January
Monthly Compliance Report

Solid Waste Permit #588
Bristol Integrated Solid Waste Management Facility
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SCS ENGINEERS

02218208.05-18 | February 10, 2023

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INTRODUCTION

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) in accordance with item 8.iii in Appendix A of the Consent Decree between the City and VDEQ. This report covers the Solid Waste Permit #588 landfill during the month of January.

1.0 GAS COLLECTION

The City has continued steps to operate, develop, and improve the facility's landfill gas collection and control system (GCCS). The following sections describe steps City is taking in collaboration with its consultants and operations and monitoring contractor.

1.1 SURFACE AND LEACHATE COLLECTION EMISSIONS

1.1.1 Surface Emissions

1.1.1.1 Monitoring

In addition to standard regulatory quarterly surface emissions monitoring, SCS performed additional surface emissions monitoring on January 5, 2023, January 11, 2023, January 19, 2023, January 26, 2023 and January 30, 2023. These Weekly Surface Emissions Monitoring (SEM) Events were performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

The monitoring in December 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 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.

SCS submitted letters to VDEQ outlining the results on January 5, 2023, January 11, 2023, January 19, 2023, January 26, 2023, and January 30, 2023. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the three monitoring events in December.

Table 1. Summary of December Surface Emissions Monitoring

Description	January 5, 2023	January 11, 2023	January 19, 2023	January 26, 2023	January 30, 2023
Number of Points Sampled	149	149	149	149	149
Number of Points in Serpentine Route	100	100	100	100	100
Number of Points at Surface Cover Penetrations	49	49	49	49	49

Description	January 5, 2023	January 11, 2023	January 19, 2023	January 26, 2023	January 30, 2023
Number of Exceedances[1]	0	0	0	1	0
Number of Serpentine Exceedances	0	0	0	0	0
Number of Pipe Penetration Exceedances	0	0	0	1	0

Only one exceedance was found over the course of the month of January.

1.1.2 Leachate Collection Emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill on January 5, 2023 and January 6, 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 SCS-FS' summary report for the month of January dated February 7, 2023 A copy of this report is included in Appendix B. The monitoring data for the clean-outs at the southern end of the landfill are listed as LC01 – LC10. The monitoring data for the clean-outs at the northern end of the landfill are listed as NC01 – NC10. Based on site records and correspondence, SCS prepared a summary of the pipe numbering relative to the function of the pipes shown in Table 2.

Table 2. Cleanout Pipe Identification

Northern Cleanouts		Southern Cleanouts	
ID #	Description	ID #	Description
NC01	Leachate East	LC01	Gradient West
NC02	Leachate Center	LC02	Gradient East
NC03	Leachate West	LC03	Leachate Center
NC04	Witness East	LC04	Witness East
NC05	Witness Center	LC05	Leachate West
NC06	Witness West	LC06	Gradient Center West
NC07	Gradient East	LC07	Leachate East
NC08	Gradient Center East	LC08	Gradient Center East
NC09	Gradient Center West	LC09	Leachate West
NC10	Gradient West	LC10	Witness Center

1.2 EXISTING GAS EXTRACTION SYSTEM PERFORMANCE

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

[2] Sensor could not be lowered below 60 feet

1.3 REMOTE MONITORING SYSTEM

SCS Remote Monitoring & Control (SCS-RMC) had previously furnished 25 industrial internet of things (IIoT) temperature sensors for installation on landfill gas wells at the Bristol Landfill, VA. The sensors are capable of recording and transmitting gas temperatures and GPS locations. The sensors will upload data collected via a cellular connection to a database managed by SCS-RMC.

- As outlined in the November Monthly Compliance Report for the SWP #588 Landfill the system is currently undergoing commissioning. Following a review of precision of the automated well-head temperature sensors, SCS replaced the existing wellhead temperature sensors on Well #51 and Well #68. The sensors had a longer temperature probe (2 inches long) and were replaced on January 6, 2023. SCS has reviewed the data from these sensors and noted improved precision.

- On January 5, 2023, SCS used field instrumentation to measure the temperature at Well 51 and Well 68.

  - The field instrumentation at Well 51 indicated a temperature of 130°F. The automated temperature sensor during the same general timeframe indicated a temperature of 127°F.
  - The field instrumentation Well 68 indicated a temperature of 129°F. The automated temperature sensor during the same general timeframe indicated a temperature of 128°F.

- SCS believes the larger range of temperatures recorded by the two different methods at Well 51 is due in part to lower gas flows at that location.

- The results of the comparison of temperatures measured using the two methods indicates that the precision of the 2-inch remote sensors is accurate. Based on these results, SCS has ordered additional sensors with 2 inch long probes to replace the sensors on the other wellheads. These sensors are expected to be delivered and installed during the week of February 20, 2023.

Despite the system still being subject to ongoing commissioning, the City began sharing data with VDEQ on a daily basis per the Department's request. This reporting began with the November 30, 2022 data which was submitted on December 1, 2022. Daily averages for each wellhead are reported to the Department the following day. A report with the daily temperature data is included as Appendix C.

The sensor on Well 68 was damaged and did not report temperatures from January 1, 2023 to January 4, 2023. A replacement sensor was installed on January 5, 2023. After installation, some updates to the software for the instrumentation were required, which resulted in inaccurate temperature readings on that day. The system is still in the commissioning phase, and caution should be used when making any interpretations based on the data in this report.

1.4 LARGE-DIAMETER DUAL-PHASE EXTRACTION WELLS

SCS completed design work on an expansion of the existing GCCS during the month of December. The proposed expansion includes at least 5 large diameter dual-phase extraction wells. SCS will submitted the design to VDEQ prior to December 31, 2022. The City has commenced solicitation of

contractor's bids for this project by advertising for bids on December 12, 2022 and conducting the Pre-bid Meeting on December 16, 2022. The contractor's bids were due to the City on January 12, 2023. The City 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.

Upon establishing the proposed schedule for executing the field construction activities, which will be negotiated between the City and the selected Contractor, the City will inform VDEQ of the anticipated milestone dates. In accordance with typical protocols, the Construction Certification Report documenting the CQA activities related to construction of this subsequent phase of the project will be submitted to VDEQ upon completion.

1.5 VDEQ CONCURRENCE ON WELLS

The City has engaged with VDEQ in discussions about the proposed approach for landfill GCCS improvements and expansions. On October 27, 2022 SCS provided VDEQ with an overview of the proposed GCCS expansion design outlined in Section 1.4. SCS submitted the design of the landfill GCCS expansion to VDEQ on December 31, 2022. The City and SCS intend to continue engaging with the Department throughout the design and installation process. The City intends to delay installation of temporary or final cover systems until the City and VDEQ agree that the GCCS is sufficient.

2.0 SIDEWALL ODOR MITIGATION

The City has initiated design and construction work to address fugitive emissions emanating from the quarry sidewalls. Specific aspects of the proposed design features are outlined in the following sections.

2.1 PERIMETER GAS COLLECTION SYSTEM

SCS' design of the GCCS expansion outlined in Section 1.5 includes perimeter LFG wells. These wells will be placed 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. SCS submitted the design to VDEQ which includes these wells on December 31, 2022. The City has commenced solicitation of contractor's bids for this project by advertising for bids on December 12, 2022 and conducting the Pre-bid Meeting on December 16, 2022. The contractor's bids were due to the City on January 12, 2023. The City 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.

Upon establishing the proposed schedule for executing the field construction activities, which will be negotiated between the City and the selected Contractor, the City will inform VDEQ of the anticipated milestone dates. In accordance with typical protocols, the Construction Certification Report documenting the CQA activities related to construction of this subsequent phase of the project will be submitted to VDEQ upon completion. A copy of the bid package is included in Appendix D.

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 during the month of October. 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 1st. A project manual detailing the system specifications of the system was developed concurrently with the design of the system.

2.3 PILOT SYSTEM CONSTRUCTION

SCS-CONS continued construction of Phase 1 of the sidewall odor mitigation system. The low permeability soil layer was placed during the first week of January. Inclement weather limited low permeability soil placement. SCS-CONS was able to make progress on low permeable soil placement by importing dry material and utilizing tarps to protect material after placement. Low permeable soil placement is shown in Figure 1.

Shotcrete was applied to the wall between January 6, 2023 and January 11, 2023. After shotcrete was applied, SCS-CONS began installation of the external odor mitigation horizontal collector (upper collector). Additional low permeability soil was placed adjacent to and on top of the upper collector.

SCS-CONS connected the two horizontal collector to the 2 HP Rotron blower and LSC CF-10 solar powered flare. On January 31, 2023 construction of Phase 1 was substantially complete and SCS was able begin extracting gas using the Rotron blower. The flare was lit briefly and SCS was able to take gas readings at the blower inlet. Methane readings at the blower inlet ranged from 32% to 40% CH_4. SCS will continue testing the pilot system as the final layers of low permeable soil are placed.

Figure 1. Sidewall Odor Mitigation System Construction

2.4 FULL SYSTEM CONSTRUCTION

SCS-CONS began construction of the Phase 2 perimeter landfill gas horizontal collector (lower collector) during the month of January. SCS-CONS constructed the lower collector at times when inclement weather limited construction of Phase 1 of the system.

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 will be placed in each borehole and the hole will be backfilled around the casing with aggregate. A series of temperature sensors will be placed inside the steel casing. At the top of each borehole, an industrial internet of things (IIoT) transmitter will collect the data from the sensors and transmit 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

The in-situ Landfill Temperature Monitoring System Project encountered significant challenges during the month of January. Shortly after installation of the temperature measurement instrumentation (which occurred in late December), 7 of the 9 sensors installed stopped functioning. SCS-RMC mobilized to the site on January 11, 2023 to troubleshoot the non-functional temperature sensors. Part of the troubleshooting process involved placing another temperature sensor in the steel casings and measuring temperatures at various depths. The results of those measurements conducted on January 11, 2023 and January 12, 2023 are shown in Table 3

Table 3. Temperatures Measured within Temperature Monitoring System Casings on January 11, 2023 and January 12, 2023 (°F)

Depth (ft)	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7
20	234	146	210	129	120	210	203
40	235	190	212	207	130	215	213
60	232	210	244	207	147	215	226
80	229	235	246	206	210	-[2]	232
100	228	253	238	207	210	-	235
120	222	266	238	203	201	-	240
140	267	247	230	210	226	-	240
160	292	-[3]	228	226	266	-	240
180	-[4]	-	223	260	267	-	243
200	-	-	217	214	255	-	226

In many cases temperatures recorded within the casing exceeded the temperatures expected based on temperatures of the waste core tailings recorded during drilling of the in-situ Landfill Temperature Monitoring System or the temperatures measured at landfill gas collection wellheads during the past 18 months. Some temperatures exceeded the operating range of the temperature sensors that were installed into the probe casings in late December. SCS believes that the high temperatures and/or exposure to certain constituents in the subsurface fluids (liquids and/or gases) are the most likely cause of the failure of the temperature sensors.

[2] Sensor could not be lowered below 60 feet
[3] Casing does not extend below 160 feet.
[4] Casing does not extend below 180 feet.

On January 24, 2023 and January 25, 2023, SCS-RMC mobilized to the site again to take additional temperature measurements within the steel probe casings. In some cases liquids (or an actual physical obstruction at TP-6) within the casing limited the depths at which measurements could be taken. Temperature measurements taken during the second mobilization are summarized in Table 4.

Table 4. Temperatures Measured within Temperature Monitoring System Casings on January 24, 2023 and January 25, 2023 (°F)

Depth (ft)	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7
20	204	78	105	140	154	-[5]	211
40	251	80	124	-[6]	-[7]	-	215
60	240	120	189	-	-	-	224
80	275	180	260	-	-	-	232
100	293	281	291	-	-	-	232
120	303	300	304	-	-	-	-[8]
140	293	-[9]	-[10]	-	-	-	-
160	330	-	-	-	-	-	-

SCS-RMC has identified an alternative temperature sensor to be placed in the casing that has a higher operating range and is expected to withstand the temperatures measured in the waste, as well as chemical compatibility issues. The replacement sensors have been ordered and are expected to be installed during the month of February. Installation of the replacement sensors will require minor modifications to the configuration of the probe cap fitting and connections at the probe terminus of the in-situ Landfill Temperature Monitoring System.

Two of the temperature probes (TP-8 and TP-9) reported temperatures using the originally installed instrumentation. The daily average temperatures recorded in those probes are shown in Table 5 and Table 6. The temperature instrumentation within both of these probes will be replaced along with the rest of the probes to maintain consistency of equipment.

Table 5. Temperatures Measure within Temperature Probe 8 from January 16, 2023 until January 31, 2023 (°F)

Depth (ft)	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	42	42	49	50	42	40	44	37	46	47	38	42	48	40	45	48
20	171	171	171	172	173	173	171	171	172	171	171	170	170	170	170	170
40	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174	174

[5] Protective cover could not be removed from casing.
[6] Liquids prevented measurement below 20 feet.
[7] Liquids prevented measurement below 20 feet.
[8] The primary temperature measurement instrument stopped functioning before a measurement could be taken from TP-7. The secondary instrument could not measure depths greater than 100 feet.
[9] Liquids prevented measurement below 120 feet.
[10] Liquids prevented measurement below 120 feet.

Depth (ft)	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
60	173	173	173	173	173	173	173	173	173	173	174	174	174	173	173	173
80	175	175	175	175	175	175	175	175	176	176	176	176	176	176	176	176
100	175	175	175	175	175	175	175	175	176	175	176	176	175	175	175	175
120	178	177	177	177	177	178	178	178	178	178	178	178	178	178	178	178
140	185	185	185	185	185	185	186	186	186	186	186	186	186	186	186	186
160	182	182	182	181	181	182	182	182	182	182	182	182	182	182	182	182
180	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182
200	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
220	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171	171

Table 6. Temperatures Measure within Temperature Probe 9 from January 16, 2023 until January 31, 2023 (°F)

Depth (ft)	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	44	43	52	51	42	42	45	38	47	48	38	41	49	40	47	49
20	115	115	115	115	115	115	115	115	116	115	115	116	116	116	116	116
40	134	134	134	134	135	134	133	132	134	132	132	133	133	133	133	133
60	142	142	142	142	143	141	139	139	142	140	139	140	140	140	140	140
80	155	155	156	156	155	152	150	149	151	149	149	150	150	150	150	150
100	155	155	155	155	155	154	152	151	153	152	151	152	152	152	152	152
120	153	153	153	153	153	153	153	153	153	153	152	152	153	152	152	152
140	144	144	143	143	143	143	144	145	144	144	145	145	145	144	144	144
160	133	133	133	133	133	133	132	132	132	132	132	132	132	132	132	132
180	119	119	119	119	119	119	119	120	120	120	120	120	120	120	120	120
200	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111

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 about the leachate. The following sections detail steps taken to achieve these goals.

4.1 EXISTING SYSTEM OPTIMIZATION

During mobilizations to conduct surface emissions monitoring outlined in Section 1.1.1, SCS also collected stroke counter data from the pumps installed in the GCCS wells. Stroke counts were collected from 18 wells on January 5, 2023; January 11, 2023; January 19, 2023; January 26, 2023; and January 30, 2023. The data collected is summarized in Table 7.

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

Well	January 5, 2023	January 11, 2023	January 19, 2023	January 26, 2023	January 30, 2023
EW64	98027	98027	98033	98033	98033
EW61	212014	212015	212026	212047	212047
EW50	607679	607679	645961	668671	668671
EW49	439615	439615	439621	439636	439637
EW60	163908	163908	163913	163913	163913
EW52	227419	227419	227419	227419	227419
EW68	1606408	1624865	1625460	1633964	1638657
EW67	193258	193258	193258	193258	193258
EW54	105861	105863	105864	105864	105864
EW55	529010	529010	529010	529010	529010
EW58	1615381	1615384	1615392	1615403	1615406
EW59	925226	982636	1099706	1100113	1100119
EW57	125098	125103	125106	125106	125106
EW65	3572	3572	3802	3871	3871
EW63[11]	---	---	---	---	---
EW62	113988	113988	113992	113992	113992
EW53	1849469	1852531	1852535	1852553	1852553

Based on this data and stroke counts taken on December 27, 2022, SCS can estimate the number of gallons of liquid pumped from each well. SCS assumed that each stroke correlates to approximately 0.3 gallons of liquid removed from the well. This data will then be used to repair or replace pumps or replace nonfunctional stroke counters. Estimates of the quantities of liquids removed between the reading dates is shown in Table 8 below.

Table 8. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) December 27, 2022 to January 5, 2023	Liquids Removed (gal) January 5, 2023 to January 11, 2023	Liquids Removed (gal) January 11, 2023 to January 19, 2023	Liquids Removed (gal) January 19, 2023 to January 26, 2023	Liquids Removed (gal) January 26, 2023 to January 30, 2023
EW64	0	0	1.8	0	0
EW61	1.8	0.3	3.3	6.3	0
EW50	0	0	11484.6	6813.0	0
EW49	0	0	1.8	4.5	0.3

[11] The pump in Well 63 has been disconnected for maintenance.

Well	Liquids Removed (gal) December 27, 2022 to January 5, 2023	Liquids Removed (gal) January 5, 2023 to January 11, 2023	Liquids Removed (gal) January 11, 2023 to January 19, 2023	Liquids Removed (gal) January 19, 2023 to January 26, 2023	Liquids Removed (gal) January 26, 2023 to January 30, 2023
EW60	5860.5	0	1.5	0	0
EW52[12]	0	0	0	0	0
EW68	35541.0	5537.1	178.5	2551.2	1407.9
EW67	0	0	0	0	0
EW54	0	0.6	0.3	0	0
EW55	0	0	0	0	0
EW58[13]	0.9	0.9	2.4	3.3	0.9
EW59	1.5	17223.0	35121.0	122.1	1.8
EW57	75	1.5	0.9	0	0
EW65	0	0	69.0	20.7	0
EW63	-	-	-	-	-
EW62	0	0	1.2	0	0
EW53	0	918.6	1.2	5.4	0

SCS estimates that approximately 123,000 gallons of liquids were removed from the landfill gas collection and control system during the month of January. 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 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 give the landfill conditions.

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 #588 Landfill. The Plan documents procedures and instructions necessary to implement a leachate monitoring program for the Dual Phase Landfill Gas Extraction Wells (LFG-EWs) installed within the Permit #588 Landfill. The Plan was prepared in response to the Expert Panel Report prepared by the

[12] Subsequent investigation indicated that the pump in EW 52 is working but strokes are not being recorded.
[13] Subsequent investigation indicated that the pump in EW 58 is working but strokes are not being recorded.

Expert Panel convened by the Virginia Department of Environmental Quality to address odor problems and operational concerns at the Facility.

On December 1, 2022, SCS submitted to VDEQ the revised Plan addressing comments provided by VDEQ in an email dated November 28, 2022 regarding laboratory analytical methods. The revised Plan included modified sections addressing extraction well and pump maintenance and sample collection procedures.

4.3 SAMPLING AND ANALYSIS

4.3.1 Sample Collection

On January 17 and 18, 2023, SCS collected leachate samples from seven Dual Phase LFG-EWs (EW-50, EW-58, EW-59, and EW-65). Pumps were not running at the time of sample collection in the following wells: EW-49, EW-51, EW-53, EW-54, EW-55, EW-58, EW-61, EW-62, EW-64, and EW-65. There was no pump in EW-56 and EW-63 at the time of sample collection. 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.

The samples were delivered to Enthalpy Analytical (Enthalpy) in Richmond, Virginia and 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 outlined in the Dual Phase Landfill Gas Extraction Well Leachate Monitoring Plan.

The samples sent to Weck were only analyzed for volatile fatty acids (VFAs). Due a heavy backlog, the VFA results were not available at the time of this report submission. The January 2023 VFA results will be provided in the February 2023 Monthly Compliance Report. In addition, there continues to be a delay in the issuance of the lab report for a majority of the December 2022 VFA analyses. VFA results were issued for the December 2022 sampling of EW-50. The final COA for this analysis is included in Appendix F. The COA also includes the VELAP certification information for Pace Analytical.

4.3.2 Quality Assurance and Quality Control

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

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

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

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

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

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

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

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

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

4.3.3 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[14]. 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

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

parameter detections less than 10 times that of the trip blank, field blank, and/or method/laboratory blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Data with a "B" qualifier are considered not validated as the detection may be anomalous due to cross-contamination during sampling, transportation of samples, or laboratory analysis. No leachate results were flagged with a "B" qualifier for the December 2022 monitoring event as no constituents were detected in the December 2022 trip and method blanks.

4.3.4 Laboratory Analytical Results

Parameter results for the January 2023 monitoring event are presented on **Table 9**. The associated COA is included in **Appendix F**. Parameter results from the January 2023 and previous monitoring event (November and December 2022) are presented on a table in **Appendix F**. As previously stated, the January 2023 VFA results were not available at the time of this report submission. The January 2023 VFA results will be provided in the February 2023 Monthly Compliance Report. In addition, there continues to be a delay in the issuance of the lab report for a majority of the December 2022 VFA analyses. VFA results were issued for the December 2022 sampling of EW-50 and the results are presented on the table in **Appendix F**. The final COA for December 2022 EW-50 VFA analysis is included in **Appendix F.**

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-58	EW-59	EW-65	LOD	LOQ
Parameter	January 2023 Concentration					
Ammonia as N (mg/L)	**1520**	**1500**	---	**1330**	50	50
	---	---	**2440**	---	100	100
Biological Oxygen Demand (mg/L)	**9920**	**999**	**28100**	**7060**	0.2	2
Chemical Oxygen Demand (mg/L)	---	**3630**	---	---	500	500
	14900	---	---	**8430**	2000	2000
	---	---	**47600**	---	5000	5000
Nitrate as N (mg/L)	---	ND	---	---	0.35	1.35
	---	---	---	ND	1.1	1.1
	3.9	---	---	---	2.1	2.1
	---	---	ND	---	2.2	2.2
Nitrite as N (mg/L)	---	ND	---	---	0.25	1.25
	---	---	---	ND	1	1
	ND	---	ND	---	2	2
Total Kjeldahl Nitrogen (mg/L)	**1840**	**881**	---	**1410**	20	50
	---	---	**2970**	---	40	100
Total Recoverable Phenolics (mg/L)	**27.2**	**1.3**	---	**20.2**	0.75	1.25
	---	---	**56.5**	---	1.5	2.5
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)						
Anthracene	---	ND	---	---	243	485
	---	---	---	ND	253	505
	ND	---	---	---	490	980
	---	---	ND	---	500	1000
TOTAL METALS (mg/L)						
Arsenic	**0.285**	**0.596**	**0.225**	**0.846**	0.01	0.02
Barium	**0.643**	**0.683**	**1.92**	**0.554**	0.005	0.01
Cadmium	ND	ND	ND	ND	0.002	0.004
Chromium	**0.31**	**0.488**	**0.178**	**0.155**	0.008	0.01
Copper	ND	**0.0127**	**0.0256**	ND	0.008	0.01
Lead	ND	ND	ND	ND	0.006	0.01
Mercury	ND	ND	---	ND	0.0004	0.0004
	---	---	ND	---	0.004	0.004
Nickel	**0.1074**	**0.1442**	**0.0407**	**0.0769**	0.007	0.01
Selenium	ND	ND	ND	ND	0.04	0.05
Silver	ND	ND	ND	ND	0.005	0.01
Zinc	**0.133**	**0.15**	**0.074**	**0.0752**	0.01	0.01

Table 9. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-50	EW-58	EW-59	EW-65	LOD	LOQ
Parameter	January 2023 Concentration					
VOLATILE ORGANIC COMPOUNDS (ug/L)						
2-Butanone (MEK)	**3480**	**632**	---	---	30	100
	---	---	**7840**	**5470**	300	1000
Acetone	---	**1530**	---	---	70	100
	---	---	**22200**	**14000**	700	1000
	8130	---	---	---	1750	2500
Benzene	**240**	**28.7**	**1620**	**167**	4	10
Ethylbenzene	**65.1**	ND	**93.9**	**20.8**	4	10
Tetrahydrofuran	**183**	**566**	**1810**	**352**	100	100
Toluene	**122**	**8 J**	**139**	**35.3**	5	10
Xylenes, Total	**138**	ND	**134**	**38.1**	10	30

--- = not applicable
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

4.3.5 Monitoring Data Evaluation and Interpretation

As an ETLF, the characteristics of leachate from the SWP588 Landfill are anticipated to be different than that of leachate from a typical sanitary landfill. Table 10 provides a comparison of the January 2023 concentrations detected in the leachate from the LFG-EWs to concentrations commonly detected in new landfills[15] (less than two years old) for select parameters and concentrations detected in other ETLFs. The below table also provides data for leachate samples collected from the SWP588 Landfill's leachate collection system in July and November 2022. As shown on the below table, the constituent concentrations detected in the liquids from the LFG-EWs are similar to the detected concentrations in leachate from other ETLFs. These high concentrations are the products of endothermic pyrolysis of the waste in an ETLF.

[15] Tchobanoglous, George, Hilary Theisen, and Samuel Vigil. Integrated Solid Waste Management Engineering Principles and Management Issues. McGraw-Hill, Inc. New York. 1993.

Table 10. Leachate Composition Comparison

Parameter	SWP588 Dual Phase LFG-EWs Leachate	Typical New Sanitary Landfill Leachate	Other ETLFs	SWP588 Leachate Collection System
Ammonia as N (mg/L)	1330 - 2440	10 - 800	n/a	406
Biological Oxygen Demand (mg/L)	999 - 28100	2000 – 30000	728 - 65000	2170
Chemical Oxygen Demand (mg/L)	3630 - 47600	3000 – 60000	8400 - 79000	1760
Nitrate as N (mg/L)	ND (<0.35) - 3.9	n/a	4.64 - 10.5	n/a
pH (s.u.)	6.17 – 8.18	4.5 - 7.5	6.4 - 9.6	7.61 - 8.03
Total Kjeldahl Nitrogen (mg/L)	881 - 2970	n/a	3280 - 4860	455
TOTAL METALS (mg/L)				
Arsenic	0.225 - 0.846	n/a	0.1 - 0.98	0.156 - 0.267
Barium	0.554 - 1.92	n/a	0.18 - 1.29	0.944
Chromium	0.155 - 0.488	n/a	0.74 - 1.28	0.0779 - 0.0973
Copper	ND (<0.008) - 0.0256	n/a	ND (<0.05) - 0.07	0.0236
Nickel	0.0407 - 0.1442	n/a	0.07 - 0.37	0.0194
Zinc	0.074 - 0.15	n/a	0.41 - 12.9	n/a
VOLATILE ORGANIC COMPOUNDS (ug/L)				
2-Butanone (MEK)	632 - 7840	n/a	200 - 20700	n/a
Acetone	1530 - 22200	n/a	200 - 45400	n/a
Benzene	28.7 - 1620	n/a	10.4 - 64.4	304 - 1530
Ethylbenzene	20.8 - 93.9	n/a	2.0 - 14	85.2 - 183
Toluene	35.3 - 139	n/a	8 - 40.5	32.4 - 87.4
Xylenes, Total	38.1 - 138	n/a	14 - 32	65.2 - 158

mg/L = milligrams per liter
n/a = not available
ND = Not detected. Number shown in parenthesis is the laboratory's limit of detection.
s.u. = standard units
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 prepared a settlement monitoring and management plan. The plan provides for means and methods for monitoring surface elevations across the surface of the landfill, prior to, and after placement of the EVOH cover system. The settlement monitoring and management plan includes procedures for placement of settlement monitoring before and after the placement of the EVOH cover.

Settlement monitoring outlined in the plan includes two components:

- Installation and monitoring of settlement plates installed within the waste mass
- Monthly surveys of the landfill topography

The plan also addresses data collection procedures, settlement analysis, settlement plate design, and reporting procedures. The plan was submitted to VDEQ on November 15, 2022.

5.2 MONTHLY SURVEYS

5.2.1 Topographic Data Collection

The City, through SCS, collected topographic data of the Solid Waste Permit #588 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On January 10, 2023 the flight was completed and the topographic data collected. The topographic data collected is shown on Sheet 1 in Appendix E.

The topography within the landfill footprint was compared to topographic data collected by SCS using photogrammetric methods on December 2, 2022. A drawing depicting the December 2, 2022 topography is included as Sheet 2 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 17,100 cubic yards. During that same time period approximately 1,000,800 cubic yards of 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 16,100 cubic yards.

The largest settlement occurred primarily in the southern end of the landfill where the waste settled by 1 foot or more in some areas. Settlement in the northern portion of the landfill was generally less substantial. Some areas around the edges of the waste exhibited an increase in elevation, likely due to sediment deposition during storm events. Increases in elevation along the western edge of the landfill and most likely due to installation of the Sidewall Odor Mitigation System. Soil stockpile locations associated with the Sidewall Odor Mitigation System showed a larger negative elevation change due to material removal from the stockpiles. A visual depiction of settlement and filling at the landfill during this time is depicted on Sheet 3 in Appendix E.

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 change within the waste is approximately 0.6 feet.

SCS will collect topographic data covering the landfill surface again in February using photogrammetric methods via UAV. This data will be compared to the data collected in January.

5.2.2 Settlement Plate Surveys

On November 7, 2022 SCS field services installed 12 settlement plates on the Solid Waste Permit #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 sprayed painted orange to improve visibility.

The locations of the settlement plates were surveyed by the City's surveyor on November 14, 2022. The settlement plates were surveyed again on December 13, 2022 and January 3, 2023. The settlement plate locations are depicted on Sheet 4 in Appendix E. The surveyed coordinates[16] and elevation changes of the settlement plates are shown in Table 11.

Table 11. Settlement Plate Locations

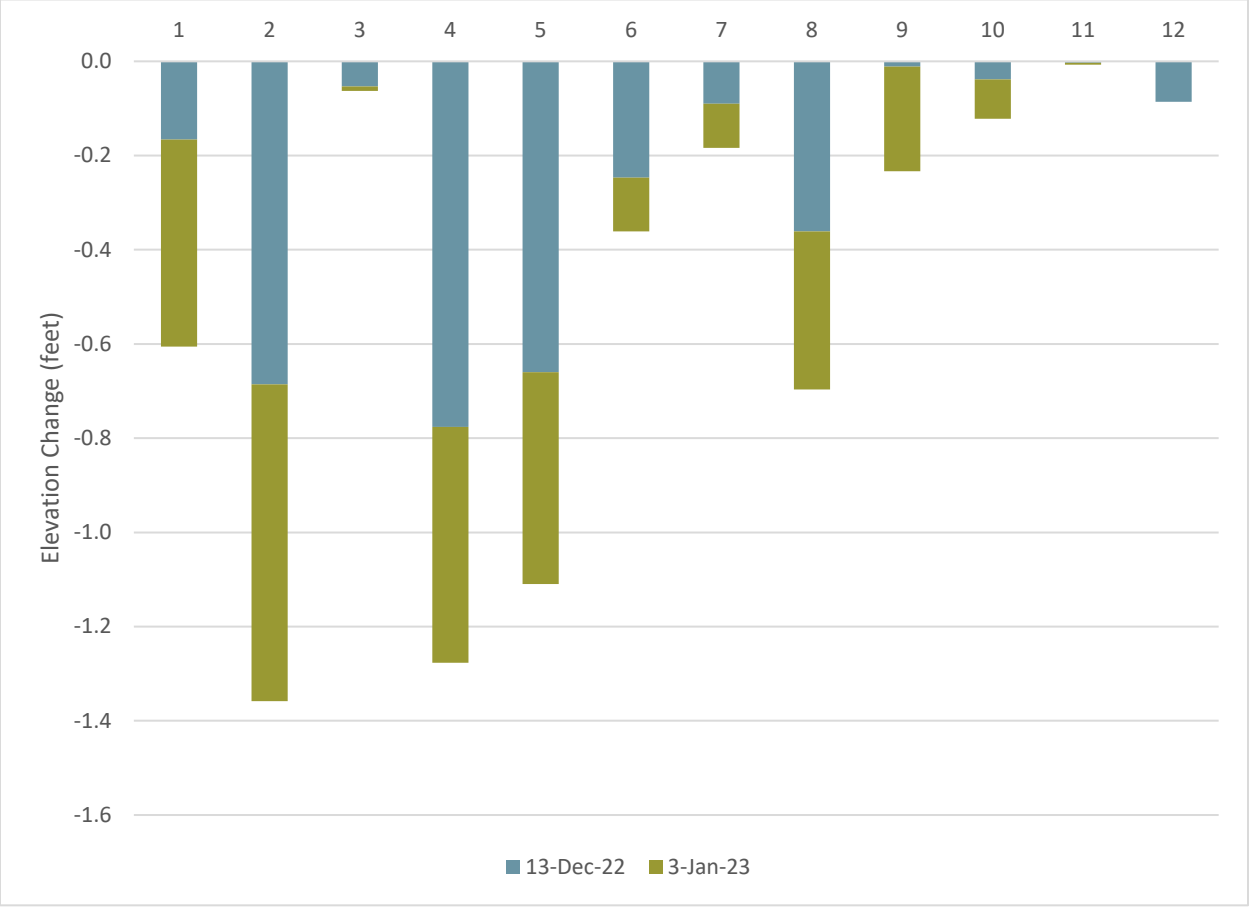
Settlement Plate	Northing	Easting	Elevation on January 3, 2023	Elevation Change Since December 13, 2022	Elevation Change Since Installation
SP-1	3,397,886.2	10,412,078.3	1,833.8	-0.4	-0.6
SP-2	3,397,806.4	10,412,364.4	1,809.2	-0.7	-1.4
SP-3	3,397,787.3	10,412,536.8	1,783.6	0.0	-0.1
SP-4	3,398,250.6	10,412,183.9	1,816.2	-0.5	-1.3
SP-5	3,398,256.4	10,412,338.8	1,799.7	-0.4	-1.1
SP-6	3,398,249.4	10,412,510.9	1,777.3	-0.1	-0.4
SP-7	3,398,737.8	10,412,157.3	1,828.4	-0.1	-0.2
SP-8	3,398,679.2	10,412,290.8	1,806.7	-0.3	-0.7
SP-9	3,398,673.4	10,412,400.8	1,785.6	-0.2	-0.2
SP-10	3,399,080.6	10,412,092.1	1,840.1	-0.1	-0.1
SP-11	3,399,216.3	10,412,183.7	1,816.3	0.0	0.0
SP-12	3,399,381.8	10,412,019.4	1,810.6	0.0	-0.1

Settlement Plates 1, 2, 4, 5, and 8 demonstrated substantial elevation change. These settlement plates are towards the center of the waste mass and in the southern end of the landfill. This area is where waste was most recently placed and is expected to show the most rapid settlement. This area is also the location of the gas wells exhibiting higher temperatures. Settlement Plate 8 exhibited less

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

of a change in elevation compared to the other three plates and is located further north than the other settlement plates. The elevation changes are also shown graphically in Figure 2.

Figure 2. Elevation Change of Settlement Plates



The rest of the settlement plates exhibited minimal settlement or values that are within the expected range for landfill settlement. The elevations changes of the settlement plates are generally consistent with elevation changes exhibited by a review of topographic data as outlined in Section 5.2.1.

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

6.0 INTERMEDIATE COVER AND EVOH COVER SYSTEM

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

6.1 INTERMEDIATE COVER INSTALLATION

The City completed hauling and placement of a 12-inch thick intermediate cover across the entire landfill prior to October 10, 2022. The cover was placed in accordance with 9VAC20-81-140(B)(1)(d).

SCS coordinated with the City to dig a series of test holes to verify cover thickness in select locations. Details of these verifications

6.2 EVOH COVER SYSTEM DESIGN

SCS submited the Ethylene Vinyl Alcohol (EVOH) Geomembrane Deployment Plan and product specification to VDEQ on January 30, 2023. SCS has prepared the rawings (7 sheets) titled "Interim EVOH Cover System Preliminary Design Plans" dated January 30, 2023 which include the layout and details of the proposed EVOH deployment. Those drawings are included in Appendix D.

The design addressed the gas collection infrastructure, grading work to be completed prior to deployment, estimates of stormwater volumes, stormwater channel profile, material volumes, and construction materials to be used.

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.

6.4 EVOH COVER SYSTEM INSTALLATION

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

7.0 STORM WATER MANAGEMENT

As discussed in section 6.3, the EVOH deployment plan included some initial stormwater management details. These details will be further refined as the design process progresses during the month of February.

8.0 MISCELLANEOUS

8.1 CEASE WASTE ACCEPTANCE

The City ceased acceptance of offsite waste at the Solid Waste Permit #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 #588 landfill on December 30, 2022. The Plan documents procedures for monitoring, maintaining, and repair/upgrade for the landfill cover, leachate and gas collection system, sidewall odor mitigation system, and the stormwater management controls for the City of Bristol Integrated Solid Waste

Management Facility Solid Waste Permit #588 Landfill. The Plan is intended to be a "living" document to be revised as construction is completed and new information becomes available.

8.3 MONTHLY COMPLIANCE REPORTS

As outlined in the introduction this report is intended to provide comprehensive updates regarding progress towards completion of each item outlined 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, outlined the actions taken as part of their community outreach efforts. For the month of January, those actions include:

- **January – ongoing basis:** Eight updates posted on the BristalVALandfill.org site and the existing City of Bristol Landfill Notifications and Information page covering several important updates including:
  - Progress updates during construction of the Sidewall Odor Mitigation System
  - Information related to the Motion for Mediation between Bristol, VA and Bristol, TN
  - Bristol, VA's request for contractor bids related to the Landfill Gas System expansion
  - Provided links to news articles discussing construction updates and information related to how Bristol, VA is funding current and future work at the landfill
  - Announcement of Bristol, VA entering a formal consent decree with the Virginia Office of the Attorney General and the Virginia Department of Environmental Quality.
- **January 6th:** Email communication sent to the list of members of the public signed up through the Bristol, VA website, the BristolVALandfill.org website, or at the November 1 Open House to receive information via email
  - Email provided a status update on the installation of the construction of the Sidewall Odor Mitigation System
  - Email announced the city was in the process of planning a second Open House, which will occur in February
  - Linked to a news article related to the U.S. District Court ordering the lawsuit to mediation, as well as to the Statement from Bristol, VA on the order
- **January 27th:** Email communication sent to the list of members of the public signed up through the Bristol, VA website, the BristolVALandfill.org website, or at the November 1 Open House to receive information via email
  - Email informed the public that Bristol, VA has entered a formal consent decree with the Virginia Office of the Attorney General and the Virginia Department of Environmental Quality
  - Links were provided where recipients could view the consent decree and submit public comments

- Email also included an update on construction of the Sidewall Odor Mitigation System
- Links included to a news article about why the landfill smells (Cardinal News) and to an article about Bristol, VA City Council approving $24 million for work related to the landfill

Appendix A

Surface Emissions Monitoring Summary Letters

January 11, 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 – January 5, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on January 5, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

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 newly installed temperature probes. 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 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances[1]	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

In accordance with the Plan of Action in Response to the Expert Panel Report, if no exceedances are detected during four consecutive monitoring events, monitoring frequency can be reduced from weekly to monthly. Therefore, since the January 5, 2023 weekly event was the first consecutive event with no exceedances, if the next three events also exhibit no exceedances, then the City may request the Department allow monitoring to be reduced to a monthly basis. However, at this time, monitoring will continue on a weekly basis.

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 performed corrective actions including wellhead vacuum adjustments, the installation of well-bore seal, and addition of soil cover prior to this event at locations that previously exhibited elevated methane concentrations.

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

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

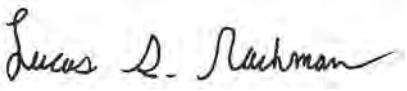
1 Exceedance locations were marked in the field with red flagging and were identified to landfill personnel to initiate corrective actions.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	1/5/23 Event	1/5/23 Event Result	Comments
EW-34	12/9/22	30-Day Retest	Pass	Exceedance Resolved
EW-52	12/27/22	10-Day Retest	Pass	Requires 30-Day Retest
EW-40	12/27/22	10-Day Retest	Pass	Requires 30-Day Retest
EW-55	12/27/22	10-Day Retest	Pass	Requires 30-Day Retest

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

Sincerely,



Charles J. Warren, PE
Project Manager
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	417.0 PPM	OK			Start Serpentine Route
2	74.1 PPM	OK			
3	133.0 PPM	OK			
4	19.4 PPM	OK			
5	104.0 PPM	OK			
6	14.0 PPM	OK			
7	23.1 PPM	OK			
8	19.4 PPM	OK			
9	15.5 PPM	OK			
10	120.0 PPM	OK			
11	26.6 PPM	OK			
12	20.5 PPM	OK			
13	6.7 PPM	OK			
14	4.0 PPM	OK			
15	16.9 PPM	OK			
16	78.7 PPM	OK			
17	68.5 PPM	OK			
18	14.9 PPM	OK			
19	17.7 PPM	OK			
20	20.7 PPM	OK			
21	18.8 PPM	OK			
22	41.2 PPM	OK			
23	5.2 PPM	OK			
24	1.3 PPM	OK			
25	33.6 PPM	OK			
26	178.0 PPM	OK			
27	300.0 PPM	OK			
28	246.0 PPM	OK			
29	205.0 PPM	OK			
30	239.0 PPM	OK			
31	77.8 PPM	OK			
32	39.9 PPM	OK			
33	34.8 PPM	OK			
34	315.0 PPM	OK			
35	197.0 PPM	OK			
36	69.5 PPM	OK			
37	141.0 PPM	OK			
38	295.0 PPM	OK			
39	108.0 PPM	OK			
40	439.0 PPM	OK			
41	24.9 PPM	OK			
42	16.0 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	6.0 PPM	OK			
44	6.4 PPM	OK			
45	6.9 PPM	OK			
46	3.7 PPM	OK			
47	15.6 PPM	OK			
48	5.5 PPM	OK			
49	6.6 PPM	OK			
50	10.0 PPM	OK			
51	4.6 PPM	OK			
52	11.1 PPM	OK			
53	6.4 PPM	OK			
54	8.2 PPM	OK			
55	6.6 PPM	OK			
56	6.4 PPM	OK			
57	13.6 PPM	OK			
58	5.7 PPM	OK			
59	15.2 PPM	OK			
60	10.1 PPM	OK			
61	3.9 PPM	OK			
62	5.9 PPM	OK			
63	9.7 PPM	OK			
64	13.0 PPM	OK			
65	21.2 PPM	OK			
66	24.1 PPM	OK			
67	9.9 PPM	OK			
68	14.1 PPM	OK			
69	6.0 PPM	OK			
70	118.0 PPM	OK			
71	4.6 PPM	OK			
72	2.9 PPM	OK			
73	21.1 PPM	OK			
74	3.1 PPM	OK			
75	134.0 PPM	OK			
76	282.0 PPM	OK			
77	92.8 PPM	OK			
78	260.0 PPM	OK			
79	211.0 PPM	OK			
80	129.0 PPM	OK			
81	284.0 PPM	OK			
82	27.0 PPM	OK			
83	24.0 PPM	OK			
84	6.0 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	5.0 PPM	OK			
86	3.7 PPM	OK			
87	10.8 PPM	OK			
88	3.3 PPM	OK			
89	6.7 PPM	OK			
90	10.7 PPM	OK			
91	17.9 PPM	OK			
92	48.1 PPM	OK			
93	38.3 PPM	OK			
94	16.6 PPM	OK			
95	5.0 PPM	OK			
96	4.2 PPM	OK			
97	174.0 PPM	OK			
98	105.0 PPM	OK			
99	7.6 PPM	OK			
100	9.3 PPM	OK			End Serpentine Route
101	358.0 PPM	OK			EW-35
102	452.0 PPM	OK			EW-52
103	89.5 PPM	OK			TP-4
104	76.8 PPM	OK			EW-60
105	39.9 PPM	OK			EW-48
106	49.9 PPM	OK			TP-6
107	4.8 PPM	OK			EW-61
108	5.4 PPM	OK			EW-36
109	375.0 PPM	OK			EW-34
110	24.7 PPM	OK			EW-50
111	17.4 PPM	OK			EW-67
112	215.0 PPM	OK			EW-47
113	354.0 PPM	OK			EW-54
114	23.0 PPM	OK			EW-55
115	176.0 PPM	OK			TP-2
116	29.4 PPM	OK			EW-46
117	67.8 PPM	OK			EW-66
118	6.8 PPM	OK			EW-58
119	274.0 PPM	OK			EW-57
120	14.0 PPM	OK			TP-1
121	227.0 PPM	OK			EW-59
122	302.0 PPM	OK			EW-56
123	449.0 PPM	OK			EW-41
124	242.0 PPM	OK			EW-53
125	60.5 PPM	OK			EW-40

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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	8.0 PPM	OK			TP-3
127	131.0 PPM	OK			EW-51
128	107.0 PPM	OK			EW-39
129	32.1 PPM	OK			TP-5
130	143.0 PPM	OK			EW-68
131	18.5 PPM	OK			EW-38
132	4.5 PPM	OK			TP-7
133	0.1 PPM	OK			EW-49
134	2.4 PPM	OK			EW-31R
135	1.1 PPM	OK			EW-65
136	2.4 PPM	OK			EW-37
137	4.4 PPM	OK			TP-8
138	1.0 PPM	OK			EW-64
139	3.4 PPM	OK			EW-30R
140	2.3 PPM	OK			EW-63
141	8.6 PPM	OK			EW-42
142	21.9 PPM	OK			TP-9
143	3.3 PPM	OK			EW-33R
144	32.2 PPM	OK			EW-62
145	4.8 PPM	OK			EW-29R
146	7.3 PPM	OK			EW-25
147	12.0 PPM	OK			EW-24
148	1.3 PPM	OK			EW-32
149	5.9 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

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

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

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

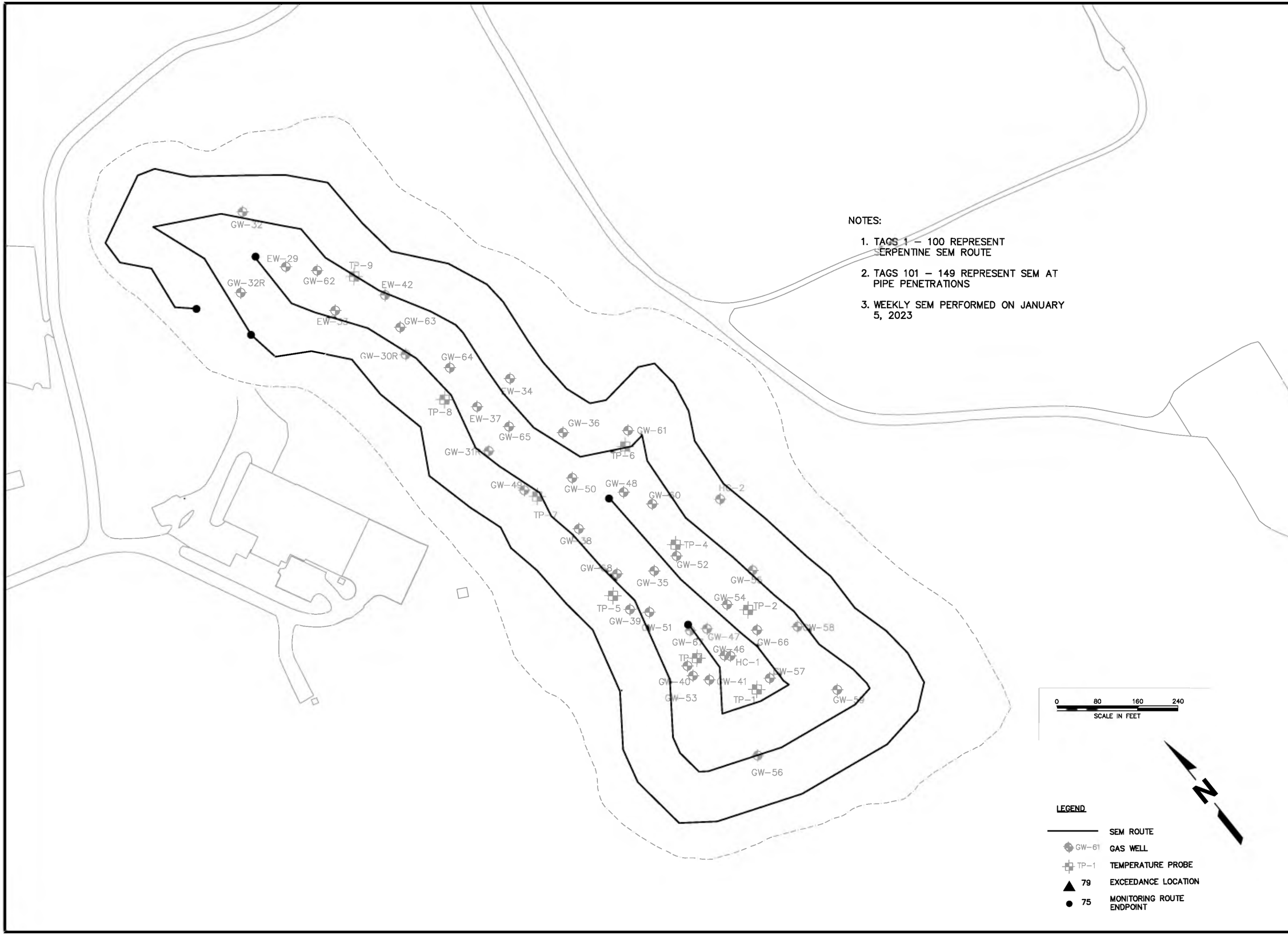
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 149 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 45°F Wind: W - 10 MPH

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

1/5/2023	8:43	ZERO	0.2 PPM
1/5/2023	8:50	SPAN	502.0 PPM

Background Reading:

1/5/2023	8:51	Upwind	5.5 PPM
1/5/2023	8:55	Downwind	6.9 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JANUARY 5, 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.
15321 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: 1/5/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

January 18, 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 – January 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 January 11, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

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 newly installed temperature probes. 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 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances[1]	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

In accordance with the Plan of Action in Response to the Expert Panel Report, if no exceedances are detected during four consecutive monitoring events, monitoring frequency can be reduced from weekly to monthly. Therefore, since the January 11, 2023 weekly event was the second consecutive event with no exceedances, if the next two events also exhibit no exceedances, then the City may request the Department allow monitoring to be reduced to a monthly basis. However, at this time, monitoring will continue on a weekly basis.

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 performed corrective actions including wellhead vacuum adjustments, the installation of well-bore seal, and addition of soil cover prior to this event at locations that previously exhibited elevated methane concentrations.

