Monthly Compliance Report

Solid Waste Permit #588
Bristol Integrated Solid Waste Management Facility
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02218208.05 | December 9, 2022

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EXECUTIVE SUMMARY

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) outlining steps taken towards the action items outlined in the Plan of Action submitted to VDEQ on July 6, 2022. This report covers the Solid Waste Permit #588 landfill during the month of November.

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 outline 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 November 4, 2022, November 14, 2022, November 18, 2022, and November 23, 2022. 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 included applicable areas 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 the November 9, 2022, November 16, 2022, November 23, 2022, and November 30, 2022. Copies of those submittals are included in Appendix A. Table 1 summarizes the results of the three monitoring events in October.

Table 1. Summary of November Surface Emissions Monitoring

Description	November 4, 2022	November 14, 2022	November 18, 2022	November 23, 2022
Number of Points Sampled	139	139	145	145
Number of Points in Serpentine Route	100	100	100	100
Number of Points at Surface Cover Penetrations	39	39	45	45

Description	November 4, 2022	November 14, 2022	November 18, 2022	November 23, 2022
Number of Exceedances[1]	10	11	6	10
Number of Serpentine Exceedances	0	0	0	0
Number of Pipe Penetration Exceedances	10	11	6	10

1.1.1.2 Corrective Actions

The City purchased Landtec polyvinyl chloride (PVC) well-bore seals (seals) from QED. The seals measure approximately 10 feet by 10 feet with a mounting boot in the center of the seal. The seals are designed to go around the landfill gas well casing and are intended to be buried approximately 1 foot below the surface.

Installation of the seals on existing wells presents challenges when compared to installation during well construction. The existing wells have multiple pipes attached that convey air, gas, and condensate and the removal of these lines requires substantial time and effort. Additionally, many of the wells were equipped with a flange adaptor that limits the feasibility of slipping the seals over the well. SCS believes that the most efficient method of installation would be to cut the seals to place the on the wells and then re-attach the edges of the seal. After consulting with the vendor and SCS' geosynthetics installation technician, SCS intends to reattach the edges of the seal by heat leistering the edges and pressing them together. This work is scheduled for completion in December.

1.1.2 Leachate Collection emissions

SCS Field Services (SCS-FS) visited the Bristol Landfill during the month of November 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 November dated December 6, 2022. 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

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

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 November.

In addition to the activities outlined in the report between November 14, 2022 and November 18, 2022 SCS-FS completed upgrades to the southern leachate clean-out gas collection system. Figure 1 shows the new GCCS connections to the southern leachate clean-outs.

Figure 1. South Leachate Cleanout Manifold and Cleanout Tie-ins to the GCCS

The project involved replacing the existing 4-inch landfill gas (LFG) header connecting the wellheads on the southern cleanouts with the rest of the (GCCS) with a larger header. The header will be replaced by an 8-inch or 12-inch header depending on the location. The resulting upgrades are anticipated to increase LFG flows from the southern clean-outs. Header installation is shown in Figure 2.

Figure 2. Installation of 12-inch Header, 2-Inch Airline, and 4-Inch Forcemain in Common Trench

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

Two sensors were initially installed on wells and began recording temperature data. An initial review of the data and comparison with temperature readings recorded by field staff indicated that the measurements taken by the remote sensors were impacted by ambient air temperatures. The installation of additional sensors was put on hold until the installations could be modified to improve the accuracy of temperature readings.

The City, SCS, SCS-FS, and SCS-RMC had previously coordinated with the wellhead manufacturer to identify an installation configuration that provided more direct access to gas flow. The proposed

solution was to thread the sensor into a saddle that could be attached to the wellhead. The City procured the necessary adapter parts which were delivered to the site during the month of October. Figure 3 shows a sensor attached to the saddle adaptor.

Figure 3. Wellhead Temperature Sensor and Adaptor Saddle

Beginning on November 7, 2022, SCS-FS began the process of installing the sensors on the wellheads. Installation was completed on November 8, 2022. Figure 4 shows completed installation of the temperature sensor and transmitter.

Figure 4. Wellhead Temperature Sensor after Installation

An initial review of temperatures reported by the probes indicated that the temperatures reported by the wells varied compared with the GEM thermocouple that has historically been used to measure temperatures at the site. On November 10, 2022, after coordinating with the device manufacturer SCS-RMC modified the manner in which temperatures were calculated.

In order to further evaluate the precision of the remote wellhead temperature sensors, on November 17, 2022 SCS field staff measured the wellhead temperature using the GEM and compared those to the values reported by the remote sensor. Those readings indicated that the sensor was reading within 9 degrees Fahrenheit of the GEM. The sensor and GEM were also both placed in an ice bath. Readings in the ice bath were within 1 degree Fahrenheit. Figure 5 shows the remote sensor in the ice bath.

Figure 5. Testing Accuracy of Temperature Sensor using an Ice Bath

Following that exercise, SCS identified several wells where recent temperature readings taken using the GEM varied from values reported by remote sensors. On November 29, 2022 SCS took readings from 4 additional wells using a GEM and compared those temperatures to values reported by the remote sensors. Significant differences between the two sets of values were observed.

On November 30, 2022, SCS then took steps to assess if there was an issue with the function of the temperature sensors or if the placement of the sensors was impacting the precision of the readings. To perform this assessment, one of the sensors was placed in an ice bath and a pot of boiling water to compare the readings with known temperatures. In both cases temperatures reported by the sensors were within approximately 2 percent of expected values. Figure 6 shows a temperature sensor placed in a pot of boiling water.

Figure 6. Testing Accuracy of Temperature Sensor using Boiling Water

Based on this analysis, it is unlikely that discrepancies in temperature readings were due to sensor malfunction. SCS again contacted the manufacturer who indicated two possible factors that may contribute to the discrepancy:

- The sensor housings are exposed to ambient temperatures which are impacting the readings and

- The sensors themselves are not reaching far enough into the gas stream to precisely measure the gas temperature.

A review of the temperature sensor data indicated that temperature readings were lower at night and higher during the day. This supported impacts of ambient temperatures on the housings and subsequently the sensors. To mitigate this impact SCS placed pipe insulation on select sensor housings. The insulation was then covered with a layer of reflective tape. Figure 7 shows the insulation placed on a temperature sensor housing prior to the addition of reflective tape. SCS will review the temperature sensor data during the month of December to gauge the effectiveness of the insulation method.

Figure 7. Temperature Sensor Housing with Insulation

The second factor will be addressed by trialing temperature sensors with longer probes that are expected to project further into the gas stream. SCS has ordered sensors in two different lengths that will be trialed to assess their precision in this application.

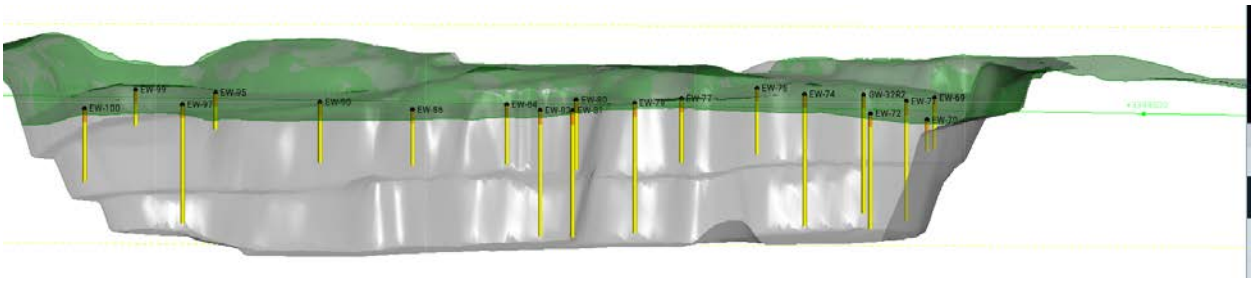
Despite the system still being subject to ongoing commissioning, the City began sharing data with VDEQ on a daily basis per the Department's request. This reporting began with the November 30, 2022 data which was submitted on December 1, 2022. Daily averages for each wellhead were reported the following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

The sensor on Well 55 did not report temperatures on November 30, 2022 because the transmitter lost cellular connection. The connection has since been restored. The sensor on Well 68 was damaged and is not currently reporting temperatures. A replacement sensor has been ordered and will be installed once it arrives on site. It should be noted that the system is still in the commissioning phase when making any interpretations based on the data in this report.

1.4 LARGE-DIAMETER DUAL-PHASE EXTRACTION WELLS

SCS continued design work on an expansion of the existing GCCS during the month of November. The proposed expansion is anticipated to include at least 5 large diameter dual-phase extraction wells. A conceptual cross section of the proposed additional wells is shown in Figure 8. SCS will submit the design to VDEQ prior to December 31, 2022. The City intends to initiate the bidding process for construction of the GCCS prior to December 31, 2022.

Figure 8. Conceptual Cross Section of Dual-Phase Extraction Wells included in Landfill GCCS Expansion



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. 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.

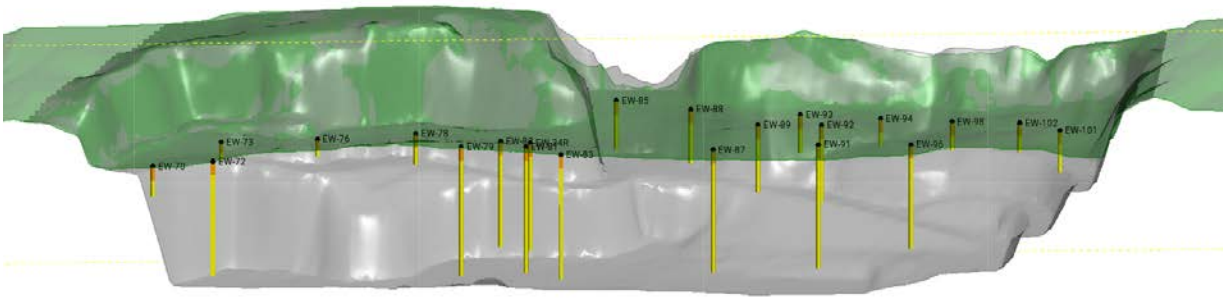
2.0 SIDEWALL ODOR MITIGATION

The City has initiated design 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 will include perimeter LFG wells. These wells are intended to collect gas near the sidewalls that may not be collected by the rest of the GCCS. 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. A conceptual cross section of the proposed additional wells is shown in Figure 9. SCS will submit a design to VDEQ which includes these wells prior to December 31, 2022. The City intends to initiate the bidding process for construction of the GCCS expansion prior to December 31, 2022.

Figure 9. Conceptual Cross Section of Perimeter Gas Extraction Wells included in Landfill GCCS Expansion



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

On November 7, 2022 the City posted an invitation to bid for the project on the City's website. On November 15, 2022 a pre-bid meeting was held for the project. The only attendees were representatives of the City and SCS. The original bid due date was listed as November 22, 2022 in the original bid posting.

In an attempt increase the likelihood that contractors would bid on the project, the City issued and addendum on November 21, 2022 that extended the deadline to November 29, 2022. In another effort to increase the likelihood that bids would be received, on November 22, 2022, Bristol City Council voted to allow SCS-FS to bid on the project.

On November 29, 2022 bidding concluded and SCS-FS was the only bidder. The City intends to award the project to SCS-FS pending approval by the City Council.

The proposed system is designed to be constructed in two phases. Phase 1 will include approximately 200 feet along the western sidewall. The intent is for Phase 1 to serve as a test segment prior to completing construction of the remainder of the system. The City included a

milestone date of December 31, 2022 in the contract for construction of Phase 1 of the proposed system.

2.4 FULL SYSTEM CONSTRUCTION

The remainder of the sidewall odor mitigation system will be constructed as part of Phase 2. Based on constructability and effectiveness of Phase 1, modifications to the design and methods of construction may be made prior to constructing Phase 2. The City intends to include contract times in the construction contract that require the contractor to complete Phase 2 before June 14, 2023.

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 outlined 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. A copy of those drawings is included in Appendix G.

3.2 TEMPERATURE MONITORING SYSTEM INSTALLATION

On November 1, 2022 Connelly continued drilling for TP-1 reaching 180 feet. The desired depth of the borehole was 200 ft. but due to the projectile liquids evacuating from the borehole, they could no longer drill further in a safe or efficient way. Connelly pumped fluids in the hole hoping the probe would be able to advance in the borehole and loosen up, but the probe was caught on material and wouldn't let it advance. When the probe was brought up, the casing was damaged with a 40-ft portion of the probe remaining at the bottom of the boring.

On November 4, 2022, Connelly attempted to retrieve the 40 ft. of remaining steel casing from the bottom of the borehole. The pieces retrieved were damaged and not able to be used. The damaged casing is shown in Figure 10. Connelly was able to clear out all of the blockage, and decided to apply "geo-thermal" glue to the potential failure points of the probe to avoid future disconnections in future installations.

On November 7, 2022, Connelly completed installation on TP-1 by placing the probe as deep as it could go due to blockage, 165 ft., and backfilling the hole based on the design specifications.

On November 8, 2022, Connelly began drilling for TP-2. Its desired drilling depth was set at 160 ft. but the drill was not able to advance past 155 ft., so TP-2 was installed and placed to 155 ft. On the same day, drilling for TP-3 began however, they punctured the adjacent 2-in airline. The downslope 2-in airline isolation valve was closed, and upslope and downslope sections of the punctured airline were capped with 2-in PVC slip caps and duct tape.

Figure 10. TP-1 Casing Damage

On November 10, 2022, Connelly was able to complete TP-3 and install it at the desired depth of 220 ft with the probe being placed at 218 ft. On November 14, Connelly drilled the borehole for TP-5 and on Wednesday November 16, 2022, the borehole for TP-4. TP-4 was drilled to a depth of 200 ft., as proposed. Temperature probe TP-5 was drilled 25 feet shorter than the specifications due to a discrepancy in field documentation. On November 28, 2022, TP-7 was drilled to a depth of 200 ft. and drilling to the desired depth of 222 ft was completed on November 29, 2022.

After completing TP-7, Connelly began drilling TP-6. On November 30, Connelly finished drilling TP-6 to a depth of 208 feet and began drilling TP-8 with a target depth of 235 feet. The proposed depth was reduced by 2 feet, because the surveyed well location was on top of a pile of soil that had a height of approximately 2 feet. The pile was removed prior to drilling.

During the drilling process, temperatures of excavated waste were measured once for every 20 vertical feet of drilling. The Construction Quality Assurance (CQA) technician also recorded field observations[2] of the moisture content and waste characteristics. This data was recorded on the project drill logs. Drill logs for TP-1, TP-2, TP-3, TP-4, and TP-5 and included in Appendix H.

Recorded temperatures were generally highest toward the center of each boring. No temperatures were measured that exceeded 200 degrees Fahrenheit. In most cases, higher temperatures coincided with wet or damp waste conditions. Based on SCS' experience with other elevated temperature landfills (ETLFs), these conditions are consistent with ETLF conditions. The temperatures measured are generally lower than other ETLFs.

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.

[2] Moisture content and waste characteristics were not recorded during drilling of TP-1 due to the difficult drilling conditions.

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 November 4, 2022; November 14, 2022; November 18, 2022; and November 23, 2022. The data collected is summarized in Table 3.

Table 3. Summary of Dual Extraction Well Pump Stroke Counter Data

Well	November 4, 2022	November 14, 2022	November 18, 2022	November 23, 2022
GW64	97953	97953	97963	97969
GW61	211552	211552	211666	211751
GW50	567291	589508	589508	592666
GW49	438137	438137	438705	439612
GW60	55250	55269	55269	55269
GW52	227419	227419	227419	227419
GW68	1311931	1311931	1311931	1311931
GW67	87445	135015	135015	135015
GW54	105743	105751	105751	105751
GW55	529010	529010	529010	529010
GW58	1614727	1615362	1615365	1615366
GW59	703132	756994	757000	757001
GW57	124846	124846	124846	124846
GW65	562	562	1016	3365
GW63	47629	47629	47632	47669
GW62	113998	113999	113991	113971
GW53	893303	1482501	1482501	1492759

Based on this data and stroke counts taken on October 28, 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 4 below.

Table 4. Summary of Dual Extraction Well Pump Liquids Removal

Well	Liquids Removed (gal) October 28, 2022 to November 4, 2022	Liquids Removed (gal) November 4, 2022 to November 14, 2022	Liquids Removed (gal) November 14, 2022 to November 18, 2022	Liquids Removed (gal) November 18, 2022 to November 23, 2022
EW64	3.3	0	3	1.8
EW61	3.6	0	34.2	25.5
EW50	4776.6	6665.1	0	947.4
EW49	1.2	0	170.4	272.1
EW60	0	5.7	0	0
EW52[3]	0	0	0	0
EW68	15673.8	0	0	0
EW67	0	0	0	0
EW54	0	14271	0	0
EW55	0.9	2.4	0	0
EW58[4]	0	0	0	0.3
EW59	1892.7	190.5	0.9	0.3
EW57	46731.3	16158.6	1.8	0
EW65	3.6	0	0	704.7
EW63	1.2	0	136.2	11.1
EW62	1.2	0	0.9	0
EW53	0.9	0.3	0	3077.4

During the month of November, Piedmont Industrial Services (Piedmont) replaced 9 pumps at GW-50, 52, 53, 54, 55, 57, 58, 60, and 67. The air hose for GW-68 was replaced, and the pump was able to stroke after that repair.

The effects of those repairs varied as shown in this data. In some cases repairs showed improvement in pump performance, but that performance was not always observed in the following week's stroke count data. The City's contractors will continue repairs of pumping infrastructure and pumps during the month of December.

The and SCS understand that operations of dewatering pumps are critical addressing 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. For example in Table 4, the pump in EW-57 operated effectively during two weeks following repair. The pump did not appear to be operating effectively during the last two weeks of the month. Figure 11

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

shows an example of challenges posed by the landfill conditions. This pump was clogged by materials in the gas well.

Figure 11. Material Clogging Landfill Gas Well Dewatering Pump

Such short maintenance intervals require significant resources to maintain operations of the pumps. The City and SCS are working to identify ways to improve pump reliability. As a first step SCS reached out to the pump manufacturers to identify ways to improve pump reliability. Site visits by representatives of the pump manufacturers are anticipated during the month of December.

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 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 November 16, 2022, SCS collected leachate samples from three Dual Phase LFG-EWs (EW-59, EW-61, and EW-65). Pumps were not running at the time of sample collection in the following wells: EW-49, EW-50, EW-52, EW-53, EW-54, EW-55, EW-57, EW-58, EW-60, EW-62, EW-63, EW-64, EW-67, and EW-68. There were no pumps in EW-51 and EW-56 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 in Richmond, Virginia for analysis. The laboratory's Virginia Division of Consolidated Laboratory Services certifications are provided on the certificate of analysis included in Appendix F. The samples were analyzed for the following parameters utilizing the following analytical methods.

