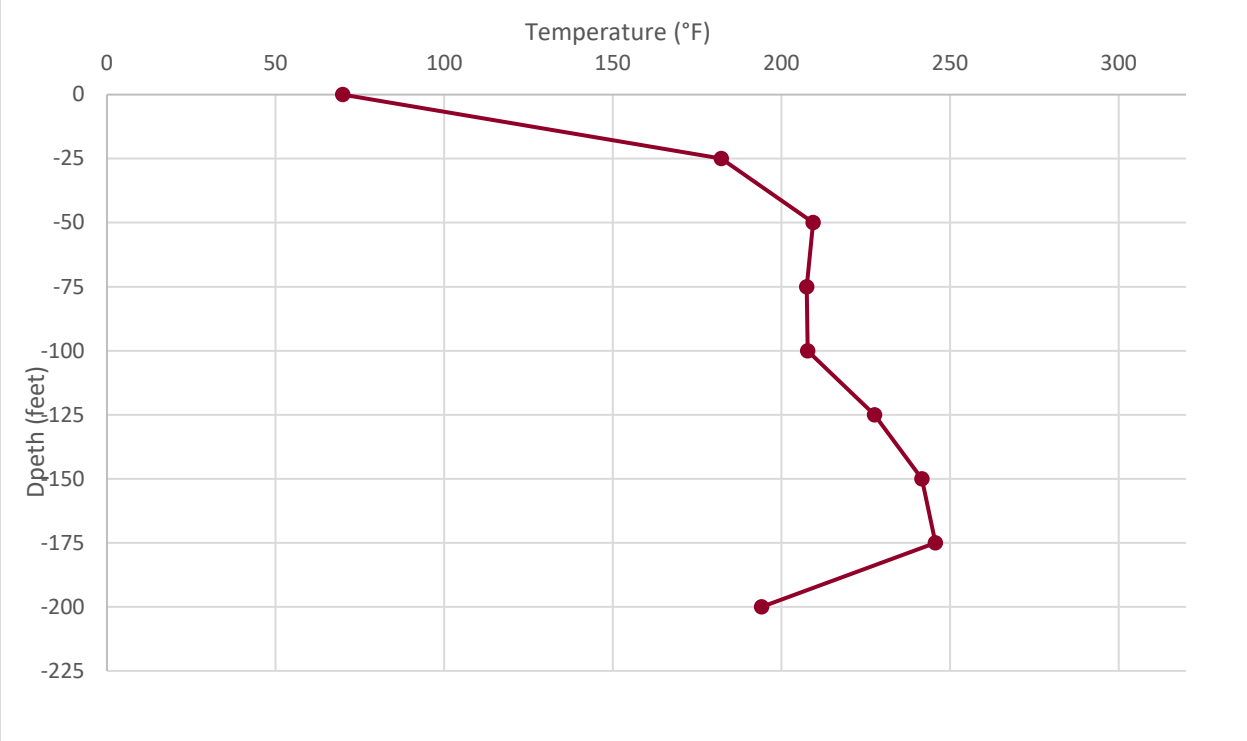


Figure B- 20. Average Temperatures Recorded by TP-5 on August 16, 2023

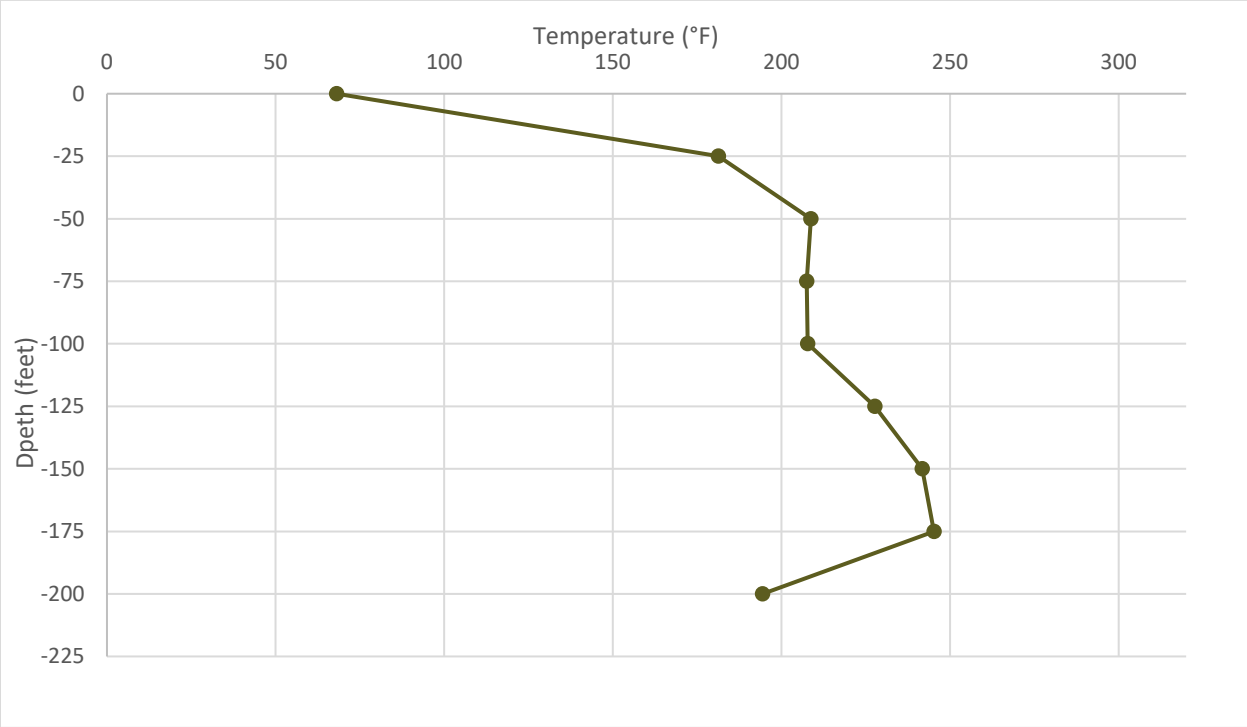


Figure B- 21. Average Temperatures Recorded by TP-5 on August 23, 2023

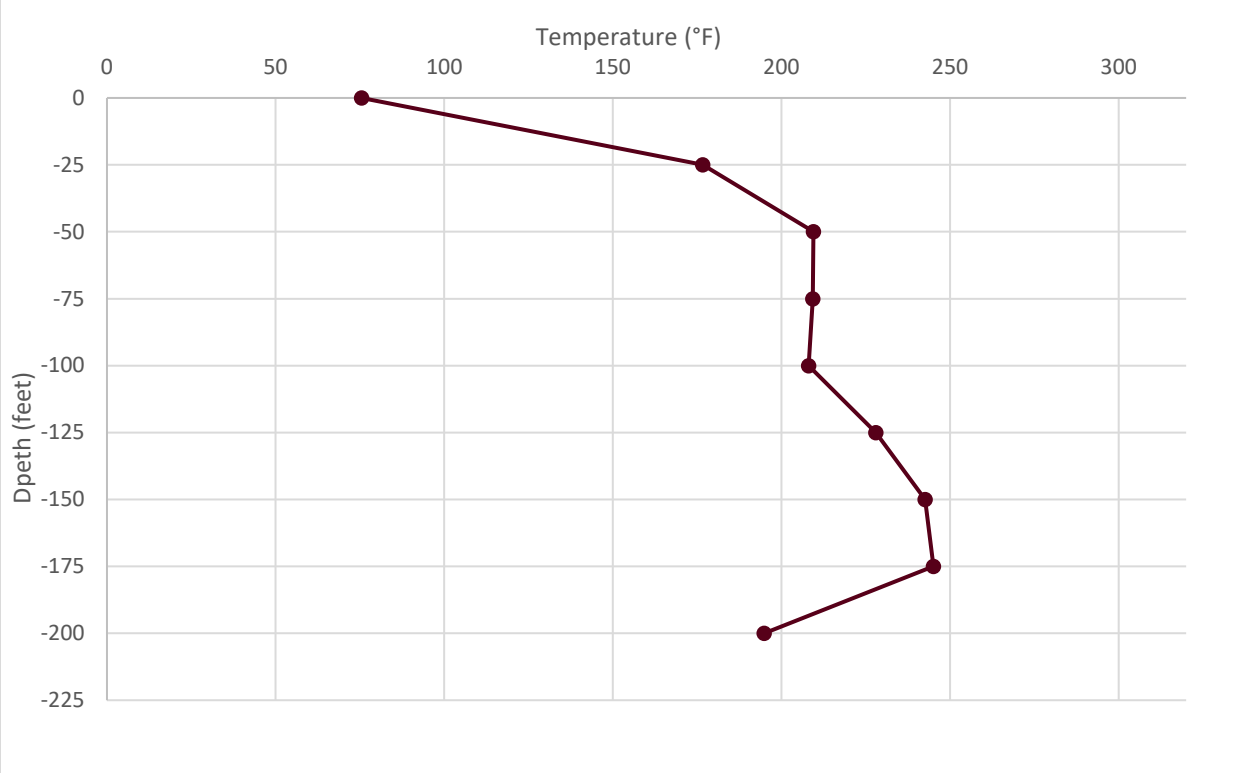


Figure B- 22. Average Temperatures Recorded by TP-5 on August 30, 2023

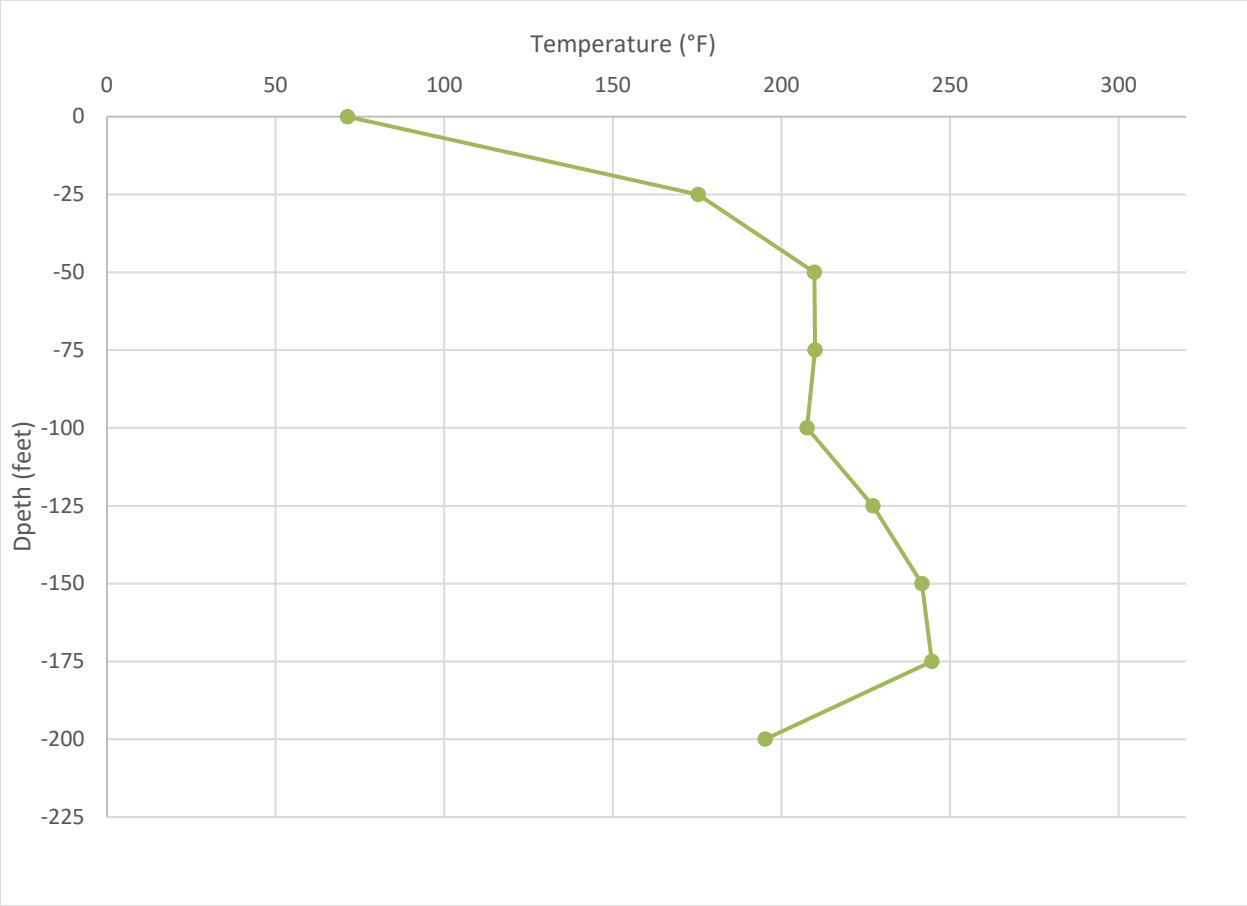


Figure B- 23. Average Temperatures Recorded by TP-6 on August 2, 2023

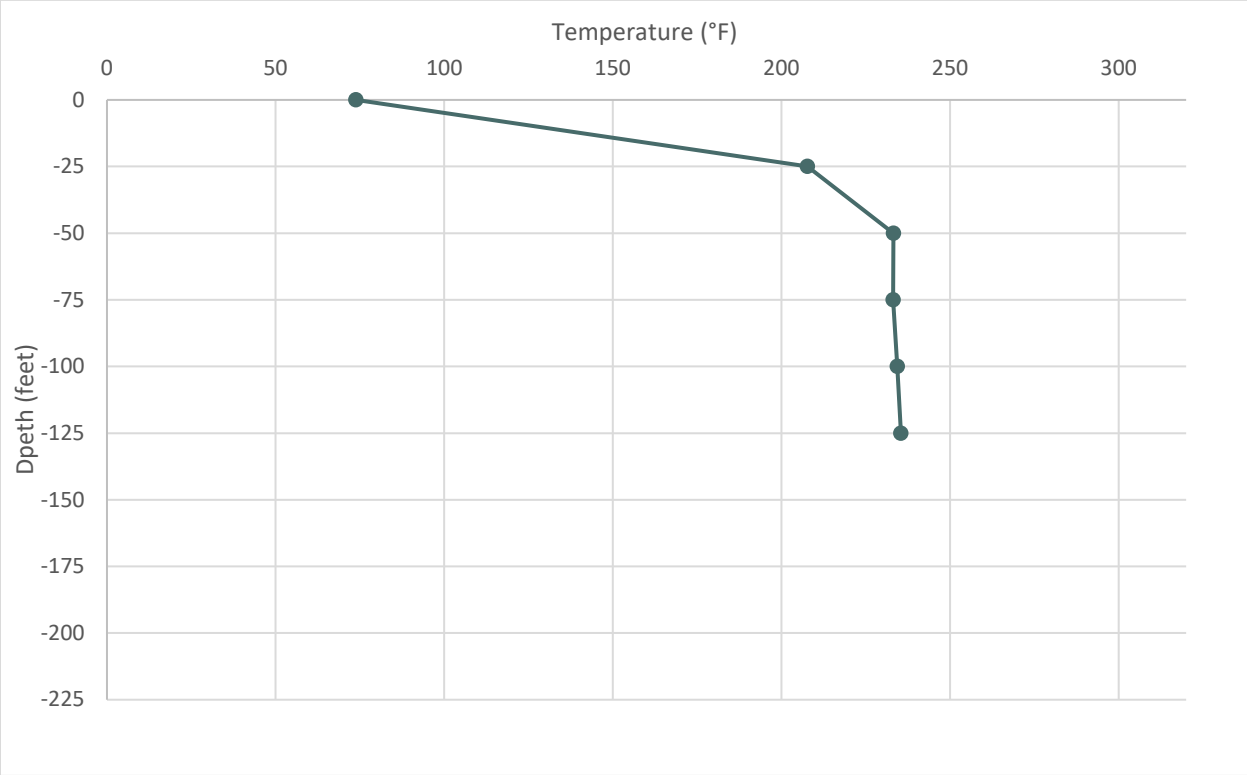


Figure B- 24. Average Temperatures Recorded by TP-6 on August 9, 2023

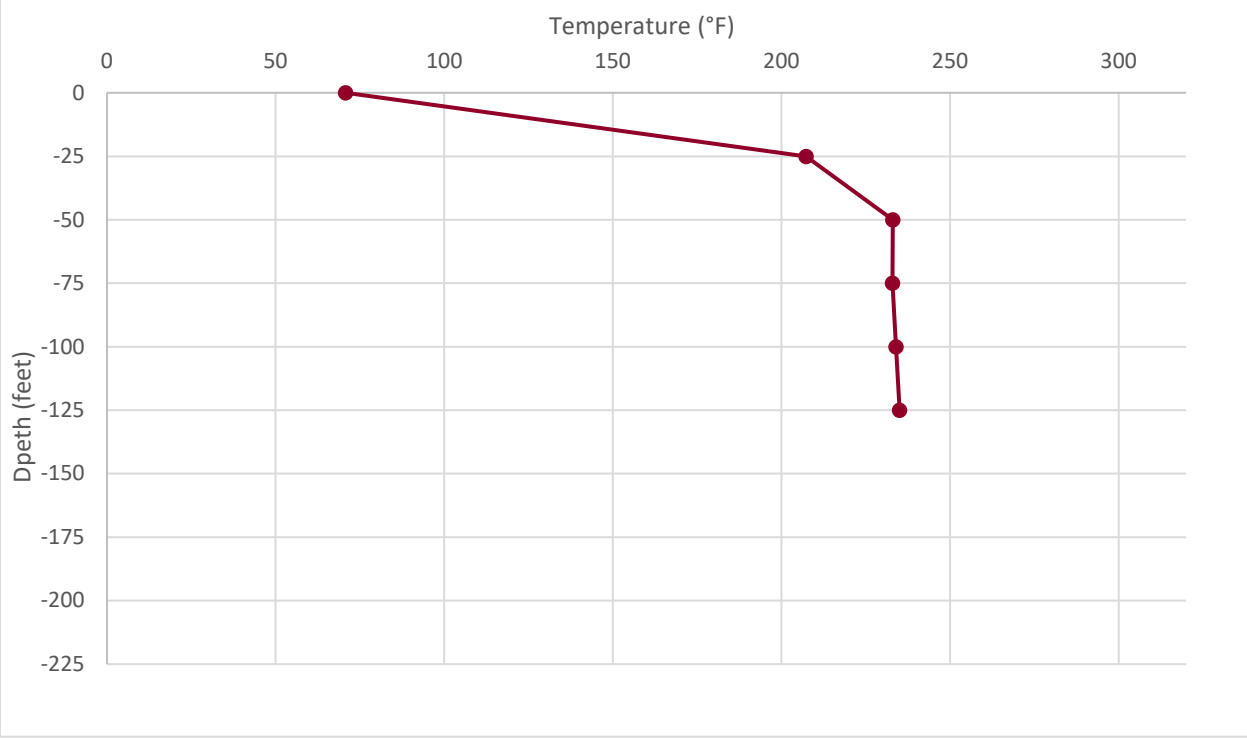


Figure B- 25. Average Temperatures Recorded by TP-6 on August 16, 2023

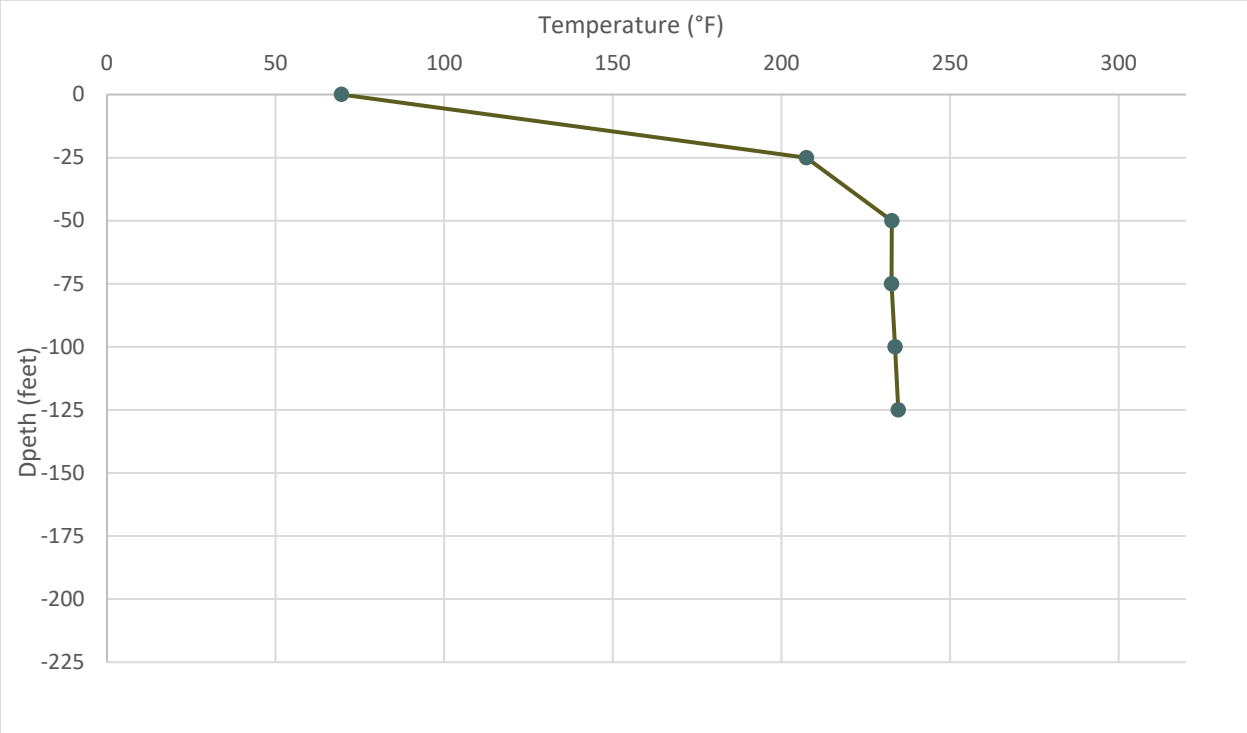


Figure B- 26. Average Temperatures Recorded by TP-6 on August 23, 2023

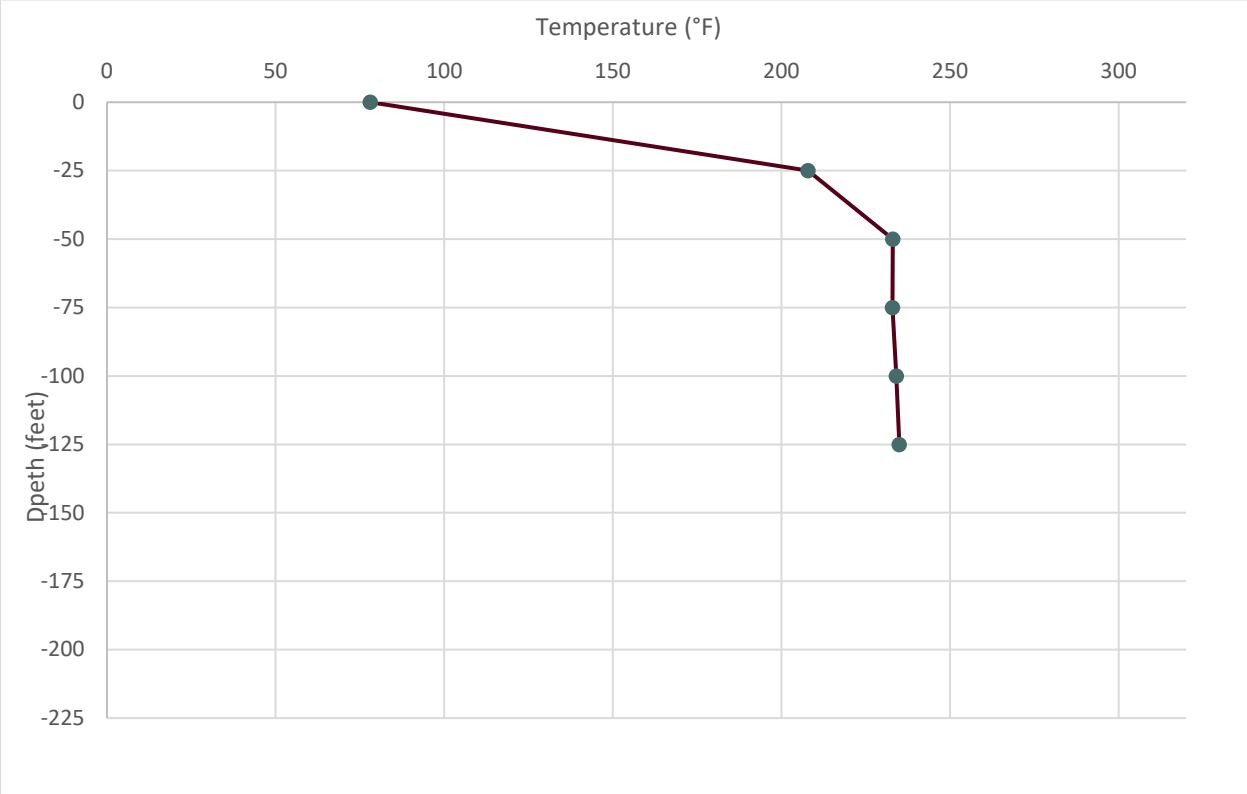


Figure B- 27. Average Temperatures Recorded by TP-6 on August 30, 2023

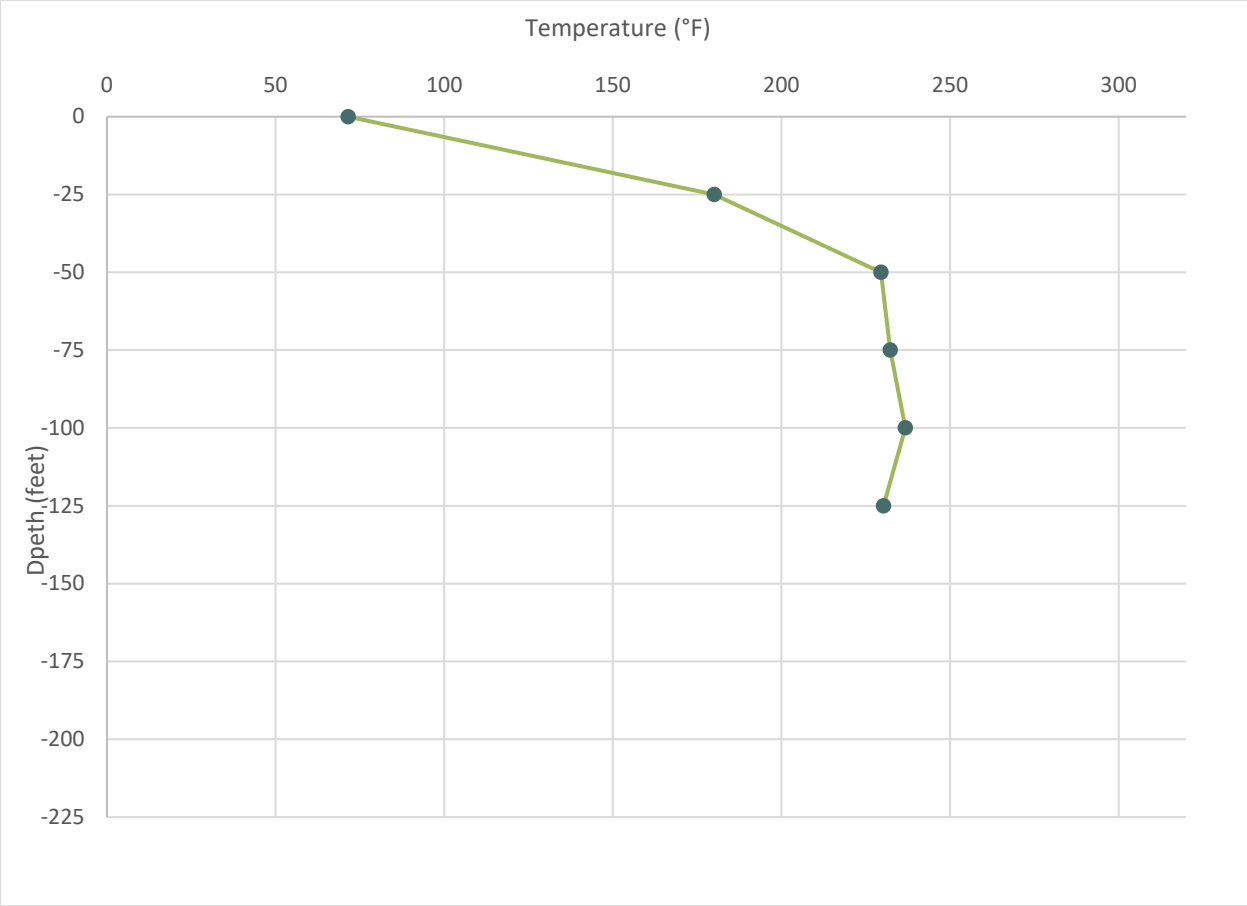


Figure B- 28. Average Temperatures Recorded by TP-7 on August 2, 2023

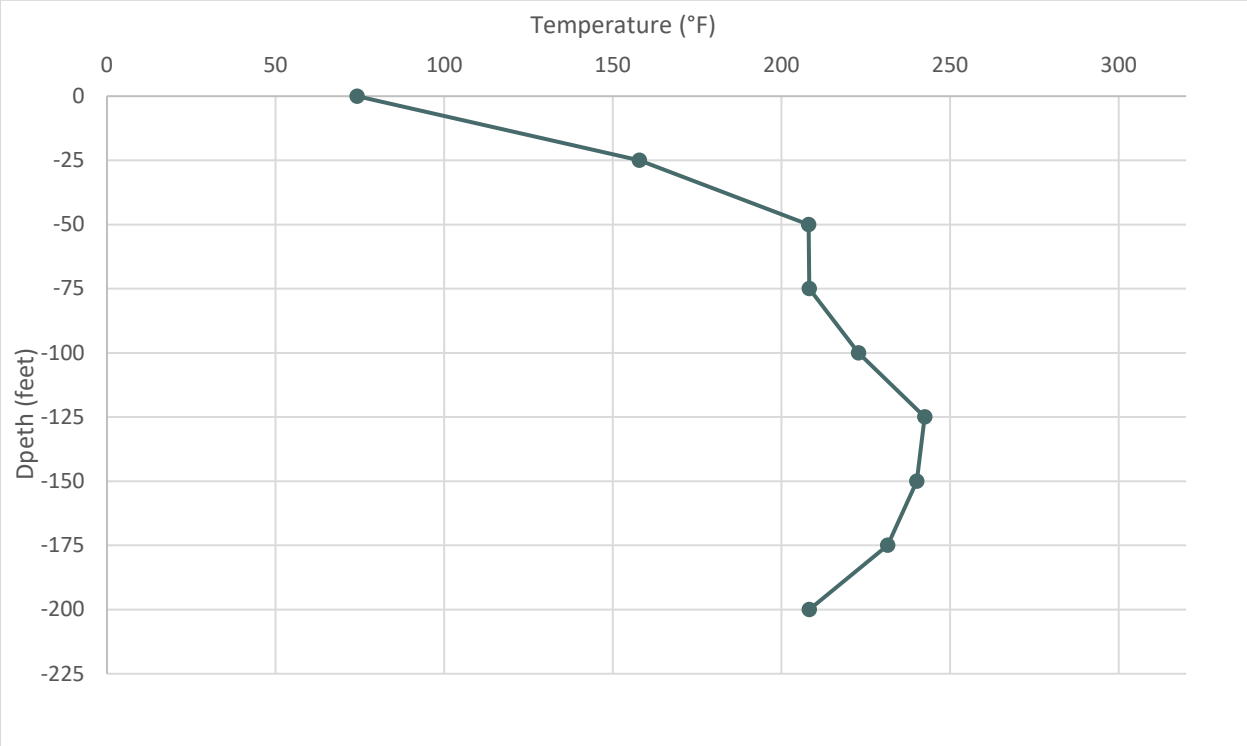