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

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

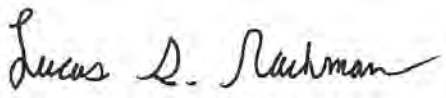
1 Exceedance locations were marked in the field with red flagging and were identified to landfill personnel to initiate corrective actions.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	1/11/23 Event	1/11/23 Event Result	Comments
EW-52	12/27/22	N/A	Pass	Requires 30-Day Retest
EW-40	12/27/22	N/A	Pass	Requires 30-Day Retest
EW-55	12/27/22	N/A	Pass	Requires 30-Day Retest

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

Sincerely,



Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	260.0 PPM	OK			Start Serpentine Route
2	2.5 PPM	OK			
3	9.9 PPM	OK			
4	49.2 PPM	OK			
5	31.5 PPM	OK			
6	1.5 PPM	OK			
7	2.0 PPM	OK			
8	3.3 PPM	OK			
9	17.2 PPM	OK			
10	7.7 PPM	OK			
11	4.5 PPM	OK			
12	13.2 PPM	OK			
13	45.1 PPM	OK			
14	47.1 PPM	OK			
15	39.6 PPM	OK			
16	51.4 PPM	OK			
17	22.5 PPM	OK			
18	39.1 PPM	OK			
19	34.4 PPM	OK			
20	80.0 PPM	OK			
21	45.5 PPM	OK			
22	26.6 PPM	OK			
23	31.7 PPM	OK			
24	28.0 PPM	OK			
25	31.9 PPM	OK			
26	29.1 PPM	OK			
27	26.4 PPM	OK			
28	40.2 PPM	OK			
29	45.7 PPM	OK			
30	38.5 PPM	OK			
31	88.0 PPM	OK			
32	155.0 PPM	OK			
33	73.0 PPM	OK			
34	15.8 PPM	OK			
35	12.6 PPM	OK			
36	24.6 PPM	OK			
37	163.0 PPM	OK			
38	25.6 PPM	OK			
39	21.9 PPM	OK			
40	390.0 PPM	OK			
41	118.0 PPM	OK			
42	7.4 PPM	OK			

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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	6.4 PPM	OK			
44	8.2 PPM	OK			
45	33.4 PPM	OK			
46	9.2 PPM	OK			
47	6.6 PPM	OK			
48	334.0 PPM	OK			
49	6.8 PPM	OK			
50	1.8 PPM	OK			
51	3.3 PPM	OK			
52	5.5 PPM	OK			
53	4.5 PPM	OK			
54	4.5 PPM	OK			
55	2.9 PPM	OK			
56	3.2 PPM	OK			
57	3.4 PPM	OK			
58	7.0 PPM	OK			
59	5.0 PPM	OK			
60	2.6 PPM	OK			
61	2.7 PPM	OK			
62	2.2 PPM	OK			
63	1.8 PPM	OK			
64	1.8 PPM	OK			
65	1.4 PPM	OK			
66	2.5 PPM	OK			
67	3.1 PPM	OK			
68	117.0 PPM	OK			
69	57.2 PPM	OK			
70	378.0 PPM	OK			
71	175.0 PPM	OK			
72	128.0 PPM	OK			
73	203.0 PPM	OK			
74	32.9 PPM	OK			
75	51.2 PPM	OK			
76	67.6 PPM	OK			
77	9.2 PPM	OK			
78	438.0 PPM	OK			
79	28.1 PPM	OK			
80	17.5 PPM	OK			
81	29.4 PPM	OK			
82	49.4 PPM	OK			
83	3.8 PPM	OK			
84	7.3 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	14.0 PPM	OK			
86	9.0 PPM	OK			
87	8.4 PPM	OK			
88	3.8 PPM	OK			
89	1.3 PPM	OK			
90	2.1 PPM	OK			
91	13.9 PPM	OK			
92	14.6 PPM	OK			
93	8.0 PPM	OK			
94	5.7 PPM	OK			
95	6.4 PPM	OK			
96	138.0 PPM	OK			
97	85.5 PPM	OK			
98	5.0 PPM	OK			
99	8.8 PPM	OK			
100	8.1 PPM	OK			End Serpentine Route
101	302.0 PPM	OK			EW-35
102	493.0 PPM	OK			EW-52
103	6.3 PPM	OK			TP-4
104	101.0 PPM	OK			EW-60
105	102.0 PPM	OK			EW-48
106	5.9 PPM	OK			TP-6
107	14.0 PPM	OK			EW-61
108	8.0 PPM	OK			EW-36
109	356.0 PPM	OK			EW-34
110	2.4 PPM	OK			EW-50
111	72.7 PPM	OK			EW-67
112	213.0 PPM	OK			EW-47
113	466.0 PPM	OK			EW-54
114	49.6 PPM	OK			EW-55
115	151.0 PPM	OK			TP-2
116	38.9 PPM	OK			EW-46
117	317.0 PPM	OK			EW-66
118	29.2 PPM	OK			EW-58
119	485.0 PPM	OK			EW-57
120	117.0 PPM	OK			TP-1
121	254.0 PPM	OK			EW-59
122	337.0 PPM	OK			EW-56
123	305.0 PPM	OK			EW-41
124	119.0 PPM	OK			EW-53
125	246.0 PPM	OK			EW-40

SCS ENGINEERS

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	18.5 PPM	OK			TP-3
127	81.9 PPM	OK			EW-51
128	27.8 PPM	OK			EW-39
129	97.9 PPM	OK			TP-5
130	31.4 PPM	OK			EW-68
131	92.8 PPM	OK			EW-38
132	3.6 PPM	OK			TP-7
133	5.1 PPM	OK			EW-49
134	16.5 PPM	OK			EW-31R
135	8.0 PPM	OK			EW-65
136	9.2 PPM	OK			EW-37
137	6.6 PPM	OK			TP-8
138	22.2 PPM	OK			EW-64
139	10.2 PPM	OK			EW-30R
140	20.5 PPM	OK			EW-63
141	29.7 PPM	OK			EW-42
142	8.4 PPM	OK			TP-9
143	7.1 PPM	OK			EW-33R
144	219.0 PPM	OK			EW-62
145	9.1 PPM	OK			EW-29R
146	20.3 PPM	OK			EW-25
147	21.3 PPM	OK			EW-24
148	22.2 PPM	OK			EW-32
149	40.1 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

SCS ENGINEERS

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

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

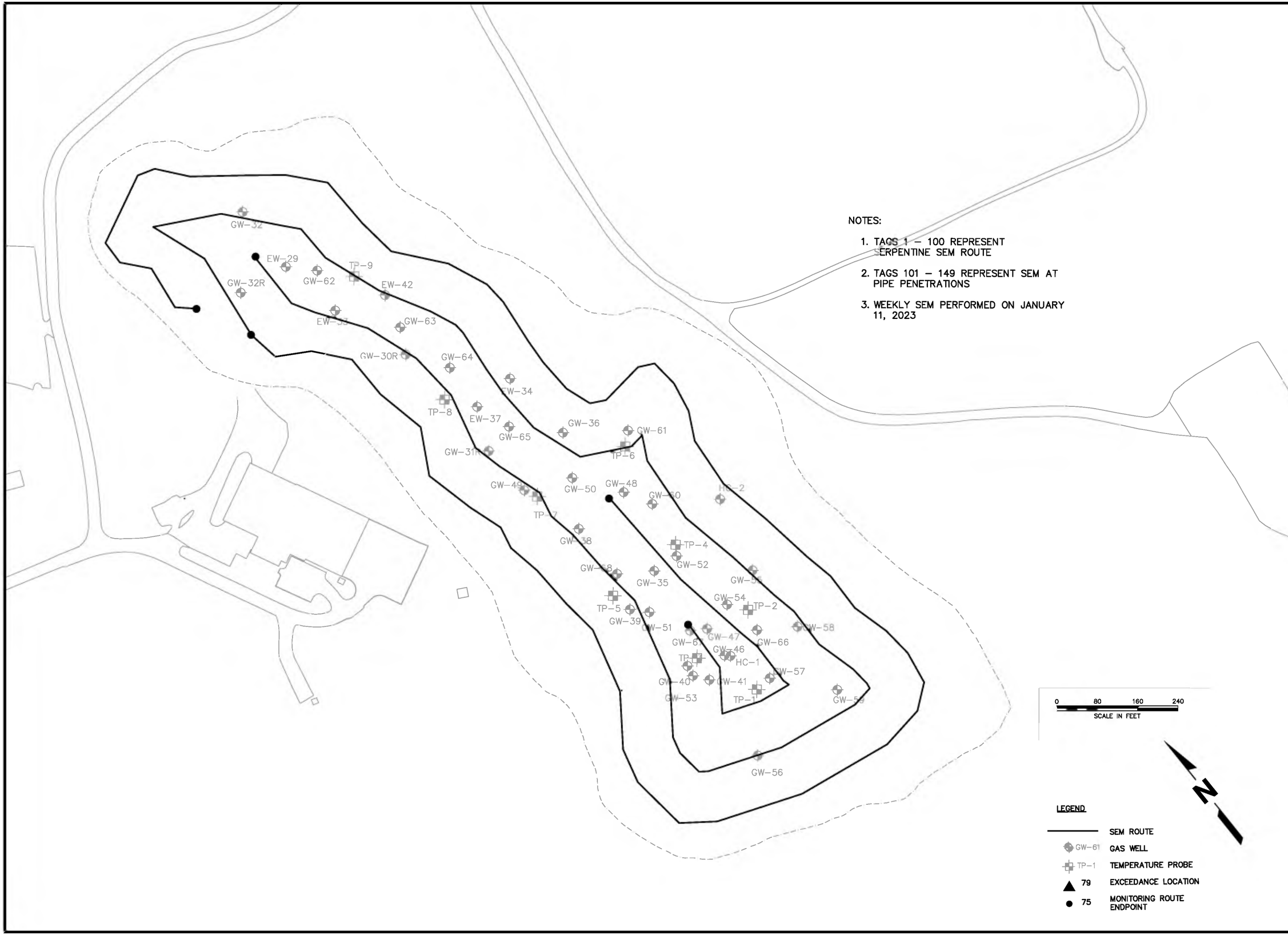
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 149 represent SEM at Pipe Penetrations
Weather Conditions: Sunny, 45°F Wind: E - 5 MPH

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

1/11/2023	9:32	ZERO	0.0 PPM
1/11/2023	9:35	SPAN	501.0 PPM

Background Reading:

1/11/2023	9:36	Upwind	2.5 PPM
1/11/2023	9:45	Downwind	8.1 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JANUARY 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.
15321 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

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

FILE: 02218208.04
DATE: 1/11/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

January 25, 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 – January 25, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on January 19, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

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 newly installed temperature probes. 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 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances[1]	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

In accordance with the Plan of Action in Response to the Expert Panel Report, if no exceedances are detected during four consecutive monitoring events, monitoring frequency can be reduced from weekly to monthly. Therefore, since the January 19, 2023 weekly event was the third consecutive event with no exceedances, if the next event also exhibits no exceedances, then the City may request the Department allow monitoring to be reduced to a monthly basis. However, at this time, monitoring will continue on a weekly basis.

Remonitoring of Ongoing Exceedances

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

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

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

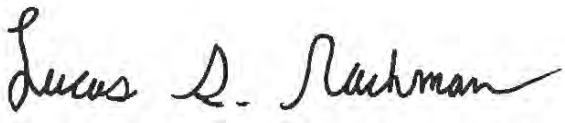
1 Exceedance locations were marked in the field with red flagging and were identified to landfill personnel to initiate corrective actions.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	1/19/23 Event	1/19/23 Event Result	Comments
EW-52	12/27/22	N/A	Pass	Requires 30-Day Retest
EW-40	12/27/22	N/A	Pass	Requires 30-Day Retest
EW-55	12/27/22	N/A	Pass	Requires 30-Day Retest

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

Sincerely,



Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 19, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	69.0 PPM	OK			Start Serpentine Route
2	62.3 PPM	OK			
3	36.0 PPM	OK			
4	317.0 PPM	OK			
5	156.0 PPM	OK			
6	34.3 PPM	OK			
7	117.0 PPM	OK			
8	68.8 PPM	OK			
9	15.5 PPM	OK			
10	32.8 PPM	OK			
11	80.3 PPM	OK			
12	22.0 PPM	OK			
13	14.7 PPM	OK			
14	42.4 PPM	OK			
15	18.9 PPM	OK			
16	153.0 PPM	OK			
17	83.0 PPM	OK			
18	68.0 PPM	OK			
19	51.8 PPM	OK			
20	22.9 PPM	OK			
21	120.0 PPM	OK			
22	186.0 PPM	OK			
23	27.0 PPM	OK			
24	23.9 PPM	OK			
25	19.5 PPM	OK			
26	69.5 PPM	OK			
27	37.9 PPM	OK			
28	233.0 PPM	OK			
29	269.0 PPM	OK			
30	414.0 PPM	OK			
31	469.0 PPM	OK			
32	394.0 PPM	OK			
33	391.0 PPM	OK			
34	190.0 PPM	OK			
35	73.7 PPM	OK			
36	61.4 PPM	OK			
37	118.0 PPM	OK			
38	81.1 PPM	OK			
39	130.0 PPM	OK			
40	114.0 PPM	OK			
41	55.0 PPM	OK			
42	28.0 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 19, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	27.2 PPM	OK			
44	45.0 PPM	OK			
45	27.3 PPM	OK			
46	18.4 PPM	OK			
47	196.0 PPM	OK			
48	30.1 PPM	OK			
49	23.0 PPM	OK			
50	21.6 PPM	OK			
51	49.7 PPM	OK			
52	30.9 PPM	OK			
53	55.7 PPM	OK			
54	33.7 PPM	OK			
55	123.0 PPM	OK			
56	30.8 PPM	OK			
57	35.4 PPM	OK			
58	29.4 PPM	OK			
59	133.0 PPM	OK			
60	30.4 PPM	OK			
61	32.9 PPM	OK			
62	55.2 PPM	OK			
63	45.6 PPM	OK			
64	49.8 PPM	OK			
65	44.6 PPM	OK			
66	92.8 PPM	OK			
67	86.9 PPM	OK			
68	55.9 PPM	OK			
69	71.9 PPM	OK			
70	94.5 PPM	OK			
71	32.9 PPM	OK			
72	14.4 PPM	OK			
73	82.7 PPM	OK			
74	268.0 PPM	OK			
75	94.1 PPM	OK			
76	116.0 PPM	OK			
77	78.0 PPM	OK			
78	102.0 PPM	OK			
79	56.7 PPM	OK			
80	49.7 PPM	OK			
81	79.4 PPM	OK			
82	69.9 PPM	OK			
83	135.0 PPM	OK			
84	15.0 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 19, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	216.0 PPM	OK			
86	19.7 PPM	OK			
87	10.9 PPM	OK			
88	16.1 PPM	OK			
89	24.9 PPM	OK			
90	53.3 PPM	OK			
91	34.3 PPM	OK			
92	28.2 PPM	OK			
93	10.1 PPM	OK			
94	15.6 PPM	OK			
95	91.3 PPM	OK			
96	331.0 PPM	OK			
97	247.0 PPM	OK			
98	73.6 PPM	OK			
99	132.0 PPM	OK			
100	113.0 PPM	OK			End Serpentine Route
101	51.8 PPM	OK			EW-35
102	381.0 PPM	OK			EW-52
103	41.2 PPM	OK			TP-4
104	117.0 PPM	OK			EW-60
105	302.0 PPM	OK			EW-48
106	98.6 PPM	OK			TP-6
107	58.8 PPM	OK			EW-61
108	21.5 PPM	OK			EW-36
109	24.1 PPM	OK			EW-34
110	22.9 PPM	OK			EW-50
111	226.0 PPM	OK			EW-67
112	237.0 PPM	OK			EW-47
113	403.0 PPM	OK			EW-54
114	50.9 PPM	OK			EW-55
115	29.4 PPM	OK			TP-2
116	67.4 PPM	OK			EW-46
117	428.0 PPM	OK			EW-66
118	376.0 PPM	OK			EW-58
119	23.8 PPM	OK			EW-57
120	56.3 PPM	OK			TP-1
121	205.0 PPM	OK			EW-59
122	321.0 PPM	OK			EW-56
123	241.0 PPM	OK			EW-41
124	228.0 PPM	OK			EW-53
125	150.0 PPM	OK			EW-40

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 19, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	83.8 PPM	OK			TP-3
127	101.0 PPM	OK			EW-51
128	208.0 PPM	OK			EW-39
129	91.2 PPM	OK			TP-5
130	155.0 PPM	OK			EW-68
131	497.0 PPM	OK			EW-38
132	19.3 PPM	OK			TP-7
133	16.1 PPM	OK			EW-49
134	7.5 PPM	OK			EW-31R
135	14.7 PPM	OK			EW-65
136	14.7 PPM	OK			EW-37
137	21.9 PPM	OK			TP-8
138	17.0 PPM	OK			EW-64
139	34.8 PPM	OK			EW-30R
140	17.1 PPM	OK			EW-63
141	33.2 PPM	OK			EW-42
142	8.7 PPM	OK			TP-9
143	45.8 PPM	OK			EW-33R
144	131.0 PPM	OK			EW-62
145	31.9 PPM	OK			EW-29R
146	23.6 PPM	OK			EW-25
147	58.1 PPM	OK			EW-24
148	47.4 PPM	OK			EW-32
149	62.2 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 19, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

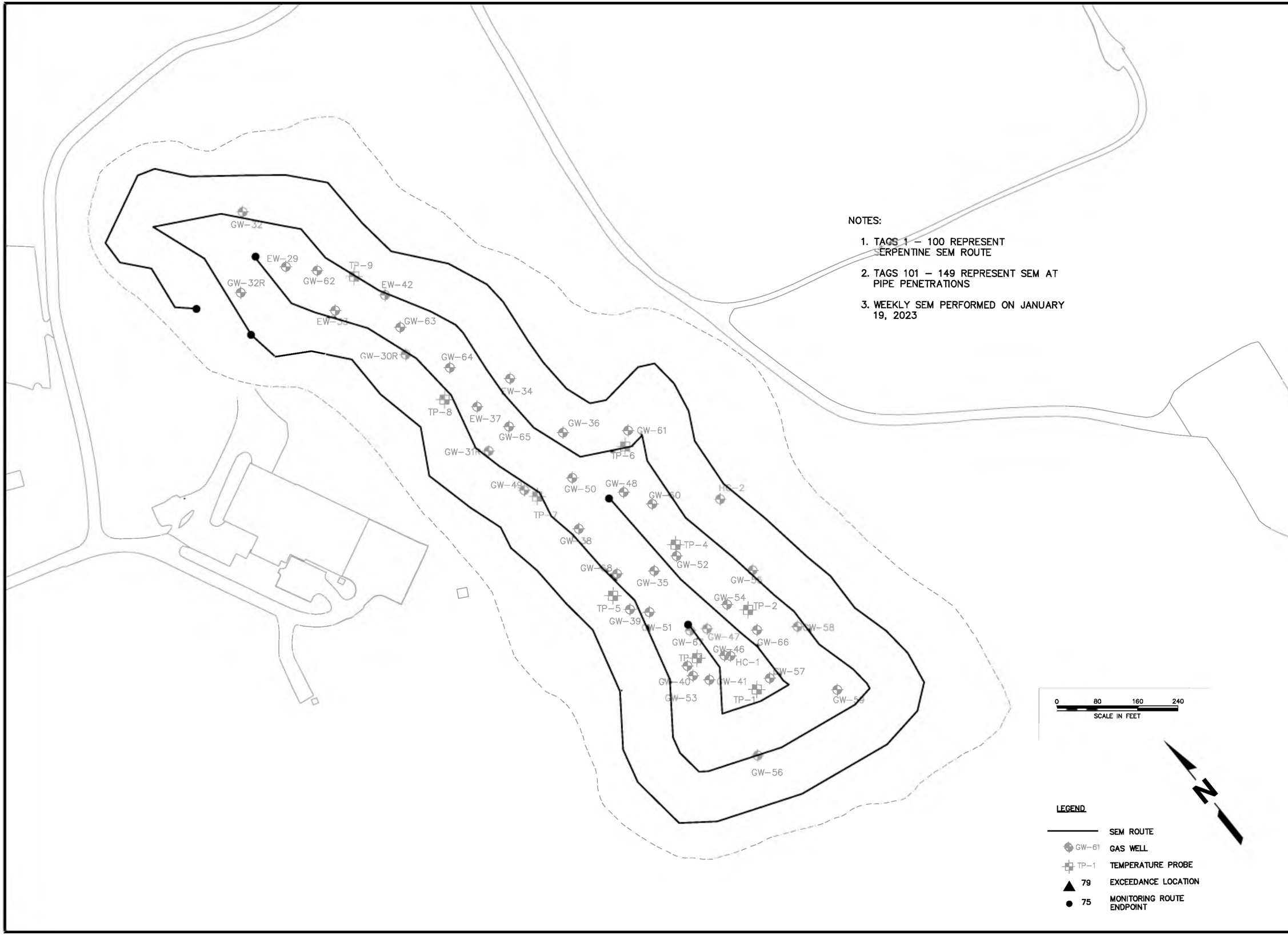
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 149 represent SEM at Pipe Penetrations
Weather Conditions: Cloudy, 60°F Wind: W - 15 MPH

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

1/19/2023	8:36	ZERO	0.0 PPM
1/19/2023	8:41	SPAN	501.0 PPM

Background Reading:

1/19/2023	8:51	Upwind	8.5 PPM
1/19/2023	8:54	Downwind	6.5 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JANUARY 19, 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.
15321 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
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PROJ. NO.	DWN. BY:	Q/A RVW BY:
02218208.04	LSN	
DSN. BY:	CHK. BY:	APP. BY:
LSN	DBK	

FILE: 02218208.04
DATE: 1/19/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

February 1, 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 – January 26, 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 January 26, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

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 newly installed temperature probes. 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 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances[1]	1
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	1

Proposed corrective actions at the one location with a methane exceedance, the pipe penetration of well 53, involved reconnecting the exceedance well to vacuum. Results of corrective actions and remonitoring results will be presented in subsequent reports.

Remonitoring of Ongoing Exceedances

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

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

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

1 Exceedance locations were marked in the field with red flagging and were identified to landfill personnel to initiate corrective actions.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	1/26/23 Event	1/26/23 Event Result	Comments
EW-52	12/27/22	30-Day Retest	Pass	Exceedance Resolved
EW-40	12/27/22	30-Day Retest	Pass	Exceedance Resolved
EW-55	12/27/22	30-Day Retest	Pass	Exceedance Resolved

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

Sincerely,

Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 26, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	11.0 PPM	OK			Start Serpentine Route
2	10.6 PPM	OK			
3	5.0 PPM	OK			
4	4.4 PPM	OK			
5	13.7 PPM	OK			
6	51.6 PPM	OK			
7	24.2 PPM	OK			
8	21.9 PPM	OK			
9	3.0 PPM	OK			
10	3.2 PPM	OK			
11	4.8 PPM	OK			
12	5.6 PPM	OK			
13	10.2 PPM	OK			
14	5.7 PPM	OK			
15	6.4 PPM	OK			
16	4.1 PPM	OK			
17	27.8 PPM	OK			
18	4.2 PPM	OK			
19	7.1 PPM	OK			
20	8.6 PPM	OK			
21	8.0 PPM	OK			
22	7.2 PPM	OK			
23	12.4 PPM	OK			
24	6.7 PPM	OK			
25	9.8 PPM	OK			
26	10.7 PPM	OK			
27	61.3 PPM	OK			
28	79.8 PPM	OK			
29	22.7 PPM	OK			
30	14.7 PPM	OK			
31	24.7 PPM	OK			
32	18.4 PPM	OK			
33	196.0 PPM	OK			
34	45.9 PPM	OK			
35	49.3 PPM	OK			
36	102.0 PPM	OK			
37	12.0 PPM	OK			
38	10.6 PPM	OK			
39	37.7 PPM	OK			
40	33.4 PPM	OK			
41	21.3 PPM	OK			
42	5.2 PPM	OK			

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 26, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	3.9 PPM	OK			
44	3.8 PPM	OK			
45	4.9 PPM	OK			
46	2.2 PPM	OK			
47	13.6 PPM	OK			
48	15.9 PPM	OK			
49	6.7 PPM	OK			
50	13.7 PPM	OK			
51	7.6 PPM	OK			
52	4.3 PPM	OK			
53	29.7 PPM	OK			
54	10.3 PPM	OK			
55	8.0 PPM	OK			
56	4.6 PPM	OK			
57	3.4 PPM	OK			
58	4.4 PPM	OK			
59	3.2 PPM	OK			
60	2.2 PPM	OK			
61	4.6 PPM	OK			
62	6.4 PPM	OK			
63	6.0 PPM	OK			
64	2.8 PPM	OK			
65	5.1 PPM	OK			
66	5.9 PPM	OK			
67	17.3 PPM	OK			
68	2.9 PPM	OK			
69	8.5 PPM	OK			
70	6.0 PPM	OK			
71	59.8 PPM	OK			
72	89.4 PPM	OK			
73	16.5 PPM	OK			
74	21.4 PPM	OK			
75	249.0 PPM	OK			
76	187.0 PPM	OK			
77	32.4 PPM	OK			
78	69.2 PPM	OK			
79	37.6 PPM	OK			
80	54.5 PPM	OK			
81	29.5 PPM	OK			
82	7.0 PPM	OK			
83	117.0 PPM	OK			
84	4.1 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 26, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	3.9 PPM	OK			
86	16.9 PPM	OK			
87	2.3 PPM	OK			
88	4.0 PPM	OK			
89	3.4 PPM	OK			
90	2.9 PPM	OK			
91	4.2 PPM	OK			
92	5.8 PPM	OK			
93	5.7 PPM	OK			
94	16.8 PPM	OK			
95	26.1 PPM	OK			
96	86.0 PPM	OK			
97	6.4 PPM	OK			
98	418.0 PPM	OK			
99	97.0 PPM	OK			
100	77.7 PPM	OK			End Serpentine Route
101	256.0 PPM	OK			EW-35
102	120.0 PPM	OK			EW-52
103	15.6 PPM	OK			TP-4
104	38.6 PPM	OK			EW-60
105	35.7 PPM	OK			EW-48
106	23.9 PPM	OK			TP-6
107	6.5 PPM	OK			EW-61
108	6.9 PPM	OK			EW-36
109	16.8 PPM	OK			EW-34
110	46.4 PPM	OK			EW-50
111	43.9 PPM	OK			EW-67
112	60.9 PPM	OK			EW-47
113	51.0 PPM	OK			EW-54
114	6.6 PPM	OK			EW-55
115	118.0 PPM	OK			TP-2
116	278.0 PPM	OK			EW-46
117	287.0 PPM	OK			EW-66
118	80.3 PPM	OK			EW-58
119	95.2 PPM	OK			EW-57
120	59.1 PPM	OK			TP-1
121	360.0 PPM	OK			EW-59
122	194.0 PPM	OK			EW-56
123	467.0 PPM	OK			EW-41
124	2553.0 PPM	HIGH_ALRM	36.59818	-82.14787	EW-53
125	141.0 PPM	OK			EW-40

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 26, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	59.5 PPM	OK			TP-3
127	281.0 PPM	OK			EW-51
128	332.0 PPM	OK			EW-39
129	73.0 PPM	OK			TP-5
130	80.7 PPM	OK			EW-68
131	218.0 PPM	OK			EW-38
132	7.4 PPM	OK			TP-7
133	3.7 PPM	OK			EW-49
134	8.8 PPM	OK			EW-31R
135	3.2 PPM	OK			EW-65
136	1.7 PPM	OK			EW-37
137	7.1 PPM	OK			TP-8
138	2.7 PPM	OK			EW-64
139	4.1 PPM	OK			EW-30R
140	4.1 PPM	OK			EW-63
141	6.0 PPM	OK			EW-42
142	2.6 PPM	OK			TP-9
143	8.7 PPM	OK			EW-33R
144	235.0 PPM	OK			EW-62
145	2.3 PPM	OK			EW-29R
146	140.0 PPM	OK			EW-25
147	15.4 PPM	OK			EW-24
148	2.5 PPM	OK			EW-32
149	4.6 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	1

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - JANUARY 26, 2023
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

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

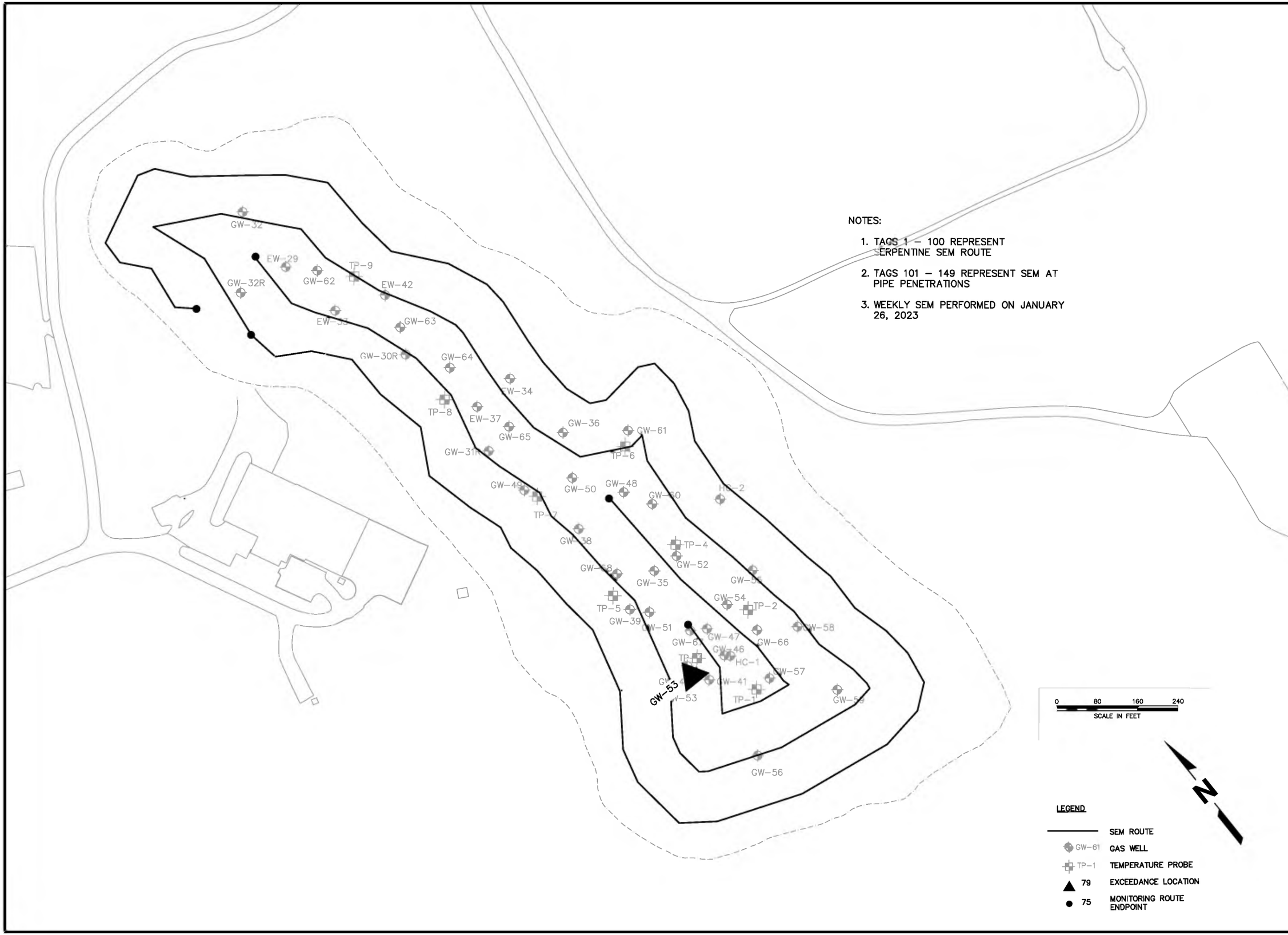
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 149 represent SEM at Pipe Penetrations
Weather Conditions: Cloudy, 35˚F Wind: W - 10 MPH

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

1/26/2023	7:50	ZERO	0.0 PPM
1/26/2023	7:57	SPAN	503.0 PPM

Background Reading:

1/26/2023	8:00	Upwind	4.2 PPM
1/26/2023	8:02	Downwind	2 PPM



NO.	REVISION	DATE

SHEET TITLE
WEEKLY SEM ROUTE

PROJECT TITLE
SURFACE EMISSIONS MONITORING
SOLID WASTE PERMIT #588

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
15321 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: 1/26/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

February 8, 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 – January 30, 2023
Bristol Integrated Solid Waste Facility – Bristol, Virginia

Dear Mr. Chapman:

On behalf of the City of Bristol (City), SCS Engineers (SCS), is pleased to submit the results of the Weekly Surface Emissions Monitoring event performed at the Bristol Integrated Solid Waste Facility located in Bristol, Virginia on January 30, 2023. This Weekly Surface Emissions Monitoring (SEM) Event was performed in accordance with Section 3.5 of the Plan of Action in Response to the Expert Panel Report, submitted to VDEQ on July 6, 2022.

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 newly installed temperature probes. 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 588 Landfill has a surface area of approximately 17.3 acres. Therefore, the minimum number of sampling points to cover the appropriate portion of the landfill footprint, utilizing a 30-meter grid interval, is approximately 82 (4.75 points per acre). A summary of the results of the surface emissions monitory is provided in Table 1.

Table 1. Summary of Surface Emissions Monitoring

Description	Quantity
Number of Points Sampled	149
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	49
Number of Exceedances[1]	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

Remonitoring of Ongoing Exceedances

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

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

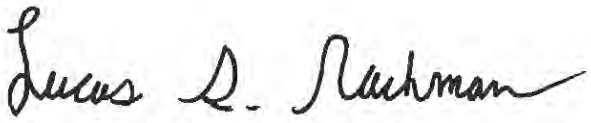
A summary of ongoing exceedance points is provided in Table 2.

Table 2. Ongoing Weekly SEM Exceedances

Point ID	Initial Exceedance Date	1/30/23 Event	1/30/23 Event Result	Comments
EW-53	1/26/23	10-Day Retest	Pass	Requires 30-Day Retest

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

Sincerely,



Quinn F. Bernier, PE
Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/QFB/cjw

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

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

SCS ENGINEERS

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	47 PPM	OK			Start Serpentine Route
2	331 PPM	OK			
3	28.7 PPM	OK			
4	33.1 PPM	OK			
5	128 PPM	OK			
6	1.9 PPM	OK			
7	59.5 PPM	OK			
8	21.2 PPM	OK			
9	13.1 PPM	OK			
10	15.5 PPM	OK			
11	11.7 PPM	OK			
12	14.9 PPM	OK			
13	18.9 PPM	OK			
14	30.3 PPM	OK			
15	34 PPM	OK			
16	31.7 PPM	OK			
17	68 PPM	OK			
18	69 PPM	OK			
19	13.7 PPM	OK			
20	7.5 PPM	OK			
21	23.9 PPM	OK			
22	41 PPM	OK			
23	15.9 PPM	OK			
24	99.2 PPM	OK			
25	23.6 PPM	OK			
26	4.2 PPM	OK			
27	5.2 PPM	OK			
28	8.8 PPM	OK			
29	11.8 PPM	OK			
30	5.8 PPM	OK			
31	11.8 PPM	OK			
32	32 PPM	OK			
33	66.7 PPM	OK			
34	32.5 PPM	OK			
35	34.6 PPM	OK			
36	43.6 PPM	OK			
37	27.5 PPM	OK			
38	31.7 PPM	OK			
39	104 PPM	OK			
40	28 PPM	OK			
41	23.2 PPM	OK			
42	134 PPM	OK			

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

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	63.2 PPM	OK			
44	5.3 PPM	OK			
45	5.8 PPM	OK			
46	8.2 PPM	OK			
47	7 PPM	OK			
48	43.2 PPM	OK			
49	42.8 PPM	OK			
50	27.5 PPM	OK			
51	47.3 PPM	OK			
52	16.6 PPM	OK			
53	6.7 PPM	OK			
54	2.5 PPM	OK			
55	2.1 PPM	OK			
56	49.4 PPM	OK			
57	4.1 PPM	OK			
58	6.3 PPM	OK			
59	8 PPM	OK			
60	11.8 PPM	OK			
61	34.7 PPM	OK			
62	24.5 PPM	OK			
63	19.4 PPM	OK			
64	6.5 PPM	OK			
65	7.1 PPM	OK			
66	3.8 PPM	OK			
67	8.2 PPM	OK			
68	17.9 PPM	OK			
69	26.7 PPM	OK			
70	19.3 PPM	OK			
71	17.2 PPM	OK			
72	11.6 PPM	OK			
73	14.4 PPM	OK			
74	8.4 PPM	OK			
75	11.2 PPM	OK			
76	17.8 PPM	OK			
77	62.1 PPM	OK			
78	63.5 PPM	OK			
79	9.3 PPM	OK			
80	56.8 PPM	OK			
81	256 PPM	OK			
82	132 PPM	OK			
83	47.3 PPM	OK			
84	127 PPM	OK			

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	239 PPM	OK			
86	69.6 PPM	OK			
87	298 PPM	OK			
88	252 PPM	OK			
89	13.5 PPM	OK			
90	12.5 PPM	OK			
91	64.5 PPM	OK			
92	10.5 PPM	OK			
93	31 PPM	OK			
94	230 PPM	OK			
95	18.5 PPM	OK			
96	479 PPM	OK			
97	78.5 PPM	OK			
98	33.6 PPM	OK			
99	39.5 PPM	OK			
100	PPM	OK			End Serpentine
	161				Route
101	96 PPM	OK			EW-35
102	19.3 PPM	OK			EW-52
103	121 PPM	OK			TP-4
104	39.6 PPM	OK			EW-60
105	5 PPM	OK			EW-48
106	85.1 PPM	OK			TP-6
107	5.5 PPM	OK			EW-61
108	117 PPM	OK			EW-36
109	20 PPM	OK			EW-34
110	47.3 PPM	OK			EW-50
111	160 PPM	OK			EW-67
112	415 PPM	OK			EW-47
113	132 PPM	OK			EW-54
114	21.1 PPM	OK			EW-55
115	14 PPM	OK			TP-2
116	289 PPM	OK			EW-46
117	7 PPM	OK			EW-66
118	47.4 PPM	OK			EW-58
119	19.8 PPM	OK			EW-57
120	442 PPM	OK			TP-1
121	135 PPM	OK			EW-59
122	232 PPM	OK			EW-56
123	273 PPM	OK			EW-41
124	99 PPM	OK			EW-53
125	41.8 PPM	OK			EW-40

SCS ENGINEERS

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

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	23.4 PPM	OK			TP-3
127	172 PPM	OK			EW-51
128	118 PPM	OK			EW-39
129	205 PPM	OK			TP-5
130	52 PPM	OK			EW-68
131	47.6 PPM	OK			EW-38
132	5.7 PPM	OK			TP-7
133	2.3 PPM	OK			EW-49
134	5.5 PPM	OK			EW-31R
135	9.6 PPM	OK			EW-65
136	37.5 PPM	OK			EW-37
137	25.8 PPM	OK			TP-8
138	31 PPM	OK			EW-64
139	38.7 PPM	OK			EW-30R
140	71.3 PPM	OK			EW-63
141	37.5 PPM	OK			EW-42
142	31.2 PPM	OK			TP-9
143	63.3 PPM	OK			EW-33R
144	2.4 PPM	OK			EW-62
145	69.5 PPM	OK			EW-29R
146	277 PPM	OK			EW-25
147	3.5 PPM	OK			EW-24
148	4.4 PPM	OK			EW-32
149	6.8 PPM	OK			EW-32R

Number of locations sampled:	149
Number of exceedance locations:	0

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

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

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

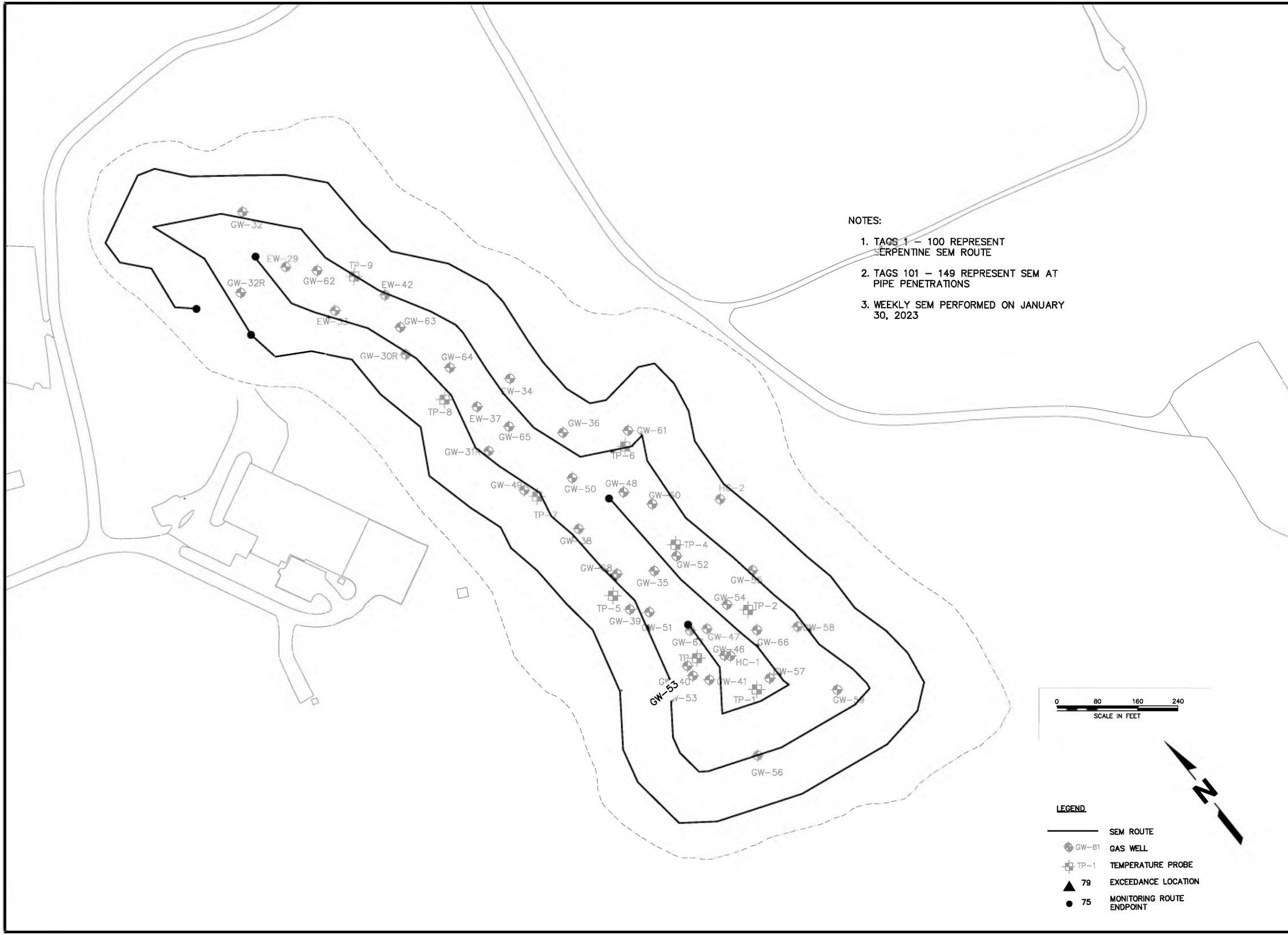
NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 149 represent SEM at Pipe Penetrations
Weather Conditions: Foggy, 45°F Wind: W - 5 MPH

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

1/30/2023	9:52	ZERO	0.0 PPM
1/30/2023	9:53	SPAN	502.0 PPM

Background Reading:

1/30/2023	9:56	Upwind	2.5 PPM
1/30/2023	10:01	Downwind	2.2 PPM



NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 149 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON JANUARY 30, 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.
15321 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

PROJ. NO.	DWN. BY:	Q/A REW BY:
02218208.04	LSN	
DSK. BY:	CHK. BY:	APP. BY:
LSN	DBK	

FILE: 02218208.04
DATE: 1/30/23
SCALE: AS SHOWN
DRAWING NO. 1 of 1

Appendix B

SCS-FS January Summary Report

February 7, 2023
Job No. 07220028.00

Mr. Michael Martin
City of Bristol
2125 Shakesville Road
Bristol, VA 24201

Subject: Summary of Operation, Monitoring, and Maintenance (OM&M) Services
Permit Area 588 Gas Collection Control System (GCCS)
City of Bristol Integrated Solid Waste Management Facility, Bristol, Virginia
January 2023

Dear Mr. Martin:

SCS Field Services (SCS-FS) visited the Bristol Integrated Solid Waste Management Facility (ISWMF) during the month of January, 2023, for routine and non-routine monitoring and maintenance on the Solid Waste Permit (SWP) #588 gas collection and control system (GCCS). This report summarizes the work performed and presents the data collected. The monitoring data is presented in the following attachments:

Attachment 1. SWP #588 Wellfield Monitoring Data
Attachment 2. Exceedance Detail Report
Attachment 3. Enhanced Monitoring Record Form and Analytical Results
Attachment 4. Daily Logs

The tables in Attachment 1 include the January blower/flare station (BFS) monitoring data and the last three months of monitoring data for the wellheads and the leachate cleanouts.

GCCS SITE ACTIVITES

On January 5, SCS-FS performed routine wellfield monitoring and non-routine maintenance. SCS-FS monitored the BFS and the extraction wells (EW) in SWP #588. SCS-FS also replaced the wellhead temperature monitoring probes in EW-51 and -68 with longer probes and placed additional soil cover around the wellheads.

On January 6, SCS-FS conducted non-routine enhanced monitoring and carbon monoxide (CO) sampling (enhanced monitoring) for compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) at EW-37, -57, and -64. Samples for CO and fixed gases analysis were collected and submitted to Enthalpy Analytical for analysis. Analytical results are included in Attachment 3. SCS-FS also monitored the leachate cleanouts on the north and south side of SWP #588.

On January 12, SCS-FS conducted enhanced monitoring at EW-37, -57, and -64. Samples for CO and fixed gases analysis were collected and submitted to Enthalpy Analytical for analysis. No sample was collected at EW-64, as it was below the regulatory limit of 145 degrees Fahrenheit. The laboratory reported that the sample volume for EW-57 was insufficient to complete the analysis.

On January 17-19, SCS-FS fabricated pipe stands for headerline supports and lowered the casing on EW-46.

On January 18, SCS-FS conducted enhanced monitoring at EW-37 and -57. A samples for CO and fixed gases analysis was collected at EW-37 and submitted to Enthalpy Analytical for analysis. No sample was collected at EW-57 due to liquid in the sample ports. The Ingenco plant and flare were operating. A sample could not be collected from EW-57 due to liquid at the sampling port.

On January 25, SCS-FS conducted enhanced monitoring and CO sampling at EW-37 and -57. Samples for CO and fixed gases analysis were collected and submitted to Enthalpy Analytical for analysis.

Please contact either of the undersigned if you have any questions or need additional information regarding this report.

Very truly yours,

Austin Wubbe
Project Coordinator
SCS FIELD SERVICES

Thomas M. Lock
Vice President / Northeast Region Manager
SCS FIELD SERVICES

Attachments
cc: Bob Dick, SCS Engineers

Attachments

1. Wellfield Monitoring Data
2. Exceedance Detail Report
3. Enhanced Monitoring Record Forms and Analytical Results
4. Daily Logs

Attachment 1

SWP #588 Wellfield Monitoring Data

Bristol Virginia Landfill - SWP #588 Extraction Well Data - 11/01/2022 to 01/31/2023

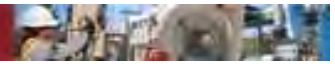
Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	System Pressure ("H20)	Comments
30R	11/3/2022 14:02	23.1	19.4	6.7	50.8	130.6	130.6	-1.64	-1.57	-12.69	
30R	12/8/2022 12:45	22.0	34.3	3.5	40.2	129.4	129.6	-21.61	-21.59	-21.13	
30R	1/12/2023 12:22	49.0	37.1	0.5	13.4	127.2	127.3	-7.04	-6.68	-5.77	
31R	11/3/2022 13:35	19.5	44.5	3.4	32.6	164.6	164.6	-16.56	-17.66	-17.49	
31R	11/4/2022 09:09	18.5	20.2	7.3	54.0	131.0	131.3	-0.70	-0.73	-0.73	
31R	12/8/2022 12:08	25.7	25.1	5.1	44.1	132.9	132.9	-0.83	-0.83	-7.90	
31R	1/5/2023 13:43	21.0	38.2	2.8	38.0	138.2	138.3	-21.01	-21.01	-21.40	
32R	12/8/2022 11:10	50.1	39.1	0.0	10.8	130.1	130.1	-1.83	-1.77	-5.40	
32R	1/5/2023 12:42	48.8	39.5	0.0	11.7	128.6	128.6	-2.38	-2.39	-6.16	
29	11/3/2022 14:05	58.9	38.3	0.2	2.6	117.6	117.8	-9.18	-9.17	-11.22	
29	12/8/2022 11:15	60.0	39.0	0.2	0.8	99.6	99.7	-4.00	-3.98	-3.97	
29	12/8/2022 11:15	60.0	39.0	0.2	0.8	99.6	99.7	-4.00	-3.98	-3.97	
29	1/5/2023 12:45	56.0	38.5	1.0	4.5	100.0	100.0	-4.72	-4.35	-4.35	
32	11/3/2022 14:21	54.7	39.3	0.3	5.7	86.7	84.4	-5.60	-5.41	-9.66	
32	11/10/2022 12:28	58.0	41.6	0.4	0.0	72.0	72.0	-4.77	-4.77	-7.90	Slightly Open
32	12/8/2022 11:29	58.9	41.1	0.0	0.0	72.6	72.7	-4.70	-4.64	-8.59	
32	1/5/2023 12:47	57.1	42.9	0.0	0.0	72.0	72.3	-3.94	-3.90	-10.65	
33	11/3/2022 14:24	43.2	36.0	0.5	20.3	76.9	76.9	-2.19	-2.20	-2.21	
33	12/8/2022 11:51	35.3	27.3	5.0	32.4	130.5	130.3	-1.42	-1.41	-7.98	
33	1/5/2023 13:11	37.0	29.5	4.2	29.3	129.4	129.5	-2.02	-2.02	-1.54	
34	11/3/2022 13:47	29.1	68.9	0.8	1.2	123.1	122.1	-13.20	-6.42	-12.76	
34	12/8/2022 12:35	2.4	74.0	0.0	23.6	139.2	139.3	-4.90	-4.36	-4.34	
34	1/5/2023 13:37	2.8	72.8	0.1	24.3	138.0	138.0	-8.90	-8.86	-8.83	
35	11/3/2022 12:31	53.9	32.1	4.3	9.7	90.2	92.4	-1.45	-3.36	-14.63	
35	12/8/2022 13:40	0.2	0.4	21.4	78.0	68.0	68.5	-10.43	-10.40	-20.27	
35	1/5/2023 14:15	32.6	23.4	9.9	34.1	66.9	66.9	-7.11	-7.05	-20.05	
36	11/3/2022 13:05	41.7	22.5	8.1	27.7	85.8	86.0	-19.50	-19.44	-19.41	
36	12/8/2022 13:00	24.8	16.0	13.2	46.0	65.3	65.2	-21.97	-21.96	-21.95	
36	1/5/2023 13:51	15.1	10.1	16.4	58.4	65.7	65.8	-22.56	-22.15	-22.14	
37	11/10/2022 10:40	18.2	24.0	7.1	50.7	147.6	147.7	-13.82	-13.78	-14.12	Fully Open
37	11/17/2022 10:50	18.4	24.7	7.3	49.6	147.2	147.3	-8.91	-8.90	-8.79	Fully Open
37	12/8/2022 12:32	18.7	28.4	6.3	46.6	151.2	150.8	-1.64	-1.61	-8.05	
37	12/9/2022 09:19	19.0	28.3	6.7	46.0	148.5	148.5	-1.51	-1.53	-7.09	High Temp
37	12/14/2022 08:37	17.4	28.4	6.2	48.0	148.6	148.6	-1.56	-1.57	-7.82	
37	12/20/2022 11:19	14.7	25.2	6.6	53.5	148.6	148.6	-1.45	-1.47	-6.88	Fully Open
37	1/5/2023 13:34	15.5	27.4	6.3	50.8	151.9	151.8	-2.26	-2.23	-8.95	

Bristol Virginia Landfill - SWP #588 Extraction Well Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	System Pressure ("H20)	Comments
37	1/6/2023 07:24	16.1	26.9	6.7	50.3	149.2	149.2	-1.97	-1.95	-9.11	
37	1/12/2023 12:18	15.0	24.3	6.2	54.5	149.7	149.7	-8.51	-8.49	-8.14	High Temp
37	1/18/2023 12:33	14.0	26.2	6.8	53.0	149.0	149.0	-1.84	-1.82	-8.05	High Temp
37	1/25/2023 11:53	14.2	28.4	6.1	51.3	149.7	149.8	-1.82	-1.79	-7.80	High Temp
38	11/3/2022 13:13	52.5	32.3	4.0	11.2	87.4	87.1	-6.47	-6.38	-6.32	
38	12/8/2022 13:18	38.1	25.5	8.0	28.4	82.5	82.6	-14.24	-14.24	-14.24	
38	1/5/2023 14:06	34.6	23.0	9.5	32.9	104.2	104.1	-13.31	-13.30	-13.32	
39	11/3/2022 12:41	59.4	40.3	0.3	0.0	111.3	111.3	-15.89	-14.68	-15.32	
39	12/8/2022 13:28	5.8	6.5	18.6	69.1	60.7	60.7	-10.74	-10.22	-9.33	
39	1/5/2023 14:21	29.4	20.0	11.0	39.6	60.2	60.3	-18.07	-18.44	-17.71	
40	11/3/2022 11:51	58.1	41.7	0.2	0.0	128.9	128.9	-2.28	-2.24	-13.84	
40	12/8/2022 14:11	54.4	45.6	0.0	0.0	132.9	133.0	-9.66	-9.10	-15.24	
40	1/5/2023 15:04	45.5	54.2	0.3	0.0	138.5	139.3	-17.73	-17.72	-18.69	
41	11/3/2022 11:40	57.7	41.8	0.5	0.0	117.4	118.8	-16.42	-16.29	-15.78	
41	12/8/2022 14:05	53.4	46.4	0.2	0.0	73.4	72.7	-19.53	-18.44	-18.28	
41	1/5/2023 15:06	50.6	49.3	0.2		128.3	128.4	-6.73	-6.67	-16.59	
42	11/3/2022 14:10	53.4	37.0	1.7	7.9	123.8	123.7	-1.58	-1.51	-1.51	
42	12/8/2022 11:56	55.3	40.2	0.8	3.7	115.7	115.8	-0.87	-0.86	-0.84	
42	1/5/2023 13:13	36.4	27.4	7.5	28.7	120.0	119.9	-1.47	-0.88	-0.88	
46	11/3/2022 11:34	51.8	41.1	0.5	6.6	153.8	153.8	-7.67	-7.56	-15.82	
46	11/4/2022 09:24	47.0	41.4	1.1	10.5	149.7	150.2	-7.33	-7.31	-16.89	
46	11/10/2022 10:59	57.6	39.6	0.9	1.9	150.2	150.2	-5.63	-5.62	-17.00	Slightly Open
46	12/8/2022 14:14	45.7	44.1	0.0	10.2	140.0	140.0	-1.31	-1.28	-19.84	
46	1/5/2023 14:51	54.0	46.0	0.0	0.0	143.9	143.9	-1.25	-1.24	-20.36	
47	11/3/2022 12:06	59.0	40.8	0.2	0.0	134.6	131.5	-18.27	-17.93	-17.61	
47	12/8/2022 13:58	42.2	37.3	5.5	15.0	94.4	94.5	-21.60	-21.56	-21.56	
47	1/5/2023 15:11	54.0	36.5	3.1	6.4	63.0	62.6	-21.41	-21.29	-21.15	
48	11/3/2022 12:56	45.2	28.8	6.2	19.8	80.7	80.7	-18.39	-18.28	-17.63	
48	12/8/2022 13:10	2.4	3.0	19.9	74.7	61.1	61.0	-21.00	-20.97	-20.97	
48	1/5/2023 14:01	3.2	2.9	20.0	73.9	65.2	65.5	-21.80	-21.77	-21.77	
49	11/3/2022 13:30	36.2	30.4	3.6	29.8	135.2	135.4	-6.40	-6.90	-16.49	
49	12/8/2022 12:49	30.9	34.0	1.2	33.9	137.0	136.9	-8.06	-8.04	-8.03	
49	1/5/2023 13:45	28.9	31.9	5.1	34.1	136.1	136.2	-9.02	-9.03	-9.04	
50	11/3/2022 13:10	40.8	26.2	6.0	27.0	126.9	126.9	-1.20	-0.92	-17.78	
50	12/8/2022 12:56	42.8	30.8	4.3	22.1	105.3	105.4	-1.63	-1.63	-1.51	
50	1/5/2023 13:48	44.4	32.3	2.6	20.7	124.4	124.3	-2.65	-2.61	-2.42	