Table 5. Laboratory Analytical Parameters and Methods

Parameter	Analytical Method
Ammonia	EPA 350.1 R2.0
Biological Oxygen Demand	SM22 5210B-2021
Chemical Oxygen Demand	SM22 5220D-2011
Nitrate and Nitrite	SM22 4500-NO3F-2011
Total Kjeldahl Nitrogen	EPA 351.2 R2.0
Semi-Volatile Organic Compound: Anthracene	SW-846 Method 8270E
Total Metals: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, and Zinc	SW-846 Method 6010D
Total Metal: Mercury	SW-846 Method 7470A
Total Recoverable Phenolics	SW-846 Method 9065
Volatile Fatty Acids: Acetic Acid, Butyric Acid, Lactic Acid, Propionic Acid, and Pyruvic Acid	SW-846 Method 8015
Volatile Organic Compounds: Acetone, Benzene, Ethyl benzene, Methyl ethyl ketone, Tetrahydrofuran, Toluene, and Total Xylenes	SW-846 Method 8260D

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.

The trip blank detection for the November 2022 monitoring event is presented on **Table 6**. No method blank detects were identified for the November 2022 monitoring event. The laboratory analysis report for the November 2022 monitoring event trip blank is included in **Appendix F**. The November 2022 monitoring event laboratory QA/QC report, including the method blank results, are included in **Appendix F**.

Table 6. Quality Control Blank Detection Summary

QC Blank	Parameter	November 2022 Concentration (ug/L)	LOD (ug/L)	LOQ (ug/L)
Trip Blank	Acetone	9.36 J	7	10

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
QC = Quality Control
ug/L = micrograms per liter

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[5]. Data flagged with a "J" qualifier indicates the quantitation of the parameter is less than the laboratory's limit of quantitation but greater than the laboratory's limit of detection (LOD); thus, the concentration is considered estimated. Samples with parameter detections less than five times that of the trip blank, field blank, and/or method blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Samples with common laboratory contaminant parameter detections less than 10 times that of the trip blank, field blank, and/or method/laboratory blank detection but greater than the laboratory's LOD are flagged with a "B" qualifier. Data with a "B" qualifier are considered not validated as the detection may be anomalous due to cross-contamination during sampling, transportation of samples, or laboratory analysis. No leachate results were flagged with a "B" qualifier for the November 2022 monitoring event as acetone was not detected less than 10 times the concentration detected in the trip blank.

4.3.4 Laboratory Analytical Results

Parameter results for the November 2022 monitoring event are presented on **Table 7**. The associated certificate of analysis is included in **Appendix F**.

Table 7. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-59	EW-61	EW-65	LOD	LOQ
Parameter	Concentration				
Ammonia as N (mg/L)	**1560**	**1400**	**1380**	50	50
BOD (mg/L)	**15700**	**5860**	**5140**	0.2	2
COD (mg/L)	---	**9790**	**10800**	1000	1000
	23500	---	---	2000	2000

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

Table 7. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-59	EW-61	EW-65	LOD	LOQ
Parameter	Concentration				
Nitrate+Nitrite as N (mg/L)	**2.91**	**0.16**	**0.33**	0.1	0.1
Total Kjeldahl Nitrogen (mg/L)	---	**1290**	**1470**	20	50
	2110	---	---	50	125
Total Recoverable Phenolics (mg/L)	---	**5.68**	**3**	0.3	0.5
	28.8	---	---	0.75	1.25
SEMI-VOLATILE ORGANIC COMPOUND (ug/L)					
Anthracene	---	ND	ND	46.7	93.5
	ND D20	---	---	93.5	187
TOTAL METALS (mg/L)					
Arsenic	**0.863**	**0.464**	**1.3**	0.02	0.04
Barium	**0.871**	**0.485**	**0.36**	0.01	0.02
Cadmium	ND	ND	ND	0.004	0.008
Chromium	**0.208**	**0.112**	**0.354**	0.016	0.02
Copper	ND	ND	ND	0.016	0.02
Lead	ND	ND	**0.017 J**	0.012	0.02
Mercury	---	**0.00169**	**0.00053**	0.0004	0.0004
	ND	---	---	0.0008	0.0008
Nickel	**0.0866**	**0.1344**	**0.173**	0.014	0.02
Selenium	ND	ND	ND	0.08	0.1
Silver	ND	ND	ND	0.01	0.02
Zinc	ND	**0.032**	**0.694**	0.02	0.02
VOLATILE FATTY ACIDS mg/L					
Acetic Acid	---	**1600**	---	25	100
	3500	---	**150 J**	62	250
Butyric Acid	---	**430**	---	12	100
	830	---	ND	29	250
Lactic Acid	---	ND	---	11	100
	ND	---	ND	27	250
Propionic Acid	---	**620**	---	11	100
	1600	---	**73 J**	27	250
Pyruvic Acid	---	**46 J**	---	12	100
	98 J	---	ND	30	250
VOLATILE ORGANIC COMPOUNDS (ug/L)					
2-Butanone (MEK)	**3510**	---	**1140**	30	100
	---	**15600**	---	300	1000
Acetone	---	---	**4420**	70	100
	16100	**38300**	---	700	1000

Table 7. Monthly LFG-EW Leachate Monitoring Event Summary

Well ID	EW-59	EW-61	EW-65	LOD	LOQ
Parameter	Concentration				
Benzene	**7.4 J**	**2860**	**50.4**	4	10
Ethylbenzene	ND	**194**	**16.2**	4	10
Tetrahydrofuran	**309**	---	**176**	100	100
	---	**8530**	---	1000	1000
Toluene	ND	**214**	**32.8**	5	10
Xylenes, Total	ND	**185**	**37.8**	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 8 provides a comparison of the concentrations detected in the leachate from the LFG-EWs to concentrations commonly detected in mature landfills[6] (greater than 10 years old) for select parameters. The below table also provides data for leachate samples collected from the SWP588 Landfill's leachate collection system in July and November 2022.

Table 8. Leachate Composition Comparison

Parameter	Typical Mature Sanitary Landfill Leachate	SWP588 Dual Phase LFG-EWs Leachate	SWP588 Leachate Collection System
Ammonia as N (mg/L)	20 - 40	1380 - 1560	406
BOD (mg/L)	100 - 200	5140 - 15700	2170
COD (mg/L)	100 - 500	9790 - 23500	1760
pH (s.u.)	6.5 - 7.5	7.49 - 8.37	7.61

mg/L = milligrams per liter
ND = Not detected. Number shown in parenthesis is the laboratory's limit of detection.
s.u. = standard units

In addition to the parameters listed above, the concentrations of 2-butanone, acetone, benzene, and tetrahydrofuran detection in the leachate from the LFG-EWs is considered high for leachate from a sanitary landfill but typical for leachate from an ETLF and especially for samples collected from areas

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

of the landfill with very high temperatures. These high concentrations are the products of endothermic pyrolysis of the waste in an ETLF.

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. A copy of the plan is included in Appendix D.

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 November 8, 2022 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 NV5 (formerly Quantum Spatial) using aerial Light Detection and Ranging (Lidar) on October 7, 2022. A drawing depicting the October 7, 2022 topography is included as Sheet 3 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 15,500 cubic yards. During that same time period approximately 8,300 cubic yards of fill were placed on the landfill. Based on the initial survey date of October 7, 2022, which is before intermediate cover placement activities had completed, this material is likely intermediate cover material placed on the landfill. This resulted in a net volume decrease of approximately 7,200 cubic yards. Filling primarily occurred in the southwestern and southeastern perimeters of the landfill. Settlement was spread across the remainder of the landfill. A visual depiction of settlement and filling at the landfill during this time is depicted on Sheet 4 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 0.3 feet.

SCS will collect topographic data covering the landfill surface again in December using photogrammetric methods via UAV. This data will be compared to the data collected in November. This data is expected to allow for better analysis since filling is anticipated to be limited.

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. Figure 12 shows one of the as-built settlement plates.

The locations of the settlement plates were surveyed by the City's surveyor on November 14, 2022. The settlement plate locations are depicted on Sheet 4 in Appendix E. The surveyed coordinates[7] of the settlement plates are shown in Table 5.

Table 9. Settlement Plate Locations

Settlement Plate	Northing	Easting	Elevation
SP-1	3,397,885.9970	10,412,077.7840	1,834.4090
SP-2	3,397,806.1050	10,412,363.9700	1,810.5630
SP-3	3,397,787.2650	10,412,536.7840	1,783.6680
SP-4	3,398,250.4640	10,412,183.3200	1,817.4870
SP-5	3,398,256.2360	10,412,338.7660	1,800.7700
SP-6	3,398,249.1900	10,412,510.8610	1,777.6560
SP-7	3,398,737.9410	10,412,157.1360	1,828.6250
SP-8	3,398,678.9270	10,412,290.3630	1,807.3480
SP-9	3,398,673.3100	10,412,400.7300	1,785.8620
SP-10	3,399,080.3870	10,412,092.1310	1,840.2000
SP-11	3,399,216.0930	10,412,183.7830	1,816.3270
SP-12	3,399,381.9200	10,412,019.6720	1,810.6600

The settlement plates will be surveyed again during the month of December. The elevations surveyed will be compared to the elevations surveyed in November.

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

Figure 12. Settlement Plate after Installation

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 is being placed in accordance with 9VAC20-81-140(B)(1)(d).

On October 11, 2022 an employee of Golder Associates dug test holes which were observed by SCS' project manager Brandon King. All of the test holes indicated at least 12 inches of soil cover was in place on top of the waste. On October 20, 2022 SCS dug 7 additional test holes across the landfill confirm the depth of intermediate cover. The depth of intermediate cover exceeded 12 inches at all 7 locations. The approximate locations of the test holes are shown in Figure 13.

The intermediate cover soil will be supplemented as needed to address erosion or displacement of cover soil by other sources.

Figure 13. Intermediate Cover Depth Checks

Intermediate Cover Depth Check Locations

6.2 EVOH COVER SYSTEM DESIGN

SCS has begun the process of preparing a scope for the EVOH cover system design for submittal to the City.

6.3 EVOH COVER SYSTEM PROCUREMENT

City has initiated discussion with the EVOH cover vendor, Viaflex, to facilitate future procurement of an EVOH cover system.

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

SCS is reviewing the topography collected on October 7, 2022 to determine the scope of design needed to manage stormwater on the site. SCS is preparing an approach for submittal to the City that will address stormwater management design, construction, and stormwater sampling.

8.0 CEASE WASTE ACCEPTANCE

The City ceased acceptance of offsite waste at the Solid Waste Permit #588 landfill prior to September 12, 2022.

9.0 LONG-TERM PLAN

The City has begun reviewing available resources and the workload associated with long term maintenance and monitoring of the landfill.

10.0 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 November, those actions include:

- November 1st: New website dedicated to the Bristol Quarry Landfill launched
  - BristolVALandfill.org contains history about the landfill and recent odor issues, information about the ongoing remediation at the site, updates integrated with the Bristol, Virginia government website, and a place for website visitors to sign up for updates and submit questions they may have about ongoing activities at the quarry landfill.
  - The website includes a "Recent Updates" section where timely and weekly updates are posted. For the past month updates have focused on the ongoing borehole

drilling for thermocouple installation and the bidding process for the pilot sidewall odor mitigation system.

- November 1st: Informational Open House hosted at City Council Chambers

  - The City of Bristol, Virginia hosted an Open House where residents of Bristol, Virginia and Bristol, TN came to learn more about the ongoing remediation progress at the quarry landfill. Over 40 members of the public attended the hour and a half event.
  - In attendance to answer questions at the Open House were: City Manager Randy Eads, Mayor Anthony Farnum, Vice Mayor Neal Osborne, Senior Vice President with SCS Engineers Robert B. Gardner, PE, BCEE and Craig Benson, PhD, PE, DGE, BCEE, NAE. Two consultants with McGuireWoods Consulting, LLC on contract with the City of Bristol were also in attendance.

- November 21st: Email communication sent to the list of members of the public signed up through the Bristol, VA website, the new BristolVALandfill.org website, or at the Open House to receive information via email

  - Email directed recipients to BristolVALandfill.org and more specifically to the Frequently Asked Questions portion of the website. The FAQs came from questions submitted by residents over the past several weeks.

- Week of November 28th: Informational mail piece sent to over 16,000 households, which included residents in both Bristol, VA and Bristol, TN

  - Mail piece included information on recent issues at the landfill, remediation steps the City of Bristol is taking to address the issues and included the timeline of remedial activities planned for the next 12 months.

Appendix A

Surface Emissions Monitoring Summary Letters

November 9, 2022
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 – November 4, 2022
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 November 4, 2022. 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 included applicable areas 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. 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	139
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	39
Number of Exceedances[1]	10
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	10

Proposed corrective actions at these locations involved addition and compaction of low permeability soil as well as vacuum adjustments to adjacent vertical wells. In some select locations a foam seal or a well bore skirt may be installed. 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 performed corrective actions including wellhead vacuum adjustments and addition of soil cover prior to this event at locations that previously exhibited elevated methane concentrations[2].

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	11/4/22 Event	11/4/22 Event Result	Comments
EW-46	10/10/22	N/A	Pass	Requires 30-Day Retest
EW-67	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-56	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-57	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-41	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-53	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-40	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-51	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-68	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-42	8/12/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-52	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-39	8/19/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-48	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-47	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-54	9/2/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-35	9/9/22	N/A	Fail	Subject to 1960(c)(4)(v)

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

Sincerely,

Lauren E. Harris
Associate Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/LEH/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Crystal Bazyk, VDEQ
Charles Warren, SCS Engineers

Encl. Surface Emissions Monitoring Results
Bristol SEM Route Drawing

November 16, 2022
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 – November 14, 2022
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 November 14, 2022. 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. Note that this monitoring was originally scheduled to be completed on November 11, 2022, but was rescheduled due to weather.

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 included applicable areas 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, with the exception at the surface cover penetration of EW-56, where monitoring was unable to be performed due to Health and Safety concerns. 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	139
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	39
Number of Exceedances[1]	11
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	11

Proposed corrective actions at these locations involved addition and compaction of low permeability soil as well as vacuum adjustments to adjacent vertical wells. In some select locations a foam seal or a well bore skirt may be installed. 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 performed corrective actions including wellhead vacuum adjustments and addition of soil cover prior to this event at locations that previously exhibited elevated methane concentrations[2].

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	11/14/22 Event	11/14/22 Event Result	Comments
EW-46	10/10/22	30-Day Retest	Pass	No Further Action
EW-50	11/4/22	10-Day Retest	Pass	Requires 30-Day Retest
EW-55	11/4/22	10-Day Retest	Fail	Requires 2nd 10-Day Retest
EW-67	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-56	8/4/22	N/A	N/A	Subject to 1960(c)(4)(v)
EW-57	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-41	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-53	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-40	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-51	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-68	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-42	8/12/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-52	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-39	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-48	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-47	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-54	9/2/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-35	9/9/22	N/A	Fail	Subject to 1960(c)(4)(v)

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

Sincerely,

Charles J. Warren
Associate Project Professional
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/LEH/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Crystal Bazyk, 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 - NOVEMBER 14, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	4.3 PPM	OK			Start Serpentine Route
2	211.0 PPM	OK			
3	14.9 PPM	OK			
4	13.8 PPM	OK			
5	74.9 PPM	OK			
6	68.4 PPM	OK			
7	10.1 PPM	OK			
8	6.9 PPM	OK			
9	4.3 PPM	OK			
10	5.2 PPM	OK			
11	15.0 PPM	OK			
12	4.5 PPM	OK			
13	16.1 PPM	OK			
14	62.7 PPM	OK			
15	16.6 PPM	OK			
16	24.9 PPM	OK			
17	32.4 PPM	OK			
18	31.3 PPM	OK			
19	15.8 PPM	OK			
20	24.8 PPM	OK			
21	11.1 PPM	OK			
22	8.8 PPM	OK			
23	7.4 PPM	OK			
24	61.6 PPM	OK			
25	20.6 PPM	OK			
26	29.0 PPM	OK			
27	26.1 PPM	OK			
28	18.2 PPM	OK			
29	6.6 PPM	OK			
30	81.0 PPM	OK			
31	13.0 PPM	OK			
32	26.5 PPM	OK			
33	6.3 PPM	OK			
34	3.2 PPM	OK			
35	21.8 PPM	OK			
36	14.0 PPM	OK			
37	11.5 PPM	OK			
38	29.7 PPM	OK			
39	14.9 PPM	OK			
40	79.7 PPM	OK			
41	11.8 PPM	OK			
42	17.3 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 14, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	11.3 PPM	OK			
44	13.8 PPM	OK			
45	30.6 PPM	OK			
46	72.8 PPM	OK			
47	1.9 PPM	OK			
48	1.2 PPM	OK			
49	7.1 PPM	OK			
50	77.1 PPM	OK			
51	45.9 PPM	OK			
52	9.5 PPM	OK			
53	5.5 PPM	OK			
54	20.5 PPM	OK			
55	54.3 PPM	OK			
56	3.9 PPM	OK			
57	2.6 PPM	OK			
58	3.7 PPM	OK			
59	18.6 PPM	OK			
60	74.7 PPM	OK			
61	39.1 PPM	OK			
62	5.5 PPM	OK			
63	7.6 PPM	OK			
64	12.3 PPM	OK			
65	8.2 PPM	OK			
66	33.9 PPM	OK			
67	46.4 PPM	OK			
68	385.0 PPM	OK			
69	8.4 PPM	OK			
70	47.3 PPM	OK			
71	13.6 PPM	OK			
72	82.3 PPM	OK			
73	23.5 PPM	OK			
74	27.0 PPM	OK			
75	29.9 PPM	OK			
76	41.0 PPM	OK			
77	77.1 PPM	OK			
78	5.3 PPM	OK			
79	145.0 PPM	OK			
80	66.9 PPM	OK			
81	22.1 PPM	OK			
82	34.3 PPM	OK			
83	2.4 PPM	OK			
84	5.0 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 14, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	4.2 PPM	OK			
86	2.2 PPM	OK			
87	5.6 PPM	OK			
88	1.2 PPM	OK			
89	3.2 PPM	OK			
90	3.2 PPM	OK			
91	91.9 PPM	OK			
92	0.7 PPM	OK			
93	1.9 PPM	OK			
94	257.0 PPM	OK			
95	9.5 PPM	OK			
96	96.9 PPM	OK			
97	14.8 PPM	OK			
98	40.1 PPM	OK			
99	27.0 PPM	OK			
100	201.0 PPM	OK			End Serpentine Route
101	2054.0 PPM	HIGH_ALRM	36.59916	-82.14769	EW-35
102	16500.0 PPM	HIGH_ALRM	36.59900	-82.14750	EW-52
103	167.0 PPM	OK			EW-60
104	265.0 PPM	OK			EW-48
105	9.7 PPM	OK			EW-61
106	4.5 PPM	OK			EW-36
107	253.0 PPM	OK			EW-34
108	3.0 PPM	OK			EW-65
109	72.9 PPM	OK			EW-50
110	7310.0 PPM	HIGH_ALRM	36.59869	-82.14711	EW-55
111	917.0 PPM	HIGH_ALRM	36.59865	-82.14743	EW-54
112	89.0 PPM	OK			EW-47
113	3043.0 PPM	HIGH_ALRM	36.59864	-82.14774	EW-67
114	23.5 PPM	OK			EW-46
115	2150.0 PPM	HIGH_ALRM	36.59842	-82.14735	EW-66
116	8.7 PPM	OK			EW-58
117	936.0 PPM	HIGH_ALRM	36.59815	-82.14750	EW-57
118	195.0 PPM	OK			EW-59
119	127.0 PPM	OK			EW-41
120	8074.0 PPM	HIGH_ALRM	36.59841	-82.14793	EW-53
121	722.0 PPM	HIGH_ALRM	36.59864	-82.14796	EW-40
122	858.0 PPM	HIGH_ALRM	36.59884	-82.14786	EW-51
123	2012.0 PPM	HIGH_ALRM	36.59906	-82.14800	EW-39
124	121.0 PPM	OK			EW-68
125	40.1 PPM	OK			EW-38