Figure B- 29. Average Temperatures Recorded by TP-7 on August 9, 2023

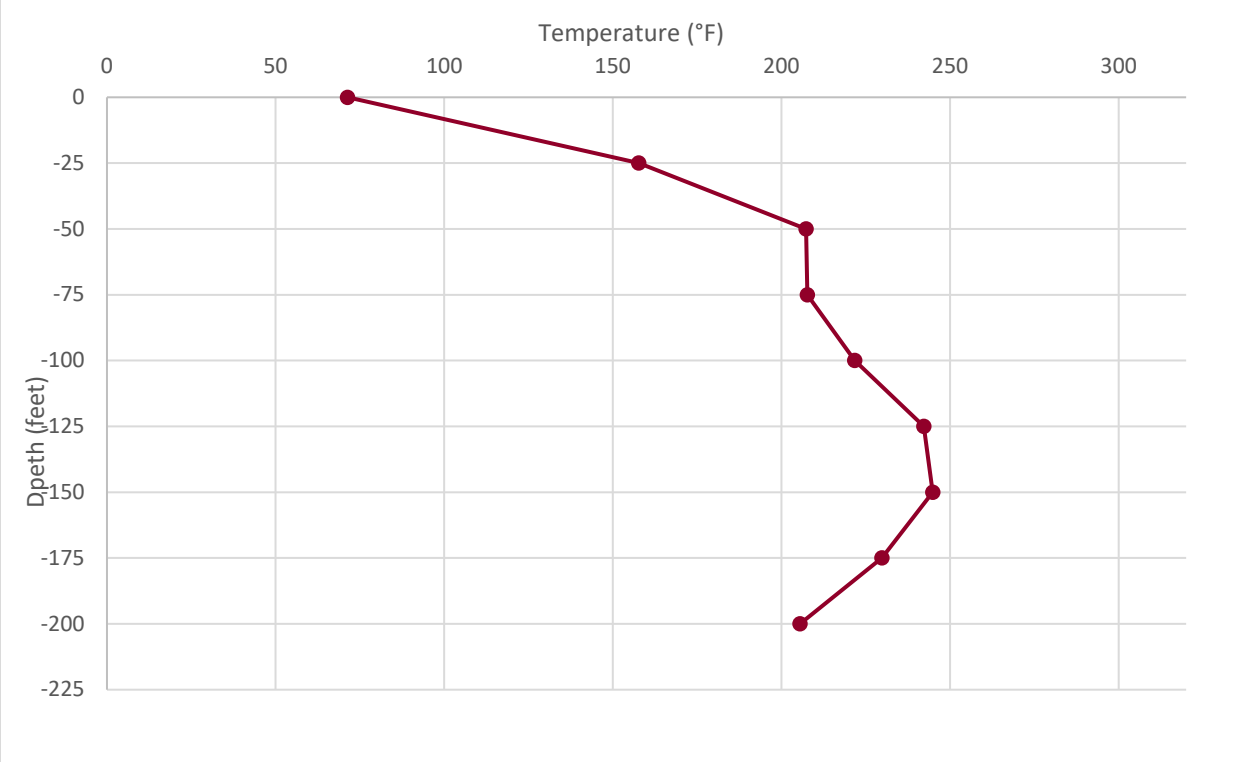


Figure B- 30. Average Temperatures Recorded by TP-8 on August 2, 2023

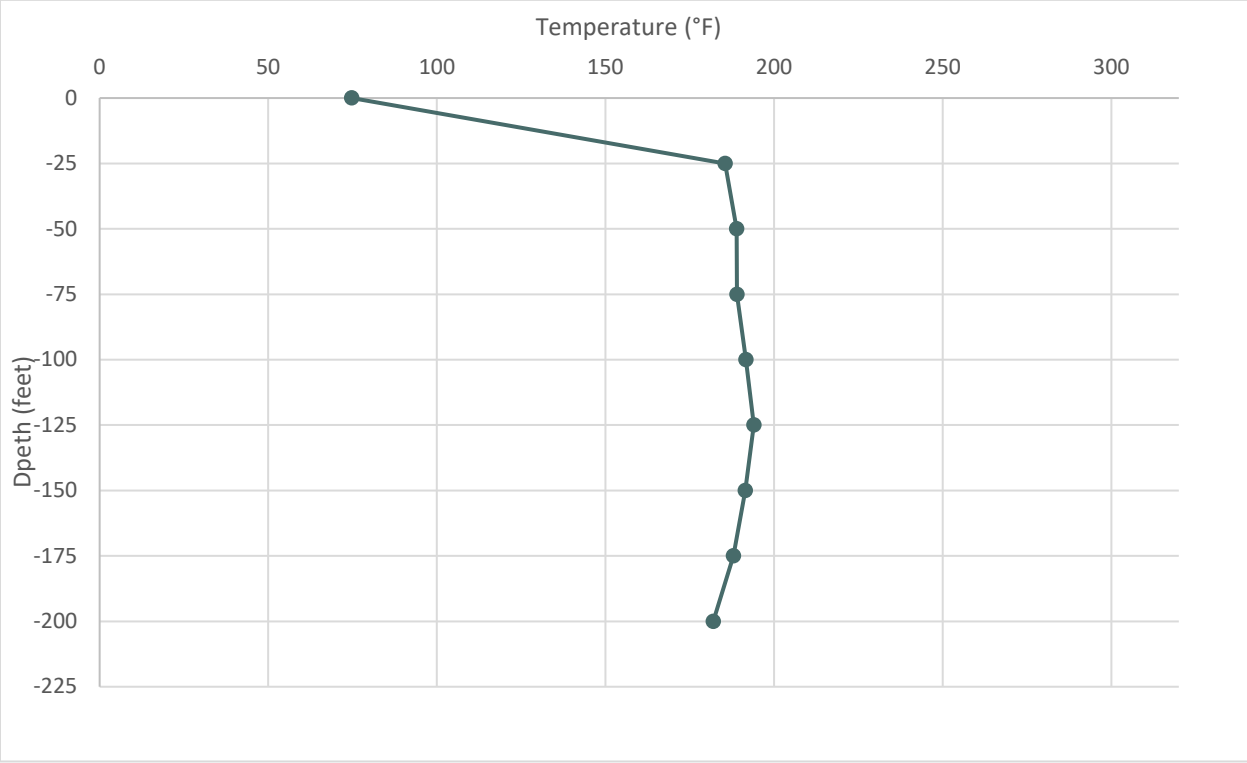


Figure B- 31. Average Temperatures Recorded by TP-8 on August 9, 2023

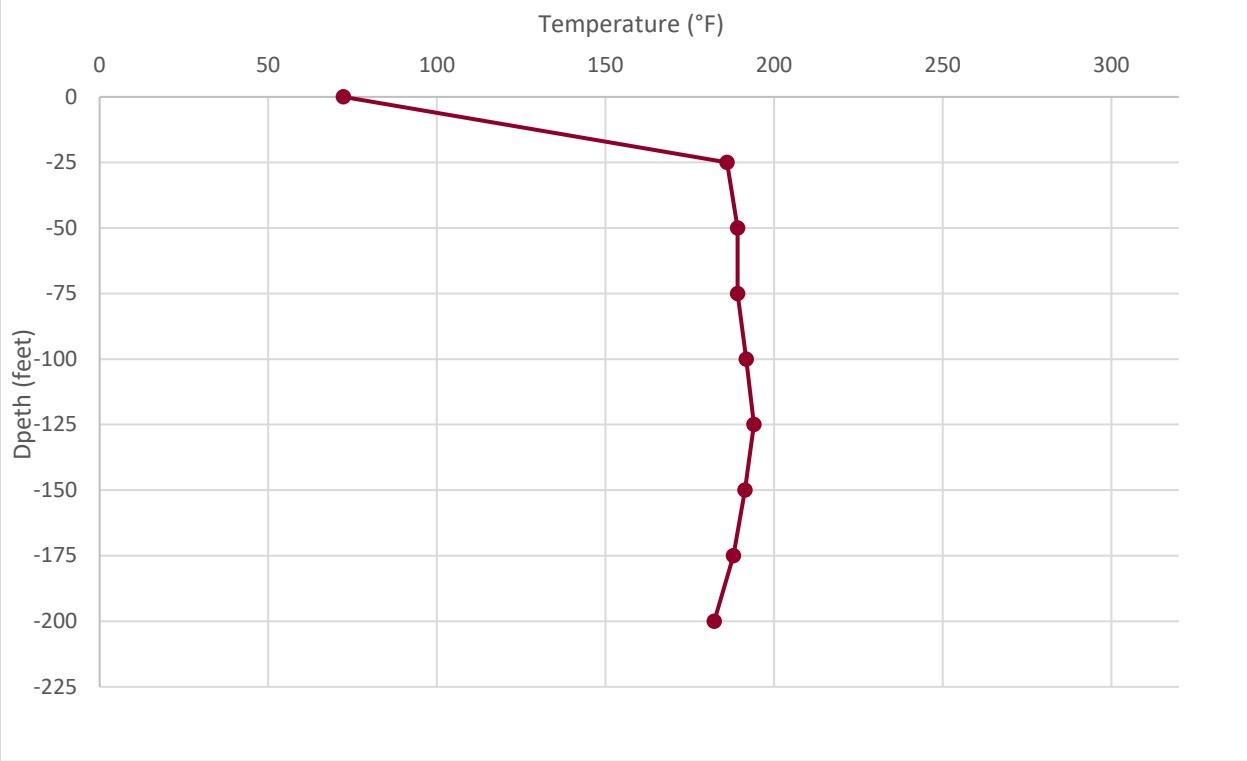


Figure B- 32. Average Temperatures Recorded by TP-8 on August 16, 2023

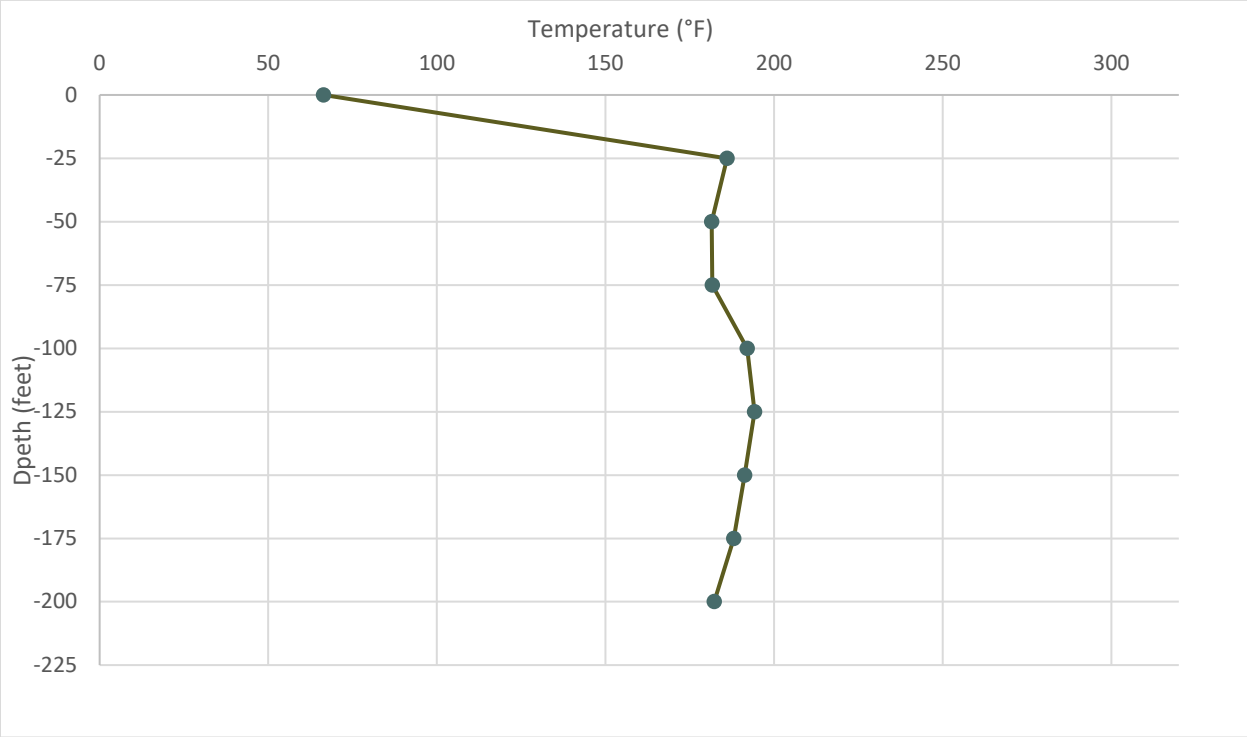


Figure B- 33. Average Temperatures Recorded by TP-8 on August 23, 2023

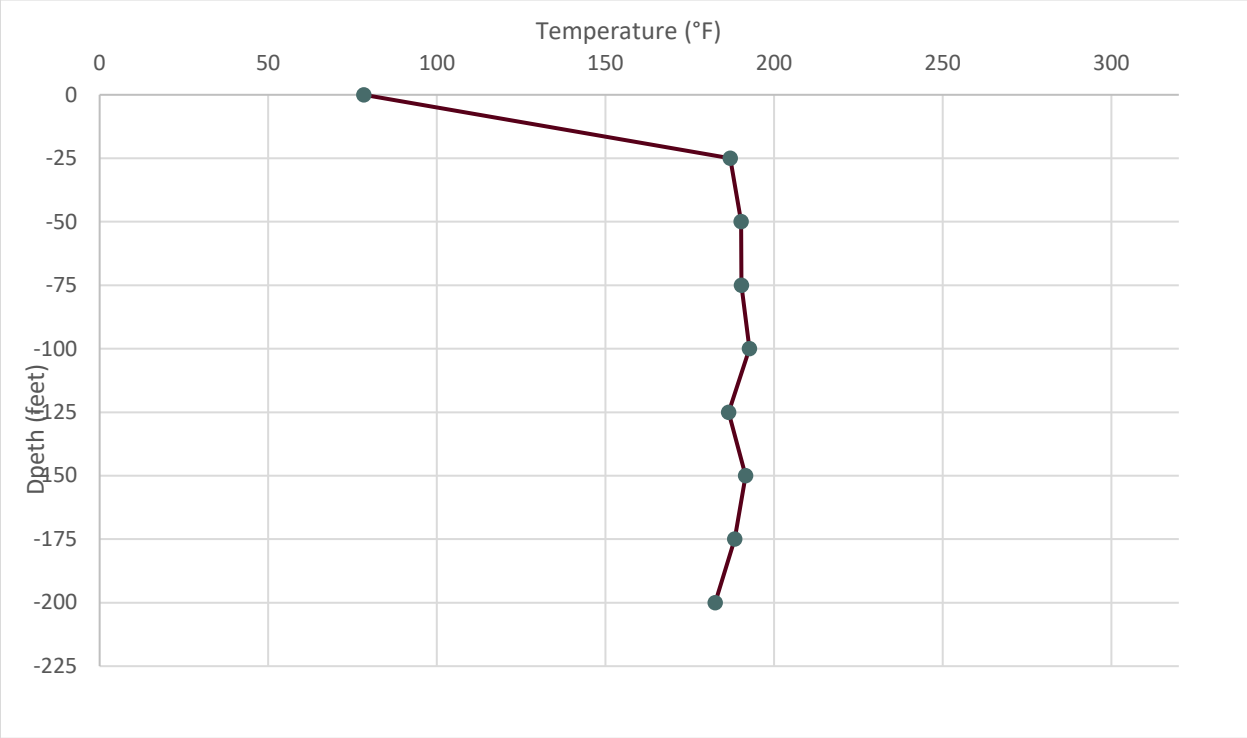


Figure B- 34. Average Temperatures Recorded by TP-8 on August 30, 2023

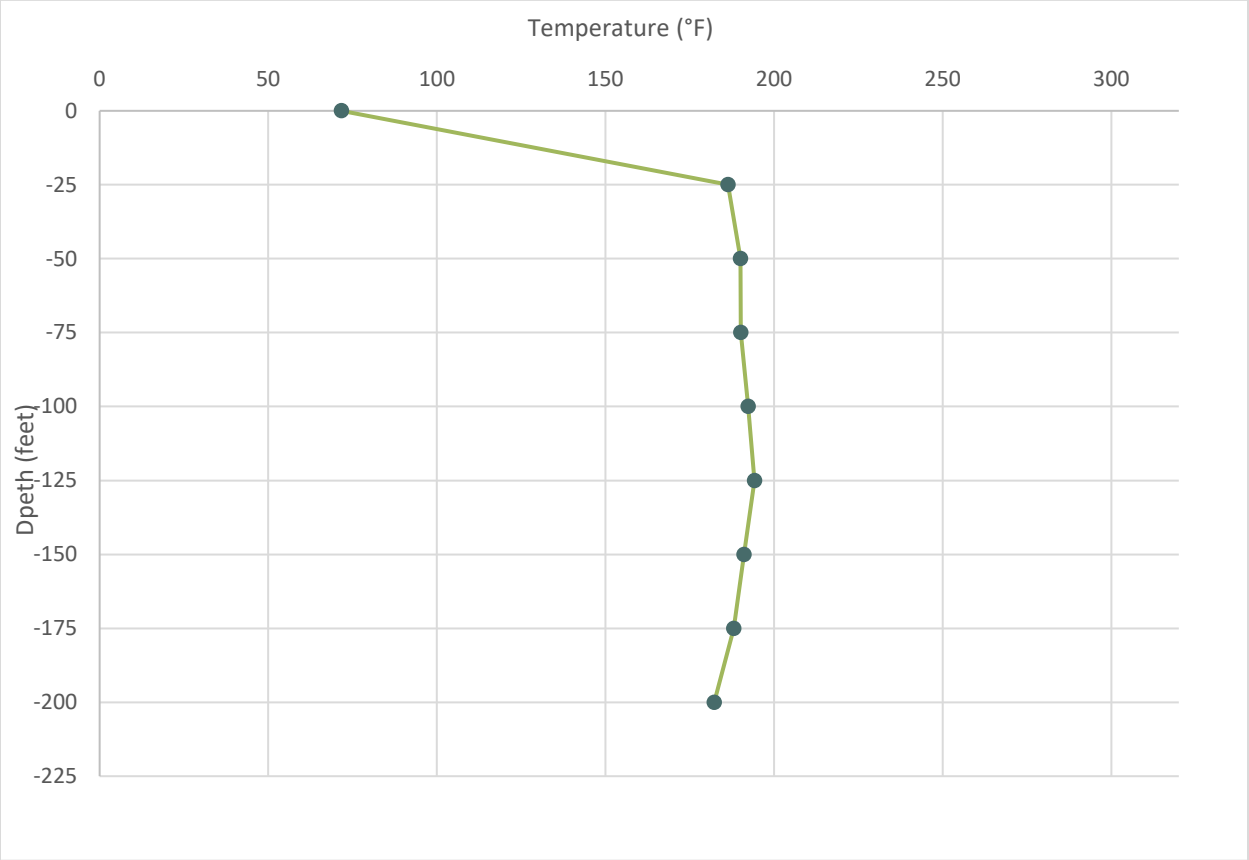


Figure B- 35. Average Temperatures Recorded by TP-9 on August 2, 2023

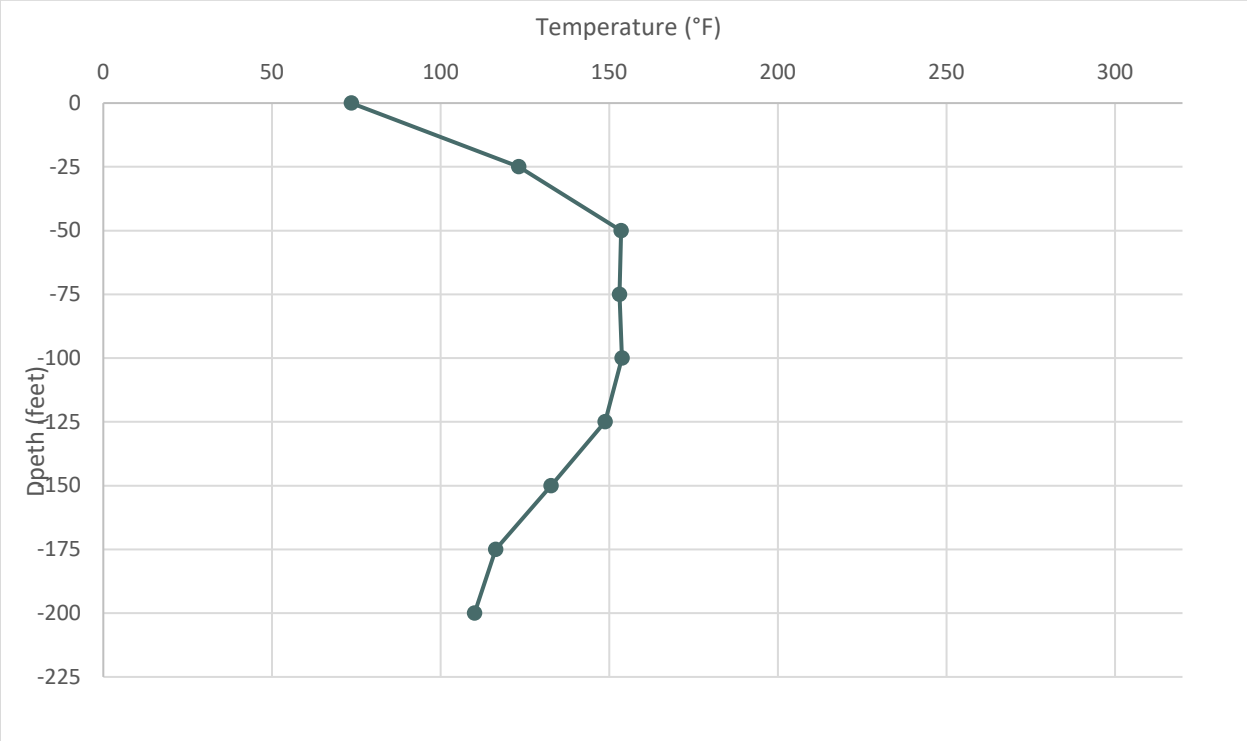


Figure B- 36. Average Temperatures Recorded by TP-9 on August 9, 2023

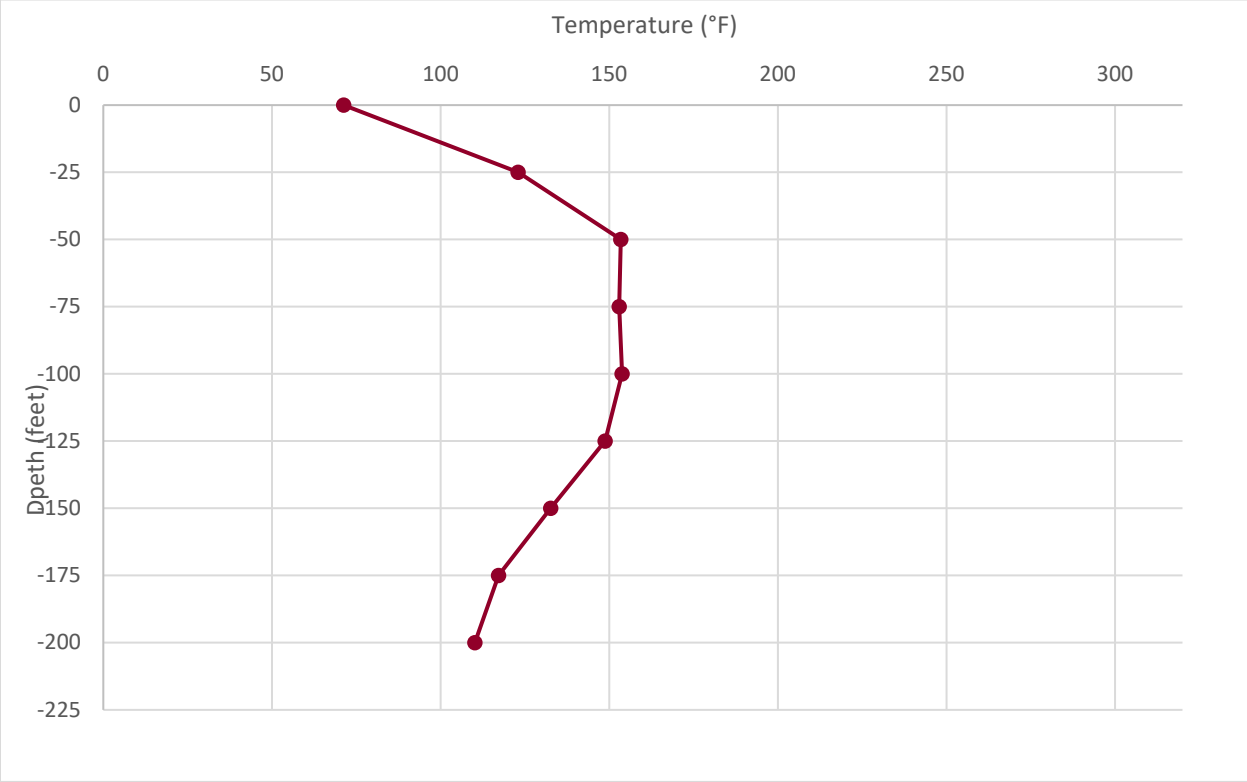
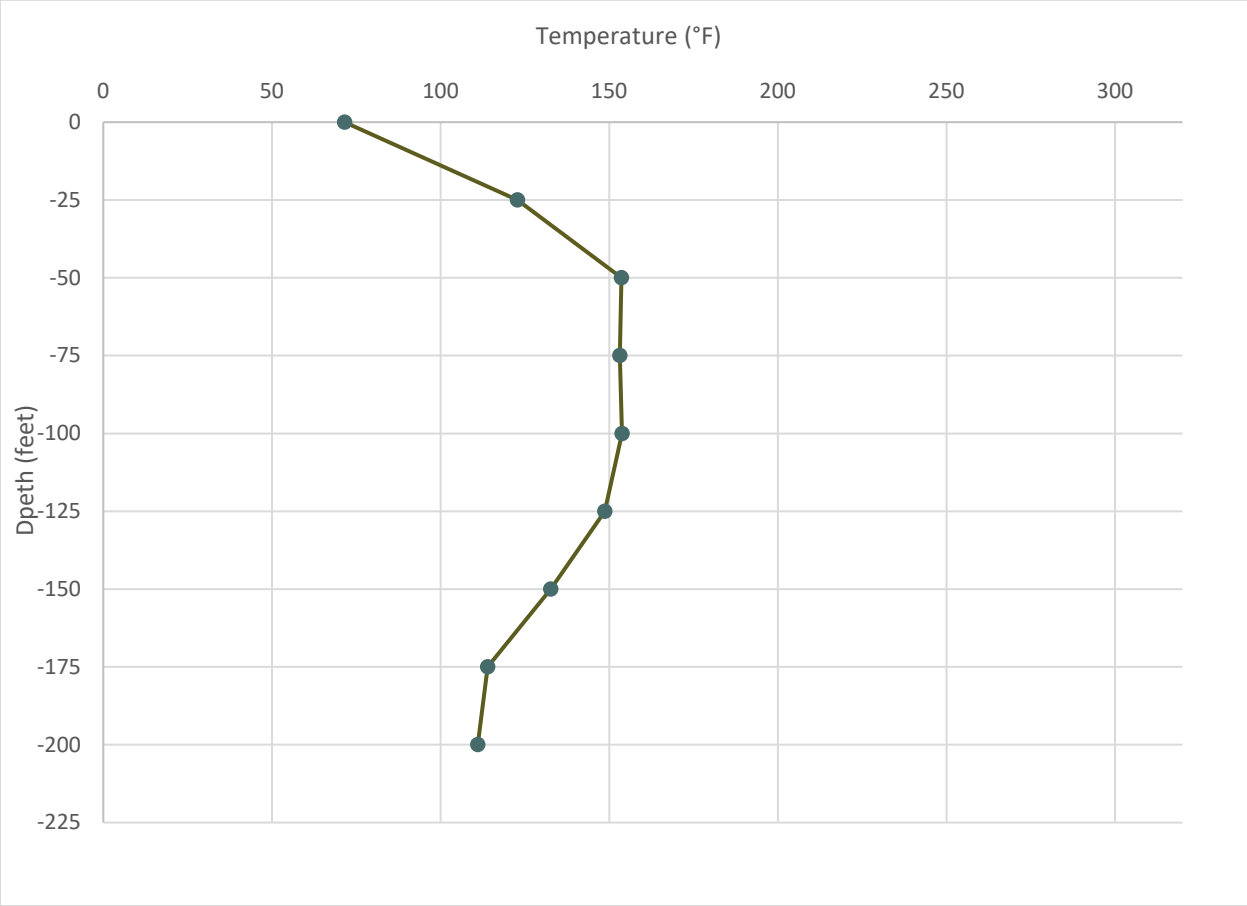


Figure B- 37. Average Temperatures Recorded by TP-9 on August 16, 2023



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 monthly basis at a minimum.