Bristol Virginia Landfill - SWP #588 Extraction Well Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	System Pressure ("H20)	Comments
51	11/3/2022 12:36	50.5	44.7	2.5	2.3	164.4	164.4	-16.52	-15.88	-16.63	
51	11/4/2022 09:17	43.1	43.8	2.0	11.1	160.2	161.1	-15.49	-16.59	-17.52	
51	11/10/2022 10:53	20.4	49.2	6.6	23.8	117.5	117.6	-10.93	-11.87	-12.22	Fully Open
51	12/8/2022 13:34	3.2	70.6	1.3	24.9	174.4	175.7		-12.24	-13.46	
51	12/8/2022 13:35	4.8	68.0	1.3	25.9	175.7	175.3	-13.74	-13.27	-11.55	
51	12/9/2022 09:42	5.5	70.1	0.9	23.5	163.1	165.5	-7.16	-7.40	-7.91	High Temp
51	12/14/2022 10:11	18.2	63.9	1.1	16.8	104.1	104.2	-5.51	-5.50	-5.53	Recheck
51	1/5/2023 14:24	39.2	53.9	0.7	6.2	130.6	130.5	-12.19	-11.49	-11.43	
52	11/3/2022 12:24	31.8	60.8	1.3	6.1	168.0	168.1	-14.84	-14.68	-16.68	
52	11/4/2022 09:34	26.8	61.1	0.7	11.4	164.3	164.6	-14.45	-14.48	-17.83	
52	11/17/2022 10:55	8.5	12.4	17.0	62.1	108.6	108.9	-17.47	-17.45	-17.46	Fully Open
52	12/8/2022 13:44	36.6	54.4	1.7	7.3	138.1	138.2	-19.77	-19.20	-18.64	
52	1/5/2023 14:12	42.2	56.8	0.2	0.8	144.0	144.0	-18.01	-17.51	-16.92	
53	11/3/2022 11:47	54.5	45.3	0.2	0.0	151.4	151.3	-12.18	-12.33	-15.73	
53	11/4/2022 09:29	52.2	44.3	3.5	0.0	134.6	140.6	-12.77	-12.78	-16.66	
53	11/10/2022 11:10	56.0	43.0	1.0	0.0	141.7	141.8	-13.76	-13.69	-16.53	Slightly Open
53	12/8/2022 14:08	40.5	59.5	0.0	0.0	140.0	140.0	-16.84	-16.83	-18.64	
53	1/5/2023 15:02	48.6	38.7	3.9	8.8	120.0	120.9	-17.79	-17.77	-1.68	Positive Static Press.
54	11/3/2022 12:12	36.4	63.6	0.0	0.0	137.5	137.8	-10.60	-10.76	-17.62	
54	12/8/2022 13:54	31.1	68.9	0.0	0.0	151.5	151.5	-0.72	-0.22	-20.52	
54	12/9/2022 09:35	33.6	62.4	4.0	0.0	143.8	144.0	-0.36	-0.33	-20.55	Increased Flow/Vacuum
54	12/9/2022 09:38	35.1	63.7	1.1	0.1	138.4	139.6	-6.84	-8.81	-20.41	Increased Flow/Vacuum
54	1/5/2023 15:14	35.3	64.7	0.0	0.0	61.7	62.0	-21.14	-21.13	-21.16	
55	11/3/2022 12:16	26.3	18.5	9.4	45.8	118.0	118.0	-16.16	-16.14	-16.13	
55	12/20/2022 11:28	10.3	25.6	13.2	50.9	97.5	100.2	-21.38	-21.38	-20.81	Well needs extension/lowered,Fully Open
55	1/5/2023 15:16	42.2	34.0	4.2	19.6	60.8	60.5	-20.98	-20.94	-20.92	
56	11/3/2022 10:55	53.4	46.2	0.3	0.1	143.7	143.7	-16.43	-16.35	-16.93	80% Open
56	12/8/2022 14:25	48.8	51.2	0.0	0.0	140.2	143.1	-19.89	-19.92	-19.83	No Change
56	1/5/2023 14:38	44.3	40.0	3.6	12.1	130.4	130.4	-18.30	-18.28	-20.14	
57	11/3/2022 11:05	50.6	49.2	0.2	0.0	144.3	144.9	-17.22	-17.12	-17.28	
57	12/8/2022 14:23	32.1	31.4	5.1	31.4	113.8	114.6	-6.84	-6.86	-24.00	Opened Valve 1/2 Turn or Less
57	1/5/2023 14:43	41.4	49.1	9.4	0.1	143.4	145.6	-20.55	-20.54	-20.37	
57	1/6/2023 07:40	48.1	51.8	0.1	0.0	148.1	148.4	-21.06	-21.04	-20.79	
57	1/12/2023 12:36	38.0	45.7	1.4	14.9	176.1	176.9	-12.83	-8.09	-12.03	High Temp
57	1/18/2023 11:59	6.4	10.5	16.9	66.2	172.4	172.4	0.04	0.04	0.05	High Temp
57	1/25/2023 12:05	31.7	59.3	0.6	8.4	170.0	170.3	-20.15	-20.16	-20.04	Opened for Sample

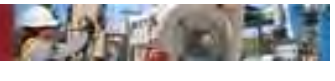


Bristol Virginia Landfill - SWP #588 Extraction Well Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	System Pressure ("H20)	Comments
57	1/25/2023 12:05	31.7	59.3	0.6	8.4	170.0	170.3	-20.15	-20.16	-20.04	Opened for Sample
58	11/3/2022 11:11	36.4	45.5	1.1	17.0	128.0	128.0	-3.94	-3.92	-16.85	
58	12/8/2022 14:23	20.0	18.9	8.1	53.0	127.2	127.3	-11.61	-11.58	-11.56	
58	1/5/2023 14:48	26.7	36.1	2.2	35.0	119.7	120.2	-6.01	-6.01	-6.00	
59	11/3/2022 10:59	34.4	37.6	4.4	23.6	126.8	126.3	-1.67	-1.61	-18.43	
59	12/8/2022 14:17	45.1	40.2	3.3	11.4	131.2	131.1	-17.37	-17.30	-19.92	No Change
59	1/5/2023 14:40	31.5	30.6	5.9	32.0	114.2	114.3	-1.62	-1.58	-22.29	
60	11/3/2022 12:49	48.8	33.2	0.6	17.4	136.4	136.3	-14.81	-14.40	-17.24	
60	12/8/2022 13:14	59.6	40.2	0.0	0.2	126.2	126.2	-6.01	-5.97	-5.96	
60	1/5/2023 14:09	52.0	48.0	0.0	0.0	138.5	138.7	-5.20	-5.15	-21.46	
61	11/3/2022 13:00	24.5	16.8	11.3	47.4	109.3	109.3	-0.74	-0.70	-0.56	
61	12/8/2022 13:06	39.0	54.6	0.1	6.3	58.9	83.2	-0.30	-0.12	-0.14	
61	1/5/2023 13:54	36.2	49.9	1.9	12.0	127.3	127.3	-0.93	-0.87	-20.71	
62	11/3/2022 14:19	18.9	15.7	9.8	55.6	130.4	130.3	-1.06	-0.99	-0.96	
62	12/8/2022 11:42	22.2	21.0	7.7	49.1	129.7	129.6	-0.73	-0.76	-8.21	
62	1/5/2023 13:06	54.2	45.8	0.0	0.0	62.5	62.6	-0.14	-0.10	-9.22	
63	11/3/2022 14:05	26.8	24.0	5.8	43.4	130.4	130.6	-0.49	-0.42	-0.37	
63	12/8/2022 12:03	26.1	26.8	6.2	40.9	134.5	134.6	-0.15	-0.16	-7.89	
63	1/5/2023 13:16	19.3	19.4	8.7	52.6	130.2	130.1	-0.76	-0.32	-8.85	
64	11/3/2022 13:57	28.8	26.9	6.1	38.2	144.4	144.0	-0.34	-0.35	-13.50	
64	12/8/2022 12:22	29.8	32.2	6.3	31.7	139.3	139.3	-4.98	-3.96	-7.96	
64	1/5/2023 13:28	21.4	26.3	5.9	46.4	147.4	147.3	-0.88	-0.92	-0.92	
64	1/6/2023 07:34	20.9	25.8	6.5	46.8	145.0	145.2	-1.07	-1.04	-1.02	
64	1/12/2023 12:26	22.5	27.2	5.5	44.8	144.7	144.8	-0.97	-0.97	-0.95	
65	11/3/2022 13:41	5.2	9.1	12.3	73.4	138.7	138.5	-8.65	-1.94	-1.84	
65	12/8/2022 12:40	9.8	14.9	10.9	64.4	133.4	133.5	-1.20	-1.21	-1.19	
65	1/5/2023 13:39	8.7	14.3	10.9	66.1	135.6	135.7	-1.77	-1.24	-1.24	
66	11/3/2022 11:18	49.2	48.7	0.1	2.0	140.6	140.8	-2.53	-2.53	-16.67	
66	12/8/2022 14:20	44.9	55.0	0.1	0.0	128.6	128.5	-2.15	-2.11	-2.10	
66	1/12/2023 12:32	45.0	50.8	0.0	4.2	122.1	124.8	-6.19	-6.19	-6.19	
67	11/3/2022 12:00	37.4	62.6	0.0	0.0	154.1	151.4	-18.32	-17.60	-17.91	
67	11/4/2022 09:20	33.7	59.5	0.3	6.5	145.4	147.8	-18.58	-18.53	-18.53	
67	11/10/2022 10:55	38.1	61.9	0.0	0.0	169.3	169.3	-16.62	-16.60	-18.36	Slightly Open
67	11/17/2022 10:59	32.2	62.0	0.1	5.7	154.6	155.0	-19.00	-18.98	-20.02	
67	11/29/2022 11:14	36.3	63.7	0.0	0.0	153.7	154.6	-19.40	-19.42	-19.77	Fully Open
67	12/8/2022 14:01	16.4	54.2	3.2	26.2	159.5	159.5	-4.33	-3.78	-21.19	

Bristol Virginia Landfill - SWP #588 Extraction Well Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	System Pressure ("H20)	Comments
67	12/9/2022 09:30	16.1	55.0	3.0	25.9	172.2	173.0	-7.45	-7.49	-21.06	High Temp
67	12/14/2022 10:02	20.4	61.1	2.2	16.3	175.3	175.5	-2.74	-2.76	-20.17	Slightly Open
67	12/20/2022 11:24	15.2	28.6	10.5	45.7	134.7	134.6	-20.14	-20.14	-20.50	Fully Open
67	1/5/2023 15:09	38.0	61.6	0.1	0.3	68.6	68.5	-20.97	-20.97	-20.97	
68	11/3/2022 12:44	58.1	36.5	2.6	2.8	131.1	130.7	-6.34	-6.35	-15.53	
68	12/8/2022 13:22	56.0	40.1	1.3	2.6	127.3	127.4	-12.19	-12.18	-19.95	
68	1/5/2023 14:17	58.6	41.4	0.0	0.0	129.1	129.0	-15.54	-15.10	-20.49	
HC01	11/3/2022 11:27	8.3	5.6	17.4	68.7	75.3	76.5	-16.87	-15.72		
HC01	12/8/2022 14:17	6.8	5.8	18.9	68.5	58.3	58.1	-20.03	-19.96		
HC01	1/5/2023 14:54	26.5	20.2	12.3	41.0	62.1	61.9	-19.73	-20.18		



Bristol Virginia Landfill - North South Leachate Clean-Outs Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Comments
LC01	11/3/2022 12:34	51.0	46.5	0.6	1.9	88.2	88.7	-14.31	-14.30	
LC01	12/8/2022 13:06	51.7	48.3	0.0	0.0	59.0	58.8	-20.59	-20.53	Increased Flow/Vacuum
LC01	12/8/2022 13:08	51.7	48.3	0.0	0.0	58.4	58.4	-20.32	-20.29	No Change
LC01	1/5/2023 13:49	0.9	1.1	19.7	78.3	69.8	69.4	-20.15	-20.13	
LC01	1/6/2023 07:51	50.2	48.0	1.8	0.0	52.9	52.9	-21.21	-21.16	
LC01	1/6/2023 09:42	38.8	43.5	17.8	0.0	59.1	57.6	-20.59	-20.61	
LC02	11/3/2022 12:36	38.9	38.9	4.7	17.5	88.3	86.7	-14.86	-14.87	
LC02	12/8/2022 13:10	46.6	48.5	0.0	4.9	58.3	58.2	-20.68	-20.64	No Change
LC02	1/5/2023 13:52	45.5	47.1	1.1	6.3	57.8	57.7	-20.82	-20.80	
LC02	1/6/2023 07:53	47.3	47.7	0.1	4.9	53.3	53.3	-21.21	-21.25	
LC03	11/3/2022 12:41	45.6	38.3	2.8	13.3	80.6	81.4	-15.76	-15.80	
LC03	12/8/2022 13:16	14.5	7.3	16.8	61.4	72.2	74.9	-21.69	-23.97	
LC03	1/6/2023 07:54	9.5	5.5	18.5	66.5	52.6	52.6	-22.57	-22.57	
LC04	11/3/2022 12:44	38.7	33.1	5.1	23.1	78.2	77.9	-15.91	-15.92	
LC04	12/8/2022 13:19	21.6	13.0	11.0	54.4	75.7	75.7	-22.38	-21.74	No Change
LC04	1/6/2023 07:56	14.4	7.1	15.3	63.2	53.1	53.5	-22.76	-22.74	
LC05	11/3/2022 12:45	48.2	47.0	0.8	4.0	85.6	86.1	-20.76	-15.41	
LC05	12/8/2022 13:22	52.1	44.2	0.0	3.7	74.9	73.6	-21.91	-21.22	Opened Valve 1/2 to 1 Turn
LC05	1/6/2023 07:59	52.2	46.0	0.0	1.8	54.5	54.5	-21.25	-21.24	
LC06	11/3/2022 12:47	40.0	32.6	5.4	22.0	87.7	87.8	-18.63	-18.78	
LC06	12/8/2022 13:24	36.0	23.1	8.2	32.7	72.5	72.5	-22.47	-21.69	Increased Flow/Vacuum
LC06	1/6/2023 08:01	27.3	21.3	11.7	39.7	53.7	53.7	-22.65	-22.64	
LC08	11/3/2022 12:48	46.6	43.8	1.1	8.5	88.4	88.3	-16.75	-14.32	
LC08	12/8/2022 13:27	49.0	45.8	0.0	5.2	72.9	72.9	-20.74	-20.18	Increased Flow/Vacuum
LC08	1/6/2023 07:57	47.8	46.9	0.2	5.1	54.3	54.3	-20.92	-20.92	
LC09	11/3/2022 12:50	49.0	43.2	1.6	6.2	88.1	88.0	-16.06	-15.94	
LC09	12/8/2022 13:29	35.4	22.5	8.1	34.0	72.4	72.3	-22.04	-23.11	Increased Flow/Vacuum
LC09	1/6/2023 08:03	43.5	26.5	6.2	23.8	54.0	54.1	-22.73	-22.72	
LC10	11/3/2022 12:52	50.0	44.3	1.2	4.5	87.6	87.5	-15.81	-15.84	
LC10	12/8/2022 13:31	13.9	9.8	16.2	60.1	71.5	71.4	-21.93	-21.91	No Change
LC10	1/6/2023 08:04	33.4	22.6	9.8	34.2	56.6	56.7	-22.59	-22.60	
NC01	11/3/2022 12:59	0.5	0.3	21.3	77.9	86.4	88.5	-13.84	-13.81	
NC01	12/8/2022 13:39	0.2	0.3	21.4	78.1	72.0	72.2	-19.69	-19.64	No Change
NC01	1/6/2023 08:21	0.2	0.3	22.1	77.4	38.2	38.1	-20.14	-20.13	
NC02	11/3/2022 13:01	0.8	0.5	21.2	77.5	90.2	89.9	-13.99	-13.96	

Bristol Virginia Landfill - North South Leachate Clean-Outs Data - 11/01/2022 to 01/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Adj Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Comments
NC02	12/8/2022 13:42	0.1	0.2	21.6	78.1	73.9	74.0	-19.64	-19.61	No Change
NC02	12/8/2022 13:45	0.1	0.2	21.6	78.1	75.4	76.6	-19.61	-19.60	
NC02	1/6/2023 08:23	3.4	3.4	19.6	73.6	37.3	37.2	-1.26	-1.25	
NC03	11/3/2022 13:04	2.3	1.4	20.5	75.8	91.0	91.0	-14.02	-14.02	
NC03	11/3/2022 13:18	2.0	1.4	19.9	76.7	92.3	92.5	-14.20	-14.18	
NC03	12/8/2022 13:48	0.2	0.1	21.6	78.1	76.5	76.6	-19.73	-19.68	No Change
NC03	1/6/2023 08:26	0.7	1.0	21.8	76.5	37.3	37.3	-20.12	-20.10	
NC04	11/3/2022 13:09	0.1	0.0	21.1	78.8	96.2	96.2	-13.92	-13.90	
NC04	12/8/2022 13:50	13.3	9.8	13.4	63.5	76.7	76.7	-19.87	-19.78	Increased Flow/Vacuum
NC04	1/6/2023 08:27	0.1	0.2	22.3	77.4	37.1	37.0	-18.83	-18.82	
NC05	11/3/2022 13:10	0.1	0.0	21.1	78.8	94.5	94.3	-13.93	-13.88	
NC05	12/8/2022 13:54	10.8	9.7	12.9	66.6	75.1	74.8	-19.73	-19.64	Increased Flow/Vacuum
NC05	1/6/2023 08:28	0.1	0.2	22.4	77.3	37.1	37.1	-18.89	-18.86	
NC06	11/3/2022 13:11	0.1	0.0	21.1	78.8	94.3	94.3	-13.80	-13.79	
NC06	12/8/2022 13:55	0.1	0.1	21.7	78.1	73.8	73.8	-19.72	-19.69	Increased Flow/Vacuum
NC06	1/6/2023 08:29	0.1	0.2	22.4	77.3	37.2	37.2	-18.75	-18.75	
NC07	11/3/2022 13:14	33.9	18.1	6.7	41.3	95.7	95.8	-14.15	-14.18	
NC07	12/8/2022 13:57	15.6	10.9	10.7	62.8	73.4	73.4	-19.83	-19.82	No Change
NC07	1/6/2023 08:31	6.0	5.7	16.9	71.4	37.4	37.4	-20.14	-20.13	
NC08	11/3/2022 13:15	45.0	24.9	1.7	28.4	94.6	94.4	-14.09	-14.12	
NC08	12/8/2022 13:59	24.0	17.3	3.1	55.6	73.6	73.8	-19.82	-19.85	Opened Valve 1/2 Turn or Less
NC08	1/6/2023 08:33	7.3	6.6	13.4	72.7	37.6	37.6	-20.09	-20.07	
NC09	11/3/2022 13:16	45.4	24.6	3.1	26.9	93.0	92.9	-14.13	-14.15	
NC09	12/8/2022 14:00	25.5	18.6	2.4	53.5	73.9	73.7	-19.78	-20.96	Increased Flow/Vacuum
NC09	1/6/2023 08:34	15.5	14.3	5.5	64.7	42.4	43.0	-20.06	-20.05	
NC10	11/3/2022 13:05	1.4	0.7	20.8	77.1	92.7	92.9	-14.03	-14.03	
NC10	11/3/2022 13:07	1.3	0.7	20.7	77.3	96.1	96.2	-14.03	-14.04	
NC10	12/8/2022 14:02	0.2	0.3	21.2	78.3	72.7	72.8	-19.86	-19.78	No Change
NC10	1/6/2023 08:36	0.2	0.3	22.3	77.2	48.3	48.5	-15.44	-15.37	

Bristol Virginia Landfill - Blower/Flare Data - 12/01/2022 to 12/31/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Temp (F)	Static Pressure ("H2O)	Flow (scfm)	Comments
Blower Inlet	1/5/2023 11:49	35.0	34.5	3.3	27.2	74.8	-24.73	190	
Blower Inlet	1/5/2023 15:28	37.6	35.1	3.4	23.9	69.0	-24.85	190	
Blower Inlet	1/6/2023 07:09	34.6	34.2	3.6	27.6	52.2	-24.93	178	
Blower Inlet	1/12/2023 12:00	31.8	33.1	3.8	31.3	63.0	-24.43	363	
Blower Inlet	1/12/2023 13:24	31.1	32.5	4.0	32.4	75.4	-24.57	320	
Blower Inlet	1/18/2023 11:35	32.1	31.6	4.2	32.1	75.8	-24.57	219	
Blower Inlet	1/18/2023 12:36	29.4	30.1	5.5	35.0	57.0	-24.43	228	
Blower Inlet	1/25/2023 11:22	34.4	35.2	3.5	26.9	62.4	-24.61	588	
Blower Inlet	1/25/2023 12:29	34.7	34.9	3.3	27.1	67.2	-24.57	593	

Technician/Weather

Field Technician	Record Date	Ambient Temp	Barometric Pressure	Wind Speed	Wind Direction	General Weather			
RYAN SEYMOUR	1/5/2023	57	28.03	0	N/A	Calm wind			
RYAN SEYMOUR	1/6/2023	37	28.09	0	N/A	Calm wind			
RYAN SEYMOUR	1/12/2023	60	27.83	6	E	Light wind			
RYAN SEYMOUR	1/18/2023	60	28.11	6	E	Light wind			
RYAN SEYMOUR	1/25/2023	37	27.71	0	NE	Calm wind			

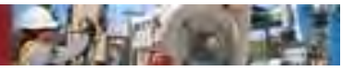
Attachment 2

Exceedance Detail Report

Exceedance Detail Report
Date Range: 01/01/2023 to 01/31/2023

Report Date: 02/07/2023
Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	CO Req	Total Days Open	Corrective Action Comments	Corrective Action Due Dates		
					CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)							
BRTLGW37				**Active**			**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
37		3/30/2022 12:20:33 PM	0		13.8	6.4	150	150	-1.24	-1.75	check,,,,,,	N			4/3/2022	4/13/2022	7/27/2022
37		4/6/2022 12:14:16 PM	7		14.2	7.3	149	149	-1.98	-1.95	Change,,,,,,,	N					
37		4/13/2022 1:45:11 PM	7		16.5	7	159	159	-1.70	-1.70	Comments:,,,,,,,	N					
37		4/13/2022 1:47:58 PM	0		16	7	159	159	-2.10	-2.14	Comments:,,,,,,,	N					
37		4/21/2022 7:24:55 AM	8		13.1	8.3	159	159	-2.35	-2.27	Comments:,,,,,,,	N					
37		5/4/2022 12:21:07 PM	13		13	7.3	149	149	-2.57	-2.42	Open,No Change,,,,,,	N					
37		5/16/2022 10:51:43 AM	12		11.6	9.8	150	150	-2.21	-2.39	,	N					
37		5/16/2022 2:09:00 PM	0		14.9	9.8	159	159	-2.48	-2.48	Comments:,,,,,,,	N					
37		5/24/2022 10:23:52 AM	8		17	7.8	150	150	-3.44	-3.43	Comments:,,,,,,,	N					
37		5/24/2022 10:26:15 AM	0		17.3	7.9	150	150	-3.47	-3.44	Comments:,,,,,,,	N					
37		6/1/2022 12:43:16 PM	8		22	6.2	150	150	-2.89	-2.89	Comments:,,,,,,,	N					
37		6/8/2022 11:34:45 AM	7		6.5	14.8	155.8	155.9	-12.72	-12.63	Comments:,,,,,,,	N					
37		6/16/2022 1:35:06 PM	8		21.6	6.7	153.9	153.8	-2.56	-2.54	Comments:,,,,,,,	N					
37		7/6/2022 12:59:43 PM	20		19.2	6.6	154.2	153.8	-2.44	-2.43	Comments:,,,,,,,	N					
37		7/11/2022 1:31:12 PM	5		19.8	6.7	155.5	155.5	-2.25	-2.19	Comments:,,,,,,,	N					
37		7/11/2022 1:36:48 PM	0		19.6	6.5	155.7	155.8	-2.12	-2.10	Comments:,,,,,,,	N					
37		8/3/2022 12:31:49 PM	23		20	7.3	155.5	155.5	-2.39	-2.38	Comments:,,,,,,,	N					
37		8/3/2022 12:35:39 PM	0		20.2	7.3	155.4	155.4	-2.72	-2.77	Comments:,,,,,,,	N					
37		8/3/2022 2:29:58 PM	0		19.5	6.6	152.2	152.9	-3.03	-3.01	Comments:,,,,,,,	N					
37		8/24/2022 11:44:07 AM	21		19.2	7.6	152.7	152.8	-15.16	-15.14	Open,,,,,,,	N					
37		9/1/2022 11:37:46 AM	8		20.8	7.6	155	154.7	-3.14	-3.14	Comments:,,,,,,,	N					
37		9/1/2022 12:28:35 PM	0		18.9	7.9	152.7	152.7	-15.15	-15.13	Comments:,,,,,,,	N					
37		10/12/2022 10:08:08 AM	41		20.5	7.6	152	151.5	-2.69	-2.64	Comments:,,,,,,,	N					
37		10/12/2022 2:36:59 PM	0		28.3	7.1	151	151	-2.74	-2.75	Comments:,,,,,,,	N					
37		10/19/2022 10:59:40 AM	7		20	7.4	149	149.1	-2.94	-2.85	Comments:,,,,,,,	N					
37		11/10/2022 10:40:07 AM	22		18.2	7.1	147.6	147.7	-13.82	-13.78	Comments:Fully Open,,,,,,,	N					
37		11/17/2022 10:50:44 AM	7		18.4	7.3	147.2	147.3	-8.91	-8.90	Comments:Fully Open,,,,,,,	N					
37		12/8/2022 12:32:15 PM	21		18.7	6.3	151.2	150.8	-1.64	-1.61	Comments:,,,,,,,	N					
37		12/9/2022 9:19:24 AM	1		19	6.7	148.5	148.5	-1.51	-1.53	Comments:High Temp,,,,,,,	N					
37		12/14/2022 8:37:04 AM	5		17.4	6.2	148.6	148.6	-1.56	-1.57	Comments:,,,,,,,	N					
37		12/20/2022 11:19:00 AM	6		14.7	6.6	148.6	148.6	-1.45	-1.47	Comments:Fully Open,,,,,,,	N					
37		1/5/2023 1:34:21 PM	16		15.5	6.3	151.9	151.8	-2.26	-2.23	Comments:,,,,,,,	N					
37		1/6/2023 7:24:18 AM	1		16.1	6.7	149.2	149.2	-1.97	-1.95	Comments:,,,,,,,	N					
37		1/12/2023 12:18:14 PM	6		15	6.2	149.7	149.7	-8.51	-8.49	Comments:High Temp,,,,,,,	N					
37		1/18/2023 12:33:18 PM	6		14	6.8	149	149	-1.84	-1.82	Comments:High Temp,,,,,,,	N					
37		1/25/2023 11:53:12 AM	7		14.2	6.1	149.7	149.8	-1.82	-1.79	Comments:High Temp,,,,,,,	N					
37		2/1/2023 1:33:56 PM	7		18.2	6.3	150.9	150.9	-1.89	-1.86	Comments:,,,,,,,	N	309				
BRTLGW57				**Active**			**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
57		1/5/2023 2:43:59 PM	0		41.4	9.4	143.4	145.6	-20.55	-20.54	Comments:,,,,,,,	N			1/9/2023	1/19/2023	5/4/2023
57		1/6/2023 7:40:46 AM	1		48.1	0.1	148.1	148.4	-21.06	-21.04	Comments:,,,,,,,	N					
57		1/12/2023 12:36:07 PM	6		38	1.4	176.1	176.9	-12.83	-8.09	Comments:High Temp,,,,,,,	N					
57		1/18/2023 11:59:14 AM	6		6.4	16.9	172.4	172.4	0.04	0.04	Comments:High Temp,,,,,,,	N					
57		1/25/2023 12:05:49 PM	7		31.7	0.6	170	170.3	-20.15	-20.16	Sample,,,,,,,	N					



Exceedance Detail Report
Date Range: 01/01/2023 to 01/31/2023

Report Date: 02/07/2023
Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	CO Req	Total Days Open	Corrective Action Comments	Corrective Action Due Dates		
					CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)							
57		1/25/2023 12:05:49 PM	0		31.7	0.6	170	170.3	-20.15	-20.16	Sample,,,,,,,	N					
57		2/1/2023 11:27:35 AM	7		43.8	0.5	155.3	155.3	-21.19	-20.85	Comments:,,,,,,,	N	28				
BRTLGW64				**Active**			**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
64		1/5/2023 1:28:56 PM	0		21.4	5.9	147.4	147.3	-0.88	-0.92	Comments:,,,,,,,	N		good reading on 01/12/2023	1/9/2023	1/19/2023	5/4/2023
64		1/6/2023 7:34:07 AM	1		20.9	6.5	145	145.2	-1.07	-1.04	Comments:,,,,,,,	N		good reading on 01/12/2023			
64		1/12/2023 12:26:25 PM	6		22.5	5.5	144.7	144.8	-0.97	-0.97	Comments:,,,,,,,	N	8				

Points with Exceedances	4
Closed Exceedances	3
Open Exceedances	1

Parameter exceeds rule (Exceedance)

Parameter in compliance (Exceedance cleared)

Attachment 3

Enhanced Monitoring Record Forms and Analytical Results

ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: Bristol **Technician: Ryan Seymour**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
37	2023-01-06 08:55:00	16.1	6.7	149.2	yes	yes	no	no	no	no	no	N/a
57	2023-01-06 09:00:00	48.1	0.1	148.1	yes	yes	no	no	no	no	no	N/a
64	2023-01-06 09:10:00	20.9	6.5	145.0	yes	yes	no	no	no	no	no	Need more dirt around well, can't reach the system side

ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: Bristol **Technician: Ryan Seymour**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
57	2023-01-12 12:15:00	38.0	1.4	176.1	yes	yes	no	no	no	no	no	NC
37	2023-01-12 12:17:00	15.0	6.2	149.7	yes	yes	no	no	no	no	no	Nc

ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: Bristol **Technician: Ryan Seymour**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
EW57	2023-01-18 11:54:00	NA	NA	170	no	yes	yes	no	no	no	yes	Liquid in test ports. Flow fail on GEM reading due to liquid.
EW37	2023-01-18 12:12:00	14.0	6.8	149	yes	yes	no	no	no	no	no	

ENHANCED MONITORING RECORD FORM

- FORM TO BE COMPLETED IF ANY WELLHEAD TEMPERATURES OVER 145F THAT CANNOT BE CORRECTED IN 7 DAYS
- WEEKLY MONITORING MUST BEGIN WITHIN 7 DAYS OF EXCEEDANCE FOR CO AND VISUAL OBSERVATIONS
- TEMPERATURES AT OR ABOVE 165F REQUIRE ANNUAL DOWNHOLE TEMPERATURE MONITORING (10FT INTERVALS)
- TEMPERATURES AT OR ABOVE 170F REQUIRE 24-HOUR PADEP NOTIFICATION; IMMEDIATELY CONTACT ENGINEERS IN THIS CASE

Landfill Name: Bristol **Technician: Ryan**

Well ID	Date & Time	GEM Reading			If Temp >145F					If Temp ≥165F	If Temp ≥170F	Comments
		CH4 (%)	O2 (%)	Well Temp (°F)	Gas Sample Collected	Pickup Scheduled?	Visible Emissions (e.g. smoke)?	Smoldering Ash Observed?	Damage to Well?	Downhole Temp Monitoring Performed?	Contacted Engineers for Notification?	
					Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
57	2023-01-25 12:05:00	31.7	0.6	170	yes	yes	no	no	no	no	yes	I let Lauren and Brandon know
37	2023-01-25 11:50:00	14.2	6.1	149	yes	yes	no	no	no	no	no	No comment

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

Certificate of Analysis

Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 9, 2023 10:30
	4330 Lewis Road, Suite 1	Date Issued:	January 16, 2023 16:12
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 01/09/2023 10:30. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

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

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

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

TNI Accredited
VELAP ID 460021

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 9, 2023 10:30
	4330 Lewis Road, Suite 1	Date Issued:	January 16, 2023 16:12
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23A0324-01	Air	01/06/2023 08:59	01/09/2023 10:30
57	23A0324-02	Air	01/06/2023 09:05	01/09/2023 10:30
64	23A0324-03	Air	01/06/2023 09:15	01/09/2023 10:30

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 37

Sample ID: 23A0324-01

Sample Matrix: Air

Sampled: 1/6/2023 08:59

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00245::12848

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 3

Receipt Vacuum(in Hg): 3

Flow Controller Type: PASSIVE

Flow Controller ID:

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	151	90.0	90.0		9	1	1/11/23 11:02	MER

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Hydrogen (H2), as received	2.22	0.18	0.18		9	1	1/11/23 11:02	MER

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

Certificate of Analysis

Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 57

Sample ID: 23A0324-02

Sample Matrix: Air

Sampled: 1/6/2023 09:05

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00281::13372

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 3.4

Receipt Vacuum(in Hg): 3.4

Flow Controller Type: PASSIVE

Flow Controller ID:

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	259	90.0	90.0		9	1	1/11/23 12:38	MER

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Hydrogen (H2), as received	3.84	0.18	0.18		9	1	1/11/23 12:38	MER

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Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 64

Sample ID: 23A0324-03

Sample Matrix: Air

Sampled: 1/6/2023 09:15

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00284::13382

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 3.8

Receipt Vacuum(in Hg): 3.8

Flow Controller Type: PASSIVE

Flow Controller ID:

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	1/11/23 13:33	MER

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Hydrogen (H2), as received	0.28	0.18	0.18		9	1	1/11/23 13:33	MER

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23A0324-01	1.00 mL / 1.00 mL	ALT-145	BGA0282	SGA0269	AG00026
23A0324-02	1.00 mL / 1.00 mL	ALT-145	BGA0282	SGA0269	AG00026
23A0324-03	1.00 mL / 1.00 mL	ALT-145	BGA0282	SGA0269	AG00026
23A0324-01	1.00 mL / 1.00 mL	EPA 3C	BGA0282	SGA0269	AG00026
23A0324-02	1.00 mL / 1.00 mL	EPA 3C	BGA0282	SGA0269	AG00026
23A0324-03	1.00 mL / 1.00 mL	EPA 3C	BGA0282	SGA0269	AG00026

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0282 - No Prep VOC GC Air										
Blank (BGA0282-BLK1)					Prepared & Analyzed: 01/11/2023					
Hydrogen (H2)	<	0.02	Vol%							
Carbon Monoxide	<	10.0	ppmv							
LCS (BGA0282-BS1)					Prepared & Analyzed: 01/11/2023					
Methane	4170	500	ppmv	5000		83.3	0-200			
Methane	4170	0.05	ppmv	5000		83.3	70-130			
Carbon dioxide	4320	500	ppmv	5000		86.5	0-200			
Carbon dioxide	4320	0.05	ppmv	5000		86.5	70-130			
Oxygen (O2)	5550	0.05	ppmv	5000		111	70-130			
Oxygen (O2)	5550	500	ppmv	5000		111	0-200			
Hydrogen (H2)	5990	200	ppmv	5100		118	0-200			
Hydrogen (H2)	5990	0.02	ppmv	5100		118	70-130			
Nitrogen (N2)	5880	1	ppmv	5000		118	70-130			
Nitrogen (N2)	5880	2000	ppmv	5000		118	0-200			
Carbon Monoxide	5020	10	ppmv	5000		100	0-200			
Carbon Monoxide	5020	0.001	ppmv	5000		100	70-130			
Duplicate (BGA0282-DUP1)				**Source: 23A0324-01**	Prepared & Analyzed: 01/11/2023					
Methane	11.4	0.45	Vol%		11.6			1.61	5	
Carbon dioxide	24.8	0.45	Vol%		25.0			0.855	5	
Oxygen (O2)	7.19	0.45	Vol%		7.31			1.67	5	
Nitrogen (N2)	50.9	9.00	Vol%		51.7			1.51	5	
Hydrogen (H2)	2.21	0.18	Vol%		2.22			0.412	5	
Hydrogen (H2)	21700	1800	ppmv		22200			2.45	25	
Carbon Monoxide	150	90.0	ppmv		151			0.538	25	
Carbon Monoxide	0.02	0.009	Vol%		0.02			0.538	5	
Duplicate (BGA0282-DUP2)				**Source: 23A0324-02**	Prepared & Analyzed: 01/11/2023					
Hydrogen (H2)	3.95	0.18	Vol%		3.84			2.83	5	
Hydrogen (H2)	39500	1800	ppmv		38400			2.83	25	
Carbon Monoxide	260	90.0	ppmv		259			0.104	25	
Carbon Monoxide	0.03	0.009	Vol%		0.03			0.104	5	

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Final Report

Laboratory Order ID 23A0324

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0282 - No Prep VOC GC Air										
Duplicate (BGA0282-DUP3)			**Source: 23A0324-03**		Prepared & Analyzed: 01/11/2023					
Hydrogen (H2)	0.29	0.18	Vol%		0.28			4.51	5	
Hydrogen (H2)	2920	1800	ppmv		2790			4.51	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0282-DUP4)			**Source: 23A0579-03**		Prepared & Analyzed: 01/13/2023					
Methane	46.6	0.45	Vol%		47.0			0.829	5	
Carbon dioxide	45.3	0.45	Vol%		45.3			0.0420	5	
Oxygen (O2)	0.52	0.45	Vol%		0.53			1.72	5	
Hydrogen (H2)	<	0.18	Vol%		<0.18			NA	5	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0282-DUP5)			**Source: 23A0579-04**		Prepared & Analyzed: 01/13/2023					
Methane	20.7	0.45	Vol%		20.8			0.484	5	
Carbon dioxide	28.6	0.45	Vol%		28.8			0.922	5	
Oxygen (O2)	1.00	0.45	Vol%		1.00			0.0198	5	
Hydrogen (H2)	5.96	0.18	Vol%		5.96			0.0821	5	
Nitrogen (N2)	33.8	9.00	Vol%		34.1			0.690	5	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0282-DUP6)			**Source: 23A0579-05**		Prepared & Analyzed: 01/13/2023					
Methane	22.0	0.45	Vol%		21.9			0.161	5	
Carbon dioxide	24.8	0.45	Vol%		24.7			0.375	5	
Oxygen (O2)	4.89	0.45	Vol%		4.89			0.166	5	
Nitrogen (N2)	34.1	9.00	Vol%		34.0			0.241	5	
Hydrogen (H2)	3.57	0.18	Vol%		3.58			0.308	5	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0282 - No Prep VOC GC Air										
Duplicate (BGA0282-DUP7)				**Source: 23A0579-06**	Prepared & Analyzed: 01/13/2023					
Methane	38.6	0.45	Vol%		38.4			0.543	5	
Carbon dioxide	39.3	0.45	Vol%		39.3			0.117	5	
Oxygen (O2)	3.02	0.45	Vol%		3.02			0.117	5	
Hydrogen (H2)	<	0.18	Vol%		<0.18			NA	5	
Nitrogen (N2)	10.7	9.00	Vol%		10.7			0.198	5	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Qualifiers and Definitions

RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume

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

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

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formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 01/27/23

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT:	INVOICE CONTACT:	SITE NAME: Bristol
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07224028.00
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? (YES) NO — PWS I.D. #:
SAMPLER NAME (PRINT): Ryan Seymour	SAMPLER SIGNATURE: Ryan Seymour	**Turn Around Time:** Circle: 10 (5 Days) or __ Day

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

063-22K-0040

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	ANALYSIS: Hydrogen	
1)	37	063-0049	5400 5	12848	1.4	221129-02	30	-9 3.1"	1/6/23	8:55	40	149.2	1/6/23	8:59	9	149	LG	x	x	
2)	57	↓	↓	13372	1.4	221129-02	30	-6 3.4"	1/6/23	9:00	40	148.1	1/6/23	9:05	10	148.9	LG	x	x	
3)	64	↓	↓	13382	1.4	221129-02	30	-6 3.8"	1/6/23	9:10	40	145	1/6/23	9:15	10	145.2	LG	x	x	
4)				13384	1.4	221129-02	30										LG	x		

RELINQUISHED:	RECEIVED: FedEx G — DATE / TIME	QC Data Package	LAB USE ONLY 310 20.4°C No seal No ice
RELINQUISHED: FedEx G — DATE / TIME	RECEIVED: KRC 1/9/23 1030 — DATE / TIME	Level I ☐	**SCS Field Services 23A0324**
RELINQUISHED: — DATE / TIME	RECEIVED: — DATE / TIME	Level II ☐	**Bristol**
		Level III ☐	**Recd: 01/09/2023 Due: 01/16/2023**
		Level IV ☐	

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Final Report

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 9, 2023 10:30 January 16, 2023 16:12
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**20.40°C**
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0671

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 13, 2023 10:15
	4330 Lewis Road, Suite 1	Date Issued:	January 20, 2023 16:19
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 01/13/2023 10:15. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

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

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

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

TNI Accredited
VELAP ID 460021

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0671

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 13, 2023 10:15
	4330 Lewis Road, Suite 1	Date Issued:	January 20, 2023 16:19
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	23A0671-02	Air	01/12/2023 13:15	01/13/2023 10:15

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0671

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 13, 2023 10:15 January 20, 2023 16:19
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 37

Sample ID: 23A0671-02
Sample Matrix: Air
Sampled: 1/12/2023 13:15

Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00366::13971
Canister Size: 1.4L

Initial Vacuum(in Hg): 30
Final Vacuum(in Hg):
Receipt Vacuum(in Hg):
Flow Controller Type: Passive
Flow Controller ID:

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	150	90.0	90.0		9	1	1/17/23 11:47	MER

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Hydrogen (H2), as received	2.46	0.18	0.18		9	1	1/17/23 11:47	MER

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Final Report

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 13, 2023 10:15 January 20, 2023 16:19
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23A0671-02	1.00 mL / 1.00 mL	ALT-145	BGA0503	SGA0475	AG00026
23A0671-02	1.00 mL / 1.00 mL	EPA 3C	BGA0503	SGA0475	AG00026

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air										
Blank (BGA0503-BLK1)							Prepared & Analyzed: 01/17/2023			
Methane	<	500	ppmv							
Carbon dioxide	<	500	ppmv							
Oxygen (O2)	<	500	ppmv							
Hydrogen (H2)	<	200	ppmv							
Nitrogen (N2)	<	2000	ppmv							
Hydrogen (H2)	<	0.02	Vol%							
Carbon Monoxide	<	10.0	ppmv							
LCS (BGA0503-BS1)							Prepared & Analyzed: 01/17/2023			
Methane	4040	500	ppmv	5000		80.8	0-200			
Methane	4040	0.05	ppmv	5000		80.8	70-130			
Carbon dioxide	4360	500	ppmv	5000		87.1	0-200			
Carbon dioxide	4360	0.05	ppmv	5000		87.1	70-130			
Oxygen (O2)	5380	0.05	ppmv	5000		108	70-130			
Oxygen (O2)	5380	500	ppmv	5000		108	0-200			
Hydrogen (H2)	5900	200	ppmv	5100		116	0-200			
Nitrogen (N2)	5690	2000	ppmv	5000		114	0-200			
Hydrogen (H2)	5900	0.02	ppmv	5100		116	70-130			
Nitrogen (N2)	5690	1	ppmv	5000		114	70-130			
Carbon Monoxide	4880	0.001	ppmv	5000		97.6	70-130			
Carbon Monoxide	4880	10	ppmv	5000		97.6	0-200			
Duplicate (BGA0503-DUP1)					**Source: 23A0671-02**		Prepared & Analyzed: 01/17/2023			
Methane	114000	4500	ppmv		114000			0.623	25	
Methane	11.4	0.45	Vol%		11.4			0.623	5	
Carbon dioxide	251000	4500	ppmv		247000			1.28	25	
Carbon dioxide	25.1	0.45	Vol%		24.7			1.28	5	
Oxygen (O2)	62700	4500	ppmv		63300			1.07	25	
Oxygen (O2)	6.27	0.45	Vol%		6.33			1.07	5	
Nitrogen (N2)	478000	18000	ppmv		475000			0.487	25	
Hydrogen (H2)	25200	1800	ppmv		24600			2.30	25	
Nitrogen (N2)	47.8	9.00	Vol%		47.5			0.487	5	

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Final Report

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air										
Duplicate (BGA0503-DUP1)			**Source: 23A0671-02**		Prepared & Analyzed: 01/17/2023					
Hydrogen (H2)	2.52	0.18	Vol%		2.46			2.30	5	
Carbon Monoxide	149	90.0	ppmv		150			1.20	25	
Carbon Monoxide	0.01	0.009	Vol%		0.02			1.20	5	
Duplicate (BGA0503-DUP2)			**Source: 23A0754-01**		Prepared & Analyzed: 01/20/2023					
Methane	292000	4500	ppmv		289000			1.05	25	
Methane	29.2	0.45	Vol%		28.9			1.05	5	
Carbon dioxide	31.4	0.45	Vol%		31.1			0.925	5	
Carbon dioxide	314000	4500	ppmv		311000			0.925	25	
Oxygen (O2)	1.79	0.45	Vol%		1.80			0.333	5	
Oxygen (O2)	17900	4500	ppmv		18000			0.333	25	
Hydrogen (H2)	47000	1800	ppmv		46900			0.363	25	
Nitrogen (N2)	25.9	9.00	Vol%		25.7			0.763	5	
Nitrogen (N2)	259000	18000	ppmv		257000			0.763	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0503-DUP3)			**Source: 23A0754-02**		Prepared & Analyzed: 01/20/2023					
Methane	208000	4500	ppmv		207000			0.651	25	
Methane	20.8	0.45	Vol%		20.7			0.651	5	
Carbon dioxide	284000	4500	ppmv		283000			0.451	25	
Carbon dioxide	28.4	0.45	Vol%		28.3			0.451	5	
Oxygen (O2)	1.20	0.45	Vol%		1.19			0.427	5	
Oxygen (O2)	12000	4500	ppmv		11900			0.427	25	
Hydrogen (H2)	57400	1800	ppmv		58000			1.04	25	
Nitrogen (N2)	375000	18000	ppmv		374000			0.283	25	
Nitrogen (N2)	37.5	9.00	Vol%		37.4			0.283	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0671

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 13, 2023 10:15 January 20, 2023 16:19
Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air										
Duplicate (BGA0503-DUP4)				**Source: 23A0954-01**	Prepared & Analyzed: 01/20/2023					
Methane	<	500	ppmv		108000			NA	25	
Methane	<	0.05	Vol%		10.8			NA	5	
Carbon dioxide	<	0.05	Vol%		23.9			NA	5	
Carbon dioxide	<	500	ppmv		239000			NA	25	
Oxygen (O2)	563	500	ppmv		68900			197	25	
Oxygen (O2)	0.06	0.05	Vol%		6.89			197	5	
Hydrogen (H2)	<	200	ppmv		25000			NA	25	
Nitrogen (N2)	<	2000	ppmv		492000			NA	25	
Nitrogen (N2)	<	1.00	Vol%		49.2			NA	5	
Hydrogen (H2)	<	0.02	Vol%		2.50			NA	5	
Carbon Monoxide	<	10.0	ppmv		144			NA	25	
Carbon Monoxide	<	0.001	Vol%		0.01			NA	5	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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Final Report

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Qualifiers and Definitions

RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume

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

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

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formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 01/27/23

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT:	INVOICE CONTACT:	SITE NAME:
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07220628.06
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:

Is sample for compliance reporting? (YES) NO | **Regulatory State:** VA | Is sample from a chlorinated supply? YES (NO) | PWS I.D. #:

SAMPLER NAME (PRINT): Ryan Seymour SAMPLER SIGNATURE: Ryan Seymour **Turn Around Time:** Circle: 10 (5 Days) or __ Day

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

063-22K-0040

	CLIENT SAMPLE I.D. (water@wc11/2)	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Info: Canister ID	Canister Info: Size (L)	Canister Info: Cleaning Batch ID	Canister Info: LAB Outgoing Canister Vacuum (in Hg)	Canister Info: LAB Receiving Canister Vacuum (in Hg)	Sampling Start Info: Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Info: Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	ANALYSIS: Hydrogen	
								Barometric Pres. (in Hg):					Barometric Pres. (in Hg):							
1)	57			13960	1.4	221129-02	30	~~30~~ 28 11	1/12/23	12:55 pm	30	— 176	1/12/23	1:02 PM	30	176	LG	x	X	
2)	37			13971	1.4	221128-01	30	~~30~~ 5.0 "	1/12/23	1:10 pm	30	149	1/12/23	1:15 pm	10	149	LG	x	X	
3)				13384	1.4	221129.02	30		1/12/23				1/12/23				Lu	X	X	
4)																				

RELINQUISHED: Ryan Seymour 1/12/23	RECEIVED:	DATE / TIME	QC Data Package Level I ☐
RELINQUISHED: DATE / TIME 5:30 pm	RECEIVED: Fed Ex E	DATE / TIME	**LAB USE ONLY**
RELINQUISHED: Fed Ex E DATE / TIME	RECEIVED: M Stevens 1/13/23 10 15	DATE / TIME	

SCS Field Services **23A0671**
Bristol
Recd: 01/13/2023 **Due: 01/20/2023**

310
20.4C
no seal
no ice

v130325002

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Final Report

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Submitted To:	Tom Lock	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**20.40°C**
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	No
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

Samples logged for VOC Fixed Gases by EPA 3C and ALT 145 CO per Tom Lock via email, which differs from the COC (Alt 145 CO, Hydrogen).
MRS 01/13/23 1213

Sample -01was cacelled due to there not being sufficient sample volume. Client has been notified on 1/17/23 via email. DFE 1/17/23 1401

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 20, 2023 9:25
	4330 Lewis Road, Suite 1	Date Issued:	January 27, 2023 14:02
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 01/20/2023 09:25. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

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

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

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

TNI Accredited
VELAP ID 460021

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 20, 2023 9:25
	4330 Lewis Road, Suite 1	Date Issued:	January 27, 2023 14:02
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW37	23A0954-01	Air	01/18/2023 12:32	01/20/2023 09:25

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Final Report

Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: EW37

Sample ID: 23A0954-01

Sample Matrix: Air

Sampled: 1/18/2023 12:32

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00071::00331

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg):

Receipt Vacuum(in Hg):

Flow Controller Type: PASSIVE

Flow Controller ID:

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

Analyte	Result (ppmv)	MDL (ppmv)	LOQ (ppmv)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	144	90.0	90.0		9	1	1/20/23 15:46	MER

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

Analyte	Result (Vol%)	MDL (Vol%)	LOQ (Vol%)	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	10.8	0.45	0.45		9	1	1/20/23 15:46	MER
Carbon dioxide, as received	23.9	0.45	0.45		9	1	1/20/23 15:46	MER
Oxygen (O2), as received	6.89	0.45	0.45		9	1	1/20/23 15:46	MER
Hydrogen (H2), as received	2.50	0.18	0.18		9	1	1/20/23 15:46	MER
Nitrogen (N2), as received	48.6	18.0	18.0		18	1	1/20/23 16:45	MER

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23A0954-01	1.00 mL / 1.00 mL	ALT-145	BGA0503	SGA0613	AG00026
23A0954-01	1.00 mL / 1.00 mL	EPA 3C	BGA0503	SGA0613	AG00026
23A0954-01RE1	1.00 mL / 1.00 mL	EPA 3C	BGA0503	SGA0613	AG00026

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Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air											
Blank (BGA0503-BLK1)					Prepared & Analyzed: 01/17/2023						
Methane		<	500	ppmv							
Methane		<	0.05	Vol%							
Carbon dioxide		<	500	ppmv							
Carbon dioxide		<	0.05	Vol%							
Oxygen (O2)		<	500	ppmv							
Oxygen (O2)		<	0.05	Vol%							
Hydrogen (H2)		<	200	ppmv							
Nitrogen (N2)		<	2000	ppmv							
Nitrogen (N2)		<	1.00	Vol%							
Hydrogen (H2)		<	0.02	Vol%							
Carbon Monoxide		<	10.0	ppmv							
LCS (BGA0503-BS1)					Prepared & Analyzed: 01/17/2023						
Methane	4040		500	ppmv	5000		80.8	0-200			
Methane	4040		0.05	ppmv	5000		80.8	70-130			
Carbon dioxide	4360		500	ppmv	5000		87.1	0-200			
Carbon dioxide	4360		0.05	ppmv	5000		87.1	70-130			
Oxygen (O2)	5380		500	ppmv	5000		108	0-200			
Oxygen (O2)	5380		0.05	ppmv	5000		108	70-130			
Nitrogen (N2)	5690		2000	ppmv	5000		114	0-200			
Hydrogen (H2)	5900		200	ppmv	5100		116	0-200			
Hydrogen (H2)	5900		0.02	ppmv	5100		116	70-130			
Nitrogen (N2)	5690		1	ppmv	5000		114	70-130			
Carbon Monoxide	4880		10	ppmv	5000		97.6	0-200			
Carbon Monoxide	4880		0.001	ppmv	5000		97.6	70-130			
Duplicate (BGA0503-DUP1)					**Source: 23A0671-02**	Prepared & Analyzed: 01/17/2023					
Methane	114000		4500	ppmv		114000			0.623	25	
Methane	11.4		0.45	Vol%		11.4			0.623	5	
Carbon dioxide	251000		4500	ppmv		247000			1.28	25	
Carbon dioxide	25.1		0.45	Vol%		24.7			1.28	5	
Oxygen (O2)	62700		4500	ppmv		63300			1.07	25	

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air										
Duplicate (BGA0503-DUP1)				**Source: 23A0671-02**	Prepared & Analyzed: 01/17/2023					
Oxygen (O2)	6.27	0.45	Vol%		6.33			1.07	5	
Hydrogen (H2)	25200	1800	ppmv		24600			2.30	25	
Nitrogen (N2)	478000	18000	ppmv		475000			0.487	25	
Nitrogen (N2)	47.8	9.00	Vol%		47.5			0.487	5	
Hydrogen (H2)	2.52	0.18	Vol%		2.46			2.30	5	
Carbon Monoxide	149	90.0	ppmv		150			1.20	25	
Carbon Monoxide	0.01	0.009	Vol%		0.02			1.20	5	
Duplicate (BGA0503-DUP2)				**Source: 23A0754-01**	Prepared & Analyzed: 01/20/2023					
Methane	29.2	0.45	Vol%		28.9			1.05	5	
Methane	292000	4500	ppmv		289000			1.05	25	
Carbon dioxide	31.4	0.45	Vol%		31.1			0.925	5	
Carbon dioxide	314000	4500	ppmv		311000			0.925	25	
Oxygen (O2)	17900	4500	ppmv		18000			0.333	25	
Oxygen (O2)	1.79	0.45	Vol%		1.80			0.333	5	
Nitrogen (N2)	25.9	9.00	Vol%		25.7			0.763	5	
Nitrogen (N2)	259000	18000	ppmv		257000			0.763	25	
Hydrogen (H2)	47000	1800	ppmv		46900			0.363	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BGA0503-DUP3)				**Source: 23A0754-02**	Prepared & Analyzed: 01/20/2023					
Methane	20.8	0.45	Vol%		20.7			0.651	5	
Methane	208000	4500	ppmv		207000			0.651	25	
Carbon dioxide	284000	4500	ppmv		283000			0.451	25	
Carbon dioxide	28.4	0.45	Vol%		28.3			0.451	5	
Oxygen (O2)	12000	4500	ppmv		11900			0.427	25	
Oxygen (O2)	1.20	0.45	Vol%		1.19			0.427	5	
Hydrogen (H2)	57400	1800	ppmv		58000			1.04	25	
Nitrogen (N2)	375000	18000	ppmv		374000			0.283	25	
Nitrogen (N2)	37.5	9.00	Vol%		37.4			0.283	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

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Final Report

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0503 - No Prep VOC GC Air										
Duplicate (BGA0503-DUP4)				**Source: 23A0954-01**	Prepared & Analyzed: 01/20/2023					
Methane	109000	4500	ppmv		108000			0.960	25	
Methane	10.9	0.45	Vol%		10.8			0.960	5	
Carbon dioxide	24.2	0.45	Vol%		23.9			1.32	5	
Carbon dioxide	242000	4500	ppmv		239000			1.32	25	
Oxygen (O2)	70200	4500	ppmv		68900			1.81	25	
Oxygen (O2)	7.02	0.45	Vol%		6.89			1.81	5	
Hydrogen (H2)	25600	1800	ppmv		25000			2.37	25	
Nitrogen (N2)	497000	18000	ppmv		492000			1.05	25	
Hydrogen (H2)	2.56	0.18	Vol%		2.50			2.37	5	
Carbon Monoxide	145	90.0	ppmv		144			0.374	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			0.374	5	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Qualifiers and Definitions

RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume

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

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

ENTHALPY ANALYTICAL
formerly *Air, Water & Soil Laboratories*

AIR ANALYSIS
CHAIN OF COUSTODY

Equipment due 2/6/2023

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

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

063-23A-0005

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information (Barometric Pres. (in Hg): 30.07): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information (Barometric Pres. (in Hg):): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	hydrogen	CH4 CO2 O2 N2 H2
1)	EW37	ST005		331	1.4	221228-01	21.2	3.4"	01/18	12:30pm	27	149°	01/18	12:32 pm	9	149°	LG	x	X	X
2)				335	1.4	221228-01	21.2										LG	x		
3)				10047	1.4	221228-01	21.2										LG	x		
4)				12453	1.4	221228-01	21.2										LG	x		

20.5°C, 310, no ice, no seal

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
		FedEx E	
FedEx E		CSB	1/20/23 0925

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

LAB USE ONLY

SCS Field Services 23A0954
Bristol
Recd: 01/20/2023 Due: 01/27/2023

v130325002

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 23A0954

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 20, 2023 9:25 January 27, 2023 14:02
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**20.50°C**
How were samples received?	FedEx Express
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

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Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 27, 2023 11:02
	4330 Lewis Road, Suite 1	Date Issued:	February 2, 2023 16:04
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 01/27/2023 11:02. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars

Technical Director

End Notes:

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

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

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

TNI Accredited
VELAP ID 460021

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Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	January 27, 2023 11:02
	4330 Lewis Road, Suite 1	Date Issued:	February 2, 2023 16:04
	Harrisburg, PA 17111	Project Number:	[none]
Submitted To:	Tom Lock	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
57	23A1337-02	Air	01/25/2023 12:08	01/27/2023 11:02
37	23A1337-03	Air	01/25/2023 11:55	01/27/2023 11:02

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Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 57

Sample ID: 23A1337-02
Sample Matrix: Air
Sampled: 1/25/2023 12:08

Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00024::10047
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.1
Final Vacuum(in Hg):
Receipt Vacuum(in Hg):
Flow Controller Type: Passive
Flow Controller ID:

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

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	300	90.0	90.0		9	1	1/31/23 12:05	MER

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

Analyte	Vol% Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	25.2	0.45	0.45		9	1	1/31/23 12:05	MER
Carbon dioxide, as received	53.8	0.45	0.45		9	1	1/31/23 12:05	MER
Oxygen (O2), as received	1.48	0.45	0.45		9	1	1/31/23 12:05	MER
Hydrogen (H2), as received	6.78	0.36	0.36		18	1	1/31/23 17:27	MER
Nitrogen (N2), as received	ND	9.00	9.00		9	1	1/31/23 12:05	MER
Carbon Monoxide, as received	0.03	0.009	0.009		9	1	1/31/23 12:05	MER

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:
Field Sample #: 37

Sample ID: 23A1337-03
Sample Matrix: Air
Sampled: 1/25/2023 11:55

Sample Type: LV

Sample Description/Location:
Sub Description/Location:
Canister ID: 063-00310::12453
Canister Size: 1.4L

Initial Vacuum(in Hg): 21.1
Final Vacuum(in Hg):
Receipt Vacuum(in Hg):
Flow Controller Type: Passive
Flow Controller ID:

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

Analyte	Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	148	90.0	90.0		9	1	1/31/23 13:12	MER

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

Analyte	Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Methane, as received	11.7	0.45	0.45		9	1	1/31/23 13:12	MER
Carbon dioxide, as received	25.8	0.45	0.45		9	1	1/31/23 13:12	MER
Oxygen (O2), as received	6.18	0.45	0.45		9	1	1/31/23 13:12	MER
Hydrogen (H2), as received	2.39	0.18	0.18		9	1	1/31/23 13:12	MER
Nitrogen (N2), as received	45.6	18.0	18.0		18	1	1/31/23 17:43	MER
Carbon Monoxide, as received	0.01	0.009	0.009		9	1	1/31/23 13:12	MER

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GC/TCD - Unadjusted, as received basis			**Preparation Method:**	**No Prep VOC GC Air**	
23A1337-02	1.00 mL / 1.00 mL	ALT-145	BGA0766	SGA0947	AG00026
23A1337-03	1.00 mL / 1.00 mL	ALT-145	BGA0766	SGA0947	AG00026
23A1337-02	1.00 mL / 1.00 mL	EPA 3C	BGA0766	SGA0947	AG00026
23A1337-02RE1	1.00 mL / 1.00 mL	EPA 3C	BGA0766	SGA0947	AG00026
23A1337-03	1.00 mL / 1.00 mL	EPA 3C	BGA0766	SGA0947	AG00026
23A1337-03RE1	1.00 mL / 1.00 mL	EPA 3C	BGA0766	SGA0947	AG00026

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0766 - No Prep VOC GC Air										
Blank (BGA0766-BLK1)					Prepared & Analyzed: 01/25/2023					
Methane	<	0.05	Vol%							
Carbon dioxide	<	0.05	Vol%							
Oxygen (O2)	<	0.05	Vol%							
Hydrogen (H2)	<	0.02	Vol%							
Nitrogen (N2)	<	1.00	Vol%							
Carbon Monoxide	<	10.0	ppmv							
Carbon Monoxide	<	0.001	Vol%							
LCS (BGA0766-BS1)					Prepared & Analyzed: 01/25/2023					
Methane	4070	500	ppmv	5000		81.4	0-200			
Methane	4070	0.05	ppmv	5000		81.4	70-130			
Carbon dioxide	4300	500	ppmv	5000		86.0	0-200			
Carbon dioxide	4300	0.05	ppmv	5000		86.0	70-130			
Oxygen (O2)	5260	0.05	ppmv	5000		105	70-130			
Oxygen (O2)	5260	500	ppmv	5000		105	0-200			
Nitrogen (N2)	5810	2000	ppmv	5000		116	0-200			
Hydrogen (H2)	5960	200	ppmv	5100		117	0-200			
Nitrogen (N2)	5810	1	ppmv	5000		116	70-130			
Hydrogen (H2)	5960	0.02	ppmv	5100		117	70-130			
Carbon Monoxide	4950	10	ppmv	5000		99.0	0-200			
Carbon Monoxide	4950	0.001	ppmv	5000		99.0	70-130			
Duplicate (BGA0766-DUP1)				**Source: 23A1035-01**	Prepared & Analyzed: 01/25/2023					
Methane	229000	4500	ppmv		228000			0.633	25	
Methane	22.9	0.45	Vol%		22.8			0.632	5	
Carbon dioxide	286000	4500	ppmv		285000			0.485	25	
Carbon dioxide	28.6	0.45	Vol%		28.5			0.485	5	
Oxygen (O2)	15500	4500	ppmv		15700			1.39	25	
Oxygen (O2)	1.55	0.45	Vol%		1.57			1.39	5	
Nitrogen (N2)	336000	18000	ppmv		336000			0.0580	25	
Hydrogen (H2)	54500	1800	ppmv		54600			0.204	25	
Nitrogen (N2)	33.6	9.00	Vol%		33.6			0.0580	5	

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Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0766 - No Prep VOC GC Air											
Duplicate (BGA0766-DUP1)				**Source: 23A1035-01**		Prepared & Analyzed: 01/25/2023					
Carbon Monoxide		<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide		<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0766-DUP2)				**Source: 23A1035-02**		Prepared & Analyzed: 01/25/2023					
Methane	28.8		0.45	Vol%		28.7			0.285	5	
Methane	288000		4500	ppmv		287000			0.285	25	
Carbon dioxide	31.4		0.45	Vol%		31.1			0.783	5	
Carbon dioxide	314000		4500	ppmv		311000			0.783	25	
Oxygen (O2)	15700		4500	ppmv		15500			0.946	25	
Oxygen (O2)	1.57		0.45	Vol%		1.55			0.946	5	
Hydrogen (H2)	62900		1800	ppmv		62200			1.17	25	
Nitrogen (N2)	25.7		9.00	Vol%		25.5			0.650	5	
Nitrogen (N2)	257000		18000	ppmv		255000			0.650	25	
Carbon Monoxide		<	0.009	Vol%		<0.009			NA	5	
Carbon Monoxide		<	90.0	ppmv		<90.0			NA	25	
Duplicate (BGA0766-DUP3)				**Source: 23A1035-03**		Prepared & Analyzed: 01/25/2023					
Methane	31.0		0.45	Vol%		31.1			0.499	5	
Methane	310000		4500	ppmv		311000			0.499	25	
Carbon dioxide	352000		4500	ppmv		353000			0.417	25	
Carbon dioxide	35.2		0.45	Vol%		35.3			0.417	5	
Oxygen (O2)	1.36		0.45	Vol%		1.37			0.368	5	
Oxygen (O2)	13600		4500	ppmv		13700			0.368	25	
Nitrogen (N2)	21.1		9.00	Vol%		21.2			0.594	5	
Hydrogen (H2)	65600		1800	ppmv		65600			0.0264	25	
Nitrogen (N2)	211000		18000	ppmv		212000			0.594	25	
Carbon Monoxide		<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide		<	0.009	Vol%		<0.009			NA	5	

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Final Report

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0766 - No Prep VOC GC Air										
Duplicate (BGA0766-DUP4)				**Source: 23A1035-04**	Prepared & Analyzed: 01/25/2023					
Methane	149000	4500	ppmv		149000			0.483	25	
Methane	14.9	0.45	Vol%		14.9			0.483	5	
Carbon dioxide	253000	4500	ppmv		252000			0.507	25	
Carbon dioxide	25.3	0.45	Vol%		25.2			0.507	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Nitrogen (N2)	453000	18000	ppmv		451000			0.486	25	
Hydrogen (H2)	18800	1800	ppmv		19000			1.01	25	
Hydrogen (H2)	1.88	0.18	Vol%		1.90			1.01	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0766-DUP5)				**Source: 23A1337-02**	Prepared & Analyzed: 01/31/2023					
Methane	251000	4500	ppmv		252000			0.551	25	
Methane	25.1	0.45	Vol%		25.2			0.551	5	
Carbon dioxide	53.6	0.45	Vol%		53.8			0.363	5	
Carbon dioxide	536000	4500	ppmv		538000			0.363	25	
Oxygen (O2)	14600	4500	ppmv		14800			0.833	25	
Oxygen (O2)	1.46	0.45	Vol%		1.48			0.833	5	
Nitrogen (N2)	52200	18000	ppmv		52500			0.508	25	
Hydrogen (H2)	69300	1800	ppmv		68700			0.823	25	
Nitrogen (N2)	<	9.00	Vol%		<9.00			NA	5	
Carbon Monoxide	0.03	0.009	Vol%		0.03			0.239	5	
Carbon Monoxide	301	90.0	ppmv		300			0.239	25	
Duplicate (BGA0766-DUP6)				**Source: 23A1337-03**	Prepared & Analyzed: 01/31/2023					
Methane	117000	4500	ppmv		117000			0.503	25	
Methane	11.7	0.45	Vol%		11.7			0.503	5	
Carbon dioxide	26.0	0.45	Vol%		25.8			0.732	5	
Carbon dioxide	260000	4500	ppmv		258000			0.732	25	
Oxygen (O2)	6.20	0.45	Vol%		6.18			0.409	5	
Oxygen (O2)	62000	4500	ppmv		61800			0.409	25	
Nitrogen (N2)	455000	18000	ppmv		454000			0.181	25	
Hydrogen (H2)	24600	1800	ppmv		23900			3.14	25	
Hydrogen (H2)	2.46	0.18	Vol%		2.39			3.14	5	

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0766 - No Prep VOC GC Air										
Duplicate (BGA0766-DUP6)				**Source: 23A1337-03**	Prepared & Analyzed: 01/31/2023					
Carbon Monoxide	145	90.0	ppmv		148			1.60	25	
Carbon Monoxide	0.01	0.009	Vol%		0.01			1.60	5	
Duplicate (BGA0766-DUP7)				**Source: 23A1447-01**	Prepared & Analyzed: 01/31/2023					
Methane	225000	4500	ppmv		222000			1.52	25	
Methane	22.5	0.45	Vol%		22.2			1.52	5	
Carbon dioxide	307000	4500	ppmv		302000			1.49	25	
Carbon dioxide	30.7	0.45	Vol%		30.2			1.49	5	
Oxygen (O2)	4900	4500	ppmv		4820			1.60	25	
Oxygen (O2)	0.49	0.45	Vol%		0.48			1.60	5	
Hydrogen (H2)	20200	1800	ppmv		20500			1.18	25	
Nitrogen (N2)	405000	18000	ppmv		400000			1.22	25	
Nitrogen (N2)	40.5	9.00	Vol%		40.0			1.22	5	
Hydrogen (H2)	2.02	0.18	Vol%		2.05			1.18	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0766-DUP8)				**Source: 23A1447-02**	Prepared & Analyzed: 01/31/2023					
Methane	385000	4500	ppmv		386000			0.358	25	
Methane	38.5	0.45	Vol%		38.6			0.358	5	
Carbon dioxide	387000	4500	ppmv		387000			0.128	25	
Carbon dioxide	38.7	0.45	Vol%		38.7			0.128	5	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Oxygen (O2)	<	0.45	Vol%		<0.45			NA	5	
Hydrogen (H2)	63200	1800	ppmv		63300			0.261	25	
Nitrogen (N2)	111000	18000	ppmv		111000			0.102	25	
Nitrogen (N2)	11.1	9.00	Vol%		11.1			0.102	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

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Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

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

Enthalpy Analytical

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0766 - No Prep VOC GC Air										
Duplicate (BGA0766-DUP9)				**Source: 23A1447-03**	Prepared & Analyzed: 01/31/2023					
Methane	283000	4500	ppmv		287000			1.55	25	
Methane	28.3	0.45	Vol%		28.7			1.55	5	
Carbon dioxide	317000	4500	ppmv		320000			0.863	25	
Carbon dioxide	31.7	0.45	Vol%		32.0			0.863	5	
Oxygen (O2)	19200	4500	ppmv		19400			1.33	25	
Oxygen (O2)	1.92	0.45	Vol%		1.94			1.33	5	
Hydrogen (H2)	65500	1800	ppmv		65700			0.373	25	
Nitrogen (N2)	263000	18000	ppmv		266000			1.25	25	
Nitrogen (N2)	26.3	9.00	Vol%		26.6			1.25	5	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	
Duplicate (BGA0766-DUPA)				**Source: 23A1447-04**	Prepared & Analyzed: 01/31/2023					
Methane	363000	4500	ppmv		363000			0.0254	25	
Methane	36.3	0.45	Vol%		36.3			0.0254	5	
Carbon dioxide	381000	4500	ppmv		380000			0.123	25	
Carbon dioxide	38.1	0.45	Vol%		38.0			0.123	5	
Oxygen (O2)	19500	4500	ppmv		19500			0.170	25	
Oxygen (O2)	1.95	0.45	Vol%		1.95			0.170	5	
Nitrogen (N2)	147000	18000	ppmv		146000			0.148	25	
Nitrogen (N2)	14.7	9.00	Vol%		14.6			0.148	5	
Hydrogen (H2)	47800	1800	ppmv		47300			1.09	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Carbon Monoxide	<	0.009	Vol%		<0.009			NA	5	

ENTHALPY ANALYTICAL

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

Certificate of Analysis

Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications
EPA 3C in Air			
Methane	VELAP		
Oxygen (O2)	VELAP		
Nitrogen (N2)	VELAP		

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

Qualifiers and Definitions

RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
PF	Preparation Factor
MDL	Method Detection Limit
LOQ	Limit of Quantitation
ppbv	parts per billion by volume
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.

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

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 2/6/2023

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: Sarah Eadsly	INVOICE CONTACT:	SITE NAME: Bristol
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 07220028.00
PHONE #:	INVOICE PHONE #:	P.O. #:
FAX #: EMAIL:		Pretreatment Program:
Is sample for compliance reporting? YES (NO)	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): Ryan Seymour	SAMPLER SIGNATURE: Ryan Seymour	**Turn Around Time:** Circle: 10 (5 Days) or __ Day

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

063-23A-0005

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO	hydrocarbons	TO-15 CO2 N2 H2
	Barometric Pres. (in Hg):								Barometric Pres.: 30.03				Barometric Pres. (in Hg):							
1)	~~EW37~~	~~ST005~~		~~331~~	1.4	221228-01	~~21.2~~		~~01/18~~	~~12:30~~ 12:30pm	~~27~~	~~149°~~	~~01/18~~	~~12:32~~ pm	~~9~~	~~149°~~	LG	x	~~X~~	~~X~~
2)	Empty	ST005		335	1.4	221228-01	21.2	EMPTY	—	—	RETURN	—	—	—	—	—	LG	x	X	X
3)	57	ST005 ↓		10047	1.4	221228-01	21.2	~~10~~ 5.6	1/25/23	12:05pm	27	148	1/25/23	12:08pm	10	148	LG	x	X	X
4)	37	↓		12453	1.4	221228-01	21.2	~~10~~ 5.2	1/25/23	11:50AM	26	170	1/25/23	11:55 AM	10	170	LG	x		

19.3°C, 310, no ice, no seal

RELINQUISHED: Ryan Seymour 1/25/23	RECEIVED: FedEx G DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: FedEx G DATE / TIME	RECEIVED: CSB 1/27/23 1102 DATE / TIME	Level I ☐	**SCS Field Services 23A1337**
RELINQUISHED: DATE / TIME	RECEIVED: DATE / TIME	Level II ☐	**Bristol**
		Level III ☐	**Recd: 01/27/2023 Due: 02/03/2023**
		Level IV ☐	

v130325002

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

Certificate of Analysis

Final Report

Laboratory Order ID 23A1337

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	January 27, 2023 11:02 February 2, 2023 16:04
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**19.30°C**
How were samples received?	FedEx Ground
Were Custody Seals used? If so, were they received intact?	No
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

Attachment 4

Daily Logs

SCS FIELD SERVICES DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	1.05.22	**PROJECT NAME**	BRISTOL
TEMP	53	**WEATHER**	Partly cloud	**B.P.**	29.99	**WIND**	15mph NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	12					
			DAILY TOTAL			

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4	1	Day	
Truck	1	Day	Generator		Day	

INSTRUMENT CALIBRATION (CAL. GAS)							
MODEL	S/N	CH4 (%-VOL)	CH4 (%-LEL)	02 LOW CALE %-VOL)	CO2 (%-VOL)	H2S (PPM)	
5000	500399	50		20.9	34.9		

SUMMARY	Scs was on site for monthly monitoring and blower flare check.
	I calibrated my gem. I bump tested Mx4.

Enhanced monitoring at EW-37 and -57. I notified SCS Engineers that well 57 was 176 degrees. I couldn't get an accurate sample because liquid/foam in the sample ports.

I also confirmed the old phase (221) well heads need to be cleaned or replaced with new QED well heads. Parts for repairs on order.

Noted settlement around EW-55 and -64.

I didn't leave comments on my 221 readings because I wrote the comments down in my book. Etools didn't work with my comments.

Adjustments were made to the 221 during monthly monitoring. For example: GW 3, closed down a little. GW 8, closed. GW 19, installed 1 inch orifice plate, closed it.

Prepared by:
Ryan Seymour

ACCEPTED BY: _____

I understand that when performing a one person job assignment, I am acting as my own supervisor.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.07 **TASK NO.** **DATE** 1/5/23 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	7				

EQUIPMENT	EQUIPMENT

WORK PERFORMED - DESCRIPTION OF ITEM (Example, Routine, SEM, etc)			WORK PERFORMED DESCRIPTION OF ITEM		

Notes	Installed temperature probes in wells 51 and 68. Placed dirt around wells with skid steer.

SCS FIELD SERVICES DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00004	**DATE**	1.06.22	**PROJECT NAME**	BRISTOL
TEMP	37	**WEATHER**	Partly cloud	**B.P.**	30.19	**WIND**	7mph E

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	12					
Billy Bellew	12					
			DAILY TOTAL	24		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4	1	Day	
Truck	1	Day	Generator		Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	02 LOW CALE %-VOL)	CO2 (%-VOL)	H2S (PPM)	
MODEL	S/N						
5000	500399	50		20.9	34.9		

SUMMARY	
	Scs was on site for monthly monitoring and blower flare check.
	I calibrated my gem and grabbed a blower flare reading. The flare was running upon arrival.
	Blower: CH4-34.6 % CO2- 34.2 % O2- 3.6 % BAL- 27.6 % ins-sp- 24.93
	Today I grabbed readings from 37, 57, and 64. Those were my only wells over 145.

Grabbed readings from the leachate cleanouts North and South side.

Prepared by:
Ryan Seymour

ACCEPTED BY: _____

I understand that when performing a one person job assignment, I am acting as my own supervisor.

WB ENTERPRISE, LLC

DATE	1/17/2023

DAILY ACTIVITY LOG

NAME	Will Brown Brandon Fitzgerald	START TIME	7:00AM	END TIME	5:30PM	# OF HOURS	10.5
LOCATION	Bristol						

Mob.

Picked up metal for pipe stands. Welded pipe stands.

SCS FIELD SERVICES DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00005	**DATE**	01/18/22	**PROJECT NAME**	Bristol
TEMP	60 degrees F	**WEATHER**	cloudy	**B.P.**	30.03" Hg	**WIND**	E @ 6 MPH

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan DeHart	17					
Ryan Seymour	16.50					
			DAILY TOTAL	33.50		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4	2	Day	
Truck	1	Day	Generator	0	Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4	CH4	02 LOW SCALE	CO2		
MODEL	S/N	(%-VOL)	(%-LEL)	%-VOL)	(%-VOL)	H2S (PPM)	
5000	2648	49.9		20.9	34.9		

SUMMARY

SCS was on site for CO sampling and 221 line well head investigation.

Flare was burning and plant was running on arrival and departure.

Bump tested MX4s.

GEM reading at Blower inlet: 32.1% CH4, 31.6% CO2, 4.2% O2, 32.1% Bal, -24.57" vacuum, 320 SCFM

Rechecks were required on GW37 (149F) and GW57 (172F). Could not acquire a sample or an accurate reading on GW57 due to liquid in the test ports. GEM experienced flow fail and filled water trap while monitoring GW57. A CO sample was taken from GW37. Notified engineers of exceedances and requirements to acquire a sample on GW57.

GW57 pump hose fitting that connects to the drain line appears to be damaged/bent.

Performed investigation on the condition of well heads in the 221 cell. Inspected ferncos, valves, flex hoses, pitot tubes, protective cover caps, and pump attachments. More information on individual wells can be found on separate information sheet.

Used acetone to flush out debris inside pitot tube for all wellheads in the 221 line. GWs 03, 09, and 06 are missing pitot tubes.

Out of the 19 wells in the 221 cell more than 50% will require new well head set ups. Recommend repairing/replacing all 19 well heads.

PREPARED BY: Ryan DeHart ACCEPTED BY: _____

I understand that when performing a one person job assignment, I am acting as my own supervisor.

WB ENTERPRISE, LLC

DATE	1/18/2023

DAILY ACTIVITY LOG

NAME	Will Brown Brandon Fitzgerald	START TIME	7:00AM	END TIME	6:00PM	# OF HOURS	11
LOCATION	Bristol						

Made up 6” stringers, 300’. Dug in to fix vac in 498.

WB ENTERPRISE, LLC

DATE	1/19/2023

DAILY ACTIVITY LOG

NAME	Will Brown Brandon Fitzgerald	START TIME	7:00AM	END TIME	4:00PM	# OF HOURS	8
LOCATION	Bristol						

Finished pipe stands and cut down EW46.
Mob.

SCS FIELD SERVICES DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	1.25.22	**PROJECT NAME**	BRISTOL
TEMP	48	**WEATHER**	Partly cloud	**B.P.**	30.04	**WIND**	7mph NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	14					
			DAILY TOTAL	14		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4	1	Day	
Truck	1	Day	Generator		Day	

INSTRUMENT CALIBRATION (CAL. GAS)		CH4 (%-VOL)	CH4 (%-LEL)	02 LOW CALE %-VOL)	CO2 (%-VOL)	H2S (PPM)	
MODEL	S/N						
5000	500399	50		20.9	34.9		

SUMMARY	Scs was on site for monthly monitoring and blower flare check.
	I calibrated my gem. I bump tested Mx4.

Enhanced monitoring at EW-57 and 37. I informed Lauren that 57 was at 170 degrees.

Blower reading: CH4- 34.4% CO2- 35.2% O2- 3.5% BAL- 26.9%

Noted air leak at EW-20 due to missing a rubber cap. Parts for repair on order.

221 reading: CH4: 11.8% CO2: 8.3% O2: 15.9% BAL: 64.1%

Prepared by:
Ryan Seymour

ACCEPTED BY: _____

I understand that when performing a one person job assignment, I am acting as my own supervisor.

Appendix C

Solid Waste Permit #588 Daily Wellhead Temperature Averages

Solid Waste Permit 588 Daily Wellhead Temperature Averages

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

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

SCS ENGINEERS

07222143.00 | February 7, 2023

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

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

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	118.9	117.5	121.3
Jan 2	118.6	116.0	121.6
Jan 3	119.4	114.6	122.1
Jan 4	118.7	116.3	121.4
Jan 5	117.1	115.4	119.3
Jan 6	115.5	114.1	117.3
Jan 7	116.0	114.1	117.7
Jan 8	114.9	113.3	116.7
Jan 9	115.0	113.2	116.4
Jan 10	115.5	113.0	118.2
Jan 11	116.8	113.9	119.8
Jan 12	116.8	112.4	120.7
Jan 13	111.7	109.6	114.2
Jan 14	110.1	108.2	111.3
Jan 15	112.1	89.0	116.2
Jan 16	114.7	110.8	118.4
Jan 17	114.0	112.0	115.4
Jan 18	115.4	113.9	117.6
Jan 19	114.7	112.1	117.0
Jan 20	111.1	109.6	113.9
Jan 21	112.9	111.1	114.9
Jan 22	113.6	111.3	116.8
Jan 23	109.3	106.7	111.8
Jan 24	112.4	107.9	115.7
Jan 25	112.6	107.9	118.0
Jan 26	108.5	107.8	109.3
Jan 27	109.4	106.9	111.4
Jan 28	111.8	109.3	114.6
Jan 29	111.1	108.5	112.5
Jan 30	112.6	110.6	114.2
Jan 31	112.5	110.5	114.3
Summary	**114.0**	**108.5**	**119.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 35

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	55.2	45.8	62.2
Jan 2	53.2	43.4	67.7
Jan 3	60.1	52.4	73.8
Jan 4	57.5	48.7	70.4
Jan 5	48.7	40.2	60.9
Jan 6	45.2	38.5	53.4
Jan 7	43.8	36.0	54.9
Jan 8	44.8	39.9	47.8
Jan 9	41.6	31.3	47.3
Jan 10	40.2	29.0	54.6
Jan 11	46.7	34.0	60.5
Jan 12	52.9	46.6	65.1
Jan 13	38.9	31.0	49.4
Jan 14	30.8	28.4	33.1
Jan 15	33.8	26.4	48.4
Jan 16	38.9	26.4	56.7
Jan 17	44.9	40.2	48.3
Jan 18	53.0	48.1	64.0
Jan 19	53.8	45.4	63.1
Jan 20	42.6	33.3	50.8
Jan 21	38.9	29.4	52.8
Jan 22	46.6	38.8	56.6
Jan 23	37.4	33.8	45.0
Jan 24	38.5	26.4	53.6
Jan 25	50.2	39.8	63.1
Jan 26	37.3	35.0	42.4
Jan 27	35.3	30.1	43.5
Jan 28	39.0	26.4	56.0
Jan 29	40.3	34.9	44.9
Jan 30	47.5	42.5	52.8
Jan 31	47.4	43.2	51.3
Summary	**44.7**	**30.8**	**60.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 39

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	52.7	44.8	60.7
Jan 2	51.3	42.4	64.7
Jan 3	58.6	50.3	72.0
Jan 4	54.5	43.7	71.1
Jan 5	45.7	36.1	60.4
Jan 6	42.9	34.8	54.3
Jan 7	41.9	34.0	55.2
Jan 8	42.8	38.9	45.1
Jan 9	38.4	30.1	43.5
Jan 10	36.9	26.2	57.4
Jan 11	44.6	31.3	58.2
Jan 12	50.9	45.0	62.9
Jan 13	37.9	31.0	48.8
Jan 14	29.2	26.2	32.2
Jan 15	32.8	26.2	50.5
Jan 16	37.1	26.2	54.2
Jan 17	42.9	38.7	46.0
Jan 18	51.3	45.9	65.7
Jan 19	52.7	43.1	65.4
Jan 20	41.2	31.8	50.1
Jan 21	37.8	27.5	57.8
Jan 22	45.4	38.2	54.8
Jan 23	35.6	30.9	42.5
Jan 24	37.2	26.2	59.4
Jan 25	49.7	38.3	65.1
Jan 26	36.1	33.8	40.8
Jan 27	34.5	26.6	46.4
Jan 28	38.0	26.2	59.2
Jan 29	39.3	33.6	44.0
Jan 30	46.6	40.7	51.9
Jan 31	46.5	43.0	50.3
Summary	**43.0**	**29.2**	**58.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 40

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	118.3	114.7	120.3
Jan 2	117.8	113.0	122.8
Jan 3	119.2	114.3	123.6
Jan 4	118.8	116.2	123.4
Jan 5	115.2	111.1	120.6
Jan 6	111.8	109.0	115.3
Jan 7	110.5	105.4	114.8
Jan 8	107.9	104.9	112.9
Jan 9	108.6	104.6	111.8
Jan 10	110.9	104.9	116.4
Jan 11	113.8	108.1	119.8
Jan 12	114.9	108.3	121.9
Jan 13	104.7	101.4	113.4
Jan 14	101.8	97.9	106.2
Jan 15	72.1	28.2	106.1
Jan 16	38.4	26.8	60.4
Jan 17	42.8	37.9	46.8
Jan 18	78.1	46.6	117.7
Jan 19	114.0	111.3	119.9
Jan 20	96.2	52.0	111.2
Jan 21	49.3	35.5	108.4
Jan 22	45.6	37.1	56.6
Jan 23	63.9	33.0	103.8
Jan 24	69.5	31.9	109.7
Jan 25	109.9	103.5	117.8
Jan 26	72.4	34.3	105.2
Jan 27	105.8	101.6	110.1
Jan 28	109.6	103.2	116.1
Jan 29	108.3	103.4	110.5
Jan 30	112.0	108.6	114.4
Jan 31	111.5	106.0	115.0
Summary	**95.9**	**38.4**	**119.2**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 46

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	130.4	128.8	132.1
Jan 2	130.6	127.9	134.0
Jan 3	131.3	127.2	135.3
Jan 4	130.7	127.1	133.9
Jan 5	130.7	128.4	132.6
Jan 6	131.9	130.6	133.7
Jan 7	131.9	129.8	134.0
Jan 8	129.2	126.9	131.7
Jan 9	131.0	130.0	132.2
Jan 10	131.4	129.7	134.8
Jan 11	132.3	130.6	135.4
Jan 12	132.1	127.6	135.6
Jan 13	129.1	127.2	130.6
Jan 14	128.2	126.6	129.6
Jan 15	94.8	29.4	129.8
Jan 16	37.9	25.6	60.0
Jan 17	43.2	38.4	47.2
Jan 18	86.7	46.0	139.3
Jan 19	133.5	131.0	135.8
Jan 20	113.5	46.6	131.3
Jan 21	45.9	32.3	130.6
Jan 22	46.4	38.9	56.4
Jan 23	79.8	33.4	132.8
Jan 24	77.4	27.1	133.4
Jan 25	132.1	127.1	136.0
Jan 26	107.7	40.9	131.4
Jan 27	130.3	128.4	131.7
Jan 28	131.5	129.7	135.2
Jan 29	130.6	127.0	132.0
Jan 30	132.7	130.8	133.7
Jan 31	132.5	130.2	133.8
Summary	**112.5**	**37.9**	**133.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 47

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	77.9	69.8	82.0
Jan 2	76.8	67.0	89.0
Jan 3	81.5	75.1	92.3
Jan 4	79.7	75.1	88.0
Jan 5	72.3	66.8	79.3
Jan 6	67.1	62.8	74.0
Jan 7	66.4	59.3	76.0
Jan 8	63.3	59.1	69.1
Jan 9	62.2	55.3	67.9
Jan 10	63.2	53.9	77.9
Jan 11	69.3	58.3	81.9
Jan 12	71.8	66.1	85.1
Jan 13	55.6	49.2	62.5
Jan 14	49.6	47.4	52.8
Jan 15	48.4	26.5	71.1
Jan 16	36.7	26.5	53.1
Jan 17	42.6	37.3	46.3
Jan 18	62.0	46.1	85.7
Jan 19	76.0	71.4	84.2
Jan 20	64.4	59.6	71.3
Jan 21	45.6	31.2	66.5
Jan 22	45.1	36.3	55.6
Jan 23	47.9	32.6	63.6
Jan 24	53.8	26.5	72.1
Jan 25	72.4	63.7	84.9
Jan 26	62.1	59.5	67.2
Jan 27	60.8	54.5	68.5
Jan 28	66.2	55.5	84.1
Jan 29	64.2	59.2	67.5
Jan 30	71.6	65.9	75.3
Jan 31	70.6	63.0	74.7
Summary	**62.8**	**36.7**	**81.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 49

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	129.5	128.3	130.3
Jan 2	129.6	127.2	131.2
Jan 3	129.6	125.7	130.8
Jan 4	129.8	128.5	131.9
Jan 5	128.3	126.3	129.6
Jan 6	127.2	125.5	129.0
Jan 7	128.0	126.7	129.9
Jan 8	126.9	125.5	129.1
Jan 9	127.4	125.9	129.2
Jan 10	127.8	126.2	129.7
Jan 11	129.1	127.2	131.3
Jan 12	128.7	123.6	130.4
Jan 13	125.3	123.6	126.5
Jan 14	124.6	123.6	127.0
Jan 15	127.0	109.8	129.7
Jan 16	128.9	126.5	131.0
Jan 17	125.8	122.6	129.4
Jan 18	125.1	124.3	126.9
Jan 19	124.2	121.4	125.8
Jan 20	121.0	119.4	122.5
Jan 21	122.9	121.1	124.7
Jan 22	123.1	120.9	126.0
Jan 23	120.6	118.5	123.0
Jan 24	122.7	119.9	125.1
Jan 25	122.5	118.2	126.1
Jan 26	119.4	118.3	120.7
Jan 27	120.6	118.3	123.3
Jan 28	123.3	121.3	125.7
Jan 29	123.3	121.2	124.4
Jan 30	124.5	123.5	125.8
Jan 31	124.0	121.4	125.5
Summary	**125.5**	**119.4**	**129.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 50

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	108.6	105.7	110.1
Jan 2	107.3	104.2	111.0
Jan 3	108.0	104.7	112.3
Jan 4	107.5	105.7	111.2
Jan 5	105.7	103.8	108.4
Jan 6	104.2	102.6	105.8
Jan 7	103.5	101.2	105.7
Jan 8	103.3	101.5	105.3
Jan 9	100.2	97.9	103.4
Jan 10	103.7	99.8	107.9
Jan 11	108.0	102.6	114.3
Jan 12	110.0	105.7	113.2
Jan 13	102.2	98.1	109.7
Jan 14	98.6	97.1	100.8
Jan 15	100.9	69.8	107.2
Jan 16	104.7	99.6	109.6
Jan 17	108.3	103.9	112.1
Jan 18	111.0	109.3	114.5
Jan 19	108.4	105.9	110.7
Jan 20	104.5	101.6	108.5
Jan 21	109.2	107.3	113.4
Jan 22	107.3	103.6	111.5
Jan 23	101.5	98.6	106.0
Jan 24	105.8	99.7	112.8
Jan 25	105.9	100.1	110.4
Jan 26	98.6	97.2	100.2
Jan 27	96.9	94.5	99.4
Jan 28	100.5	96.1	106.1
Jan 29	101.6	99.6	103.2
Jan 30	103.5	100.6	105.9
Jan 31	102.8	98.1	105.2
Summary	**104.6**	**96.9**	**111.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 51

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	85.9	78.7	92.5
Jan 2	86.9	76.3	99.6
Jan 3	95.8	86.4	108.2
Jan 4	91.6	85.7	101.1
Jan 5	103.5	78.3	126.6
Jan 6	115.3	111.4	119.2
Jan 7	117.2	112.5	122.9
Jan 8	108.4	92.2	119.0
Jan 9	101.0	95.2	105.4
Jan 10	110.8	100.7	119.7
Jan 11	116.6	107.9	124.6
Jan 12	116.5	103.1	131.5
Jan 13	92.5	87.2	99.5
Jan 14	88.0	85.3	94.2
Jan 15	96.5	26.0	116.4
Jan 16	110.6	45.3	135.2
Jan 17	117.6	100.9	133.8
Jan 18	107.9	102.4	112.9
Jan 19	107.5	101.6	117.9
Jan 20	88.6	81.2	98.8
Jan 21	85.0	51.1	94.8
Jan 22	102.5	92.0	113.1
Jan 23	85.8	75.4	104.4
Jan 24	79.5	70.8	90.1
Jan 25	88.5	78.3	96.5
Jan 26	71.7	69.0	75.6
Jan 27	71.8	64.8	79.1
Jan 28	81.0	67.4	98.2
Jan 29	81.9	78.6	86.5
Jan 30	87.1	78.8	91.8
Jan 31	86.9	78.0	92.1
Summary	**96.1**	**71.7**	**117.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 52

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	117.0	112.6	119.0
Jan 2	116.3	109.2	123.1
Jan 3	118.6	110.6	124.2
Jan 4	118.2	114.6	123.2
Jan 5	113.9	109.9	118.0
Jan 6	109.3	105.2	114.2
Jan 7	109.7	105.7	113.6
Jan 8	107.5	103.6	112.0
Jan 9	105.8	102.0	110.3
Jan 10	106.9	100.0	113.4
Jan 11	109.8	102.3	117.1
Jan 12	110.2	101.1	118.4
Jan 13	97.8	92.3	100.4
Jan 14	94.2	90.3	98.1
Jan 15	101.0	65.0	113.0
Jan 16	104.7	89.8	117.5
Jan 17	106.5	102.4	111.2
Jan 18	109.6	106.5	118.8
Jan 19	108.3	104.2	116.3
Jan 20	98.1	94.6	102.8
Jan 21	99.9	70.4	106.5
Jan 22	106.0	101.6	113.1
Jan 23	95.6	90.5	106.5
Jan 24	100.5	93.9	110.2
Jan 25	104.9	95.0	115.6
Jan 26	97.0	95.4	98.9
Jan 27	97.5	91.7	102.0
Jan 28	103.5	96.9	112.2
Jan 29	102.8	98.7	106.4
Jan 30	107.0	103.6	110.5
Jan 31	105.8	97.6	109.0
Summary	**105.9**	**94.2**	**118.6**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 53

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	128.4	123.6	131.8
Jan 2	127.3	121.8	133.3
Jan 3	128.8	122.3	133.5
Jan 4	128.0	123.9	132.8
Jan 5	125.4	121.3	129.1
Jan 6	123.9	121.9	126.2
Jan 7	124.1	120.7	129.3
Jan 8	120.7	117.3	124.6
Jan 9	125.3	117.8	139.4
Jan 10	134.7	103.7	146.8
Jan 11	135.1	95.2	148.7
Jan 12	135.6	118.5	147.3
Jan 13	126.9	97.9	139.2
Jan 14	128.2	113.5	138.2
Jan 15	117.4	95.1	140.4
Jan 16	101.3	91.6	115.0
Jan 17	85.7	78.6	97.4
Jan 18	109.9	80.9	147.9
Jan 19	139.4	134.9	145.1
Jan 20	127.6	102.7	140.4
Jan 21	106.7	91.3	131.5
Jan 22	100.7	87.6	110.9
Jan 23	99.5	65.2	135.1
Jan 24	114.4	87.0	135.5
Jan 25	127.4	118.5	133.9
Jan 26	106.6	85.5	123.9
Jan 27	122.1	116.1	126.7
Jan 28	127.2	121.7	131.9
Jan 29	127.2	118.3	132.6
Jan 30	133.5	130.4	137.1
Jan 31	134.7	130.5	137.4
Summary	**121.7**	**85.7**	**139.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 54

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	115.7	110.4	118.2
Jan 2	115.4	106.7	124.4
Jan 3	117.0	106.7	123.4
Jan 4	116.8	112.5	124.1
Jan 5	111.8	107.7	115.2
Jan 6	107.9	102.1	113.5
Jan 7	109.2	103.8	115.6
Jan 8	104.9	99.0	113.6
Jan 9	106.0	102.7	111.2
Jan 10	108.7	101.4	118.1
Jan 11	112.7	104.5	121.7
Jan 12	113.7	101.3	124.2
Jan 13	96.5	90.5	102.4
Jan 14	93.9	88.7	100.5
Jan 15	105.6	84.5	118.9
Jan 16	107.0	96.9	117.7
Jan 17	107.2	97.3	113.2
Jan 18	115.7	110.3	127.7
Jan 19	111.0	103.8	116.9
Jan 20	99.4	94.0	108.2
Jan 21	103.7	95.4	116.5
Jan 22	104.7	96.6	113.6
Jan 23	93.7	81.8	105.5
Jan 24	103.3	79.2	118.9
Jan 25	98.5	81.4	112.5
Jan 26	93.4	89.4	98.7
Jan 27	95.8	87.4	103.6
Jan 28	105.4	98.0	116.1
Jan 29	103.2	93.6	106.6
Jan 30	109.8	103.9	114.2
Jan 31	109.6	101.8	113.7
Summary	**106.4**	**93.4**	**117.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 55

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	90.2	84.8	93.4
Jan 2	88.5	80.7	98.3
Jan 3	90.4	81.1	97.7
Jan 4	89.8	85.9	96.6
Jan 5	82.4	77.5	86.6
Jan 6	76.7	70.9	81.4
Jan 7	78.5	72.8	85.8
Jan 8	77.6	73.2	81.2
Jan 9	70.7	65.8	76.1
Jan 10	71.3	61.6	81.1
Jan 11	76.6	66.2	88.1
Jan 12	77.6	67.8	90.5
Jan 13	58.3	50.6	72.7
Jan 14	49.9	46.6	53.5
Jan 15	52.0	27.0	77.1
Jan 16	36.6	26.4	54.1
Jan 17	42.4	37.8	46.2
Jan 18	55.0	46.0	72.7
Jan 19	64.4	56.9	74.5
Jan 20	53.0	47.5	60.8
Jan 21	41.5	26.3	55.6
Jan 22	44.6	26.3	55.3
Jan 23	37.7	32.8	43.9
Jan 24	42.4	26.4	56.7
Jan 25	57.4	26.3	73.5
Jan 26	46.9	45.6	49.5
Jan 27	46.9	40.4	54.1
Jan 28	53.8	43.4	71.0
Jan 29	53.8	49.9	56.8
Jan 30	60.1	55.5	63.9
Jan 31	59.8	54.5	63.0
Summary	**62.2**	**36.6**	**90.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 56

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	119.4	117.3	121.3
Jan 2	118.9	115.7	122.9
Jan 3	120.4	116.2	124.7
Jan 4	119.6	116.9	123.8
Jan 5	115.3	113.1	117.7
Jan 6	112.8	110.5	114.6
Jan 7	113.8	111.7	116.7
Jan 8	112.3	108.5	116.7
Jan 9	113.3	111.3	116.1
Jan 10	113.6	110.0	116.9
Jan 11	115.9	111.0	120.5
Jan 12	117.2	113.1	122.8
Jan 13	111.2	108.7	116.7
Jan 14	108.5	106.2	111.4
Jan 15	83.1	46.4	112.1
Jan 16	50.7	37.8	67.9
Jan 17	53.0	46.5	57.7
Jan 18	82.6	54.2	117.7
Jan 19	116.7	113.1	119.0
Jan 20	101.3	60.1	114.3
Jan 21	57.5	51.6	113.6
Jan 22	57.0	48.5	68.8
Jan 23	70.8	37.8	109.4
Jan 24	74.5	45.8	111.8
Jan 25	112.9	107.5	120.5
Jan 26	88.3	54.3	110.1
Jan 27	108.5	105.5	110.4
Jan 28	111.6	108.0	116.6
Jan 29	110.9	107.5	112.7
Jan 30	114.6	111.3	117.0
Jan 31	114.6	109.8	116.4
Summary	**100.7**	**50.7**	**120.4**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 57

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	109.8	90.3	123.4
Jan 2	122.6	113.3	128.1
Jan 3	124.8	119.5	129.6
Jan 4	123.5	121.0	127.2
Jan 5	119.3	116.8	121.6
Jan 6	117.5	114.9	120.0
Jan 7	116.6	112.2	120.8
Jan 8	113.1	92.9	117.7
Jan 9	91.2	72.6	109.5
Jan 10	87.9	72.3	145.1
Jan 11	149.1	141.4	154.4
Jan 12	154.8	149.9	161.3
Jan 13	152.5	107.2	156.7
Jan 14	153.4	145.8	165.8
Jan 15	138.9	99.0	158.0
Jan 16	137.9	117.8	156.3
Jan 17	136.5	127.1	145.4
Jan 18	144.5	104.7	156.3
Jan 19	157.7	155.1	161.0
Jan 20	152.6	145.7	156.0
Jan 21	149.6	147.5	153.2
Jan 22	150.9	147.2	156.4
Jan 23	153.5	150.0	157.4
Jan 24	142.2	124.5	155.7
Jan 25	133.8	125.4	140.0
Jan 26	115.9	90.1	126.6
Jan 27	124.2	121.4	126.7
Jan 28	124.9	118.1	130.0
Jan 29	122.9	120.2	124.6
Jan 30	125.1	122.2	127.4
Jan 31	123.1	119.0	126.4
Summary	**131.3**	**87.9**	**157.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 58

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	111.5	108.9	112.5
Jan 2	111.2	106.6	115.2
Jan 3	112.8	110.0	116.1
Jan 4	111.9	110.7	114.8
Jan 5	109.0	107.0	111.5
Jan 6	107.4	105.6	108.8
Jan 7	107.7	104.5	111.6
Jan 8	105.9	104.1	109.6
Jan 9	103.8	102.3	106.4
Jan 10	104.8	99.7	109.6
Jan 11	108.2	103.2	112.7
Jan 12	105.4	99.6	111.9
Jan 13	81.4	54.7	102.1
Jan 14	56.0	51.7	61.2
Jan 15	52.9	28.6	92.2
Jan 16	36.3	26.1	58.2
Jan 17	42.3	37.4	46.3
Jan 18	57.8	46.0	77.0
Jan 19	61.3	56.5	69.1
Jan 20	48.8	42.2	65.0
Jan 21	39.6	27.5	58.5
Jan 22	45.3	36.5	56.2
Jan 23	68.6	33.9	110.4
Jan 24	66.2	26.1	113.0
Jan 25	112.2	108.2	116.8
Jan 26	89.7	40.4	109.8
Jan 27	108.3	106.1	110.0
Jan 28	109.6	105.0	113.9
Jan 29	109.0	106.9	110.5
Jan 30	110.8	108.8	112.6
Jan 31	109.8	108.0	111.4
Summary	**87.3**	**36.3**	**112.8**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 59

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	106.7	104.0	107.8
Jan 2	106.0	103.0	108.9
Jan 3	107.2	104.8	109.3
Jan 4	106.9	105.7	108.9
Jan 5	104.5	103.2	106.6
Jan 6	103.0	101.2	105.1
Jan 7	103.0	100.4	105.9
Jan 8	103.1	100.8	105.2
Jan 9	105.9	100.7	116.3
Jan 10	107.5	101.8	111.5
Jan 11	108.5	103.6	112.8
Jan 12	111.5	108.8	114.4
Jan 13	108.6	105.3	110.8
Jan 14	104.2	102.7	107.3
Jan 15	74.0	28.1	104.6
Jan 16	37.0	26.9	53.5
Jan 17	42.5	37.6	46.6
Jan 18	80.0	46.3	128.8
Jan 19	111.7	109.6	114.1
Jan 20	93.6	47.2	110.5
Jan 21	43.8	30.8	106.5
Jan 22	45.2	37.5	55.9
Jan 23	69.4	32.7	113.6
Jan 24	66.2	26.9	120.2
Jan 25	110.6	105.1	114.1
Jan 26	88.4	36.9	111.4
Jan 27	105.0	103.3	106.3
Jan 28	105.2	102.2	107.6
Jan 29	105.0	103.5	106.0
Jan 30	106.3	105.6	107.1
Jan 31	106.0	104.0	106.8
Summary	**92.8**	**37.0**	**111.7**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 60

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	51.9	42.1	62.3
Jan 2	47.2	27.6	65.2
Jan 3	53.3	27.6	74.1
Jan 4	54.1	44.4	66.8
Jan 5	77.2	34.8	110.8
Jan 6	96.9	94.1	99.6
Jan 7	94.9	91.0	99.0
Jan 8	92.4	89.8	96.7
Jan 9	89.0	85.0	93.1
Jan 10	89.3	82.4	95.2
Jan 11	93.7	87.3	101.5
Jan 12	94.5	88.2	102.4
Jan 13	83.9	80.5	90.3
Jan 14	80.0	77.6	82.3
Jan 15	85.5	55.3	94.0
Jan 16	91.0	83.8	98.0
Jan 17	92.5	88.3	96.3
Jan 18	96.6	94.4	101.4
Jan 19	95.1	91.3	99.0
Jan 20	86.4	84.6	90.8
Jan 21	88.9	85.2	94.6
Jan 22	90.9	88.0	95.6
Jan 23	83.0	79.8	89.7
Jan 24	88.0	81.3	94.6
Jan 25	89.6	82.8	97.6
Jan 26	81.9	80.4	83.4
Jan 27	82.3	78.2	86.4
Jan 28	87.7	82.5	94.1
Jan 29	87.3	83.4	90.4
Jan 30	91.3	88.5	94.3
Jan 31	90.7	85.2	93.6
Summary	**84.1**	**47.2**	**96.9**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 62

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	51.7	40.7	61.5
Jan 2	48.9	37.9	66.8
Jan 3	59.0	48.0	78.1
Jan 4	55.1	48.2	69.2
Jan 5	46.8	35.1	62.2
Jan 6	42.6	32.4	54.6
Jan 7	38.7	30.7	54.2
Jan 8	40.0	32.1	43.8
Jan 9	38.4	30.5	44.1
Jan 10	35.7	26.8	56.7
Jan 11	41.9	26.8	60.4
Jan 12	50.7	43.0	65.0
Jan 13	37.3	30.9	48.9
Jan 14	28.8	26.8	32.4
Jan 15	34.0	26.8	53.5
Jan 16	38.1	26.8	58.1
Jan 17	42.4	37.3	47.1
Jan 18	52.6	46.6	68.4
Jan 19	54.5	44.6	66.8
Jan 20	41.6	30.8	53.1
Jan 21	38.5	26.8	59.3
Jan 22	45.2	37.2	55.2
Jan 23	35.1	31.0	43.4
Jan 24	38.7	26.8	59.0
Jan 25	50.4	39.0	66.1
Jan 26	35.7	33.3	40.7
Jan 27	34.9	26.8	46.0
Jan 28	40.2	26.8	62.6
Jan 29	39.0	33.2	43.3
Jan 30	46.3	40.8	51.3
Jan 31	46.4	42.3	50.6
Summary	**42.9**	**28.8**	**59.0**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 63

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	117.9	114.9	119.5
Jan 2	117.4	111.9	122.1
Jan 3	118.2	111.8	123.2
Jan 4	118.5	114.1	123.5
Jan 5	115.0	110.5	117.0
Jan 6	112.0	108.8	115.0
Jan 7	113.1	110.0	116.6
Jan 8	110.7	106.6	114.9
Jan 9	110.3	107.3	113.2
Jan 10	111.0	105.1	115.4
Jan 11	113.8	107.7	119.5
Jan 12	113.8	105.2	120.6
Jan 13	104.7	100.6	108.0
Jan 14	102.4	99.1	105.9
Jan 15	106.2	48.2	115.8
Jan 16	112.3	107.0	118.6
Jan 17	110.8	104.1	114.0
Jan 18	114.5	112.1	120.3
Jan 19	111.8	108.7	117.3
Jan 20	105.5	102.3	110.3
Jan 21	109.4	104.8	114.0
Jan 22	109.2	104.4	114.6
Jan 23	102.8	99.8	108.1
Jan 24	108.4	101.1	115.6
Jan 25	107.0	99.0	115.1
Jan 26	101.0	99.5	103.5
Jan 27	102.3	97.0	106.3
Jan 28	107.6	103.2	114.9
Jan 29	105.1	98.6	107.9
Jan 30	109.3	105.3	111.9
Jan 31	107.8	102.4	111.6
Summary	**110.0**	**101.0**	**118.5**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 64

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	124.7	122.5	126.0
Jan 2	124.0	118.9	128.3
Jan 3	124.9	118.3	128.6
Jan 4	124.3	120.3	128.3
Jan 5	121.3	118.0	123.5
Jan 6	118.5	116.2	120.9
Jan 7	118.7	114.7	123.4
Jan 8	117.5	114.5	120.9
Jan 9	117.1	114.8	121.2
Jan 10	117.6	111.9	122.0
Jan 11	120.2	114.9	125.2
Jan 12	120.2	114.5	126.0
Jan 13	112.9	109.1	115.3
Jan 14	110.3	107.6	113.5
Jan 15	113.9	93.8	120.2
Jan 16	117.1	111.4	123.2
Jan 17	115.8	83.8	125.9
Jan 18	125.3	123.3	128.4
Jan 19	117.4	102.5	125.5
Jan 20	106.2	104.4	109.4
Jan 21	109.1	106.5	112.9
Jan 22	110.6	108.1	115.7
Jan 23	105.3	102.4	109.5
Jan 24	108.9	103.2	112.8
Jan 25	110.0	105.0	115.2
Jan 26	104.3	103.2	106.3
Jan 27	105.0	101.7	107.9
Jan 28	108.6	105.7	112.3
Jan 29	108.0	105.3	110.9
Jan 30	110.7	107.3	113.4
Jan 31	110.6	107.2	113.2
Summary	**114.8**	**104.3**	**125.3**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 65