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 14, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	8.8 PPM	OK			EW-49
127	2.3 PPM	OK			EW-31R
128	5.3 PPM	OK			EW-37
129	22.2 PPM	OK			EW-64
130	270.0 PPM	OK			EW-30R
131	221.0 PPM	OK			EW-63
132	87.7 PPM	OK			EW-42
133	249.0 PPM	OK			EW-33R
134	296.0 PPM	OK			EW-62
135	210.0 PPM	OK			EW-29R
136	23.3 PPM	OK			EW-25
137	34.0 PPM	OK			EW-24
138	5.9 PPM	OK			EW-32
139	159.0 PPM	OK			EW-32R

Number of locations sampled:	139
Number of exceedance locations:	11

NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 139 represent SEM at Pipe Penetrations
Weather Conditions: Sunny 40°F Wind: SE - 10 MPH

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

11/14/2022	9:52	ZERO	0.0 PPM
11/14/2022	9:54	SPAN	501.0 PPM

Background Reading:

11/14/2022	11:06	Upwind	1.2 PPM
11/14/2022	11:08	Downwind	4.3 PPM

NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 139 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON NOVEMBER 14, 2022

EXISTING CITY OF BRISTOL LANDFILL (PERMIT No. 498)

CITY OF BRISTOL PARCEL 425– A–4 DB 333 PG 430

LEGEND

- SEM ROUTE
- GW–61 GAS WELL
- 79 EXCEEDANCE LOCATION
- 75 MONITORING ROUTE ENDPOINT

NO.	REVISION	DATE

SHEET TITLE: **BRISTOL SEM ROUTE**

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

CLIENT: **BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2125 SHAKESVILLE RD
BRISTOL, VA

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.	DWN. BY:	Q/A R/W BY:
02218206.04	LSN	APP. BY:
DSN. BY:	CHK. BY:	
LSN	DBK	

CADD FILE:

DATE: 11/14/22

SCALE: AS SHOWN

DRAWING NO. 1 of 1

November 22, 2022
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 – November 18, 2022
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 November 18, 2022. 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 included applicable areas 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, 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	145
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	45
Number of Exceedances[1]	6
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	6

Proposed corrective actions at these locations involved addition and compaction of low permeability soil as well as vacuum adjustments to adjacent vertical wells. In some select locations a foam seal or a well bore skirt may be installed. 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 performed corrective actions including wellhead vacuum adjustments and addition of soil cover prior to this event at locations that previously exhibited elevated methane concentrations[2].

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	11/18/22 Event	11/18/22 Event Result	Comments
EW-50	11/4/22	N/A	Pass	Requires 30-Day Retest
EW-55	11/4/22	2nd 10-Day Retest	Fail	Subject to 1960(c)(4)(v)
EW-66	11/14/22	10-Day Retest	Pass	Requires 30-Day Retest
EW-67	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-56	8/4/22	N/A	N/A	Subject to 1960(c)(4)(v)
EW-57	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-41	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-53	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-40	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-51	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-68	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-42	8/12/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-52	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-39	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-48	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-47	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-54	9/2/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-35	9/9/22	N/A	Fail	Subject to 1960(c)(4)(v)

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

Sincerely,

Charles J. Warren
Project Manager
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/LEH/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Crystal Bazyk, 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 - NOVEMBER 18, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	16.0 PPM	OK			Start Serpentine Route
2	9.1 PPM	OK			
3	176.0 PPM	OK			
4	123.0 PPM	OK			
5	11.7 PPM	OK			
6	12.8 PPM	OK			
7	20.4 PPM	OK			
8	113.0 PPM	OK			
9	8.8 PPM	OK			
10	4.7 PPM	OK			
11	6.6 PPM	OK			
12	7.5 PPM	OK			
13	4.0 PPM	OK			
14	16.4 PPM	OK			
15	3.7 PPM	OK			
16	28.9 PPM	OK			
17	11.2 PPM	OK			
18	7.6 PPM	OK			
19	3.9 PPM	OK			
20	28.0 PPM	OK			
21	15.5 PPM	OK			
22	46.8 PPM	OK			
23	3.7 PPM	OK			
24	3.2 PPM	OK			
25	9.7 PPM	OK			
26	19.7 PPM	OK			
27	9.4 PPM	OK			
28	5.3 PPM	OK			
29	30.0 PPM	OK			
30	7.2 PPM	OK			
31	43.6 PPM	OK			
32	39.8 PPM	OK			
33	39.8 PPM	OK			
34	13.0 PPM	OK			
35	16.3 PPM	OK			
36	11.2 PPM	OK			
37	23.3 PPM	OK			
38	131.0 PPM	OK			
39	77.8 PPM	OK			
40	91.2 PPM	OK			
41	60.4 PPM	OK			
42	13.0 PPM	OK			

SCS ENGINEERS

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 18, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	7.5 PPM	OK			
44	5.1 PPM	OK			
45	4.4 PPM	OK			
46	7.7 PPM	OK			
47	21.6 PPM	OK			
48	6.0 PPM	OK			
49	21.8 PPM	OK			
50	8.0 PPM	OK			
51	14.0 PPM	OK			
52	8.5 PPM	OK			
53	6.6 PPM	OK			
54	14.1 PPM	OK			
55	7.7 PPM	OK			
56	18.1 PPM	OK			
57	7.8 PPM	OK			
58	7.4 PPM	OK			
59	10.9 PPM	OK			
60	13.2 PPM	OK			
61	11.2 PPM	OK			
62	3.8 PPM	OK			
63	6.7 PPM	OK			
64	5.0 PPM	OK			
65	37.3 PPM	OK			
66	5.5 PPM	OK			
67	16.1 PPM	OK			
68	42.8 PPM	OK			
69	73.5 PPM	OK			
70	10.4 PPM	OK			
71	9.2 PPM	OK			
72	4.6 PPM	OK			
73	15.7 PPM	OK			
74	39.3 PPM	OK			
75	27.4 PPM	OK			
76	7.3 PPM	OK			
77	216.0 PPM	OK			
78	17.3 PPM	OK			
79	14.0 PPM	OK			
80	37.5 PPM	OK			
81	92.5 PPM	OK			
82	175.0 PPM	OK			
83	29.2 PPM	OK			
84	3.6 PPM	OK			

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 18, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	3.0 PPM	OK			
86	2.7 PPM	OK			
87	5.7 PPM	OK			
88	3.3 PPM	OK			
89	4.3 PPM	OK			
90	8.9 PPM	OK			
91	14.4 PPM	OK			
92	15.4 PPM	OK			
93	62.5 PPM	OK			
94	84.5 PPM	OK			
95	83.4 PPM	OK			
96	140.0 PPM	OK			
97	7.7 PPM	OK			
98	143.0 PPM	OK			
99	5.0 PPM	OK			
100	3.9 PPM	OK			End Serpentine Route
101	3366.0 PPM	HIGH_ALRM	36.59916	-82.14769	EW-35
102	415.0 PPM	OK			EW-52
103	33.9 PPM	OK			TP-4
104	441.0 PPM	OK			EW-60
105	154.0 PPM	OK			EW-48
106	27.4 PPM	OK			EW-61
107	6.1 PPM	OK			EW-36
108	155.0 PPM	OK			EW-34
109	60.9 PPM	OK			EW-50
110	3319.0 PPM	HIGH_ALRM	36.59864	-82.14774	EW-67
111	158.0 PPM	OK			EW-47
112	8548.0 PPM	HIGH_ALRM	36.59865	-82.14743	EW-54
113	15700.0 PPM	HIGH_ALRM	36.59869	-82.14711	EW-55
114	69.4 PPM	OK			TP-2
115	7.9 PPM	OK			EW-46
116	192.0 PPM	OK			EW-66
117	10.1 PPM	OK			EW-58
118	200.0 PPM	OK			EW-57
119	63.4 PPM	OK			TP-1
120	8.2 PPM	OK			EW-59
121	1178.0 PPM	HIGH_ALRM	36.59789	-82.14790	EW-56
122	184.0 PPM	OK			EW-41
123	51.5 PPM	OK			EW-53
124	168.0 PPM	OK			EW-40
125	329.0 PPM	OK			TP-3

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 18, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	290.0 PPM	OK			EW-51
127	241.0 PPM	OK			EW-39
128	6.2 PPM	OK			TP-5
129	6307.0 PPM	HIGH_ALRM	36.59912	-82.14790	EW-68
130	127.0 PPM	OK			EW-38
131	4.7 PPM	OK			EW-49
132	8.2 PPM	OK			EW-31R
133	6.9 PPM	OK			EW-65
134	5.5 PPM	OK			EW-37
135	5.6 PPM	OK			EW-64
136	5.5 PPM	OK			EW-30R
137	4.7 PPM	OK			EW-63
138	16.5 PPM	OK			EW-42
139	5.7 PPM	OK			EW-33R
140	5.5 PPM	OK			EW-62
141	2.0 PPM	OK			EW-29R
142	53.1 PPM	OK			EW-25
143	24.5 PPM	OK			EW-24
144	4.1 PPM	OK			EW-32
145	7.3 PPM	OK			EW-32R

Number of locations sampled:	145
Number of exceedance locations:	6

NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 145 represent SEM at Pipe Penetrations
Weather Conditions: Sunny 35°F Wind: W - 15 MPH

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

11/18/2022	9:46	ZERO	0.0 PPM
11/18/2022	9:47	SPAN	501.0 PPM

Background Reading:

11/18/2022	9:54	Upwind	4.1 PPM
11/18/2022	9:58	Downwind	1.9 PPM

NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 145 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON NOVEMBER 18, 2022

(PERMIT No. 221)

EXISTING CITY OF BRISTOL LANDFILL (PERMIT No. 498)

CITY OF BRISTOL
PARCEL 425– A–4
DB 333 PG 430

GW-68 GW-35 GW-54 GW-55 GW-67 GW-56

LEGEND

- SEM ROUTE
- GW-61 GAS WELL
- 79 EXCEEDANCE LOCATION
- 75 MONITORING ROUTE ENDPOINT

NO.	REVISION	DATE

SHEET TITLE: **BRISTOL SEM ROUTE**

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

CLIENT: **BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2125 SHAKESVILLE RD
BRISTOL, VA

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.	DWN. BY:	Q/A R/W BY:
02218206.04	LSN	
DSN. BY:	CHK. BY:	APP. BY:
LSN	DBK	

CADD FILE:

DATE: 11/18/22

SCALE: AS SHOWN

DRAWING NO. 1 of 1

November 30, 2022
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 – November 23, 2022
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 November 23, 2022. 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 included applicable areas 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, 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	145
Number of Points in Serpentine Route	100
Number of Points at Surface Cover Penetrations	45
Number of Exceedances[1]	10
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	10

Proposed corrective actions at these locations involved addition and compaction of low permeability soil as well as vacuum adjustments to adjacent vertical wells. In some select locations a foam seal or a well bore skirt may be installed. 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 performed corrective actions including wellhead vacuum adjustments 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	11/28/22 Event	11/28/22 Event Result	Comments
EW-50	11/4/22	N/A	Pass	Requires 30-Day Retest
EW-66	11/14/22	2nd 10-Day Retest	Fail	Requires 30-Day Retest
EW-67	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-56	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-57	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-41	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-53	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-40	8/4/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-51	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-68	8/4/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-42	8/12/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-52	8/19/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-39	8/19/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-48	8/26/22	N/A	Pass	Subject to 1960(c)(4)(v)
EW-47	8/26/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-54	9/2/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-35	9/9/22	N/A	Fail	Subject to 1960(c)(4)(v)
EW-55	11/4/22	N/A	Pass	Subject to 1960(c)(4)(v)

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

Sincerely,

Charles J. Warren
Project Manager
SCS Engineers

Lucas S. Nachman
Project Professional
SCS Engineers

LSN/LEH/cjw

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Crystal Bazyk, 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 - NOVEMBER 23, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
1	4.1 PPM	OK			Start Serpentine Route
2	61.3 PPM	OK			
3	23.1 PPM	OK			
4	25.5 PPM	OK			
5	26.4 PPM	OK			
6	46.2 PPM	OK			
7	28.9 PPM	OK			
8	17.5 PPM	OK			
9	17.1 PPM	OK			
10	12.5 PPM	OK			
11	27.7 PPM	OK			
12	142.0 PPM	OK			
13	89.5 PPM	OK			
14	26.9 PPM	OK			
15	56.2 PPM	OK			
16	423.0 PPM	OK			
17	60.7 PPM	OK			
18	46.9 PPM	OK			
19	183.0 PPM	OK			
20	124.0 PPM	OK			
21	222.0 PPM	OK			
22	174.0 PPM	OK			
23	214.0 PPM	OK			
24	200.0 PPM	OK			
25	264.0 PPM	OK			
26	240.0 PPM	OK			
27	225.0 PPM	OK			
28	171.0 PPM	OK			
29	182.0 PPM	OK			
30	317.0 PPM	OK			
31	199.0 PPM	OK			
32	65.4 PPM	OK			
33	88.4 PPM	OK			
34	95.5 PPM	OK			
35	56.9 PPM	OK			
36	41.6 PPM	OK			
37	309.0 PPM	OK			
38	166.0 PPM	OK			
39	323.0 PPM	OK			
40	114.0 PPM	OK			
41	266.0 PPM	OK			
42	348.0 PPM	OK			

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 23, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
43	20.8 PPM	OK			
44	21.6 PPM	OK			
45	3.7 PPM	OK			
46	4.2 PPM	OK			
47	5.6 PPM	OK			
48	2.0 PPM	OK			
49	2.4 PPM	OK			
50	2.7 PPM	OK			
51	24.9 PPM	OK			
52	11.7 PPM	OK			
53	14.3 PPM	OK			
54	27.1 PPM	OK			
55	26.0 PPM	OK			
56	37.6 PPM	OK			
57	25.6 PPM	OK			
58	49.0 PPM	OK			
59	7.8 PPM	OK			
60	11.2 PPM	OK			
61	26.7 PPM	OK			
62	104.0 PPM	OK			
63	3.4 PPM	OK			
64	26.1 PPM	OK			
65	10.3 PPM	OK			
66	6.9 PPM	OK			
67	10.3 PPM	OK			
68	8.8 PPM	OK			
69	41.8 PPM	OK			
70	3.2 PPM	OK			
71	19.7 PPM	OK			
72	329.0 PPM	OK			
73	145.0 PPM	OK			
74	81.1 PPM	OK			
75	104.0 PPM	OK			
76	87.7 PPM	OK			
77	1.7 PPM	OK			
78	2.1 PPM	OK			
79	53.7 PPM	OK			
80	23.9 PPM	OK			
81	2.1 PPM	OK			
82	140.0 PPM	OK			
83	94.5 PPM	OK			
84	48.2 PPM	OK			

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 23, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
85	28.6 PPM	OK			
86	5.8 PPM	OK			
87	4.0 PPM	OK			
88	4.7 PPM	OK			
89	3.1 PPM	OK			
90	2.8 PPM	OK			
91	44.0 PPM	OK			
92	22.2 PPM	OK			
93	10.4 PPM	OK			
94	6.4 PPM	OK			
95	121.0 PPM	OK			
96	12.0 PPM	OK			
97	48.2 PPM	OK			
98	4.1 PPM	OK			
99	82.4 PPM	OK			
100	293.0 PPM	OK			End Serpentine Route
101	5624.0 PPM	HIGH_ALRM	36.59916	-82.14769	EW-35
102	1118.0 PPM	HIGH_ALRM	36.59900	-82.14750	EW-52
103	66.9 PPM	OK			TP-4
104	990.0 PPM	HIGH_ALRM	36.59931	-82.14742	EW-60
105	173.0 PPM	OK			EW-48
106	77.8 PPM	OK			EW-61
107	7.4 PPM	OK			EW-36
108	356.0 PPM	OK			EW-34
109	97.8 PPM	OK			EW-50
110	4341.0 PPM	HIGH_ALRM	36.59864	-82.14774	EW-67
111	13600.0 PPM	HIGH_ALRM	36.59879	-82.14763	EW-47
112	1467.0 PPM	HIGH_ALRM	36.59865	-82.14743	EW-54
113	202.0 PPM	OK			EW-55
114	6.4 PPM	OK			TP-2
115	5.6 PPM	OK			EW-46
116	789.0 PPM	HIGH_ALRM	36.59842	-82.14735	EW-66
117	194.0 PPM	OK			EW-58
118	274.0 PPM	OK			EW-57
119	75.8 PPM	OK			TP-1
120	221.0 PPM	OK			EW-59
121	3077.0 PPM	HIGH_ALRM	36.59789	-82.14790	EW-56
122	455.0 PPM	OK			EW-41
123	3739.0 PPM	HIGH_ALRM	36.59841	-82.14793	EW-53
124	2296.0 PPM	HIGH_ALRM	36.59864	-82.14796	EW-40
125	153.0 PPM	OK			TP-3