SCS ENGINEERS

07222143.00 | September 6, 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)
Aug 1	109.4	105.8	114.4
Aug 2	111.0	107.1	115.5
Aug 3	111.2	109.4	112.9
Aug 4	111.2	94.0	116.1
Aug 5	113.0	109.5	116.2
Aug 6	112.3	109.6	115.2
Aug 7	112.3	108.0	115.6
Aug 8	106.5	72.4	114.1
Aug 9	112.6	110.4	116.0
Aug 10	111.2	107.7	114.7
Aug 11	112.5	109.7	116.5
Aug 12	112.2	109.5	115.4
Aug 13	112.4	109.9	116.4
Aug 14	112.9	107.3	116.6
Aug 15	112.2	107.4	115.5
Aug 16	104.1	69.6	115.4
Aug 17	78.2	59.6	93.4
Aug 18	74.8	62.5	91.8
Aug 19	73.5	54.8	93.7
Aug 20	76.9	57.9	96.6
Aug 21	79.7	62.5	97.5
Aug 22	81.3	66.7	96.8
Aug 23	80.4	63.9	97.7
Aug 24	89.7	66.3	111.7
Aug 25	92.4	68.9	113.7
Aug 26	85.4	68.8	101.4
Aug 27	77.1	68.4	97.1
Aug 28	87.3	68.0	110.0
Aug 29	85.6	68.3	102.6
Aug 30	84.6	67.9	105.8
Summary	**97.5**	**73.5**	**113.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 35

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	75.0	61.3	92.9
Aug 2	76.4	61.2	93.8
Aug 3	70.1	67.3	74.0
Aug 4	77.9	68.5	95.1
Aug 5	78.7	61.8	98.4
Aug 6	76.0	68.0	88.8
Aug 7	74.9	67.8	88.0
Aug 8	71.5	64.0	80.5
Aug 9	74.1	61.6	90.6
Aug 10	70.4	64.8	82.9
Aug 11	77.5	65.3	94.5
Aug 12	74.3	65.9	92.5
Aug 13	75.4	65.0	94.1
Aug 14	74.0	67.5	85.7
Aug 15	75.4	66.3	89.5
Aug 16	71.8	60.1	90.2
Aug 17	75.2	62.0	95.1
Aug 18	74.3	61.8	91.1
Aug 19	72.2	55.3	96.3
Aug 20	76.5	58.8	101.4
Aug 21	78.6	62.6	98.4
Aug 22	80.5	68.1	95.9
Aug 23	79.9	66.0	100.6
Aug 24	80.2	68.2	98.4
Aug 25	79.8	69.9	97.6
Aug 26	81.3	70.2	97.4
Aug 27	76.8	70.0	93.6
Aug 28	77.7	69.9	96.6
Aug 29	75.1	69.1	86.6
Aug 30	73.7	67.2	82.3
Summary	**75.8**	**70.1**	**81.3**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 39

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	0.0	131.9	131.9
Aug 2	0.0	131.9	131.9
Aug 3	0.0	131.9	131.9
Aug 4	0.0	131.9	131.9
Aug 5	0.0	131.9	131.9
Aug 6	0.0	131.9	131.9
Aug 7	0.0	131.9	131.9
Aug 8	0.0	131.9	131.9
Aug 9	0.0	131.9	131.9
Aug 10	0.0	131.9	131.9
Aug 11	0.0	131.9	131.9
Aug 12	0.0	131.9	131.9
Aug 13	0.0	131.9	131.9
Aug 14	0.0	131.9	131.9
Aug 15	0.0	131.9	131.9
Aug 16	0.0	131.9	131.9
Aug 17	0.0	131.9	131.9
Aug 18	0.0	131.9	131.9
Aug 19	0.0	131.9	131.9
Aug 20	0.0	131.9	131.9
Aug 21	0.0	131.9	131.9
Aug 22	0.0	131.9	131.9
Aug 23	0.0	131.9	131.9
Aug 24	0.0	131.9	131.9
Aug 25	0.0	131.9	131.9
Aug 26	0.0	131.9	131.9
Aug 27	0.0	131.9	131.9
Aug 28	0.0	131.9	131.9
Aug 29	0.0	131.9	131.9
Aug 30	0.0	131.9	131.9
Summary	**0.0**	**0.0**	**0.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 40

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	74.8	26.9	94.0
Aug 2	76.4	61.0	96.2
Aug 3	69.8	67.2	73.8
Aug 4	77.3	67.3	95.0
Aug 5	78.3	61.0	100.4
Aug 6	75.3	67.7	87.3
Aug 7	74.2	67.8	88.8
Aug 8	71.0	63.4	80.5
Aug 9	73.4	61.3	90.0
Aug 10	70.1	64.7	79.9
Aug 11	75.9	65.3	94.7
Aug 12	74.6	65.8	93.8
Aug 13	74.7	64.8	92.8
Aug 14	73.8	67.4	86.9
Aug 15	74.6	64.1	92.3
Aug 16	70.7	58.4	91.3
Aug 17	74.5	60.9	94.4
Aug 18	73.9	62.8	93.0
Aug 19	69.7	26.9	97.7
Aug 20	76.2	59.0	101.2
Aug 21	75.8	26.9	96.8
Aug 22	74.4	26.9	97.0
Aug 23	80.1	64.5	102.8
Aug 24	76.5	26.9	99.3
Aug 25	79.6	68.6	98.9
Aug 26	78.5	26.9	99.8
Aug 27	77.4	68.9	98.3
Aug 28	77.1	68.6	93.8
Aug 29	74.8	68.1	91.0
Aug 30	73.5	67.1	83.0
Summary	**74.9**	**69.7**	**80.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 46

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	0.0	81.5	81.5
Aug 2	0.0	81.5	81.5
Aug 3	0.0	81.5	81.5
Aug 4	0.0	81.5	81.5
Aug 5	0.0	81.5	81.5
Aug 6	0.0	81.5	81.5
Aug 7	0.0	81.5	81.5
Aug 8	0.0	81.5	81.5
Aug 9	0.0	81.5	81.5
Aug 10	0.0	81.5	81.5
Aug 11	0.0	81.5	81.5
Aug 12	0.0	81.5	81.5
Aug 13	0.0	81.5	81.5
Aug 14	0.0	81.5	81.5
Aug 15	0.0	81.5	81.5
Aug 16	0.0	81.5	81.5
Aug 17	0.0	81.5	81.5
Aug 18	0.0	81.5	81.5
Aug 19	0.0	81.5	81.5
Aug 20	0.0	81.5	81.5
Aug 21	0.0	81.5	81.5
Aug 22	0.0	81.5	81.5
Aug 23	0.0	81.5	81.5
Aug 24	0.0	81.5	81.5
Aug 25	0.0	81.5	81.5
Aug 26	0.0	81.5	81.5
Aug 27	0.0	81.5	81.5
Aug 28	0.0	81.5	81.5
Aug 29	0.0	81.5	81.5
Aug 30	0.0	81.5	81.5
Summary	**0.0**	**0.0**	**0.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 47

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	77.4	62.0	96.1
Aug 2	77.6	62.1	95.4
Aug 3	72.7	68.0	78.2
Aug 4	81.4	72.3	94.6
Aug 5	81.6	63.1	100.1
Aug 6	77.0	68.5	86.1
Aug 7	76.2	70.4	87.6
Aug 8	72.3	65.0	85.4
Aug 9	76.9	69.6	87.3
Aug 10	69.9	66.0	77.0
Aug 11	76.7	66.1	95.6
Aug 12	74.4	66.0	90.4
Aug 13	76.0	65.3	90.9
Aug 14	73.9	67.7	86.4
Aug 15	75.7	68.8	87.6
Aug 16	78.1	64.0	89.0
Aug 17	78.6	64.2	92.6
Aug 18	76.5	63.1	89.6
Aug 19	71.9	55.6	94.4
Aug 20	75.8	58.6	95.9
Aug 21	79.8	62.7	98.1
Aug 22	81.4	67.7	97.3
Aug 23	83.5	66.1	102.0
Aug 24	82.0	70.7	98.9
Aug 25	80.8	73.0	90.0
Aug 26	88.0	77.0	98.8
Aug 27	78.7	71.3	97.8
Aug 28	79.2	70.9	99.7
Aug 29	78.6	71.5	95.5
Aug 30	77.0	70.8	87.1
Summary	**77.6**	**69.9**	**88.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 49

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	0.0	122.7	122.7
Aug 2	0.0	131.2	131.2
Aug 3	0.0	139.6	139.6
Aug 4	148.4	144.7	149.3
Aug 5	145.1	145.0	145.6
Aug 6	0.0	144.4	144.4
Aug 7	0.0	143.8	143.8
Aug 8	0.0	143.3	143.3
Aug 9	145.9	143.0	147.8
Aug 10	142.5	139.3	144.7
Aug 11	145.5	142.5	148.3
Aug 12	144.8	141.1	147.7
Aug 13	143.3	141.7	144.8
Aug 14	143.6	142.2	146.7
Aug 15	146.1	142.0	147.6
Aug 16	142.8	133.9	147.8
Aug 17	124.3	101.4	144.7
Aug 18	107.4	98.3	133.3
Aug 19	137.2	128.6	143.7
Aug 20	138.5	132.5	145.4
Aug 21	142.2	133.4	149.9
Aug 22	143.9	143.0	145.0
Aug 23	143.0	136.3	147.4
Aug 24	142.6	137.2	145.2
Aug 25	142.8	141.9	144.1
Aug 26	142.5	141.2	143.1
Aug 27	141.3	136.2	142.8
Aug 28	141.8	140.6	143.2
Aug 29	141.6	140.7	142.8
Aug 30	141.0	139.9	141.8
Summary	**112.6**	**0.0**	**148.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 50

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	117.6	114.1	120.6
Aug 2	118.0	116.8	119.6
Aug 3	117.0	115.8	117.9
Aug 4	116.3	113.3	118.9
Aug 5	116.7	114.6	119.0
Aug 6	115.9	114.8	117.1
Aug 7	116.5	112.1	118.1
Aug 8	117.1	115.9	118.7
Aug 9	116.9	116.0	118.3
Aug 10	115.8	114.2	117.6
Aug 11	116.6	115.3	118.6
Aug 12	116.1	115.0	117.9
Aug 13	116.1	114.8	118.1
Aug 14	114.8	112.6	116.5
Aug 15	114.0	111.9	116.0
Aug 16	111.5	97.3	116.6
Aug 17	115.9	112.4	119.7
Aug 18	114.5	95.7	119.3
Aug 19	101.9	90.6	114.6
Aug 20	105.6	97.6	115.8
Aug 21	111.6	99.3	122.6
Aug 22	118.9	117.5	120.5
Aug 23	118.7	117.2	121.6
Aug 24	118.2	117.0	120.2
Aug 25	118.7	117.5	120.4
Aug 26	118.1	117.0	119.6
Aug 27	118.3	116.3	119.9
Aug 28	118.6	117.2	120.4
Aug 29	118.8	117.7	120.7
Aug 30	117.3	116.2	118.1
Summary	**115.7**	**101.9**	**118.9**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 51

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	75.4	63.6	96.1
Aug 2	79.7	62.9	99.1
Aug 3	120.3	69.1	190.5
Aug 4	93.9	76.6	189.2
Aug 5	121.6	71.1	191.5
Aug 6	93.4	85.4	102.4
Aug 7	137.6	84.0	175.9
Aug 8	160.6	158.5	162.6
Aug 9	121.6	72.3	159.5
Aug 10	72.7	66.2	85.7
Aug 11	77.8	66.9	97.2
Aug 12	75.6	67.2	92.0
Aug 13	76.6	66.6	95.2
Aug 14	77.2	68.4	116.6
Aug 15	74.5	66.9	86.2
Aug 16	71.1	59.4	87.7
Aug 17	90.3	61.2	189.8
Aug 18	92.1	61.0	189.3
Aug 19	72.3	55.1	100.4
Aug 20	88.0	58.8	192.5
Aug 21	92.6	63.3	188.2
Aug 22	147.1	75.0	194.2
Aug 23	89.4	74.9	110.0
Aug 24	124.5	70.8	193.4
Aug 25	116.8	77.1	192.7
Aug 26	83.6	75.7	95.4
Aug 27	99.2	72.4	191.0
Aug 28	132.3	78.6	192.0
Aug 29	104.9	77.2	192.0
Aug 30	100.4	72.4	193.4
Summary	**98.8**	**71.1**	**160.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 52

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	158.7	129.1	172.1
Aug 2	150.1	145.7	154.0
Aug 3	143.4	140.9	146.0
Aug 4	144.1	142.4	146.1
Aug 5	144.1	140.6	147.6
Aug 6	145.4	139.6	147.9
Aug 7	164.8	143.1	183.1
Aug 8	145.0	141.2	147.8
Aug 9	142.0	140.1	145.5
Aug 10	145.7	138.5	150.4
Aug 11	143.6	139.3	145.4
Aug 12	141.3	138.0	145.4
Aug 13	146.1	142.8	149.4
Aug 14	148.8	144.1	152.1
Aug 15	147.9	143.4	151.3
Aug 16	144.1	139.0	147.5
Aug 17	145.6	144.1	147.5
Aug 18	145.7	136.9	148.1
Aug 19	142.1	136.8	148.1
Aug 20	143.1	138.5	149.4
Aug 21	147.3	143.0	151.7
Aug 22	146.5	145.4	148.7
Aug 23	145.4	141.5	148.1
Aug 24	145.8	144.4	147.1
Aug 25	145.5	144.1	146.5
Aug 26	145.2	144.1	146.7
Aug 27	144.2	141.8	145.8
Aug 28	144.3	142.3	146.2
Aug 29	144.2	143.5	145.2
Aug 30	144.0	143.3	146.1
Summary	**146.1**	**141.3**	**164.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 53

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	156.1	147.9	167.4
Aug 2	166.4	145.0	193.4
Aug 3	157.0	150.7	165.0
Aug 4	152.4	75.4	181.2
Aug 5	145.7	136.7	153.5
Aug 6	139.3	133.3	142.1
Aug 7	145.2	136.7	159.9
Aug 8	0.0	81.4	81.4
Aug 9	164.6	67.2	193.5
Aug 10	157.6	151.9	164.9
Aug 11	151.2	83.5	170.5
Aug 12	0.0	166.0	166.0
Aug 13	0.0	165.2	165.2
Aug 14	0.0	164.4	164.4
Aug 15	153.0	147.5	164.0
Aug 16	142.3	65.7	167.8
Aug 17	150.8	145.4	159.6
Aug 18	148.2	139.2	158.9
Aug 19	143.8	134.2	154.3
Aug 20	146.9	139.8	156.0
Aug 21	152.7	135.4	188.1
Aug 22	112.7	26.5	179.7
Aug 23	105.0	64.7	158.4
Aug 24	152.1	148.7	156.9
Aug 25	164.4	147.5	186.9
Aug 26	159.2	154.9	162.4
Aug 27	154.7	145.2	161.7
Aug 28	170.8	152.5	191.1
Aug 29	174.7	159.1	186.3
Aug 30	181.0	171.5	192.4
Summary	**131.6**	**0.0**	**181.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 54

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	95.7	73.6	158.2
Aug 2	91.0	76.6	139.0
Aug 3	77.1	74.8	80.4
Aug 4	88.5	73.1	160.4
Aug 5	79.7	66.9	96.5
Aug 6	77.8	72.1	88.2
Aug 7	77.2	70.3	86.6
Aug 8	73.8	66.7	82.6
Aug 9	92.5	63.4	166.7
Aug 10	73.8	67.3	83.0
Aug 11	78.9	67.7	95.1
Aug 12	82.8	67.2	151.9
Aug 13	81.2	66.2	155.7
Aug 14	84.9	69.4	157.9
Aug 15	148.8	68.7	171.7
Aug 16	112.9	93.1	161.0
Aug 17	125.7	85.2	168.5
Aug 18	103.9	83.3	113.2
Aug 19	89.2	74.4	110.6
Aug 20	86.8	73.4	109.2
Aug 21	83.8	67.2	109.3
Aug 22	104.2	69.5	167.3
Aug 23	89.2	75.2	104.9
Aug 24	86.7	75.0	102.5
Aug 25	85.2	75.0	101.6
Aug 26	86.0	75.5	102.8
Aug 27	80.8	71.7	101.4
Aug 28	82.2	72.6	99.0
Aug 29	79.6	72.7	96.7
Aug 30	78.7	71.5	89.0
Summary	**89.3**	**73.8**	**148.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 55

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	123.1	94.6	176.3
Aug 2	115.7	95.8	158.1
Aug 3	103.4	85.4	139.9
Aug 4	109.4	91.9	159.5
Aug 5	102.9	87.3	120.0
Aug 6	98.7	93.2	105.4
Aug 7	102.7	81.5	134.8
Aug 8	97.6	82.1	148.8
Aug 9	99.5	85.8	129.0
Aug 10	87.2	75.6	99.7
Aug 11	100.4	83.9	153.0
Aug 12	89.8	81.3	102.1
Aug 13	91.6	82.1	108.3
Aug 14	92.3	80.7	109.3
Aug 15	86.9	76.8	100.9
Aug 16	106.3	80.4	147.2
Aug 17	102.8	92.6	115.5
Aug 18	104.7	86.3	121.4
Aug 19	93.5	77.8	114.6
Aug 20	97.1	82.2	117.6
Aug 21	100.6	85.4	117.7
Aug 22	100.1	89.2	112.6
Aug 23	99.8	86.9	120.7
Aug 24	101.1	91.9	113.3
Aug 25	103.5	96.3	114.1
Aug 26	101.6	37.5	115.7
Aug 27	101.1	89.2	116.7
Aug 28	100.3	90.5	112.5
Aug 29	97.9	90.8	111.1
Aug 30	99.2	93.3	107.7
Summary	**100.4**	**86.9**	**123.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 56

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	119.4	113.8	127.1
Aug 2	116.8	110.5	126.6
Aug 3	112.7	107.1	116.9
Aug 4	117.8	112.6	126.2
Aug 5	118.0	109.1	128.7
Aug 6	117.8	112.1	123.2
Aug 7	117.5	108.0	123.9
Aug 8	115.1	108.7	119.5
Aug 9	114.7	109.8	122.6
Aug 10	107.5	96.9	117.6
Aug 11	111.5	105.5	123.0
Aug 12	111.0	106.3	120.3
Aug 13	111.5	105.5	122.7
Aug 14	112.9	104.5	123.6
Aug 15	110.6	99.1	124.0
Aug 16	115.9	106.0	128.2
Aug 17	119.1	113.4	128.1
Aug 18	117.5	101.1	125.9
Aug 19	94.4	77.1	113.7
Aug 20	85.4	69.7	109.0
Aug 21	98.5	67.7	126.4
Aug 22	119.1	114.3	126.6
Aug 23	120.0	112.5	130.4
Aug 24	124.4	120.5	131.1
Aug 25	126.4	123.5	132.2
Aug 26	127.0	124.1	133.0
Aug 27	125.3	118.9	130.5
Aug 28	123.8	118.9	129.1
Aug 29	122.0	119.2	126.0
Aug 30	120.9	118.4	124.0
Summary	**115.2**	**85.4**	**127.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 57

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	164.0	155.3	176.0
Aug 2	165.6	158.8	174.9
Aug 3	155.3	150.0	161.5
Aug 4	157.9	150.1	166.3
Aug 5	161.0	145.4	183.9
Aug 6	147.6	139.4	150.3
Aug 7	131.3	96.3	148.0
Aug 8	141.0	97.1	185.0
Aug 9	156.5	147.3	165.1
Aug 10	145.9	134.4	151.7
Aug 11	148.4	144.5	153.7
Aug 12	145.4	139.4	149.9
Aug 13	146.2	140.3	152.8
Aug 14	148.0	145.0	152.1
Aug 15	147.0	140.4	152.3
Aug 16	0.0	147.4	147.4
Aug 17	0.0	143.9	143.9
Aug 18	142.1	133.7	146.8
Aug 19	138.4	131.3	149.7
Aug 20	141.2	133.7	150.7
Aug 21	143.3	135.7	152.2
Aug 22	144.7	140.0	149.7
Aug 23	145.2	138.3	154.5
Aug 24	147.4	145.1	152.2
Aug 25	0.0	148.7	148.7
Aug 26	147.7	146.5	150.1
Aug 27	144.0	143.5	149.1
Aug 28	0.0	143.6	143.6
Aug 29	0.0	143.7	143.7
Aug 30	152.4	139.9	168.1
Summary	**123.6**	**0.0**	**165.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 58

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	95.7	89.0	105.7
Aug 2	94.7	86.5	104.5
Aug 3	90.7	88.6	92.9
Aug 4	93.9	88.9	105.1
Aug 5	90.5	74.9	103.1
Aug 6	93.7	89.0	98.4
Aug 7	91.4	85.3	99.6
Aug 8	97.4	68.8	132.6
Aug 9	113.0	64.5	154.6
Aug 10	82.6	65.9	147.1
Aug 11	131.5	121.8	137.7
Aug 12	122.9	112.4	130.0
Aug 13	116.0	109.1	124.3
Aug 14	106.6	83.8	127.7
Aug 15	87.2	69.7	115.3
Aug 16	106.6	90.7	117.0
Aug 17	113.2	101.5	135.9
Aug 18	103.0	68.5	112.2
Aug 19	79.6	62.0	101.1
Aug 20	84.8	70.2	103.3
Aug 21	87.1	72.6	115.0
Aug 22	102.1	78.7	130.5
Aug 23	124.5	88.0	139.2
Aug 24	99.3	80.5	117.6
Aug 25	115.2	96.2	127.7
Aug 26	113.6	96.0	126.3
Aug 27	99.7	90.4	112.2
Aug 28	102.1	92.9	112.7
Aug 29	101.9	95.9	111.4
Aug 30	102.8	97.0	108.2
Summary	**101.4**	**79.6**	**131.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 59

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	116.0	115.8	116.2
Aug 2	116.5	115.9	117.1
Aug 3	0.0	116.4	116.4
Aug 4	116.5	113.8	118.0
Aug 5	116.5	115.3	117.7
Aug 6	115.8	115.7	116.0
Aug 7	117.7	116.8	118.7
Aug 8	0.0	117.3	117.3
Aug 9	115.4	114.4	117.3
Aug 10	115.7	113.3	119.0
Aug 11	116.2	114.0	118.6
Aug 12	116.9	114.8	120.2
Aug 13	116.8	115.3	118.9
Aug 14	117.2	114.9	120.9
Aug 15	115.0	109.2	120.5
Aug 16	113.9	100.4	117.8
Aug 17	114.3	113.6	115.2
Aug 18	112.1	85.3	114.9
Aug 19	88.7	55.8	118.4
Aug 20	113.3	106.5	120.8
Aug 21	114.0	98.9	129.3
Aug 22	115.6	114.2	117.7
Aug 23	111.6	43.5	116.4
Aug 24	114.4	113.6	115.0
Aug 25	114.5	113.7	121.2
Aug 26	110.7	43.1	114.5
Aug 27	113.6	113.2	114.7
Aug 28	113.8	113.2	115.6
Aug 29	113.6	113.2	114.3
Aug 30	113.9	113.2	116.6
Summary	**106.3**	**0.0**	**117.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 60

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	110.9	103.5	131.8
Aug 2	108.2	102.1	122.0
Aug 3	105.0	102.1	107.7
Aug 4	119.8	103.1	150.5
Aug 5	112.2	107.3	117.2
Aug 6	109.6	105.4	113.2
Aug 7	115.7	102.0	145.3
Aug 8	123.3	92.2	156.2
Aug 9	128.7	114.0	160.8
Aug 10	115.5	110.8	120.2
Aug 11	141.9	110.5	167.0
Aug 12	135.5	136.1	137.2
Aug 13	124.1	128.3	128.8
Aug 14	0.0	83.7	83.7
Aug 15	118.6	58.5	129.6
Aug 16	114.4	121.2	121.6
Aug 17	114.2	54.0	120.2
Aug 18	141.9	126.3	152.4
Aug 19	119.9	113.5	126.9
Aug 20	127.7	110.1	157.6
Aug 21	133.1	125.0	146.7
Aug 22	126.3	121.4	149.4
Aug 23	120.1	117.5	122.8
Aug 24	118.3	115.3	127.2
Aug 25	131.2	126.5	148.4
Aug 26	118.8	118.8	119.3
Aug 27	117.4	117.6	117.6
Aug 28	116.9	116.9	116.9
Aug 29	0.0	116.4	116.4
Aug 30	0.0	116.0	116.0
Summary	**109.0**	**0.0**	**141.9**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 62

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	125.6	123.3	128.2
Aug 2	126.1	124.2	128.5
Aug 3	125.0	123.0	126.4
Aug 4	125.6	106.6	128.6
Aug 5	126.8	124.2	129.0
Aug 6	126.1	122.3	127.3
Aug 7	125.1	119.4	127.0
Aug 8	123.4	112.0	126.2
Aug 9	125.4	124.0	127.5
Aug 10	123.5	119.4	126.1
Aug 11	125.2	123.5	127.6
Aug 12	123.6	119.8	125.5
Aug 13	123.1	121.1	126.2
Aug 14	121.7	116.7	125.1
Aug 15	120.6	114.3	124.0
Aug 16	114.4	84.5	124.6
Aug 17	96.2	79.7	107.5
Aug 18	83.7	70.2	96.8
Aug 19	80.8	67.2	99.3
Aug 20	81.7	65.7	101.2
Aug 21	83.5	69.1	100.6
Aug 22	84.3	73.1	99.6
Aug 23	83.8	69.1	101.1
Aug 24	98.7	71.7	124.9
Aug 25	115.0	98.4	126.6
Aug 26	106.3	84.5	115.4
Aug 27	84.0	73.8	99.7
Aug 28	100.9	77.4	126.1
Aug 29	119.4	101.8	130.9
Aug 30	126.2	118.2	130.3
Summary	**110.9**	**80.8**	**126.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 63

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	126.0	122.7	130.9
Aug 2	126.9	123.7	130.6
Aug 3	124.0	119.7	126.9
Aug 4	124.1	91.6	129.8
Aug 5	127.8	123.6	131.6
Aug 6	126.6	124.4	128.6
Aug 7	125.7	117.2	128.8
Aug 8	122.7	100.4	128.0
Aug 9	126.8	124.7	129.6
Aug 10	124.1	118.7	127.2
Aug 11	127.2	124.1	131.2
Aug 12	126.4	122.3	130.0
Aug 13	126.7	122.7	131.2
Aug 14	126.1	119.4	129.4
Aug 15	124.3	118.1	127.9
Aug 16	115.7	76.0	127.6
Aug 17	92.9	70.6	110.2
Aug 18	77.5	65.1	94.6
Aug 19	75.6	56.7	96.5
Aug 20	78.6	60.8	100.3
Aug 21	81.3	65.4	100.0
Aug 22	83.0	69.4	98.6
Aug 23	82.8	66.6	101.9
Aug 24	99.5	69.3	129.5
Aug 25	115.1	92.2	130.8
Aug 26	101.8	78.1	116.4
Aug 27	79.9	71.6	99.5
Aug 28	98.7	71.5	129.4
Aug 29	110.6	89.3	126.7
Aug 30	110.0	85.1	127.2
Summary	**109.6**	**75.6**	**127.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 64

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	130.4	127.9	133.3
Aug 2	131.1	129.2	134.3
Aug 3	128.0	125.0	130.6
Aug 4	130.1	116.5	134.1
Aug 5	132.2	128.8	138.3
Aug 6	130.1	127.8	132.1
Aug 7	129.6	122.7	131.7
Aug 8	127.0	99.7	131.2
Aug 9	131.3	129.0	133.1
Aug 10	129.2	124.9	131.9
Aug 11	131.9	129.7	134.4
Aug 12	130.5	126.7	132.8
Aug 13	130.6	127.5	133.4
Aug 14	129.6	123.7	134.7
Aug 15	127.7	121.8	130.9
Aug 16	121.5	84.5	130.4
Aug 17	96.5	64.5	132.4
Aug 18	73.9	63.1	86.2
Aug 19	72.0	55.8	91.2
Aug 20	75.4	59.5	93.3
Aug 21	78.7	63.8	96.3
Aug 22	80.7	68.0	95.2
Aug 23	80.7	64.8	97.1
Aug 24	107.6	67.4	145.4
Aug 25	127.6	73.9	144.3
Aug 26	105.4	72.4	138.9
Aug 27	76.1	69.1	93.7
Aug 28	108.6	68.6	143.7
Aug 29	125.5	71.9	142.2
Aug 30	119.6	68.9	142.7
Summary	**113.3**	**72.0**	**132.2**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 65

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	118.8	91.6	140.5
Aug 2	135.0	133.9	136.4
Aug 3	133.2	131.4	134.4
Aug 4	132.6	92.5	136.8
Aug 5	134.7	132.0	136.9
Aug 6	134.0	132.3	135.3
Aug 7	133.3	127.9	135.1
Aug 8	129.6	86.1	133.4
Aug 9	132.3	131.0	134.8
Aug 10	130.0	126.0	132.5
Aug 11	131.9	129.9	134.6
Aug 12	130.3	126.6	132.9
Aug 13	130.0	127.5	133.7
Aug 14	128.5	121.7	131.9
Aug 15	125.9	119.7	129.5
Aug 16	120.2	77.5	133.6
Aug 17	128.9	123.3	132.9
Aug 18	128.5	126.0	131.5
Aug 19	129.8	126.9	132.8
Aug 20	129.8	126.7	132.9
Aug 21	129.7	127.7	132.9
Aug 22	129.3	126.7	132.2
Aug 23	128.6	117.7	134.3
Aug 24	128.3	121.2	131.3
Aug 25	127.4	124.8	131.3
Aug 26	126.9	124.1	131.3
Aug 27	125.0	118.3	130.1
Aug 28	124.8	119.8	130.3
Aug 29	129.3	121.0	135.6
Aug 30	132.3	131.1	133.3
Summary	**129.3**	**118.8**	**135.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 66

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	86.8	76.8	109.2
Aug 2	89.6	82.5	112.3
Aug 3	83.6	80.0	88.2
Aug 4	89.2	82.4	99.0
Aug 5	109.9	69.7	139.3
Aug 6	133.9	129.2	136.8
Aug 7	110.6	90.3	135.4
Aug 8	96.5	89.7	102.9
Aug 9	95.3	88.6	103.5
Aug 10	87.4	77.4	97.7
Aug 11	93.0	85.0	106.2
Aug 12	91.2	85.8	100.4
Aug 13	92.4	85.4	103.7
Aug 14	93.4	86.9	106.5
Aug 15	93.1	86.9	103.0
Aug 16	107.9	88.3	135.1
Aug 17	134.5	132.0	138.8
Aug 18	132.1	108.1	135.7
Aug 19	108.6	103.9	116.4
Aug 20	111.2	107.3	120.4
Aug 21	126.0	109.7	141.7
Aug 22	136.8	133.7	140.9
Aug 23	137.1	127.9	145.2
Aug 24	140.0	134.3	143.4
Aug 25	141.0	138.8	143.0
Aug 26	141.0	139.7	143.3
Aug 27	138.5	118.9	143.6
Aug 28	137.6	127.8	140.5
Aug 29	137.4	134.7	139.2
Aug 30	137.2	135.9	138.6
Summary	**113.8**	**83.6**	**141.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 67

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	120.1	96.1	134.2
Aug 2	146.0	109.2	180.4
Aug 3	138.0	122.1	153.8
Aug 4	167.3	133.5	182.7
Aug 5	159.1	151.7	165.2
Aug 6	157.0	141.0	176.3
Aug 7	152.6	149.7	168.5
Aug 8	0.0	158.0	158.0
Aug 9	174.7	160.5	181.5
Aug 10	169.1	162.0	175.8
Aug 11	163.3	156.8	168.9
Aug 12	156.6	149.3	162.7
Aug 13	153.8	142.9	160.7
Aug 14	168.5	138.3	183.5
Aug 15	172.3	164.6	183.6
Aug 16	159.8	146.0	171.6
Aug 17	159.5	102.6	180.2
Aug 18	183.0	180.2	185.0
Aug 19	172.2	167.9	185.1
Aug 20	167.7	164.7	171.3
Aug 21	170.4	161.3	183.3
Aug 22	170.1	166.5	181.5
Aug 23	164.7	158.7	172.3
Aug 24	173.1	157.2	184.0
Aug 25	175.3	165.7	185.1
Aug 26	175.3	167.4	184.0
Aug 27	166.9	156.6	170.5
Aug 28	173.4	163.2	184.6
Aug 29	182.4	171.7	187.0
Aug 30	174.1	166.4	185.3
Summary	**158.9**	**0.0**	**183.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 68