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	93.8	91.1	95.9
Jan 2	93.3	83.6	101.3
Jan 3	96.1	88.1	102.5
Jan 4	95.2	91.3	100.8
Jan 5	89.1	83.4	93.2
Jan 6	84.0	80.7	87.8
Jan 7	83.9	78.3	91.8
Jan 8	83.5	81.1	87.4
Jan 9	81.7	77.8	88.7
Jan 10	81.9	71.7	89.8
Jan 11	88.6	77.6	97.6
Jan 12	89.9	80.8	99.3
Jan 13	76.4	70.4	84.5
Jan 14	71.4	68.8	76.5
Jan 15	79.4	61.1	89.5
Jan 16	84.3	72.5	95.3
Jan 17	85.0	70.3	91.8
Jan 18	92.2	87.9	100.2
Jan 19	91.2	87.8	97.6
Jan 20	80.1	76.5	85.2
Jan 21	83.6	76.7	97.9
Jan 22	85.4	80.7	92.9
Jan 23	76.7	72.8	84.7
Jan 24	83.2	72.8	95.5
Jan 25	85.5	77.3	96.5
Jan 26	76.2	74.8	78.3
Jan 27	77.3	71.7	81.9
Jan 28	84.2	76.1	96.0
Jan 29	82.4	78.2	86.1
Jan 30	86.7	80.6	90.6
Jan 31	86.8	79.9	90.2
Summary	**84.8**	**71.4**	**96.1**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 66

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	113.8	108.5	117.2
Jan 2	112.6	104.8	119.8
Jan 3	114.3	106.8	119.9
Jan 4	112.8	109.4	118.7
Jan 5	107.8	103.7	111.0
Jan 6	103.9	100.2	106.9
Jan 7	105.5	99.2	111.2
Jan 8	103.0	98.2	110.3
Jan 9	102.6	97.9	109.3
Jan 10	105.4	97.2	112.2
Jan 11	108.6	98.3	117.3
Jan 12	106.8	92.0	117.4
Jan 13	88.5	81.8	103.0
Jan 14	82.3	78.4	88.9
Jan 15	57.9	33.0	87.4
Jan 16	45.2	29.3	67.5
Jan 17	50.7	44.8	55.2
Jan 18	73.7	54.8	106.9
Jan 19	81.7	76.2	88.1
Jan 20	69.2	52.3	82.9
Jan 21	50.4	33.9	80.4
Jan 22	52.7	45.7	64.9
Jan 23	53.6	37.1	79.9
Jan 24	61.1	27.9	90.0
Jan 25	70.8	54.8	83.6
Jan 26	51.0	43.3	61.7
Jan 27	62.2	50.9	73.3
Jan 28	79.2	69.0	91.9
Jan 29	77.8	73.9	81.6
Jan 30	84.8	78.4	90.2
Jan 31	83.7	72.9	89.4
Summary	**83.0**	**45.2**	**114.3**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 67

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1	106.7	97.3	111.1
Jan 2	104.9	94.2	115.9
Jan 3	107.9	95.1	116.4
Jan 4	104.6	99.4	114.0
Jan 5	95.3	88.8	102.9
Jan 6	83.8	75.5	89.2
Jan 7	85.7	77.7	91.3
Jan 8	79.5	73.3	89.4
Jan 9	78.4	71.6	87.0
Jan 10	82.0	68.8	93.9
Jan 11	89.5	72.8	104.8
Jan 12	91.9	75.1	109.6
Jan 13	68.6	57.6	80.5
Jan 14	60.4	56.2	68.9
Jan 15	75.5	58.6	92.5
Jan 16	75.0	59.9	92.0
Jan 17	79.3	65.3	87.9
Jan 18	93.1	84.3	109.1
Jan 19	94.3	86.1	102.8
Jan 20	75.7	70.3	86.9
Jan 21	81.8	76.0	96.0
Jan 22	83.4	73.1	96.5
Jan 23	71.7	64.1	83.2
Jan 24	84.1	63.3	97.7
Jan 25	90.8	73.6	107.2
Jan 26	73.9	69.7	79.6
Jan 27	77.7	67.7	91.1
Jan 28	90.4	78.7	103.7
Jan 29	88.5	79.6	95.7
Jan 30	99.4	90.4	106.8
Jan 31	98.3	83.5	104.4
Summary	**86.2**	**60.4**	**107.9**

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Well 68

Bristol, Virginia

Date	Average (°F)	Minimum (°F)	Maximum (°F)
Jan 1			
Jan 2			
Jan 3			
Jan 4			
Jan 5	129.6	126.3	181.3
Jan 6	128.4	127.0	129.2
Jan 7	128.6	127.8	129.6
Jan 8	128.4	127.2	129.5
Jan 9	128.5	127.7	129.1
Jan 10	127.0	125.2	128.1
Jan 11	127.1	126.5	128.2
Jan 12	126.5	124.5	127.8
Jan 13	125.2	124.6	125.6
Jan 14	125.2	124.7	125.7
Jan 15	125.8	115.4	127.3
Jan 16	126.4	124.5	127.6
Jan 17	126.2	125.4	126.7
Jan 18	126.5	126.2	127.1
Jan 19	126.4	125.8	127.0
Jan 20	125.4	124.7	126.2
Jan 21	121.7	55.2	127.0
Jan 22	125.9	125.2	126.8
Jan 23	125.1	124.3	126.0
Jan 24	125.7	124.2	126.5
Jan 25	125.4	124.2	126.3
Jan 26	124.7	124.0	125.5
Jan 27	124.8	124.0	125.9
Jan 28	125.3	124.6	126.2
Jan 29	125.0	123.8	125.6
Jan 30	125.4	124.6	125.9
Jan 31	125.2	124.2	125.6
Summary	**109.9**	**0.0**	**129.6**

Appendix D

EVOH Deployment Plan

BRISTOL, VIRGINIA INTEGRATED SOLID WASTE MANAGEMENT FACILITY
SOLID WASTE PERMIT #588

INTERIM EVOH COVER SYSTEM
PRELIMINARY DESIGN PLANS

BRISTOL, VIRGINIA

INDEX OF DRAWINGS

PREPARED FOR:

CITY OF BRISTOL, VIRGINIA
300 LEE STREET
BRISTOL, VIRGINIA 24201

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TURNPIKE, SUITE 305
MIDLOTHIAN, VIRGINIA 23113-7313
PH. (804) 378-7440 FAX. (703) 471-6676
WWW.SCSENGINEERS.COM

SCS PROJECT NO. 02218208.11

JANUARY 30, 2023

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
1/30/23
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

SHEET TITLE: COVER SHEET
PROJECT TITLE: INTERIM EVOH COVER SYSTEM SWP #588 PRELIMINARY DESIGN PLANS

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) 379-7433

PROJ. NO. 02218208.05 | DSN. BY: TRW/SHA | D/A R/W 6% C.J.W
DSK. BY: TRW/CJW | CHK. BY: TRW | APP. BY: C.J.W

CADD FILE: 02218208.05
DATE: 1/30/23
SCALE: AS SHOWN
DRAWING NO. 1 of 7

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LEGEND:

- 1800 — EXISTING CONTOUR, MAJOR
- EXISTING CONTOUR, MINOR
- 1800 — PROPOSED CONTOUR, MAJOR
- PROPOSED CONTOUR, MINOR
- EXISTING 2" AIR LINE
- EXISTING 4" FORCE MAIN
- EXISTING LFG HEADER
- 4G — EXISTING 4" LFG HEADER
- 6G — EXISTING 6" LFG HEADER
- 8G — EXISTING 8" LFG HEADER
- 12G — EXISTING 12" LFG HEADER
- BUILDING
- L — EXISTING LEACHATE PIPE
- L — PROPOSED LEACHATE PIPE
- L — LEACHATE CLEANOUT
- STORMWATER PIPE
- EXISTING GRAVEL ROAD
- RIP RAP/ ROCKS
- SILT FENCE
- CELL BOUNDARY
- EDGE OF LINER
- LANDFILL GAS VENT
- LANDFILL GAS PIPE
- LOD — LIMITS OF DISTURBANCE
- SOIL TYPE BOUNDARY
- DRAINAGE AREA
- STREAM OR WATERLINE
- CENTERLINE
- (TS) TEMPORARY SEEDING
- (PS) PERMANENT SEEDING
- (CIP) CULVERT INLET PROTECTION
- (OP) OUTLET PROTECTION
- (SF) SILT FENCE
- (CE) CONSTRUCTION ENTRANCE
- (MU) MULCHING
- (B/M) BLANKETS AND MATTING
- RUNOFF FLOW DIRECTION
- LFG HEADER 6"ø

LEGEND:

- GV-## PROPOSED LFG COLLECTION STRIP
- TP-3 EXISTING TEMPERATURE PROBE
- EXISTING WELLHEAD
- EXISTING AIR RELEASE VALVE
- EXISTING ISOLATION VALVE
- EXISTING LEACHATE CLEANOUT
- EXISTING U-TRAP
- EXISTING CONDENSATE PUMP STATION
- EXISTING HORIZONTAL COLLECTOR SUMP
- EXISTING LFG LIGUIDS CONTAINMENT TANK
- GP-5 EXISTING GAS PROBE
- MW-110 EXISTING GROUNDWATER MONITORING WELL
- EXISTING MANHOLE
- FACILITY BOUNDARY
- WASTE MANAGEMENT UNIT BOUNDARY
- APPROXIMATE EXTENT OF WASTE
- EXISTING ROAD OUTLINE
- EXISTING LFG HORIZONTAL COLLECTOR
- PROPOSED LFG HORIZONTAL COLLECTOR
- LFG — EXISTING LFG COLLECTION PIPING
- LFG — PROPOSED LFG COLLECTION PIPING
- 8G — PROPOSED 8" LFG COLLECTION PIPING
- 12G — PROPOSED 12" LFG COLLECTION PIPING
- 16G — PROPOSED 16" LFG COLLECTION PIPING
- 18G — PROPOSED 18" LFG COLLECTION PIPING
- 24G — PROPOSED 24" LFG COLLECTION PIPING
- 28G — PROPOSED 28" LFG COLLECTION PIPING
- 36G — PROPOSED 36" LFG COLLECTION PIPING
- PROPOSED 2" AIR LINE
- PROPOSED 4" FORCE MAIN

GENERAL NOTES:

1. OWNER/DEVELOPER: CITY OF BRISTOL, VIRGINIA
2. CONSULTING ENGINEER: SCS ENGINEERS, 15521 MIDLOTHIAN TURNPIKE #305, MIDLOTHIAN, VA 23113
3. LOCATION OF EXISTING SEWER, WATER, OR GAS LINES, CONDUITS, OR OTHER STRUCTURES ACROSS, UNDERNEATH, OR OTHERWISE ALONG THE LINE OF PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THE PLANS, AND IF SHOWN ARE ONLY APPROXIMATELY CORRECT. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT ENGINEER IMMEDIATELY IF LOCATION OF ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF A UTILITY NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL OBTAIN FIELD UTILITY LOCATIONS BY CALLING "MISS UTILITY" FORTY EIGHT (48) HOURS PRIOR TO WORKING IN THE VICINITY OF EXISTING UTILITIES.
4. BOUNDARY INFORMATION TAKEN FROM OTHERS.
5. THESE DRAWINGS ARE NOT SUITABLE FOR CONSTRUCTION.
6. HORIZONTAL DATA IS BASED ON US STATE PLANE NAD 1983 VIRGINIA SOUTH ZONE. VERTICAL DATA BASED ON NAVD 88.

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
1/30/23
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

SHEET TITLE
GENERAL NOTES AND LEGEND

PROJECT TITLE
INTERIM EVOH COVER SYSTEM
SWP #588 PRELIMINARY DESIGN PLANS

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

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

PROJ NO 02218208.05 | DWN. BY: TRW/SHA | Q/A RVW BY: CJW
DSN. BY: TRW/CJW | CHK. BY: TRW | APP. BY: CJW

CADD FILE: 02218208.05
DATE: 1/30/23
SCALE: AS SHOWN
DRAWING NO.

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GENERAL NOTES

1. OUTSIDE OF THE QUARRY FOOTPRINT, GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022. WITHIN THE QUARRY, THE GRADES ARE BASED UPON AN SCS DRONE FLYOVER DATED DECEMBER 2, 2022.
2. EXISTING LFG HEADER WAS OBTAINED FROM SCS CONSTRUCTION DRAWINGS. LAST UPDATED JULY 6, 2022.
3. THE APPROXIMATE SIDEWALL LOCATION BOUNDARY LINE WAS CREATED USING THE SURVEY LIMIT BOUNDARY LINE PROVIDED BY DRAPER ADEN ASSOCIATES, DATED JUNE 8, 2020, EDITED BASED ON A REVIEW OF TOPOGRAPHIC DATA AND AERIAL IMAGERY.
4. THE LFG WELLHEADS SHOWN WITH A LARGER WELLHEAD ICON REPRESENT WELLS WHICH WERE DRILLED DURING THE MONTHS OF SEPTEMBER AND OCTOBER OF 2021, AND LATER CONNECTED IN NOVEMBER AND DECEMBER OF 2021. THESE WELLS HAVE NOT YET BEEN SURVEYED FOLLOWING THEIR INSTALLATION AND THEREFORE THE LOCATIONS SHOWN ARE BASED ON THE EXPANSION DESIGN DRAWINGS DATED AUGUST 13, 2021
5. THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
6. THE LOCATIONS OF WELLS GW-16, GW-17, GW-19, GW-20, AND GW-21 WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
PROFESSIONAL ENGINEER

DATE
REVISION

EXISTING CONDITIONS

INTERIM EVOH COVER SYSTEM
SWP #588 PRELIMINARY DESIGN PLANS

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

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

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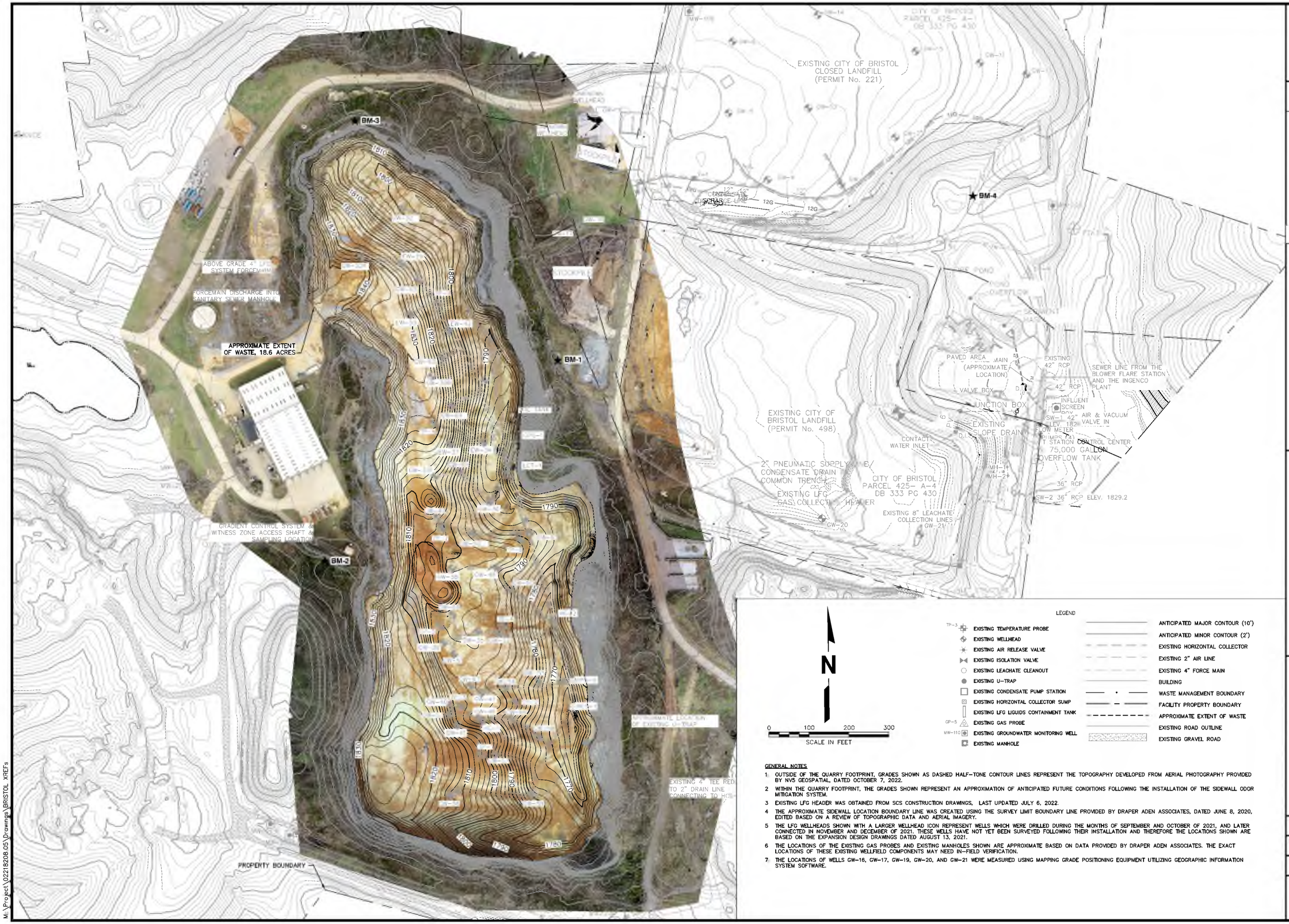

LEGEND

TP-3 ✚ EXISTING TEMPERATURE PROBE	ANTICIPATED MAJOR CONTOUR (10')
⊕ EXISTING WELLHEAD	ANTICIPATED MINOR CONTOUR (2')
✳ EXISTING AIR RELEASE VALVE	EXISTING HORIZONTAL COLLECTOR
⋈ EXISTING ISOLATION VALVE	EXISTING 2" AIR LINE
○ EXISTING LEACHATE CLEANOUT	EXISTING 4" FORCE MAIN
● EXISTING U-TRAP	BUILDING
□ EXISTING CONDENSATE PUMP STATION	WASTE MANAGEMENT BOUNDARY
▣ EXISTING HORIZONTAL COLLECTOR SUMP	FACILITY PROPERTY BOUNDARY
▯ EXISTING LFG LIQUIDS CONTAINMENT TANK	APPROXIMATE EXTENT OF WASTE
GP-5 △ EXISTING GAS PROBE	EXISTING ROAD OUTLINE
MW-110 ◙ EXISTING GROUNDWATER MONITORING WELL	▨ EXISTING GRAVEL ROAD
◘ EXISTING MANHOLE	

GENERAL NOTES

1. OUTSIDE OF THE QUARRY FOOTPRINT, GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022.
2. WITHIN THE QUARRY FOOTPRINT, THE GRADES SHOWN REPRESENT AN APPROXIMATION OF ANTICIPATED FUTURE CONDITIONS FOLLOWING THE INSTALLATION OF THE SIDEWALL ODOR MITIGATION SYSTEM.
3. EXISTING LFG HEADER WAS OBTAINED FROM SCS CONSTRUCTION DRAWINGS, LAST UPDATED JULY 6, 2022.
4. THE APPROXIMATE SIDEWALL LOCATION BOUNDARY LINE WAS CREATED USING THE SURVEY LIMIT BOUNDARY LINE PROVIDED BY DRAPER ADEN ASSOCIATES, DATED JUNE 8, 2020, EDITED BASED ON A REVIEW OF TOPOGRAPHIC DATA AND AERIAL IMAGERY.
5. THE LFG WELLHEADS SHOWN WITH A LARGER WELLHEAD ICON REPRESENT WELLS WHICH WERE DRILLED DURING THE MONTHS OF SEPTEMBER AND OCTOBER OF 2021, AND LATER CONNECTED IN NOVEMBER AND DECEMBER OF 2021. THESE WELLS HAVE NOT YET BEEN SURVEYED FOLLOWING THEIR INSTALLATION AND THEREFORE THE LOCATIONS SHOWN ARE BASED ON THE EXPANSION DESIGN DRAWINGS DATED AUGUST 13, 2021.
6. THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
7. THE LOCATIONS OF WELLS GW-16, GW-17, GW-19, GW-20, AND GW-21 WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.

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CHARLES WARREN
#053809
1/30/23

NO	REVISION	DATE
△		
△		
△		
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△		

SHEET TITLE
ANTICIPATED CONDITIONS

PROJECT TITLE
INTERIM EVOH COVER SYSTEM
SWP #588 PRELIMINARY DESIGN PLANS

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
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PROJ. NO. 02218208.05	DWN. BY TRW/SHA	Q/A RVW BY CJW
CHK. BY TRW/CJW	CHK. BY TRW	APP. BY CJW

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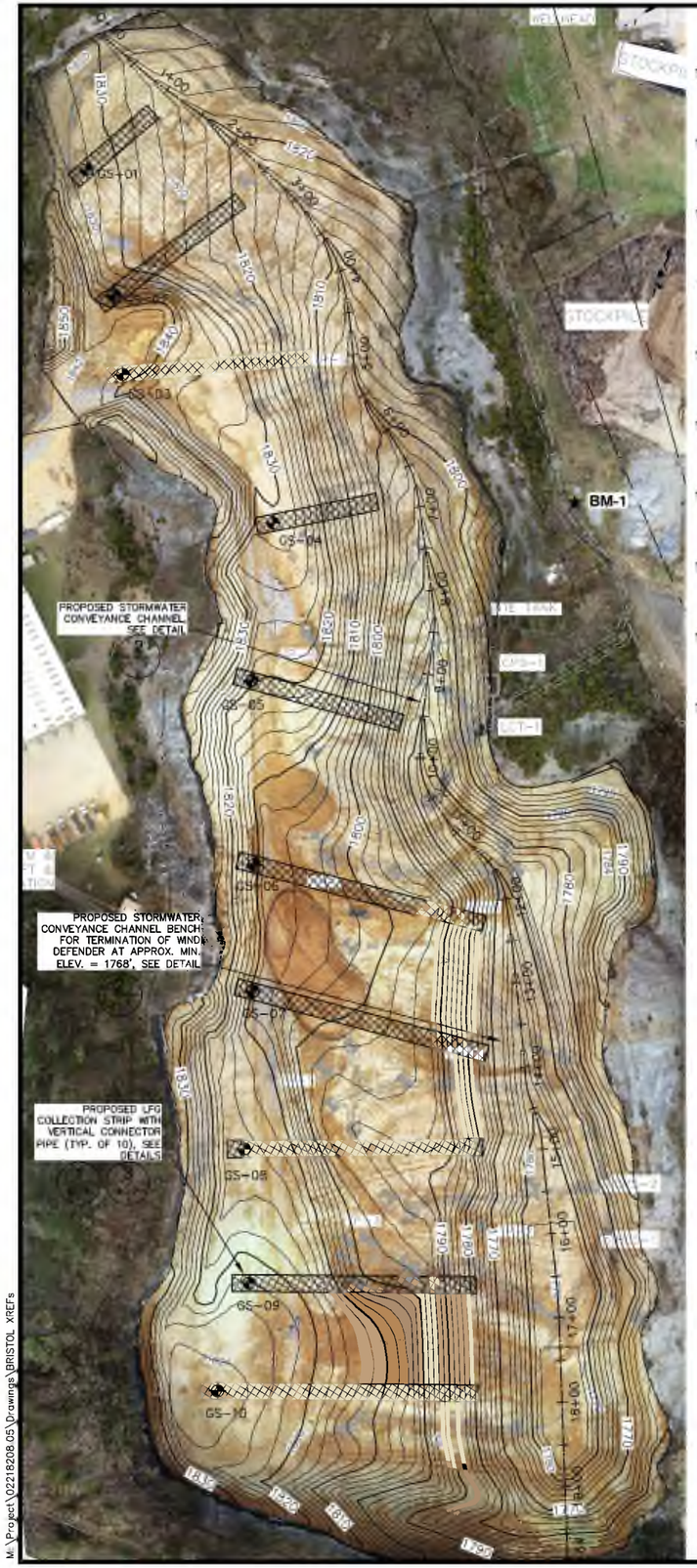
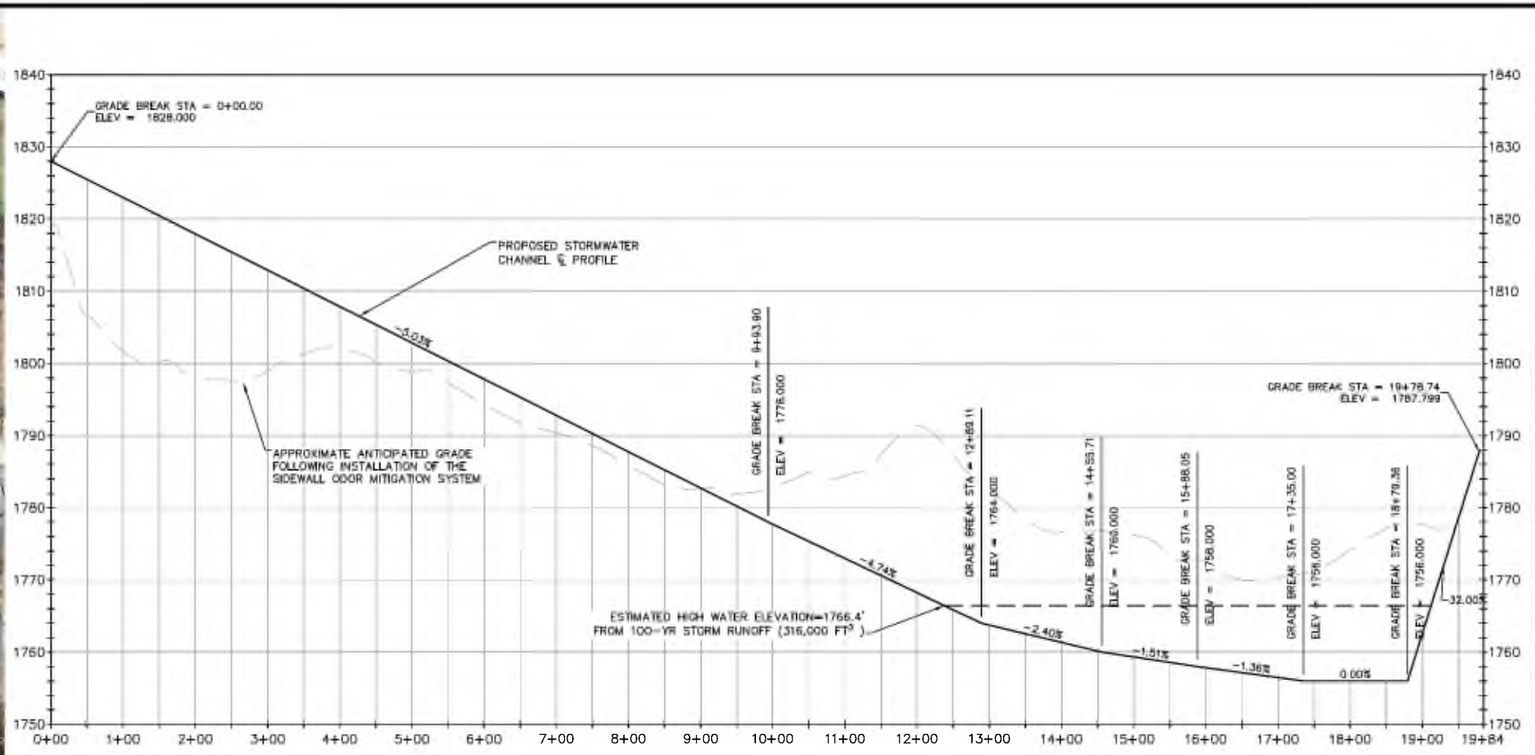




STORMWATER CHANNEL CENTERLINE PROFILE
SCALE: H: 1"=100', V: 1" = 10'
NOTE: INDICATED SCALE MAY VARY DEPENDING ON PLOT SIZE

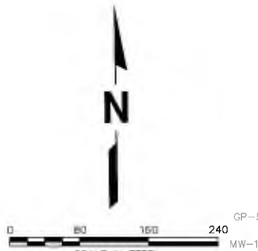
EVOH Concept- Gas Collection Strip Panels	
GAS STRIP ID	LENGTH (FT)
GS-01	125
GS-02	205
GS-03	245
GS-04	145
GS-05	205
GS-06	300
GS-07	310
GS-08	300
GS-09	290
GS-10	330
TOTAL	2455

1 / S.5 LFG COLLECTION STRIP SCHEDULE

PRELIMINARY EARTHWORK ESTIMATE, BASED UPON COMPARISON OF THE ANTICIPATED CONDITIONS TO THE EVOH COVER SYSTEM INSTALLATION GRADE:

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
VOLUME - Total Earthwork Estimate	fill	1.000	1.000	808667.12	61872.88	62940.61	992.27<Cut>



LEGEND

- TP-3 EXISTING TEMPERATURE PROBE
- EXISTING WELLHEAD
- EXISTING AIR RELEASE VALVE
- EXISTING ISOLATION VALVE
- EXISTING LEACHATE CLEANOUT
- EXISTING U-TRAP
- EXISTING CONDENSATE PUMP STATION
- EXISTING HORIZONTAL COLLECTOR SUMP
- EXISTING LFG LIGUIDS CONTAINMENT TANK
- GP-5 EXISTING GAS PROBE
- MW-110 EXISTING GROUNDWATER MONITORING WELL
- EXISTING MANHOLE
- PROPOSED MAJOR CONTOUR (10')
- PROPOSED MINOR CONTOUR (2')
- EXISTING HORIZONTAL COLLECTOR
- EXISTING 2" AIR LINE
- EXISTING 4" FORCE MAIN
- BUILDING
- WASTE MANAGEMENT BOUNDARY
- FACILITY PROPERTY BOUNDARY
- APPROXIMATE EXTENT OF WASTE
- EXISTING ROAD OUTLINE
- EXISTING GRAVEL ROAD
- GS-10 PROPOSED LFG COLLECTION STRIP

GENERAL NOTES

1. WITHIN THE QUARRY FOOTPRINT, THE HALF-TONE CONTOURS REPRESENT AN APPROXIMATION OF ANTICIPATED FUTURE CONDITIONS FOLLOWING THE INSTALLATION OF THE SIDEWALL ODOR MITIGATION SYSTEM. THE FULL-TONE CONTOURS SHOW THE PROPOSED EVOH COVER SYSTEM INSTALLATION GRADE.
2. SCS PLANS TO EXPAND THE LANDFILL GAS SYSTEM TO INCORPORATE THE LFG COLLECTION STRIPS. SCS PLANS TO APPLY VACUUM PRESSURE TO THE VERTICAL COLLECTION PIPES NEAR THE TOP OF THE COLLECTION STRIPS.
3. EXISTING LFG HEADER WAS OBTAINED FROM SCS CONSTRUCTION DRAWINGS, LAST UPDATED JULY 6, 2022.
4. THE APPROXIMATE SIDEWALL LOCATION BOUNDARY LINE WAS CREATED USING THE SURVEY LIMIT BOUNDARY LINE PROVIDED BY DRAPER ADEN ASSOCIATES, DATED JUNE 8, 2020, EDITED BASED ON A REVIEW OF TOPOGRAPHIC DATA AND AERIAL IMAGERY.
5. THE LFG WELLHEADS SHOWN WITH A LARGER WELLHEAD ICON REPRESENT WELLS WHICH WERE DRILLED DURING THE MONTHS OF SEPTEMBER AND OCTOBER OF 2021, AND LATER CONNECTED IN NOVEMBER AND DECEMBER OF 2021. THESE WELLS HAVE NOT YET BEEN SURVEYED FOLLOWING THEIR INSTALLATION AND THEREFORE THE LOCATIONS SHOWN ARE BASED ON THE EXPANSION DESIGN DRAWINGS DATED AUGUST 13, 2021.
6. THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
1/30/23
PROFESSIONAL ENGINEER

NO.	REVISION	DATE
1		
2		
3		
4		
5		

SHEET TITLE: PROPOSED STORMWATER CHANNEL AND LFG COLLECTION STRIPS

PROJECT TITLE: INTERIM EVOH COVER SYSTEM SWP #588 PRELIMINARY DESIGN PLANS

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
15821 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
PH. (804) 378-7440 FAX. (804) 378-7433

PROJ. NO. 02218208.05
DSN. BY: TFW/GHA
CHK. BY: TFW
APP. BY: CJW
ISSUE DATE: TFW/CJW

CADD FILE: 02218208.05
DATE: 1/30/23
SCALE: AS SHOWN
DRAWING NO. 5 of 7

M:\Project\02218208.05\Drawings\BRISTOL XREFs

GENERAL NOTES

1. THE APPROXIMATE THREE DIMENSIONAL SURFACE AREA OF THE EVOH COVER SYSTEM IS 19.0 ACRES.
2. WITHIN THE QUARRY FOOTPRINT, THE GRADES SHOWN REPRESENT THE PROPOSED INSTALLATION GRADE FOR THE EVOH COVER SYSTEM.
3. EXISTING LFG HEADER WAS OBTAINED FROM SCS CONSTRUCTION DRAWINGS, LAST UPDATED JULY 6, 2022.
4. THE APPROXIMATE SIDEWALL LOCATION BOUNDARY LINE WAS CREATED USING THE SURVEY LIMIT BOUNDARY LINE PROVIDED BY DRAPER ADEN ASSOCIATES, DATED JUNE 8, 2020, EDITED BASED ON A REVIEW OF TOPOGRAPHIC DATA AND AERIAL IMAGERY.
5. THE LFG WELLHEADS SHOWN WITH A LARGER WELLHEAD ICON REPRESENT WELLS WHICH WERE DRILLED DURING THE MONTHS OF SEPTEMBER AND OCTOBER OF 2021, AND LATER CONNECTED IN NOVEMBER AND DECEMBER OF 2021. THESE WELLS HAVE NOT YET BEEN SURVEYED FOLLOWING THEIR INSTALLATION AND THEREFORE THE LOCATIONS SHOWN ARE BASED ON THE EXPANSION DESIGN DRAWINGS DATED AUGUST 13, 2021.
6. THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
7. THE LOCATIONS OF WELLS GW-16, GW-17, GW-19, GW-20, AND GW-21 WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
1/30/23
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

SHEET TITLE: EVOH COVER SYSTEM INSTALLATION GRADE AND AREA

PROJECT TITLE: INTERIM EVOH COVER SYSTEM SWP #588 PRELIMINARY DESIGN PLANS

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
15521 MIDLOTHIAN TNPK - MIDLOTHIAN, VA 23113
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PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	SIA REV. BY:	APP. BY:
02218208.05	TRW/CJW	TRW/SHA	TRW	CJW	CJW

CADD FILE: 02218208.05

DATE: 1/30/23

SCALE: AS SHOWN

DRAWING NO. 6 of 7

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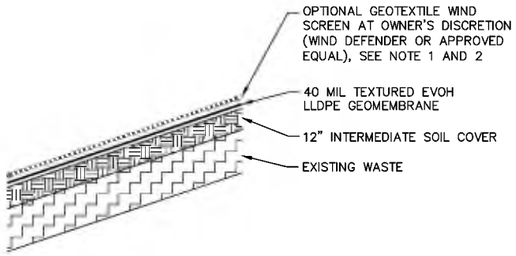
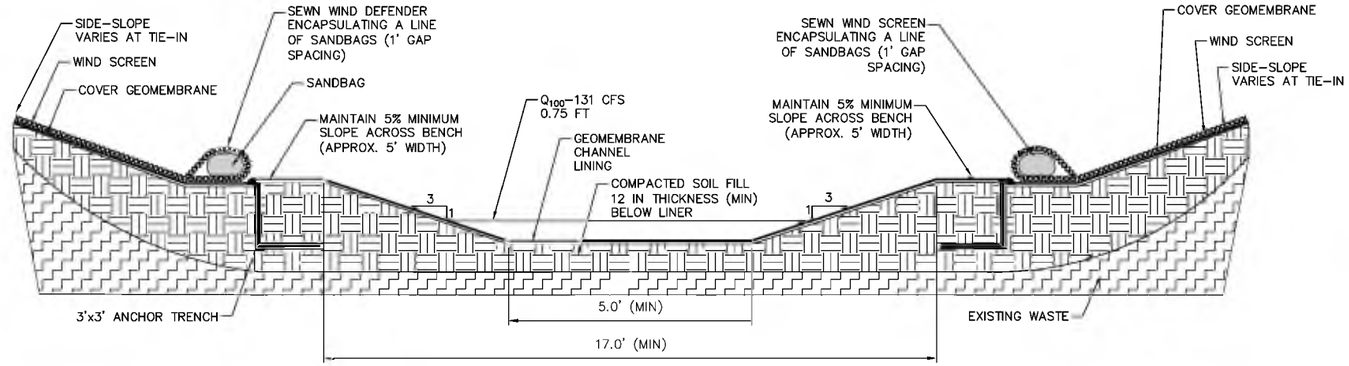


1 6 7 INTERIM EVOH COVER
NOT TO SCALE

NOTES:

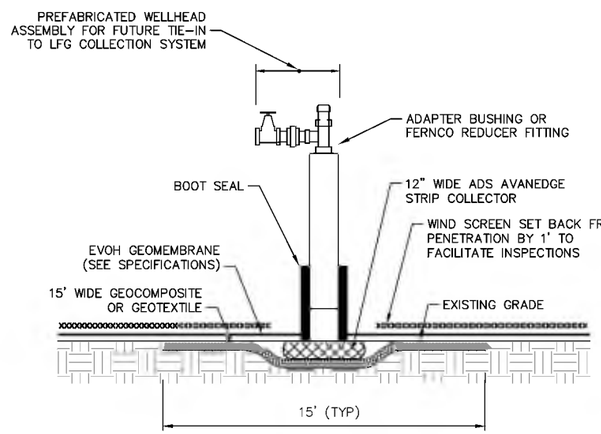
1 THE OWNER MAY OR MAY NOT ELECT TO INCLUDE A GEOTEXTILE WIND SCREEN



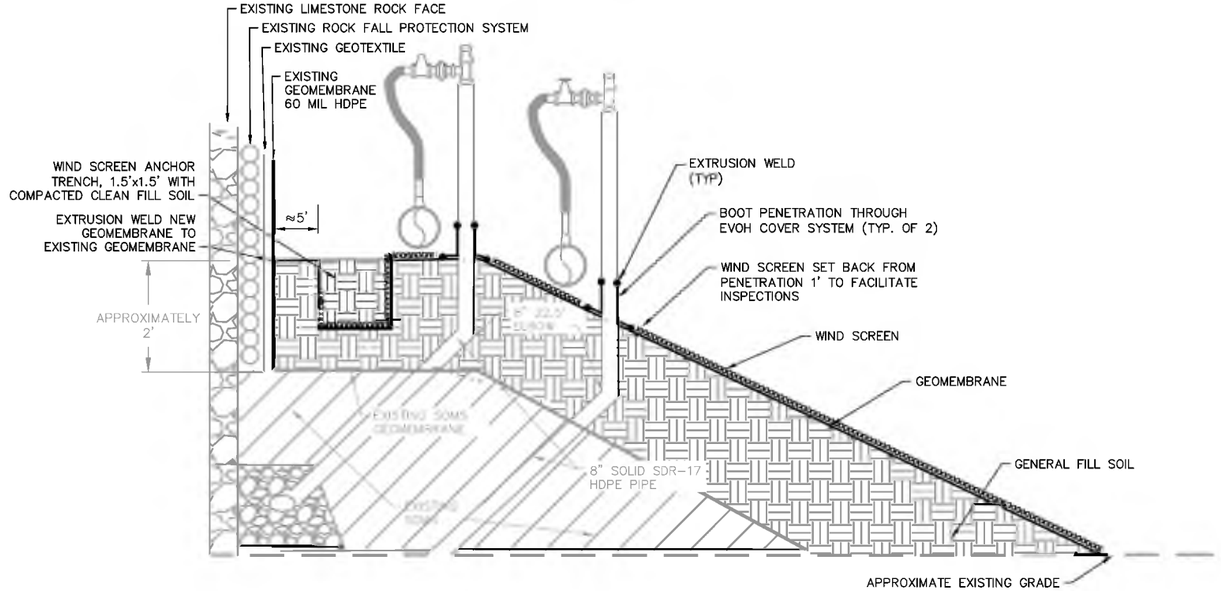
2 5 7 STORMWATER CHANNEL PRELIMINARY DESIGN
NOT TO SCALE

NOTES:

1. CHANNEL SLOPE IS APPROXIMATELY 5%. THE 100-YR FLOW DEPTH IS APPROX. 0.75 FT.



3 5 7 LFG COLLECTION STRIPS
NOT TO SCALE



4 6 7 EVOH COVER SYSTEM TIE-IN TO EXISTING SIDEWALL LINER
NOT TO SCALE

NOTE:
1 THESE DETAILS HAVE BEEN DEVELOPED IN CONJUNCTION WITH PLANNING EFFORTS AND DEPICT CONCEPTUAL DESIGN INFORMATION. THE ACTUAL DESIGN AND MATERIAL MAY BE MODIFIED TO ACCOMMODATE FIELD CONDITIONS OR ADJUSTED BASED ON ADDITIONAL DATA OR COST IMPLICATIONS DURING ENGINEERING DESIGN ACTIVITIES AND CONSTRUCTION.
2. THE OWNER MAY OR MAY NOT ELECT TO INCLUDE A GEOTEXTILE WIND SCREEN. THE DETAILS CURRENTLY ASSUME THE USE OF A GEOTEXTILE WIND SCREEN.
3. INTERIM COVER WILL BE UTILIZED OVER THE EXTENT OF THE LANDFILL IN THE NEAR TERM. IN THE EVENT THE DECISION IS MADE TO PERMANENTLY CLOSE THE LANDFILL, THE LANDFILL WILL RECEIVE FINAL COVER.

M:\Project\02218208.05\Drawings\BRISTOL XREFs

COMMONWEALTH OF VIRGINIA
CHARLES WARREN
#053809
1/30/23
PROFESSIONAL ENGINEER

NO	REVISION	DATE

SHEET TITLE: DETAILS

PROJECT TITLE: INTERIM EVOH COVER SYSTEM SWP #588 PRELIMINARY DESIGN PLANS

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

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

PROJ NO 02218208.05 | DWN. BY TRW/SHA | Q/A REVIEW BY C.JW
CSM. BY TRW/C.JW | CHK. BY TRW | APP. BY C.JW

CADD FILE: 02218208.05
DATE: 1/30/23
SCALE: AS SHOWN
DRAWING NO. 7 of 7

Appendix E

Monthly Topography Analysis

LEGEND

MAJOR CONTOURS (EVERY 10')
MINOR CONTOURS (EVERY 2')
APPROX. SIDEWALL LOCATION

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENT THE TOPOGRAPHY CAPTURED ON JANUARY 10, 2023 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD–83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD–88

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

NO. | REVISION | DATE

SHEET TITLE: JANUARY 2023 SITE 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.
52 SOUTH MAIN ST. SUITE A - MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

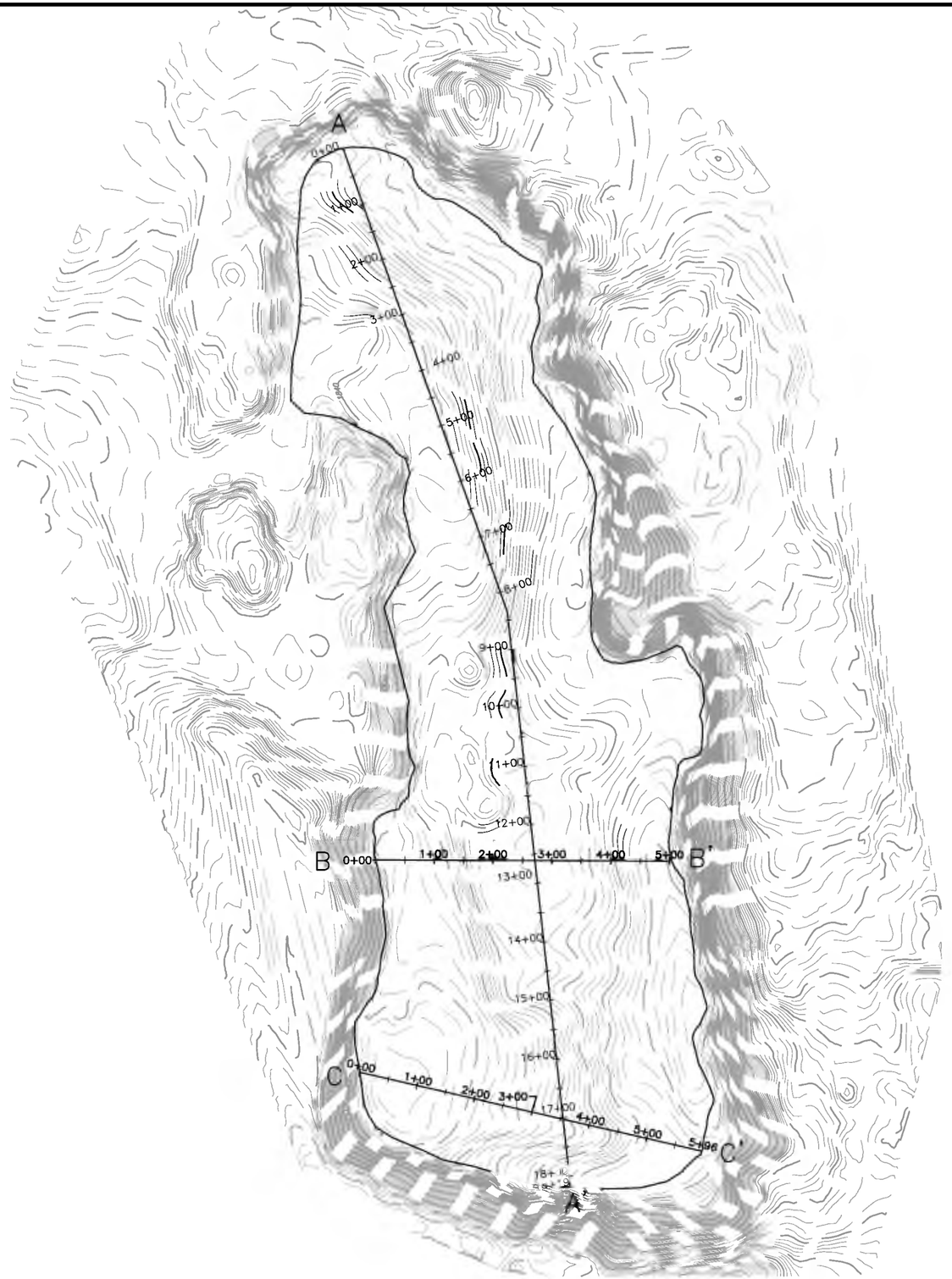
PROJ. NO.
DES. BY: SRB
DRN. BY: SRB
CHK. BY: CJW
APP. BY: CJW
S/A KW PE: CJW

CADD FILE:

DATE: 1/26/2023

SCALE: 1" = 100'

DRAWING NO. 1 of 5



LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROX. SIDEWALL LOCATION

NOTES:

1. GRADES SHOWN AS CONTOUR LINES ONLY WITHIN THE PERMIT 588 BOUNDARY REPRESENT THE TOPOGRAPHY CAPTURED ON DECEMBER 2, 2022 BY SCS ENGINEERS.
2. ANY DETERMINATION OF TOPOGRAPHY OR CONTOURS, OR ANY DEPICTION OF PHYSICAL IMPROVEMENTS, PROPERTY LINES, OR BOUNDARIES IS FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR DESIGN, MODIFICATION, OR CONSTRUCTION OF IMPROVEMENTS TO REAL PROPERTY OR FOR FLOOD PLAIN DETERMINATION.
3. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88

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

NO. | REVISION | DATE

SHEET TITLE
DECEMBER 2022 LANDFILL TOPO

PROJECT TITLE
MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
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PH. (609) 654-4000 SCSENGINEERS.COM

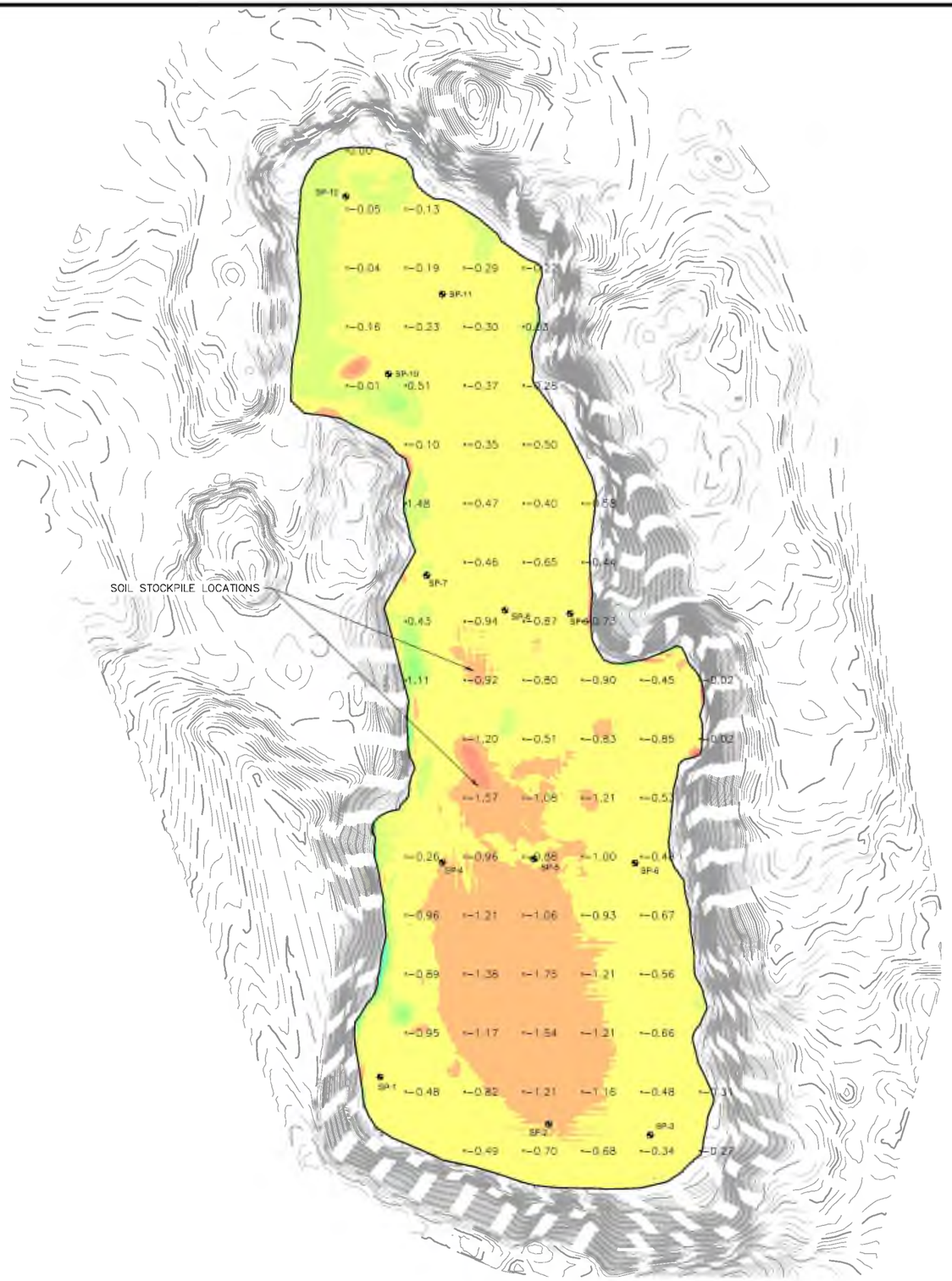
PROJ NO | DSN BY: SRB | D/A APVD BY: CJW
DSN BY: SRB | CHK BY: CJW | APP BY: CJW
CHK BY: CJW

CADD FILE:

DATE: 1/26/2023

SCALE: 1"=100'

DRAWING NO.
2 of **5**



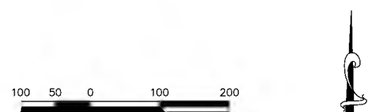
Volume
Base Surface 12-2-22 FLYOVER
Comparison Surface 1-10-23 FLYOVER

Cut Volume 17074.21 Cu. Yd.
Fill Volume 990.57 Cu. Yd.
Net Cut 16083.64 Cu. Yd.