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

EXHIBIT 1. SURFACE EMISSIONS MONITORING RESULTS
WEEKLY MONITORING EVENT - NOVEMBER 23, 2022
BRISTOL INTEGRATED SOLID WASTE FACILITY - BRISTOL, VIRGINIA

ID #	Methane Concentration	Compliance	GPS Coordinates Lat.	Long.	Comments
126	350.0 PPM	OK			EW-51
127	23.4 PPM	OK			EW-39
128	32.1 PPM	OK			TP-5
129	125.0 PPM	OK			EW-68
130	372.0 PPM	OK			EW-38
131	17.6 PPM	OK			EW-49
132	5.7 PPM	OK			EW-31R
133	5.3 PPM	OK			EW-65
134	3.2 PPM	OK			EW-37
135	2.1 PPM	OK			EW-64
136	2.1 PPM	OK			EW-30R
137	3.8 PPM	OK			EW-63
138	152.0 PPM	OK			EW-42
139	2.6 PPM	OK			EW-33R
140	1.7 PPM	OK			EW-62
141	9.4 PPM	OK			EW-29R
142	130.0 PPM	OK			EW-25
143	81.4 PPM	OK			EW-24
144	5.5 PPM	OK			EW-32
145	1.8 PPM	OK			EW-32R

Number of locations sampled:	145
Number of exceedance locations:	10

NOTES:
Points 1 through 100 represent serpentine SEM route.
Points 101 through 145 represent SEM at Pipe Penetrations
Weather Conditions: Sunny 50°F Wind: 0 MPH

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

11/23/2022	9:34	ZERO	0.1 PPM
11/23/2022	9:36	SPAN	499.0 PPM

Background Reading:

11/23/2022	9:40	Upwind	2.9 PPM
11/23/2022	9:53	Downwind	8.1 PPM

NOTES:

1. TAGS 1 – 100 REPRESENT SERPENTINE SEM ROUTE
2. TAGS 101 – 145 REPRESENT SEM AT PIPE PENETRATIONS
3. WEEKLY SEM PERFORMED ON NOVEMBER 23, 2022

(PERMIT No. 221)

EXISTING CITY OF BRISTOL LANDFILL (PERMIT No. 498)

CITY OF BRISTOL
PARCEL 425– A–4
DB 333 PG 430

GW-60
GW-35
GW-52
GW-47
GW-54
GW-40
GW-67
GW-53
GW-66
GW-56

LEGEND

	SEM ROUTE
GW-61	GAS WELL
79	EXCEEDANCE LOCATION
75	MONITORING ROUTE ENDPOINT

NO.	REVISION	DATE

SHEET TITLE: **BRISTOL SEM ROUTE**

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

CLIENT: **BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2125 SHAKESVILLE RD
BRISTOL, VA

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.	DWN. BY:	Q/A R/W BY:
02218206.04	LSN	
DSN. BY:	CHK. BY:	APP. BY:
LSN	DBK	

CADD FILE:

DATE: 11/23/22

SCALE: AS SHOWN

DRAWING NO. 1 of 1

Appendix B

SCS-FS October Summary Report

December 6, 2022
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 for Gas Collection Control System (GCCS) at the City of Bristol Landfill, Bristol, Virginia November 2022

Dear Mr. Martin:

SCS Field Services (SCS-FS) visited the Bristol Landfill during the month of November, 2022, for routine and non-routine monitoring and maintenance on the 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. Wellfield Monitoring Data
Attachment 2. Exceedance Detail Report
Attachment 3. Enhanced Monitoring Record Form and Analytical Results
Attachment 4. Daily Logs

GCCS SITE ACTIVITES

On November 3, SCS-FS visited the landfill for routine and non-routine monitoring. The Flare was operating and the Ingenco Power Plant was not operating. SCS-FS monitored the blower/flare station (BFS), the extraction wells (EW) in Cell 221 and 588 and the North and South Leachate Clean-outs.

On November 4, SCS-FS conducted non-routine recheck enhanced monitoring and carbon monoxide (CO) analysis (enhanced monitoring) for compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) at wells EW-31R, -46, -51, -52, -53, and -67. SCS-FS sampled for CO at EW-46, -51, -52, and -67, and submitted the samples to Enthalpy Analytical for analysis. Analytical results are included in Attachment 3. SCS-FS monitored the north and south leachate clean outs.

Between November 7 and 23, SCS-FS made the following repairs and system modifications:

- Installed new 8- and 12-inch header piping and air and force main piping to the south leachate clean-outs, and installed new QED wellheads.
- Installed remote temperature probes on selected wells in Cell 588.

On November 10, SCS-FS monitored the BFS and conducted non-routine enhanced monitoring at EW-37, -46, -51, and -52. Samples were collected for CO at EW-37, -46, and -67, and submitted to Enthalpy Analytical for analysis. A sample could not be collected from EW-52 due to liquid at the

sampling port. SCS-FS conducted non-routine recheck monitoring at EW-3 for a pressure exceedance and monitored a slight vacuum.

On November 17, SCS-FS monitored the BFS and conducted non-routine enhanced monitoring and CO analysis sampling at EW-37, -52, and -67, and submitted the samples to Enthalpy Analytical for analysis. SCS-FS conducted non-routine recheck monitoring for the pressure exceedance at EW-3 and noted that vacuum was present.

On November 29th, SCS-FS monitored the BFS and conducted non-routine enhanced monitoring and CO analysis sampling at EW-67 and submitted to Enthalpy Analytical for analysis. SCS-FS monitored GW-19 in Cell 498 since vacuum was restored earlier in the month and noted the valve is set at 10% open.

RECOMMENDATIONS

SCS-FS has the following recommendations based on observations made during our site visits:

- Continue adding cover to the landfill surface and realigning the header so liquid drains to condensate sumps.
- Maintain spare pumps in working order.
- Connect wells GW-20 and -21 in permit area 498 to the active extraction system.

SCS-FS appreciates the opportunity to provide our services. Please contact either of the undersigned if you have any questions or need additional information.

Very truly yours,

Mike Gibbons
Project Manager
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

Wellfield Monitoring Data

Bristol Virginia Landfill - Blower/Flare Data - 11/01/2022 to 11/30/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Static Pressure ("H2O)	Temp (F)	Flow (scfm)	Comments
Blower Inlet	11/3/2022 10:18	33.8	32.1	4.7	29.4	-24.9	0.0	0	
Blower Inlet	11/3/2022 10:21	31.8	31.2	4.9	32.1	-24.1	82.1	315	
Blower Inlet	11/3/2022 14:35	32.6	31.9	4.4	31.1	-24.2	85.0	280	
Blower Inlet	11/4/2022 08:35	0.0	0.2	20.9	78.9	0.1	61.8	0	
Blower Inlet	11/4/2022 08:38	50.0	35.1	0.0	14.9	-0.1	62.1	0	
Blower Inlet	11/4/2022 08:42	33.9	33.6	4.1	28.4	-24.3	62.3	328	
Blower Inlet	11/10/2022 10:14	31.9	30.4	5.2	32.5	-24.3	74.8	298	
Blower Inlet	11/10/2022 12:03	32.0	30.1	5.0	32.9	-24.3	82.2	290	
Blower Inlet	11/17/2022 10:33	33.2	32.0	5.0	29.8	-24.1	69.9	300	
Blower Inlet	11/17/2022 11:34	35.4	32.7	5.2	26.7	-24.2	67.5	298	
Blower Inlet	11/29/2022 10:37	34.0	32.1	4.5	29.4	-24.3	50.0	360	
Blower Inlet	11/29/2022 11:34	35.2	32.2	4.6	28.0	-24.2	74.4	360	
Blower Outlet	11/3/2022 10:21	33.7	31.6	4.8	29.9	0.2	0.0	0	
L221 Header	11/3/2022 10:18	25.8	19.7	10.2	44.3	-24.0	83.6	315	

Technician/Weather

Field Technician	Record Date	Ambient Temp	Barometric Pressure	Wind Speed	Wind Direction	General Weather			
Will Fabre	11/3/2022	53	28.32	12	NE	Partly cloudy			
Ryan Seymour	11/4/2022	62	28.27	3	NE	Partly cloudy			
Ryan Seymour	11/10/2022	60	28.24	3	NE	Partly cloudy			
Ryan Seymour	11/17/2022	33	28.23	7	SE	Partly cloudy			
Ryan Seymour	11/29/2022	50	28.15	4	SE	Partly cloudy			

Bristol Virginia Landfill - Extraction Well Data - 11/01/2022 to 11/30/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Temp (F)	Flow (scfm)	System Pressure ("H20)	Comments
01	11/3/2022 11:09	56.2	39.1	1.0	3.7	-22.8	-22.9	65.1		-22.5	
02	11/3/2022 11:00	31.3	20.2	11.0	37.5	-15.3	-15.3	79.0		-23.3	
03	11/3/2022 10:56	59.4	40.3	0.2	0.1	0.5	-0.3	76.3		-23.4	
03	11/10/2022 10:22	59.1	40.9	0.0	0.0	-0.1	0.0	71.2	5.7	-10.6	Adjustment Up
03	11/17/2022 10:38	31.0	23.0	9.6	36.4	-2.6	-2.6	49.6	50.9	-13.4	
04	11/3/2022 10:40	49.9	37.1	2.6	10.4	-6.2	-6.2	74.1		-23.3	
05	11/3/2022 10:36	55.3	40.8	0.9	3.0	-23.1	-22.7	69.5		-23.2	
06	11/3/2022 11:56	61.5	37.5	0.0	1.0	1.3	-1.9	89.8		-23.3	
06	11/3/2022 11:58	54.5	34.3	2.1	9.1	-5.9	-6.4	66.3		-23.3	Adjusted up
07	11/3/2022 11:45	56.1	39.0	0.5	4.4	-10.2	-10.1	74.5		-23.4	
07	11/3/2022 11:50	56.2	39.5	0.4	3.9	-11.7	-11.7	87.8		-23.4	Adjusted up
08	11/3/2022 11:41	31.2	20.7	10.0	38.1	-0.1	-0.1	84.2		-23.5	
09	11/3/2022 11:31	53.0	36.9	1.7	8.4	-22.7	-22.7	85.4		-23.6	
10	11/3/2022 11:27	56.4	42.0	0.4	1.2	-6.1	-6.1	82.9	140.6	-23.4	
11	11/3/2022 11:22	22.3	15.8	12.9	49.0	-23.2	-23.2	77.5		-23.3	
12	11/3/2022 11:13	32.7	23.3	9.1	34.9	-23.7	-23.6	71.6	21.7	-23.5	
13	11/3/2022 10:49	54.2	38.6	0.9	6.3	-23.4	-23.3	65.1		-23.4	
14	11/3/2022 11:36	42.3	25.7	6.3	25.7	-2.4	-2.4	77.4		-23.4	
15	11/3/2022 11:04	57.8	39.3	0.7	2.2	-23.4	-23.5	73.7		-23.4	
16	11/3/2022 12:14	33.6	35.0	0.6	30.8	-11.9	-11.9	80.4		-23.4	
17	11/3/2022 12:17	44.2	36.2	0.7	18.9	-18.0	-17.9	77.0		-23.3	
18	11/3/2022 13:26	44.9	37.0	1.1	17.0	-12.0	-11.9	79.7	3.0	-23.3	
19	11/29/2022 10:43	3.0	11.7	6.2	79.1	-13.9	-13.8	70.0			Needs system pressure port
23	11/3/2022 12:05	0.2	0.3	20.6	78.9	-2.1	-2.0	65.1		-23.5	
23	11/3/2022 12:10	0.1	0.3	20.8	78.8	-2.7	-2.7	61.1		-23.4	
24	11/3/2022 13:55	5.5	4.9	17.8	71.8	-2.3	-2.3	89.0	4.3	-20.7	
25	11/3/2022 13:58	0.3	8.3	18.9	72.5	-1.1	-1.0	93.3	3.2	-20.8	
29	11/3/2022 14:05	58.9	38.3	0.2	2.6	-9.2	-9.2	117.6	191.7	-11.2	
30R	11/3/2022 14:02	23.1	19.4	6.7	50.8	-1.6	-1.6	130.6	74.4	-12.7	
31R	11/3/2022 13:35	19.5	44.5	3.4	32.6	-16.6	-17.7	164.6		-17.5	
31R	11/4/2022 09:09	18.5	20.2	7.3	54.0	-0.7	-0.7	131.0		-0.7	
32	11/3/2022 14:21	54.7	39.3	0.3	5.7	-5.6	-5.4	86.7	150.0	-9.7	
32	11/10/2022 12:28	58.0	41.6	0.4	0.0	-4.8	-4.8	72.0		-7.9	Slightly Open
33	11/3/2022 14:24	43.2	36.0	0.5	20.3	-2.2	-2.2	76.9	96.0	-2.2	
34	11/3/2022 13:47	29.1	68.9	0.8	1.2	-13.2	-6.4	123.1		-12.8	

Bristol Virginia Landfill - Extraction Well Data - 11/01/2022 to 11/30/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Temp (F)	Flow (scfm)	System Pressure ("H20)	Comments
35	11/3/2022 12:31	53.9	32.1	4.3	9.7	-1.5	-3.4	90.2		-14.6	
36	11/3/2022 13:05	41.7	22.5	8.1	27.7	-19.5	-19.4	85.8		-19.4	
37	11/10/2022 10:40	18.2	24.0	7.1	50.7	-13.8	-13.8	147.6		-14.1	Fully Open
37	11/17/2022 10:50	18.4	24.7	7.3	49.6	-8.9	-8.9	147.2	161.2	-8.8	Fully Open
38	11/3/2022 13:13	52.5	32.3	4.0	11.2	-6.5	-6.4	87.4	161.6	-6.3	
39	11/3/2022 12:41	59.4	40.3	0.3	0.0	-15.9	-14.7	111.3		-15.3	
40	11/3/2022 11:51	58.1	41.7	0.2	0.0	-2.3	-2.2	128.9	10.7	-13.8	
41	11/3/2022 11:40	57.7	41.8	0.5	0.0	-16.4	-16.3	117.4		-15.8	
42	11/3/2022 14:10	53.4	37.0	1.7	7.9	-1.6	-1.5	123.8	75.1	-1.5	
46	11/3/2022 11:34	51.8	41.1	0.5	6.6	-7.7	-7.6	153.8		-15.8	
46	11/4/2022 09:24	47.0	41.4	1.1	10.5	-7.3	-7.3	149.7		-16.9	
46	11/10/2022 10:59	57.6	39.6	0.9	1.9	-5.6	-5.6	150.2		-17.0	Slightly Open
47	11/3/2022 12:06	59.0	40.8	0.2	0.0	-18.3	-17.9	134.6	58.4	-17.6	
48	11/3/2022 12:56	45.2	28.8	6.2	19.8	-18.4	-18.3	80.7		-17.6	
49	11/3/2022 13:30	36.2	30.4	3.6	29.8	-6.4	-6.9	135.2		-16.5	
50	11/3/2022 13:10	40.8	26.2	6.0	27.0	-1.2	-0.9	126.9	12.5	-17.8	
51	11/3/2022 12:36	50.5	44.7	2.5	2.3	-16.5	-15.9	164.4		-16.6	
51	11/4/2022 09:17	43.1	43.8	2.0	11.1	-15.5	-16.6	160.2		-17.5	
51	11/10/2022 10:53	20.4	49.2	6.6	23.8	-10.9	-11.9	117.5		-12.2	Fully Open
52	11/3/2022 12:24	31.8	60.8	1.3	6.1	-14.8	-14.7	168.0		-16.7	
52	11/4/2022 09:34	26.8	61.1	0.7	11.4	-14.5	-14.5	164.3		-17.8	
52	11/17/2022 10:55	8.5	12.4	17.0	62.1	-17.5	-17.5	108.6	42.6	-17.5	Fully Open
53	11/3/2022 11:47	54.5	45.3	0.2	0.0	-12.2	-12.3	151.4	3.2	-15.7	
53	11/4/2022 09:29	52.2	44.3	3.5	0.0	-12.8	-12.8	134.6	3.1	-16.7	
53	11/10/2022 11:10	56.0	43.0	1.0	0.0	-13.8	-13.7	141.7	5.6	-16.5	Slightly Open
54	11/3/2022 12:12	36.4	63.6	0.0	0.0	-10.6	-10.8	137.5		-17.6	
55	11/3/2022 12:16	26.3	18.5	9.4	45.8	-16.2	-16.1	118.0		-16.1	
56	11/3/2022 10:55	53.4	46.2	0.3	0.1	-16.4	-16.4	143.7	12.6	-16.9	80% Open
57	11/3/2022 11:05	50.6	49.2	0.2	0.0	-17.2	-17.1	144.3		-17.3	
58	11/3/2022 11:11	36.4	45.5	1.1	17.0	-3.9	-3.9	128.0	6.7	-16.9	
59	11/3/2022 10:59	34.4	37.6	4.4	23.6	-1.7	-1.6	126.8	23.2	-18.4	
60	11/3/2022 12:49	48.8	33.2	0.6	17.4	-14.8	-14.4	136.4	27.2	-17.2	
61	11/3/2022 13:00	24.5	16.8	11.3	47.4	-0.7	-0.7	109.3	45.0	-0.6	
62	11/3/2022 14:19	18.9	15.7	9.8	55.6	-1.1	-1.0	130.4	33.2	-1.0	
63	11/3/2022 14:05	26.8	24.0	5.8	43.4	-0.5	-0.4	130.4	0.0	-0.4	

Bristol Virginia Landfill - Extraction Well Data - 11/01/2022 to 11/30/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H20)	Temp (F)	Flow (scfm)	System Pressure ("H20)	Comments
64	11/3/2022 13:57	28.8	26.9	6.1	38.2	-0.3	-0.4	144.4	34.5	-13.5	
65	11/3/2022 13:41	5.2	9.1	12.3	73.4	-8.7	-1.9	138.7	27.0	-1.8	
66	11/3/2022 11:18	49.2	48.7	0.1	2.0	-2.5	-2.5	140.6	92.9	-16.7	
67	11/3/2022 12:00	37.4	62.6	0.0	0.0	-18.3	-17.6	154.1	57.0	-17.9	
67	11/4/2022 09:20	33.7	59.5	0.3	6.5	-18.6	-18.5	145.4	7.5	-18.5	
67	11/10/2022 10:55	38.1	61.9	0.0	0.0	-16.6	-16.6	169.3		-18.4	Slightly Open
67	11/17/2022 10:59	32.2	62.0	0.1	5.7	-19.0	-19.0	154.6		-20.0	
67	11/29/2022 11:14	36.3	63.7	0.0	0.0	-19.4	-19.4	153.7	41.3	-19.8	Fully Open
68	11/3/2022 12:44	58.1	36.5	2.6	2.8	-6.3	-6.4	131.1	7.0	-15.5	
HC01	11/3/2022 11:27	8.3	5.6	17.4	68.7	-16.9	-15.7	75.3	0.0		