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Aug 1	135.7	131.4	140.3
Aug 2	135.7	133.2	138.3
Aug 3	134.7	130.3	136.5
Aug 4	135.0	133.5	137.2
Aug 5	133.9	130.5	136.3
Aug 6	134.0	132.1	135.4
Aug 7	129.6	94.5	136.5
Aug 8	132.0	112.8	134.6
Aug 9	133.5	131.5	135.7
Aug 10	132.6	129.6	135.1
Aug 11	130.5	128.0	132.7
Aug 12	132.2	128.7	135.2
Aug 13	133.1	131.8	134.6
Aug 14	131.7	129.5	134.7
Aug 15	131.5	130.1	133.2
Aug 16	130.3	124.5	133.0
Aug 17	130.5	129.5	131.8
Aug 18	129.0	119.5	130.9
Aug 19	123.0	117.2	128.5
Aug 20	123.0	113.2	130.6
Aug 21	129.1	122.7	135.3
Aug 22	130.9	130.1	131.8
Aug 23	129.6	126.1	132.4
Aug 24	129.7	127.8	131.6
Aug 25	129.6	129.0	130.6
Aug 26	129.6	129.0	130.4
Aug 27	129.1	127.3	130.6
Aug 28	128.9	127.6	130.5
Aug 29	128.5	127.6	129.4
Aug 30	128.2	125.9	131.6
Summary	**130.8**	**123.0**	**135.7**

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-Aug	168.0	227.2	227.6	250.2	266.7	271.1
2-Aug	167.9	227.3	227.8	250.3	266.7	271.2
3-Aug	167.6	227.0	227.5	249.8	266.5	271.0
4-Aug	167.9	227.4	227.8	250.0	266.9	271.4
5-Aug	167.8	227.7	228.1	250.4	267.1	271.6
6-Aug	167.7	227.3	227.9	250.1	266.8	271.3
7-Aug	167.6	227.0	227.5	249.9	266.9	271.4
8-Aug	167.5	227.0	227.6	249.9	266.8	271.3
9-Aug	167.6	227.2	227.7	250.2	266.8	271.4
10-Aug	167.5	226.6	227.1	249.7	266.7	271.3
11-Aug	167.7	226.5	227.0	249.8	266.9	271.6
12-Aug	167.6	226.2	226.7	249.5	266.8	271.6
13-Aug	167.7	226.0	226.5	249.5	266.8	271.7
14-Aug	167.5	225.6	226.1	249.2	266.7	271.5
15-Aug	167.5	225.7	226.1	249.3	266.7	271.6
16-Aug	167.4	225.2	225.7	249.1	266.7	271.7
17-Aug	167.5	225.3	225.8	249.2	266.9	272.0
18-Aug	167.4	225.2	225.7	249.2	266.9	272.0
19-Aug	167.3	225.0	225.6	249.1	266.8	271.9
20-Aug	167.4	225.1	225.7	249.3	267.0	272.1
21-Aug	167.5	224.9	225.5	249.4	267.1	272.2
22-Aug	167.6	224.9	225.4	249.5	267.2	272.3
23-Aug	167.6	224.7	225.2	249.5	267.2	272.4
24-Aug	167.4	224.1	224.7	249.3	267.0	272.3
25-Aug	167.3	223.6	224.1	249.2	266.9	272.2
26-Aug	167.4	223.6	224.1	249.4	267.0	272.5
27-Aug	167.2	223.3	223.8	249.3	266.9	272.5
28-Aug	167.2	223.2	223.7	249.2	266.8	272.5
29-Aug	167.1	223.0	223.5	249.1	266.6	272.4
30-Aug	167.1	222.9	223.4	249.2	266.6	272.5
31-Aug	166.9	224.3	224.9	250.1	266.6	272.3
Average	**167.5**	**225.5**	**226.0**	**249.6**	**266.8**	**271.8**

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-Aug	161.6	241.6	241.9	268.0	256.1	267.6
2-Aug	161.1	241.6	242.0	268.0	255.9	267.6
3-Aug	160.8	241.3	241.7	267.7	255.6	267.3
4-Aug	160.9	241.7	242.1	268.1	256.0	267.7
5-Aug	160.6	241.7	242.1	268.2	256.0	267.8
6-Aug	160.1	241.5	241.9	267.9	255.6	267.5
7-Aug	159.8	241.5	241.9	267.9	255.6	267.5
8-Aug	159.5	241.5	241.8	267.9	255.5	267.4
9-Aug	159.2	241.6	242.0	268.1	255.7	267.6
10-Aug	159.0	241.4	241.8	267.8	255.5	267.4
11-Aug	159.2	241.7	242.2	268.1	255.7	267.7
12-Aug	158.9	241.6	242.0	268.0	255.5	267.4
13-Aug	158.7	241.9	242.3	268.1	255.6	267.6
14-Aug	158.6	241.7	242.2	268.0	255.6	267.5
15-Aug	158.9	241.8	242.2	268.2	255.7	267.6
16-Aug	*	*	*	*	*	*
17-Aug	*	*	*	*	*	*
18-Aug	*	*	*	*	*	*
19-Aug	*	*	*	*	*	*
20-Aug	*	*	*	*	*	*
21-Aug	*	*	*	*	*	*
22-Aug	*	*	*	*	*	*
23-Aug	*	*	*	*	*	*
24-Aug	*	*	*	*	*	*
25-Aug	*	*	*	*	*	*
26-Aug	*	*	*	*	*	*
27-Aug	*	*	*	*	*	*
28-Aug	*	*	*	*	*	*
29-Aug	*	*	*	*	*	*
30-Aug	*	*	*	*	*	*
31-Aug	*	*	*	*	*	*
Average	**159.8**	**241.6**	**242.0**	**268.0**	**255.7**	**267.5**

* Indicates days that the sensors were not operational

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-Aug	208.0	208.2	231.1	253.0	263.8	269.5	271.0	255.6
2-Aug	207.8	210.0	232.8	252.7	263.8	269.4	270.8	255.8
3-Aug	207.5	214.9	219.5	252.5	263.5	269.0	270.5	255.4
4-Aug	208.0	208.2	215.1	253.1	264.0	269.7	271.1	255.8
5-Aug	207.3	207.7	213.3	252.1	263.6	269.1	270.4	256.1
6-Aug	207.0	216.5	219.0	251.8	263.4	268.8	270.1	255.8
7-Aug	207.2	207.8	214.1	252.4	263.6	269.4	270.5	255.8
8-Aug	207.8	208.3	208.3	252.9	263.7	269.8	270.9	255.6
9-Aug	207.6	208.8	214.6	252.6	263.7	269.7	270.7	255.9
10-Aug	206.8	211.5	208.1	252.0	263.3	269.1	270.1	255.7
11-Aug	206.8	209.1	214.9	251.5	263.4	269.0	270.0	256.1
12-Aug	207.1	209.5	221.2	251.5	263.4	269.0	270.1	256.0
13-Aug	207.2	212.3	224.8	251.2	263.3	268.9	269.8	255.9
14-Aug	207.0	208.8	217.7	251.3	263.1	268.9	269.8	255.9
15-Aug	207.0	207.6	208.9	251.3	263.3	269.0	269.9	256.0
16-Aug	207.2	210.6	216.7	251.1	263.1	269.0	269.8	255.9
17-Aug	207.3	211.4	221.1	251.4	263.3	269.1	269.9	256.1
18-Aug	207.4	208.9	216.3	251.4	263.3	269.2	270.0	256.0
19-Aug	207.3	208.1	211.1	251.4	263.4	269.3	270.1	256.1
20-Aug	207.6	208.6	216.5	251.6	263.6	269.4	270.3	256.3
21-Aug	207.7	208.9	215.1	251.7	263.5	269.5	270.3	256.3
22-Aug	207.6	208.3	214.4	251.8	263.6	269.7	270.4	256.4
23-Aug	207.6	209.3	212.9	251.9	263.7	269.6	270.5	256.5
24-Aug	207.4	210.1	218.6	251.9	263.6	269.4	270.3	256.4
25-Aug	207.2	220.1	222.1	251.7	263.4	269.3	270.1	256.3
26-Aug	207.3	226.3	228.7	252.0	263.6	269.5	270.4	256.6
27-Aug	207.3	219.0	220.2	252.0	263.5	269.6	270.4	256.5
28-Aug	206.9	214.4	215.0	251.6	263.3	269.2	270.1	256.4
29-Aug	207.0	207.4	209.3	251.3	263.1	269.2	270.0	256.4
30-Aug	206.9	207.6	209.3	251.4	263.2	269.4	270.2	256.3
31-Aug	207.0	209.0	212.3	251.1	263.0	269.2	269.8	256.2
Average	**207.3**	**210.9**	**216.9**	**251.8**	**263.5**	**269.3**	**270.3**	**256.1**

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-Aug	168.6	206.2	206.3	249.8	261.5	261.3	246.3	177.0
2-Aug	167.8	205.1	205.1	250.2	261.4	261.3	246.2	176.8
3-Aug	166.9	204.3	204.1	250.3	261.3	261.1	245.9	176.5
4-Aug	166.0	204.8	205.2	251.1	261.8	261.6	246.4	177.2
5-Aug	166.0	206.3	206.7	251.5	262.8	260.8	246.5	177.3
6-Aug	165.6	207.6	207.6	251.5	261.9	261.3	246.3	177.2
7-Aug	165.4	207.6	207.6	252.1	262.0	261.1	246.3	177.2
8-Aug	164.8	207.6	207.6	252.0	264.8	258.6	246.2	177.1
9-Aug	165.1	207.7	207.8	252.3	264.2	259.5	246.4	177.4
10-Aug	164.7	207.4	207.3	252.2	263.8	259.4	246.2	177.1
11-Aug	164.6	207.9	208.0	247.6	265.5	258.7	246.6	177.6
12-Aug	164.8	207.7	207.7	250.5	263.2	260.4	246.2	177.3
13-Aug	165.1	207.9	207.9	252.5	263.3	260.6	246.5	177.5
14-Aug	165.6	207.7	207.7	252.3	263.0	260.9	246.3	177.3
15-Aug	172.0	207.7	207.7	252.0	264.7	259.8	246.4	177.4
16-Aug	182.4	207.6	207.7	224.1	263.6	260.2	246.2	177.5
17-Aug	196.7	207.6	207.7	213.6	263.4	260.8	246.5	177.7
18-Aug	205.3	207.7	207.7	214.7	263.9	260.3	246.4	177.6
19-Aug	206.8	207.8	207.9	208.5	263.7	260.5	246.4	177.5
20-Aug	207.9	208.1	208.2	208.3	264.6	260.4	246.6	177.2
21-Aug	208.2	208.1	208.2	208.2	264.8	260.6	246.5	176.4
22-Aug	208.2	208.2	208.2	208.3	264.5	260.9	246.7	176.9
23-Aug	206.6	208.1	208.2	208.4	264.2	261.2	246.7	177.0
24-Aug	200.0	208.0	208.0	208.6	264.1	261.2	246.5	176.9
25-Aug	203.1	207.8	207.9	208.4	264.0	261.0	246.5	177.1
26-Aug	206.7	207.9	207.9	208.3	264.2	261.2	246.8	177.5
27-Aug	207.1	207.6	207.6	207.9	264.1	260.8	246.5	177.3
28-Aug	207.6	207.6	207.5	207.8	264.1	261.0	246.5	177.4
29-Aug	207.5	207.5	207.5	207.9	263.4	261.0	246.4	177.3
30-Aug	207.4	207.3	207.4	207.5	262.2	260.9	246.4	177.4
31-Aug	207.6	207.5	207.5	207.6	261.9	261.2	246.4	177.5
Average	**185.9**	**207.4**	**207.4**	**229.9**	**263.4**	**260.6**	**246.4**	**177.2**

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-Aug	182.0	209.1	207.8	208.1	228.0	242.2	246.5	193.9
2-Aug	181.9	209.9	207.9	208.2	228.0	242.2	246.5	194.0
3-Aug	181.9	209.7	207.6	207.8	227.8	242.0	246.2	193.9
4-Aug	182.0	209.8	207.7	208.0	227.9	242.2	246.3	194.2
5-Aug	182.3	210.2	207.8	208.0	227.8	242.1	246.2	194.2
6-Aug	182.6	210.1	207.7	207.9	227.7	241.9	246.0	194.1
7-Aug	182.3	209.8	208.4	207.7	227.6	241.8	246.0	194.2
8-Aug	182.3	209.8	209.1	207.7	227.5	241.7	245.7	194.1
9-Aug	182.1	209.4	207.5	207.7	227.6	241.7	245.7	194.1
10-Aug	182.1	208.8	207.6	207.5	227.5	241.7	245.6	194.1
11-Aug	182.5	209.2	210.0	207.7	227.6	241.8	245.6	194.3
12-Aug	182.4	210.1	210.9	207.8	228.1	242.0	245.6	194.4
13-Aug	182.5	210.1	211.0	207.9	227.9	242.0	245.5	194.3
14-Aug	182.7	209.9	209.5	207.8	227.6	241.7	245.5	194.4
15-Aug	182.0	208.8	207.5	207.8	227.8	241.7	245.3	194.3
16-Aug	181.3	208.8	207.5	207.7	227.7	241.7	245.2	194.4
17-Aug	181.2	208.9	207.5	207.7	227.6	241.8	245.2	194.4
18-Aug	180.7	209.1	208.8	207.7	228.1	241.9	245.2	194.5
19-Aug	180.3	209.1	209.4	207.9	228.6	242.3	245.1	194.5
20-Aug	179.1	209.5	209.0	208.1	229.0	242.7	245.1	194.6
21-Aug	177.4	209.4	208.7	208.3	229.1	242.9	245.2	194.8
22-Aug	177.1	209.6	208.0	208.2	229.0	242.9	245.2	194.8
23-Aug	176.6	209.5	209.3	208.0	228.0	242.6	245.1	194.9
24-Aug	176.8	209.3	209.3	208.0	227.5	242.3	245.0	194.9
25-Aug	176.5	209.5	209.3	208.0	227.5	242.3	244.9	195.0
26-Aug	176.1	209.5	209.4	207.8	227.5	242.3	244.9	195.0
27-Aug	175.7	209.8	209.5	207.8	227.5	242.3	244.9	195.1
28-Aug	175.9	210.1	209.8	207.7	227.2	241.9	244.8	195.1
29-Aug	175.0	209.9	209.9	207.7	227.1	241.7	244.6	195.0
30-Aug	175.3	209.8	209.9	207.6	227.1	241.7	244.6	195.1
31-Aug	174.9	209.6	209.9	207.6	227.0	241.4	244.3	194.9
Average	**179.8**	**209.5**	**208.8**	**207.8**	**227.8**	**242.0**	**245.4**	**194.5**

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-Aug	207.7	233.2	233.1	234.4	235.4
2-Aug	207.7	233.2	233.1	234.4	235.4
3-Aug	207.3	232.9	232.9	234.1	235.1
4-Aug	207.5	233.3	233.2	234.5	235.5
5-Aug	207.6	233.3	233.2	234.4	235.5
6-Aug	207.4	233.1	233.1	234.2	235.3
7-Aug	207.2	233.0	233.0	234.1	235.1
8-Aug	207.3	232.9	232.9	233.9	235.0
9-Aug	207.3	233.0	232.9	234.0	235.1
10-Aug	207.0	232.9	232.8	233.8	234.8
11-Aug	207.4	233.1	233.0	234.0	235.1
12-Aug	207.3	232.9	232.8	233.9	234.9
13-Aug	207.6	232.9	232.9	234.0	234.9
14-Aug	207.4	232.8	232.8	233.8	234.7
15-Aug	207.3	232.9	232.8	233.9	234.8
16-Aug	207.4	232.7	232.6	233.7	234.6
17-Aug	207.4	232.9	232.8	233.9	234.8
18-Aug	207.4	232.8	232.8	233.8	234.8
19-Aug	207.6	232.8	232.7	233.8	234.8
20-Aug	207.9	232.9	232.8	234.0	234.9
21-Aug	207.9	232.9	232.9	234.0	234.9
22-Aug	207.8	233.0	232.9	234.1	234.9
23-Aug	207.9	233.0	232.9	234.1	235.0
24-Aug	207.7	233.0	232.9	234.1	234.9
25-Aug	207.7	233.0	233.0	234.1	235.0
26-Aug	207.6	233.0	233.0	234.1	235.0
27-Aug	207.4	232.7	232.7	233.8	234.7
28-Aug	199.4	232.4	232.5	233.5	234.4
29-Aug	183.7	228.6	232.4	237.5	230.9
30-Aug	180.1	229.5	232.3	236.8	230.2
31-Aug	178.5	230.6	232.1	234.3	233.1
Average	**204.7**	**232.6**	**232.8**	**234.2**	**234.6**

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-Aug	158.4	208.1	208.3	214.6	242.6	240.1	231.5	208.3
2-Aug	157.8	208.0	208.2	222.9	242.5	240.1	231.5	208.2
3-Aug	157.6	207.7	207.8	222.9	242.5	239.7	231.3	207.9
4-Aug	158.0	207.6	208.0	222.7	243.0	239.9	231.4	208.1
5-Aug	158.1	207.7	208.2	222.4	243.0	239.8	231.4	207.9
6-Aug	157.9	207.5	208.1	221.7	242.9	239.5	231.1	207.2
7-Aug	157.8	207.4	207.9	222.3	243.0	239.6	231.0	207.1
8-Aug	157.7	207.4	207.7	222.6	242.9	240.0	230.5	206.9
9-Aug	157.7	207.3	207.7	221.7	242.3	244.7	229.8	205.6
10-Aug	157.5	206.9	207.3	216.2	241.4	247.7	229.6	204.7
11-Aug	157.7	207.4	207.6	207.7	241.7	246.7	230.2	205.2
12-Aug	157.6	207.3	207.5	207.4	240.4	248.9	229.8	204.8
13-Aug	*	*	*	*	*	*	*	*
14-Aug	*	*	*	*	*	*	*	*
15-Aug	*	*	*	*	*	*	*	*
16-Aug	*	*	*	*	*	*	*	*
17-Aug	*	*	*	*	*	*	*	*
18-Aug	*	*	*	*	*	*	*	*
19-Aug	*	*	*	*	*	*	*	*
20-Aug	*	*	*	*	*	*	*	*
21-Aug	*	*	*	*	*	*	*	*
22-Aug	*	*	*	*	*	*	*	*
23-Aug	*	*	*	*	*	*	*	*
24-Aug	*	*	*	*	*	*	*	*
25-Aug	*	*	*	*	*	*	*	*
26-Aug	*	*	*	*	*	*	*	*
27-Aug	*	*	*	*	*	*	*	*
28-Aug	*	*	*	*	*	*	*	*
29-Aug	*	*	*	*	*	*	*	*
30-Aug	*	*	*	*	*	*	*	*
31-Aug	*	*	*	*	*	*	*	*
Average	**157.8**	**207.5**	**207.9**	**218.8**	**242.3**	**242.2**	**230.8**	**206.8**

* Indicates days that the sensors were not operational

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-Aug	185.4	188.8	188.8	191.5	193.8	191.4	187.9	181.8
2-Aug	185.5	188.9	188.9	191.6	194.0	191.5	187.9	182.0
3-Aug	185.4	188.7	188.7	191.5	193.7	191.3	187.8	181.7
4-Aug	185.6	188.9	189.0	191.6	194.0	191.7	188.2	182.2
5-Aug	185.7	189.0	189.1	191.6	194.0	191.6	188.1	182.3
6-Aug	185.8	189.1	189.1	191.7	194.0	191.4	188.0	182.3
7-Aug	185.8	188.9	189.0	191.5	193.8	191.3	187.9	182.1
8-Aug	185.8	189.0	189.0	191.7	193.9	191.3	187.9	182.1
9-Aug	186.0	189.1	189.2	191.8	194.0	191.4	188.0	182.2
10-Aug	185.9	189.0	189.1	191.7	193.7	191.3	187.9	182.1
11-Aug	186.3	189.4	189.5	191.9	194.1	191.5	188.1	182.4
12-Aug	186.2	189.2	189.3	191.8	194.0	191.2	187.9	182.1
13-Aug	186.4	189.4	189.6	192.1	194.3	191.5	188.1	182.3
14-Aug	186.4	189.4	189.5	191.9	194.1	191.3	187.9	182.1
15-Aug	186.2	189.4	189.5	192.0	194.1	191.4	188.1	182.3
16-Aug	186.1	189.4	189.5	192.0	194.2	191.3	188.0	182.2
17-Aug	185.7	189.6	189.7	192.0	194.2	191.4	188.1	182.3
18-Aug	184.6	189.6	189.8	192.1	194.3	191.4	188.1	182.3
19-Aug	186.0	189.8	189.9	192.3	194.4	191.4	188.1	182.3
20-Aug	185.8	190.0	190.0	192.4	194.6	191.5	188.2	182.3
21-Aug	186.7	190.1	190.1	192.6	194.6	191.5	188.2	182.4
22-Aug	186.8	190.0	190.2	192.6	194.6	191.6	188.3	182.4
23-Aug	187.0	190.2	190.3	192.7	194.6	191.6	188.3	182.6
24-Aug	186.9	190.2	190.3	192.6	194.5	191.4	188.2	182.4
25-Aug	187.0	190.2	190.3	192.6	194.5	191.4	188.2	182.3
26-Aug	187.1	190.2	190.3	192.6	194.5	191.5	188.3	182.5
27-Aug	187.1	190.1	190.2	192.4	194.1	191.2	188.1	182.3
28-Aug	187.1	190.1	190.2	192.4	194.3	191.3	188.2	182.4
29-Aug	186.5	190.1	190.2	192.4	194.2	191.2	188.0	182.2
30-Aug	186.2	190.1	190.2	192.3	194.2	191.1	188.1	182.3
31-Aug	186.6	190.1	190.2	192.5	194.4	191.2	188.2	182.3
Average	**186.2**	**189.5**	**189.6**	**192.1**	**194.2**	**191.4**	**188.1**	**182.2**

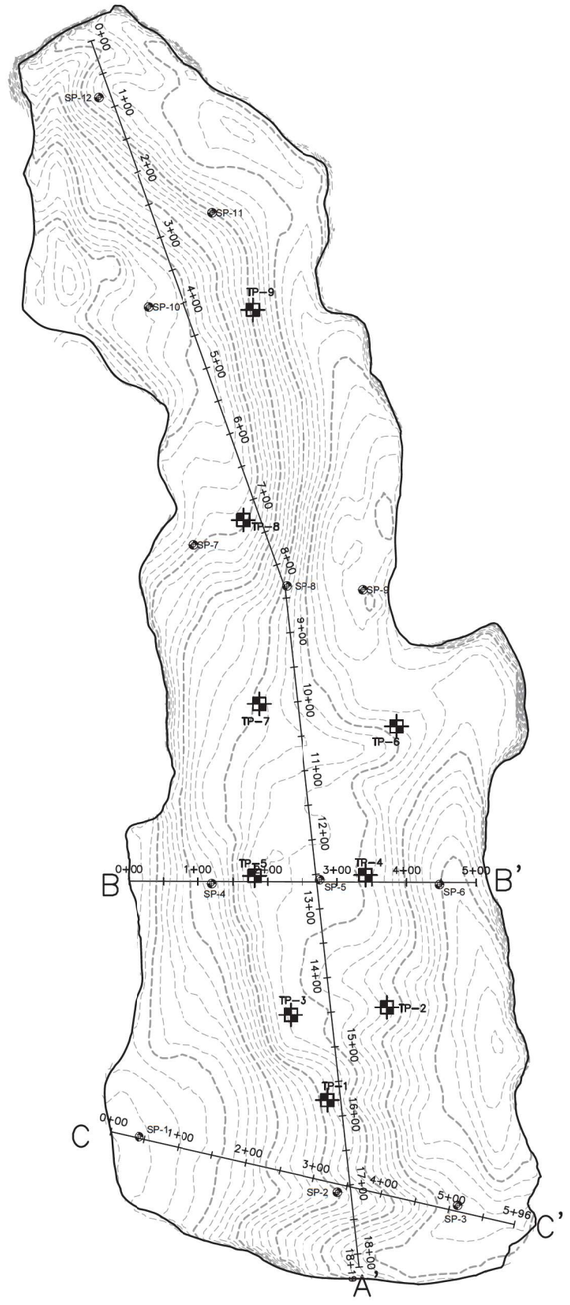
Solid Waste Permit 588 Daily Borehole Temperature Averages for Borehole 9

	Depth from Surface							
Date	25 ft	50 ft	75 ft	100 ft	125 ft	150 ft	175 ft	200 ft
1-Aug	123.3	153.6	153.1	153.9	148.8	132.8	116.3	110.2
2-Aug	123.2	153.5	153.1	153.8	148.8	132.8	116.3	110.1
3-Aug	123.0	153.2	152.7	153.6	148.6	132.5	116.3	109.8
4-Aug	123.3	153.6	153.1	154.1	149.1	132.9	116.9	110.3
5-Aug	123.4	153.6	153.2	154.0	149.1	132.9	117.0	110.3
6-Aug	123.3	153.6	153.2	153.9	148.9	132.8	117.0	110.2
7-Aug	123.1	153.5	153.0	153.8	148.8	132.7	117.1	110.1
8-Aug	123.0	153.4	152.9	153.6	148.7	132.5	117.0	110.0
9-Aug	123.0	153.5	153.0	153.8	148.8	132.7	117.3	110.2
10-Aug	123.0	153.3	152.9	153.7	148.7	132.6	117.2	110.0
11-Aug	123.0	153.5	153.1	154.0	148.9	132.8	117.6	110.4
12-Aug	123.0	153.5	153.0	153.7	148.6	132.6	117.4	110.2
13-Aug	123.1	153.6	153.3	153.9	148.8	132.8	117.6	110.5
14-Aug	123.0	153.6	153.1	153.8	148.7	132.7	117.5	110.4
15-Aug	122.8	153.6	153.1	153.8	148.7	132.8	115.2	110.7
16-Aug	122.8	153.6	153.1	153.8	148.7	132.7	113.9	111.0
17-Aug	122.8	153.5	153.1	153.8	148.8	132.7	114.2	111.0
18-Aug	122.4	153.1	152.6	153.3	148.2	132.1	113.7	110.4
19-Aug	*	*	*	*	*	*	*	*
20-Aug	*	*	*	*	*	*	*	*
21-Aug	*	*	*	*	*	*	*	*
22-Aug	*	*	*	*	*	*	*	*
23-Aug	*	*	*	*	*	*	*	*
24-Aug	*	*	*	*	*	*	*	*
25-Aug	*	*	*	*	*	*	*	*
26-Aug	*	*	*	*	*	*	*	*
27-Aug	*	*	*	*	*	*	*	*
28-Aug	*	*	*	*	*	*	*	*
29-Aug	*	*	*	*	*	*	*	*
30-Aug	*	*	*	*	*	*	*	*
31-Aug	*	*	*	*	*	*	*	*
Average	**123.0**	**153.5**	**153.0**	**153.8**	**148.8**	**132.7**	**116.4**	**110.3**

* Indicates days that the sensors were not operational

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 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 1, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

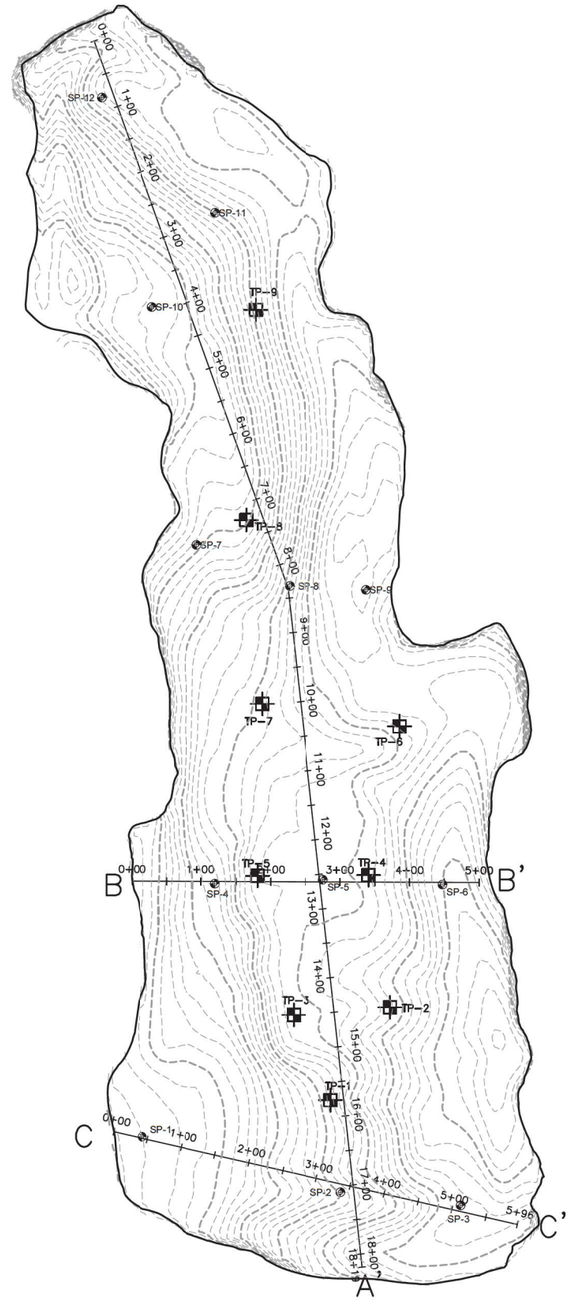
PROJ. NO. 02218208.05
DSN. BY:
DWN. BY: HGW
CHK. BY: CJW
QA REVIEW BY:
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 8/16/2023

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 AUGUST 2, 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: AUGUST 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
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53 SOUTH MAIN ST, SUITE 1, MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

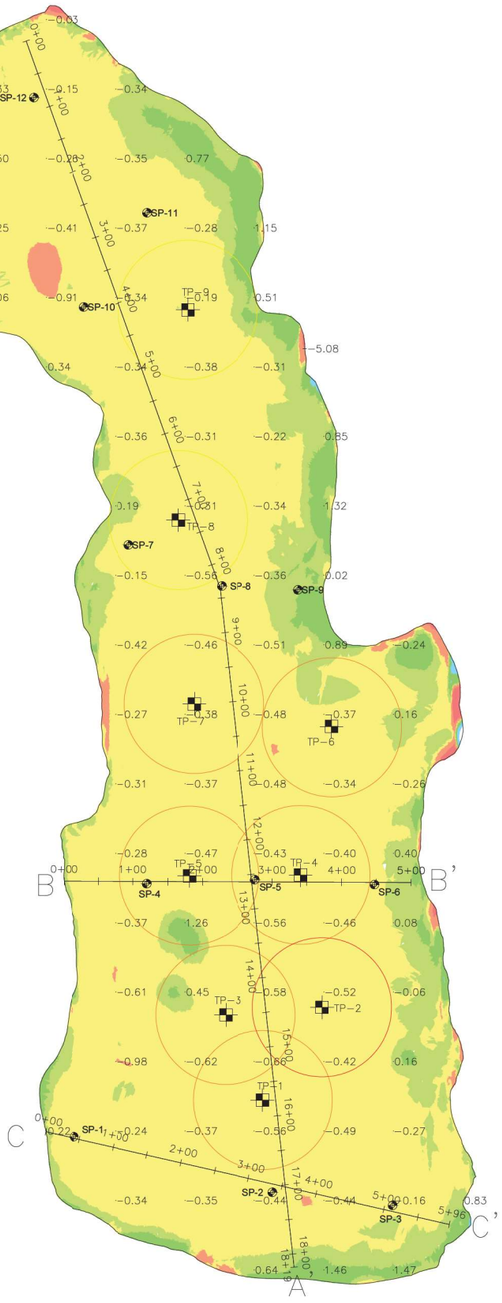
PROJ. NO. 02218208.05
DSN. BY:
DWN. BY: HGW
CHK. BY: CJW
QA REVIEW:
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 8/16/2023

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 – JULY 12, 2023
Comparison Surface	TOPO – AUGUST 2, 2023
Cut Volume	9,909 Cu. Yd.
Fill Volume	4,055 Cu. Yd.
Net Fill	5,854 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-11.000	-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 JULY 12, 2023 AND AUGUST 2, 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: AUGUST VOLUME CHANGE JULY 2023 TO AUGUST 2023

PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

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

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

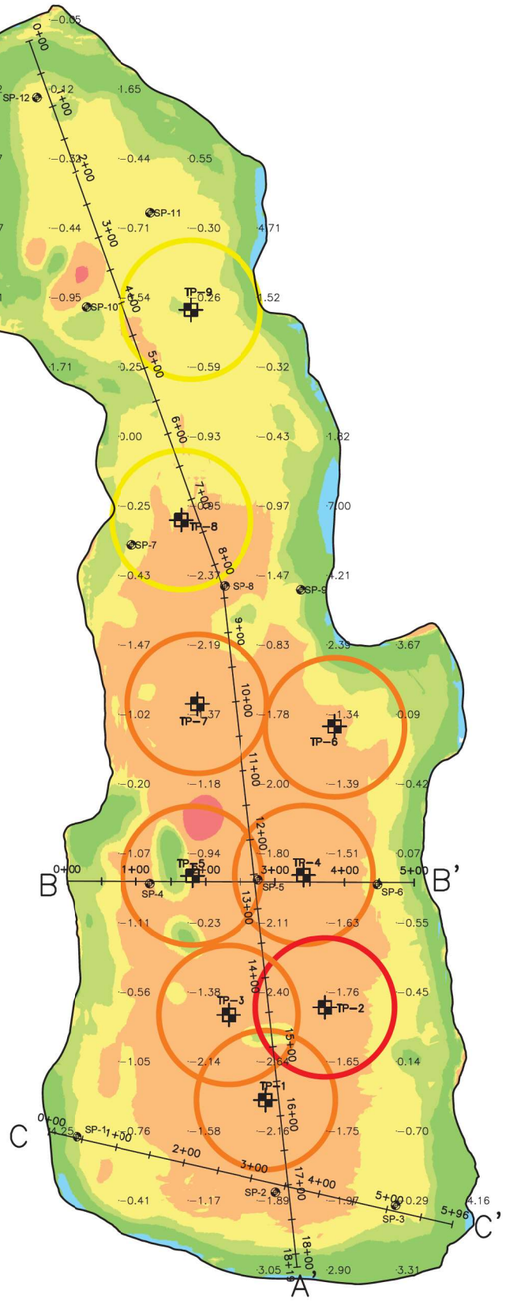
PROJ. NO. 02208.05
DSN. BY:
DWN. BY: HGW
CHK. BY: CJW
Q/A RVW. BY:
APP. BY: CJW

CADD FILE: SURF COMP

DATE: 8/16/2023

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 – MAY 11, 2023
Comparison Surface TOPO – AUGUST 2, 2023

Cut Volume	25,162 Cu. Yd.
Fill Volume	13,515 Cu. Yd.
Net Cut	11,647 Cu. Yd.