Elevations		
Color	Min. Elevation	Max. Elevation
	-10.00'	-3.00'
	-3.00'	-2.00'
	-2.00'	-1.00'
	-1.00'	0.00'
	0.00'	1.00'
	1.00'	2.00'
	2.00'	3.00'
	3.00'	10.00'

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AREIAL TOPOGRAPHY DATA CAPTURED ON DECEMBER 2, 2022 AND THE AERIAL TOPOGRAPHY DATA CAPTURED ON JANUARY 10, 2022 BY SCS ENGINEERS. POSITIVE VALUE (+) INDICATES FILL AND NEGATIVE VALUES (-) INDICATE 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. SETTLEMENT PLATE LOCATIONS AND COORDINATES ARE BASED ON A SITE SPECIFIC COORDINATE SYSTEM.
4. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
5. THE VERTICAL DATUM IS BASED UPON NAVD-88



LEGEND

MAJOR CONTOURS (EVERY 10')
MINOR CONTOURS (EVERY 2')
APPROX. SIDEWALL LOCATION
SP-XX SETTLEMENT PLATE

NO	REVISION	DATE

SHEET TITLE
VOLUME CHANGE JANUARY 2022

PROJECT TITLE
MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

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

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

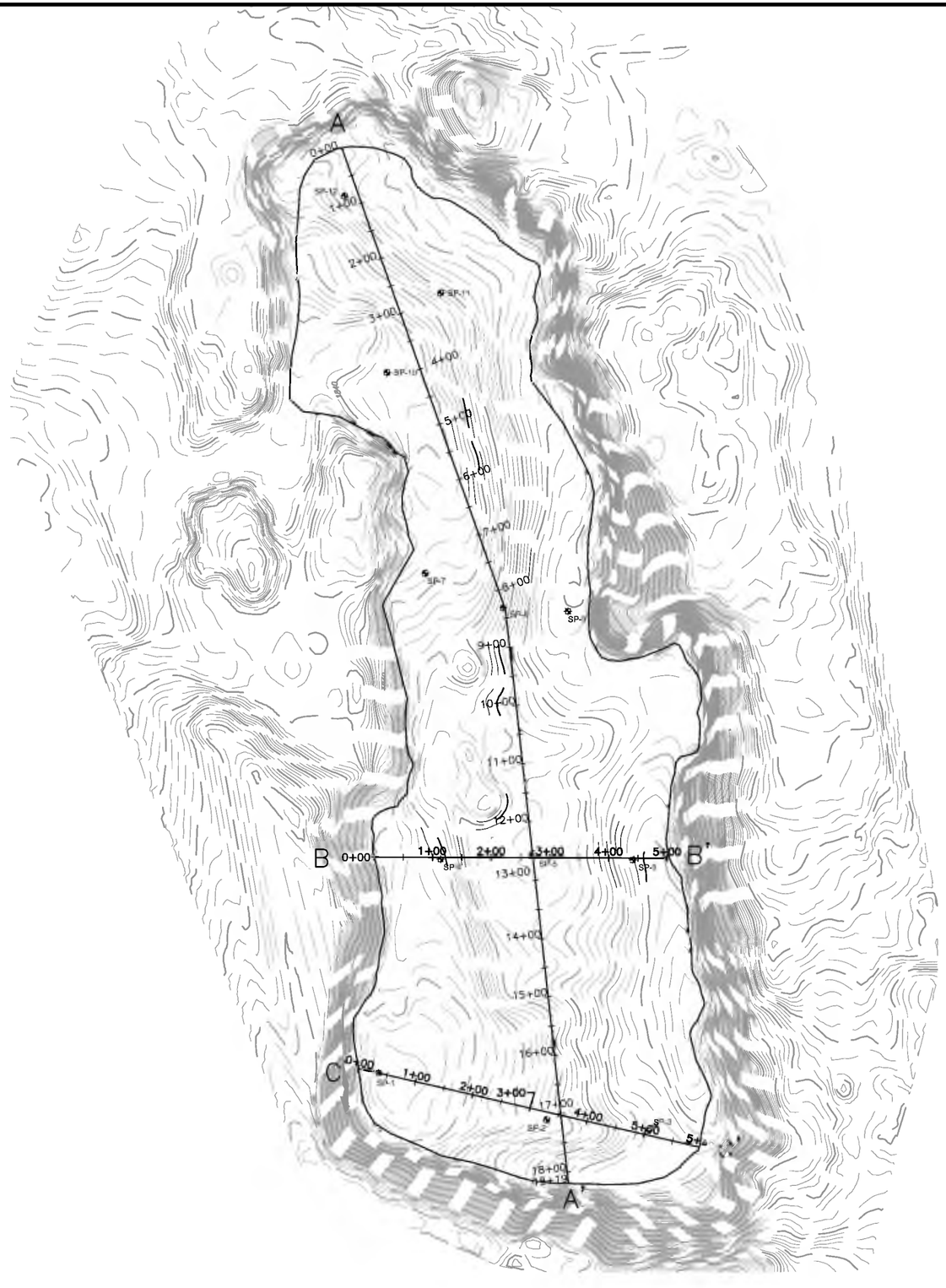
PROJ. NO. 02218208.05 | DWN. BY: SRB | S/A REV. BY: CJW
DSN. BY: SRB | CHK. BY: CJW | APP. BY: CJW

CADD FILE:

DATE: 1/26/2023

SCALE: 1"=100'

DRAWING NO.
3 of 5



Settlement Plate	Elevations		
	11/14/2022	12/13/2022	1/3/2023
SP-1	1834.4	1834.2	1833.8
SP-2	1810.6	1809.9	1809.2
SP-3	1783.7	1783.6	1783.6
SP-4	1817.5	1816.7	1816.2
SP-5	1800.8	1800.1	1799.7
SP-6	1777.7	1777.4	1777.3
SP-7	1828.6	1828.5	1828.4
SP-8	1807.3	1807.0	1806.7
SP-9	1785.9	1785.9	1785.6
SP-10	1840.2	1840.2	1840.1
SP-11	1816.3	1816.3	1816.3
SP-12	1810.7	1810.6	1810.6

NOTES:

1. SETTLEMENT PLATES INSTALLED ON NOVEMBER 7, 2022 BY SCS FIELD SERVICES.
2. SETTLEMENT PLATES SURVEYED ON NOVEMBER 14, 2022 BY CITY OF BRISTOL, VIRGINIA.
3. SETTLEMENT PLATE LOCATIONS AND COORDINATES ARE BASED ON A SITE SPECIFIC COORDINATE SYSTEM.
4. THE HORIZONTAL DATUM OF THE SURROUNDING TOPOGRAPHY IS VIRGINIA STATE PLANE SOUTH ZONE NAD–83 (2011).
5. THE VERTICAL DATUM OF THE SURROUNDING TOPOGRAPHY IS BASED UPON NAVD–88.

LEGEND

- MAJOR CONTOURS (EVERY 10')
- MINOR CONTOURS (EVERY 2')
- APPROX. SIDEWALL LOCATION
- SP-XX SETTLEMENT PLATE

100 50 0 100 200

SCALE: 1"=100'

NO. | REVISION | DATE

SHEET TITLE: SETTLEMENT PLATE AS-BUILT

PROJECT TITLE: MONTHLY TOPOGRAPHY ANALYSIS SOLID WASTE PERMIT #588

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

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

PROJ. NO. 02218208.05 | DSN. BY: SRB | Q/A REVIEW BY: CJW
DRK. BY: SRB | CHK. BY: CJW | APP. BY: CJW

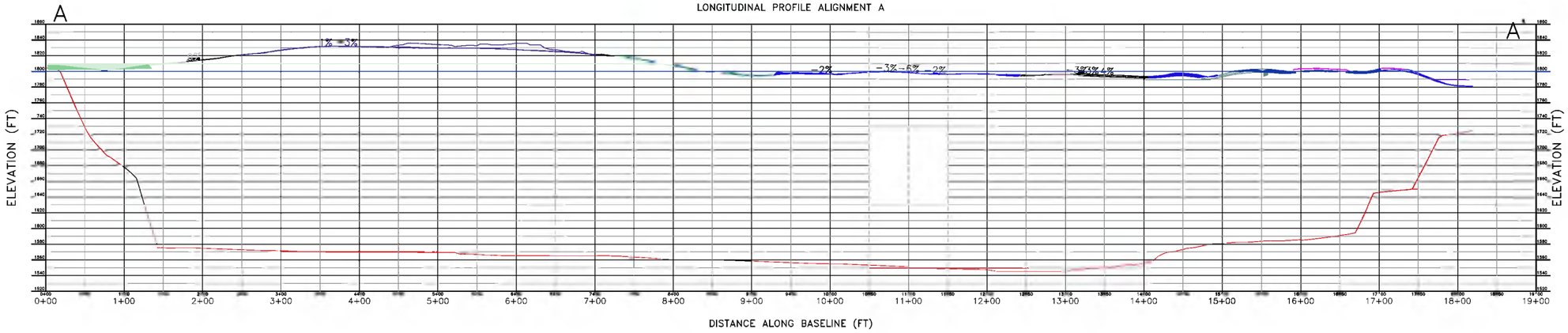
CADD FILE:

DATE: 1/26/2023

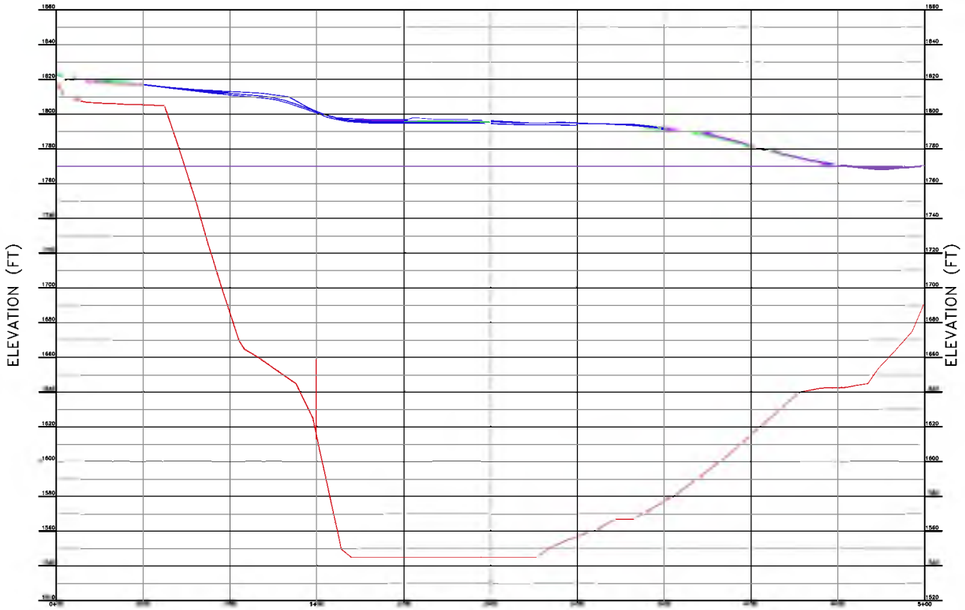
SCALE: 1"=100'

DRAWING NO. 4 of 5

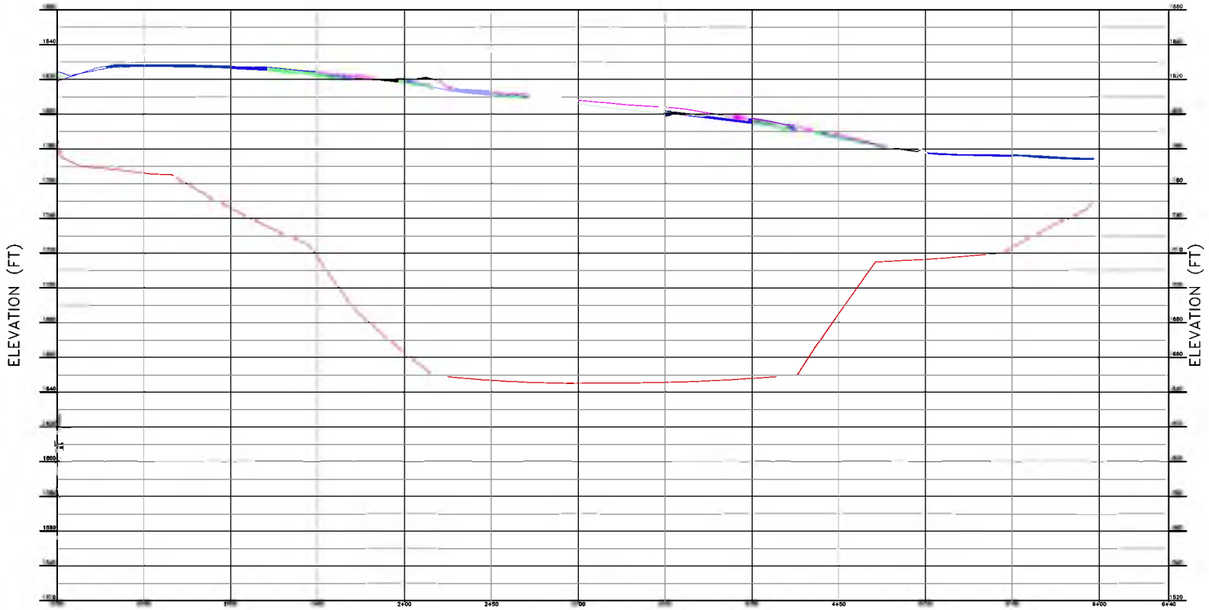
LONGITUDINAL PROFILE ALIGNMENT A



LONGITUDINAL PROFILE ALIGNMENT B



LONGITUDINAL PROFILE ALIGNMENT C



LEGEND

- BOTTOM LINER GRADES
- OCTOBER 2022 FLYOVER TOPO
- DECEMBER 2022 FLYOVER TOPO
- JANUARY 2023 FLYOVER TOPO

NO.	REVISION	DATE

SHEET TITLE: **PROFILES**

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

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

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

PROJ. NO: 02218208.05 | DWN. BY: SRB | CHK. BY: CJW | QA PM* BY: CJW | APP. BY: CJW
DSN. BY: SRB

CADD FILE:

DATE: 1/26/2023

SCALE: 1"=100'

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

Appendix F

Sample Collection Log

Lab Reports

Historical LFG-EW Leachate Monitoring Results Summary

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-49	Not Pumping								
EW-50	1/17/2023	12:30	46.5	7.81	21.37	0.61	-209.3	>1100	
EW-51	Not Pumping								
EW-52	Not Pumping								
EW-53	Not Pumping								
EW-54	Not Pumping								
EW-55	Not Pumping								
EW-56	No Pump								
EW-57	Not Pumping								
EW-58	1/17/2023	12:55	46.1	8.18	10.94	0.41	-163.9	>1100	
EW-59	1/18/2023	8:25	54.4	6.17	27.35	0.15	-135.3	>1100	
EW-60	Not Pumping								
EW-61	Not Pumping								
EW-62	No Pump								
EW-63	Not Pumping								
EW-64	Not Pumping								
EW-65	1/18/2023	8:00	48.8	7.87	9.17	0.16	-51	>1100	
EW-67	Not Pumping								
EW-68	Not Pumping								

Sampler: A. Minnick, W. Fabrie (SCS)

Samples Shipped By: Courier

Log Checked By: J. Robb (SCS)

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

Final Report

Laboratory Order ID 22L1241

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	December 23, 2022 8:00
		Date Issued:	January 27, 2023 16:49
		Project Number:	02218208.15 Task 1
Submitted To:	Jennifer Robb	Purchase Order:	
Client Site I.D.:	City of Bristol Landfills		

Enclosed are the results of analyses for samples received by the laboratory on 12/23/2022 08:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars
Technical Director

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

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

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

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

Analysis Detects Report

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

Date Issued: 1/27/2023 4:49:20PM

Laboratory Sample ID: **22L1241-01** **Client Sample ID:** **EW-50**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6010D	1.02		0.0200	0.0400	1	mg/L
Barium	01	SW6010D	0.566		0.0100	0.0200	1	mg/L
Chromium	01	SW6010D	0.503		0.0160	0.0200	1	mg/L
Mercury	01	SW7470A	0.00051		0.00040	0.00040	1	mg/L
Nickel	01	SW6010D	0.1722		0.0140	0.0200	1	mg/L
Zinc	01	SW6010D	0.208		0.0200	0.0200	1	mg/L
2-Butanone (MEK)	01	SW8260D	3140		30.0	100	10	ug/L
Acetone	01RE1	SW8260D	8500		1750	2500	250	ug/L
Benzene	01	SW8260D	301		4.00	10.0	10	ug/L
Ethylbenzene	01	SW8260D	67.3		4.00	10.0	10	ug/L
Tetrahydrofuran	01	SW8260D	151		100	100	10	ug/L
Toluene	01	SW8260D	122		5.00	10.0	10	ug/L
Xylenes, Total	01	SW8260D	161		10.0	30.0	10	ug/L
Ammonia as N	01	EPA350.1 R2.0	1700		100	100	1000	mg/L
BOD	01	SM22 5210B-2011	6440		0.2	2.0	1	mg/L
COD	01	SM22 5220D-2011	7440		1000	1000	100	mg/L
Nitrate+Nitrite as N	01RE2	SM22 4500-NO3F-2011	0.32		0.10	0.10	1	mg/L
TKN as N	01	EPA351.2 R2.0	1510		200	500	1000	mg/L
Total Recoverable Phenolics	01	SW9065	24.9		1.50	2.50	1	mg/L

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

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Certificate of Analysis

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

Date Issued: 1/27/2023 4:49:20PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-50	22L1241-01	Non-Potable Water	12/21/2022 16:05	12/23/2022 08:00
Trip Blank	22L1241-02	Non-Potable Water	11/14/2022 16:10	12/23/2022 08:00

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Client Sample ID: **EW-50** **Laboratory Sample ID:** **22L1241-01**

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	SW6010D	12/27/2022 10:00	12/28/2022 15:46	BLOD		0.0100	0.0200	1	mg/L	AB
Arsenic	01	7440-38-2	SW6010D	12/27/2022 10:00	12/28/2022 15:46	1.02		0.0200	0.0400	1	mg/L	AB
Barium	01	7440-39-3	SW6010D	12/27/2022 10:00	12/28/2022 15:46	0.566		0.0100	0.0200	1	mg/L	AB
Cadmium	01	7440-43-9	SW6010D	12/27/2022 10:00	12/28/2022 15:46	BLOD		0.0040	0.0080	1	mg/L	AB
Chromium	01	7440-47-3	SW6010D	12/27/2022 10:00	12/28/2022 15:46	0.503		0.0160	0.0200	1	mg/L	AB
Copper	01	7440-50-8	SW6010D	12/27/2022 10:00	12/28/2022 15:46	BLOD		0.0160	0.0200	1	mg/L	AB
Mercury	01	7439-97-6	SW7470A	12/28/2022 08:55	12/28/2022 15:42	0.00051		0.00040	0.00040	1	mg/L	ACM
Nickel	01	7440-02-0	SW6010D	12/27/2022 10:00	12/28/2022 15:46	0.1722		0.0140	0.0200	1	mg/L	AB
Lead	01	7439-92-1	SW6010D	12/27/2022 10:00	12/28/2022 15:46	BLOD		0.0120	0.0200	1	mg/L	AB
Selenium	01	7782-49-2	SW6010D	12/27/2022 10:00	12/28/2022 15:46	BLOD		0.0800	0.100	1	mg/L	AB
Zinc	01	7440-66-6	SW6010D	12/27/2022 10:00	12/28/2022 15:46	0.208		0.0200	0.0200	1	mg/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	12/23/2022 15:04	12/23/2022 15:04	3140		30.0	100	10	ug/L	RJB
Acetone	01RE1	67-64-1	SW8260D	12/23/2022 15:28	12/23/2022 15:28	8500		1750	2500	250	ug/L	RJB
Benzene	01	71-43-2	SW8260D	12/23/2022 15:04	12/23/2022 15:04	301		4.00	10.0	10	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	12/23/2022 15:04	12/23/2022 15:04	67.3		4.00	10.0	10	ug/L	RJB
Toluene	01	108-88-3	SW8260D	12/23/2022 15:04	12/23/2022 15:04	122		5.00	10.0	10	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	12/23/2022 15:04	12/23/2022 15:04	161		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	12/23/2022 15:04	12/23/2022 15:04	151		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*82.9 %*	*70-120*	*12/23/2022 15:04*	*12/23/2022 15:04*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*94.5 %*	*75-120*	*12/23/2022 15:04*	*12/23/2022 15:04*							
Surr: Dibromofluoromethane (Surr)	*01*	*80.2 %*	*70-130*	*12/23/2022 15:04*	*12/23/2022 15:04*							
Surr: Toluene-d8 (Surr)	*01*	*97.4 %*	*70-130*	*12/23/2022 15:04*	*12/23/2022 15:04*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*	*83.5 %*	*70-120*	*12/23/2022 15:28*	*12/23/2022 15:28*							
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*	*94.6 %*	*75-120*	*12/23/2022 15:28*	*12/23/2022 15:28*							

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Certificate of Analysis

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Client Site I.D.: City of Bristol Landfills
Submitted To: Jennifer Robb

Client Sample ID: **EW-50** **Laboratory Sample ID:** **22L1241-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*01RE1*	*81.1 %*	*70-130*	*12/23/2022 15:28*	*12/23/2022 15:28*							
Surr: Toluene-d8 (Surr)	*01RE1*	*97.7 %*	*70-130*	*12/23/2022 15:28*	*12/23/2022 15:28*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	12/27/2022 09:30	12/27/2022 23:25	BLOD		9.71	9.71	50	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*%*	*5-136*	*12/27/2022 09:30*	*12/27/2022 23:25*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*	*32.0 %*	*9-117*	*12/27/2022 09:30*	*12/27/2022 23:25*							
Surr: 2-Fluorophenol (Surr)	*01*	*22.0 %*	*5-60*	*12/27/2022 09:30*	*12/27/2022 23:25*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*50.0 %*	*5-151*	*12/27/2022 09:30*	*12/27/2022 23:25*							
Surr: Phenol-d5 (Surr)	*01*	*31.0 %*	*5-60*	*12/27/2022 09:30*	*12/27/2022 23:25*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*26.0 %*	*5-141*	*12/27/2022 09:30*	*12/27/2022 23:25*							

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Client Sample ID: **EW-50** **Laboratory Sample ID:** **22L1241-01**

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	12/27/2022 13:12	12/28/2022 10:42	1700		100	100	1000	mg/L	MKS
BOD	01	E1640606	SM22 5210B-2011	12/23/2022 13:01	12/23/2022 13:01	6440		0.2	2.0	1	mg/L	LAM
COD	01	NA	SM22 5220D-2011	01/03/2023 16:04	01/03/2023 16:04	7440		1000	1000	100	mg/L	MGC
Nitrate as N	01	14797-55-8	Calc.	12/28/2022 13:56	12/28/2022 13:56	BLOD		1.10	5.10	100	mg/L	MGC
Nitrate+Nitrite as N	01RE2	E701177	SM22 4500-NO3F-2011	12/28/2022 13:56	12/28/2022 13:56	0.32		0.10	0.10	1	mg/L	MGC
Nitrite as N	01	14797-65-0	SM22 4500-NO2B-2011	12/23/2022 10:45	12/23/2022 16:17	BLOD		1.00	5.00	100	mg/L	LTN
Total Recoverable Phenolics	01	NA	SW9065	12/29/2022 09:30	12/29/2022 13:30	24.9		1.50	2.50	1	mg/L	MKS
TKN as N	01	E17148461	EPA351.2 R2.0	12/29/2022 10:36	12/29/2022 10:36	1510		200	500	1000	mg/L	MJRL

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Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **22L1241-02**

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	12/23/2022 13:26	12/23/2022 13:26	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	02	67-64-1	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	02	71-43-2	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	02	108-88-3	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	02	109-99-9	SW8260D	12/23/2022 13:26	12/23/2022 13:26	BLOD		10.0	10.0	1	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*		*84.9 %*	*70-120*	*12/23/2022 13:26*	*12/23/2022 13:26*						
Surr: 4-Bromofluorobenzene (Surr)	*02*		*88.4 %*	*75-120*	*12/23/2022 13:26*	*12/23/2022 13:26*						
Surr: Dibromofluoromethane (Surr)	*02*		*83.6 %*	*70-130*	*12/23/2022 13:26*	*12/23/2022 13:26*						
Surr: Toluene-d8 (Surr)	*02*		*101 %*	*70-130*	*12/23/2022 13:26*	*12/23/2022 13:26*						

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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 BFL0966 - EPA200.2/R2.8										
Blank (BFL0966-BLK1)				Prepared: 12/27/2022 Analyzed: 12/28/2022						
Arsenic	ND	0.0400	mg/L							
Barium	ND	0.0200	mg/L							
Cadmium	ND	0.0080	mg/L							
Chromium	ND	0.0200	mg/L							
Copper	ND	0.0200	mg/L							
Lead	ND	0.0200	mg/L							
Nickel	ND	0.0200	mg/L							
Selenium	ND	0.100	mg/L							
Silver	ND	0.0200	mg/L							
Zinc	ND	0.0200	mg/L							
LCS (BFL0966-BS1)				Prepared: 12/27/2022 Analyzed: 12/28/2022						
Arsenic	1.06	0.0400	mg/L	1.00		106	80-120			
Barium	1.05	0.0200	mg/L	1.00		105	80-120			
Cadmium	1.09	0.0080	mg/L	1.00		109	80-120			
Chromium	1.08	0.0200	mg/L	1.00		108	80-120			
Copper	1.06	0.0200	mg/L	1.00		106	80-120			
Lead	1.03	0.0200	mg/L	1.00		103	80-120			
Nickel	1.083	0.0200	mg/L	1.00		108	80-120			
Selenium	1.02	0.100	mg/L	1.00		102	80-120			
Silver	0.192	0.0200	mg/L	0.200		96.1	80-120			
Zinc	1.08	0.0200	mg/L	1.00		108	80-120			
Matrix Spike (BFL0966-MS1)	**Source: 22L1183-04**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Arsenic	1.80	0.0400	mg/L	1.00	0.574	122	75-125			
Barium	1.83	0.0200	mg/L	1.00	0.793	104	75-125			

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

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0966 - EPA200.2/R2.8										
Matrix Spike (BFL0966-MS1)	**Source: 22L1183-04**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Cadmium	1.12	0.0080	mg/L	1.00	BLOD	112	75-125			
Chromium	1.90	0.0200	mg/L	1.00	0.822	108	75-125			
Copper	1.06	0.0200	mg/L	1.00	BLOD	106	75-125			
Lead	1.01	0.0200	mg/L	1.00	BLOD	101	75-125			
Nickel	1.439	0.0200	mg/L	1.00	0.3460	109	75-125			
Selenium	0.551	0.100	mg/L	1.00	BLOD	55.1	75-125			M
Silver	0.0329	0.0200	mg/L	0.200	BLOD	16.4	75-125			M
Zinc	1.42	0.0200	mg/L	1.00	0.286	114	75-125			
Matrix Spike Dup (BFL0966-MSD1)	**Source: 22L1183-04**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Arsenic	1.77	0.0400	mg/L	1.00	0.574	119	75-125	1.64	20	
Barium	1.86	0.0200	mg/L	1.00	0.793	107	75-125	1.81	20	
Cadmium	1.09	0.0080	mg/L	1.00	BLOD	109	75-125	2.61	20	
Chromium	1.95	0.0200	mg/L	1.00	0.822	113	75-125	2.65	20	
Copper	1.04	0.0200	mg/L	1.00	BLOD	104	75-125	2.20	20	
Lead	0.994	0.0200	mg/L	1.00	BLOD	99.4	75-125	2.00	20	
Nickel	1.424	0.0200	mg/L	1.00	0.3460	108	75-125	1.02	20	
Selenium	0.969	0.100	mg/L	1.00	BLOD	96.9	75-125	55.1	20	P
Silver	0.196	0.0200	mg/L	0.200	BLOD	97.8	75-125	142	20	P
Zinc	1.40	0.0200	mg/L	1.00	0.286	112	75-125	1.28	20	
Batch BFL1016 - SW7470A										
Blank (BFL1016-BLK1)				Prepared & Analyzed: 12/28/2022						
Mercury	ND	0.00020	mg/L							
LCS (BFL1016-BS1)				Prepared & Analyzed: 12/28/2022						

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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 BFL1016 - SW7470A										
LCS (BFL1016-BS1)				Prepared & Analyzed: 12/28/2022						
Mercury	0.00233	0.00020	mg/L	0.00250		93.2	80-120			
Matrix Spike (BFL1016-MS1)	**Source: 22L0995-04**			Prepared & Analyzed: 12/28/2022						
Mercury	0.00227	0.00020	mg/L	0.00250	BLOD	90.6	80-120			
Matrix Spike Dup (BFL1016-MSD1)	**Source: 22L0995-04**			Prepared & Analyzed: 12/28/2022						
Mercury	0.00212	0.00020	mg/L	0.00250	BLOD	85.0	80-120	6.44	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 BFL0941 - SW5030B-MS										
Blank (BFL0941-BLK1)				Prepared & Analyzed: 12/23/2022						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*44.0*		ug/L	*50.0*		*87.9*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*47.7*		ug/L	*50.0*		*95.4*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*42.2*		ug/L	*50.0*		*84.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.2*		ug/L	*50.0*		*96.4*	*70-130*			
LCS (BFL0941-BS1)				Prepared & Analyzed: 12/23/2022						
1,1,1,2-Tetrachloroethane	48.6	0.4	ug/L	50.0		97.1	80-130			
1,1,1-Trichloroethane	42.7	1	ug/L	50.0		85.4	65-130			
1,1,2,2-Tetrachloroethane	45.0	0.4	ug/L	50.0		89.9	65-130			
1,1,2-Trichloroethane	49.6	1	ug/L	50.0		99.2	75-125			
1,1-Dichloroethane	42.3	1	ug/L	50.0		84.5	70-135			
1,1-Dichloroethylene	36.8	1	ug/L	50.0		73.6	70-130			
1,1-Dichloropropene	40.4	1	ug/L	50.0		80.8	75-135			
1,2,3-Trichlorobenzene	46.1	1	ug/L	50.0		92.2	55-140			
1,2,3-Trichloropropane	45.8	1	ug/L	50.0		91.6	75-125			
1,2,4-Trichlorobenzene	49.6	1	ug/L	50.0		99.3	65-135			
1,2,4-Trimethylbenzene	44.2	1	ug/L	50.0		88.5	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	49.6	1	ug/L	50.0		99.2	50-130			
1,2-Dibromoethane (EDB)	46.9	1	ug/L	50.0		93.9	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
LCS (BFL0941-BS1)				Prepared & Analyzed: 12/23/2022						
1,2-Dichlorobenzene	45.6	0.5	ug/L	50.0		91.3	70-120			
1,2-Dichloroethane	37.6	1	ug/L	50.0		75.3	70-130			
1,2-Dichloropropane	48.1	0.5	ug/L	50.0		96.2	75-125			
1,3,5-Trimethylbenzene	44.5	1	ug/L	50.0		89.0	75-125			
1,3-Dichlorobenzene	45.6	1	ug/L	50.0		91.2	75-125			
1,3-Dichloropropane	46.4	1	ug/L	50.0		92.7	75-125			
1,4-Dichlorobenzene	45.7	1	ug/L	50.0		91.4	75-125			
2,2-Dichloropropane	42.2	1	ug/L	50.0		84.4	70-135			
2-Butanone (MEK)	44.0	10	ug/L	50.0		88.0	30-150			
2-Chlorotoluene	48.4	1	ug/L	50.0		96.8	75-125			
2-Hexanone (MBK)	45.3	5	ug/L	50.0		90.5	55-130			
4-Chlorotoluene	46.1	1	ug/L	50.0		92.2	75-130			
4-Isopropyltoluene	43.6	1	ug/L	50.0		87.2	75-130			
4-Methyl-2-pentanone (MIBK)	49.3	5	ug/L	50.0		98.6	60-135			
Acetone	45.9	10	ug/L	50.0		91.8	40-140			
Benzene	47.4	1	ug/L	50.0		94.8	80-120			
Bromobenzene	47.0	1	ug/L	50.0		94.1	75-125			
Bromochloromethane	44.2	1	ug/L	50.0		88.5	65-130			
Bromodichloromethane	52.3	0.5	ug/L	50.0		105	75-120			
Bromoform	49.4	1	ug/L	50.0		98.9	70-130			
Bromomethane	28.0	1	ug/L	50.0		55.9	30-145			
Carbon disulfide	34.8	10	ug/L	50.0		69.6	35-160			
Carbon tetrachloride	48.0	1	ug/L	50.0		95.9	65-140			
Chlorobenzene	48.5	1	ug/L	50.0		97.0	80-120			
Chloroethane	41.7	1	ug/L	50.0		83.5	60-135			

Enthalpy Analytical
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
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Client Site I.D.: City of Bristol Landfills
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 BFL0941 - SW5030B-MS										
LCS (BFL0941-BS1)				Prepared & Analyzed: 12/23/2022						
Chloroform	40.2	0.5	ug/L	50.0		80.5	65-135			
Chloromethane	43.5	1	ug/L	50.0		86.9	40-125			
cis-1,2-Dichloroethylene	41.0	1	ug/L	50.0		82.1	70-125			
cis-1,3-Dichloropropene	41.2	1	ug/L	50.0		82.4	70-130			
Dibromochloromethane	51.0	0.5	ug/L	50.0		102	60-135			
Dibromomethane	50.2	1	ug/L	50.0		100	75-125			
Dichlorodifluoromethane	51.2	1	ug/L	50.0		102	30-155			
Ethylbenzene	47.7	1	ug/L	50.0		95.3	75-125			
Hexachlorobutadiene	47.1	0.8	ug/L	50.0		94.2	50-140			
Isopropylbenzene	44.7	1	ug/L	50.0		89.3	75-125			
m+p-Xylenes	92.6	2	ug/L	100		92.6	75-130			
Methylene chloride	41.1	4	ug/L	50.0		82.3	55-140			
Methyl-t-butyl ether (MTBE)	43.8	1	ug/L	50.0		87.5	65-125			
Naphthalene	45.9	1	ug/L	50.0		91.7	55-140			
n-Butylbenzene	45.9	1	ug/L	50.0		91.9	70-135			
n-Propylbenzene	45.2	1	ug/L	50.0		90.3	70-130			
o-Xylene	47.8	1	ug/L	50.0		95.6	80-120			
sec-Butylbenzene	47.3	1	ug/L	50.0		94.7	70-125			
Styrene	44.0	1	ug/L	50.0		88.0	65-135			
tert-Butylbenzene	44.1	1	ug/L	50.0		88.2	70-130			
Tetrachloroethylene (PCE)	51.0	1	ug/L	50.0		102	45-150			
Toluene	47.1	1	ug/L	50.0		94.2	75-120			
trans-1,2-Dichloroethylene	39.8	1	ug/L	50.0		79.7	60-140			
trans-1,3-Dichloropropene	44.2	1	ug/L	50.0		88.3	55-140			
Trichloroethylene	47.2	1	ug/L	50.0		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 BFL0941 - SW5030B-MS										
LCS (BFL0941-BS1)				Prepared & Analyzed: 12/23/2022						
Trichlorofluoromethane	44.6	1	ug/L	50.0		89.1	60-145			
Vinyl chloride	46.7	0.5	ug/L	50.0		93.4	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*39.8*		ug/L	*50.0*		*79.5*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.2*		ug/L	*50.0*		*98.4*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*41.3*		ug/L	*50.0*		*82.6*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.4*		ug/L	*50.0*		*98.8*	*70-130*			
Matrix Spike (BFL0941-MS1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
1,1,1,2-Tetrachloroethane	47.8	0.4	ug/L	50.0	BLOD	95.6	80-130			
1,1,1-Trichloroethane	42.4	1	ug/L	50.0	BLOD	84.9	65-130			
1,1,2,2-Tetrachloroethane	43.0	0.4	ug/L	50.0	BLOD	85.9	65-130			
1,1,2-Trichloroethane	48.7	1	ug/L	50.0	BLOD	97.3	75-125			
1,1-Dichloroethane	41.7	1	ug/L	50.0	BLOD	83.4	70-135			
1,1-Dichloroethylene	36.1	1	ug/L	50.0	BLOD	72.2	50-145			
1,1-Dichloropropene	39.5	1	ug/L	50.0	BLOD	79.0	75-135			
1,2,3-Trichlorobenzene	47.3	1	ug/L	50.0	BLOD	94.5	55-140			
1,2,3-Trichloropropane	43.6	1	ug/L	50.0	BLOD	87.3	75-125			
1,2,4-Trichlorobenzene	49.5	1	ug/L	50.0	BLOD	99.0	65-135			
1,2,4-Trimethylbenzene	44.3	1	ug/L	50.0	BLOD	88.6	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	49.4	1	ug/L	50.0	BLOD	98.8	50-130			
1,2-Dibromoethane (EDB)	46.9	1	ug/L	50.0	BLOD	93.8	80-120			
1,2-Dichlorobenzene	45.9	0.5	ug/L	50.0	BLOD	91.7	70-120			
1,2-Dichloroethane	36.9	1	ug/L	50.0	BLOD	73.7	70-130			
1,2-Dichloropropane	47.9	0.5	ug/L	50.0	BLOD	95.8	75-125			
1,3,5-Trimethylbenzene	43.4	1	ug/L	50.0	BLOD	86.8	75-124			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
Matrix Spike (BFL0941-MS1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
1,3-Dichlorobenzene	45.7	1	ug/L	50.0	BLOD	91.5	75-125			
1,3-Dichloropropane	45.4	1	ug/L	50.0	BLOD	90.8	75-125			
1,4-Dichlorobenzene	45.9	1	ug/L	50.0	BLOD	91.8	75-125			
2,2-Dichloropropane	41.6	1	ug/L	50.0	BLOD	83.3	70-135			
2-Butanone (MEK)	52.6	10	ug/L	50.0	BLOD	105	30-150			
2-Chlorotoluene	47.9	1	ug/L	50.0	BLOD	95.8	75-125			
2-Hexanone (MBK)	43.4	5	ug/L	50.0	BLOD	86.8	55-130			
4-Chlorotoluene	45.7	1	ug/L	50.0	BLOD	91.4	75-130			
4-Isopropyltoluene	43.3	1	ug/L	50.0	BLOD	86.7	75-130			
4-Methyl-2-pentanone (MIBK)	46.6	5	ug/L	50.0	BLOD	93.1	60-135			
Acetone	40.8	10	ug/L	50.0	BLOD	81.6	40-140			
Benzene	46.4	1	ug/L	50.0	BLOD	92.8	80-120			
Bromobenzene	47.0	1	ug/L	50.0	BLOD	93.9	75-125			
Bromochloromethane	44.5	1	ug/L	50.0	BLOD	89.0	65-130			
Bromodichloromethane	51.2	0.5	ug/L	50.0	BLOD	102	75-136			
Bromoform	48.0	1	ug/L	50.0	BLOD	95.9	70-130			
Bromomethane	28.8	1	ug/L	50.0	BLOD	57.7	30-145			
Carbon disulfide	26.9	10	ug/L	50.0	BLOD	53.8	35-160			
Carbon tetrachloride	47.4	1	ug/L	50.0	BLOD	94.8	65-140			
Chlorobenzene	47.3	1	ug/L	50.0	BLOD	94.6	80-120			
Chloroethane	41.0	1	ug/L	50.0	BLOD	81.9	60-135			
Chloroform	39.8	0.5	ug/L	50.0	BLOD	79.5	65-135			
Chloromethane	42.1	1	ug/L	50.0	BLOD	84.2	40-125			
cis-1,2-Dichloroethylene	40.4	1	ug/L	50.0	BLOD	80.9	70-125			
cis-1,3-Dichloropropene	39.4	1	ug/L	50.0	BLOD	78.8	47-136			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
Matrix Spike (BFL0941-MS1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
Dibromochloromethane	50.2	0.5	ug/L	50.0	BLOD	100	60-135			
Dibromomethane	49.8	1	ug/L	50.0	BLOD	99.7	75-125			
Dichlorodifluoromethane	51.2	1	ug/L	50.0	BLOD	102	30-155			
Ethylbenzene	47.4	1	ug/L	50.0	BLOD	94.7	75-125			
Hexachlorobutadiene	46.8	0.8	ug/L	50.0	BLOD	93.5	50-140			
Isopropylbenzene	44.1	1	ug/L	50.0	BLOD	88.2	75-125			
m+p-Xylenes	90.8	2	ug/L	100	BLOD	90.8	75-130			
Methylene chloride	40.7	4	ug/L	50.0	BLOD	81.3	55-140			
Methyl-t-butyl ether (MTBE)	43.4	1	ug/L	50.0	BLOD	86.7	65-125			
Naphthalene	46.0	1	ug/L	50.0	BLOD	91.9	55-140			
n-Butylbenzene	45.5	1	ug/L	50.0	BLOD	91.0	70-135			
n-Propylbenzene	45.3	1	ug/L	50.0	BLOD	90.6	70-130			
o-Xylene	47.2	1	ug/L	50.0	BLOD	94.3	80-120			
sec-Butylbenzene	46.1	1	ug/L	50.0	BLOD	92.1	70-125			
Styrene	43.8	1	ug/L	50.0	BLOD	87.6	65-135			
tert-Butylbenzene	43.5	1	ug/L	50.0	BLOD	87.1	70-130			
Tetrachloroethylene (PCE)	48.6	1	ug/L	50.0	BLOD	97.3	51-231			
Toluene	47.2	1	ug/L	50.0	BLOD	94.4	75-120			
trans-1,2-Dichloroethylene	39.9	1	ug/L	50.0	BLOD	79.9	60-140			
trans-1,3-Dichloropropene	43.0	1	ug/L	50.0	BLOD	86.0	55-140			
Trichloroethylene	45.9	1	ug/L	50.0	BLOD	91.8	70-125			
Trichlorofluoromethane	43.5	1	ug/L	50.0	BLOD	87.0	60-145			
Vinyl chloride	45.7	0.5	ug/L	50.0	BLOD	91.5	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*40.2*		ug/L	*50.0*		*80.4*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.4*		ug/L	*50.0*		*98.7*	*75-120*			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
Matrix Spike (BFL0941-MS1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
Surr: Dibromofluoromethane (Surr)	*40.4*		ug/L	*50.0*		*80.9*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.7*		ug/L	*50.0*		*97.4*	*70-130*			
Matrix Spike Dup (BFL0941-MSD1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
1,1,1,2-Tetrachloroethane	51.4	0.4	ug/L	50.0	BLOD	103	80-130	7.26	30	
1,1,1-Trichloroethane	43.9	1	ug/L	50.0	BLOD	87.7	65-130	3.31	30	
1,1,2,2-Tetrachloroethane	47.4	0.4	ug/L	50.0	BLOD	94.7	65-130	9.74	30	
1,1,2-Trichloroethane	52.9	1	ug/L	50.0	BLOD	106	75-125	8.35	30	
1,1-Dichloroethane	43.4	1	ug/L	50.0	BLOD	86.8	70-135	4.00	30	
1,1-Dichloroethylene	36.4	1	ug/L	50.0	BLOD	72.7	50-145	0.717	30	
1,1-Dichloropropene	40.1	1	ug/L	50.0	BLOD	80.2	75-135	1.51	30	
1,2,3-Trichlorobenzene	50.0	1	ug/L	50.0	BLOD	99.9	55-140	5.55	30	
1,2,3-Trichloropropane	48.3	1	ug/L	50.0	BLOD	96.5	75-125	10.1	30	
1,2,4-Trichlorobenzene	52.6	1	ug/L	50.0	BLOD	105	65-135	6.02	30	
1,2,4-Trimethylbenzene	46.0	1	ug/L	50.0	BLOD	91.9	75-130	3.72	30	
1,2-Dibromo-3-chloropropane (DBCP)	51.8	1	ug/L	50.0	BLOD	104	50-130	4.74	30	
1,2-Dibromoethane (EDB)	51.4	1	ug/L	50.0	BLOD	103	80-120	9.18	30	
1,2-Dichlorobenzene	48.8	0.5	ug/L	50.0	BLOD	97.5	70-120	6.09	30	
1,2-Dichloroethane	39.9	1	ug/L	50.0	BLOD	79.7	70-130	7.79	30	
1,2-Dichloropropane	50.7	0.5	ug/L	50.0	BLOD	101	75-125	5.62	30	
1,3,5-Trimethylbenzene	45.6	1	ug/L	50.0	BLOD	91.1	75-124	4.83	30	
1,3-Dichlorobenzene	48.1	1	ug/L	50.0	BLOD	96.1	75-125	4.99	30	
1,3-Dichloropropane	50.6	1	ug/L	50.0	BLOD	101	75-125	10.8	30	
1,4-Dichlorobenzene	47.6	1	ug/L	50.0	BLOD	95.1	75-125	3.57	30	
2,2-Dichloropropane	42.2	1	ug/L	50.0	BLOD	84.3	70-135	1.27	30	

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
Matrix Spike Dup (BFL0941-MSD1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
2-Butanone (MEK)	43.7	10	ug/L	50.0	BLOD	87.4	30-150		30	
2-Chlorotoluene	49.5	1	ug/L	50.0	BLOD	99.0	75-125	3.33	30	
2-Hexanone (MBK)	42.3	5	ug/L	50.0	BLOD	84.5	55-130		30	
4-Chlorotoluene	48.9	1	ug/L	50.0	BLOD	97.8	75-130	6.72	30	
4-Isopropyltoluene	44.8	1	ug/L	50.0	BLOD	89.7	75-130	3.43	30	
4-Methyl-2-pentanone (MIBK)	46.3	5	ug/L	50.0	BLOD	92.6	60-135	0.603	30	
Acetone	37.7	10	ug/L	50.0	BLOD	75.3	40-140		30	
Benzene	49.1	1	ug/L	50.0	BLOD	98.2	80-120	5.70	30	
Bromobenzene	51.9	1	ug/L	50.0	BLOD	104	75-125	10.1	30	
Bromochloromethane	46.8	1	ug/L	50.0	BLOD	93.6	65-130	5.13	30	
Bromodichloromethane	55.1	0.5	ug/L	50.0	BLOD	110	75-136	7.38	30	
Bromoform	54.0	1	ug/L	50.0	BLOD	108	70-130	11.9	30	
Bromomethane	31.3	1	ug/L	50.0	BLOD	62.6	30-145	8.18	30	
Carbon disulfide	29.1	10	ug/L	50.0	BLOD	58.3	35-160		30	
Carbon tetrachloride	48.1	1	ug/L	50.0	BLOD	96.2	65-140	1.44	30	
Chlorobenzene	50.7	1	ug/L	50.0	BLOD	101	80-120	6.90	30	
Chloroethane	41.9	1	ug/L	50.0	BLOD	83.8	60-135	2.29	30	
Chloroform	41.4	0.5	ug/L	50.0	BLOD	82.8	65-135	4.09	30	
Chloromethane	44.4	1	ug/L	50.0	BLOD	88.9	40-125	5.46	30	
cis-1,2-Dichloroethylene	42.9	1	ug/L	50.0	BLOD	85.8	70-125	5.97	30	
cis-1,3-Dichloropropene	42.9	1	ug/L	50.0	BLOD	85.8	47-136	8.48	30	
Dibromochloromethane	54.1	0.5	ug/L	50.0	BLOD	108	60-135	7.50	30	
Dibromomethane	54.3	1	ug/L	50.0	BLOD	109	75-125	8.62	30	
Dichlorodifluoromethane	52.8	1	ug/L	50.0	BLOD	106	30-155	3.15	30	
Ethylbenzene	50.5	1	ug/L	50.0	BLOD	101	75-125	6.36	30	

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0941 - SW5030B-MS										
Matrix Spike Dup (BFL0941-MSD1)	**Source: 22L1132-01**			Prepared & Analyzed: 12/23/2022						
Hexachlorobutadiene	49.5	0.8	ug/L	50.0	BLOD	99.0	50-140	5.63	30	
Isopropylbenzene	46.3	1	ug/L	50.0	BLOD	92.6	75-125	4.84	30	
m+p-Xylenes	98.5	2	ug/L	100	BLOD	98.5	75-130	8.15	30	
Methylene chloride	41.9	4	ug/L	50.0	BLOD	83.8	55-140		30	
Methyl-t-butyl ether (MTBE)	46.4	1	ug/L	50.0	BLOD	92.7	65-125	6.66	30	
Naphthalene	50.5	1	ug/L	50.0	BLOD	101	55-140	9.31	30	
n-Butylbenzene	47.0	1	ug/L	50.0	BLOD	94.1	70-135	3.31	30	
n-Propylbenzene	46.8	1	ug/L	50.0	BLOD	93.5	70-130	3.17	30	
o-Xylene	50.6	1	ug/L	50.0	BLOD	101	80-120	7.02	30	
sec-Butylbenzene	48.9	1	ug/L	50.0	BLOD	97.9	70-125	6.02	30	
Styrene	47.2	1	ug/L	50.0	BLOD	94.4	65-135	7.43	30	
tert-Butylbenzene	45.7	1	ug/L	50.0	BLOD	91.4	70-130	4.86	30	
Tetrachloroethylene (PCE)	52.5	1	ug/L	50.0	BLOD	105	51-231	7.73	30	
Toluene	49.4	1	ug/L	50.0	BLOD	98.7	75-120	4.49	30	
trans-1,2-Dichloroethylene	40.1	1	ug/L	50.0	BLOD	80.3	60-140	0.500	30	
trans-1,3-Dichloropropene	45.6	1	ug/L	50.0	BLOD	91.1	55-140	5.85	30	
Trichloroethylene	48.1	1	ug/L	50.0	BLOD	96.3	70-125	4.72	30	
Trichlorofluoromethane	44.2	1	ug/L	50.0	BLOD	88.5	60-145	1.71	30	
Vinyl chloride	45.7	0.5	ug/L	50.0	BLOD	91.4	50-145	0.109	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*40.6*		ug/L	*50.0*		*81.3*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*50.4*		ug/L	*50.0*		*101*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*42.0*		ug/L	*50.0*		*83.9*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.4*		ug/L	*50.0*		*98.8*	*70-130*			

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Certificate of Analysis

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

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 BFL0968 - SW3510C/EPA600-MS										
Blank (BFL0968-BLK1)				Prepared & Analyzed: 12/27/2022						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*55.6*		ug/L	*100*		*55.6*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*29.9*		ug/L	*50.0*		*59.8*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*37.4*		ug/L	*100*		*37.4*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*37.8*		ug/L	*50.0*		*75.6*	*5-151*			
Surr: Phenol-d5 (Surr)	*26.1*		ug/L	*100*		*26.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*39.8*		ug/L	*50.0*		*79.6*	*5-141*			
LCS (BFL0968-BS1)				Prepared & Analyzed: 12/27/2022						
1,2,4-Trichlorobenzene	15.0	10.0	ug/L	50.0		30.0	57-130			L
1,2-Dichlorobenzene	14.9	10.0	ug/L	50.0		29.7	22-115			
1,3-Dichlorobenzene	14.0	10.0	ug/L	50.0		28.0	22-112			
1,4-Dichlorobenzene	14.0	10.0	ug/L	50.0		28.0	13-112			
2,4,6-Trichlorophenol	13.3	10.0	ug/L	50.0		26.6	52-129			L
2,4-Dichlorophenol	15.9	10.0	ug/L	50.0		31.9	53-122			L
2,4-Dimethylphenol	17.0	5.00	ug/L	50.0		34.0	42-120			L
2,4-Dinitrophenol	21.3	50.0	ug/L	50.0		42.6	48-127			L
2,4-Dinitrotoluene	18.9	10.0	ug/L	50.0		37.7	10-173			
2,6-Dinitrotoluene	15.4	10.0	ug/L	50.0		30.8	68-137			L
2-Chloronaphthalene	13.9	10.0	ug/L	50.0		27.8	65-120			L
2-Chlorophenol	16.2	10.0	ug/L	50.0		32.5	36-120			L
2-Nitrophenol	19.8	10.0	ug/L	50.0		39.5	45-167			L
4,6-Dinitro-2-methylphenol	25.0	50.0	ug/L	50.0		49.9	53-130			L
4-Bromophenyl phenyl ether	13.6	10.0	ug/L	50.0		27.1	65-120			L
4-Chlorophenyl phenyl ether	12.1	10.0	ug/L	50.0		24.2	38-145			L

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0968 - SW3510C/EPA600-MS										
LCS (BFL0968-BS1)				Prepared & Analyzed: 12/27/2022						
4-Nitrophenol	8.51	50.0	ug/L	50.0		17.0	13-129			
Acenaphthene	13.8	10.0	ug/L	50.0		27.5	60-132			L
Acenaphthylene	14.7	10.0	ug/L	50.0		29.3	54-126			L
Anthracene	18.2	10.0	ug/L	50.0		36.3	43-120			L
Benzo (a) anthracene	25.7	10.0	ug/L	50.0		51.4	42-133			
Benzo (a) pyrene	26.7	10.0	ug/L	50.0		53.4	32-148			
Benzo (b) fluoranthene	24.3	10.0	ug/L	50.0		48.6	42-140			
Benzo (g,h,i) perylene	24.4	10.0	ug/L	50.0		48.8	10-195			
Benzo (k) fluoranthene	25.6	10.0	ug/L	50.0		51.1	25-146			
bis (2-Chloroethoxy) methane	15.9	10.0	ug/L	50.0		31.7	49-165			L
bis (2-Chloroethyl) ether	16.0	10.0	ug/L	50.0		32.0	43-126			L
2,2'-Oxybis (1-chloropropane)	15.7	10.0	ug/L	50.0		31.5	63-139			L
bis (2-Ethylhexyl) phthalate	30.1	10.0	ug/L	50.0		60.2	29-137			
Butyl benzyl phthalate	33.1	10.0	ug/L	50.0		66.1	10-140			
Chrysene	25.5	10.0	ug/L	50.0		51.0	44-140			
Dibenz (a,h) anthracene	27.2	10.0	ug/L	50.0		54.4	10-200			
Diethyl phthalate	16.2	10.0	ug/L	50.0		32.4	10-120			
Dimethyl phthalate	14.0	10.0	ug/L	50.0		28.0	10-120			
Di-n-butyl phthalate	23.2	10.0	ug/L	50.0		46.3	10-120			
Di-n-octyl phthalate	28.7	10.0	ug/L	50.0		57.3	19-132			
Fluoranthene	23.5	10.0	ug/L	50.0		47.1	43-121			
Fluorene	14.5	10.0	ug/L	50.0		29.0	70-120			L
Hexachlorobenzene	14.5	1.00	ug/L	50.0		29.0	10-142			
Hexachlorobutadiene	14.6	10.0	ug/L	50.0		29.3	38-120			L
Hexachlorocyclopentadiene	10.2	10.0	ug/L	50.0		20.4	10-76			

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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 BFL0968 - SW3510C/EPA600-MS										
LCS (BFL0968-BS1)				Prepared & Analyzed: 12/27/2022						
Hexachloroethane	14.3	10.0	ug/L	50.0		28.7	55-120			L
Indeno (1,2,3-cd) pyrene	27.2	10.0	ug/L	50.0		54.4	10-151			
Isophorone	8.30	10.0	ug/L	50.0		16.6	47-180			L
Naphthalene	14.3	5.00	ug/L	50.0		28.6	36-120			L
Nitrobenzene	17.8	10.0	ug/L	50.0		35.5	54-158			L
n-Nitrosodimethylamine	13.2	10.0	ug/L	50.0		26.4	10-85			
n-Nitrosodi-n-propylamine	16.4	10.0	ug/L	50.0		32.8	14-198			
n-Nitrosodiphenylamine	12.6	10.0	ug/L	50.0		25.1	12-97			
p-Chloro-m-cresol	14.9	10.0	ug/L	50.0		29.8	10-142			
Phenanthrene	18.4	10.0	ug/L	50.0		36.7	65-120			L
Phenol	7.88	10.0	ug/L	50.5		15.6	17-120			L
Pyrene	25.7	10.0	ug/L	50.0		51.5	70-120			L
Pyridine	13.2	10.0	ug/L	50.0		26.5	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*27.1*		ug/L	*100*		*27.1*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*14.3*		ug/L	*50.0*		*28.7*	*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*		*37.4*	*5-151*			
Surr: Phenol-d5 (Surr)	*15.2*		ug/L	*100*		*15.2*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*29.2*		ug/L	*50.0*		*58.4*	*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 BFL0935 - No Prep Wet Chem										
Blank (BFL0935-BLK1)				Prepared & Analyzed: 12/23/2022						
BOD	ND	2.0	mg/L							
LCS (BFL0935-BS1)				Prepared & Analyzed: 12/23/2022						
BOD	193	2	mg/L	198		97.5	84.6-115.4			
Duplicate (BFL0935-DUP1)	**Source: 22L1202-04**			Prepared & Analyzed: 12/23/2022						
BOD	ND	2.0	mg/L		2.3			NA	20	
Batch BFL0948 - No Prep Wet Chem										
Blank (BFL0948-BLK1)				Prepared & Analyzed: 12/23/2022						
Nitrite as N	ND	0.05	mg/L							
LCS (BFL0948-BS1)				Prepared & Analyzed: 12/23/2022						
Nitrite as N	0.12	0.05	mg/L	0.100		116	80-120			
Matrix Spike (BFL0948-MS1)	**Source: 22L1209-07**			Prepared & Analyzed: 12/23/2022						
Nitrite as N	0.09	0.05	mg/L	0.100	BLOD	91.0	80-120			
Matrix Spike Dup (BFL0948-MSD1)	**Source: 22L1209-07**			Prepared & Analyzed: 12/23/2022						
Nitrite as N	0.09	0.05	mg/L	0.100	BLOD	91.0	80-120	0.00	20	
Batch BFL0977 - No Prep Wet Chem										
Blank (BFL0977-BLK1)				Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	ND	0.10	mg/L							