Bristol Virginia Landfill - North and South Leachate Clean-outs Data - 11/01/2022 to 11/30/2022

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Static Pressure ("H2O)	Temp (F)	Comments
LC01	11/3/2022 12:34	51.0	46.5	0.6	1.9	-14.3	88.2	
LC02	11/3/2022 12:36	38.9	38.9	4.7	17.5	-14.9	88.3	
LC03	11/3/2022 12:41	45.6	38.3	2.8	13.3	-15.8	80.6	
LC04	11/3/2022 12:44	38.7	33.1	5.1	23.1	-15.9	78.2	
LC05	11/3/2022 12:45	48.2	47.0	0.8	4.0	-20.8	85.6	
LC06	11/3/2022 12:47	40.0	32.6	5.4	22.0	-18.6	87.7	
LC08	11/3/2022 12:48	46.6	43.8	1.1	8.5	-16.8	88.4	
LC09	11/3/2022 12:50	49.0	43.2	1.6	6.2	-16.1	88.1	
LC10	11/3/2022 12:52	50.0	44.3	1.2	4.5	-15.8	87.6	
NC01	11/3/2022 12:59	0.5	0.3	21.3	77.9	-13.8	86.4	
NC02	11/3/2022 13:01	0.8	0.5	21.2	77.5	-14.0	90.2	
NC03	11/3/2022 13:04	2.3	1.4	20.5	75.8	-14.0	91.0	
NC03	11/3/2022 13:18	2.0	1.4	19.9	76.7	-14.2	92.3	
NC04	11/3/2022 13:09	0.1	0.0	21.1	78.8	-13.9	96.2	
NC05	11/3/2022 13:10	0.1	0.0	21.1	78.8	-13.9	94.5	
NC06	11/3/2022 13:11	0.1	0.0	21.1	78.8	-13.8	94.3	
NC07	11/3/2022 13:14	33.9	18.1	6.7	41.3	-14.2	95.7	
NC08	11/3/2022 13:15	45.0	24.9	1.7	28.4	-14.1	94.6	
NC09	11/3/2022 13:16	45.4	24.6	3.1	26.9	-14.1	93.0	
NC10	11/3/2022 13:05	1.4	0.7	20.8	77.1	-14.0	92.7	
NC10	11/3/2022 13:07	1.3	0.7	20.7	77.3	-14.0	96.1	

Attachment 2

Exceedance Detail Report

Exceedance Detail Report
Date Range: 11/01/2022 to 11/30/2022

Report Date: 12/06/2022
Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	Effective Date	% 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)							
BRTLGW06				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
06		11/3/2022 11:56:53 AM	0			61.5	0	89.8	74.7	1.27	-1.87	Comments:,,,,,,,	N		good reading on 11/03/2022	11/7/2022	11/17/2022	3/2/2023
06		11/3/2022 11:58:35 AM	0			54.5	2.1	66.3	64.8	-5.91	-6.35	Comments:,,,,,,,	N	1				
BRTLGW03				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
03		11/3/2022 10:56:11 AM	0			59.4	0.2	76.3	70.4	0.52	-0.29	Comments:,,,,,,,	N		good reading on 11/17/2022	11/7/2022	11/17/2022	3/2/2023
03		11/10/2022 10:22:56 AM	7			59.1	0	71.2	70.9	-0.06	0.00	see notes,,,,,,,	N		good reading on 11/17/2022			
03		11/17/2022 10:38:00 AM	7			31	9.6	49.6	48.7	-2.62	-2.58	Comments:,,,,,,,	N	15				
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	heck,,,,,,	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	Comments:No 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	Comments:Adjustment,,,,,,,	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	246				
BRTLG31R				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
31R		11/3/2022 1:35:36 PM	0			19.5	3.4	164.6	164.6	-16.56	-17.66	Comments:,,,,,,,	N		good reading on 11/04/2022	11/7/2022	11/17/2022	3/2/2023
31R		11/4/2022 9:09:24 AM	1			18.5	7.3	131	131.3	-0.70	-0.73	Comments:,,,,,,,	N	2				
BRTLGW51				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
51		11/3/2022 12:36:50 PM	0			50.5	2.5	164.4	164.4	-16.52	-15.88	Comments:,,,,,,,	N		good reading on 11/10/2022	11/7/2022	11/17/2022	3/2/2023
51		11/4/2022 9:17:47 AM	1			43.1	2	160.2	161.1	-15.49	-16.59	Comments:,,,,,,,	N		good reading on 11/10/2022			
51		11/10/2022 10:53:02 AM	6			20.4	6.6	117.5	117.6	-10.93	-11.87	Comments:Fully Open,,,,,,,	N	8				
BRTLGW52				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**

Exceedance Detail Report
Date Range: 11/01/2022 to 11/30/2022

Report Date: 12/06/2022
Site Name: Bristol Virginia Landfill

Point ID	Point Name	Record Date	Days Between Readings	Point Status	Effective Date	% 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)							
52		11/3/2022 12:24:59 PM	0			31.8	1.3	168	168.1	-14.84	-14.68	Comments:,,,,,,,	N		good reading on 11/17/2022	11/7/2022	11/17/2022	3/2/2023
52		11/4/2022 9:34:18 AM	1			26.8	0.7	164.3	164.6	-14.45	-14.48	Comments:,,,,,,,	N		good reading on 11/17/2022			
52		11/17/2022 10:55:47 AM	13			8.5	17	108.6	108.9	-17.47	-17.45	Comments:Fully Open,,,,,,,	N	15				
BRTLGW53				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
53		11/3/2022 11:47:18 AM	0			54.5	0.2	151.4	151.3	-12.18	-12.33	Comments:,,,,,,,	N		good reading on 11/04/2022	11/7/2022	11/17/2022	3/2/2023
53		11/4/2022 9:29:13 AM	1			52.2	3.5	134.6	140.6	-12.77	-12.78	Comments:,,,,,,,	N	2				
BRTLGW67				**Active**				**>= 145**	**>= 145**	**>= 0**	**>= 0**				**NESHAP AAAA HOV 145**	**5 Day**	**15 Day**	**120 Day**
67		11/3/2022 12:00:51 PM	0			37.4	0	154.1	151.4	-18.32	-17.60	Comments:,,,,,,,	N			11/7/2022	11/17/2022	3/2/2023
67		11/4/2022 9:20:55 AM	1			33.7	0.3	145.4	147.8	-18.58	-18.53	Comments:,,,,,,,	N					
67		11/10/2022 10:55:52 AM	6			38.1	0	169.3	169.3	-16.62	-16.60	Open,,,,,,,	N					
67		11/17/2022 10:59:01 AM	7			32.2	0.1	154.6	155	-19.00	-18.98	Comments:,,,,,,,	N					
67		11/29/2022 11:14:00 AM	12			36.3	0	153.7	154.6	-19.40	-19.42	Comments:Fully Open,,,,,,,	N	28				

Points with Exceedances	8
Closed Exceedances	6
Open Exceedances	2

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	
52	2022-11-04 09:30:00	26.8	0.7	164.3	yes	yes	yes	no	no	no	no	Visible steam from ground
46	2022-11-04 09:20:00	47.0	1.1	149.7	yes	yes	yes	no	no	no	no	Visible steam from ground
67	2022-11-04 09:24:00	33.7	0.3	145.4	yes	yes	yes	no	no	no	no	Visible steam from ground
51	2022-11-04 09:36:00	43.1	2.0	160.2	yes	yes	no	no	no	no	no	N/A

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	2022-11-10 11:11:00	18.2	7.1	147.6	yes	yes	no	no	no	no	no	Just for a description this well is coming out of the side of the hill. Almost horizontal
67	2022-11-10 11:15:00	38.1	0	169	yes	yes	no	no	no	no	no	This well just got foam sprayed around the base
46	2022-11-10 11:25:00	57.6	0.9	150.2	yes	yes	no	no	no	no	no	This well is almost laying over as well. And it's right next HC01 they are practically on top of each other

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	
52	2022-11-10 11:30:00	N/A	N/A	N/A	no	no	no	no	no	no	no	Could not get read or sample due to liquid in sample

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	
67	2022-11-17 10:47:00	32.2	0.1	154.6	yes	yes	yes	no	no	no	no	Collected Sample
52	2022-11-17 10:55:00	8.5	12.4	108.6	no	no	no	no	no	no	no	Well is under 145 degrees no sample needed.
37	2022-11-17 10:50:00	18.4	7.3	147.2	yes	yes	no	no	no	no	no	Collected sample

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	
67	2022-11-29 11:13:00	36.3	0	153.7	yes	yes	no	no	no	no	no	Collected Sample.

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

Certificate of Analysis

Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 8, 2022 10:20
	4330 Lewis Road, Suite 1	Date Issued:	November 15, 2022 16:30
	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 11/08/2022 10:20. 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 22K0376

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	4330 Lewis Road, Suite 1	Date Issued:	November 15, 2022 16:30
	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
51	22K0376-01	Air	11/04/2022 09:17	11/08/2022 10:20
67	22K0376-02	Air	11/04/2022 09:22	11/08/2022 10:20
46	22K0376-03	Air	11/04/2022 09:26	11/08/2022 10:20
52	22K0376-04	Air	11/04/2022 09:34	11/08/2022 10:20

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 51

Sample ID: 22K0376-01

Sample Matrix: Air

Sampled: 11/4/2022 09:17

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00184::11073

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 7.0

Receipt Vacuum(in Hg): 7.0

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	539	90.0	90.0		9	1	11/10/22 11:33	DFH

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Certificate of Analysis

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:	November 8, 2022 10:20 November 15, 2022 16:30
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 67

Sample ID: 22K0376-02

Sample Matrix: Air

Sampled: 11/4/2022 09:22

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00318::12384

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.4

Receipt Vacuum(in Hg): 5.4

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	780	90.0	90.0		9	1	11/10/22 12:28	DFH

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 46

Sample ID: 22K0376-03

Sample Matrix: Air

Sampled: 11/4/2022 09:26

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00018::12410

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.4

Receipt Vacuum(in Hg): 5.4

Flow Controller Type: Passive

Flow Controller ID:

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

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	11/10/22 13:22	DFH

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Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 52

Sample ID: 22K0376-04

Sample Matrix: Air

Sampled: 11/4/2022 09:34

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00022::12413

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.2

Receipt Vacuum(in Hg): 5.2

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	438	90.0	90.0		9	1	11/10/22 14:15	DFH

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
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**	
22K0376-01	1.00 mL / 1.00 mL	ALT-145	BFK0429	SFK0410	AG00026
22K0376-02	1.00 mL / 1.00 mL	ALT-145	BFK0429	SFK0410	AG00026
22K0376-03	1.00 mL / 1.00 mL	ALT-145	BFK0429	SFK0410	AG00026
22K0376-04	1.00 mL / 1.00 mL	ALT-145	BFK0429	SFK0410	AG00026

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Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
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 BFK0429 - No Prep VOC GC Air										
Blank (BFK0429-BLK1)					Prepared & Analyzed: 11/10/2022					
Carbon Monoxide	<	10.0	ppmv							
LCS (BFK0429-BS1)					Prepared & Analyzed: 11/10/2022					
Methane	4180	500	ppmv	5000		83.6	0-200			
Carbon dioxide	4200	500	ppmv	5000		83.9	0-200			
Oxygen (O2)	5150	500	ppmv	5000		103	0-200			
Nitrogen (N2)	5530	2000	ppmv	5000		111	0-200			
Hydrogen (H2)	5780	200	ppmv	5100		113	0-200			
Carbon Monoxide	4890	10	ppmv	5000		97.7	0-200			
Duplicate (BFK0429-DUP1)				**Source: 22K0368-01**	Prepared & Analyzed: 11/10/2022					
Methane	146000	4500	ppmv		146000			0.00197	25	
Carbon dioxide	107000	4500	ppmv		106000			0.960	25	
Oxygen (O2)	139000	4500	ppmv		139000			0.108	25	
Hydrogen (H2)	3420	1800	ppmv		3250			5.15	25	
Nitrogen (N2)	501000	18000	ppmv		501000			0.0638	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK0429-DUP2)				**Source: 22K0457-02**	Prepared & Analyzed: 11/10/2022					
Methane	374000	4500	ppmv		377000			0.948	25	
Carbon dioxide	299000	4500	ppmv		302000			1.07	25	
Oxygen (O2)	44200	4500	ppmv		44700			1.09	25	
Nitrogen (N2)	194000	18000	ppmv		196000			1.07	25	
Hydrogen (H2)	21000	1800	ppmv		21100			0.375	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK0429-DUP3)				**Source: 22K0318-01**	Prepared & Analyzed: 11/10/2022					
Methane	334000	4500	ppmv		334000			0.0518	25	
Carbon dioxide	336000	4500	ppmv		336000			0.0183	25	
Oxygen (O2)	31500	4500	ppmv		31500			0.0566	25	
Nitrogen (N2)	234000	18000	ppmv		234000			0.152	25	
Hydrogen (H2)	<	1800	ppmv		<1800			NA	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

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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:	November 8, 2022 10:20 November 15, 2022 16:30
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 BFK0429 - No Prep VOC GC Air										
Duplicate (BFK0429-DUP4)			**Source: 22K0376-01**		Prepared & Analyzed: 11/10/2022					
Methane	323000	4500	ppmv		323000			0.0737	25	
Carbon dioxide	421000	4500	ppmv		421000			0.00644	25	
Oxygen (O2)	24800	4500	ppmv		24800			0.157	25	
Hydrogen (H2)	85700	1800	ppmv		85000			0.826	25	
Nitrogen (N2)	88600	18000	ppmv		88600			0.0203	25	
Carbon Monoxide	539	90.0	ppmv		539			0.0668	25	
Duplicate (BFK0429-DUP5)			**Source: 22K0376-02**		Prepared & Analyzed: 11/10/2022					
Methane	200000	4500	ppmv		200000			0.118	25	
Carbon dioxide	585000	4500	ppmv		584000			0.190	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Hydrogen (H2)	180000	1800	ppmv		179000			0.678	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	787	90.0	ppmv		780			0.873	25	
Duplicate (BFK0429-DUP6)			**Source: 22K0376-03**		Prepared & Analyzed: 11/10/2022					
Methane	385000	4500	ppmv		385000			0.151	25	
Carbon dioxide	385000	4500	ppmv		385000			0.0942	25	
Oxygen (O2)	9910	4500	ppmv		9970			0.675	25	
Hydrogen (H2)	22700	1800	ppmv		22800			0.232	25	
Nitrogen (N2)	135000	18000	ppmv		136000			0.115	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK0429-DUP7)			**Source: 22K0376-04**		Prepared & Analyzed: 11/10/2022					
Methane	142000	4500	ppmv		143000			0.214	25	
Carbon dioxide	575000	4500	ppmv		574000			0.226	25	
Oxygen (O2)	10800	4500	ppmv		10800			0.105	25	
Nitrogen (N2)	40300	18000	ppmv		40300			0.0737	25	
Hydrogen (H2)	223000	1800	ppmv		223000			0.0272	25	
Carbon Monoxide	447	90.0	ppmv		438			1.99	25	

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
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 BFK0429 - No Prep VOC GC Air										
Duplicate (BFK0429-DUP8)				**Source: 22K0452-01**	Prepared & Analyzed: 11/10/2022					
Methane	325000	4500	ppmv		324000			0.381	25	
Carbon dioxide	308000	4500	ppmv		306000			0.774	25	
Oxygen (O2)	32300	4500	ppmv		32200			0.339	25	
Hydrogen (H2)	<	1800	ppmv		<1800			NA	25	
Nitrogen (N2)	277000	18000	ppmv		276000			0.405	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2022
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	11/30/2022

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Final Report

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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.

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formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 11/30/22

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	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 OT

063-22J-0032

	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		
1)	51			11073	1.4	221018-04	30	30 (7.0)	11/4/22	9:10AM	30	160	11/4/22	9:17 AM	4	160	LG	x		
2)	67			12384	1.4	221013-02	30	30 (5.4)	11/4/22	9:20AM	30	145	11/4/22	9:22 AM	5	145	LG	x		
3)	46			12410	1.4	221014-01	30	30 (5.4)	11/4/22	9:24 AM	30	149	11/4/22	9:26 AM	5	149	LG	x		
4)	52			12413	1.4	221018-04	30	30 (5.2)	11/4/22	9:30AM	30	164	11/4/22	9:34AM	6	164	LG	x		

310, 20.3°C, no ice, no seal

RELINQUISHED: Ryan Seymour	DATE / TIME	RECEIVED: FedEx E	DATE / TIME
RELINQUISHED: FedEx E	DATE / TIME	RECEIVED: mm 11/8/22 1020	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY

SCS Field Services 22K0376
Bristol
Recd: 11/08/2022 Due: 11/15/2022

v130325002

063-22J-0032-Bristol CO-COC

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0376

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 8, 2022 10:20 November 15, 2022 16:30
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

Samples Received at:	**20.30°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

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

Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 14, 2022 10:00
	4330 Lewis Road, Suite 1	Date Issued:	November 18, 2022 13:53
	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 11/14/2022 10:00. 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.