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−11.000	−5.000	
2	−5.000	−1.000	
3	−1.000	0.000	
4	0.000	1.000	
5	1.000	5.000	
6	5.000	10.000	

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AERIAL TOPOGRAPHY DATA CAPTURED ON MAY 11, 2023 AND AUGUST 2, 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: AUGUST VOLUME CHANGE MAY 2023 TO AUGUST 2023

PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

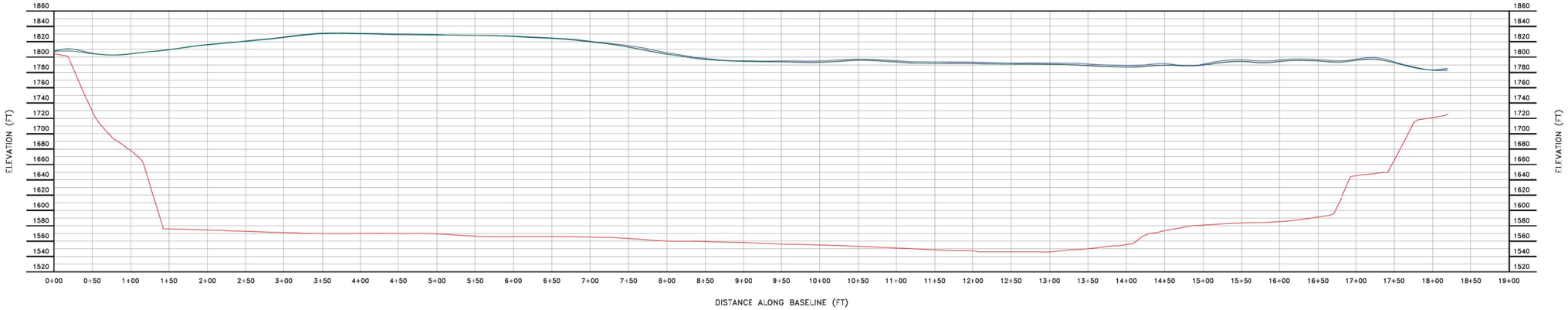
CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

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

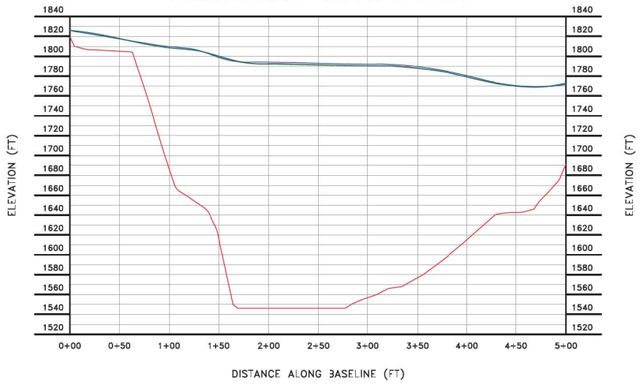
PROJ. NO. 27213208.05
DSN. BY:
DWN. BY: HGW
CHK. BY: CJW
QA/A KVK BY:
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 8/16/2023
SCALE: 1" = 100'
DRAWING NO. 4 of 5

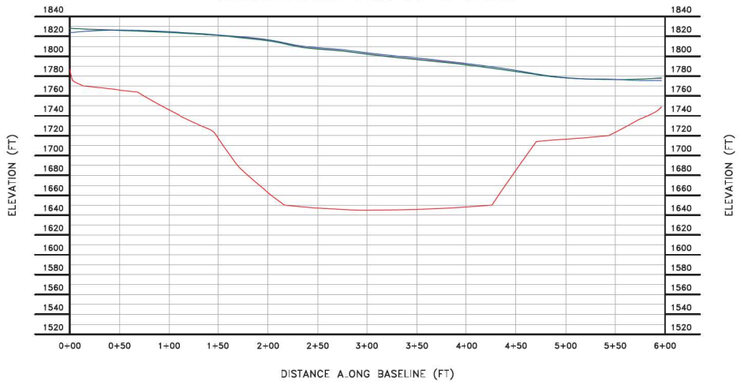
LONGITUDINAL PROFILE A ALIGN



LONGITUDINAL PROFILE B ALIGN



LONGITUDINAL PROFILE C ALIGN



LEGEND

- BOTTOM LINER ELEVATION
- MAY 2023 TOPO
- JULY 2023 TOPO
- AUGUST 2023 TOPO

NO.	REVISION	DATE

SHEET TITLE: **PROFILES**

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

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

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

PROJ. NO: 02218208.05
DSN. BY:
DWN. BY: HGW
CHK. BY: CJW
QA/QC BY:
APP. BY: CJW

CADD FILE: SURF COMP
DATE: 8/16/2023
SCALE: AS NOTED
DRAWING NO. 5 of 5

Appendix F

Field Logs

Lab Report

Historical LFG-EW Leachate Monitoring Results Summary

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

Date	08/14 - 08/18, 2023										
Personnel	A. Minnick, L. Nelson										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Stickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-33B	8/17/2023	180			x		13.00	145.92	5.60		possible very sludgy bottom, not running
EW-36A	8/17/2023	184	---				N/A	unable	5.45		Hazardously Hot
EW-49	8/17/2023		96.15	12/20-21/2022	x	90	1777822	64.15	6.75	32.00	not running
EW-50	8/17/2023		77.70	12/20-21/2022	x	83	1147550	37.98	5.25	39.72	not running
EW-51	8/16/2023		92.80	12/20-21/2022	x	95	102431	41.38	5.55	51.42	air hose off
EW-52	8/16/2023		98.70	12/20-21/2022	x	93	192105	41.12	3.10	57.58	not running, air hose too loose, repaired
EW-53	8/16/2023		100.70	12/20-21/2022	x		2296361	unsure	4.53		not running, possibly dry from pumping recently
EW-54	8/16/2023		82.70	12/20-21/2022	x	75	566986	36.52	5.15	46.18	
EW-55	8/16/2023		90.40	12/20-21/2022	x	90	235885	36.77	6.23	53.63	not running
EW-56	8/16/2023		58.50	12/20-21/2022	x, not attached	58	N/A	44.91	5.30	13.59	at 60 degree angle no attachments no cycle
EW-57	8/16/2023		107.40	12/20-21/2022	x	425173	664456	41.29	4.53	66.11	not running
EW-58	8/16/2023		84.50	12/20-21/2022	x	82	2318729	31.37	5.55	53.13	running, no sample port
EW-59	8/16/2023		73.40	12/20-21/2022	x	64	2398795	31.27	4.20	42.13	not running
EW-60	8/16/2023		81.80	12/20-21/2022	x	70	426468	34.31	3.70	47.49	not running
EW-61	8/16/2023		87.80	12/20-21/2022	x	66	243266	52.15	4.23	35.65	not running no sample port
EW-62	8/17/2023		110.60	12/20-21/2022	x	80	179223	91.43	3.30	19.17	not running
EW-63	8/17/2023		62.10	12/20-21/2022		64	N/A	59.02	4.79	3.08	no pump connected
EW-64	8/17/2023		109.00	12/20-21/2022	x	113	157019	64.12	4.30	44.88	
EW-65	8/17/2023		88.40	12/20-21/2022	x	50	3973	50.62	5.58	37.78	
EW-67	8/16/2023		107.75	12/20-21/2022	x	62.5	798804	41.51	5.23	66.24	Not running
EW-68	8/17/2023		73.57	12/20-21/2022	x	68	2215363	37.41	3.71	36.16	
EW-69	8/17/2023	93	98.00	5/3/2023						98.00	no pump, unlabeled
EW-70	8/17/2023	66	71.00	5/3/2023	x		13	4.89	2.01	66.11	
EW-71	8/17/2023	180	185.80	7/18/2023	x		N/A	113.97	5.00	71.83	No sample port not running
EW-72	8/17/2023	180	141.21	8/17/2023	x		N/A	93.48	4.28	47.73	not running, obstruction at 120'

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

Date	08/14 - 08/18, 2023										
Personnel	A. Minnick, L. Nelson										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Stickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-73	8/17/2023	111	116.00	5/3/2023	x		19	65.11	3.81	50.89	not running
EW-74	8/17/2023	180	184.15	7/18/2023	x		16	165.44	5.31	18.71	not running, sludge
EW-75	8/17/2023	179	124.58	8/17/2023	x		9	121.22	4.82	3.36	not running
EW-76	8/17/2023	122	127.00	5/3/2023	x		13	66.22	3.47	60.78	
EW-77	8/17/2023	180	185.22	8/17/2023		N/A	N/A	135.44	4.1	49.78	no pump
EW-78	8/17/2023	52	57.00	5/3/2023	x		16504	7.9	3.51	49.10	DTL is possible sludge
EW-79	8/17/2023	180	185.64	8/17/2023		N/A	N/A	153.25	4.24	32.39	no pump
EW-80	8/17/2023	144	149.00	5/3/2023		N/A	N/A	136.11	5.60	12.89	no pump
EW-81	8/17/2023	180	151.56	8/17/2023		N/A	N/A	104.93	4.70	46.63	no pump
EW-82	8/17/2023	180	163.26	8/17/2023		N/A	N/A	89.72	4.39	73.54	no pump, suction high
EW-83	8/17/2023	180	167.04	8/17/2023		N/A	N/A	122.79	6.25	44.25	Very soft likely foam
EW-84	8/17/2023	137	130.56	8/17/2023		N/A	N/A	97.53	4.53	33.03	not running no sample port
EW-85	8/16/2023	86	91.00	5/3/2023			10	7.62	2.70	83.38	
EW-86	8/17/2023	148	153.00	5/3/2023		N/A	N/A	68.98	4.92	84.02	no pump
EW-87	8/16/2023	180	149.57	8/16/2023		N/A	N/A	52.23	5.02	97.34	no pump, soft bottom
EW-88	8/16/2023	95	100.00	5/3/2023	x		132091	34.63	3.29	65.37	no sample port, audible boiling sound
EW-89	8/16/2023	121	84.57	8/16/2023			N/A	30.97	3.84	53.60	no pump, soft bottom
EW-90	8/16/2023	109	114.00	5/3/2023			N/A	66.58	5.15	47.42	no pump
EW-91	8/16/2023	180	137.70	8/16/2023			N/A	39.92	5.35	97.78	no pump
EW-92	8/16/2023	140	112.99	8/16/2023			N/A	38.32	5.49	74.67	no pump, soft bottom
EW-93	8/16/2023	106	111.00	5/3/2023			N/A	24.43	3.85	86.57	no pump
EW-94	8/16/2023	45	50.00	5/3/2023	x		767761	22.62	4.66	27.38	not running, running on 8/15/2023
EW-95	8/16/2023	63	68.00	5/3/2023			N/A	61.21	3.50	6.79	not running, no sample port
EW-96	8/16/2023	180	164.35	7/18/2023			N/A	42.32	5.00	122.03	muddy surface
EW-97	8/16/2023	180	67.95	8/16/2023			N/A	58.61	4.15	9.34	not connected
EW-98	8/16/2023	51	51.00	5/3/2023	x		778587	20.96	3.67	30.04	soft bottom, running

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

Date	08/14 - 08/18, 2023										
Personnel	A. Minnick, L. Nelson										
Location ID	Date	Scheduled Borehole Depth (ft)	Measured Well Casing Depth		Should Have Pump	Pump Depth (ft)	Cycle Count	Depth to Liquid (ft)	Casing Stickup (ft)	Liquid Column Thickness (ft)	Comments
			(ft)	(Date)							
EW-99	8/16/2023	60	65.00	5/3/2023			N/A	unable	Unable		unable to check, pressurized
EW-100	8/16/2023	130	108.50	5/3/2023			N/A	56.74	3.50	51.76	
Log Checked By:	L. Howard/J. Robb										

--- = not applicable/available

Note: Depth to liquid is subtracted 1.5 ft due to missing line on indicator - compared to written field log.

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-54	8/15/2023	15:05	70.7	5.33	31.4	0.24	-62.4	>1100	Lighter Foam Head
EW-57	8/15/2023	15:05	61.9	5.22	33.8	1.03	57.7	>1100	Very Thick milky grey foam
EW-94	8/15/2023	14:20	66.8	5.23	30	1.41	33.7	>1100	
EW-98	8/15/2023	13:45	35.5	8.04	4.07	4.18	-61.7	223.7	light brown

Sampler: L. Nelson, A. Minick

Samples Shipped By: Courier

Log Checked By: J. Robb

Laboratory: Enthalpy Analytical

TNI Accredited
VELAP ID 460021

ENTHALPY ANALYTICAL

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

Certificate of Analysis

DRAFT REPORT

Laboratory Order ID 23H0914

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	August 17, 2023 9:00
		Date Issued:	August 31, 2023 14:20
		Project Number:	02218208.15 T1
Submitted To:	Jennifer Robb	Purchase Order:	
Client Site I.D.:	2023 City of Bristol Landfill Leachate		

Enclosed are the results of analyses for samples received by the laboratory on 08/17/2023 09:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

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

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

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

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

Analysis Detects Report

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

Date Issued: 8/31/2023 2:20:22PM

Laboratory Sample ID: **23H0914-01** **Client Sample ID:** **EW-57**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6020B	430		5.0	10	10	ug/L
Barium	01	SW6020B	1580		10.0	50.0	10	ug/L
Chromium	01	SW6020B	449		4.00	10.0	10	ug/L
Copper	01	SW6020B	17.6		3.00	10.0	10	ug/L
Mercury	01	SW6020B	3.97		2.00	2.00	10	ug/L
Nickel	01	SW6020B	96.73		10.00	10.00	10	ug/L
Zinc	01	SW6020B	1710		25.0	50.0	10	ug/L
2-Butanone (MEK)	01RE1	SW8260D	3000		750	2500	250	ug/L
Acetone	01RE1	SW8260D	18700		1750	2500	250	ug/L
Benzene	01	SW8260D	168		20.0	50.0	50	ug/L
Tetrahydrofuran	01	SW8260D	3210		500	500	50	ug/L
Ammonia as N	01	EPA350.1 R2.0	1890		146	200	2000	mg/L
BOD	01	SM5210B-2016	>33225		0.2	2.0	1	mg/L
COD	01	SM5220D-2011	58600		5000	5000	500	mg/L
TKN as N	01	EPA351.2 R2.0	2820		100	250	500	mg/L
Total Recoverable Phenolics	01	EPA420.1	31.4		1.50	2.50	50	mg/L

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Analysis Detects Report

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

Date Issued: 8/31/2023 2:20:22PM

Laboratory Sample ID: **23H0914-02** **Client Sample ID:** **EW-98**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02	SW6020B	150		2.5	5.0	5	ug/L
Barium	02	SW6020B	218		5.00	25.0	5	ug/L
Chromium	02	SW6020B	27.6		2.00	5.00	5	ug/L
Nickel	02	SW6020B	20.29		5.000	5.000	5	ug/L
Zinc	02	SW6020B	112		12.5	25.0	5	ug/L
2-Butanone (MEK)	02	SW8260D	5950		60.0	200	20	ug/L
Acetone	02RE1	SW8260D	20900		700	1000	100	ug/L
Benzene	02	SW8260D	379		8.00	20.0	20	ug/L
Ethylbenzene	02	SW8260D	16.8	J	8.00	20.0	20	ug/L
m+p-Xylenes	02	SW8260D	31.0	J	12.0	40.0	20	ug/L
o-Xylene	02	SW8260D	17.4	J	8.00	20.0	20	ug/L
Tetrahydrofuran	02	SW8260D	2880		200	200	20	ug/L
Toluene	02	SW8260D	36.6		10.0	20.0	20	ug/L
Xylenes, Total	02	SW8260D	48.4	J	20.0	60.0	20	ug/L
Ammonia as N	02	EPA350.1 R2.0	222		146	200	2000	mg/L
BOD	02	SM5210B-2016	506		0.2	2.0	1	mg/L
COD	02	SM5220D-2011	1750		500	500	1	mg/L
TKN as N	02	EPA351.2 R2.0	279		10.0	25.0	50	mg/L
Total Recoverable Phenolics	02	EPA420.1	1.46		0.150	0.250	5	mg/L

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Analysis Detects Report

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

Date Issued: 8/31/2023 2:20:22PM

Laboratory Sample ID: **23H0914-03** **Client Sample ID:** **EW-94**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	03	SW6020B	290		5.0	10	10	ug/L
Barium	03	SW6020B	1480		10.0	50.0	10	ug/L
Chromium	03	SW6020B	259		4.00	10.0	10	ug/L
Lead	03	SW6020B	13		10	10	10	ug/L
Nickel	03	SW6020B	51.30		10.00	10.00	10	ug/L
Zinc	03	SW6020B	914		25.0	50.0	10	ug/L
2-Butanone (MEK)	03	SW8260D	7350		150	500	50	ug/L
Acetone	03RE1	SW8260D	87700		3500	5000	500	ug/L
Tetrahydrofuran	03	SW8260D	1200		500	500	50	ug/L
Ammonia as N	03	EPA350.1 R2.0	2140		146	200	2000	mg/L
BOD	03	SM5210B-2016	>32805		0.2	2.0	1	mg/L
COD	03	SM5220D-2011	60600		5000	5000	500	mg/L
TKN as N	03	EPA351.2 R2.0	2850		100	250	500	mg/L
Total Recoverable Phenolics	03	EPA420.1	40.4		1.50	2.50	50	mg/L

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Analysis Detects Report

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

Date Issued: 8/31/2023 2:20:22PM

Laboratory Sample ID: **23H0914-04** **Client Sample ID:** **EW-54**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	04	SW6020B	320		5.0	10	10	ug/L
Barium	04	SW6020B	1610		10.0	50.0	10	ug/L
Chromium	04	SW6020B	606		4.00	10.0	10	ug/L
Copper	04	SW6020B	3.43	J	3.00	10.0	10	ug/L
Lead	04	SW6020B	14		10	10	10	ug/L
Mercury	04	SW6020B	3.12		2.00	2.00	10	ug/L
Nickel	04	SW6020B	145.7		10.00	10.00	10	ug/L
Zinc	04RE1	SW6020B	5920		50.0	100	20	ug/L
2-Butanone (MEK)	04RE1	SW8260D	25600		1500	5000	500	ug/L
Acetone	04RE1	SW8260D	72500		3500	5000	500	ug/L
Benzene	04	SW8260D	2320		20.0	50.0	50	ug/L
Ethylbenzene	04	SW8260D	80.0		20.0	50.0	50	ug/L
m+p-Xylenes	04	SW8260D	119		30.0	100	50	ug/L
o-Xylene	04	SW8260D	60.5		20.0	50.0	50	ug/L
Tetrahydrofuran	04	SW8260D	7370		500	500	50	ug/L
Toluene	04	SW8260D	105		25.0	50.0	50	ug/L
Xylenes, Total	04	SW8260D	180		50.0	150	50	ug/L
Ammonia as N	04	EPA350.1 R2.0	1600		146	200	2000	mg/L
BOD	04	SM5210B-2016	>33045		0.2	2.0	1	mg/L
COD	04	SM5220D-2011	59000		5000	5000	500	mg/L
TKN as N	04	EPA351.2 R2.0	2240		100	250	500	mg/L
Total Recoverable Phenolics	04	EPA420.1	28.6		1.50	2.50	50	mg/L

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

Enthalpy Analytical
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-57	23H0914-01	Ground Water	08/15/2023 13:30	08/17/2023 09:00
EW-98	23H0914-02	Ground Water	08/15/2023 13:45	08/17/2023 09:00
EW-94	23H0914-03	Ground Water	08/15/2023 14:20	08/17/2023 09:00
EW-54	23H0914-04	Ground Water	08/15/2023 15:05	08/17/2023 09:00
Trip Blank	23H0914-05	Non-Potable Water	08/09/2023 16:15	08/17/2023 09:00

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Client Sample ID: **EW-57** **Laboratory Sample ID:** **23H0914-01**

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	08/18/2023 17:00	08/21/2023 10:17	BLOD		0.600	10.0	10	ug/L	AB
Arsenic	01	7440-38-2	SW6020B	08/18/2023 17:00	08/21/2023 10:17	430		5.0	10	10	ug/L	AB
Barium	01	7440-39-3	SW6020B	08/18/2023 17:00	08/21/2023 10:17	1580		10.0	50.0	10	ug/L	AB
Cadmium	01	7440-43-9	SW6020B	08/18/2023 17:00	08/21/2023 10:17	BLOD		1.00	10.0	10	ug/L	AB
Chromium	01	7440-47-3	SW6020B	08/18/2023 17:00	08/21/2023 10:17	449		4.00	10.0	10	ug/L	AB
Copper	01	7440-50-8	SW6020B	08/18/2023 17:00	08/21/2023 10:17	17.6		3.00	10.0	10	ug/L	AB
Mercury	01	7439-97-6	SW6020B	08/18/2023 17:00	08/21/2023 10:17	3.97		2.00	2.00	10	ug/L	AB
Nickel	01	7440-02-0	SW6020B	08/18/2023 17:00	08/21/2023 10:17	96.73		10.00	10.00	10	ug/L	AB
Lead	01	7439-92-1	SW6020B	08/18/2023 17:00	08/21/2023 10:17	BLOD		10	10	10	ug/L	AB
Selenium	01	7782-49-2	SW6020B	08/18/2023 17:00	08/21/2023 10:17	BLOD		8.50	10.0	10	ug/L	AB
Zinc	01	7440-66-6	SW6020B	08/18/2023 17:00	08/21/2023 10:17	1710		25.0	50.0	10	ug/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01RE1	78-93-3	SW8260D	08/21/2023 17:37	08/21/2023 17:37	3000		750	2500	250	ug/L	RJB
Acetone	01RE1	67-64-1	SW8260D	08/21/2023 17:37	08/21/2023 17:37	18700		1750	2500	250	ug/L	RJB
Benzene	01	71-43-2	SW8260D	08/18/2023 17:12	08/18/2023 17:12	168		20.0	50.0	50	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	08/18/2023 17:12	08/18/2023 17:12	BLOD		20.0	50.0	50	ug/L	RJB
m+p-Xylenes	01	179601-23-1	SW8260D	08/18/2023 17:12	08/18/2023 17:12	BLOD		30.0	100	50	ug/L	RJB
o-Xylene	01	95-47-6	SW8260D	08/18/2023 17:12	08/18/2023 17:12	BLOD		20.0	50.0	50	ug/L	RJB
Toluene	01	108-88-3	SW8260D	08/18/2023 17:12	08/18/2023 17:12	BLOD		25.0	50.0	50	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	08/18/2023 17:12	08/18/2023 17:12	BLOD		50.0	150	50	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	08/18/2023 17:12	08/18/2023 17:12	3210		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*		*96.7 %*	*70-120*	*08/18/2023 17:12*	*08/18/2023 17:12*						
Surr: 4-Bromofluorobenzene (Surr)	*01*		*100 %*	*75-120*	*08/18/2023 17:12*	*08/18/2023 17:12*						

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Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Client Sample ID: **EW-57** **Laboratory Sample ID:** **23H0914-01**

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)	*01*		*90.5 %*	*70-130*	*08/18/2023 17:12*	*08/18/2023 17:12*						
Surr: Toluene-d8 (Surr)	*01*		*99.1 %*	*70-130*	*08/18/2023 17:12*	*08/18/2023 17:12*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*		*113 %*	*70-120*	*08/21/2023 17:37*	*08/21/2023 17:37*						
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*		*99.7 %*	*75-120*	*08/21/2023 17:37*	*08/21/2023 17:37*						
Surr: Dibromofluoromethane (Surr)	*01RE1*		*111 %*	*70-130*	*08/21/2023 17:37*	*08/21/2023 17:37*						
Surr: Toluene-d8 (Surr)	*01RE1*		*102 %*	*70-130*	*08/21/2023 17:37*	*08/21/2023 17:37*						
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	08/22/2023 09:10	08/22/2023 19:05	BLOD		1000	2000	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*01*		*%*	*5-136*	*08/22/2023 09:10*	*08/22/2023 19:05*						*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*		*%*	*9-117*	*08/22/2023 09:10*	*08/22/2023 19:05*						*DS*
Surr: 2-Fluorophenol (Surr)	*01*		*15.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 19:05*						
Surr: Nitrobenzene-d5 (Surr)	*01*		*2.00 %*	*5-151*	*08/22/2023 09:10*	*08/22/2023 19:05*						*DS*
Surr: Phenol-d5 (Surr)	*01*		*23.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 19:05*						
Surr: p-Terphenyl-d14 (Surr)	*01*		*2.00 %*	*5-141*	*08/22/2023 09:10*	*08/22/2023 19:05*						*DS*

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Submitted To: Jennifer Robb

Client Sample ID: **EW-57** **Laboratory Sample ID:** **23H0914-01**

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	08/29/2023 12:22	08/29/2023 12:22	1890		146	200	2000	mg/L	SPH
BOD	01	E1640606	SM5210B-2016	08/17/2023 11:53	08/17/2023 11:53	>33225		0.2	2.0	1	mg/L	NBT
BOD	01	E1640606	SM5210B-2016	08/17/2023 11:53	08/17/2023 11:53	>33225		0.2	2.0	1	mg/L	NBT
COD	01	NA	SM5220D-2011	08/22/2023 11:00	08/22/2023 11:00	58600		5000	5000	500	mg/L	MGC
Nitrate as N	01	14797-55-8	Calc.	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.50	3.50	50	mg/L	MGC
Nitrate+Nitrite as N	01	E701177	SM4500-NO3F-2016	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.00	1.00	1	mg/L	TMB
Nitrite as N	01	14797-65-0	SM4500-NO2B-2011	08/17/2023 11:00	08/17/2023 11:00	BLOD		0.50	2.50	50	mg/L	MGC
Total Recoverable Phenolics	01	NA	EPA420.1	08/31/2023 08:54	08/31/2023 08:54	31.4		1.50	2.50	50	mg/L	AAL
TKN as N	01	E17148461	EPA351.2 R2.0	08/27/2023 13:10	08/27/2023 13:10	2820		100	250	500	mg/L	TMB

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Client Sample ID: **EW-98** **Laboratory Sample ID:** **23H0914-02**

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	08/18/2023 17:00	08/21/2023 10:31	BLOD		0.300	5.00	5	ug/L	AB
Arsenic	02	7440-38-2	SW6020B	08/18/2023 17:00	08/21/2023 10:31	150		2.5	5.0	5	ug/L	AB
Barium	02	7440-39-3	SW6020B	08/18/2023 17:00	08/21/2023 10:31	218		5.00	25.0	5	ug/L	AB
Cadmium	02	7440-43-9	SW6020B	08/18/2023 17:00	08/21/2023 10:31	BLOD		0.500	5.00	5	ug/L	AB
Chromium	02	7440-47-3	SW6020B	08/18/2023 17:00	08/21/2023 10:31	27.6		2.00	5.00	5	ug/L	AB
Copper	02	7440-50-8	SW6020B	08/18/2023 17:00	08/21/2023 10:31	BLOD		1.50	5.00	5	ug/L	AB
Mercury	02	7439-97-6	SW6020B	08/18/2023 17:00	08/21/2023 10:31	BLOD		1.00	1.00	5	ug/L	AB
Nickel	02	7440-02-0	SW6020B	08/18/2023 17:00	08/21/2023 10:31	20.29		5.000	5.000	5	ug/L	AB
Lead	02	7439-92-1	SW6020B	08/18/2023 17:00	08/21/2023 10:31	BLOD		5.0	5.0	5	ug/L	AB
Selenium	02	7782-49-2	SW6020B	08/18/2023 17:00	08/21/2023 10:31	BLOD		4.25	5.00	5	ug/L	AB
Zinc	02	7440-66-6	SW6020B	08/18/2023 17:00	08/21/2023 10:31	112		12.5	25.0	5	ug/L	AB