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL0977 - No Prep Wet Chem										
LCS (BFL0977-BS1)				Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	2.02	0.1	mg/L	2.00		101	90-110			
Matrix Spike (BFL0977-MS1)	**Source: 22L1077-05**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	2.15	0.10	mg/L	2.00	BLOD	108	89.3-131			
Matrix Spike (BFL0977-MS2)	**Source: 22L1154-05**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	2.26	0.10	mg/L	2.00	BLOD	113	89.3-131			
Matrix Spike Dup (BFL0977-MSD1)	**Source: 22L1077-05**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	2.18	0.10	mg/L	2.00	BLOD	109	89.3-131	1.39	20	
Matrix Spike Dup (BFL0977-MSD2)	**Source: 22L1154-05**			Prepared: 12/27/2022 Analyzed: 12/28/2022						
Ammonia as N	2.16	0.10	mg/L	2.00	BLOD	108	89.3-131	4.52	20	
Batch BFL1035 - No Prep Wet Chem										
Blank (BFL1035-BLK1)				Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BFL1035-BS1)				Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	2.65	0.1	mg/L	2.50		106	90-110			
Matrix Spike (BFL1035-MS1)	**Source: 22L1254-01**			Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	2.93	0.10	mg/L	2.50	0.13	112	90-110			M
Matrix Spike (BFL1035-MS2)	**Source: 22L1290-01**			Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	3.53	0.10	mg/L	2.50	0.92	104	90-110			

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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 BFL1035 - No Prep Wet Chem										
Matrix Spike Dup (BFL1035-MSD1)	**Source: 22L1254-01**			Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	2.89	0.10	mg/L	2.50	0.13	110	90-110	1.37	20	M
Matrix Spike Dup (BFL1035-MSD2)	**Source: 22L1290-01**			Prepared & Analyzed: 12/28/2022						
Nitrate+Nitrite as N	3.54	0.10	mg/L	2.50	0.92	105	90-110	0.424	20	
Batch BFL1048 - No Prep Wet Chem										
Blank (BFL1048-BLK1)				Prepared & Analyzed: 12/29/2022						
TKN as N	ND	0.50	mg/L							
LCS (BFL1048-BS1)				Prepared & Analyzed: 12/29/2022						
TKN as N	10.3	0.50	mg/L	10.0		103	90-110			
Matrix Spike (BFL1048-MS1)	**Source: 22L1324-01**			Prepared & Analyzed: 12/29/2022						
TKN as N	9.96	0.50	mg/L	10.0	0.55	94.1	90-110			
Matrix Spike (BFL1048-MS2)	**Source: 22L1324-02**			Prepared & Analyzed: 12/29/2022						
TKN as N	9.55	0.50	mg/L	10.0	0.30	92.5	90-110			
Matrix Spike Dup (BFL1048-MSD1)	**Source: 22L1324-01**			Prepared & Analyzed: 12/29/2022						
TKN as N	10.4	0.50	mg/L	10.0	0.55	98.0	90-110	3.89	20	
Matrix Spike Dup (BFL1048-MSD2)	**Source: 22L1324-02**			Prepared & Analyzed: 12/29/2022						
TKN as N	9.73	0.50	mg/L	10.0	0.30	94.3	90-110	1.88	20	
Batch BFL1068 - No Prep Wet Chem										
Blank (BFL1068-BLK1)				Prepared & Analyzed: 12/29/2022						
Total Recoverable Phenolics	ND	0.050	mg/L							

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFL1068 - No Prep Wet Chem										
LCS (BFL1068-BS1)				Prepared & Analyzed: 12/29/2022						
Total Recoverable Phenolics	0.49	0.050	mg/L	0.500		98.0	80-120			
Matrix Spike (BFL1068-MS1)	**Source: 22L1381-01**			Prepared & Analyzed: 12/29/2022						
Total Recoverable Phenolics	0.53	0.050	mg/L	0.500	0.05	96.0	70-130			
Matrix Spike Dup (BFL1068-MSD1)	**Source: 22L1381-01**			Prepared & Analyzed: 12/29/2022						
Total Recoverable Phenolics	0.51	0.050	mg/L	0.500	0.05	92.8	70-130	3.09	20	
Batch BGA0028 - No Prep Wet Chem										
Blank (BGA0028-BLK1)				Prepared & Analyzed: 01/03/2023						
COD	ND	10.0	mg/L							
LCS (BGA0028-BS1)				Prepared & Analyzed: 01/03/2023						
COD	49.0	10.0	mg/L	50.0		97.9	88-119			
Matrix Spike (BGA0028-MS1)	**Source: 22L1333-01**			Prepared & Analyzed: 01/03/2023						
COD	48.3	10.0	mg/L	50.0	BLOD	96.5	72.4-130			
Matrix Spike Dup (BGA0028-MSD1)	**Source: 22L1333-01**			Prepared & Analyzed: 01/03/2023						
COD	48.6	10.0	mg/L	50.0	BLOD	97.2	72.4-130	0.710	20	

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Analytical Summary

22L1241-01 Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.2/R2.8**	
22L1241-01	25.0 mL / 50.0 mL	SW6010D	BFL0966	SFL0985	AL20157

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
22L1241-01	300 mL / 300 mL	SM22 5210B-2011	BFL0935	SFL0989	
22L1241-01	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
22L1241-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
22L1241-01	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
22L1241-01RE1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
22L1241-01RE2	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
22L1241-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
22L1241-01	0.100 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
22L1241-01	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
22L1241-01	1030 mL / 2.00 mL	SW8270E	BFL0968	SFL0965	AL20040

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
22L1241-01	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010

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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**	
22L1241-01RE1	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
22L1241-02	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
22L1241-01	10.0 mL / 20.0 mL	SW7470A	BFL1016	SFL1009	AL20166

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Certificate of Analysis

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

Date Issued: 1/27/2023 4:49:20PM

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:**	**EPA200.2/R2.8**	
BFL0966-BLK1	25.0 mL / 50.0 mL	SW6010D	BFL0966	SFL0985	AL20157
BFL0966-BS1	25.0 mL / 50.0 mL	SW6010D	BFL0966	SFL0985	AL20157
BFL0966-MS1	25.0 mL / 50.0 mL	SW6010D	BFL0966	SFL0985	AL20157
BFL0966-MSD1	25.0 mL / 50.0 mL	SW6010D	BFL0966	SFL0985	AL20157

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BFL0935-BLK1	300 mL / 300 mL	SM22 5210B-2011	BFL0935	SFL0989	
BFL0935-BS1	300 mL / 300 mL	SM22 5210B-2011	BFL0935	SFL0989	
BFL0935-DUP1	300 mL / 300 mL	SM22 5210B-2011	BFL0935	SFL0989	
BFL0948-BLK1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
BFL0948-BS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
BFL0948-MRL1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
BFL0948-MS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
BFL0948-MSD1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BFL0948	SFL0904	AJ20138
BFL0977-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL0977-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL0977-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL0977-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL0977-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL0977-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFL0977	SFL0970	AL20158
BFL1035-BLK1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1035-BS1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163

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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**	
BFL1035-MRL1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1035-MS1	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1035-MS2	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1035-MSD1	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1035-MSD2	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFL1035	SFL0996	AL20163
BFL1048-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-MRL1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1048-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL1048	SFL1019	AL20168
BFL1068-BLK1	5.00 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
BFL1068-BS1	5.00 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
BFL1068-MRL1	5.00 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
BFL1068-MS1	5.00 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
BFL1068-MSD1	5.00 mL / 10.0 mL	SW9065	BFL1068	SFL1020	AL20103
BGA0028-BLK1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092
BGA0028-BS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092
BGA0028-MRL1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092
BGA0028-MS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092
BGA0028-MSD1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0028	SGA0038	AL20092

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BFL0968-BLK1	1000 mL / 1.00 mL	SW8270E	BFL0968	SFL0965	AL20040
BFL0968-BS1	1000 mL / 1.00 mL	SW8270E	BFL0968	SFL0965	AL20040

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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**	
BFL0941-BLK1	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
BFL0941-BLK2	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
BFL0941-BS1	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
BFL0941-BS2	5.00 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
BFL0941-MS1	0.250 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010
BFL0941-MSD1	0.250 mL / 5.00 mL	SW8260D	BFL0941	SFL0911	AL20010

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BFL1016-BLK1	20.0 mL / 20.0 mL	SW7470A	BFL1016	SFL1009	AL20166
BFL1016-BS1	20.0 mL / 20.0 mL	SW7470A	BFL1016	SFL1009	AL20166
BFL1016-MS1	20.0 mL / 20.0 mL	SW7470A	BFL1016	SFL1009	AL20166
BFL1016-MSD1	20.0 mL / 20.0 mL	SW7470A	BFL1016	SFL1009	AL20166

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Date Issued: 1/27/2023 4:49:20PM

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
SM22 4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP
SM22 4500-NO3F-2011 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM22 5210B-2011 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM22 5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6010D in Non-Potable Water	
Arsenic	VELAP,WVDEP
Barium	VELAP,WVDEP,PADEP
Cadmium	VELAP,WVDEP,PADEP
Chromium	VELAP,WVDEP
Copper	VELAP,WVDEP
Lead	VELAP,WVDEP
Nickel	VELAP,WVDEP
Selenium	VELAP,WVDEP
Silver	VELAP,WVDEP,PADEP
Zinc	VELAP,WVDEP
SW7470A in Non-Potable Water	
Mercury	VELAP,NCDEQ,WVDEP

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Certified Analyses included in this Report

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

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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Qualifiers and Definitions

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

ENTHALPY ANALYTICAL

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
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CHAIN OF CUSTODY

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

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

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Ammonia - EPA 350.1	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011	Nitrite SM22 450-NO3F-2011	SVOC (Anthracene) 8270	Total Metals (As, Ba, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn) 6010	Mercury - 7470	Total Recoverable Phenolics - 9065	V. Fatty Acids (See List) 8015	VOCs (See List) 8260
1) EW-50	X					12/21/22	1605		WW	12											
2) Trip Blank	X					11/14/22	1610		DI	2											X
3)																					
4)																					
5)																					
6)																					
7)																					
8)																					
9)																					
10)																					

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

COMMENTS: Sample VOCs unpreserved

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

277
Scaled
ice
5.4

RELINQUISHED: Will Fabrie	DATE / TIME 12/21/22 1445	RECEIVED:	DATE / TIME
RELINQUISHED: LCN	DATE / TIME	RECEIVED: 40	DATE / TIME 12/23/22 0800
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐

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

SCS-W **22L1241**
City of Bristol Landfills Solid Wast
Recd: 12/23/2022 Due: 01/10/2023

v130325002

ENTHALPY ANALYTICAL

Sample Preservation Log

40 for KRC

Order ID 221241 Date Performed: 12/23/22 Analyst Performing Check: _____

Sample ID	Container ID	Metals pH as Received <2	Metals pH as Received Other	Metals Final pH	Cyanide pH as Received >12	Cyanide pH as Received Other	Cyanide Final pH	Sulfide pH as Received >9	Sulfide pH as Received Other	Sulfide Final pH	Ammonia pH as Received <2	Ammonia pH as Received Other	Ammonia Final pH	TKN pH as Received <2	TKN pH as Received Other	TKN Final pH	Phos, Tot pH as Received <2	Phos, Tot pH as Received Other	Phos, Tot Final pH	NO3+NO2 pH as Received <2	NO3+NO2 pH as Received Other	NO3+NO2 Final pH	DRO pH as Received <2	DRO pH as Received Other	DRO Final pH	Pesticide (8081/608/508) PCB DW only Received Res. Cl +	Pesticide Received Res. Cl -	Pesticide final + or -	SVOC (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 <2	Pest/PCB (508) / SVOC(525) pH as Received Other	Pest/PCB (508) / SVOC(525) Final pH	COD pH as Received <2	COD pH as Received Other	COD Final pH	Phenolics pH as Received <2	Phenolics pH as Received Other	Phenolics Final pH
01	A		6	<2																																							
01	B											7	<2		7	<2					7	<2																	7	<2				
01	F																																										6	<2
01	G																													—													

OH ID: _____ HNO3 ID: 2K02236 CrVI preserved date/time: _____ Analyst Initials: _____

3O4 ID: 2I03036 Na2S2O3 ID: _____ *pH must be adjusted between 9.3 - 9.7 Buffer Sol'n ID: _____

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

Metals were received with pH = 6 HNO3 was added at 1010 on 23 December 2022 by KRC in the Log-In room to bring pH= <2.

'a only certifies DISS CrVI and not T CrVI as an approved analyte under 40CFR136 for waste water.

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Submitted To: Jennifer Robb

Date Issued: 1/27/2023 4:49:20PM

Laboratory Order ID: 22L1241

Sample Conditions Checklist

Samples Received at:	**5.40°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	No
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	Yes
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

The COC indicated the sample matrix for samples as Wastewater. However, the analysis requested are for the Groundwater method. The sample matrix has been logged as Non-potable water. Sample -01B:EW-50 was received with a pH of 7 and sample -01F:EW-50 was received with a pH of 6 and H2SO4 was added to both to

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bring the pH to <2. Jennifer Robb notified via email
YO 23 DEC 2022 1108

In house analysis due 1/6/2022 to Jennifer Robb. SE 1/3/2022

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 01/27/2023

Report # 222122834

Project 22L1241

Samples Collected 12/21/22

Deliver To	*Additional Recipients*
Daniel Elliott Enthalpy 1941 Reymet Road Richmond, VA 23237 804 358 8295	NONE

ACCREDITED
CERT # 6429.01

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics - The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Calista P. Laird

Authorized Signature
Pace Gulf Coast Report 222122834

Certifications

Certification	Certification Number
A2LA Accredited (DoD ELAP-QSM 5.4)	6429.01
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: Enthalpy Analytical **Report:** 222122834

Pace Analytical Gulf Coast received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

GENERAL CHEMISTRY

In method AM23G, sample was run outside of recognized holding time.

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22212283401	22L1241-01:EW-50	Water	12/21/22 16:05	12/28/22 11:18

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

AM23G						
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22212283401	22L1241-01:EW-50	Acetic Acid	mg/L	1800	500	NA
22212283401	22L1241-01:EW-50	Formic Acid	mg/L	3000	500	NA
22212283401	22L1241-01:EW-50	Hexanoic Acid	mg/L	39J	500	NA
22212283401	22L1241-01:EW-50	i-Pentanoic Acid	mg/L	59J	500	NA
22212283401	22L1241-01:EW-50	Lactic Acid	mg/L	90J	500	NA
22212283401	22L1241-01:EW-50	Propionic Acid	mg/L	640	500	NA

Sample Results

22L1241-01:EW-50	Collect Date	12/21/2022 16:05	Lab ID	22212283401
	Receive Date	12/28/2022 11:18	Matrix	Water

AM23G *Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	500	01/25/23 16:35	758420	LHM	NA

CAS#	Parameter	Result	DL	LOQ	Units
64-19-7	**Acetic Acid**	**1800**	62	250	mg/L
107-92-6	Butyric Acid	250 U	29	250	mg/L
64-18-6	**Formic Acid**	**3000**	27	250	mg/L
142-62-1	**Hexanoic Acid**	**39J**	29	250	mg/L
646-07-1	i-Hexanoic Acid	250 U	28	250	mg/L
503-74-2	**i-Pentanoic Acid**	**59J**	30	250	mg/L
50-21-5	**Lactic Acid**	**90J**	27	250	mg/L
109-52-4	Pentanoic Acid	250 U	28	250	mg/L
79-09-4	**Propionic Acid**	**640**	27	250	mg/L
127-17-3	Pyruvic Acid	250 U	30	250	mg/L

General Chemistry QC Summary

Analytical Batch 758420	Client ID	MB758420		LCS758420				LCSD758420				
	Lab ID	2444292		2444293				2444294				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	01/25/23 06:03		01/25/23 05:32				01/25/23 19:13				
	Matrix	Water		Water				Water				
AM23G		Units Result	mg/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Acetic Acid	64-19-7	0.50U	0.50	2.0	2.3	115	70 - 130	2.0	2.5	126	9	20
Butyric Acid	107-92-6	0.50U	0.50	2.0	2.0	102	70 - 130	2.0	2.2	109	7	20
Formic Acid	64-18-6	0.50U	0.50	2.0	2.0	98	70 - 130	2.0	2.1	104	6	20
Hexanoic Acid	142-62-1	0.50U	0.50	2.0	2.2	108	70 - 130	2.0	2.4	118	10	20
i-Hexanoic Acid	646-07-1	0.50U	0.50	2.0	2.1	104	70 - 130	2.0	2.3	117	12	20
i-Pentanoic Acid	503-74-2	0.50U	0.50	2.0	1.9	96	70 - 130	2.0	2.0	100	4	20
Lactic Acid	50-21-5	0.50U	0.50	2.0	2.1	106	70 - 130	2.0	2.5	125	16	20
Pentanoic Acid	109-52-4	0.50U	0.50	2.0	2.2	110	70 - 130	2.0	2.3	115	5	20
Propionic Acid	79-09-4	0.50U	0.50	2.0	2.2	110	70 - 130	2.0	2.4	119	8	20
Pyruvic Acid	127-17-3	0.50U	0.50	2.0	2.0	101	70 - 130	2.0	2.2	109	8	20

AIR WATER SOIL LABORATORIES, INC.

Pace Gulf Coast
7979 Innovation Park Dr, Baton Rouge, LA 70820
~~Pittsburgh PA 15238~~

Client ID: Enthalapy - Enthalpy Analytical
SDG: 222122834
PM: RWe

CHAIN OF CUSTODY

PAGE 1 OF 1

CLIENT NAME:	Air, Water and Soil Lab	PROJECT NAME:	22L1241
CLIENT CONTACT:	Daniel Elliott	SITE NAME:	22L1241
CLIENT ADDRESS:	1941 Reyment Rd, Richmond VA 23237	PROJECT NUMBER:	22L1241
CLIENT PHONE NUMBER:	804-358-8295	P.O. NUMBER:	038684
CLIENT FAX NUMBER:	EMAIL: support@awslabs.com	REGULATORY AUTHORITY:	
Is sample for compliance reporting? YES NO	Is sample from a chlorinated supply? YES NO	PWS I.D. #:	
SAMPLER NAME (PRINT):	SAMPLER SIGNATURE:	Turn Around	Day(s)

Have ammonia and TKN samples been verified to be dechlorinated at the time of sampling?: YES NO

CLIENT SAMPLE I.D.	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Number of Containers	Grab	Composite	Field Filtered (Dissolved Metals)	MATRIX: Ground Water / Surface Water	Waste Water / Storm Water	Drinking Water	Soil	Solids	Other Non-Potable Water	ANALYSIS / (PRESERVATIVE): Volatile Fatty Acids						COMMENTS
																					Quote I.D.:
1) 22L1241-01: EW-50			12/21/2022	1605	3	X								x	X						PLEASE NOTE PRESERVATIVE(S) or PUMP RATE (L/min) 1
2)																					
3)																					
4)																					
5)																					
6)																					
7)																					
8)																					
9)																					
10)																					

	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED: JH 12/27/22 1526		RECEIVED: FedEx Express	12/27/22 1526
RELINQUISHED: Fed Ex	DATE / TIME 12/28/22 1118	RECEIVED:	DATE / TIME 12/28/22 1118
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY

COOLER TEMP E38 4.0

7708 8716 5249

PacePittsburghVFA

Pace Analytical

SAMPLE RECEIVING CHECKLIST

222122834

SAMPLE DELIVERY GROUP 222122834	
Client PM RWe Enthalapy - Enthalpy Analytical	**Transport Method** FEDEX
Profile Number 304926	**Received By** McCune, Dodie N.
Line Item(s) 1 - VFAs	**Receive Date(s)** 12/28/22

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☐	☑

COOLERS

Airbill	Thermometer ID: E38	Temp °C
770887165249		4.0

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

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 23A0880

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	January 19, 2023 8:00
		Date Issued:	February 3, 2023 11:50
		Project Number:	0221820.15 Task 1
Submitted To:	Jennifer Robb	Purchase Order:	
Client Site I.D.:	City of Bristol Landfill		

Enclosed are the results of analyses for samples received by the laboratory on 01/19/2023 08:00. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

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

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

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

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

Analysis Detects Report

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

Date Issued: 2/3/2023 11:50:55AM

Laboratory Sample ID: **23A0880-01** **Client Sample ID:** **EW-50**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6010D	0.285		0.0100	0.0200	1	mg/L
Barium	01	SW6010D	0.643		0.0050	0.0100	1	mg/L
Chromium	01	SW6010D	0.310		0.0080	0.0100	1	mg/L
Nickel	01	SW6010D	0.1074		0.0070	0.0100	1	mg/L
Zinc	01	SW6010D	0.133		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	01	SW8260D	3480		30.0	100	10	ug/L
Acetone	01RE1	SW8260D	8130		1750	2500	250	ug/L
Benzene	01	SW8260D	240		4.00	10.0	10	ug/L
Ethylbenzene	01	SW8260D	65.1		4.00	10.0	10	ug/L
Tetrahydrofuran	01	SW8260D	183		100	100	10	ug/L
Toluene	01	SW8260D	122		5.00	10.0	10	ug/L
Xylenes, Total	01	SW8260D	138		10.0	30.0	10	ug/L
Ammonia as N	01	EPA350.1 R2.0	1520		50.0	50.0	500	mg/L
BOD	01	SM22 5210B-2011	9920		0.2	2.0	1	mg/L
COD	01	SM22 5220D-2011	14900		2000	2000	200	mg/L
Nitrate as N	01	Calc.	3.90		2.10	2.10	200	mg/L
Nitrate+Nitrite as N	01	SM22 4500-NO3F-2011	3.90		0.10	0.10	1	mg/L
TKN as N	01	EPA351.2 R2.0	1840		20.0	50.0	100	mg/L
Total Recoverable Phenolics	01	SW9065	27.2		0.750	1.25	25	mg/L

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Analysis Detects Report

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

Date Issued: 2/3/2023 11:50:55AM

Laboratory Sample ID: **23A0880-02** **Client Sample ID:** **EW-58**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02	SW6010D	0.596		0.0100	0.0200	1	mg/L
Barium	02	SW6010D	0.683		0.0050	0.0100	1	mg/L
Chromium	02	SW6010D	0.488		0.0080	0.0100	1	mg/L
Copper	02	SW6010D	0.0127		0.0080	0.0100	1	mg/L
Nickel	02	SW6010D	0.1442		0.0070	0.0100	1	mg/L
Zinc	02	SW6010D	0.150		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	02	SW8260D	632		30.0	100	10	ug/L
Acetone	02	SW8260D	1530		70.0	100	10	ug/L
Benzene	02	SW8260D	28.7		4.00	10.0	10	ug/L
Tetrahydrofuran	02	SW8260D	566		100	100	10	ug/L
Toluene	02	SW8260D	8.00	J	5.00	10.0	10	ug/L
Ammonia as N	02RE1	EPA350.1 R2.0	1500		50.0	50.0	500	mg/L
BOD	02	SM22 5210B-2011	999		0.2	2.0	1	mg/L
COD	02	SM22 5220D-2011	3630		500	500	1	mg/L
Nitrate+Nitrite as N	02	SM22 4500-NO3F-2011	0.17		0.10	0.10	1	mg/L
TKN as N	02	EPA351.2 R2.0	881		20.0	50.0	100	mg/L
Total Recoverable Phenolics	02	SW9065	1.30		0.750	1.25	25	mg/L

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Analysis Detects Report

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

Date Issued: 2/3/2023 11:50:55AM

Laboratory Sample ID: **23A0880-03** **Client Sample ID:** **EW-65**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	03	SW6010D	0.846		0.0100	0.0200	1	mg/L
Barium	03	SW6010D	0.554		0.0050	0.0100	1	mg/L
Chromium	03	SW6010D	0.155		0.0080	0.0100	1	mg/L
Nickel	03	SW6010D	0.0769		0.0070	0.0100	1	mg/L
Zinc	03	SW6010D	0.0752		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	03RE1	SW8260D	5470		300	1000	100	ug/L
Acetone	03RE1	SW8260D	14000		700	1000	100	ug/L
Benzene	03	SW8260D	167		4.00	10.0	10	ug/L
Ethylbenzene	03	SW8260D	20.8		4.00	10.0	10	ug/L
Tetrahydrofuran	03	SW8260D	352		100	100	10	ug/L
Toluene	03	SW8260D	35.3		5.00	10.0	10	ug/L
Xylenes, Total	03	SW8260D	38.1		10.0	30.0	10	ug/L
Ammonia as N	03	EPA350.1 R2.0	1330		50.0	50.0	500	mg/L
BOD	03	SM22 5210B-2011	7060		0.2	2.0	1	mg/L
COD	03	SM22 5220D-2011	8430		2000	2000	200	mg/L
Nitrate+Nitrite as N	03	SM22 4500-NO3F-2011	0.17		0.10	0.10	1	mg/L
TKN as N	03	EPA351.2 R2.0	1410		20.0	50.0	100	mg/L
Total Recoverable Phenolics	03	SW9065	20.2		0.750	1.25	25	mg/L

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Analysis Detects Report

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

Date Issued: 2/3/2023 11:50:55AM

Laboratory Sample ID: **23A0880-04** **Client Sample ID:** **EW-59**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	04	SW6010D	0.225		0.0100	0.0200	1	mg/L
Barium	04	SW6010D	1.92		0.0050	0.0100	1	mg/L
Chromium	04	SW6010D	0.178		0.0080	0.0100	1	mg/L
Copper	04	SW6010D	0.0256		0.0080	0.0100	1	mg/L
Nickel	04	SW6010D	0.0407		0.0070	0.0100	1	mg/L
Zinc	04	SW6010D	0.0740		0.0100	0.0100	1	mg/L
2-Butanone (MEK)	04RE1	SW8260D	7840		300	1000	100	ug/L
Acetone	04RE1	SW8260D	22200		700	1000	100	ug/L
Benzene	04	SW8260D	1620		4.00	10.0	10	ug/L
Ethylbenzene	04	SW8260D	93.9		4.00	10.0	10	ug/L
Tetrahydrofuran	04	SW8260D	1810		100	100	10	ug/L
Toluene	04	SW8260D	139		5.00	10.0	10	ug/L
Xylenes, Total	04	SW8260D	134		10.0	30.0	10	ug/L
Ammonia as N	04RE1	EPA350.1 R2.0	2440		100	100	1000	mg/L
BOD	04	SM22 5210B-2011	28100		0.2	2.0	1	mg/L
COD	04	SM22 5220D-2011	47600		5000	5000	500	mg/L
Nitrate+Nitrite as N	04	SM22 4500-NO3F-2011	1.22		0.20	0.20	1	mg/L
TKN as N	04	EPA351.2 R2.0	2970		40.0	100	200	mg/L
Total Recoverable Phenolics	04	SW9065	56.5		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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Richmond, Virginia 23237
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 2/3/2023 11:50:55AM
Client Site I.D.: City of Bristol Landfill
Submitted To: Jennifer Robb

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-50	23A0880-01	Ground Water	01/17/2023 12:30	01/19/2023 08:00
EW-58	23A0880-02	Ground Water	01/17/2023 12:55	01/19/2023 08:00
EW-65	23A0880-03	Ground Water	01/18/2023 08:00	01/19/2023 08:00
EW-59	23A0880-04	Ground Water	01/18/2023 08:25	01/19/2023 08:00
Trip Blank	23A0880-05	Ground Water	01/09/2023 14:30	01/19/2023 08:00

Due to matrix interference, Nitrite for sample 23A0880-01 and -04 had reporting limits twice what the EPA MCL is.

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 2/3/2023 11:50:55AM
Client Site I.D.: City of Bristol Landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23A0880-01**

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	SW6010D	01/20/2023 12:15	01/24/2023 14:52	BLOD		0.0050	0.0100	1	mg/L	ACM
Arsenic	01	7440-38-2	SW6010D	01/20/2023 12:15	01/24/2023 14:52	0.285		0.0100	0.0200	1	mg/L	ACM
Barium	01	7440-39-3	SW6010D	01/20/2023 12:15	01/24/2023 14:52	0.643		0.0050	0.0100	1	mg/L	ACM
Cadmium	01	7440-43-9	SW6010D	01/20/2023 12:15	01/24/2023 14:52	BLOD		0.0020	0.0040	1	mg/L	ACM
Chromium	01	7440-47-3	SW6010D	01/20/2023 12:15	01/24/2023 14:52	0.310		0.0080	0.0100	1	mg/L	ACM
Copper	01	7440-50-8	SW6010D	01/20/2023 12:15	01/24/2023 14:52	BLOD		0.0080	0.0100	1	mg/L	ACM
Mercury	01	7439-97-6	SW7470A	01/23/2023 12:00	01/23/2023 16:24	BLOD		0.00040	0.00040	1	mg/L	SGT
Nickel	01	7440-02-0	SW6010D	01/20/2023 12:15	01/24/2023 14:52	0.1074		0.0070	0.0100	1	mg/L	ACM
Lead	01	7439-92-1	SW6010D	01/20/2023 12:15	01/24/2023 14:52	BLOD		0.0060	0.0100	1	mg/L	ACM
Selenium	01	7782-49-2	SW6010D	01/20/2023 12:15	01/24/2023 14:52	BLOD		0.0400	0.0500	1	mg/L	ACM
Zinc	01	7440-66-6	SW6010D	01/20/2023 12:15	01/24/2023 14:52	0.133		0.0100	0.0100	1	mg/L	ACM
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	01/19/2023 19:42	01/19/2023 19:42	3480		30.0	100	10	ug/L	RJB
Acetone	01RE1	67-64-1	SW8260D	01/19/2023 20:10	01/19/2023 20:10	8130		1750	2500	250	ug/L	RJB
Benzene	01	71-43-2	SW8260D	01/19/2023 19:42	01/19/2023 19:42	240		4.00	10.0	10	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	01/19/2023 19:42	01/19/2023 19:42	65.1		4.00	10.0	10	ug/L	RJB
Toluene	01	108-88-3	SW8260D	01/19/2023 19:42	01/19/2023 19:42	122		5.00	10.0	10	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	01/19/2023 19:42	01/19/2023 19:42	138		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	01/19/2023 19:42	01/19/2023 19:42	183		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*106 %*	*70-120*	*01/19/2023 19:42*	*01/19/2023 19:42*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*98.2 %*	*75-120*	*01/19/2023 19:42*	*01/19/2023 19:42*							
Surr: Dibromofluoromethane (Surr)	*01*	*103 %*	*70-130*	*01/19/2023 19:42*	*01/19/2023 19:42*							
Surr: Toluene-d8 (Surr)	*01*	*103 %*	*70-130*	*01/19/2023 19:42*	*01/19/2023 19:42*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*	*98.5 %*	*70-120*	*01/19/2023 20:10*	*01/19/2023 20:10*							
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*	*99.0 %*	*75-120*	*01/19/2023 20:10*	*01/19/2023 20:10*							

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Richmond, Virginia 23237
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 2/3/2023 11:50:55AM
Client Site I.D.: City of Bristol Landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23A0880-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*01RE1*	*104 %*	*70-130*	*01/19/2023 20:10*	*01/19/2023 20:10*							
Surr: Toluene-d8 (Surr)	*01RE1*	*104 %*	*70-130*	*01/19/2023 20:10*	*01/19/2023 20:10*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	01/20/2023 09:00	01/20/2023 19:24	BLOD		490	980	50	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*%*	*5-136*	*01/20/2023 09:00*	*01/20/2023 19:24*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*01*	*40.0 %*	*9-117*	*01/20/2023 09:00*	*01/20/2023 19:24*							
Surr: 2-Fluorophenol (Surr)	*01*	*17.0 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 19:24*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*48.0 %*	*5-151*	*01/20/2023 09:00*	*01/20/2023 19:24*							
Surr: Phenol-d5 (Surr)	*01*	*26.0 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 19:24*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*24.0 %*	*5-141*	*01/20/2023 09:00*	*01/20/2023 19:24*							

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Client Name: SCS Engineers-Winchester
Date Issued: 2/3/2023 11:50:55AM
Client Site I.D.: City of Bristol Landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-50** **Laboratory Sample ID:** **23A0880-01**

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	01/19/2023 16:28	01/19/2023 16:28	1520		50.0	50.0	500	mg/L	MGC
BOD	01	E1640606	SM22 5210B-2011	01/19/2023 10:42	01/19/2023 10:42	9920		0.2	2.0	1	mg/L	MJRL
COD	01	NA	SM22 5220D-2011	01/20/2023 14:53	01/20/2023 14:53	14900		2000	2000	200	mg/L	MGC
Nitrate as N	01	14797-55-8	Calc.	01/26/2023 18:53	01/26/2023 18:53	3.90		2.10	2.10	200	mg/L	AAL
Nitrate+Nitrite as N	01	E701177	SM22 4500-NO3F-2011	01/26/2023 18:53	01/26/2023 18:53	3.90		0.10	0.10	1	mg/L	MAH
Nitrite as N	01	14797-65-0	SM22 4500-NO2B-2011	01/19/2023 10:45	01/19/2023 12:00	BLOD		2.00	2.00	200	mg/L	AAL
Total Recoverable Phenolics	01	NA	SW9065	01/24/2023 16:10	01/24/2023 16:10	27.2		0.750	1.25	25	mg/L	TMB
TKN as N	01	E17148461	EPA351.2 R2.0	01/27/2023 13:38	01/27/2023 13:38	1840		20.0	50.0	100	mg/L	AAL

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

Client Sample ID: **EW-58** **Laboratory Sample ID:** **23A0880-02**

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	SW6010D	01/20/2023 12:15	01/24/2023 14:55	BLOD		0.0050	0.0100	1	mg/L	ACM
Arsenic	02	7440-38-2	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.596		0.0100	0.0200	1	mg/L	ACM
Barium	02	7440-39-3	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.683		0.0050	0.0100	1	mg/L	ACM
Cadmium	02	7440-43-9	SW6010D	01/20/2023 12:15	01/24/2023 14:55	BLOD		0.0020	0.0040	1	mg/L	ACM
Chromium	02	7440-47-3	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.488		0.0080	0.0100	1	mg/L	ACM
Copper	02	7440-50-8	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.0127		0.0080	0.0100	1	mg/L	ACM
Mercury	02	7439-97-6	SW7470A	01/23/2023 12:00	01/23/2023 16:26	BLOD		0.00040	0.00040	1	mg/L	SGT
Nickel	02	7440-02-0	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.1442		0.0070	0.0100	1	mg/L	ACM
Lead	02	7439-92-1	SW6010D	01/20/2023 12:15	01/24/2023 14:55	BLOD		0.0060	0.0100	1	mg/L	ACM
Selenium	02	7782-49-2	SW6010D	01/20/2023 12:15	01/24/2023 14:55	BLOD		0.0400	0.0500	1	mg/L	ACM
Zinc	02	7440-66-6	SW6010D	01/20/2023 12:15	01/24/2023 14:55	0.150		0.0100	0.0100	1	mg/L	ACM

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Client Sample ID: **EW-58** **Laboratory Sample ID:** **23A0880-02**

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	01/19/2023 16:38	01/19/2023 16:38	632		30.0	100	10	ug/L	RJB
Acetone	02	67-64-1	SW8260D	01/19/2023 16:38	01/19/2023 16:38	1530		70.0	100	10	ug/L	RJB
Benzene	02	71-43-2	SW8260D	01/19/2023 16:38	01/19/2023 16:38	28.7		4.00	10.0	10	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	01/19/2023 16:38	01/19/2023 16:38	BLOD		4.00	10.0	10	ug/L	RJB
Toluene	02	108-88-3	SW8260D	01/19/2023 16:38	01/19/2023 16:38	8.00	J	5.00	10.0	10	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	01/19/2023 16:38	01/19/2023 16:38	BLOD		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	02	109-99-9	SW8260D	01/19/2023 16:38	01/19/2023 16:38	566		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*		*108 %*	*70-120*	*01/19/2023 16:38*	*01/19/2023 16:38*						
Surr: 4-Bromofluorobenzene (Surr)	*02*		*97.6 %*	*75-120*	*01/19/2023 16:38*	*01/19/2023 16:38*						
Surr: Dibromofluoromethane (Surr)	*02*		*103 %*	*70-130*	*01/19/2023 16:38*	*01/19/2023 16:38*						
Surr: Toluene-d8 (Surr)	*02*		*103 %*	*70-130*	*01/19/2023 16:38*	*01/19/2023 16:38*						

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

Client Sample ID: **EW-58** **Laboratory Sample ID:** **23A0880-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Semivolatile Organic Compounds by GCMS												
Anthracene	02	120-12-7	SW8270E	01/20/2023 09:00	01/20/2023 19:59	BLOD		243	485	50	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*02*	*146 %*	*5-136*	*01/20/2023 09:00*	*01/20/2023 19:59*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*02*	*43.0 %*	*9-117*	*01/20/2023 09:00*	*01/20/2023 19:59*							
Surr: 2-Fluorophenol (Surr)	*02*	*26.5 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 19:59*							
Surr: Nitrobenzene-d5 (Surr)	*02*	*53.0 %*	*5-151*	*01/20/2023 09:00*	*01/20/2023 19:59*							
Surr: Phenol-d5 (Surr)	*02*	*26.5 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 19:59*							
Surr: p-Terphenyl-d14 (Surr)	*02*	*53.0 %*	*5-141*	*01/20/2023 09:00*	*01/20/2023 19:59*							
Wet Chemistry Analysis												
Ammonia as N	02RE1	7664-41-7	EPA350.1 R2.0	01/19/2023 16:28	01/19/2023 16:28	1500		50.0	50.0	500	mg/L	MGC
BOD	02	E1640606	SM22 5210B-2011	01/19/2023 10:42	01/19/2023 10:42	999		0.2	2.0	1	mg/L	MJRL
COD	02	NA	SM22 5220D-2011	01/20/2023 14:53	01/20/2023 14:53	3630		500	500	1	mg/L	MGC
Nitrate as N	02	14797-55-8	Calc.	01/26/2023 18:53	01/26/2023 18:53	BLOD		0.350	1.35	1	mg/L	AAL
Nitrate+Nitrite as N	02	E701177	SM22 4500-NO3F-2011	01/26/2023 18:53	01/26/2023 18:53	0.17		0.10	0.10	1	mg/L	MAH
Nitrite as N	02	14797-65-0	SM22 4500-NO2B-2011	01/19/2023 10:45	01/19/2023 12:00	BLOD		0.25	1.25	1	mg/L	AAL
Total Recoverable Phenolics	02	NA	SW9065	01/24/2023 16:10	01/24/2023 16:10	1.30		0.750	1.25	25	mg/L	TMB
TKN as N	02	E17148461	EPA351.2 R2.0	01/27/2023 13:39	01/27/2023 13:39	881		20.0	50.0	100	mg/L	AAL

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Client Sample ID: **EW-65** **Laboratory Sample ID:** **23A0880-03**

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	SW6010D	01/20/2023 12:15	01/24/2023 14:57	BLOD		0.0050	0.0100	1	mg/L	ACM
Arsenic	03	7440-38-2	SW6010D	01/20/2023 12:15	01/24/2023 14:57	0.846		0.0100	0.0200	1	mg/L	ACM
Barium	03	7440-39-3	SW6010D	01/20/2023 12:15	01/24/2023 14:57	0.554		0.0050	0.0100	1	mg/L	ACM
Cadmium	03	7440-43-9	SW6010D	01/20/2023 12:15	01/24/2023 14:57	BLOD		0.0020	0.0040	1	mg/L	ACM
Chromium	03	7440-47-3	SW6010D	01/20/2023 12:15	01/24/2023 14:57	0.155		0.0080	0.0100	1	mg/L	ACM
Copper	03	7440-50-8	SW6010D	01/20/2023 12:15	01/24/2023 14:57	BLOD		0.0080	0.0100	1	mg/L	ACM
Mercury	03	7439-97-6	SW7470A	01/23/2023 12:00	01/23/2023 16:28	BLOD		0.00040	0.00040	1	mg/L	SGT
Nickel	03	7440-02-0	SW6010D	01/20/2023 12:15	01/24/2023 14:57	0.0769		0.0070	0.0100	1	mg/L	ACM
Lead	03	7439-92-1	SW6010D	01/20/2023 12:15	01/24/2023 14:57	BLOD		0.0060	0.0100	1	mg/L	ACM
Selenium	03	7782-49-2	SW6010D	01/20/2023 12:15	01/24/2023 14:57	BLOD		0.0400	0.0500	1	mg/L	ACM
Zinc	03	7440-66-6	SW6010D	01/20/2023 12:15	01/24/2023 14:57	0.0752		0.0100	0.0100	1	mg/L	ACM
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	03RE1	78-93-3	SW8260D	01/19/2023 18:06	01/19/2023 18:06	5470		300	1000	100	ug/L	RJB
Acetone	03RE1	67-64-1	SW8260D	01/19/2023 18:06	01/19/2023 18:06	14000		700	1000	100	ug/L	RJB
Benzene	03	71-43-2	SW8260D	01/19/2023 17:37	01/19/2023 17:37	167		4.00	10.0	10	ug/L	RJB
Ethylbenzene	03	100-41-4	SW8260D	01/19/2023 17:37	01/19/2023 17:37	20.8		4.00	10.0	10	ug/L	RJB
Toluene	03	108-88-3	SW8260D	01/19/2023 17:37	01/19/2023 17:37	35.3		5.00	10.0	10	ug/L	RJB
Xylenes, Total	03	1330-20-7	SW8260D	01/19/2023 17:37	01/19/2023 17:37	38.1		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	03	109-99-9	SW8260D	01/19/2023 17:37	01/19/2023 17:37	352		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*03*		*112 %*	*70-120*	*01/19/2023 17:37*	*01/19/2023 17:37*						
Surr: 4-Bromofluorobenzene (Surr)	*03*		*100 %*	*75-120*	*01/19/2023 17:37*	*01/19/2023 17:37*						
Surr: Dibromofluoromethane (Surr)	*03*		*103 %*	*70-130*	*01/19/2023 17:37*	*01/19/2023 17:37*						
Surr: Toluene-d8 (Surr)	*03*		*102 %*	*70-130*	*01/19/2023 17:37*	*01/19/2023 17:37*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*03RE1*		*102 %*	*70-120*	*01/19/2023 18:06*	*01/19/2023 18:06*						
Surr: 4-Bromofluorobenzene (Surr)	*03RE1*		*100 %*	*75-120*	*01/19/2023 18:06*	*01/19/2023 18:06*						

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Client Site I.D.: City of Bristol Landfill
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Client Sample ID: **EW-65** **Laboratory Sample ID:** **23A0880-03**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*03RE1*	*100 %*	*70-130*	*01/19/2023 18:06*	*01/19/2023 18:06*							
Surr: Toluene-d8 (Surr)	*03RE1*	*103 %*	*70-130*	*01/19/2023 18:06*	*01/19/2023 18:06*							
Semivolatile Organic Compounds by GCMS												
Anthracene	03	120-12-7	SW8270E	01/20/2023 09:00	01/20/2023 20:34	BLOD		253	505	50	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*03*	*134 %*	*5-136*	*01/20/2023 09:00*	*01/20/2023 20:34*							
Surr: 2-Fluorobiphenyl (Surr)	*03*	*49.0 %*	*9-117*	*01/20/2023 09:00*	*01/20/2023 20:34*							
Surr: 2-Fluorophenol (Surr)	*03*	*23.5 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 20:34*							
Surr: Nitrobenzene-d5 (Surr)	*03*	*54.0 %*	*5-151*	*01/20/2023 09:00*	*01/20/2023 20:34*							
Surr: Phenol-d5 (Surr)	*03*	*30.0 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 20:34*							
Surr: p-Terphenyl-d14 (Surr)	*03*	*21.0 %*	*5-141*	*01/20/2023 09:00*	*01/20/2023 20:34*							

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Client Sample ID: **EW-65** **Laboratory Sample ID:** **23A0880-03**

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	01/19/2023 16:28	01/19/2023 16:28	1330		50.0	50.0	500	mg/L	MGC
BOD	03	E1640606	SM22 5210B-2011	01/19/2023 10:45	01/19/2023 10:45	7060		0.2	2.0	1	mg/L	MJRL
COD	03	NA	SM22 5220D-2011	01/20/2023 14:53	01/20/2023 14:53	8430		2000	2000	200	mg/L	MGC
Nitrate as N	03	14797-55-8	Calc.	01/26/2023 18:53	01/26/2023 18:53	BLOD		1.10	1.10	100	mg/L	AAL
Nitrate+Nitrite as N	03	E701177	SM22 4500-NO3F-2011	01/26/2023 18:53	01/26/2023 18:53	0.17		0.10	0.10	1	mg/L	MAH
Nitrite as N	03	14797-65-0	SM22 4500-NO2B-2011	01/19/2023 10:45	01/19/2023 12:00	BLOD		1.00	1.00	100	mg/L	AAL
Total Recoverable Phenolics	03	NA	SW9065	01/24/2023 16:10	01/24/2023 16:10	20.2		0.750	1.25	25	mg/L	TMB
TKN as N	03	E17148461	EPA351.2 R2.0	01/27/2023 13:40	01/27/2023 13:40	1410		20.0	50.0	100	mg/L	AAL

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Date Issued: 2/3/2023 11:50:55AM

Client Sample ID: **EW-59** **Laboratory Sample ID:** **23A0880-04**

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	SW6010D	01/20/2023 12:15	01/24/2023 14:59	BLOD		0.0050	0.0100	1	mg/L	ACM
Arsenic	04	7440-38-2	SW6010D	01/20/2023 12:15	01/24/2023 14:59	0.225		0.0100	0.0200	1	mg/L	ACM
Barium	04	7440-39-3	SW6010D	01/20/2023 12:15	01/24/2023 14:59	1.92		0.0050	0.0100	1	mg/L	ACM
Cadmium	04	7440-43-9	SW6010D	01/20/2023 12:15	01/24/2023 14:59	BLOD		0.0020	0.0040	1	mg/L	ACM
Chromium	04	7440-47-3	SW6010D	01/20/2023 12:15	01/24/2023 14:59	0.178		0.0080	0.0100	1	mg/L	ACM
Copper	04	7440-50-8	SW6010D	01/20/2023 12:15	01/24/2023 14:59	0.0256		0.0080	0.0100	1	mg/L	ACM
Mercury	04	7439-97-6	SW7470A	01/23/2023 12:00	01/23/2023 16:30	BLOD		0.00400	0.00400	1	mg/L	SGT
Nickel	04	7440-02-0	SW6010D	01/20/2023 12:15	01/24/2023 14:59	0.0407		0.0070	0.0100	1	mg/L	ACM
Lead	04	7439-92-1	SW6010D	01/20/2023 12:15	01/24/2023 14:59	BLOD		0.0060	0.0100	1	mg/L	ACM
Selenium	04	7782-49-2	SW6010D	01/20/2023 12:15	01/24/2023 14:59	BLOD		0.0400	0.0500	1	mg/L	ACM
Zinc	04	7440-66-6	SW6010D	01/20/2023 12:15	01/24/2023 14:59	0.0740		0.0100	0.0100	1	mg/L	ACM
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	04RE1	78-93-3	SW8260D	01/19/2023 19:04	01/19/2023 19:04	7840		300	1000	100	ug/L	RJB
Acetone	04RE1	67-64-1	SW8260D	01/19/2023 19:04	01/19/2023 19:04	22200		700	1000	100	ug/L	RJB
Benzene	04	71-43-2	SW8260D	01/19/2023 18:34	01/19/2023 18:34	1620		4.00	10.0	10	ug/L	RJB
Ethylbenzene	04	100-41-4	SW8260D	01/19/2023 18:34	01/19/2023 18:34	93.9		4.00	10.0	10	ug/L	RJB
Toluene	04	108-88-3	SW8260D	01/19/2023 18:34	01/19/2023 18:34	139		5.00	10.0	10	ug/L	RJB
Xylenes, Total	04	1330-20-7	SW8260D	01/19/2023 18:34	01/19/2023 18:34	134		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	04	109-99-9	SW8260D	01/19/2023 18:34	01/19/2023 18:34	1810		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*04*	*109 %*	*70-120*	*01/19/2023 18:34*	*01/19/2023 18:34*							
Surr: 4-Bromofluorobenzene (Surr)	*04*	*96.9 %*	*75-120*	*01/19/2023 18:34*	*01/19/2023 18:34*							
Surr: Dibromofluoromethane (Surr)	*04*	*98.6 %*	*70-130*	*01/19/2023 18:34*	*01/19/2023 18:34*							
Surr: Toluene-d8 (Surr)	*04*	*97.4 %*	*70-130*	*01/19/2023 18:34*	*01/19/2023 18:34*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*04RE1*	*112 %*	*70-120*	*01/19/2023 19:04*	*01/19/2023 19:04*							
Surr: 4-Bromofluorobenzene (Surr)	*04RE1*	*101 %*	*75-120*	*01/19/2023 19:04*	*01/19/2023 19:04*							

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Certificate of Analysis

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

Date Issued: 2/3/2023 11:50:55AM

Client Sample ID: **EW-59** **Laboratory Sample ID:** **23A0880-04**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*04RE1*	*104 %*	*70-130*	*01/19/2023 19:04*	*01/19/2023 19:04*							
Surr: Toluene-d8 (Surr)	*04RE1*	*103 %*	*70-130*	*01/19/2023 19:04*	*01/19/2023 19:04*							
Semivolatile Organic Compounds by GCMS												
Anthracene	04	120-12-7	SW8270E	01/20/2023 09:00	01/20/2023 21:09	BLOD		500	1000	50	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*04*	*%*	*5-136*	*01/20/2023 09:00*	*01/20/2023 21:09*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*04*	*32.0 %*	*9-117*	*01/20/2023 09:00*	*01/20/2023 21:09*							
Surr: 2-Fluorophenol (Surr)	*04*	*13.0 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 21:09*							
Surr: Nitrobenzene-d5 (Surr)	*04*	*32.0 %*	*5-151*	*01/20/2023 09:00*	*01/20/2023 21:09*							
Surr: Phenol-d5 (Surr)	*04*	*25.0 %*	*5-60*	*01/20/2023 09:00*	*01/20/2023 21:09*							
Surr: p-Terphenyl-d14 (Surr)	*04*	*20.0 %*	*5-141*	*01/20/2023 09:00*	*01/20/2023 21:09*							
Wet Chemistry Analysis												
Ammonia as N	04RE1	7664-41-7	EPA350.1 R2.0	01/19/2023 16:28	01/19/2023 16:28	2440		100	100	1000	mg/L	MGC
BOD	04	E1640606	SM22 5210B-2011	01/19/2023 10:49	01/19/2023 10:49	28100		0.2	2.0	1	mg/L	MJRL
COD	04	NA	SM22 5220D-2011	01/20/2023 14:53	01/20/2023 14:53	47600		5000	5000	500	mg/L	MGC
Nitrate as N	04	14797-55-8	Calc.	01/27/2023 14:03	01/27/2023 14:03	BLOD		2.20	2.20	200	mg/L	AAL
Nitrate+Nitrite as N	04	E701177	SM22 4500-NO3F-2011	01/27/2023 14:03	01/27/2023 14:03	1.22		0.20	0.20	1	mg/L	NBT
Nitrite as N	04	14797-65-0	SM22 4500-NO2B-2011	01/19/2023 10:45	01/19/2023 12:00	BLOD		2.00	2.00	200	mg/L	AAL
Total Recoverable Phenolics	04	NA	SW9065	02/01/2023 10:48	02/01/2023 11:00	56.5		1.50	2.50	50	mg/L	MAH
TKN as N	04	E17148461	EPA351.2 R2.0	01/27/2023 13:41	01/27/2023 13:41	2970		40.0	100	200	mg/L	AAL

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Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **23A0880-05**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	05	78-93-3	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	05	67-64-1	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	05	71-43-2	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	05	100-41-4	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	05	108-88-3	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	05	1330-20-7	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	05	109-99-9	SW8260D	01/19/2023 14:10	01/19/2023 14:10	BLOD		10.0	10.0	1	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*05*	*90.6 %*	*70-120*	*01/19/2023 14:10*	*01/19/2023 14:10*							
Surr: 4-Bromofluorobenzene (Surr)	*05*	*99.8 %*	*75-120*	*01/19/2023 14:10*	*01/19/2023 14:10*							
Surr: Dibromofluoromethane (Surr)	*05*	*97.4 %*	*70-130*	*01/19/2023 14:10*	*01/19/2023 14:10*							
Surr: Toluene-d8 (Surr)	*05*	*102 %*	*70-130*	*01/19/2023 14:10*	*01/19/2023 14:10*							

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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 BGA0632 - EPA200.2/R2.8										
Blank (BGA0632-BLK1)				Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	ND	0.0200	mg/L							
Barium	ND	0.0100	mg/L							
Cadmium	ND	0.0040	mg/L							
Chromium	ND	0.0100	mg/L							
Copper	ND	0.0100	mg/L							
Lead	ND	0.0100	mg/L							
Nickel	ND	0.0100	mg/L							
Selenium	ND	0.0500	mg/L							
Silver	ND	0.0100	mg/L							
Zinc	ND	0.0100	mg/L							
LCS (BGA0632-BS1)				Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	0.497	0.0200	mg/L	0.500		99.4	80-120			
Barium	0.503	0.0100	mg/L	0.500		101	80-120			
Cadmium	0.515	0.0040	mg/L	0.500		103	80-120			
Chromium	0.510	0.0100	mg/L	0.500		102	80-120			
Copper	0.525	0.0100	mg/L	0.500		105	80-120			
Lead	0.517	0.0100	mg/L	0.500		103	80-120			
Nickel	0.5163	0.0100	mg/L	0.500		103	80-120			
Selenium	0.507	0.0500	mg/L	0.500		101	80-120			
Silver	0.0972	0.0100	mg/L	0.100		97.2	80-120			
Zinc	0.510	0.0100	mg/L	0.500		102	80-120			
Matrix Spike (BGA0632-MS1)	**Source: 23A0891-01**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	0.535	0.0200	mg/L	0.500	BLOD	107	75-125			
Barium	0.550	0.0100	mg/L	0.500	0.0308	104	75-125			