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 14, 2022 10:00
	4330 Lewis Road, Suite 1	Date Issued:	November 18, 2022 13:53
	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
37	22K0707-01	Air	11/10/2022 11:32	11/14/2022 10:00
67	22K0707-02	Air	11/10/2022 11:12	11/14/2022 10:00
46	22K0707-03	Air	11/10/2022 11:17	11/14/2022 10:00

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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: 22K0707-01

Sample Matrix: Air

Sampled: 11/10/2022 11:32

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00069::00130

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 6.8

Receipt Vacuum(in Hg): 6.8

Flow Controller Type: Passive

Flow Controller ID:

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

Analyte	ppmv Result	MDL	LOQ	Flag/Qual	Dilution	PF	Date/Time Analyzed	Analyst
Carbon Monoxide, as received	ND	90.0	90.0		9	1	11/17/22 14:14	DFH

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 67

Sample ID: 22K0707-02

Sample Matrix: Air

Sampled: 11/10/2022 11:12

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00105::262

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 6.8

Receipt Vacuum(in Hg): 6.8

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	1020	90.0	90.0		9	1	11/17/22 15:07	DFH

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Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 46

Sample ID: 22K0707-03

Sample Matrix: Air

Sampled: 11/10/2022 11:17

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00146::9203

Canister Size: 1.4

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 6.4

Receipt Vacuum(in Hg): 6.4

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	90.4	90.0	90.0		9	1	11/17/22 16:00	DFH

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Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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**	
22K0707-01	1.00 mL / 1.00 mL	ALT-145	BFK0717	SFK0664	AG00026
22K0707-02	1.00 mL / 1.00 mL	ALT-145	BFK0717	SFK0664	AG00026
22K0707-03	1.00 mL / 1.00 mL	ALT-145	BFK0717	SFK0664	AG00026

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Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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 BFK0717 - No Prep VOC GC Air										
Blank (BFK0717-BLK1)					Prepared & Analyzed: 11/17/2022					
Carbon Monoxide	<	10.0	ppmv							
LCS (BFK0717-BS1)					Prepared & Analyzed: 11/17/2022					
Methane	4270	500	ppmv	5000		85.4	0-200			
Carbon dioxide	4210	500	ppmv	5000		84.3	0-200			
Oxygen (O2)	5140	500	ppmv	5000		103	0-200			
Nitrogen (N2)	5510	2000	ppmv	5000		110	0-200			
Hydrogen (H2)	5950	200	ppmv	5100		117	0-200			
Carbon Monoxide	4940	10	ppmv	5000		98.7	0-200			
Duplicate (BFK0717-DUP1)			**Source: 22K0628-01**		Prepared & Analyzed: 11/17/2022					
Methane	244000	4500	ppmv		245000			0.256	25	
Carbon dioxide	516000	4500	ppmv		514000			0.522	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Hydrogen (H2)	154000	1800	ppmv		155000			0.269	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	808	90.0	ppmv		807			0.167	25	
Duplicate (BFK0717-DUP2)			**Source: 22K0628-02**		Prepared & Analyzed: 11/17/2022					
Methane	66700	4500	ppmv		67100			0.615	25	
Carbon dioxide	613000	4500	ppmv		611000			0.365	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	254000	1800	ppmv		255000			0.440	25	
Carbon Monoxide	994	90.0	ppmv		995			0.0633	25	
Duplicate (BFK0717-DUP3)			**Source: 22K0628-03**		Prepared & Analyzed: 11/17/2022					
Methane	68300	4500	ppmv		69000			1.01	25	
Carbon dioxide	630000	4500	ppmv		632000			0.365	25	
Oxygen (O2)	4550	4500	ppmv		4610			1.32	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	212000	1800	ppmv		212000			0.244	25	
Carbon Monoxide	1630	90.0	ppmv		1640			0.761	25	

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Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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 BFK0717 - No Prep VOC GC Air										
Duplicate (BFK0717-DUP4)				**Source: 22K0623-01**	Prepared & Analyzed: 11/17/2022					
Methane	251000	4500	ppmv		252000			0.730	25	
Carbon dioxide	526000	4500	ppmv		531000			0.871	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Hydrogen (H2)	133000	1800	ppmv		134000			0.980	25	
Nitrogen (N2)	22000	18000	ppmv		22200			0.999	25	
Carbon Monoxide	710	90.0	ppmv		710			0.0507	25	
Duplicate (BFK0717-DUP5)				**Source: 22K0623-02**	Prepared & Analyzed: 11/17/2022					
Methane	9980	4500	ppmv		10300			3.54	25	
Carbon dioxide	606000	4500	ppmv		604000			0.187	25	
Oxygen (O2)	15200	4500	ppmv		15300			0.446	25	
Hydrogen (H2)	221000	1800	ppmv		221000			0.144	25	
Nitrogen (N2)	56800	18000	ppmv		57000			0.470	25	
Carbon Monoxide	1730	90.0	ppmv		1740			0.529	25	
Duplicate (BFK0717-DUP6)				**Source: 22K0707-01**	Prepared & Analyzed: 11/17/2022					
Methane	137000	4500	ppmv		136000			0.583	25	
Carbon dioxide	222000	4500	ppmv		220000			0.820	25	
Oxygen (O2)	72300	4500	ppmv		71600			0.921	25	
Hydrogen (H2)	10300	1800	ppmv		10200			1.00	25	
Nitrogen (N2)	479000	18000	ppmv		475000			0.875	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK0717-DUP7)				**Source: 22K0707-02**	Prepared & Analyzed: 11/17/2022					
Methane	185000	4500	ppmv		185000			0.171	25	
Carbon dioxide	559000	4500	ppmv		559000			0.0420	25	
Oxygen (O2)	5950	4500	ppmv		5970			0.315	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	184000	1800	ppmv		186000			0.666	25	
Carbon Monoxide	1020	90.0	ppmv		1020			0.158	25	

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Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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 BFK0717 - No Prep VOC GC Air										
Duplicate (BFK0717-DUP8)				**Source: 22K0707-03**	Prepared & Analyzed: 11/17/2022					
Methane	359000	4500	ppmv		363000			1.02	25	
Carbon dioxide	363000	4500	ppmv		368000			1.26	25	
Oxygen (O2)	13400	4500	ppmv		13700			1.71	25	
Hydrogen (H2)	23000	1800	ppmv		23600			2.81	25	
Nitrogen (N2)	148000	18000	ppmv		150000			1.40	25	
Carbon Monoxide	<	90.0	ppmv		90.4			NA	25	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2022
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	11/30/2022

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
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.

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formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 12/9/2022

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	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

063-22K-0002

	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		
1)	37			130	1.4	221018-04	30	4 SF 6.8	11/10/22	11:30	30	147	11/10/22	11:32	4	147	LG	x		
2)	67			262	1.4	221018-04	30	4 SF 6.8	11/10/22	11:10	30	169.3	11/10/22	11:12	4	169.3	LG	x		
3)	46			9203	1.4	221018-04	30	4 SF 6.4	11/10/22	11:15	30	150	11/10/22	11:17	4	150	LG	x		
4)				10093	1.4	221026-01	30										LG	x		

20.2 3/0 no ice noseal

RELINQUISHED: Ryan Seymour 11/2022	RECEIVED: fedex DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: fedex DATE / TIME	RECEIVED: Yo 11/14/22 1000 DATE / TIME	Level I ☐	
RELINQUISHED: DATE / TIME	RECEIVED: DATE / TIME	Level II ☐	
		Level III ☐	
		Level IV ☐	

22K0707

SCS Field Services 22K0707
Bristol
Recd: 11/14/2022 Due: 11/21/2022
v130325002

ENTHALPY ANALYTICAL
formerly *Air, Water & Soil Laboratories*

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 12/9/2022

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	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:** Is sample from a chlorinated supply? YES NO	PWS I.D. #:
SAMPLER NAME (PRINT):	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: **10** **5 Days** **or** __ Day

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

063-22K-0002

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Canister Information: Size (L)	Canister Information: Cleaning Batch ID	Canister Information: LAB Outgoing Canister Vacuum (in Hg)	Canister Information: 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		
1)				10224	1.4	221026-03	30										LG	x		
2)				12408	1.4	221026-03	30										LG	x		
3)																				
4)																				

RELINQUISHED:	RECEIVED: DATE / TIME	QC Data Package	LAB USE ONLY
RELINQUISHED: DATE / TIME	RECEIVED: DATE / TIME	Level I ☐	
RELINQUISHED: DATE / TIME	RECEIVED: DATE / TIME	Level II ☐	
		Level III ☐	
		Level IV ☐	

22K0707

SCS Field Services **22K0707**
Bristol
Recd: 11/14/2022 **Due: 11/21/2022**

v130325002

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Certificate of Analysis

Final Report

Laboratory Order ID 22K0707

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 14, 2022 10:00 November 18, 2022 13:53
Submitted To:	Tom Lock	Project Number:	[none]
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

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

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 18, 2022 11:20
	4330 Lewis Road, Suite 1	Date Issued:	November 29, 2022 16:03
	Harrisburg, PA 17111	Project Number:	7220028.00
Submitted To:	MIke Byk	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 11/18/2022 11:20. 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.

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VELAP ID 460021

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 18, 2022 11:20
	4330 Lewis Road, Suite 1	Date Issued:	November 29, 2022 16:03
	Harrisburg, PA 17111	Project Number:	7220028.00
Submitted To:	MIke Byk	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
37	22K1038-01	Air	11/17/2022 10:55	11/18/2022 11:20
67	22K1038-02	Air	11/17/2022 11:02	11/18/2022 11:20

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 18, 2022 11:20 November 29, 2022 16:03
Submitted To:	MIke Byk	Project Number:	7220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 37

Sample ID: 22K1038-01

Sample Matrix: Air

Sampled: 11/17/2022 10:55

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00185::00278

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 5.0

Receipt Vacuum(in Hg): 5.0

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	103	90.0	90.0		9	1	11/29/22 10:07	DFH

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 18, 2022 11:20 November 29, 2022 16:03
Submitted To:	MIke Byk	Project Number:	7220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 67

Sample ID: 22K1038-02

Sample Matrix: Air

Sampled: 11/17/2022 11:02

Sample Type: LV

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00207::00300

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 6.2

Receipt Vacuum(in Hg): 6.2

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	825	90.0	90.0		9	1	11/29/22 11:00	DFH

ENTHALPY ANALYTICAL

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 18, 2022 11:20 November 29, 2022 16:03
Submitted To:	MIke Byk	Project Number:	7220028.00
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**	
22K1038-01	1.00 mL / 1.00 mL	ALT-145	BFK1004	SFK0990	AG00026
22K1038-02	1.00 mL / 1.00 mL	ALT-145	BFK1004	SFK0990	AG00026

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Submitted To:	MIke Byk	Project Number:	7220028.00
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 BFK1004 - No Prep VOC GC Air										
Blank (BFK1004-BLK1)					Prepared & Analyzed: 11/28/2022					
Carbon Monoxide	<	10.0	ppmv							
LCS (BFK1004-BS1)					Prepared & Analyzed: 11/28/2022					
Methane	4240	500	ppmv	5000		84.7	0-200			
Carbon dioxide	4030	500	ppmv	5000		80.5	0-200			
Oxygen (O2)	5080	500	ppmv	5000		102	0-200			
Nitrogen (N2)	5470	2000	ppmv	5000		109	0-200			
Hydrogen (H2)	5990	200	ppmv	5100		117	0-200			
Carbon Monoxide	4890	10	ppmv	5000		97.8	0-200			
Duplicate (BFK1004-DUP1)			**Source: 22K0962-01**		Prepared & Analyzed: 11/28/2022					
Methane	132000	4500	ppmv		133000			0.551	25	
Carbon dioxide	361000	4500	ppmv		360000			0.212	25	
Oxygen (O2)	37300	4500	ppmv		37400			0.408	25	
Nitrogen (N2)	132000	18000	ppmv		132000			0.000450	25	
Hydrogen (H2)	333000	1800	ppmv		334000			0.0112	25	
Carbon Monoxide	463	90.0	ppmv		464			0.117	25	
Duplicate (BFK1004-DUP2)			**Source: 22K0962-02**		Prepared & Analyzed: 11/28/2022					
Methane	305000	4500	ppmv		303000			0.413	25	
Carbon dioxide	307000	4500	ppmv		304000			0.925	25	
Oxygen (O2)	34200	4500	ppmv		34000			0.542	25	
Hydrogen (H2)	83000	1800	ppmv		82600			0.407	25	
Nitrogen (N2)	233000	18000	ppmv		232000			0.423	25	
Carbon Monoxide	98.4	90.0	ppmv		98.9			0.547	25	
Duplicate (BFK1004-DUP3)			**Source: 22K0962-03**		Prepared & Analyzed: 11/28/2022					
Methane	271000	4500	ppmv		273000			1.09	25	
Carbon dioxide	211000	4500	ppmv		212000			0.372	25	
Oxygen (O2)	82700	4500	ppmv		83600			1.02	25	
Nitrogen (N2)	345000	18000	ppmv		349000			1.04	25	
Hydrogen (H2)	9670	1800	ppmv		9950			2.88	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

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Submitted To:	MIke Byk	Project Number:	7220028.00
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 BFK1004 - No Prep VOC GC Air										
Duplicate (BFK1004-DUP4)				**Source: 22K0962-04**	Prepared & Analyzed: 11/28/2022					
Methane	455000	4500	ppmv		456000			0.312	25	
Carbon dioxide	375000	4500	ppmv		375000			0.175	25	
Oxygen (O2)	16100	4500	ppmv		16100			0.555	25	
Hydrogen (H2)	7530	1800	ppmv		7460			1.02	25	
Nitrogen (N2)	61800	18000	ppmv		61800			0.0100	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK1004-DUP5)				**Source: 22K0962-05**	Prepared & Analyzed: 11/28/2022					
Methane	342000	4500	ppmv		345000			0.724	25	
Carbon dioxide	397000	4500	ppmv		397000			0.0481	25	
Oxygen (O2)	5200	4500	ppmv		5280			1.63	25	
Nitrogen (N2)	19800	18000	ppmv		20100			1.75	25	
Hydrogen (H2)	191000	1800	ppmv		191000			0.251	25	
Carbon Monoxide	158	90.0	ppmv		162			2.14	25	
Duplicate (BFK1004-DUP6)				**Source: 22K0962-06**	Prepared & Analyzed: 11/28/2022					
Methane	305000	4500	ppmv		307000			0.640	25	
Carbon dioxide	328000	4500	ppmv		330000			0.661	25	
Oxygen (O2)	20500	4500	ppmv		20700			1.02	25	
Hydrogen (H2)	132000	1800	ppmv		131000			0.0206	25	
Nitrogen (N2)	153000	18000	ppmv		154000			0.869	25	
Carbon Monoxide	161	90.0	ppmv		162			0.612	25	
Duplicate (BFK1004-DUP7)				**Source: 22K0962-07**	Prepared & Analyzed: 11/28/2022					
Methane	364000	4500	ppmv		364000			0.0571	25	
Carbon dioxide	207000	4500	ppmv		207000			0.252	25	
Oxygen (O2)	5440	4500	ppmv		5610			3.13	25	
Hydrogen (H2)	90300	1800	ppmv		90100			0.204	25	
Nitrogen (N2)	263000	18000	ppmv		264000			0.279	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

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Submitted To:	MIke Byk	Project Number:	7220028.00
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 BFK1004 - No Prep VOC GC Air										
Duplicate (BFK1004-DUP8)			**Source: 22K0962-09**		Prepared & Analyzed: 11/28/2022					
Methane	394000	4500	ppmv		394000			0.0102	25	
Carbon dioxide	378000	4500	ppmv		377000			0.222	25	
Oxygen (O2)	4810	4500	ppmv		4830			0.521	25	
Hydrogen (H2)	111000	1800	ppmv		111000			0.295	25	
Nitrogen (N2)	58700	18000	ppmv		58600			0.169	25	
Carbon Monoxide	227	90.0	ppmv		224			1.16	25	
Duplicate (BFK1004-DUP9)			**Source: 22K0962-10**		Prepared & Analyzed: 11/28/2022					
Methane	380000	4500	ppmv		381000			0.276	25	
Carbon dioxide	350000	4500	ppmv		347000			0.821	25	
Oxygen (O2)	8840	4500	ppmv		8890			0.496	25	
Nitrogen (N2)	140000	18000	ppmv		141000			0.392	25	
Hydrogen (H2)	57200	1800	ppmv		57500			0.570	25	
Carbon Monoxide	93.6	90.0	ppmv		95.9			2.47	25	
Duplicate (BFK1004-DUPA)			**Source: 22K1054-02RE1**		Prepared & Analyzed: 11/29/2022					
Methane	292000	4500	ppmv		289000			0.883	25	
Carbon dioxide	447000	4500	ppmv		443000			0.920	25	
Oxygen (O2)	34100	4500	ppmv		34000			0.417	25	
Nitrogen (N2)	118000	18000	ppmv		118000			0.275	25	
Hydrogen (H2)	72500	1800	ppmv		71900			0.919	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	
Duplicate (BFK1004-DUPB)			**Source: 22K1038-01**		Prepared & Analyzed: 11/29/2022					
Methane	147000	4500	ppmv		148000			0.725	25	
Carbon dioxide	231000	4500	ppmv		233000			0.725	25	
Oxygen (O2)	73600	4500	ppmv		74200			0.703	25	
Hydrogen (H2)	13100	1800	ppmv		13000			0.698	25	
Nitrogen (N2)	482000	18000	ppmv		485000			0.671	25	
Carbon Monoxide	102	90.0	ppmv		103			0.615	25	

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Submitted To:	MIke Byk	Project Number:	7220028.00
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 BFK1004 - No Prep VOC GC Air										
Duplicate (BFK1004-DUPC)				**Source: 22K1038-02**	Prepared & Analyzed: 11/29/2022					
Methane	207000	4500	ppmv		207000			0.281	25	
Carbon dioxide	573000	4500	ppmv		570000			0.527	25	
Oxygen (O2)	5040	4500	ppmv		5000			0.779	25	
Hydrogen (H2)	168000	1800	ppmv		168000			0.0888	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	831	90.0	ppmv		825			0.717	25	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2022
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	11/30/2022

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Submitted To:	MIke Byk	Project Number:	7220028.00
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.