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Client Sample ID: **EW-98** **Laboratory Sample ID:** **23H0914-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	02	78-93-3	SW8260D	08/18/2023 16:49	08/18/2023 16:49	5950		60.0	200	20	ug/L	RJB
Acetone	02RE1	67-64-1	SW8260D	08/21/2023 17:14	08/21/2023 17:14	20900		700	1000	100	ug/L	RJB
Benzene	02	71-43-2	SW8260D	08/18/2023 16:49	08/18/2023 16:49	379		8.00	20.0	20	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	08/18/2023 16:49	08/18/2023 16:49	16.8	J	8.00	20.0	20	ug/L	RJB
m+p-Xylenes	02	179601-23-1	SW8260D	08/18/2023 16:49	08/18/2023 16:49	31.0	J	12.0	40.0	20	ug/L	RJB
o-Xylene	02	95-47-6	SW8260D	08/18/2023 16:49	08/18/2023 16:49	17.4	J	8.00	20.0	20	ug/L	RJB
Toluene	02	108-88-3	SW8260D	08/18/2023 16:49	08/18/2023 16:49	36.6		10.0	20.0	20	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	08/18/2023 16:49	08/18/2023 16:49	48.4	J	20.0	60.0	20	ug/L	RJB
Tetrahydrofuran	02	109-99-9	SW8260D	08/18/2023 16:49	08/18/2023 16:49	2880		200	200	20	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*	*107 %*	*70-120*	*08/18/2023 16:49*	*08/18/2023 16:49*							
Surr: 4-Bromofluorobenzene (Surr)	*02*	*102 %*	*75-120*	*08/18/2023 16:49*	*08/18/2023 16:49*							
Surr: Dibromofluoromethane (Surr)	*02*	*97.4 %*	*70-130*	*08/18/2023 16:49*	*08/18/2023 16:49*							
Surr: Toluene-d8 (Surr)	*02*	*98.1 %*	*70-130*	*08/18/2023 16:49*	*08/18/2023 16:49*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*02RE1*	*111 %*	*70-120*	*08/21/2023 17:14*	*08/21/2023 17:14*							
Surr: 4-Bromofluorobenzene (Surr)	*02RE1*	*100 %*	*75-120*	*08/21/2023 17:14*	*08/21/2023 17:14*							
Surr: Dibromofluoromethane (Surr)	*02RE1*	*109 %*	*70-130*	*08/21/2023 17:14*	*08/21/2023 17:14*							
Surr: Toluene-d8 (Surr)	*02RE1*	*102 %*	*70-130*	*08/21/2023 17:14*	*08/21/2023 17:14*							
Semivolatile Organic Compounds by GCMS												
Anthracene	02	120-12-7	SW8270E	08/22/2023 09:10	08/22/2023 15:52	BLOD		19.6	39.2	4	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*02*	*40.7 %*	*5-136*	*08/22/2023 09:10*	*08/22/2023 15:52*							
Surr: 2-Fluorobiphenyl (Surr)	*02*	*28.7 %*	*9-117*	*08/22/2023 09:10*	*08/22/2023 15:52*							
Surr: 2-Fluorophenol (Surr)	*02*	*23.8 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 15:52*							
Surr: Nitrobenzene-d5 (Surr)	*02*	*42.3 %*	*5-151*	*08/22/2023 09:10*	*08/22/2023 15:52*							
Surr: Phenol-d5 (Surr)	*02*	*17.5 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 15:52*							
Surr: p-Terphenyl-d14 (Surr)	*02*	*10.0 %*	*5-141*	*08/22/2023 09:10*	*08/22/2023 15:52*							

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Client Sample ID: **EW-98** **Laboratory Sample ID:** **23H0914-02**

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	08/29/2023 12:22	08/29/2023 12:22	222		146	200	2000	mg/L	SPH
BOD	02	E1640606	SM5210B-2016	08/17/2023 11:53	08/17/2023 11:53	506		0.2	2.0	1	mg/L	NBT
COD	02	NA	SM5220D-2011	08/22/2023 11:00	08/22/2023 11:00	1750		500	500	1	mg/L	MGC
Nitrate as N	02	14797-55-8	Calc.	08/26/2023 14:29	08/26/2023 14:29	BLOD		0.150	0.350	1	mg/L	MGC
Nitrate+Nitrite as N	02	E701177	SM4500-NO3F-2016	08/26/2023 14:29	08/26/2023 14:29	BLOD		0.10	0.10	1	mg/L	TMB
Nitrite as N	02	14797-65-0	SM4500-NO2B-2011	08/17/2023 11:00	08/17/2023 11:00	BLOD		0.05	0.25	1	mg/L	MGC
Total Recoverable Phenolics	02	NA	EPA420.1	08/31/2023 08:54	08/31/2023 08:54	1.46		0.150	0.250	5	mg/L	AAL
TKN as N	02	E17148461	EPA351.2 R2.0	08/27/2023 13:10	08/27/2023 13:10	279		10.0	25.0	50	mg/L	TMB

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Client Site I.D.: 2023 City of Bristol Landfill Leachate
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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23H0914-03**

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	08/18/2023 17:00	08/21/2023 10:23	BLOD		0.600	10.0	10	ug/L	AB
Arsenic	03	7440-38-2	SW6020B	08/18/2023 17:00	08/21/2023 10:23	290		5.0	10	10	ug/L	AB
Barium	03	7440-39-3	SW6020B	08/18/2023 17:00	08/21/2023 10:23	1480		10.0	50.0	10	ug/L	AB
Cadmium	03	7440-43-9	SW6020B	08/18/2023 17:00	08/21/2023 10:23	BLOD		1.00	10.0	10	ug/L	AB
Chromium	03	7440-47-3	SW6020B	08/18/2023 17:00	08/21/2023 10:23	259		4.00	10.0	10	ug/L	AB
Copper	03	7440-50-8	SW6020B	08/18/2023 17:00	08/21/2023 10:23	BLOD		3.00	10.0	10	ug/L	AB
Mercury	03	7439-97-6	SW6020B	08/18/2023 17:00	08/21/2023 10:23	BLOD		2.00	2.00	10	ug/L	AB
Nickel	03	7440-02-0	SW6020B	08/18/2023 17:00	08/21/2023 10:23	51.30		10.00	10.00	10	ug/L	AB
Lead	03	7439-92-1	SW6020B	08/18/2023 17:00	08/21/2023 10:23	13		10	10	10	ug/L	AB
Selenium	03	7782-49-2	SW6020B	08/18/2023 17:00	08/21/2023 10:23	BLOD		8.50	10.0	10	ug/L	AB
Zinc	03	7440-66-6	SW6020B	08/18/2023 17:00	08/21/2023 10:23	914		25.0	50.0	10	ug/L	AB

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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23H0914-03**

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												
2-Butanone (MEK)	03	78-93-3	SW8260D	08/18/2023 17:36	08/18/2023 17:36	7350		150	500	50	ug/L	RJB
Acetone	03RE1	67-64-1	SW8260D	08/21/2023 17:59	08/21/2023 17:59	87700		3500	5000	500	ug/L	RJB
Benzene	03	71-43-2	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		20.0	50.0	50	ug/L	RJB
Ethylbenzene	03	100-41-4	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		20.0	50.0	50	ug/L	RJB
m+p-Xylenes	03	179601-23-1	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		30.0	100	50	ug/L	RJB
o-Xylene	03	95-47-6	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		20.0	50.0	50	ug/L	RJB
Toluene	03	108-88-3	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		25.0	50.0	50	ug/L	RJB
Xylenes, Total	03	1330-20-7	SW8260D	08/18/2023 17:36	08/18/2023 17:36	BLOD		50.0	150	50	ug/L	RJB
Tetrahydrofuran	03	109-99-9	SW8260D	08/18/2023 17:36	08/18/2023 17:36	1200		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*03*	*98.9 %*	*70-120*	*08/18/2023 17:36*	*08/18/2023 17:36*							
Surr: 4-Bromofluorobenzene (Surr)	*03*	*97.8 %*	*75-120*	*08/18/2023 17:36*	*08/18/2023 17:36*							
Surr: Dibromofluoromethane (Surr)	*03*	*92.3 %*	*70-130*	*08/18/2023 17:36*	*08/18/2023 17:36*							
Surr: Toluene-d8 (Surr)	*03*	*99.9 %*	*70-130*	*08/18/2023 17:36*	*08/18/2023 17:36*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*03RE1*	*108 %*	*70-120*	*08/21/2023 17:59*	*08/21/2023 17:59*							
Surr: 4-Bromofluorobenzene (Surr)	*03RE1*	*101 %*	*75-120*	*08/21/2023 17:59*	*08/21/2023 17:59*							
Surr: Dibromofluoromethane (Surr)	*03RE1*	*109 %*	*70-130*	*08/21/2023 17:59*	*08/21/2023 17:59*							
Surr: Toluene-d8 (Surr)	*03RE1*	*102 %*	*70-130*	*08/21/2023 17:59*	*08/21/2023 17:59*							
Semivolatile Organic Compounds by GCMS												
Anthracene	03	120-12-7	SW8270E	08/22/2023 09:10	08/22/2023 19:37	BLOD		1000	2000	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*03*	*%*	*5-136*	*08/22/2023 09:10*	*08/22/2023 19:37*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*03*	*%*	*9-117*	*08/22/2023 09:10*	*08/22/2023 19:37*							*DS*
Surr: 2-Fluorophenol (Surr)	*03*	*14.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 19:37*							
Surr: Nitrobenzene-d5 (Surr)	*03*	*140 %*	*5-151*	*08/22/2023 09:10*	*08/22/2023 19:37*							
Surr: Phenol-d5 (Surr)	*03*	*20.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 19:37*							
Surr: p-Terphenyl-d14 (Surr)	*03*	*8.00 %*	*5-141*	*08/22/2023 09:10*	*08/22/2023 19:37*							

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Client Sample ID: **EW-94** **Laboratory Sample ID:** **23H0914-03**

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	08/29/2023 12:22	08/29/2023 12:22	2140		146	200	2000	mg/L	SPH
BOD	03	E1640606	SM5210B-2016	08/17/2023 11:58	08/17/2023 11:58	>32805		0.2	2.0	1	mg/L	NBT
BOD	03	E1640606	SM5210B-2016	08/17/2023 11:58	08/17/2023 11:58	>32805		0.2	2.0	1	mg/L	NBT
COD	03	NA	SM5220D-2011	08/22/2023 11:00	08/22/2023 11:00	60600		5000	5000	500	mg/L	MGC
Nitrate as N	03	14797-55-8	Calc.	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.50	3.50	50	mg/L	MGC
Nitrate+Nitrite as N	03	E701177	SM4500-NO3F-2016	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.00	1.00	1	mg/L	TMB
Nitrite as N	03	14797-65-0	SM4500-NO2B-2011	08/17/2023 11:00	08/17/2023 11:00	BLOD		0.50	2.50	50	mg/L	MGC
Total Recoverable Phenolics	03	NA	EPA420.1	08/31/2023 08:54	08/31/2023 08:54	40.4		1.50	2.50	50	mg/L	AAL
TKN as N	03	E17148461	EPA351.2 R2.0	08/27/2023 13:10	08/27/2023 13:10	2850		100	250	500	mg/L	TMB

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Client Sample ID: **EW-54** **Laboratory Sample ID:** **23H0914-04**

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	08/18/2023 17:00	08/21/2023 10:26	BLOD		0.600	10.0	10	ug/L	AB
Arsenic	04	7440-38-2	SW6020B	08/18/2023 17:00	08/21/2023 10:26	320		5.0	10	10	ug/L	AB
Barium	04	7440-39-3	SW6020B	08/18/2023 17:00	08/21/2023 10:26	1610		10.0	50.0	10	ug/L	AB
Cadmium	04	7440-43-9	SW6020B	08/18/2023 17:00	08/21/2023 10:26	BLOD		1.00	10.0	10	ug/L	AB
Chromium	04	7440-47-3	SW6020B	08/18/2023 17:00	08/21/2023 10:26	606		4.00	10.0	10	ug/L	AB
Copper	04	7440-50-8	SW6020B	08/18/2023 17:00	08/21/2023 10:26	3.43	J	3.00	10.0	10	ug/L	AB
Mercury	04	7439-97-6	SW6020B	08/18/2023 17:00	08/21/2023 10:26	3.12		2.00	2.00	10	ug/L	AB
Nickel	04	7440-02-0	SW6020B	08/18/2023 17:00	08/21/2023 10:26	145.7		10.00	10.00	10	ug/L	AB
Lead	04	7439-92-1	SW6020B	08/18/2023 17:00	08/21/2023 10:26	14		10	10	10	ug/L	AB
Selenium	04	7782-49-2	SW6020B	08/18/2023 17:00	08/21/2023 10:26	BLOD		8.50	10.0	10	ug/L	AB
Zinc	04RE1	7440-66-6	SW6020B	08/18/2023 17:00	08/21/2023 10:34	5920		50.0	100	20	ug/L	AB

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Client Sample ID: **EW-54** **Laboratory Sample ID:** **23H0914-04**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	04RE1	78-93-3	SW8260D	08/21/2023 18:21	08/21/2023 18:21	25600		1500	5000	500	ug/L	RJB
Acetone	04RE1	67-64-1	SW8260D	08/21/2023 18:21	08/21/2023 18:21	72500		3500	5000	500	ug/L	RJB
Benzene	04	71-43-2	SW8260D	08/18/2023 17:59	08/18/2023 17:59	2320		20.0	50.0	50	ug/L	RJB
Ethylbenzene	04	100-41-4	SW8260D	08/18/2023 17:59	08/18/2023 17:59	80.0		20.0	50.0	50	ug/L	RJB
m+p-Xylenes	04	179601-23-1	SW8260D	08/18/2023 17:59	08/18/2023 17:59	119		30.0	100	50	ug/L	RJB
o-Xylene	04	95-47-6	SW8260D	08/18/2023 17:59	08/18/2023 17:59	60.5		20.0	50.0	50	ug/L	RJB
Toluene	04	108-88-3	SW8260D	08/18/2023 17:59	08/18/2023 17:59	105		25.0	50.0	50	ug/L	RJB
Xylenes, Total	04	1330-20-7	SW8260D	08/18/2023 17:59	08/18/2023 17:59	180		50.0	150	50	ug/L	RJB
Tetrahydrofuran	04	109-99-9	SW8260D	08/18/2023 17:59	08/18/2023 17:59	7370		500	500	50	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*04*	*92.7 %*	*70-120*	*08/18/2023 17:59*	*08/18/2023 17:59*							
Surr: 4-Bromofluorobenzene (Surr)	*04*	*97.9 %*	*75-120*	*08/18/2023 17:59*	*08/18/2023 17:59*							
Surr: Dibromofluoromethane (Surr)	*04*	*90.1 %*	*70-130*	*08/18/2023 17:59*	*08/18/2023 17:59*							
Surr: Toluene-d8 (Surr)	*04*	*97.5 %*	*70-130*	*08/18/2023 17:59*	*08/18/2023 17:59*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*04RE1*	*109 %*	*70-120*	*08/21/2023 18:21*	*08/21/2023 18:21*							
Surr: 4-Bromofluorobenzene (Surr)	*04RE1*	*99.6 %*	*75-120*	*08/21/2023 18:21*	*08/21/2023 18:21*							
Surr: Dibromofluoromethane (Surr)	*04RE1*	*110 %*	*70-130*	*08/21/2023 18:21*	*08/21/2023 18:21*							
Surr: Toluene-d8 (Surr)	*04RE1*	*102 %*	*70-130*	*08/21/2023 18:21*	*08/21/2023 18:21*							
Semivolatile Organic Compounds by GCMS												
Anthracene	04	120-12-7	SW8270E	08/22/2023 09:10	08/22/2023 20:08	BLOD		1000	2000	50	ug/L	BMS
Surr: 2,4,6-Tribromophenol (Surr)	*04*	*%*	*5-136*	*08/22/2023 09:10*	*08/22/2023 20:08*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*04*	*%*	*9-117*	*08/22/2023 09:10*	*08/22/2023 20:08*							*DS*
Surr: 2-Fluorophenol (Surr)	*04*	*25.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 20:08*							
Surr: Nitrobenzene-d5 (Surr)	*04*	*4.00 %*	*5-151*	*08/22/2023 09:10*	*08/22/2023 20:08*							*DS*
Surr: Phenol-d5 (Surr)	*04*	*28.0 %*	*5-60*	*08/22/2023 09:10*	*08/22/2023 20:08*							
Surr: p-Terphenyl-d14 (Surr)	*04*	*8.00 %*	*5-141*	*08/22/2023 09:10*	*08/22/2023 20:08*							

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Client Sample ID: **EW-54** **Laboratory Sample ID:** **23H0914-04**

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	08/29/2023 12:22	08/29/2023 12:22	1600		146	200	2000	mg/L	SPH
BOD	04	E1640606	SM5210B-2016	08/17/2023 12:01	08/17/2023 12:01	>33045		0.2	2.0	1	mg/L	NBT
BOD	04	E1640606	SM5210B-2016	08/17/2023 12:01	08/17/2023 12:01	>33045		0.2	2.0	1	mg/L	NBT
COD	04	NA	SM5220D-2011	08/22/2023 11:00	08/22/2023 11:00	59000		5000	5000	500	mg/L	MGC
Nitrate as N	04	14797-55-8	Calc.	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.50	3.50	50	mg/L	MGC
Nitrate+Nitrite as N	04	E701177	SM4500-NO3F-2016	08/30/2023 00:00	08/30/2023 00:00	BLOD		1.00	1.00	1	mg/L	TMB
Nitrite as N	04	14797-65-0	SM4500-NO2B-2011	08/17/2023 11:00	08/17/2023 11:00	BLOD		0.50	2.50	50	mg/L	MGC
Total Recoverable Phenolics	04	NA	EPA420.1	08/31/2023 08:54	08/31/2023 08:54	28.6		1.50	2.50	50	mg/L	AAL
TKN as N	04	E17148461	EPA351.2 R2.0	08/27/2023 13:10	08/27/2023 13:10	2240		100	250	500	mg/L	TMB

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Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **23H0914-05**

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						**Sample Qualifier:**		**pH**				
2-Butanone (MEK)	05	78-93-3	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	05	67-64-1	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	05	71-43-2	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	05	100-41-4	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		0.40	1.00	1	ug/L	RJB
m+p-Xylenes	05	179601-23-1	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		0.60	2.00	1	ug/L	RJB
o-Xylene	05	95-47-6	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	05	108-88-3	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	05	1330-20-7	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	05	109-99-9	SW8260D	08/18/2023 12:54	08/18/2023 12:54	BLOD		10.0	10.0	1	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*05*		*100 %*	*70-120*	*08/18/2023 12:54*	*08/18/2023 12:54*						
Surr: 4-Bromofluorobenzene (Surr)	*05*		*100 %*	*75-120*	*08/18/2023 12:54*	*08/18/2023 12:54*						
Surr: Dibromofluoromethane (Surr)	*05*		*94.6 %*	*70-130*	*08/18/2023 12:54*	*08/18/2023 12:54*						
Surr: Toluene-d8 (Surr)	*05*		*98.3 %*	*70-130*	*08/18/2023 12:54*	*08/18/2023 12:54*						

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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 BGH0720 - EPA200.8 R5.4										
Blank (BGH0720-BLK1)				Prepared: 08/18/2023 Analyzed: 08/21/2023						
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 (BGH0720-BS1)				Prepared: 08/18/2023 Analyzed: 08/21/2023						
Mercury	0.990	0.200	ug/L	1.00		99.0	85-115			
Arsenic	49	1.0	ug/L	50.0		99.0	80-120			
Barium	48.0	5.00	ug/L	50.0		95.9	80-120			
Cadmium	47.9	1.00	ug/L	50.0		95.9	80-120			
Chromium	49.3	1.00	ug/L	50.0		98.6	80-120			
Copper	49.6	1.00	ug/L	50.0		99.1	80-120			
Lead	49	1.0	ug/L	50.0		98.3	80-120			
Nickel	48.68	1.000	ug/L	50.0		97.4	80-120			
Selenium	48.8	1.00	ug/L	50.0		97.6	80-120			
Silver	9.35	1.00	ug/L	10.0		93.5	80-120			
Zinc	49.2	5.00	ug/L	50.0		98.4	80-120			
Matrix Spike (BGH0720-MS1)	**Source: 23H0990-05**			Prepared: 08/18/2023 Analyzed: 08/21/2023						

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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 BGH0720 - EPA200.8 R5.4										
Matrix Spike (BGH0720-MS1)	**Source: 23H0990-05**			Prepared: 08/18/2023 Analyzed: 08/21/2023						
Mercury	0.985	0.200	ug/L	1.00	BLOD	98.5	70-130			
Arsenic	50	1.0	ug/L	50.0	BLOD	99.4	75-125			
Barium	73.8	5.00	ug/L	50.0	24.8	98.0	75-125			
Cadmium	49.3	1.00	ug/L	50.0	0.129	98.3	75-125			
Chromium	50.8	1.00	ug/L	50.0	BLOD	102	75-125			
Copper	51.2	1.00	ug/L	50.0	0.567	101	75-125			
Lead	51	1.0	ug/L	50.0	BLOD	101	75-125			
Nickel	51.11	1.000	ug/L	50.0	1.852	98.5	75-125			
Selenium	48.4	1.00	ug/L	50.0	BLOD	96.8	75-125			
Silver	9.53	1.00	ug/L	10.0	BLOD	95.3	75-125			
Zinc	52.6	5.00	ug/L	50.0	2.58	100	75-125			
Matrix Spike Dup (BGH0720-MSD1)	**Source: 23H0990-05**			Prepared: 08/18/2023 Analyzed: 08/21/2023						
Mercury	0.974	0.200	ug/L	1.00	BLOD	97.4	70-130	1.06	20	
Arsenic	49	1.0	ug/L	50.0	BLOD	98.5	75-125	0.910	20	
Barium	72.9	5.00	ug/L	50.0	24.8	96.2	75-125	1.25	20	
Cadmium	48.0	1.00	ug/L	50.0	0.129	95.7	75-125	2.60	20	
Chromium	49.9	1.00	ug/L	50.0	BLOD	99.8	75-125	1.80	20	
Copper	50.2	1.00	ug/L	50.0	0.567	99.3	75-125	1.86	20	
Lead	50	1.0	ug/L	50.0	BLOD	99.9	75-125	1.15	20	
Nickel	51.15	1.000	ug/L	50.0	1.852	98.6	75-125	0.0647	20	
Selenium	47.9	1.00	ug/L	50.0	BLOD	95.7	75-125	1.09	20	
Silver	9.38	1.00	ug/L	10.0	BLOD	93.8	75-125	1.58	20	
Zinc	51.9	5.00	ug/L	50.0	2.58	98.6	75-125	1.43	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 BGH0712 - SW5030B-MS										
Blank (BGH0712-BLK1)				Prepared & Analyzed: 08/18/2023						
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							
m+p-Xylenes	ND	2.00	ug/L							
o-Xylene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Tetrahydrofuran	ND	10.0	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.8*		ug/L	*50.0*		*99.7*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.1*		ug/L	*50.0*		*98.2*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*46.6*		ug/L	*50.0*		*93.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.1*		ug/L	*50.0*		*98.3*	*70-130*			
LCS (BGH0712-BS1)				Prepared & Analyzed: 08/18/2023						
1,1,1,2-Tetrachloroethane	47.1	0.4	ug/L	50.0		94.2	80-130			
1,1,1-Trichloroethane	46.2	1	ug/L	50.0		92.4	65-130			
1,1,2,2-Tetrachloroethane	46.2	0.4	ug/L	50.0		92.5	65-130			
1,1,2-Trichloroethane	46.4	1	ug/L	50.0		92.8	75-125			
1,1-Dichloroethane	45.8	1	ug/L	50.0		91.5	70-135			
1,1-Dichloroethylene	44.2	1	ug/L	50.0		88.5	70-130			
1,1-Dichloropropene	49.0	1	ug/L	50.0		98.1	75-135			
1,2,3-Trichlorobenzene	49.0	1	ug/L	50.0		98.0	55-140			
1,2,3-Trichloropropane	45.2	1	ug/L	50.0		90.3	75-125			
1,2,4-Trichlorobenzene	49.2	1	ug/L	50.0		98.3	65-135			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
LCS (BGH0712-BS1)				Prepared & Analyzed: 08/18/2023						
1,2,4-Trimethylbenzene	51.0	1	ug/L	50.0		102	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	51.9	1	ug/L	50.0		104	50-130			
1,2-Dibromoethane (EDB)	45.7	1	ug/L	50.0		91.4	80-120			
1,2-Dichlorobenzene	47.2	0.5	ug/L	50.0		94.4	70-120			
1,2-Dichloroethane	39.1	1	ug/L	50.0		78.2	70-130			
1,2-Dichloropropane	44.5	0.5	ug/L	50.0		88.9	75-125			
1,3,5-Trimethylbenzene	49.2	1	ug/L	50.0		98.4	75-125			
1,3-Dichlorobenzene	48.9	1	ug/L	50.0		97.8	75-125			
1,3-Dichloropropane	44.3	1	ug/L	50.0		88.7	75-125			
1,4-Dichlorobenzene	45.3	1	ug/L	50.0		90.6	75-125			
2,2-Dichloropropane	49.0	1	ug/L	50.0		98.1	70-135			
2-Butanone (MEK)	43.3	10	ug/L	50.0		86.6	30-150			
2-Chlorotoluene	49.3	1	ug/L	50.0		98.5	75-125			
2-Hexanone (MBK)	50.3	5	ug/L	50.0		101	55-130			
4-Chlorotoluene	48.2	1	ug/L	50.0		96.3	75-130			
4-Isopropyltoluene	55.2	1	ug/L	50.0		110	75-130			
4-Methyl-2-pentanone (MIBK)	49.8	5	ug/L	50.0		99.6	60-135			
Acetone	44.3	10	ug/L	50.0		88.6	40-140			
Benzene	46.5	1	ug/L	50.0		93.0	80-120			
Bromobenzene	45.3	1	ug/L	50.0		90.6	75-125			
Bromochloromethane	41.6	1	ug/L	50.0		83.3	65-130			
Bromodichloromethane	46.8	0.5	ug/L	50.0		93.5	75-120			
Bromoform	45.8	1	ug/L	50.0		91.6	70-130			
Bromomethane	35.4	1	ug/L	50.0		70.8	30-145			
Carbon disulfide	41.9	10	ug/L	50.0		83.8	35-160			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
LCS (BGH0712-BS1)				Prepared & Analyzed: 08/18/2023						
Carbon tetrachloride	51.7	1	ug/L	50.0		103	65-140			
Chlorobenzene	46.2	1	ug/L	50.0		92.5	80-120			
Chloroethane	36.4	1	ug/L	50.0		72.9	60-135			
Chloroform	40.3	0.5	ug/L	50.0		80.6	65-135			
Chloromethane	33.8	1	ug/L	50.0		67.7	40-125			
cis-1,2-Dichloroethylene	43.2	1	ug/L	50.0		86.4	70-125			
cis-1,3-Dichloropropene	48.7	1	ug/L	50.0		97.4	70-130			
Dibromochloromethane	46.6	0.5	ug/L	50.0		93.1	60-135			
Dibromomethane	44.2	1	ug/L	50.0		88.3	75-125			
Dichlorodifluoromethane	36.8	1	ug/L	50.0		73.6	30-155			
Ethylbenzene	48.3	1	ug/L	50.0		96.7	75-125			
Hexachlorobutadiene	49.9	0.8	ug/L	50.0		99.8	50-140			
Isopropylbenzene	46.5	1	ug/L	50.0		93.0	75-125			
m+p-Xylenes	94.9	2	ug/L	100		94.9	75-130			
Methylene chloride	38.2	4	ug/L	50.0		76.4	55-140			
Methyl-t-butyl ether (MTBE)	42.1	1	ug/L	50.0		84.2	65-125			
Naphthalene	49.1	1	ug/L	50.0		98.1	55-140			
n-Butylbenzene	55.4	1	ug/L	50.0		111	70-135			
n-Propylbenzene	51.5	1	ug/L	50.0		103	70-130			
o-Xylene	47.3	1	ug/L	50.0		94.6	80-120			
sec-Butylbenzene	57.8	1	ug/L	50.0		116	70-125			
Styrene	46.3	1	ug/L	50.0		92.6	65-135			
tert-Butylbenzene	51.8	1	ug/L	50.0		104	70-130			
Tetrachloroethylene (PCE)	51.0	1	ug/L	50.0		102	45-150			
Toluene	47.2	1	ug/L	50.0		94.5	75-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
LCS (BGH0712-BS1)				Prepared & Analyzed: 08/18/2023						
trans-1,2-Dichloroethylene	39.0	1	ug/L	50.0		77.9	60-140			
trans-1,3-Dichloropropene	53.2	1	ug/L	50.0		106	55-140			
Trichloroethylene	46.1	1	ug/L	50.0		92.3	70-125			
Trichlorofluoromethane	45.7	1	ug/L	50.0		91.4	60-145			
Vinyl chloride	40.0	0.5	ug/L	50.0		79.9	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*45.3*		ug/L	*50.0*		*90.7*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.0*		ug/L	*50.0*		*98.0*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*45.0*		ug/L	*50.0*		*90.1*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.6*		ug/L	*50.0*		*99.3*	*70-130*			
Duplicate (BGH0712-DUP1)	**Source: 23H0908-02**			Prepared & Analyzed: 08/18/2023						
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	

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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 BGH0712 - SW5030B-MS										
Duplicate (BGH0712-DUP1)	**Source: 23H0908-02**			Prepared & Analyzed: 08/18/2023						
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	
1,3-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
2,2-Dichloropropane	ND	1.00	ug/L		BLOD			NA	30	
2-Butanone (MEK)	ND	10.0	ug/L		BLOD			NA	30	
2-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	5.00	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	1.00	ug/L		BLOD			NA	30	
4-Methyl-2-pentanone (MIBK)	ND	5.00	ug/L		BLOD			NA	30	
Acetone	ND	10.0	ug/L		BLOD			NA	30	
Benzene	ND	1.00	ug/L		BLOD			NA	30	
Bromobenzene	ND	1.00	ug/L		BLOD			NA	30	
Bromochloromethane	ND	1.00	ug/L		BLOD			NA	30	
Bromodichloromethane	ND	0.50	ug/L		BLOD			NA	30	
Bromoform	ND	1.00	ug/L		BLOD			NA	30	
Bromomethane	ND	1.00	ug/L		BLOD			NA	30	
Carbon disulfide	ND	10.0	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	1.00	ug/L		BLOD			NA	30	
Chlorobenzene	ND	1.00	ug/L		BLOD			NA	30	
Chloroethane	ND	1.00	ug/L		BLOD			NA	30	
Chloroform	ND	0.50	ug/L		BLOD			NA	30	