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

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0632 - EPA200.2/R2.8										
Matrix Spike (BGA0632-MS1)	**Source: 23A0891-01**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Cadmium	0.495	0.0040	mg/L	0.500	BLOD	98.9	75-125			
Chromium	0.509	0.0100	mg/L	0.500	BLOD	102	75-125			
Copper	0.507	0.0100	mg/L	0.500	BLOD	101	75-125			
Lead	0.506	0.0100	mg/L	0.500	BLOD	101	75-125			
Nickel	0.5045	0.0100	mg/L	0.500	BLOD	101	75-125			
Selenium	0.524	0.0500	mg/L	0.500	BLOD	105	75-125			
Silver	0.104	0.0100	mg/L	0.100	BLOD	104	75-125			E
Zinc	0.512	0.0100	mg/L	0.500	0.0141	99.7	75-125			
Matrix Spike (BGA0632-MS2)	**Source: 23A0891-03**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	0.501	0.0200	mg/L	0.500	BLOD	100	75-125			
Barium	0.552	0.0100	mg/L	0.500	0.0433	102	75-125			
Cadmium	0.432	0.0040	mg/L	0.500	BLOD	86.4	75-125			
Chromium	0.491	0.0100	mg/L	0.500	0.0322	91.7	75-125			
Copper	0.470	0.0100	mg/L	0.500	0.0197	90.0	75-125			
Lead	0.446	0.0100	mg/L	0.500	BLOD	89.2	75-125			
Nickel	0.4525	0.0100	mg/L	0.500	0.0139	87.7	75-125			
Selenium	0.470	0.0500	mg/L	0.500	BLOD	94.0	75-125			
Silver	0.101	0.0100	mg/L	0.100	BLOD	101	75-125			E
Zinc	0.511	0.0100	mg/L	0.500	0.0483	92.6	75-125			
Matrix Spike Dup (BGA0632-MSD1)	**Source: 23A0891-01**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	0.513	0.0200	mg/L	0.500	BLOD	103	75-125	4.22	20	
Barium	0.543	0.0100	mg/L	0.500	0.0308	102	75-125	1.30	20	
Cadmium	0.476	0.0040	mg/L	0.500	BLOD	95.1	75-125	3.94	20	
Chromium	0.489	0.0100	mg/L	0.500	BLOD	97.9	75-125	3.91	20	

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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 BGA0632 - EPA200.2/R2.8										
Matrix Spike Dup (BGA0632-MSD1)	**Source: 23A0891-01**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Copper	0.488	0.0100	mg/L	0.500	BLOD	97.7	75-125	3.74	20	
Lead	0.487	0.0100	mg/L	0.500	BLOD	97.3	75-125	3.87	20	
Nickel	0.4865	0.0100	mg/L	0.500	BLOD	97.3	75-125	3.63	20	
Selenium	0.499	0.0500	mg/L	0.500	BLOD	99.8	75-125	4.89	20	
Silver	0.0994	0.0100	mg/L	0.100	BLOD	99.4	75-125	4.72	20	
Zinc	0.515	0.0100	mg/L	0.500	0.0141	100	75-125	0.428	20	
Matrix Spike Dup (BGA0632-MSD2)	**Source: 23A0891-03**			Prepared: 01/20/2023 Analyzed: 01/23/2023						
Arsenic	0.488	0.0200	mg/L	0.500	BLOD	97.6	75-125	2.63	20	
Barium	0.543	0.0100	mg/L	0.500	0.0433	99.9	75-125	1.64	20	
Cadmium	0.424	0.0040	mg/L	0.500	BLOD	84.8	75-125	1.89	20	
Chromium	0.482	0.0100	mg/L	0.500	0.0322	89.9	75-125	1.85	20	
Copper	0.462	0.0100	mg/L	0.500	0.0197	88.5	75-125	1.55	20	
Lead	0.440	0.0100	mg/L	0.500	BLOD	87.9	75-125	1.42	20	
Nickel	0.4453	0.0100	mg/L	0.500	0.0139	86.3	75-125	1.60	20	
Selenium	0.465	0.0500	mg/L	0.500	BLOD	92.9	75-125	1.20	20	
Silver	0.0972	0.0100	mg/L	0.100	BLOD	97.2	75-125	4.13	20	
Zinc	0.508	0.0100	mg/L	0.500	0.0483	91.8	75-125	0.707	20	
Batch BGA0667 - SW7470A										
Blank (BGA0667-BLK1)				Prepared & Analyzed: 01/23/2023						
Mercury	ND	0.00020	mg/L							
LCS (BGA0667-BS1)				Prepared & Analyzed: 01/23/2023						
Mercury	0.00256	0.00020	mg/L	0.00250		102	80-120			

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

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0667 - SW7470A										
Matrix Spike (BGA0667-MS1)		**Source: 23A0894-02**		Prepared & Analyzed: 01/23/2023						
Mercury	0.00208	0.00020	mg/L	0.00250	BLOD	83.1	80-120			
Matrix Spike (BGA0667-MS2)		**Source: 23A0926-01**		Prepared & Analyzed: 01/23/2023						
Mercury	0.00241	0.00020	mg/L	0.00250	BLOD	96.3	80-120			
Matrix Spike Dup (BGA0667-MSD1)		**Source: 23A0894-02**		Prepared & Analyzed: 01/23/2023						
Mercury	0.00209	0.00020	mg/L	0.00250	BLOD	83.7	80-120	0.758	20	
Matrix Spike Dup (BGA0667-MSD2)		**Source: 23A0926-01**		Prepared & Analyzed: 01/23/2023						
Mercury	0.00227	0.00020	mg/L	0.00250	BLOD	91.0	80-120	5.73	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 BGA0591 - SW5030B-MS										
Blank (BGA0591-BLK1)				Prepared & Analyzed: 01/19/2023						
2-Butanone (MEK)	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.00	ug/L							
Ethylbenzene	ND	1.00	ug/L							
Toluene	ND	1.00	ug/L							
Xylenes, Total	ND	3.00	ug/L							
Tetrahydrofuran	ND	10.0	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*43.6*		ug/L	*50.0*		*87.2*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*48.8*		ug/L	*50.0*		*97.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*49.6*		ug/L	*50.0*		*99.1*	*70-130*			
Surr: Toluene-d8 (Surr)	*53.0*		ug/L	*50.0*		*106*	*70-130*			
LCS (BGA0591-BS1)				Prepared & Analyzed: 01/19/2023						
1,1,1,2-Tetrachloroethane	51.0	0.4	ug/L	50.0		102	80-130			
1,1,1-Trichloroethane	52.7	1	ug/L	50.0		105	65-130			
1,1,2,2-Tetrachloroethane	48.1	0.4	ug/L	50.0		96.1	65-130			
1,1,2-Trichloroethane	50.9	1	ug/L	50.0		102	75-125			
1,1-Dichloroethane	47.4	1	ug/L	50.0		94.8	70-135			
1,1-Dichloroethylene	39.3	1	ug/L	50.0		78.7	70-130			
1,1-Dichloropropene	48.7	1	ug/L	50.0		97.4	75-135			
1,2,3-Trichlorobenzene	54.4	1	ug/L	50.0		109	55-140			
1,2,3-Trichloropropane	47.1	1	ug/L	50.0		94.2	75-125			
1,2,4-Trichlorobenzene	57.1	1	ug/L	50.0		114	65-135			
1,2,4-Trimethylbenzene	55.2	1	ug/L	50.0		110	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	56.1	1	ug/L	50.0		112	50-130			

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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 BGA0591 - SW5030B-MS										
LCS (BGA0591-BS1)				Prepared & Analyzed: 01/19/2023						
1,2-Dibromoethane (EDB)	49.5	1	ug/L	50.0		99.0	80-120			
1,2-Dichlorobenzene	55.3	0.5	ug/L	50.0		111	70-120			
1,2-Dichloroethane	46.3	1	ug/L	50.0		92.5	70-130			
1,2-Dichloropropane	50.2	0.5	ug/L	50.0		100	75-125			
1,3,5-Trimethylbenzene	52.7	1	ug/L	50.0		105	75-125			
1,3-Dichlorobenzene	54.1	1	ug/L	50.0		108	75-125			
1,3-Dichloropropane	51.6	1	ug/L	50.0		103	75-125			
1,4-Dichlorobenzene	55.6	1	ug/L	50.0		111	75-125			
2,2-Dichloropropane	48.2	1	ug/L	50.0		96.4	70-135			
2-Butanone (MEK)	35.2	10	ug/L	50.0		70.3	30-150			
2-Chlorotoluene	53.1	1	ug/L	50.0		106	75-125			
2-Hexanone (MBK)	50.9	5	ug/L	50.0		102	55-130			
4-Chlorotoluene	53.1	1	ug/L	50.0		106	75-130			
4-Isopropyltoluene	54.1	1	ug/L	50.0		108	75-130			
4-Methyl-2-pentanone (MIBK)	48.6	5	ug/L	50.0		97.2	60-135			
Acetone	43.8	10	ug/L	50.0		87.7	40-140			
Benzene	51.4	1	ug/L	50.0		103	80-120			
Bromobenzene	49.9	1	ug/L	50.0		99.8	75-125			
Bromochloromethane	48.5	1	ug/L	50.0		97.0	65-130			
Bromodichloromethane	53.4	0.5	ug/L	50.0		107	75-120			
Bromoform	51.5	1	ug/L	50.0		103	70-130			
Bromomethane	51.9	1	ug/L	50.0		104	30-145			
Carbon disulfide	49.5	10	ug/L	50.0		99.1	35-160			
Carbon tetrachloride	48.5	1	ug/L	50.0		97.1	65-140			
Chlorobenzene	50.9	1	ug/L	50.0		102	80-120			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0591 - SW5030B-MS										
LCS (BGA0591-BS1)				Prepared & Analyzed: 01/19/2023						
Chloroethane	50.2	1	ug/L	50.0		100	60-135			
Chloroform	48.2	0.5	ug/L	50.0		96.4	65-135			
Chloromethane	53.9	1	ug/L	50.0		108	40-125			
cis-1,2-Dichloroethylene	44.7	1	ug/L	50.0		89.3	70-125			
cis-1,3-Dichloropropene	42.4	1	ug/L	50.0		84.7	70-130			
Dibromochloromethane	52.8	0.5	ug/L	50.0		106	60-135			
Dibromomethane	49.2	1	ug/L	50.0		98.4	75-125			
Dichlorodifluoromethane	53.5	1	ug/L	50.0		107	30-155			
Ethylbenzene	51.6	1	ug/L	50.0		103	75-125			
Hexachlorobutadiene	50.1	0.8	ug/L	50.0		100	50-140			
Isopropylbenzene	47.1	1	ug/L	50.0		94.2	75-125			
m+p-Xylenes	97.5	2	ug/L	100		97.5	75-130			
Methylene chloride	46.8	4	ug/L	50.0		93.6	55-140			
Methyl-t-butyl ether (MTBE)	51.2	1	ug/L	50.0		102	65-125			
Naphthalene	54.1	1	ug/L	50.0		108	55-140			
n-Butylbenzene	55.5	1	ug/L	50.0		111	70-135			
n-Propylbenzene	50.9	1	ug/L	50.0		102	70-130			
o-Xylene	49.3	1	ug/L	50.0		98.6	80-120			
sec-Butylbenzene	56.5	1	ug/L	50.0		113	70-125			
Styrene	47.7	1	ug/L	50.0		95.4	65-135			
tert-Butylbenzene	52.3	1	ug/L	50.0		105	70-130			
Tetrachloroethylene (PCE)	47.3	1	ug/L	50.0		94.6	45-150			
Toluene	51.4	1	ug/L	50.0		103	75-120			
trans-1,2-Dichloroethylene	44.2	1	ug/L	50.0		88.3	60-140			
trans-1,3-Dichloropropene	37.6	1	ug/L	50.0		75.3	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 BGA0591 - SW5030B-MS										
LCS (BGA0591-BS1)				Prepared & Analyzed: 01/19/2023						
Trichloroethylene	50.2	1	ug/L	50.0		100	70-125			
Trichlorofluoromethane	50.0	1	ug/L	50.0		99.9	60-145			
Vinyl chloride	51.7	0.5	ug/L	50.0		103	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*50.8*		ug/L	*50.0*		*102*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.0*		ug/L	*50.0*		*98.0*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.8*		ug/L	*50.0*		*97.5*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.6*		ug/L	*50.0*		*101*	*70-130*			
Matrix Spike (BGA0591-MS1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
1,1,1,2-Tetrachloroethane	45.9	0.4	ug/L	50.0	BLOD	91.8	80-130			
1,1,1-Trichloroethane	54.4	1	ug/L	50.0	BLOD	109	65-130			
1,1,2,2-Tetrachloroethane	44.3	0.4	ug/L	50.0	BLOD	88.6	65-130			
1,1,2-Trichloroethane	57.2	1	ug/L	50.0	BLOD	114	75-125			
1,1-Dichloroethane	51.7	1	ug/L	50.0	BLOD	103	70-135			
1,1-Dichloroethylene	44.8	1	ug/L	50.0	BLOD	89.7	50-145			
1,1-Dichloropropene	50.8	1	ug/L	50.0	BLOD	102	75-135			
1,2,3-Trichlorobenzene	54.9	1	ug/L	50.0	BLOD	110	55-140			
1,2,3-Trichloropropane	44.6	1	ug/L	50.0	BLOD	89.2	75-125			
1,2,4-Trichlorobenzene	53.2	1	ug/L	50.0	BLOD	106	65-135			
1,2,4-Trimethylbenzene	56.4	1	ug/L	50.0	BLOD	113	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	59.4	1	ug/L	50.0	BLOD	119	50-130			
1,2-Dibromoethane (EDB)	45.6	1	ug/L	50.0	BLOD	91.2	80-120			
1,2-Dichlorobenzene	57.5	0.5	ug/L	50.0	BLOD	115	70-120			
1,2-Dichloroethane	47.8	1	ug/L	50.0	BLOD	95.6	70-130			
1,2-Dichloropropane	54.7	0.5	ug/L	50.0	BLOD	109	75-125			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0591 - SW5030B-MS										
Matrix Spike (BGA0591-MS1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
1,3,5-Trimethylbenzene	53.9	1	ug/L	50.0	BLOD	108	75-124			
1,3-Dichlorobenzene	55.6	1	ug/L	50.0	BLOD	111	75-125			
1,3-Dichloropropane	56.6	1	ug/L	50.0	BLOD	113	75-125			
1,4-Dichlorobenzene	55.2	1	ug/L	50.0	BLOD	110	75-125			
2,2-Dichloropropane	46.3	1	ug/L	50.0	BLOD	92.6	70-135			
2-Butanone (MEK)	52.7	10	ug/L	50.0	BLOD	105	30-150			
2-Chlorotoluene	54.9	1	ug/L	50.0	BLOD	110	75-125			
2-Hexanone (MBK)	45.5	5	ug/L	50.0	BLOD	91.0	55-130			
4-Chlorotoluene	53.3	1	ug/L	50.0	BLOD	107	75-130			
4-Isopropyltoluene	55.8	1	ug/L	50.0	BLOD	112	75-130			
4-Methyl-2-pentanone (MIBK)	56.6	5	ug/L	50.0	BLOD	113	60-135			
Acetone	132	10	ug/L	50.0	96.5	70.6	40-140			
Benzene	54.9	1	ug/L	50.0	BLOD	110	80-120			
Bromobenzene	44.8	1	ug/L	50.0	BLOD	89.7	75-125			
Bromochloromethane	50.3	1	ug/L	50.0	BLOD	101	65-130			
Bromodichloromethane	56.6	0.5	ug/L	50.0	BLOD	113	75-136			
Bromoform	45.6	1	ug/L	50.0	BLOD	91.1	70-130			
Bromomethane	46.7	1	ug/L	50.0	BLOD	93.5	30-145			
Carbon disulfide	52.5	10	ug/L	50.0	BLOD	105	35-160			
Carbon tetrachloride	50.8	1	ug/L	50.0	BLOD	102	65-140			
Chlorobenzene	46.0	1	ug/L	50.0	BLOD	92.1	80-120			
Chloroethane	48.9	1	ug/L	50.0	BLOD	97.7	60-135			
Chloroform	50.3	0.5	ug/L	50.0	BLOD	101	65-135			
Chloromethane	61.0	1	ug/L	50.0	BLOD	122	40-125			
cis-1,2-Dichloroethylene	49.4	1	ug/L	50.0	BLOD	98.9	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 BGA0591 - SW5030B-MS										
Matrix Spike (BGA0591-MS1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
cis-1,3-Dichloropropene	44.1	1	ug/L	50.0	BLOD	88.2	47-136			
Dibromochloromethane	59.1	0.5	ug/L	50.0	BLOD	118	60-135			
Dibromomethane	53.8	1	ug/L	50.0	BLOD	108	75-125			
Dichlorodifluoromethane	55.8	1	ug/L	50.0	BLOD	112	30-155			
Ethylbenzene	46.2	1	ug/L	50.0	BLOD	92.5	75-125			
Hexachlorobutadiene	50.3	0.8	ug/L	50.0	BLOD	101	50-140			
Isopropylbenzene	42.4	1	ug/L	50.0	BLOD	84.9	75-125			
m+p-Xylenes	88.3	2	ug/L	100	BLOD	88.3	75-130			
Methylene chloride	51.7	4	ug/L	50.0	BLOD	103	55-140			
Methyl-t-butyl ether (MTBE)	58.0	1	ug/L	50.0	BLOD	116	65-125			
Naphthalene	58.3	1	ug/L	50.0	BLOD	117	55-140			
n-Butylbenzene	55.3	1	ug/L	50.0	BLOD	111	70-135			
n-Propylbenzene	51.7	1	ug/L	50.0	BLOD	103	70-130			
o-Xylene	45.0	1	ug/L	50.0	BLOD	89.9	80-120			
sec-Butylbenzene	60.0	1	ug/L	50.0	BLOD	120	70-125			
Styrene	42.4	1	ug/L	50.0	BLOD	84.7	65-135			
tert-Butylbenzene	55.7	1	ug/L	50.0	BLOD	111	70-130			
Tetrachloroethylene (PCE)	41.9	1	ug/L	50.0	BLOD	83.7	51-231			
Toluene	55.7	1	ug/L	50.0	BLOD	111	75-120			
trans-1,2-Dichloroethylene	48.4	1	ug/L	50.0	BLOD	96.8	60-140			
trans-1,3-Dichloropropene	39.6	1	ug/L	50.0	BLOD	79.3	55-140			
Trichloroethylene	54.4	1	ug/L	50.0	BLOD	109	70-125			
Trichlorofluoromethane	52.1	1	ug/L	50.0	BLOD	104	60-145			
Vinyl chloride	46.6	0.5	ug/L	50.0	BLOD	93.2	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.5*		ug/L	*50.0*		*99.0*	*70-120*			

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0591 - SW5030B-MS										
Matrix Spike (BGA0591-MS1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
Surr: 4-Bromofluorobenzene (Surr)	*39.7*		ug/L	*50.0*		*79.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.2*		ug/L	*50.0*		*96.3*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.4*		ug/L	*50.0*		*101*	*70-130*			
Matrix Spike Dup (BGA0591-MSD1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
1,1,1,2-Tetrachloroethane	51.6	0.4	ug/L	50.0	BLOD	103	80-130		30	
1,1,1-Trichloroethane	54.1	1	ug/L	50.0	BLOD	108	65-130		30	
1,1,2,2-Tetrachloroethane	47.7	0.4	ug/L	50.0	BLOD	95.4	65-130		30	
1,1,2-Trichloroethane	53.1	1	ug/L	50.0	BLOD	106	75-125		30	
1,1-Dichloroethane	47.3	1	ug/L	50.0	BLOD	94.7	70-135		30	
1,1-Dichloroethylene	39.0	1	ug/L	50.0	BLOD	78.0	50-145		30	
1,1-Dichloropropene	50.0	1	ug/L	50.0	BLOD	100	75-135		30	
1,2,3-Trichlorobenzene	54.0	1	ug/L	50.0	BLOD	108	55-140		30	
1,2,3-Trichloropropane	47.0	1	ug/L	50.0	BLOD	94.0	75-125		30	
1,2,4-Trichlorobenzene	55.1	1	ug/L	50.0	BLOD	110	65-135		30	
1,2,4-Trimethylbenzene	56.9	1	ug/L	50.0	BLOD	114	75-130		30	
1,2-Dibromo-3-chloropropane (DBCP)	56.6	1	ug/L	50.0	BLOD	113	50-130		30	
1,2-Dibromoethane (EDB)	51.4	1	ug/L	50.0	BLOD	103	80-120		30	
1,2-Dichlorobenzene	56.2	0.5	ug/L	50.0	BLOD	112	70-120		30	
1,2-Dichloroethane	45.3	1	ug/L	50.0	BLOD	90.6	70-130		30	
1,2-Dichloropropane	52.4	0.5	ug/L	50.0	BLOD	105	75-125		30	
1,3,5-Trimethylbenzene	54.0	1	ug/L	50.0	BLOD	108	75-124		30	
1,3-Dichlorobenzene	55.6	1	ug/L	50.0	BLOD	111	75-125		30	
1,3-Dichloropropane	53.7	1	ug/L	50.0	BLOD	107	75-125		30	
1,4-Dichlorobenzene	54.3	1	ug/L	50.0	BLOD	109	75-125		30	

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Volatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0591 - SW5030B-MS										
Matrix Spike Dup (BGA0591-MSD1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
2,2-Dichloropropane	48.7	1	ug/L	50.0	BLOD	97.3	70-135		30	
2-Butanone (MEK)	42.0	10	ug/L	50.0	BLOD	84.0	30-150		30	
2-Chlorotoluene	54.6	1	ug/L	50.0	BLOD	109	75-125		30	
2-Hexanone (MBK)	46.8	5	ug/L	50.0	BLOD	93.5	55-130		30	
4-Chlorotoluene	54.7	1	ug/L	50.0	BLOD	109	75-130		30	
4-Isopropyltoluene	54.8	1	ug/L	50.0	BLOD	110	75-130		30	
4-Methyl-2-pentanone (MIBK)	49.0	5	ug/L	50.0	BLOD	98.0	60-135		30	
Acetone	108	10	ug/L	50.0	96.5	22.7	40-140		30	M
Benzene	52.4	1	ug/L	50.0	BLOD	105	80-120		30	
Bromobenzene	51.6	1	ug/L	50.0	BLOD	103	75-125		30	
Bromochloromethane	45.8	1	ug/L	50.0	BLOD	91.7	65-130		30	
Bromodichloromethane	54.2	0.5	ug/L	50.0	BLOD	108	75-136		30	
Bromoform	51.1	1	ug/L	50.0	BLOD	102	70-130		30	
Bromomethane	47.9	1	ug/L	50.0	BLOD	95.9	30-145		30	
Carbon disulfide	45.0	10	ug/L	50.0	BLOD	89.9	35-160		30	
Carbon tetrachloride	49.4	1	ug/L	50.0	BLOD	98.9	65-140		30	
Chlorobenzene	52.2	1	ug/L	50.0	BLOD	104	80-120		30	
Chloroethane	46.3	1	ug/L	50.0	BLOD	92.6	60-135		30	
Chloroform	48.3	0.5	ug/L	50.0	BLOD	96.5	65-135		30	
Chloromethane	55.1	1	ug/L	50.0	BLOD	110	40-125		30	
cis-1,2-Dichloroethylene	46.3	1	ug/L	50.0	BLOD	92.5	70-125		30	
cis-1,3-Dichloropropene	43.6	1	ug/L	50.0	BLOD	87.2	47-136		30	
Dibromochloromethane	55.3	0.5	ug/L	50.0	BLOD	111	60-135		30	
Dibromomethane	52.3	1	ug/L	50.0	BLOD	105	75-125		30	
Dichlorodifluoromethane	53.0	1	ug/L	50.0	BLOD	106	30-155		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 BGA0591 - SW5030B-MS										
Matrix Spike Dup (BGA0591-MSD1)	**Source: 23A0810-05RE1**			Prepared & Analyzed: 01/19/2023						
Ethylbenzene	52.6	1	ug/L	50.0	BLOD	105	75-125		30	
Hexachlorobutadiene	50.0	0.8	ug/L	50.0	BLOD	100	50-140		30	
Isopropylbenzene	49.2	1	ug/L	50.0	BLOD	98.4	75-125		30	
m+p-Xylenes	101	2	ug/L	100	BLOD	101	75-130		30	
Methylene chloride	47.0	4	ug/L	50.0	BLOD	93.3	55-140		30	
Methyl-t-butyl ether (MTBE)	51.6	1	ug/L	50.0	BLOD	103	65-125		30	
Naphthalene	55.7	1	ug/L	50.0	BLOD	111	55-140		30	
n-Butylbenzene	56.2	1	ug/L	50.0	BLOD	112	70-135		30	
n-Propylbenzene	52.7	1	ug/L	50.0	BLOD	105	70-130		30	
o-Xylene	50.8	1	ug/L	50.0	BLOD	102	80-120		30	
sec-Butylbenzene	58.4	1	ug/L	50.0	BLOD	117	70-125		30	
Styrene	49.1	1	ug/L	50.0	BLOD	98.3	65-135		30	
tert-Butylbenzene	54.6	1	ug/L	50.0	BLOD	109	70-130		30	
Tetrachloroethylene (PCE)	49.2	1	ug/L	50.0	BLOD	98.3	51-231		30	
Toluene	52.8	1	ug/L	50.0	BLOD	106	75-120		30	
trans-1,2-Dichloroethylene	43.0	1	ug/L	50.0	BLOD	86.0	60-140		30	
trans-1,3-Dichloropropene	38.6	1	ug/L	50.0	BLOD	77.1	55-140		30	
Trichloroethylene	51.1	1	ug/L	50.0	BLOD	102	70-125		30	
Trichlorofluoromethane	50.3	1	ug/L	50.0	BLOD	101	60-145		30	
Vinyl chloride	44.9	0.5	ug/L	50.0	BLOD	89.7	50-145		30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*44.6*		ug/L	*50.0*		*89.2*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*47.1*		ug/L	*50.0*		*94.1*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*45.9*		ug/L	*50.0*		*91.8*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.3*		ug/L	*50.0*		*101*	*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 BGA0628 - SW3510C/EPA600-MS										
Blank (BGA0628-BLK1)				Prepared & Analyzed: 01/20/2023						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*34.2*		ug/L	*100*		*34.2*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*24.2*		ug/L	*50.0*		*48.3*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*28.5*		ug/L	*100*		*28.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*27.3*		ug/L	*50.0*		*54.6*	*5-151*			
Surr: Phenol-d5 (Surr)	*20.0*		ug/L	*100*		*20.0*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*35.1*		ug/L	*50.0*		*70.2*	*5-141*			
LCS (BGA0628-BS1)				Prepared & Analyzed: 01/20/2023						
1,2,4-Trichlorobenzene	18.3	10.0	ug/L	50.0		36.6	57-130			L
1,2-Dichlorobenzene	17.7	10.0	ug/L	50.0		35.4	22-115			
1,3-Dichlorobenzene	16.2	10.0	ug/L	50.0		32.4	22-112			
1,4-Dichlorobenzene	16.5	10.0	ug/L	50.0		33.0	13-112			
2,4,6-Trichlorophenol	15.7	10.0	ug/L	50.0		31.3	52-129			L
2,4-Dichlorophenol	17.9	10.0	ug/L	50.0		35.8	53-122			L
2,4-Dimethylphenol	19.2	5.00	ug/L	50.0		38.4	42-120			L
2,4-Dinitrophenol	17.5	50.0	ug/L	50.0		35.0	48-127			L
2,4-Dinitrotoluene	23.5	10.0	ug/L	50.0		46.9	10-173			
2,6-Dinitrotoluene	23.0	10.0	ug/L	50.0		45.9	68-137			L
2-Chloronaphthalene	17.3	10.0	ug/L	50.0		34.6	65-120			L
2-Chlorophenol	19.2	10.0	ug/L	50.0		38.5	36-120			
2-Nitrophenol	21.9	10.0	ug/L	50.0		43.8	45-167			L
3,3'-Dichlorobenzidine	17.2	10.0	ug/L	50.0		34.4	10-213			
4,6-Dinitro-2-methylphenol	24.1	50.0	ug/L	50.0		48.2	53-130			L
4-Bromophenyl phenyl ether	22.4	10.0	ug/L	50.0		44.8	65-120			L

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0628 - SW3510C/EPA600-MS										
LCS (BGA0628-BS1)				Prepared & Analyzed: 01/20/2023						
4-Chlorophenyl phenyl ether	17.2	10.0	ug/L	50.0		34.4	38-145			L
4-Nitrophenol	6.99	50.0	ug/L	50.0		14.0	13-129			
Acenaphthene	18.3	10.0	ug/L	50.0		36.7	60-132			L
Acenaphthylene	19.1	10.0	ug/L	50.0		38.1	54-126			L
Anthracene	25.6	10.0	ug/L	50.0		51.2	43-120			
Benzidine	ND	50.0	ug/L	50.0			12-309			L
Benzo (a) anthracene	30.5	10.0	ug/L	50.0		61.0	42-133			
Benzo (a) pyrene	32.6	10.0	ug/L	50.0		65.2	32-148			
Benzo (b) fluoranthene	29.4	10.0	ug/L	50.0		58.8	42-140			
Benzo (g,h,i) perylene	31.7	10.0	ug/L	50.0		63.3	10-195			
Benzo (k) fluoranthene	28.5	10.0	ug/L	50.0		57.0	25-146			
bis (2-Chloroethoxy) methane	18.3	10.0	ug/L	50.0		36.6	49-165			L
bis (2-Chloroethyl) ether	18.2	10.0	ug/L	50.0		36.4	43-126			L
2,2'-Oxybis (1-chloropropane)	19.6	10.0	ug/L	50.0		39.3	63-139			L
bis (2-Ethylhexyl) phthalate	37.4	10.0	ug/L	50.0		74.8	29-137			
Butyl benzyl phthalate	40.4	10.0	ug/L	50.0		80.7	10-140			
Chrysene	30.3	10.0	ug/L	50.0		60.6	44-140			
Dibenz (a,h) anthracene	35.1	10.0	ug/L	50.0		70.1	10-200			
Diethyl phthalate	26.0	10.0	ug/L	50.0		51.9	10-120			
Dimethyl phthalate	21.9	10.0	ug/L	50.0		43.8	10-120			
Di-n-butyl phthalate	31.6	10.0	ug/L	50.0		63.2	10-120			
Di-n-octyl phthalate	31.0	10.0	ug/L	50.0		61.9	19-132			
Fluoranthene	28.8	10.0	ug/L	50.0		57.6	43-121			
Fluorene	20.2	10.0	ug/L	50.0		40.4	70-120			L
Hexachlorobenzene	24.8	1.00	ug/L	50.0		49.6	10-142			

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Semivolatile Organic Compounds by GCMS - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0628 - SW3510C/EPA600-MS										
LCS (BGA0628-BS1)				Prepared & Analyzed: 01/20/2023						
Hexachlorobutadiene	18.7	10.0	ug/L	50.0		37.4	38-120			L
Hexachlorocyclopentadiene	11.2	10.0	ug/L	50.0		22.5	10-76			
Hexachloroethane	17.1	10.0	ug/L	50.0		34.3	55-120			L
Indeno (1,2,3-cd) pyrene	35.4	10.0	ug/L	50.0		70.8	10-151			
Isophorone	9.89	10.0	ug/L	50.0		19.8	47-180			L
Naphthalene	17.2	5.00	ug/L	50.0		34.5	36-120			L
Nitrobenzene	20.2	10.0	ug/L	50.0		40.5	54-158			L
n-Nitrosodimethylamine	12.2	10.0	ug/L	50.0		24.4	10-85			
n-Nitrosodi-n-propylamine	18.8	10.0	ug/L	50.0		37.6	14-198			
n-Nitrosodiphenylamine	17.0	10.0	ug/L	50.0		34.0	12-97			
p-Chloro-m-cresol	18.2	10.0	ug/L	50.0		36.3	10-142			
Pentachlorophenol	14.8	20.0	ug/L	50.0		29.7	38-152			L
Phenanthrene	27.5	10.0	ug/L	50.0		55.0	65-120			L
Phenol	8.38	10.0	ug/L	50.0		16.8	17-120			L
Pyrene	31.5	10.0	ug/L	50.0		63.1	70-120			L
Pyridine	15.1	10.0	ug/L	50.0		30.2	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*38.4*		ug/L	*100*		*38.4*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*17.6*		ug/L	*50.0*		*35.2*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*22.5*		ug/L	*100*		*22.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*20.4*		ug/L	*50.0*		*40.8*	*5-151*			
Surr: Phenol-d5 (Surr)	*15.7*		ug/L	*100*		*15.7*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*31.6*		ug/L	*50.0*		*63.1*	*5-141*			

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0589 - No Prep Wet Chem										
Blank (BGA0589-BLK1)				Prepared & Analyzed: 01/19/2023						
BOD	ND	2.0	mg/L							
LCS (BGA0589-BS1)				Prepared & Analyzed: 01/19/2023						
BOD	194	2	mg/L	198		98.0	84.6-115.4			
Duplicate (BGA0589-DUP1)	**Source: 23A0853-01**			Prepared & Analyzed: 01/19/2023						
BOD	4.1	2.0	mg/L		4.7			13.8	20	
Batch BGA0594 - No Prep Wet Chem										
Blank (BGA0594-BLK1)				Prepared & Analyzed: 01/19/2023						
Nitrite as N	ND	0.05	mg/L							
LCS (BGA0594-BS1)				Prepared & Analyzed: 01/19/2023						
Nitrite as N	0.10	0.05	mg/L	0.100		95.0	80-120			
Matrix Spike (BGA0594-MS1)	**Source: 23A0873-03**			Prepared & Analyzed: 01/19/2023						
Nitrite as N	0.11	0.05	mg/L	0.100	BLOD	106	80-120			
Matrix Spike Dup (BGA0594-MSD1)	**Source: 23A0873-03**			Prepared & Analyzed: 01/19/2023						
Nitrite as N	0.09	0.05	mg/L	0.100	BLOD	92.0	80-120	14.1	20	
Batch BGA0617 - No Prep Wet Chem										
Blank (BGA0617-BLK1)				Prepared & Analyzed: 01/19/2023						
Ammonia as N	ND	0.10	mg/L							

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0617 - No Prep Wet Chem										
LCS (BGA0617-BS1)				Prepared & Analyzed: 01/19/2023						
Ammonia as N	1.94	0.1	mg/L	2.00		97.0	90-110			
Batch BGA0639 - No Prep Wet Chem										
Blank (BGA0639-BLK1)				Prepared & Analyzed: 01/20/2023						
COD	ND	10.0	mg/L							
LCS (BGA0639-BS1)				Prepared & Analyzed: 01/20/2023						
COD	48.8	10.0	mg/L	50.0		97.6	88-119			
Matrix Spike (BGA0639-MS1)	**Source: 23A0811-01**			Prepared & Analyzed: 01/20/2023						
COD	60.3	10.0	mg/L	50.0	10.1	100	72.4-130			
Matrix Spike Dup (BGA0639-MSD1)	**Source: 23A0811-01**			Prepared & Analyzed: 01/20/2023						
COD	57.9	10.0	mg/L	50.0	10.1	95.6	72.4-130	4.13	20	
Batch BGA0749 - No Prep Wet Chem										
Blank (BGA0749-BLK1)				Prepared & Analyzed: 01/24/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BGA0749-BS1)				Prepared & Analyzed: 01/24/2023						
Total Recoverable Phenolics	0.50	0.050	mg/L	0.500		100	80-120			
Matrix Spike (BGA0749-MS1)	**Source: 23A0936-06**			Prepared & Analyzed: 01/24/2023						
Total Recoverable Phenolics	0.81	0.050	mg/L	0.500	0.32	98.0	70-130			

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0749 - No Prep Wet Chem										
Matrix Spike Dup (BGA0749-MSD1)	**Source: 23A0936-06**			Prepared & Analyzed: 01/24/2023						
Total Recoverable Phenolics	0.77	0.050	mg/L	0.500	0.32	90.4	70-130	4.80	20	
Batch BGA0851 - No Prep Wet Chem										
Blank (BGA0851-BLK1)				Prepared & Analyzed: 01/27/2023						
TKN as N	ND	0.50	mg/L							
LCS (BGA0851-BS1)				Prepared & Analyzed: 01/27/2023						
TKN as N	9.95	0.50	mg/L	10.0		99.5	90-110			
Matrix Spike (BGA0851-MS1)	**Source: 23A0872-01**			Prepared & Analyzed: 01/27/2023						
TKN as N	11.1	0.50	mg/L	10.0	0.99	101	90-110			
Matrix Spike (BGA0851-MS2)	**Source: 23A0872-02**			Prepared & Analyzed: 01/27/2023						
TKN as N	11.4	0.50	mg/L	10.0	1.65	97.7	90-110			
Matrix Spike Dup (BGA0851-MSD1)	**Source: 23A0872-01**			Prepared & Analyzed: 01/27/2023						
TKN as N	11.6	0.50	mg/L	10.0	0.99	106	90-110	4.29	20	
Matrix Spike Dup (BGA0851-MSD2)	**Source: 23A0872-02**			Prepared & Analyzed: 01/27/2023						
TKN as N	11.9	0.50	mg/L	10.0	1.65	103	90-110	4.23	20	
Batch BGA0853 - No Prep Wet Chem										
Blank (BGA0853-BLK1)				Prepared & Analyzed: 01/26/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							

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Wet Chemistry Analysis - Quality Control

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGA0853 - No Prep Wet Chem										
LCS (BGA0853-BS1)				Prepared & Analyzed: 01/26/2023						
Nitrate+Nitrite as N	2.52	0.1	mg/L	2.50		101	90-110			
Matrix Spike (BGA0853-MS1)	**Source: 23A1177-02**			Prepared & Analyzed: 01/26/2023						
Nitrate+Nitrite as N	7.64	0.1	mg/L	2.50	4.92	109	90-110			
Matrix Spike Dup (BGA0853-MSD1)	**Source: 23A1177-02**			Prepared & Analyzed: 01/26/2023						
Nitrate+Nitrite as N	7.60	0.1	mg/L	2.50	4.92	107	90-110	0.551	20	
Batch BGA0897 - No Prep Wet Chem										
Blank (BGA0897-BLK1)				Prepared & Analyzed: 01/27/2023						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BGA0897-BS1)				Prepared & Analyzed: 01/27/2023						
Nitrate+Nitrite as N	2.62	0.1	mg/L	2.50		105	90-110			
Matrix Spike (BGA0897-MS1)	**Source: 23A1006-01**			Prepared & Analyzed: 01/27/2023						
Nitrate+Nitrite as N	2.86	0.1	mg/L	2.50	BLOD	113	90-110			M
Matrix Spike Dup (BGA0897-MSD1)	**Source: 23A1006-01**			Prepared & Analyzed: 01/27/2023						
Nitrate+Nitrite as N	2.89	0.1	mg/L	2.50	BLOD	115	90-110	1.08	20	M
Batch BGB0071 - No Prep Wet Chem										
Blank (BGB0071-BLK1)				Prepared & Analyzed: 02/01/2023						
Total Recoverable Phenolics	ND	0.050	mg/L							

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BGB0071 - No Prep Wet Chem										
LCS (BGB0071-BS1)				Prepared & Analyzed: 02/01/2023						
Total Recoverable Phenolics	0.53	0.050	mg/L	0.500		105	80-120			
Matrix Spike (BGB0071-MS1)	**Source: 23B0001-01**			Prepared & Analyzed: 02/01/2023						
Total Recoverable Phenolics	0.54	0.050	mg/L	0.500	BLOD	107	70-130			
Matrix Spike Dup (BGB0071-MSD1)	**Source: 23B0001-01**			Prepared & Analyzed: 02/01/2023						
Total Recoverable Phenolics	0.54	0.050	mg/L	0.500	BLOD	109	70-130	1.48	20	

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Analytical Summary

23A0880-01	Subcontract
23A0880-02	Subcontract
23A0880-03	Subcontract
23A0880-04	Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.2/R2.8**	
23A0880-01	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0712	AA30130
23A0880-02	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0712	AA30130
23A0880-03	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0712	AA30130
23A0880-04	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0712	AA30130

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
23A0880-01	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
23A0880-02	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
23A0880-03	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
23A0880-04	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
23A0880-01	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
23A0880-02	1.00 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
23A0880-03	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
23A0880-04	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
23A0880-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
23A0880-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
23A0880-02RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
23A0880-03	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
23A0880-04	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
23A0880-04RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117

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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**	
23A0880-01	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
23A0880-02	0.0400 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
23A0880-03	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
23A0880-04	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
23A0880-01	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
23A0880-02	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
23A0880-03	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
23A0880-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
23A0880-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
23A0880-03	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
23A0880-04	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
23A0880-01	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
23A0880-02	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
23A0880-03	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
23A0880-04	2.50 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159
23A0880-04	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
23A0880-01	1020 mL / 2.00 mL	SW8270E	BGA0628	SGA0654	AL20040
23A0880-02	1030 mL / 1.00 mL	SW8270E	BGA0628	SGA0654	AL20040
23A0880-03	990 mL / 1.00 mL	SW8270E	BGA0628	SGA0654	AL20040
23A0880-04	1000 mL / 2.00 mL	SW8270E	BGA0628	SGA0654	AL20040

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
23A0880-01	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097

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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**	
23A0880-01RE1	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-02	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-03	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-03RE1	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-04	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-04RE1	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
23A0880-05	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
23A0880-01	10.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125
23A0880-02	10.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125
23A0880-03	10.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125
23A0880-04	1.00 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125

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Certificate of Analysis

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

Date Issued: 2/3/2023 11:50:55AM

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:**	**EPA200.2/R2.8**	
BGA0632-BLK1	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-BS1	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MS1	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MS2	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MS3		SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MS4		SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MSD1	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MSD2	50.0 mL / 50.0 mL	SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MSD3		SW6010D	BGA0632	SGA0668	AA30123
BGA0632-MSD4		SW6010D	BGA0632	SGA0668	AA30123

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BGA0589-BLK1	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
BGA0589-BS1	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
BGA0589-DUP1	300 mL / 300 mL	SM22 5210B-2011	BGA0589	SGA0706	
BGA0594-BLK1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
BGA0594-BS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
BGA0594-MRL1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
BGA0594-MS1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
BGA0594-MSD1	25.0 mL / 25.0 mL	SM22 4500-NO2B-2011	BGA0594	SGA0588	AJ20138
BGA0617-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117
BGA0617-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BGA0617	SGA0617	AA30117

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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**	
BGA0617-MS1		EPA350.1 R2.0	BGA0617	SGA0617	AA30117
BGA0617-MS2		EPA350.1 R2.0	BGA0617	SGA0617	AA30117
BGA0617-MSD1		EPA350.1 R2.0	BGA0617	SGA0617	AA30117
BGA0617-MSD2		EPA350.1 R2.0	BGA0617	SGA0617	AA30117
BGA0639-BLK1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
BGA0639-BS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
BGA0639-MRL1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
BGA0639-MS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
BGA0639-MSD1	2.00 mL / 2.00 mL	SM22 5220D-2011	BGA0639	SGA0623	AA30078
BGA0749-BLK1	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
BGA0749-BS1	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
BGA0749-MRL1	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
BGA0749-MS1	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
BGA0749-MSD1	5.00 mL / 10.0 mL	SW9065	BGA0749	SGA0719	AL20103
BGA0851-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0851-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0851-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0851-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0851-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0851-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BGA0851	SGA0851	AA30157
BGA0853-BLK1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
BGA0853-BS1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
BGA0853-MRL1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
BGA0853-MS1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
BGA0853-MSD1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGA0853	SGA0828	AA30152
BGA0897-BLK1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159
BGA0897-BS1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159
BGA0897-MRL1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159
BGA0897-MS1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159

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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**	
BGA0897-MSD1	50.0 mL / 50.0 mL	SM22 4500-NO3F-2011	BGA0897	SGA0870	AA30159
BGB0071-BLK1	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103
BGB0071-BS1	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103
BGB0071-MRL1	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103
BGB0071-MS1	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103
BGB0071-MSD1	5.00 mL / 10.0 mL	SW9065	BGB0071	SGB0074	AL20103

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BGA0628-BLK1	1000 mL / 1.00 mL	SW8270E	BGA0628	SGA0654	AL20040
BGA0628-BLK2		SW8270E	BGA0628	SGA0663	AL20042
BGA0628-BS1	1000 mL / 1.00 mL	SW8270E	BGA0628	SGA0654	AL20040
BGA0628-BS2		SW8270E	BGA0628	SGA0663	AL20042

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BGA0591-BLK1	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
BGA0591-BS1	5.00 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
BGA0591-MS1	0.0200 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097
BGA0591-MSD1	0.0200 mL / 5.00 mL	SW8260D	BGA0591	SGA0586	AA30097

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BGA0667-BLK1	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125
BGA0667-BS1	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125
BGA0667-MS1	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0707	AA30125
BGA0667-MS2	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125

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Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BGA0667-MSD1	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0707	AA30125
BGA0667-MSD2	20.0 mL / 20.0 mL	SW7470A	BGA0667	SGA0682	AA30125

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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
SM22 4500-NO2B-2011 in Non-Potable Water	
Nitrite as N	VELAP,WVDEP
SM22 4500-NO3F-2011 in Non-Potable Water	
Nitrate+Nitrite as N	VELAP,WVDEP
SM22 5210B-2011 in Non-Potable Water	
BOD	VELAP,NCDEQ,WVDEP
SM22 5220D-2011 in Non-Potable Water	
COD	VELAP,NCDEQ,PADEP,WVDEP
SW6010D in Non-Potable Water	
Arsenic	VELAP,WVDEP
Barium	VELAP,WVDEP,PADEP
Cadmium	VELAP,WVDEP,PADEP
Chromium	VELAP,WVDEP
Copper	VELAP,WVDEP
Lead	VELAP,WVDEP
Nickel	VELAP,WVDEP
Selenium	VELAP,WVDEP
Silver	VELAP,WVDEP,PADEP
Zinc	VELAP,WVDEP
SW7470A in Non-Potable Water	
Mercury	VELAP,NCDEQ,WVDEP

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

Certified Analyses included in this Report

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

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2023
NC	North Carolina DENR	495	07/31/2023
NCDEQ	North Carolina DEQ	495	07/31/2023
NCDOH	North Carolina Department of Health	51714	07/31/2023
NYDOH	New York DOH Drinking Water	12096	04/01/2023
PADEP	NELAP-Pennsylvania Certificate #008	68-03503	10/31/2023
VELAP	NELAP-Virginia Certificate #12157	460021	06/14/2023
WVDEP	West Virginia DEP	350	11/30/2023

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Date Issued: 2/3/2023 11:50:55AM

Qualifiers and Definitions

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

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CHAIN OF CUSTODY

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

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

ANALYSIS / (PRESERVATIVE)

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	Ammonia - EPA 350.1 & TKN	BOD - SM22 5210B-2021	COD - SM22 5220D-2011	Nitrate SM22 450-NO3F-2011	Nitrite SM22 450-NO3F-2011	SVOC (Anthracene) 8270	Total Metals (As, Ba, Cd, Cr, Cu, Pb, Ni, Se, Ag, Zn) 6010	Mercury - 7470	Total Recoverable Phenolics - 9065	V. Fatty Acids (See List) 8015	VOCs (See List) 8260	COMMENTS: Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol. Note VOC 8260 no HCl. PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)
1) EW-50	X					011723	1230		GW	12	X	X	X	X	X	X	X	X	X	X	X	
2) EW-58	X					011723	1255		GW	12	X	X	X	X	X	X	X	X	X	X	X	
3) EW-65	X					011823	0800		GW	11	X	X	X	X	X	X	X	X	X	X	X	
4) EW-59	X					011822	0825		GW	11	X	X	X	X	X	X	X	X	X	X	X	
5)									GW													
6)									GW													
7)									GW													Sealed
8)									GW													LCL
9)									GW													3.0
10) Trip Blank	X					010923	1430		DI	2											X	277

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
[signature]	011823/1130	LCL	
LCL		90	1/19/23 0800

QC Data Package: Level III ☐ Level IV ☐

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

SCS-W 23A0880
City of Bristol Landfills Solid Wast
Recd: 01/19/2023 Due: 02/02/2023

v130325002

Bottle Kit Example

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

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Sample Preservation Log

Order ID 23A0880 Date Performed: 1/19/23 Analyst Performing Check: CSB

Sample ID	Container ID	Metals			Cyanide			Sulfide			Ammonia			TKN			Phos, Tot			NO3+NO2			DRO			Pesticide (8081/608/508) PCB DW only			SVOC (525/8270/625)			CrVI * **		Pest/PCB (508) / SVOC(525)			Phenolics			COD		
		pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH	Received Res. Cl		final + or -	Received Res. Cl		final + or -	Received pH	Final pH	pH as Received		Final pH	pH as Received		Final pH	pH as Received		Final pH
		<2	Other		>12	Other		>9	Other		<2	Other		<2	Other		<2	Other		<2	Other		<2	Other		+	-		+	-				<2	Other		<2	Other		<2	Other	
01	A		7	<2																																					
01	B										7	<2		7	<2					7	<2																	7	<2
01	D																																			7	<2			
01	E																												—											
02	A		8	<2																																				
02	B										7	<2		7	<2					7	<2																	7	<2
02	D																																			7	<2			
02	E																												—											
03	A		7	<2																																				
03	B										7	<2		7	<2					7	<2																	7	<2
03	D																																			7	<2			
03	E																												—											
04	A		6	<2																																				
04	B										6	<2		6	<2					6	<2																	6	<2
04	D																																			6	<2			

NaOH ID: _____ HNO3 ID: 2L02526

H2SO4 ID: 2L019441 Na2S2O3 ID: _____

HCL ID: _____ Na2SO3 ID: _____

CrVI preserved date/time: _____ Analyst Initials: _____

* pH must be adjusted between 9.3 - 9.7

Buffer Sol'n ID: _____

1N NaOH ID: _____ 5N NaOH: _____

Metals were received with pH =6.7.8 HNO3 was added at 0950 on 19 January 2023 by CSB in the Log-In room to bring pH= <2.

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

WHEN PRINTED
servation Log 12_0

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Sample Preservation Log

Order ID 23A0880 Date Performed: 1/19/23 Analyst Performing Check: CSB

Sample ID	Container ID	Metals			Cyanide			Sulfide			Ammonia			TKN			Phos, Tot			NO3+NO2			DRO			Pesticide (8081/608/508) PCB DW only			SVOC (525/8270/625)			CrVI * **		Pest/PCB (508) / SVOC(525)								
		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	
04	E																																								

NaOH ID: _____ HNO3 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: _____ Buffer Sol'n ID: _____

HCL ID: _____ Na_2SO_3 ID: _____ 1N NaOH ID: _____ 5N NaOH: _____

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

Certificate of Analysis

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

Date Issued: 2/3/2023 11:50:55AM

Laboratory Order ID: 23A0880

Sample Conditions Checklist

Samples Received at:	**3.00°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.	No

Sample -01B and -01D:EW-50 was received with a pH of 7 and H2SO4 was added to bring the pH to <2.
Sample -02B and -01D:EW-58 was received with a pH of 7 and H2SO4 was added to bring the pH to <2.

Enthalpy Analytical
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Sample -03B and -01D:EW-65 was received with a pH of 7 and H2SO4 was added to bring the pH to <2.
Sample -04B and -01D:EW-59 was received with a pH of 6 and H2SO4 was added to bring the pH to <2.
There is headspace in all VOA samples for sample -04:EW-59. Jennifer Robb notified via email
YO 19 JAN 2023 1107

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**											
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
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
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
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
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
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

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**											
Total 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
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
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
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
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
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
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
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

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	Monitoring Event	Concentration											
TOTAL METALS (mg/L)													
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
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
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
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
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
VOLATILE FATTY ACIDS mg/L													
Acetic Acid	November-2022	---	---	---	---	---	---	**1600**	---	---	---	25	100
		---	---	---	---	**3500**	---	---	**150 J**	---	---	62	250
	December-2022	**1800**	---	---	---	---	---	---	---	---	---	62	250
Butyric Acid	November-2022	---	---	---	---	---	---	**430**	---	---	---	12	100
		---	---	---	---	**830**	---	---	ND	---	---	29	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	29	250
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
Pyruvic Acid	November-2022	---	---	---	---	---	---	**46 J**	---	---	---	12	100
		---	---	---	---	**98 J**	---	---	ND	---	---	30	250
	December-2022	ND	---	---	---	---	---	---	---	---	---	30	250

Historical LFG-EW Leachate Monitoring Results Summary

Well ID		EW-50	EW-52	EW-57	EW-58	EW-59	EW-60	EW-61	EW-65	EW-67	EW-68	LOD	LOQ
Parameter	**Monitoring Event**	**Concentration**											
VOLATILE ORGANIC COMPOUNDS (ug/L)													
2-Butanone (MEK)	November-2022	---	---	---	---	**3510**	---	---	**1140**	---	---	30	100
		---	---	---	---	---	---	**15600**	---	---	---	300	1000
	December-2022	**3140**	---	---	---	---	**3390**	---	---	---	---	30	100
		---	**26800**	**27700**	---	**5670**	---	---	---	**21700**	**7150**	300	1000
	January-2023	**3480**	---	---	**632**	---	---	---	---	---	---	30	100
		---	---	---	---	**7840**	---	---	**5470**	---	---	300	1000
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
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
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
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
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
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

--- = not applicable

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

SCS ENGINEERS

Transmittal

Midlothian, VA

PROJECT:	City Bristol, LF Engineering, ISWMF, VA 02218208.05	DATE:	2/10/2023
SUBJECT:	January Monthly Compliance Reports SWP #588, SWP #498, & SWP #221	TRANSMITTAL ID:	00009
PURPOSE:	For Record	VIA:	Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Charles Warren Midlothian, VA	SCS Engineers	CWarren@scsengineers.com	+1-804-486-1903

TO

NAME	COMPANY	EMAIL	PHONE
Jonathan Chapman 355-A Deadmore Street Abingdon VA 24210 United States	Virginia Department of Environmental Quality	Jonathan.chapman@deq.virginia.gov	

REMARKS:

Jonathan,
In accordance with Item 8.iii of Appendix A and Item 8 of Appendix B of the Consent Decree between the City and VDEQ, SCS is submitting the Monthly Compliance Reports for the Solid Waste Permits #588, #498, and #221 on behalf of the City of Bristol, Virginia. The reports can be downloaded using the links below. Please note that the data from monthly gas monitoring of leachate collection components (Item 1.i of Appendix A), sampling and analysis of dual extraction wells (Item 4.ii of Appendix A), and topographic survey (Item 5.ii of Appendix A) are contained within the Solid Waste Permit #588 report. Let us know if you have questions about the contents of these reports.
Regards,
Charles

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	2/10/2023	January Compliance Report - SWP 221.pdf	
1	2/10/2023	January Compliance Report - SWP 498.pdf	
1	2/10/2023	January 2023 Compliance Report - SWP 588.pdf	

Transmittal

DATE: 2/10/2023
TRANSMITTAL ID: 00009

COPIES:

Bob Dick	(SCS Engineers)
Charles Warren	(SCS Engineers)
Daniel Scott	(Virginia Department of Environmental Quality)
Erin Malone	(Environmental Protection Agency)
Erin Willard	(Environmental Protection Agency)
Jacob Chandler	(Bristol, VA, City of)
Jeffery Hurst	(Virginia Department of Environmental Quality)
Joey Lamie	(City of Bristol)
Jonathan Hayes	(Bristol, VA, City of)
Michael Martin	(Bristol, VA, City of)
Randall Eads	(City of Bristol)
Robert Gardner	(SCS Engineers)
Stacy Bowers	(Virginia Department of Environmental Quality)
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