ENTHALPY ANALYTICAL
~~formerly Air, Water & Soil Laboratories~~

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 12/15/2022

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	INVOICE CONTACT:	SITE NAME: Bristol
ADDRESS:	INVOICE ADDRESS:	PROJECT NUMBER: 72202B.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-0008

	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		
	Barometric Pres. (In Hg):								Barometric Pres. (In Hg):											
1)	37			278	1.4	221109-02	30	~~-4~~ (5.0)	11/17/22	10:50 PM	30	147	11/17/22	10:55 AM	6	147	LG	x		
2)	67			300	1.4	221109-02	30	~~-7~~ (6.2)	11/17/22	10:59 AM	30	154	11/17/22	11:02 AM.	7	155	LG	x		
3)				✓ 324	1.4	221109-02	30										LG	x		
4)				✓ 11076	1.4	221109-02	30										LG	x		

20.2°C, 310, no ice, no seal

RELINQUISHED: Ryan Seymour	DATE / TIME 11/17/22 5:22 pm	RECEIVED: FedEx E	DATE / TIME
RELINQUISHED: FedEx E	DATE / TIME	RECEIVED: CSB	DATE / TIME 11/18/22 1120
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY
SCS Field Services 22K1038
Bristol
Recd: 11/18/2022 Due: 11/29/2022
v130325002

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 12/15/2022

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	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:** | Is sample from a chlorinated supply? YES NO | PWS I.D. #:

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

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

063-22K-0008

	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		
1)				12403 ✓	1.4	221109-02	30										LG	x		
2)				12415 ✓	1.4	221109-02	30										LG	x		
3)																				
4)																				

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY

SCS Field Services 22K1038
Bristol
Recd: 11/18/2022 Due: 11/29/2022

v130325002

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1038

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 18, 2022 11:20 November 29, 2022 16:03
Submitted To:	MIke Byk	Project Number:	7220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

Sample Conditions Checklist

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

Work Order Comments

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Certificate of Analysis

Final Report

Laboratory Order ID 22K1363

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 30, 2022 10:15
	4330 Lewis Road, Suite 1	Date Issued:	December 2, 2022 16:43
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	MIke Byk	Purchase Order:	07-SO04485
Client Site I.D.:	Bristol		

Enclosed are the results of analyses for samples received by the laboratory on 11/30/2022 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 22K1363

Client Name:	SCS Field Services - Harrisburg, PA	Date Received:	November 30, 2022 10:15
	4330 Lewis Road, Suite 1	Date Issued:	December 2, 2022 16:43
	Harrisburg, PA 17111	Project Number:	07220028.00
Submitted To:	MIke Byk	Purchase Order:	07-SO04485

Client Site I.D.: Bristol

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
67	22K1363-01	Air	11/29/2022 11:16	11/30/2022 10:15

ENTHALPY ANALYTICAL

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Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 30, 2022 10:15 December 2, 2022 16:43
Submitted To:	MIke Byk	Project Number:	07220028.00
Client Site I.D.:	Bristol	Purchase Order:	07-SO04485

ANALYTICAL RESULTS

Project Location:

Field Sample #: 67

Sample ID: 22K1363-01

Sample Matrix: Air

Sampled: 11/29/2022 11:16

Sample Type: LG

Sample Description/Location:

Sub Description/Location:

Canister ID: 063-00471::15034

Canister Size: 1.4L

Initial Vacuum(in Hg): 30

Final Vacuum(in Hg): 11.4

Receipt Vacuum(in Hg): 11.4

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	664	90.0	90.0		9	1	11/30/22 13:36	DFH

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Submitted To:	MIke Byk	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**	
22K1363-01	1.00 mL / 1.00 mL	ALT-145	BFK1120	SFK1048	AG00026

ENTHALPY ANALYTICAL

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Certificate of Analysis

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:	November 30, 2022 10:15 December 2, 2022 16:43
Submitted To:	MIke Byk	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 BFK1120 - No Prep VOC GC Air										
Blank (BFK1120-BLK1)					Prepared & Analyzed: 11/30/2022					
Carbon Monoxide	<	10.0	ppmv							
LCS (BFK1120-BS1)					Prepared & Analyzed: 11/30/2022					
Methane	4440	500	ppmv	5000		88.8	0-200			
Carbon dioxide	4170	500	ppmv	5000		83.4	0-200			
Oxygen (O2)	5130	500	ppmv	5000		103	0-200			
Nitrogen (N2)	5500	2000	ppmv	5000		110	0-200			
Hydrogen (H2)	5930	200	ppmv	5100		116	0-200			
Carbon Monoxide	4950	10	ppmv	5000		98.9	0-200			
Duplicate (BFK1120-DUP1)				**Source: 22K1199-01**	Prepared & Analyzed: 11/30/2022					
Methane	153000	4500	ppmv		155000			1.03	25	
Carbon dioxide	545000	4500	ppmv		551000			1.09	25	
Oxygen (O2)	25800	4500	ppmv		26100			1.20	25	
Nitrogen (N2)	99000	18000	ppmv		100000			0.990	25	
Hydrogen (H2)	150000	1800	ppmv		151000			0.756	25	
Carbon Monoxide	1280	90.0	ppmv		1290			0.867	25	
Duplicate (BFK1120-DUP2)				**Source: 22K1202-01**	Prepared & Analyzed: 11/30/2022					
Methane	262000	4500	ppmv		264000			0.900	25	
Carbon dioxide	531000	4500	ppmv		538000			1.28	25	
Oxygen (O2)	<	4500	ppmv		<4500			NA	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Hydrogen (H2)	163000	1800	ppmv		163000			0.320	25	
Carbon Monoxide	875	90.0	ppmv		885			1.09	25	
Duplicate (BFK1120-DUP3)				**Source: 22K1223-01**	Prepared & Analyzed: 11/30/2022					
Methane	484000	4500	ppmv		484000			0.0882	25	
Carbon dioxide	462000	4500	ppmv		461000			0.300	25	
Oxygen (O2)	5040	4500	ppmv		5100			1.22	25	
Hydrogen (H2)	11600	1800	ppmv		11600			0.0310	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	<	90.0	ppmv		<90.0			NA	25	

ENTHALPY ANALYTICAL

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

Certificate of Analysis

Final Report

Laboratory Order ID 22K1363

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 30, 2022 10:15 December 2, 2022 16:43
Submitted To:	MIke Byk	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 BFK1120 - No Prep VOC GC Air										
Duplicate (BFK1120-DUP4)				**Source: 22K1363-01**	Prepared & Analyzed: 11/30/2022					
Methane	196000	4500	ppmv		196000			0.220	25	
Carbon dioxide	577000	4500	ppmv		576000			0.123	25	
Oxygen (O2)	5790	4500	ppmv		5830			0.638	25	
Hydrogen (H2)	159000	1800	ppmv		158000			0.411	25	
Nitrogen (N2)	<	18000	ppmv		<18000			NA	25	
Carbon Monoxide	663	90.0	ppmv		664			0.190	25	

Certified Analytes included in this Report

Analyte	Certifications	Analyte	Certifications

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2022
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

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Certificate of Analysis

Final Report

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Submitted To:	MIke Byk	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.

ENTHALPY ANALYTICAL
formerly *Air, Water & Soil Laboratories*

AIR ANALYSIS
CHAIN OF CUSTODY

Equipment due 12/22/2022

COMPANY NAME: SCS Field Services - Harrisburg	INVOICE TO: **Same**	PROJECT NAME/Quote #: **Bristol**
CONTACT: **Mike Byk**	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:**	Is sample from a chlorinated supply? YES (NO)
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-0018

	CLIENT SAMPLE I.D.	Regulator Info: Flow Controller ID	Regulator Info: Cal Flow (mL/min)	Canister Information: Canister ID	Size (L)	Cleaning Batch ID	LAB Outgoing Canister Vacuum (in Hg)	LAB Receiving Canister Vacuum (in Hg)	Sampling Start Information: Barometric Pres. (in Hg): Start Date	Start Time (24hr clock)	Initial Canister Vacuum (in Hg)	Starting Sample Temp °F	Sampling Stop Information: Barometric Pres. (in Hg): Stop Date	Stop Time (24hr clock)	Final Canister Vacuum (in Hg)	Ending Sample Temp °F	Matrix (See Codes)	ANALYSIS: Alt 145 CO		
1)	67			15034	1.4	221110-02	30	SE 12/12/22 11.4	11/29/22	11:14A	30	153	11/29/22	11:16A	6	154	LG	x		
2)				15038	1.4	221110-02	30										LG	x		
3)				15039	1.4	221110-02	30										LG	x		
4)				15042	1.4	221110-03	30										LG	x		

20.4°C, 310, no ice, no seal

RELINQUISHED: Ryan Seymour	11/29/22	RECEIVED: FedEx E	DATE / TIME	QC Data Package: Level I ☐
RELINQUISHED: FedEx E	DATE / TIME 4:00pm.	RECEIVED: CSB	DATE / TIME 11/30/22 1015	Level II ☐
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME	Level III ☐ Level IV ☐

LAB USE ONLY

SCS Field Services 22K1363
Bristol
Recd: 11/30/2022 Due: 12/07/2022

v130325002

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

Certificate of Analysis

Final Report

Laboratory Order ID 22K1363

Client Name:	SCS Field Services - Harrisburg, PA 4330 Lewis Road, Suite 1 Harrisburg, PA 17111	Date Received: Date Issued:	November 30, 2022 10:15 December 2, 2022 16:43
Submitted To:	MIke Byk	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?	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**	11.3.22	**PROJECT NAME**	BRISTOL
TEMP	53	**WEATHER**	Partly cloudy	**B.P.**	28.15	**WIND**	12NE

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		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	35.1		

SUMMARY	
	Scs was on site for monthly monitoring, and blower flare check. Blower reading: CH4- 32.6% C02-31.9 % 02- 4.4 % BAL-31.3%
	I used the gam file that etools has onfile and it appears they don't have ID's for 19,20,21, and 22. These wells are not hooked up .

SCS FIELD SERVICES DAILY LOG

GW4- adjustment closed. (I believe the valve is broken, when you turn the head it starts lifting off the well.)
GW13- open if not fully open.
GW3-slightly open now. Started off blowing pressure at me. I made an adjustment open the vacuum went down.
GW15- the valve needs replaced the plate just turns. It wont adjust
GW3- fully open
GW2- fully open
GW1-fully open
GW12-fully open
GW11- needs to plate. It didn't seem to adjust when turned.
GW10- slightly open
GW9- fully open
GW14- fully open
GW8-the head is broke, cant make adjustment
GW7- increased vacuum -1
GW6- lowered vacuum. I think the head needs replaced though it wasn't functioning properly
GW23- no gas. Turned up vacuum
NORTH LEACHATE:
Nc1- adjustment open
Nc2- adjustment open
Nc3- adjustment open
Nc4- adjustment open
Nc5- adjustment open
Nc6- adjustment open
Nc8- adjustment open
Nc9- adjustment open
Nc10- adjustment open
I didn't adjust the south cleanouts.
STROBE COUNTERS ARE ALL ON WILL FABRE'S WORD DOCUMENT THAT WILL BE ATTACHED.

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 DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	11.4.22	**PROJECT NAME**	BRISTOL
TEMP	62	**WEATHER**	Partly cloudy	**B.P.**	28.24	**WIND**	3mph NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	13					
			DAILY TOTAL	13		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4		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 rechecks and to grab CO samples of any exceedances. Blower reading: CH4- 31.9% C02-30.4 % 02- 5.2 % BAL-32.4%
	My exceedances were GW 3 for pressure. I got it back under vacuum but it needs a new bonnet valve inside. GW 37 Was at 147 degrees so I took a sample. GW 51 Was below 145 so I didn't take sample. GW 67 Was at 169.3 degrees so I took a sample. GW 46 Was at 150.2 degrees so I took a sample. GW 53 Was below 145 degrees so I didn't take a sample. GW 52 I could not get a reading on because of liquid in the test ports./ flex hose could be shortened to help water flow through better. (I recorded video) I grabbed a reading for 32. The city hydroseeded last week and a bunch of wells got covered in stuff so you cant see the numbers anymore after I marked them all clearly.

Leaving Blower reading: methane: 32% Co2: 30.1% O2: 5% BAL: 32.8% VAC: -24.25

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 DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	11.10.22	**PROJECT NAME**	BRISTOL
TEMP	62	**WEATHER**	Partly cloudy	**B.P.**	28.24	**WIND**	3mph NE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	13					
			DAILY TOTAL	13		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4		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 rechecks and to grab CO samples of any exceedances. Blower reading: CH4- 31.9% C02-30.4 % 02- 5.2 % BAL-32.4%
	My exceedances were GW 3 for pressure. I got it back under vacuum but it needs a new bonnet valve inside. GW 37 Was at 147 degrees so I took a sample. GW 51 Was below 145 so I didn't take sample. GW 67 Was at 169.3 degrees so I took a sample. GW 46 Was at 150.2 degrees so I took a sample. GW 53 Was below 145 degrees so I didn't take a sample. GW 52 I could not get a reading on because liquid in test port. Flex hose could be shortened to help water flow through better. (I recorded video) I grabbed a reading for 32. The city hydroseeded last week and a bunch of wells got covered in stuff so you cant see the numbers anymore after I marked them all clearly.

Leaving Blower reading: methane: 32% Co2: 30.1% O2: 5% BAL: 32.8% VAC: -24.25

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 DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	11.17.22	**PROJECT NAME**	BRISTOL
TEMP	33	**WEATHER**	Partly cloudy	**B.P.**	28.21	**WIND**	7mph SE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	13					
			DAILY TOTAL	13		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4		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	50.0		20.9	35.0		

SUMMARY	Scs was on site for rechecks and to grab CO samples of any exceedances. Blower reading: CH4- 33.2% C02-32 % 02- 5.0 % BAL-29.8% vac: -24.06
	My exceedances were GW 3 for pressure. I got it back under vacuum but it needs a new bonnet valve inside. GW 37 Was at 147 degrees so I took a sample. GW 67 Was at 169.3 degrees so I took a sample. GW 52 Was at 108 so I did not have to get a sample. The city hydroseeded last week and a bunch of wells got covered in stuff so you cant see the numbers anymore after I marked them all clearly.

Leaving Blower reading: methane: 35.4% Co2: 32.7 % O2: 5.2 % BAL: 26.7% VAC: -24.18

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 DAILY LOG

JOB NO.	07220028.00	**TASK NO.**	00001	**DATE**	11.29.22	**PROJECT NAME**	BRISTOL
TEMP	50	**WEATHER**	Partly cloudy	**B.P.**	28.13	**WIND**	4mph SE

SCS-FS LABOR	HOURS	OT		HOURS	OT	
Ryan Seymour	13					
			DAILY TOTAL	13		

EQUIP, SVCS, , MLG	QTY	UNITS		QTY	UNITS	
GEM 5000	1	Day	MX4		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	50.0		20.9	35.0		

SUMMARY	Scs was on site for rechecks and to grab CO samples of any exceedances. Blower reading: CH4- 33.2% C02-32 % 02- 5.0 % BAL-29.8% vac: -24.06
	Bump tested mx4. Turned on minirae 3000 Blower / flare was running upon arrival. The plant was running also. My exceedances were GW 67 for temp. I got a reading at GW 19 they just got it hooked back up. The valve is set to 10% open. Southside lechete cleanouts number 8 is missing an orifice plate. All the other heads have a 1.25" orifice plate in them. I need assistance in order to put a plate in. Brandon said he will fix that.

Leaving Blower reading: methane: 35.4% Co2: 32.2 % O2: 4.6% BAL: 28.1% VAC: -24.19

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. 07220028.00 **TASK NO.** 08 **DATE** 11-14-22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Carl Dixon	13				
Will Brown	11.5				

EQUIPMENT	EQUIPMENT

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

Notes	Travel to Site. Trenched 520 foot of slope at 2% Fall to toward tie in point.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 08 **DATE** 11-16-22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Carl Dixon	9.5				
Will Brown	9.5				

EQUIPMENT	EQUIPMENT

WORK PERFORMED - DESCRIPTION OF ITEM (Example, Routine, SEM, etc)			WORK PERFORMED DESCRIPTION OF ITEM		
Trenching	Non-Routine	19			

Notes	Trenched 606 feet at a 2% fall towards tie in point. Busting up rocks with jack hammer attachment for excavator.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 08 **DATE** 11-17-22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Carl Dixon	10				
Will Brown	10				

EQUIPMENT	EQUIPMENT

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

Notes	Trenched 487 feet at a 2% fall towards tie in point. Busting up rocks with jack hammer attachment for excavator.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 08 **DATE** 11-18-22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Carl Dixon	9.5				
Will Brown	9.5				

EQUIPMENT	EQUIPMENT

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

Notes	Trenching 100 feet at a 2% fall towards tie in point. Busting up rocks with jack hammer attachment for excavator Placed two 320’ stingers of 8” pipe from staging area in trench.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 7 **DATE** 11/7/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	3				

EQUIPMENT	EQUIPMENT

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

Notes	Installing temperature probes.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/7/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	8.5				

EQUIPMENT	EQUIPMENT

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

Notes	Travel to Bristol. Meeting with site engineer, going over scope of work.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/8/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	5				

EQUIPMENT	EQUIPMENT

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

Notes	Fusing 8 inch pipe.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 7 **DATE** 11/8/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	5				

EQUIPMENT	EQUIPMENT

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

Notes	Installing temperature probes.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/9/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	10				
Will Brown	10				

EQUIPMENT	EQUIPMENT

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

Notes	Fusing 8 and 12 inch pipe.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/10/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	6,5				
Will Brown	6.5				

EQUIPMENT	EQUIPMENT

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

Notes	Fusing 12 inch pipe.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/19/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	3				
Carl Dixon	3				
Will Brown					

EQUIPMENT	EQUIPMENT

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

Notes	Installed 12 inch header.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/20/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	11				
Carl Dixon	11				
Will Brown	11				

EQUIPMENT	EQUIPMENT

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

Notes	Installed 8 in. header, force main and air line. Back filling.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/21/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	11				
Carl Dixon	11				
Will Brown	11				

EQUIPMENT	EQUIPMENT

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

Notes	Installed 8 in. header, force main and air line. Back filling. Performed air test on vac. header and 2 in. air line, both passed.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/22/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	10.5				
Carl Dixon	10				
Will Brown	10.5				

EQUIPMENT	EQUIPMENT

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

Notes	Tied new header into existing header with a 12 in. valve.performed air test on 4 in. force main, it passed. Finished back filling and dressing up work area. Installed well heads on leachate cleanouts.

SCS FIELD SERVICES, INC. DAILY LOG

JOB NO. 07220028.00 **TASK NO.** 8 **DATE** 11/23/22 **PROJECT NAME** Bristol Landfill

TEMP: **°F** **WEATHER**

SCS-FS LABOR (List employee completing form first.)	HOURS		SCS-FS LABOR	HOURS	
Chris Boggs	9				
Will Brown	9				

EQUIPMENT	EQUIPMENT

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

Notes	Tied leachate cleanout well heads into vac. Installed pipe supports under 8in. header.

Appendix C

Solid Waste Permit 588 Daily Wellhead Temperature Averages - November 30, 2022

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 | November 30, 2022

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

Solid Waste Permit 588 Daily Wellhead Temperature Averages for Nov 30, 2022

Bristol, Virginia

Well ID	Average Temperature (°F)
Well 32R	118.4
Well 35	51.5
Well 39	87.9
Well 40	109.7
Well 46	130.3
Well 47	75.3
Well 49	124.3
Well 50	104.9
Well 51	59.4
Well 52	109.9
Well 53	123.8
Well 54	109.0
Well 55	0.0
Well 56	109.8
Well 57	109.0
Well 58	110.9
Well 59	109.6
Well 60	102.2
Well 62	109.2
Well 63	110.2
Well 64	98.1
Well 65	85.0
Well 66	100.3
Well 67	105.9
Well 68	0.0

Appendix D

Settlement Monitoring and Management Plan

Settlement Monitoring and Management Plan

Bristol Integrated Solid Waste Management Facility

Solid Waste Permit #588

2655 Valley Drive
Bristol, VA 24201

SCS ENGINEERS

02218208.05 | November 15, 2022

15521 Midlothian Turnpike, Suite 305
Midlothian, VA 23113
804-378-7440

Signature/Certification Sheet

We certify that we have prepared this Plan, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of our knowledge.