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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 BGH0712 - SW5030B-MS										
Duplicate (BGH0712-DUP1)	**Source: 23H0908-02**			Prepared & Analyzed: 08/18/2023						
Chloromethane	ND	1.00	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
cis-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	
Dibromochloromethane	ND	0.50	ug/L		BLOD			NA	30	
Dibromomethane	ND	1.00	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	1.00	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	5.00	ug/L		BLOD			NA	30	
Ethylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Hexachlorobutadiene	ND	0.80	ug/L		BLOD			NA	30	
Iodomethane	ND	10.0	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	1.00	ug/L		BLOD			NA	30	
m+p-Xylenes	ND	2.00	ug/L		BLOD			NA	30	
Methylene chloride	ND	4.00	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	1.00	ug/L		BLOD			NA	30	
Naphthalene	ND	1.00	ug/L		BLOD			NA	30	
n-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
n-Propylbenzene	ND	1.00	ug/L		BLOD			NA	30	
o-Xylene	ND	1.00	ug/L		BLOD			NA	30	
sec-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Styrene	ND	1.00	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	1.00	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	1.00	ug/L		BLOD			NA	30	
Toluene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,2-Dichloroethylene	ND	1.00	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	1.00	ug/L		BLOD			NA	30	

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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 BGH0712 - SW5030B-MS										
Duplicate (BGH0712-DUP1)	**Source: 23H0908-02**			Prepared & Analyzed: 08/18/2023						
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	
Vinyl chloride	ND	0.50	ug/L		BLOD			NA	30	
Xylenes, Total	ND	3.00	ug/L		BLOD			NA	30	
Tetrahydrofuran	ND	10.0	ug/L		BLOD			NA	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*51.4*		ug/L	*50.0*		*103*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.2*		ug/L	*50.0*		*100*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*47.8*		ug/L	*50.0*		*95.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.1*		ug/L	*50.0*		*98.1*	*70-130*			
Matrix Spike (BGH0712-MS1)	**Source: 23H0908-01**			Prepared & Analyzed: 08/18/2023						
1,1,1,2-Tetrachloroethane	47.9	0.4	ug/L	50.0	BLOD	95.9	80-130			
1,1,1-Trichloroethane	48.0	1	ug/L	50.0	BLOD	96.0	65-130			
1,1,2,2-Tetrachloroethane	46.8	0.4	ug/L	50.0	BLOD	93.5	65-130			
1,1,2-Trichloroethane	47.9	1	ug/L	50.0	BLOD	95.8	75-125			
1,1-Dichloroethane	46.9	1	ug/L	50.0	BLOD	93.9	70-135			
1,1-Dichloroethylene	45.0	1	ug/L	50.0	BLOD	90.0	50-145			
1,1-Dichloropropene	50.4	1	ug/L	50.0	BLOD	101	75-135			
1,2,3-Trichlorobenzene	50.3	1	ug/L	50.0	BLOD	101	55-140			
1,2,3-Trichloropropane	46.2	1	ug/L	50.0	BLOD	92.3	75-125			
1,2,4-Trichlorobenzene	50.3	1	ug/L	50.0	BLOD	101	65-135			
1,2,4-Trimethylbenzene	53.2	1	ug/L	50.0	BLOD	106	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	51.7	1	ug/L	50.0	BLOD	103	50-130			
1,2-Dibromoethane (EDB)	46.2	1	ug/L	50.0	BLOD	92.4	80-120			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
Matrix Spike (BGH0712-MS1)	**Source: 23H0908-01**			Prepared & Analyzed: 08/18/2023						
1,2-Dichlorobenzene	48.4	0.5	ug/L	50.0	BLOD	96.8	70-120			
1,2-Dichloroethane	40.2	1	ug/L	50.0	BLOD	80.5	70-130			
1,2-Dichloropropane	45.8	0.5	ug/L	50.0	BLOD	91.6	75-125			
1,3,5-Trimethylbenzene	50.7	1	ug/L	50.0	BLOD	101	75-124			
1,3-Dichlorobenzene	49.7	1	ug/L	50.0	BLOD	99.5	75-125			
1,3-Dichloropropane	45.6	1	ug/L	50.0	BLOD	91.2	75-125			
1,4-Dichlorobenzene	46.9	1	ug/L	50.0	BLOD	93.8	75-125			
2,2-Dichloropropane	50.0	1	ug/L	50.0	BLOD	100	70-135			
2-Butanone (MEK)	51.1	10	ug/L	50.0	BLOD	102	30-150			
2-Chlorotoluene	49.7	1	ug/L	50.0	BLOD	99.4	75-125			
2-Hexanone (MBK)	47.3	5	ug/L	50.0	BLOD	94.6	55-130			
4-Chlorotoluene	50.6	1	ug/L	50.0	BLOD	101	75-130			
4-Isopropyltoluene	56.8	1	ug/L	50.0	BLOD	114	75-130			
4-Methyl-2-pentanone (MIBK)	46.0	5	ug/L	50.0	BLOD	92.1	60-135			
Acetone	38.4	10	ug/L	50.0	BLOD	76.8	40-140			
Benzene	47.3	1	ug/L	50.0	BLOD	94.7	80-120			
Bromobenzene	47.7	1	ug/L	50.0	BLOD	95.3	75-125			
Bromochloromethane	42.1	1	ug/L	50.0	BLOD	84.2	65-130			
Bromodichloromethane	47.6	0.5	ug/L	50.0	BLOD	95.3	75-136			
Bromoform	46.3	1	ug/L	50.0	BLOD	92.5	70-130			
Bromomethane	39.5	1	ug/L	50.0	BLOD	79.1	30-145			
Carbon disulfide	37.0	10	ug/L	50.0	BLOD	73.9	35-160			
Carbon tetrachloride	54.0	1	ug/L	50.0	BLOD	108	65-140			
Chlorobenzene	48.4	1	ug/L	50.0	BLOD	96.7	80-120			
Chloroethane	37.3	1	ug/L	50.0	BLOD	74.7	60-135			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
Matrix Spike (BGH0712-MS1)	**Source: 23H0908-01**			Prepared & Analyzed: 08/18/2023						
Chloroform	40.8	0.5	ug/L	50.0	BLOD	81.6	65-135			
Chloromethane	34.1	1	ug/L	50.0	BLOD	68.1	40-125			
cis-1,2-Dichloroethylene	44.0	1	ug/L	50.0	BLOD	88.0	70-125			
cis-1,3-Dichloropropene	50.1	1	ug/L	50.0	BLOD	100	47-136			
Dibromochloromethane	47.7	0.5	ug/L	50.0	BLOD	95.4	60-135			
Dibromomethane	45.2	1	ug/L	50.0	BLOD	90.3	75-125			
Dichlorodifluoromethane	36.6	1	ug/L	50.0	BLOD	73.3	30-155			
Ethylbenzene	50.5	1	ug/L	50.0	BLOD	101	75-125			
Hexachlorobutadiene	50.1	0.8	ug/L	50.0	BLOD	100	50-140			
Isopropylbenzene	49.4	1	ug/L	50.0	BLOD	98.7	75-125			
m+p-Xylenes	99.6	2	ug/L	100	BLOD	99.6	75-130			
Methylene chloride	39.2	4	ug/L	50.0	BLOD	78.3	55-140			
Methyl-t-butyl ether (MTBE)	42.8	1	ug/L	50.0	BLOD	85.5	65-125			
Naphthalene	50.3	1	ug/L	50.0	BLOD	101	55-140			
n-Butylbenzene	57.0	1	ug/L	50.0	BLOD	114	70-135			
n-Propylbenzene	53.3	1	ug/L	50.0	BLOD	107	70-130			
o-Xylene	49.7	1	ug/L	50.0	BLOD	99.5	80-120			
sec-Butylbenzene	59.8	1	ug/L	50.0	BLOD	120	70-125			
Styrene	48.4	1	ug/L	50.0	BLOD	96.8	65-135			
tert-Butylbenzene	53.1	1	ug/L	50.0	BLOD	106	70-130			
Tetrachloroethylene (PCE)	52.2	1	ug/L	50.0	BLOD	104	51-231			
Toluene	49.5	1	ug/L	50.0	BLOD	99.0	75-120			
trans-1,2-Dichloroethylene	42.3	1	ug/L	50.0	BLOD	84.7	60-140			
trans-1,3-Dichloropropene	53.4	1	ug/L	50.0	BLOD	107	55-140			
Trichloroethylene	47.1	1	ug/L	50.0	BLOD	94.3	70-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0712 - SW5030B-MS										
Matrix Spike (BGH0712-MS1)	**Source: 23H0908-01**			Prepared & Analyzed: 08/18/2023						
Trichlorofluoromethane	46.3	1	ug/L	50.0	BLOD	92.6	60-145			
Vinyl chloride	40.4	0.5	ug/L	50.0	BLOD	80.7	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.4*		ug/L	*50.0*		*92.8*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.2*		ug/L	*50.0*		*100*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*44.9*		ug/L	*50.0*		*89.8*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.6*		ug/L	*50.0*		*101*	*70-130*			
Batch BGH0781 - SW5030B-MS										
Blank (BGH0781-BLK1)				Prepared & Analyzed: 08/21/2023						
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							
m+p-Xylenes	ND	2.00	ug/L							
o-Xylene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*53.1*		ug/L	*50.0*		*106*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.0*		ug/L	*50.0*		*99.9*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*53.5*		ug/L	*50.0*		*107*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.9*		ug/L	*50.0*		*102*	*70-130*			
LCS (BGH0781-BS1)				Prepared & Analyzed: 08/21/2023						
1,1,1,2-Tetrachloroethane	53.7	0.4	ug/L	50.0		107	80-130			
1,1,1-Trichloroethane	60.8	1	ug/L	50.0		122	65-130			

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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 BGH0781 - SW5030B-MS										
LCS (BGH0781-BS1)				Prepared & Analyzed: 08/21/2023						
1,1,2,2-Tetrachloroethane	50.8	0.4	ug/L	50.0		102	65-130			
1,1,2-Trichloroethane	56.9	1	ug/L	50.0		114	75-125			
1,1-Dichloroethane	58.6	1	ug/L	50.0		117	70-135			
1,1-Dichloroethylene	56.5	1	ug/L	50.0		113	70-130			
1,1-Dichloropropene	62.5	1	ug/L	50.0		125	75-135			
1,2,3-Trichlorobenzene	53.0	1	ug/L	50.0		106	55-140			
1,2,3-Trichloropropane	49.9	1	ug/L	50.0		99.8	75-125			
1,2,4-Trichlorobenzene	54.3	1	ug/L	50.0		109	65-135			
1,2,4-Trimethylbenzene	59.2	1	ug/L	50.0		118	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	46.7	1	ug/L	50.0		93.5	50-130			
1,2-Dibromoethane (EDB)	53.0	1	ug/L	50.0		106	80-120			
1,2-Dichlorobenzene	55.5	0.5	ug/L	50.0		111	70-120			
1,2-Dichloroethane	54.6	1	ug/L	50.0		109	70-130			
1,2-Dichloropropane	55.5	0.5	ug/L	50.0		111	75-125			
1,3,5-Trimethylbenzene	57.3	1	ug/L	50.0		115	75-125			
1,3-Dichlorobenzene	56.3	1	ug/L	50.0		113	75-125			
1,3-Dichloropropane	54.5	1	ug/L	50.0		109	75-125			
1,4-Dichlorobenzene	53.2	1	ug/L	50.0		106	75-125			
2,2-Dichloropropane	60.5	1	ug/L	50.0		121	70-135			
2-Butanone (MEK)	46.7	10	ug/L	50.0		93.4	30-150			
2-Chlorotoluene	56.6	1	ug/L	50.0		113	75-125			
2-Hexanone (MBK)	41.3	5	ug/L	50.0		82.6	55-130			
4-Chlorotoluene	56.4	1	ug/L	50.0		113	75-130			
4-Isopropyltoluene	60.2	1	ug/L	50.0		120	75-130			
4-Methyl-2-pentanone (MIBK)	46.1	5	ug/L	50.0		92.3	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 BGH0781 - SW5030B-MS										
LCS (BGH0781-BS1)				Prepared & Analyzed: 08/21/2023						
Acetone	44.5	10	ug/L	50.0		89.0	40-140			
Benzene	55.0	1	ug/L	50.0		110	80-120			
Bromobenzene	53.0	1	ug/L	50.0		106	75-125			
Bromochloromethane	54.6	1	ug/L	50.0		109	65-130			
Bromodichloromethane	56.1	0.5	ug/L	50.0		112	75-120			
Bromoform	51.4	1	ug/L	50.0		103	70-130			
Bromomethane	39.2	1	ug/L	50.0		78.4	30-145			
Carbon disulfide	45.7	10	ug/L	50.0		91.4	35-160			
Carbon tetrachloride	62.2	1	ug/L	50.0		124	65-140			
Chlorobenzene	53.8	1	ug/L	50.0		108	80-120			
Chloroethane	45.9	1	ug/L	50.0		91.8	60-135			
Chloroform	55.2	0.5	ug/L	50.0		110	65-135			
Chloromethane	40.5	1	ug/L	50.0		81.0	40-125			
cis-1,2-Dichloroethylene	56.0	1	ug/L	50.0		112	70-125			
cis-1,3-Dichloropropene	53.2	1	ug/L	50.0		106	70-130			
Dibromochloromethane	51.7	0.5	ug/L	50.0		103	60-135			
Dibromomethane	52.4	1	ug/L	50.0		105	75-125			
Dichlorodifluoromethane	45.6	1	ug/L	50.0		91.2	30-155			
Ethylbenzene	57.2	1	ug/L	50.0		114	75-125			
Hexachlorobutadiene	57.9	0.8	ug/L	50.0		116	50-140			
Isopropylbenzene	56.4	1	ug/L	50.0		113	75-125			
m+p-Xylenes	109	2	ug/L	100		109	75-130			
Methylene chloride	51.2	4	ug/L	50.0		102	55-140			
Methyl-t-butyl ether (MTBE)	47.6	1	ug/L	50.0		95.1	65-125			
Naphthalene	50.2	1	ug/L	50.0		100	55-140			

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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 BGH0781 - SW5030B-MS										
LCS (BGH0781-BS1)				Prepared & Analyzed: 08/21/2023						
n-Butylbenzene	64.3	1	ug/L	50.0		129	70-135			
n-Propylbenzene	57.6	1	ug/L	50.0		115	70-130			
o-Xylene	56.5	1	ug/L	50.0		113	80-120			
sec-Butylbenzene	63.7	1	ug/L	50.0		127	70-125			L
Styrene	54.4	1	ug/L	50.0		109	65-135			
tert-Butylbenzene	58.6	1	ug/L	50.0		117	70-130			
Tetrachloroethylene (PCE)	59.4	1	ug/L	50.0		119	45-150			
Toluene	54.6	1	ug/L	50.0		109	75-120			
trans-1,2-Dichloroethylene	54.6	1	ug/L	50.0		109	60-140			
trans-1,3-Dichloropropene	56.5	1	ug/L	50.0		113	55-140			
Trichloroethylene	56.6	1	ug/L	50.0		113	70-125			
Trichlorofluoromethane	59.7	1	ug/L	50.0		119	60-145			
Vinyl chloride	43.9	0.5	ug/L	50.0		87.8	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*50.3*		ug/L	*50.0*		*101*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.9*		ug/L	*50.0*		*102*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*52.7*		ug/L	*50.0*		*105*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.6*		ug/L	*50.0*		*99.2*	*70-130*			
Duplicate (BGH0781-DUP1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
1,1,1,2-Tetrachloroethane	ND	4.00	ug/L		BLOD			NA	30	
1,1,1-Trichloroethane	ND	10.0	ug/L		BLOD			NA	30	
1,1,2,2-Tetrachloroethane	ND	4.00	ug/L		BLOD			NA	30	
1,1,2-Trichloroethane	ND	10.0	ug/L		BLOD			NA	30	
1,1-Dichloroethane	ND	10.0	ug/L		BLOD			NA	30	
1,1-Dichloroethylene	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 BGH0781 - SW5030B-MS										
Duplicate (BGH0781-DUP1)		**Source: 23H1058-01**		Prepared & Analyzed: 08/21/2023						
1,1-Dichloropropene	ND	10.0	ug/L		BLOD			NA	30	
1,2,3-Trichlorobenzene	ND	10.0	ug/L		BLOD			NA	30	
1,2,3-Trichloropropane	ND	10.0	ug/L		BLOD			NA	30	
1,2,4-Trichlorobenzene	ND	10.0	ug/L		BLOD			NA	30	
1,2,4-Trimethylbenzene	ND	10.0	ug/L		16.8			NA	30	
1,2-Dibromo-3-chloropropane (DBCP)	ND	10.0	ug/L		BLOD			NA	30	
1,2-Dibromoethane (EDB)	ND	10.0	ug/L		BLOD			NA	30	
1,2-Dichlorobenzene	ND	5.00	ug/L		BLOD			NA	30	
1,2-Dichloroethane	ND	10.0	ug/L		BLOD			NA	30	
1,2-Dichloropropane	ND	5.00	ug/L		BLOD			NA	30	
1,3,5-Trimethylbenzene	ND	10.0	ug/L		BLOD			NA	30	
1,3-Dichlorobenzene	ND	10.0	ug/L		BLOD			NA	30	
1,3-Dichloropropane	ND	10.0	ug/L		BLOD			NA	30	
1,4-Dichlorobenzene	ND	10.0	ug/L		14.8			NA	30	
2,2-Dichloropropane	ND	10.0	ug/L		BLOD			NA	30	
2-Butanone (MEK)	574	100	ug/L		466			20.7	30	
2-Chlorotoluene	ND	10.0	ug/L		BLOD			NA	30	
2-Hexanone (MBK)	ND	50.0	ug/L		BLOD			NA	30	
4-Chlorotoluene	ND	10.0	ug/L		BLOD			NA	30	
4-Isopropyltoluene	ND	10.0	ug/L		6.50			NA	30	
4-Methyl-2-pentanone (MIBK)	58.8	50.0	ug/L		24.9			NA	30	P
Acetone	884	100	ug/L		1240			33.7	30	P
Benzene	46.8	10.0	ug/L		568			170	30	P
Bromobenzene	ND	10.0	ug/L		BLOD			NA	30	
Bromochloromethane	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 BGH0781 - SW5030B-MS										
Duplicate (BGH0781-DUP1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
Bromodichloromethane	ND	5.00	ug/L		BLOD			NA	30	
Bromoform	ND	10.0	ug/L		BLOD			NA	30	
Bromomethane	ND	10.0	ug/L		BLOD			NA	30	
Carbon disulfide	ND	100	ug/L		BLOD			NA	30	
Carbon tetrachloride	ND	10.0	ug/L		BLOD			NA	30	
Chlorobenzene	ND	10.0	ug/L		BLOD			NA	30	
Chloroethane	ND	10.0	ug/L		BLOD			NA	30	
Chloroform	ND	5.00	ug/L		BLOD			NA	30	
Chloromethane	ND	10.0	ug/L		BLOD			NA	30	
cis-1,2-Dichloroethylene	ND	10.0	ug/L		BLOD			NA	30	
cis-1,3-Dichloropropene	ND	10.0	ug/L		BLOD			NA	30	
Dibromochloromethane	ND	5.00	ug/L		BLOD			NA	30	
Dibromomethane	ND	10.0	ug/L		BLOD			NA	30	
Dichlorodifluoromethane	ND	10.0	ug/L		BLOD			NA	30	
Di-isopropyl ether (DIPE)	ND	50.0	ug/L		BLOD			NA	30	
Ethylbenzene	ND	10.0	ug/L		58.6			NA	30	
Hexachlorobutadiene	ND	8.00	ug/L		BLOD			NA	30	
Iodomethane	ND	100	ug/L		BLOD			NA	30	
Isopropylbenzene	ND	10.0	ug/L		5.00			NA	30	
m+p-Xylenes	ND	20.0	ug/L		26.6			NA	30	
Methylene chloride	ND	40.0	ug/L		BLOD			NA	30	
Methyl-t-butyl ether (MTBE)	ND	10.0	ug/L		BLOD			NA	30	
Naphthalene	ND	10.0	ug/L		34.5			NA	30	
n-Butylbenzene	ND	10.0	ug/L		BLOD			NA	30	
n-Propylbenzene	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 BGH0781 - SW5030B-MS										
Duplicate (BGH0781-DUP1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
o-Xylene	ND	10.0	ug/L		14.4			NA	30	
sec-Butylbenzene	ND	10.0	ug/L		BLOD			NA	30	
Styrene	ND	10.0	ug/L		BLOD			NA	30	
tert-Butylbenzene	ND	10.0	ug/L		BLOD			NA	30	
Tetrachloroethylene (PCE)	ND	10.0	ug/L		BLOD			NA	30	
Toluene	5.70	10.0	ug/L		20.4			NA	30	P
trans-1,2-Dichloroethylene	ND	10.0	ug/L		BLOD			NA	30	
trans-1,3-Dichloropropene	ND	10.0	ug/L		BLOD			NA	30	
Trichloroethylene	ND	10.0	ug/L		BLOD			NA	30	
Trichlorofluoromethane	ND	10.0	ug/L		BLOD			NA	30	
Vinyl acetate	ND	100	ug/L		BLOD			NA	30	
Vinyl chloride	ND	5.00	ug/L		BLOD			NA	30	
Xylenes, Total	ND	30.0	ug/L		41.0			NA	30	
Tetrahydrofuran	313	100	ug/L		348			10.7	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*55.0*		ug/L	*50.0*		*110*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.7*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*55.4*		ug/L	*50.0*		*111*	*70-130*			
Surr: Toluene-d8 (Surr)	*51.1*		ug/L	*50.0*		*102*	*70-130*			
Matrix Spike (BGH0781-MS1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
1,1,1,2-Tetrachloroethane	50.8	0.4	ug/L	50.0	BLOD	102	80-130			
1,1,1-Trichloroethane	57.7	1	ug/L	50.0	BLOD	115	65-130			
1,1,2,2-Tetrachloroethane	58.9	0.4	ug/L	50.0	BLOD	118	65-130			
1,1,2-Trichloroethane	59.8	1	ug/L	50.0	BLOD	120	75-125			
1,1-Dichloroethane	56.8	1	ug/L	50.0	BLOD	114	70-135			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0781 - SW5030B-MS										
Matrix Spike (BGH0781-MS1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
1,1-Dichloroethylene	51.9	1	ug/L	50.0	BLOD	104	50-145			
1,1-Dichloropropene	59.0	1	ug/L	50.0	BLOD	118	75-135			
1,2,3-Trichlorobenzene	56.8	1	ug/L	50.0	BLOD	114	55-140			
1,2,3-Trichloropropane	59.8	1	ug/L	50.0	BLOD	120	75-125			
1,2,4-Trichlorobenzene	55.3	1	ug/L	50.0	BLOD	111	65-135			
1,2,4-Trimethylbenzene	58.6	1	ug/L	50.0	1.68	114	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	62.7	1	ug/L	50.0	BLOD	125	50-130			
1,2-Dibromoethane (EDB)	54.2	1	ug/L	50.0	BLOD	108	80-120			
1,2-Dichlorobenzene	54.3	0.5	ug/L	50.0	BLOD	109	70-120			
1,2-Dichloroethane	57.3	1	ug/L	50.0	BLOD	115	70-130			
1,2-Dichloropropane	54.0	0.5	ug/L	50.0	BLOD	108	75-125			
1,3,5-Trimethylbenzene	55.0	1	ug/L	50.0	BLOD	110	75-124			
1,3-Dichlorobenzene	54.6	1	ug/L	50.0	BLOD	109	75-125			
1,3-Dichloropropane	56.8	1	ug/L	50.0	BLOD	114	75-125			
1,4-Dichlorobenzene	54.0	1	ug/L	50.0	1.48	105	75-125			
2,2-Dichloropropane	54.9	1	ug/L	50.0	BLOD	110	70-135			
2-Butanone (MEK)	115	10	ug/L	50.0	46.6	136	30-150			
2-Chlorotoluene	55.7	1	ug/L	50.0	BLOD	111	75-125			
2-Hexanone (MBK)	57.4	5	ug/L	50.0	BLOD	115	55-130			
4-Chlorotoluene	53.8	1	ug/L	50.0	BLOD	108	75-130			
4-Isopropyltoluene	57.7	1	ug/L	50.0	0.65	114	75-130			
4-Methyl-2-pentanone (MIBK)	67.5	5	ug/L	50.0	2.49	130	60-135			
Acetone	189	10	ug/L	50.0	124	130	40-140			
Benzene	95.9	1	ug/L	50.0	56.8	78.1	80-120			M
Bromobenzene	50.6	1	ug/L	50.0	BLOD	101	75-125			

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Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

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 BGH0781 - SW5030B-MS										
Matrix Spike (BGH0781-MS1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
Bromochloromethane	54.0	1	ug/L	50.0	BLOD	108	65-130			
Bromodichloromethane	54.0	0.5	ug/L	50.0	BLOD	108	75-136			
Bromoform	53.9	1	ug/L	50.0	BLOD	108	70-130			
Bromomethane	34.3	1	ug/L	50.0	BLOD	68.7	30-145			
Carbon disulfide	39.7	10	ug/L	50.0	BLOD	79.5	35-160			
Carbon tetrachloride	55.1	1	ug/L	50.0	BLOD	110	65-140			
Chlorobenzene	51.0	1	ug/L	50.0	BLOD	102	80-120			
Chloroethane	40.7	1	ug/L	50.0	BLOD	81.3	60-135			
Chloroform	54.6	0.5	ug/L	50.0	BLOD	108	65-135			
Chloromethane	36.2	1	ug/L	50.0	BLOD	72.3	40-125			
cis-1,2-Dichloroethylene	53.8	1	ug/L	50.0	BLOD	108	70-125			
cis-1,3-Dichloropropene	51.0	1	ug/L	50.0	BLOD	102	47-136			
Dibromochloromethane	52.5	0.5	ug/L	50.0	BLOD	105	60-135			
Dibromomethane	53.6	1	ug/L	50.0	BLOD	107	75-125			
Dichlorodifluoromethane	40.4	1	ug/L	50.0	BLOD	80.9	30-155			
Ethylbenzene	57.1	1	ug/L	50.0	5.86	102	75-125			
Hexachlorobutadiene	55.1	0.8	ug/L	50.0	BLOD	110	50-140			
Isopropylbenzene	51.9	1	ug/L	50.0	0.50	103	75-125			
m+p-Xylenes	103	2	ug/L	100	2.66	100	75-130			
Methylene chloride	50.8	4	ug/L	50.0	BLOD	101	55-140			
Methyl-t-butyl ether (MTBE)	53.6	1	ug/L	50.0	BLOD	107	65-125			
Naphthalene	64.5	1	ug/L	50.0	3.45	122	55-140			
n-Butylbenzene	61.0	1	ug/L	50.0	BLOD	122	70-135			
n-Propylbenzene	54.3	1	ug/L	50.0	BLOD	109	70-130			
o-Xylene	53.2	1	ug/L	50.0	1.44	104	80-120			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0781 - SW5030B-MS										
Matrix Spike (BGH0781-MS1)	**Source: 23H1058-01**			Prepared & Analyzed: 08/21/2023						
sec-Butylbenzene	60.0	1	ug/L	50.0	BLOD	120	70-125			
Styrene	52.0	1	ug/L	50.0	BLOD	104	65-135			
tert-Butylbenzene	55.4	1	ug/L	50.0	BLOD	111	70-130			
Tetrachloroethylene (PCE)	52.3	1	ug/L	50.0	BLOD	105	51-231			
Toluene	53.0	1	ug/L	50.0	2.04	102	75-120			
trans-1,2-Dichloroethylene	51.3	1	ug/L	50.0	BLOD	103	60-140			
trans-1,3-Dichloropropene	55.9	1	ug/L	50.0	BLOD	112	55-140			
Trichloroethylene	52.6	1	ug/L	50.0	BLOD	105	70-125			
Trichlorofluoromethane	55.8	1	ug/L	50.0	BLOD	112	60-145			
Vinyl chloride	39.0	0.5	ug/L	50.0	BLOD	78.0	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*54.2*		ug/L	*50.0*		*108*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.3*		ug/L	*50.0*		*98.7*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*55.4*		ug/L	*50.0*		*111*	*70-130*			
Surr: Toluene-d8 (Surr)	*51.0*		ug/L	*50.0*		*102*	*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 BGH0810 - SW3510C/EPA600-MS										
Blank (BGH0810-BLK1)				Prepared & Analyzed: 08/22/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*35.6*		ug/L	*100*		*35.6*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*18.1*		ug/L	*50.0*		*36.2*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*21.4*		ug/L	*100*		*21.4*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*18.7*		ug/L	*50.0*		*37.3*	*5-151*			
Surr: Phenol-d5 (Surr)	*16.0*		ug/L	*100*		*16.0*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*11.8*		ug/L	*50.0*		*23.7*	*5-141*			
LCS (BGH0810-BS1)				Prepared & Analyzed: 08/22/2023						
1,2,4-Trichlorobenzene	17.9	10.0	ug/L	50.0		35.8	57-130			L
1,2-Dichlorobenzene	16.2	10.0	ug/L	50.0		32.3	22-115			
1,3-Dichlorobenzene	15.9	10.0	ug/L	50.0		31.8	22-112			
1,4-Dichlorobenzene	17.1	10.0	ug/L	50.0		34.2	13-112			
2,4,6-Trichlorophenol	21.4	10.0	ug/L	50.0		42.7	52-129			L
2,4-Dichlorophenol	22.1	10.0	ug/L	50.0		44.2	53-122			L
2,4-Dimethylphenol	22.6	5.00	ug/L	50.0		45.1	42-120			
2,4-Dinitrophenol	31.9	50.0	ug/L	50.0		63.7	48-127			
2,4-Dinitrotoluene	36.8	10.0	ug/L	50.0		73.7	10-173			
2,6-Dinitrotoluene	29.1	10.0	ug/L	50.0		58.2	68-137			L
2-Chloronaphthalene	21.7	10.0	ug/L	50.0		43.5	65-120			L
2-Chlorophenol	18.8	10.0	ug/L	50.0		37.7	36-120			
2-Nitrophenol	24.8	10.0	ug/L	50.0		49.5	45-167			
3,3'-Dichlorobenzidine	14.8	10.0	ug/L	50.0		29.5	10-213			
4,6-Dinitro-2-methylphenol	35.8	50.0	ug/L	50.0		71.6	53-130			
4-Bromophenyl phenyl ether	25.9	10.0	ug/L	50.0		51.7	65-120			L

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Batch BGH0810 - SW3510C/EPA600-MS										
LCS (BGH0810-BS1)				Prepared & Analyzed: 08/22/2023						
4-Chlorophenyl phenyl ether	24.9	10.0	ug/L	50.0		49.8	38-145			
4-Nitrophenol	10.6	50.0	ug/L	50.0		21.1	13-129			
Acenaphthene	26.0	10.0	ug/L	50.0		52.1	60-132			L
Acenaphthylene	27.7	10.0	ug/L	50.0		55.4	54-126			
Acetophenone	22.7	20.0	ug/L	50.0		45.4	0-200			
Anthracene	27.9	10.0	ug/L	50.0		55.7	43-120			
Benzidine	ND	50.0	ug/L	50.0			12-309			
Benzo (a) anthracene	26.6	10.0	ug/L	50.0		53.2	42-133			
Benzo (a) pyrene	25.0	10.0	ug/L	50.0		50.0	32-148			
Benzo (b) fluoranthene	25.0	10.0	ug/L	50.0		50.0	42-140			
Benzo (g,h,i) perylene	26.9	10.0	ug/L	50.0		53.8	10-195			
Benzo (k) fluoranthene	26.2	10.0	ug/L	50.0		52.5	25-146			
bis (2-Chloroethoxy) methane	26.2	10.0	ug/L	50.0		52.3	49-165			
bis (2-Chloroethyl) ether	22.2	10.0	ug/L	50.0		44.4	43-126			
2,2'-Oxybis (1-chloropropane)	21.4	10.0	ug/L	50.0		42.9	63-139			L
bis (2-Ethylhexyl) phthalate	26.4	10.0	ug/L	50.0		52.9	29-137			
Butyl benzyl phthalate	31.6	10.0	ug/L	50.0		63.2	10-140			
Chrysene	26.9	10.0	ug/L	50.0		53.8	44-140			
Dibenz (a,h) anthracene	28.3	10.0	ug/L	50.0		56.5	10-200			
Diethyl phthalate	25.5	10.0	ug/L	50.0		50.9	10-120			
Dimethyl phthalate	24.6	10.0	ug/L	50.0		49.1	10-120			
Di-n-butyl phthalate	26.0	10.0	ug/L	50.0		51.9	10-120			
Di-n-octyl phthalate	29.2	10.0	ug/L	50.0		58.4	19-132			
Fluoranthene	30.2	10.0	ug/L	50.0		60.5	43-121			
Fluorene	27.7	10.0	ug/L	50.0		55.4	70-120			L

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0810 - SW3510C/EPA600-MS										
LCS (BGH0810-BS1)				Prepared & Analyzed: 08/22/2023						
Hexachlorobenzene	20.5	1.00	ug/L	50.0		41.0	10-142			
Hexachlorobutadiene	19.8	10.0	ug/L	50.0		39.6	38-120			
Hexachlorocyclopentadiene	12.5	10.0	ug/L	50.0		25.0	10-76			
Hexachloroethane	16.3	10.0	ug/L	50.0		32.5	55-120			L
Indeno (1,2,3-cd) pyrene	26.6	10.0	ug/L	50.0		53.2	10-151			
Isophorone	21.6	10.0	ug/L	50.0		43.1	47-180			L
Naphthalene	21.1	5.00	ug/L	50.0		42.2	36-120			
Nitrobenzene	24.0	10.0	ug/L	50.0		48.1	54-158			L
n-Nitrosodimethylamine	17.0	10.0	ug/L	50.0		34.0	10-85			
n-Nitrosodi-n-propylamine	21.0	10.0	ug/L	50.0		42.0	14-198			
n-Nitrosodiphenylamine	22.0	10.0	ug/L	50.0		44.1	12-97			
p-Chloro-m-cresol	22.3	10.0	ug/L	50.0		44.7	10-142			
Pentachlorophenol	29.1	20.0	ug/L	50.0		58.3	38-152			
Phenanthrene	34.0	10.0	ug/L	50.0		68.1	65-120			
Phenol	13.8	10.0	ug/L	50.5		27.2	17-120			
Pyrene	30.3	10.0	ug/L	50.0		60.5	70-120			L
Pyridine	11.5	10.0	ug/L	50.0		23.1	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*53.1*		ug/L	*100*		*53.1*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*24.6*		ug/L	*50.0*		*49.2*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*28.5*		ug/L	*100*		*28.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*24.8*		ug/L	*50.0*		*49.5*	*5-151*			
Surr: Phenol-d5 (Surr)	*21.7*		ug/L	*100*		*21.7*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*14.5*		ug/L	*50.0*		*29.0*	*5-141*			

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0652 - No Prep Wet Chem										
Blank (BGH0652-BLK1)				Prepared & Analyzed: 08/17/2023						
BOD	ND	2.0	mg/L							
LCS (BGH0652-BS1)				Prepared & Analyzed: 08/17/2023						
BOD	208	2	mg/L	198		105	84.6-115.4			
Duplicate (BGH0652-DUP1)	**Source: 23H0808-01**			Prepared & Analyzed: 08/17/2023						
BOD	7.9	2.0	mg/L		7.2			9.16	20	
Batch BGH0656 - No Prep Wet Chem										
Blank (BGH0656-BLK1)				Prepared & Analyzed: 08/17/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGH0656-BS1)				Prepared & Analyzed: 08/17/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		95.0	80-120			
Matrix Spike (BGH0656-MS1)	**Source: 23H0914-02**			Prepared & Analyzed: 08/17/2023						
Nitrite as N	0.44	0.25	mg/L	0.500	BLOD	88.0	80-120			
Matrix Spike Dup (BGH0656-MSD1)	**Source: 23H0914-02**			Prepared & Analyzed: 08/17/2023						
Nitrite as N	0.44	0.25	mg/L	0.500	BLOD	88.0	80-120	0.00	20	
Batch BGH0657 - No Prep Wet Chem										
Blank (BGH0657-BLK1)				Prepared & Analyzed: 08/17/2023						
BOD	ND	2.0	mg/L							

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH0657 - No Prep Wet Chem										
LCS (BGH0657-BS1)				Prepared & Analyzed: 08/17/2023						
BOD	213	2	mg/L	198		108	84.6-115.4			
Duplicate (BGH0657-DUP1)	**Source: 23H0852-01**			Prepared & Analyzed: 08/17/2023						
BOD	2.9	2.0	mg/L		2.7			6.47	20	
Batch BGH0838 - No Prep Wet Chem										
Blank (BGH0838-BLK1)				Prepared & Analyzed: 08/22/2023						
COD	ND	10.0	mg/L							
LCS (BGH0838-BS1)				Prepared & Analyzed: 08/22/2023						
COD	53.3	10.0	mg/L	50.0		107	88-119			
Matrix Spike (BGH0838-MS1)	**Source: 23H0830-07**			Prepared & Analyzed: 08/22/2023						
COD	60.4	10.0	mg/L	50.0	BLOD	121	72.4-130			
Matrix Spike Dup (BGH0838-MSD1)	**Source: 23H0830-07**			Prepared & Analyzed: 08/22/2023						
COD	57.3	10.0	mg/L	50.0	BLOD	115	72.4-130	5.18	20	
Batch BGH1014 - No Prep Wet Chem										
Blank (BGH1014-BLK1)				Prepared & Analyzed: 08/26/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGH1014-BS1)				Prepared & Analyzed: 08/26/2023						
Nitrate+Nitrite as N	1.01	0.1	mg/L	1.00		101	90-110			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH1014 - No Prep Wet Chem										
Matrix Spike (BGH1014-MS1)	**Source: 23H1215-02**			Prepared & Analyzed: 08/26/2023						
Nitrate+Nitrite as N	1.64	0.10	mg/L	1.00	0.42	121	90-120			M
Matrix Spike Dup (BGH1014-MSD1)	**Source: 23H1215-02**			Prepared & Analyzed: 08/26/2023						
Nitrate+Nitrite as N	1.46	0.10	mg/L	1.00	0.42	104	90-120	11.1	20	
Batch BGH1018 - No Prep Wet Chem										
Blank (BGH1018-BLK1)				Prepared & Analyzed: 08/27/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGH1018-BS1)				Prepared & Analyzed: 08/27/2023						
TKN as N	5.19	0.50	mg/L	5.00		104	90-110			
Matrix Spike (BGH1018-MS1)	**Source: 23H1042-01**			Prepared & Analyzed: 08/27/2023						
TKN as N	5.97	0.50	mg/L	5.00	0.82	103	90-110			
Matrix Spike (BGH1018-MS2)	**Source: 23H1042-02**			Prepared & Analyzed: 08/27/2023						
TKN as N	5.98	0.50	mg/L	5.00	0.87	102	90-110			
Matrix Spike Dup (BGH1018-MSD1)	**Source: 23H1042-01**			Prepared & Analyzed: 08/27/2023						
TKN as N	5.92	0.50	mg/L	5.00	0.82	102	90-110	0.925	20	
Matrix Spike Dup (BGH1018-MSD2)	**Source: 23H1042-02**			Prepared & Analyzed: 08/27/2023						
TKN as N	5.86	0.50	mg/L	5.00	0.87	99.9	90-110	1.99	20	
Batch BGH1086 - No Prep Wet Chem										
Blank (BGH1086-BLK1)				Prepared & Analyzed: 08/29/2023						
Ammonia as N	ND	0.10	mg/L							

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Batch BGH1086 - No Prep Wet Chem										
LCS (BGH1086-BS1)				Prepared & Analyzed: 08/29/2023						
Ammonia as N	1.01	0.1	mg/L	1.00		101	90-110			
Matrix Spike (BGH1086-MS1)	**Source: 23H1246-03**			Prepared & Analyzed: 08/29/2023						
Ammonia as N	0.98	0.10	mg/L	1.00	BLOD	98.4	89.3-131			
Matrix Spike (BGH1086-MS2)	**Source: 23H0908-05**			Prepared & Analyzed: 08/29/2023						
Ammonia as N	0.99	0.10	mg/L	1.00	BLOD	98.7	89.3-131			
Matrix Spike Dup (BGH1086-MSD1)	**Source: 23H1246-03**			Prepared & Analyzed: 08/29/2023						
Ammonia as N	0.96	0.10	mg/L	1.00	BLOD	96.5	89.3-131	1.95	20	
Matrix Spike Dup (BGH1086-MSD2)	**Source: 23H0908-05**			Prepared & Analyzed: 08/29/2023						
Ammonia as N	1.01	0.10	mg/L	1.00	BLOD	101	89.3-131	2.01	20	
Batch BGH1157 - No Prep Wet Chem										
Blank (BGH1157-BLK1)				Prepared & Analyzed: 08/30/2023						
Nitrate+Nitrite as N	ND	0.05	mg/L							
LCS (BGH1157-BS1)				Prepared & Analyzed: 08/30/2023						
Nitrate+Nitrite as N	1.08	0.05	mg/L	1.00		108	90-110			
Matrix Spike (BGH1157-MS1)	**Source: 23H0998-03**			Prepared & Analyzed: 08/30/2023						
Nitrate+Nitrite as N	1.29	0.05	mg/L	1.00	0.12	117	90-120			
Matrix Spike Dup (BGH1157-MSD1)	**Source: 23H0998-03**			Prepared & Analyzed: 08/30/2023						
Nitrate+Nitrite as N	1.29	0.05	mg/L	1.00	0.12	117	90-120	0.0777	20	

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Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGH1182 - No Prep Wet Chem										
Blank (BGH1182-BLK1)				Prepared & Analyzed: 08/31/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGH1182-BS1)				Prepared & Analyzed: 08/31/2023						
Total Recoverable Phenolics	0.41	0.050	mg/L	0.505		81.2	80-120			
Matrix Spike (BGH1182-MS1)	**Source: 23H1054-07**			Prepared & Analyzed: 08/31/2023						
Total Recoverable Phenolics	0.97	0.050	mg/L	0.500	0.52	88.8	70-130			
Matrix Spike Dup (BGH1182-MSD1)	**Source: 23H1054-07**			Prepared & Analyzed: 08/31/2023						
Total Recoverable Phenolics	1.02	0.050	mg/L	0.500	0.52	100	70-130	5.62	20	

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Analytical Summary

23H0914-01	Subcontract
23H0914-02	Subcontract
23H0914-03	Subcontract
23H0914-04	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**	
23H0914-01	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
23H0914-02	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
23H0914-03	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
23H0914-04	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
23H0914-04RE1	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23H0914-01	300 mL / 300 mL	SM5210B-2016	BGH0652	SGH0815	
23H0914-01	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
23H0914-02	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
23H0914-03	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
23H0914-04	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
23H0914-02	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
23H0914-03	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
23H0914-04	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
23H0914-01	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
23H0914-02	0.0400 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
23H0914-03	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
23H0914-04	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
23H0914-02	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1014	SGH1012	AH30322

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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**	
23H0914-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
23H0914-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
23H0914-03	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
23H0914-04	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
23H0914-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
23H0914-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
23H0914-03	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
23H0914-04	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
23H0914-01	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
23H0914-03	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
23H0914-04	0.500 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
23H0914-01	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
23H0914-02	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
23H0914-03	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
23H0914-04	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23H0914-01	500 mL / 2.00 mL	SW8270E	BGH0810	SGH0871	AG30283
23H0914-02	1020 mL / 1.00 mL	SW8270E	BGH0810	SGH0873	AE30336
23H0914-03	500 mL / 2.00 mL	SW8270E	BGH0810	SGH0871	AG30283
23H0914-04	500 mL / 2.00 mL	SW8270E	BGH0810	SGH0871	AG30283

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23H0914-01	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
23H0914-02	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259

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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**	
23H0914-03	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
23H0914-04	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
23H0914-05	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
23H0914-01RE1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
23H0914-02RE1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
23H0914-03RE1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
23H0914-04RE1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312

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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**	
BGH0720-BLK1	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
BGH0720-BS1	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
BGH0720-MS1	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277
BGH0720-MSD1	50.0 mL / 50.0 mL	SW6020B	BGH0720	SGH0754	AH30277

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGH0652-BLK1	300 mL / 300 mL	SM5210B-2016	BGH0652	SGH0815	
BGH0652-BS1	300 mL / 300 mL	SM5210B-2016	BGH0652	SGH0815	
BGH0652-DUP1	300 mL / 300 mL	SM5210B-2016	BGH0652	SGH0815	
BGH0656-BLK1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
BGH0656-BS1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
BGH0656-MRL1	25.0 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
BGH0656-MS1	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
BGH0656-MSD1	5.00 mL / 25.0 mL	SM4500-NO2B-2011	BGH0656	SGH0673	AD30177
BGH0657-BLK1	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
BGH0657-BS1	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
BGH0657-DUP1	300 mL / 300 mL	SM5210B-2016	BGH0657	SGH0815	
BGH0838-BLK1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
BGH0838-BS1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
BGH0838-MS1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
BGH0838-MSD1	2.00 mL / 2.00 mL	SM5220D-2011	BGH0838	SGH0828	AH30244
BGH1014-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1014	SGH1012	AH30322

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Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGH1014-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1014	SGH1012	AH30322
BGH1014-MS1	25.0 mL / 25.0 mL	SM4500-NO3F-2016	BGH1014	SGH1012	AH30322
BGH1014-MSD1	25.0 mL / 25.0 mL	SM4500-NO3F-2016	BGH1014	SGH1012	AH30322
BGH1018-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1018-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1018-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1018-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1018-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1018-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGH1018	SGH1014	AH30328
BGH1086-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1086-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1086-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1086-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1086-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1086-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGH1086	SGH1108	AH30339
BGH1157-BLK1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
BGH1157-BS1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
BGH1157-MRL1	5.00 mL / 5.00 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
BGH1157-MS1	25.0 mL / 25.0 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
BGH1157-MSD1	25.0 mL / 25.0 mL	SM4500-NO3F-2016	BGH1157	SGH1164	AH30348
BGH1182-BLK1	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
BGH1182-BS1	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
BGH1182-MRL1	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
BGH1182-MS1	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175
BGH1182-MSD1	5.00 mL / 10.0 mL	EPA420.1	BGH1182	SGH1180	AH30175

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	

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Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGH0810-BLK1	1000 mL / 1.00 mL	SW8270E	BGH0810	SGH0871	AG30283
BGH0810-BLK2		SW8270E	BGH0810	SGH0861	AG30283
BGH0810-BLK3		SW8270E	BGH0810	SGH0910	AF30205
BGH0810-BLK4		SW8270E	BGH0810	SGH0917	AG30317
BGH0810-BS1	1000 mL / 1.00 mL	SW8270E	BGH0810	SGH0871	AG30283

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BGH0712-BLK1	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
BGH0712-BS1	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
BGH0712-DUP1	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
BGH0712-MS1	5.00 mL / 5.00 mL	SW8260D	BGH0712	SGH0733	AH30259
BGH0781-BLK1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
BGH0781-BS1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
BGH0781-DUP1	5.00 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312
BGH0781-MS1	0.500 mL / 5.00 mL	SW8260D	BGH0781	SGH0788	AG30312

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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
EPA420.1 in Non-Potable Water	
Total Recoverable Phenolics	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

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Certified Analyses included in this Report

Analyte	Certifications
Zinc	VELAP,WVDEP
SW8260D in Non-Potable Water	
2-Butanone (MEK)	VELAP,NCDEQ,PADEP,WVDEP
Acetone	VELAP,NCDEQ,PADEP,WVDEP
Benzene	VELAP,NCDEQ,PADEP,WVDEP
Ethylbenzene	VELAP,NCDEQ,PADEP,WVDEP
m+p-Xylenes	VELAP,NCDEQ,PADEP,WVDEP
o-Xylene	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

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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	07/31/2024
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 #12603	460021	06/14/2024
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

DS	Surrogate concentration reflects a dilution factor.
J	The reported result is an estimated value.
L	LCS recovery is outside of established acceptance limits
M	Matrix spike recovery is outside established acceptance limits
P	Duplicate analysis does not meet the acceptance criteria for precision
pH	The container used to analyze this sample had a pH measurement of greater than 2 s.u.
TextValuea	>33045
TextValueb	>33225

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

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CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SCS Reston	Project Name: 23-08 Bristol LFG - EW
CONTACT: Jennifer Robb	INVOICE CONTACT: Jennifer Robb	Site Name: 2023 City of Bristol Landfill Leachate
ADDRESS: 296 Victory Road, Winchester, VA 22602	INVOICE ADDRESS:	PROJECT NUMBER: 02218208.15 T1
PHONE #: (703) 471-6150	INVOICE PHONE #:	P.O. #:
FAX #: (703) 471-6676 EMAIL: Jrobb@scsengineers.com		Pretreatment Program:
Is sample for compliance reporting? YES Va	Is sample from a chlorinated supply? YES NO	PWS I.D. #:
SAMPLER NAME (PRINT): A.Minnick/L.Nelson	SAMPLER SIGNATURE:	Turn Around Tim 10 Day(s)

Matrix Codes: WW=Waste 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): VOCs (Acetone, Benzene, EB, MEK, THF, Toluene, Xylene)	VFAs	Phenolics	Metals 6020 (Ag, As, Ba, Cd, Cr, Cu, Ni, Pb, Se, Zn, Hg)	TKN, Nitrate (Cd), Nitrite,	COD, Ammonia	SVOC (Anthracene only)	BOD	COMMENTS: BOD has 48hr hold time. PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)
1) EW-58	X					081523	1330		GW	12	X	X	X	X	X	X	X	X	
2) EW-98	X					081523	1345		GW	12	X	X	X	X	X	X	X	X	
3) EW-94	X					081523	1420		GW	12	X	X	X	X	X	X	X	X	
4) EW-54	X					081523	1505		GW	12	X	X	X	X	X	X	X	X	
5)																			
6)																			
7)																			
8)																			
9)																			
10) Trip Blank	X					081023	1615		DI	2	X								

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
	08/23/1130	LCN	
RELINQUISHED: LCN	DATE / TIME	RECEIVED: Meghan Meyer	DATE / TIME 8/17/23 0900
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY
338
Ice
sealed

COOLER TEMP 0.3 °C

SCS-W 23H0914
23-08 Bristol LFG-EW
Recd: 08/17/2023 Due: 08/31/2023

ENTHALPY ANALYTICAL

Sample Preservation Log

Order ID 23H0914 Date Performed: 8/17/23 Analyst Performing Check: JH

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

NaOH ID: _____ HNO3 ID: 3604313 CrVI preserved date/time: _____ Analyst Initials: _____

*pH must be adjusted between 9.3 - 9.7

H2SO4 ID: 3D04316 Na2S2O3 ID: _____ Ammonia Buffer Sol'n ID: _____

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

Metals were received with pH = 7
HNO3 was added on 17 August 2023 at
1150 by JNH 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 23H0914 Date Performed: 8/17/23 Analyst Performing Check: JH

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)								
		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			Other			Other	
4	F																																							

NaOH ID: _____ HNO_3 ID: _____ CrVI preserved date/time: _____ Analyst Initials: _____

*** pH must be adjusted between 9.3 - 9.7***

H_2SO_4 ID: _____ $Na_2S_2O_3$ ID: _____ Ammonia Buffer Sol'n ID: _____

HCL ID: _____ Na_2SO_3 ID: _____ 5N NaOH ID: _____

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

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

ENTHALPY ANALYTICAL

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/31/2023 2:20:22PM
Client Site I.D.: 2023 City of Bristol Landfill Leachate
Submitted To: Jennifer Robb

Laboratory Order ID: 23H0914

Sample Conditions Checklist

Samples Received at:	**0.30°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	No
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis. In addition, field parameters are always received outside holding time and will be marked accordingly.	No

Jennifer Robb notified via email for bottles to be analzyed for Ammonia, Nitrate-Nitrite, Phenolics, and COD being received with a pH of 7, and VOAC40mL that were unpreserved being recieved with headspace. KRC 8/17/23 1632

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 8/31/2023 2:20:22PM

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

Submitted To: Jennifer Robb

Jennifer Robb confirmed to proceed with all analyses despite headspace. KRC
8/18/23 0920

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-54	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
	August-2023	---	---	1600	1890	---	---	---	---	---	---	---	---	---	2140	222	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
	August-2023	---	---	>33045	>33225	---	---	---	---	---	---	---	---	---	>32805	506	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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1750	500	500
		---	---	59000	58600	---	---	---	---	---	---	---	---	---	60600	---	5000	5000

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-54	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+Nitrite as N (mg/L)	November-2022	---	---	---	---	---	**2.91**	---	**0.16**	---	**0.33**	---	---	---	---	---	0.1	0.1
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.15	0.35
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	1.5	3.5
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.05	0.25
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	0.5	2.5

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-54	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 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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**279**	10	25
		---	---	**2240**	**2820**	---	---	---	---	---	---	---	---	---	**2850**	---	100	250
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**1.46**	0.15	0.25
		---	---	**28.6**	**31.4**	---	---	---	---	---	---	---	---	---	**40.4**	---	1.5	2.5

Well ID		EW-50	EW-52	EW-54	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**																
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	19.6	39.2
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	1000	2000
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.15**	0.0025	0.005
		---	---	**0.32**	**0.43**	---	---	---	---	---	---	---	---	---	**0.29**	---	0.005	0.01

Well ID		EW-50	EW-52	EW-54	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																
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
		---	---	---	---	---	---	---	---	---	---	---	---	**0.558**	---	---	0.002	0.01
		0.542	---	---	**2.28**	---	---	---	---	---	---	---	---	---	**1.02**	---	0.005	0.025
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.218**	0.005	0.025
		---	---	**1.61**	**1.58**	---	---	---	---	---	---	---	---	---	**1.48**	---	0.01	0.05
Cadmium	November-2022	---	---	---	---	---	ND	---	ND	---	ND	---	---	---	---	---	0.004	0.008
	December-2022	ND	**0.0104**	---	ND	---	ND	ND	---	---	---	ND	ND	---	---	---	0.004	0.008
	January-2023	ND	---	---	---	ND	ND	---	---	---	ND	---	---	---	---	---	0.002	0.004
	February-2023	---	---	---	---	---	---	---	---	---	---	---	**0.000297 J**	---	---	---	0.0001	0.001
	March-2023	---	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.002	0.004
	April-2023	---	---	---	---	**0.000158 J**	---	**0.000333 J**	---	---	---	---	---	---	---	---	0.0001	0.001
	May-2023	ND	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.0005	0.005
	June-2023	---	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.0005	0.005
	July-2023	**0.000219 J**	---	---	**0.000156 J**	---	---	---	---	---	---	---	---	**0.000186 J**	ND	ND	0.0001	0.001
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.0005	0.005
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	0.001	0.01
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.0276**	0.002	0.005
		---	---	**0.606**	**0.449**	---	---	---	---	---	---	---	---	---	**0.259**	---	0.004	0.01
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.0015	0.005
		---	---	**0.00343 J**	**0.0176**	---	---	---	---	---	---	---	---	---	ND	---	0.003	0.01

Well ID		EW-50	EW-52	EW-54	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																
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.005	0.005
		---	---	**0.014**	ND	---	---	---	---	---	---	---	---	---	**0.013**	---	0.01	0.01
Mercury	November-2022	---	---	---	---	---	---	---	**0.00169**	---	**0.00053**	---	---	---	---	---	0.0004	0.0004
		---	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.0008	0.0008
	December-2022	**0.00051**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
		---	---	---	**0.00118**	---	ND	**0.00588**	---	---	---	**0.0048**	ND	---	---	---	0.0008	0.0008
		---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	0.004	0.004
	January-2023	ND	---	---	---	ND	---	---	---	---	ND	---	---	---	---	---	0.0004	0.0004
		---	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.004	0.004
	February-2023	---	---	---	---	---	---	---	---	---	---	---	ND	---	---	---	0.0004	0.0004
	March-2023	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.0002	0.0002
		---	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	April-2023	---	---	---	---	---	---	**0.00128**	---	---	---	---	---	---	---	---	0.0002	0.0002
		---	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	0.0004	0.0004
	May-2023	ND	---	---	---	ND	ND	---	---	---	---	---	---	---	---	---	0.0002	0.0002
	June-2023	---	---	---	---	---	ND	---	ND	ND	---	---	---	---	---	---	0.004	0.004
	July-2023	**0.000306**	---	---	---	---	---	---	---	---	---	---	---	ND	---	ND	0.0002	0.0002
		---	---	---	**0.0107**	---	---	---	---	---	---	---	---	---	ND	---	0.001	0.001
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.001	0.001
		---	---	**0.00312**	**0.00397**	---	---	---	---	---	---	---	---	---	ND	---	0.002	0.002
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.02029**	0.005	0.005
		---	---	**0.1457**	**0.09673**	---	---	---	---	---	---	---	---	---	**0.0513**	---	0.01	0.01

Well ID		EW-50	EW-52	EW-54	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																
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.00425	0.005
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	0.0085	0.01
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	ND	0.0003	0.005
		---	---	ND	ND	---	---	---	---	---	---	---	---	---	ND	---	0.0006	0.01
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.112**	0.0125	0.025
		---	---	---	**1.71**	---	---	---	---	---	---	---	---	---	**0.914**	---	0.025	0.05
		---	---	**5.92**	---	---	---	---	---	---	---	---	---	---	---	---	0.05	0.1
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-54	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																
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

Well ID		EW-50	EW-52	EW-54	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)																		
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**5950**	60	200
		---	---	---	---	---	---	---	---	---	---	---	---	---	**7350**	---	150	500
		---	---	---	**3000**	---	---	---	---	---	---	---	---	---	---	---	750	2500
		---	---	**25600**	---	---	---	---	---	---	---	---	---	---	---	---	1500	5000
Acetone	November-2022	---	---	---	---	---	---	---	---	---	**4420**	---	---	---	---	---	70	100
		---	---	---	---	---	**16100**	---	**38300**	---	---	---	---	---	---	---	700	1000
	December-2022	---	---	---	---	---	**15600**	**5170**	---	---	---	---	**9800**	---	---	---	700	1000
		8500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1750	2500
		---	**53100**	---	**49900**	---	---	---	---	---	---	**45600**	---	---	---	---	3500	5000
	January-2023	---	---	---	---	**1530**	---	---	---	---	---	---	---	---	---	---	70	100
		---	---	---	---	---	**22200**	---	---	---	**14000**	---	---	---	---	---	700	1000
		8130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1750	2500
	February-2023	---	---	---	---	---	---	---	---	---	---	---	**23900**	---	---	---	1400	2000
	March-2023	---	---	---	---	**375**	---	---	---	---	---	---	---	---	---	---	70	100
		---	---	---	---	---	**6810**	---	---	---	---	---	---	---	---	---	700	1000
	April-2023	---	---	---	---	**8290**	---	**7560**	---	---	---	---	---	---	---	---	1750	2500
	May-2023	**10700**	---	---	---	**11700**	---	---	---	---	---	---	---	---	---	---	350	500
		---	---	---	---	---	**29600**	---	---	---	---	---	---	---	---	---	1750	2500
	June-2023	---	---	---	---	---	**29600**	---	---	---	---	---	---	---	---	---	1750	2500
		---	---	---	---	---	---	---	**61800**	**50800**	---	---	---	---	---	---	3500	5000
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	**1180**	---	---	140	200
		9780	---	---	---	---	---	---	---	---	---	---	---	---	---	---	700	1000
		---	---	---	---	---	---	---	---	---	---	---	---	---	---	**11600**	1750	2500
		---	---	---	**77200**	---	---	---	---	---	---	---	---	---	**69700**	---	7000	10000
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**20900**	700	1000
		---	---	---	**18700**	---	---	---	---	---	---	---	---	---	---	---	1750	2500
		---	---	**72500**	---	---	---	---	---	---	---	---	---	---	**87700**	---	3500	5000

Well ID		EW-50	EW-52	EW-54	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																
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**379**	8	20
		---	---	**2320**	**168**	---	---	---	---	---	---	---	---	---	ND	---	20	50
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**16.8 J**	8	20
		---	---	**80**	ND	---	---	---	---	---	---	---	---	---	ND	---	20	50
Tetrahydrofuran	November-2022	---	---	---	---	---	**309**	---	---	---	**176**	---	---	---	---	---	100	100
		---	---	---	---	---	---	---	**8530**	---	---	---	---	---	---	---	1000	1000
	December-2022	**151**	---	---	---	---	**170**	**1120**	---	---	---	---	**663**	---	---	---	100	100
		---	**5210**	---	**19800**	---	---	---	---	---	---	**6130**	---	---	---	---	1000	1000
	January-2023	**183**	---	---	---	**566**	**1810**	---	---	---	**352**	---	---	---	---	---	100	100
	February-2023	---	---	---	---	---	---	---	---	---	---	---	**3760**	---	---	---	2000	2000
	March-2023	---	---	---	---	**353**	**464**	---	---	---	---	---	---	---	---	---	100	100
	April-2023	---	---	---	---	**2410**	---	**4790**	---	---	---	---	---	---	---	---	100	100
	May-2023	ND	---	---	---	**2740**	**2380**	---	---	---	---	---	---	---	---	---	500	500
	June-2023	---	---	---	---	---	**2100**	---	---	---	---	---	---	---	---	---	200	200
		---	---	---	---	---	---	---	**7320**	**6670**	---	---	---	---	---	---	500	500
	July-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**2960**	100	100
		411	---	---	---	---	---	---	---	---	---	---	---	**616**	---	---	200	200
		---	---	---	**8380**	---	---	---	---	---	---	---	---	---	**5310**	---	500	500
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**2880**	200	200
		---	---	**7370**	**3210**	---	---	---	---	---	---	---	---	---	**1200**	---	500	500

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-54	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**																
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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**36.6**	10	20
		---	---	**105**	ND	---	---	---	---	---	---	---	---	---	ND	---	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
	August-2023	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**48.4 J**	20	60
		---	---	**180**	ND	---	---	---	---	---	---	---	---	---	ND	---	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