Name: H. James Law, P.E., Vice President/Project Director

Signature: _____

Date: November 15, 2022

Name: Charles Warren, PE, Project Manager

Signature: _____

Date: November 15, 2022

Virginia Professional Engineer's Certification:

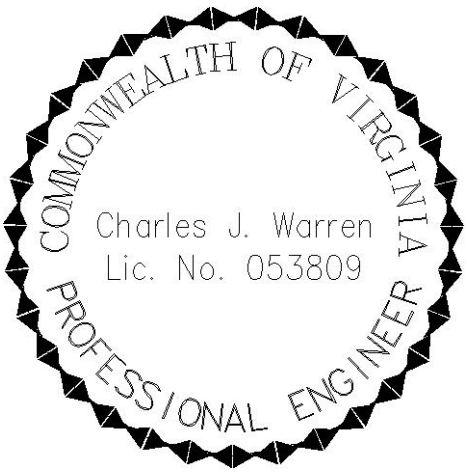


Table of Contents

List of Figures

1.0 INTRODUCTION

This Monitoring Plan and Management Plan documents procedures and instructions necessary to implement a settlement monitoring and management program for a temporary and permanent final cover system to be installed within the City of Bristol Integrated Solid Waste Management Facility Solid Waste Permit #588 Landfill. This plan was prepared in response to the Expert Panel Report (Virginia Tech, 2022) prepared by the Expert Panel convened by the Virginia Department of Environmental Quality (VDEQ) to address settlement of the landfill surface after closure concerns at the Facility.

1.1 SITE BACKGROUND

The City of Bristol Integrated Solid Waste Management Facility, which includes Solid Waste Permit Landfills #221, 498, and 588, is owned and operated by the City of Bristol. Solid Waste Permit #588 was issued by VDEQ on February 13, 1996.

The Permit #588 Landfill is constructed within a former limestone quarry. Prior to July 2007, the waste was baled prior to its placement in the landfill. In July 2007, the City of Bristol initiated placement of loose waste in the former quarry as the primary method of waste disposal. The Permit #588 Landfill is lined with a primary high-density polyethylene geomembrane and compacted clay liner placed above a secondary compacted clay liner, with a 12-inch witness zone between the two liner systems. An additional linear low-density polyethylene geomembrane liner system is in place on the quarry walls. A gradient control underdrain system is in place beneath the secondary liner for the purpose of controlling the water level to a maximum elevation of 1,557 feet above mean sea level. This gradient control water currently discharges to the Bristol Virginia Utilities (BVU) Authority Sewer.

1.2 PHYSICAL SETTING

The City of Bristol Integrated Solid Waste Management Facility is located on Valley Road in the southeastern section of the City of Bristol. The location of the Facility is illustrated on a portion of the Bristol, Virginia, United States Geologic Society 7.5-minute topographic quadrangle map presented as **Figure 1**. The land surrounding the Facility is primarily wooded and residential. Residents in the area are served by public water supply.

The Facility encompasses approximately 138 acres. The limits of waste occupied by the Permit #588 Landfill encompasses approximately 20 acres. The base of the limestone quarry covers approximately 5.6 acres. The Permit #588 Landfill is bordered to the east by the Permit #498 Landfill and to the north by intermittent streams which drain into Sinking Creek.

Based on a review of the Bristol, Virginia USGS 7.5-minute topographic quadrangle map, several unnamed tributaries of Sinking Creek are intermittent streams located east of the adjacent Permit No. 498 landfill. Sinking Creek is the nearest permanent water body and is located east/southeast of the adjacent Permit No. 498 facility.

1.3 LANDFILL TEMPORARY COVER AND FINAL COVER SYSTEM

As required by the Expert Panel convened by the Virginia Department of Environmental Quality (VDEQ) to address settlement of the landfill surface after closure concerns at the Facility, Permit No. 588 is required to have a settlement monitoring and management plan. This plan addresses the landfill surface elevation settlement prior to or after the installation of the temporary ethylene vinyl

alcohol (EVOH) geomembrane cover as well as after the installation of the permanent final cover system. Figure 2 show details of the temporary cover and the final cover systems.

The temporary cover system above the intermediate soil cover consist of (from top to bottom):

- Geotextile wind screen (wind defender or approved equal) layer
- EVOH geomembrane overlying the intermediate soil cover

The permanent final cover system consists of (from top to bottom):

- 6" vegetative support soil cover
- 18" protective soil cover
- Geocomposite drainage net (GDN) with 5 x 10^{-3} m^2/sec transmissivity
- 40 mil textured LLDPE geomembrane
- 12" of intermediate cover

2.0 SETTLEMENT MONITORING AND MANAGEMENT PLAN

As required by the Plan, the City of Bristol has prepared a settlement monitoring and management plan for DEQ for review by November 15, 2022. This settlement monitoring and management plan will be prepared in accordance with generally accepted surveying practices and minimum standards within the Commonwealth of Virginia and shall be certified and stamped/sealed by a VA-PE and a surveyor licensed in the Commonwealth of Virginia. The plan provides means and methods for monitoring surface elevations across the surface of the landfill using settlement plates embedded in the intermediate soil cover at proposed locations. The intermediate soil cover is to be installed in accordance with 9 VAC 20-8 I-I 40(B)(I)(d) of the Virginia Solid Waste Management Regulations. The proposed locations and details of the settlement plates are shown in Figures 3 and 4, respectively.

2.1 SETTLEMENT PLATES

Settlement plates are fixed points installed in the final cover used to measure changes in elevation and identify areas the magnitude of on-going settlement. The City will complete monthly topographic surveys (refer to section 2.2) on these settlement plates and maintain/implement settlement plates throughout the Landfill surface.

Settlement plates are comprised of a steel base plate and a stand pipe or rod that extends above ground and serves as an elevation reference point. The rod indicates the center of the base plate, and the initial location and elevations is surveyed by a professional surveyor (refer to the settlement plate detail in Figure 4). Subsequent surveys of the settlement plate will measure the movement in the vertical direction. Additionally, there is an option to choose to equip settlement plates with a GPS system attached and monitoring of the plate can be completed remotely. Alternatively the City may choose to attach targets to the tops of the settlement plates, so that the locations can be recorded using photogrammetric methods. Concurrent measurements will be performed in the event of a change in surveying methodology to quantify differences in the methods. Figure 3 depicts proposed 12 locations for settlements plates within the Permit 588 boundary and also 3 section locations (AA', BB', and CC'). The actual number of settlement plates may be adjusted depending on active construction within the landfill footprint. The plates may be moved within a limited area based on field conditions and necessity. More settlement plates can be added or removed as deemed appropriate or it can be replaced with settlement monuments if damaged during or after the EVOH geomembrane cover is installed.

Settlement plates are used regularly to monitor settlement on landfills. However, they are susceptible to damage and destruction from on-going landfill activities as well as natural forces including weather and animals. The riser section extending above the surface should be visible and protected from damage by equipment using tires placed over (but not touching) the rod, bollards, or other physical objects. The Permit 588 landfill is approximately 17.3 acres so the number of the proposed settlement plates represents 1.4 acres per plate, which is sufficient to provide a general trend of settlement of the existing landfill surface elevations due to waste decomposition or new physical loading from the final cover system. Therefore, the locations of the proposed settlement plates are strategically located in relation to the waste thickness and grade breaks of the base grading of the landfill.

The frequency of this monitoring plan will initially begin with monthly topographic surveys to collect settlement data necessary in estimating the rate of settlement at each settlement plate location and the net volume change due to settlement. This information will be used to design or modify the final grading and the stormwater management features of the final cover system. Details of the topographic surveys are described in Section 2.2. The initial placement and surveying of the settlement plates will be done in close coordination with the City's staff surveyor who is licensed in the Commonwealth of Virginia.

The following events are included in the management plan:

- An initial set of measurements will be taken to establish the initial baseline landfill surface elevation at each settlement plate location prior to the placement of the EVOH cover system.

- An initial set of measurements will be taken right after the installation of the EVOH.

- Monthly measurements of all settlement plates and other relevant locations for features such as the locations for leachate collection infrastructure and the southeast corner stormwater pond (future). This frequency will change depending on the result of the average settlement stated in Section 3.0.

- A fixed elevation bench mark will be set nearby, but off of the landfill surface to provide a baseline reference for the subsequent surveys

2.2 TOPOGRAPHIC SURVEYS AND FREQUENCY

This plan includes the following actions to monitor and timely address settlement of the landfill surface:

- Conduct monthly topographic surveys of the waste mass to document the magnitude and rates of settlement throughout the waste mass, beginning November 9, 2022 (i.e., thirty days after the installation of intermediate cover). Topographic survey data will be submitted to VDEQ and the EPA by the tenth day of the month following data collection. Topographic survey data may be submitted as a section of monthly progress reports submitted on the same day. The City may request, and at the discretion of DEQ, survey frequency to be reduced after the first year.

- Settlement plates will be installed prior to November 15, 2022. The as-built locations of the settlement plates will be recorded prior to November 30, 2022. The as-built information will be submitted to VDEQ and EPA with the November report. The settlement

plates will be surveyed and the results reported (by the tenth day of the month following data collection) on a monthly basis.

- Prior to installation of the EVOH cover, shape the existing Landfill surface to direct storm water runoff to a storm water management (SWM) basin located at an appropriate point of the Landfill.

2.2.1 Topographic Data Collection Procedures

In the Executive Summary of the Expert Panel Report, the Panel recommended that the site undertake monthly topographic surveys to document the locations and rates of settlement. Under the Summary of Recommendations, the report recommends the use of drones for the monthly topographic survey of the landfill surface.

SCS proposes the use of a DJI Phantom 4 Pro v2 or similar equipment as the primary UAS for topographic surveys. The flight will be performed under fair weather conditions at approximately ±200 feet above ground level at a speed of ±13 miles per hour. The UAS flight will encompass the entirety of the quarry landfill perimeter along with an outer boundary of approximately 150 feet outside of the perimeter allowing for image overlap.

SCS will use Propeller AeroPoints for ground control points (GCP) during each survey event. The AeroPoints are moveable targets with built-in GPS receivers. SCS will coordinate with the City's surveyor to establish benchmarks and/or permanent control points within the UAS flight path. The benchmarks and AeroPoints will be combined in the post-processing to establish ground control at the site and to have established surveyed points in which to compare the variable landfill surface. Other ground control methods may be used, but will be submitted to VDEQ prior to implementation.

SCS is working with the City's staff surveyor, who is licensed in the Commonwealth of Virginia to set up permanent control points to maintain consistency. The surveyed benchmarks will be outside of the waste boundary to reduce risk of settlement, obstruction, or damage. The AeroPoints would be placed on top of waste or existing cover during each visit to assist with accurate readings within the waste boundary. The flight boundary will take place outside of controlled airspace, therefore no air traffic control authorization is required. Each flight will be conducted by an FAA Part 107 licensed pilot.

Post-processing will be completed by photogrammetric software utilizing the UAS images, GCPs, and benchmarks. The output from processing will include an orthomosaic (combination of all images), point cloud files, and contours files. These contour files and point cloud files will be brought into AutoCAD 2020 for analysis. Analysis will consist primarily of surface comparison to calculate the settlement from previous topographic surveys. SCS will provide the City with the volume of settlement each month. Additionally, the topographic surveys will help address necessary changes to stormwater management features.

Topographic data collection by photogrammetric methods or similar remote sensing technology is exempt from licensure requirements under Subsection C of § 54.1-402 of the Virginia Code.

If consecutive surveys demonstrate that the total settlement over the course of 12 months is less than 2 feet, then the City may request survey frequency will be reduced to quarterly. If consecutive quarterly surveys demonstrate that the average settlement over 1 year is less than 0.5 feet, then the City will request survey frequency will be reduced to once per year.

3.0 SETTLEMENT ANALYSIS

Two sets of initial measurements will be taken to establish the initial baseline landfill surface elevation at each settlement plate location after completion of the intermediate soil cover and right after the installation of the EVOH cover system. If the time difference is more than 3 months, then the later measurements will be used as the baseline or the time zero, T_o, of the monitoring plan. Subsequent monthly measurements of all settlement plates will be taken at a frequency of once per month. The City will generally monitor the locations on about the same dates each month following the completion of the EVOH cover system. Other relevant locations for features such as the proposed future leachate storage tank and the southeast corner stormwater pond may also be computed from the landfill surface topographic survey database.

Upon completion of the topographic survey data analysis and generation of the surface contour lines, section profiles at the selected locations (AA', BB', CC') will be generated and settlement measurements will be tabulated to generate graphs in time increments at each location. The following settlement analysis will be performed at each monitoring event:

- Settlement per month at each location measured
- Change of landfill surface slopes monthly at Sections AA', BB' and CC'
- Rate of settlement at each location every 3 months
- Average settlement across the landfill surface every 3 months
- Waste volume change with time due to settlement
- Identify any change of flow path toward the stormwater pond (if applicable).

The information obtained from the above may be used to predict future settlement of the landfill surface at any timeframe after the monitoring period, or after post-closure care period of 30 years. This prediction of settlement can be done by plotting the data on semi-log graph to see the trends that change over time and then be included in designing of the final grading plan for the final cover system.

Regarding the location of leachate storage infrastructure or the stormwater pond on the landfill surface, it is recommended to preload this area (with known weight of a soil stockpile greater than the weight of the proposed structure or water) to induce load-related settlement prior to the installation of the proposed structure. The area or the test pad with known loading information can be equipped with settlement plates so settlement can be measured at regular frequency such that the coefficient of consolidation can be estimated and used for future settlement prediction.

4.0 REPORTING

Monthly settlement monitoring reports will be submitted to VDEQ by the 10th day of the following month. This report may be submitted as a stand-alone report in in combination with other reports submitted for the facility on the same day. The report will also include any modifications or replacement settlement plate(s), if damage occurred during the monitoring period. The monthly report will document the following:

- Topographic survey drone record
- Site topographic contour lines generation
- Tabulation of the monthly accumulative settlement measurement and graph presentation at each location
- Settlement analysis
  - Settlement per month at each location measured

- Change of landfill surface slopes monthly at Sections AA', BB' and CC'
- Rate of settlement at each location every 3 months
- Average settlement across the landfill surface every 3 months
- Waste volume change with time due to settlement
- Identify any change of flow path toward the stormwater pond

Reporting may be submitted in spreadsheet and graphical format as well as in section profiles at the selected locations. The information collected will be used for determining frequency of monitoring and for designing the final grading plan of the proposed final cover system.

5.0 REFERENCES

Virginia Tech College of Engineering. Expert Panel Report: Bristol Integrated Solid Waste Management Facility, Bristol, Virginia. April 25, 2022.

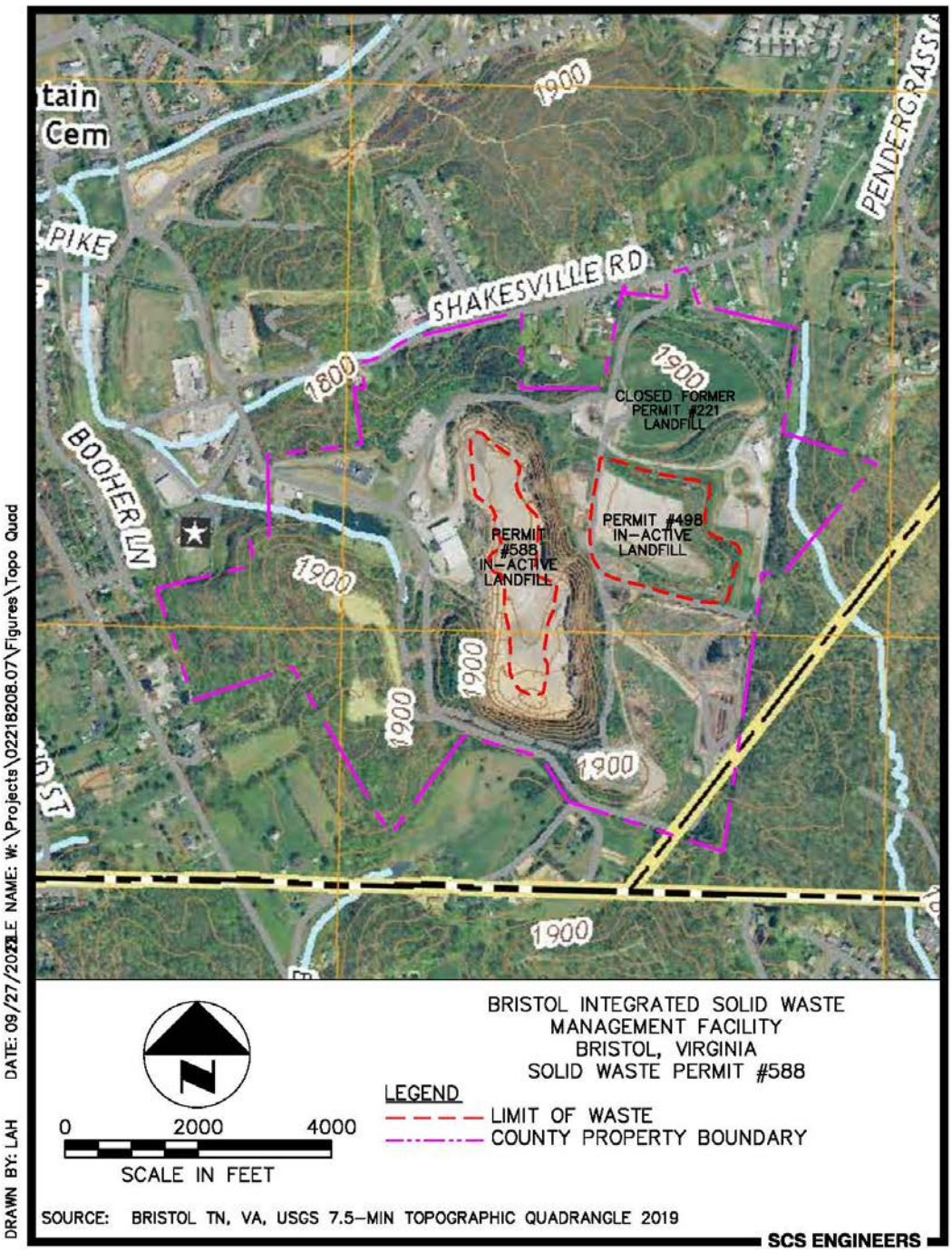


FIGURE 1 - TOPOGRAPHIC QUADRANGLE MAP

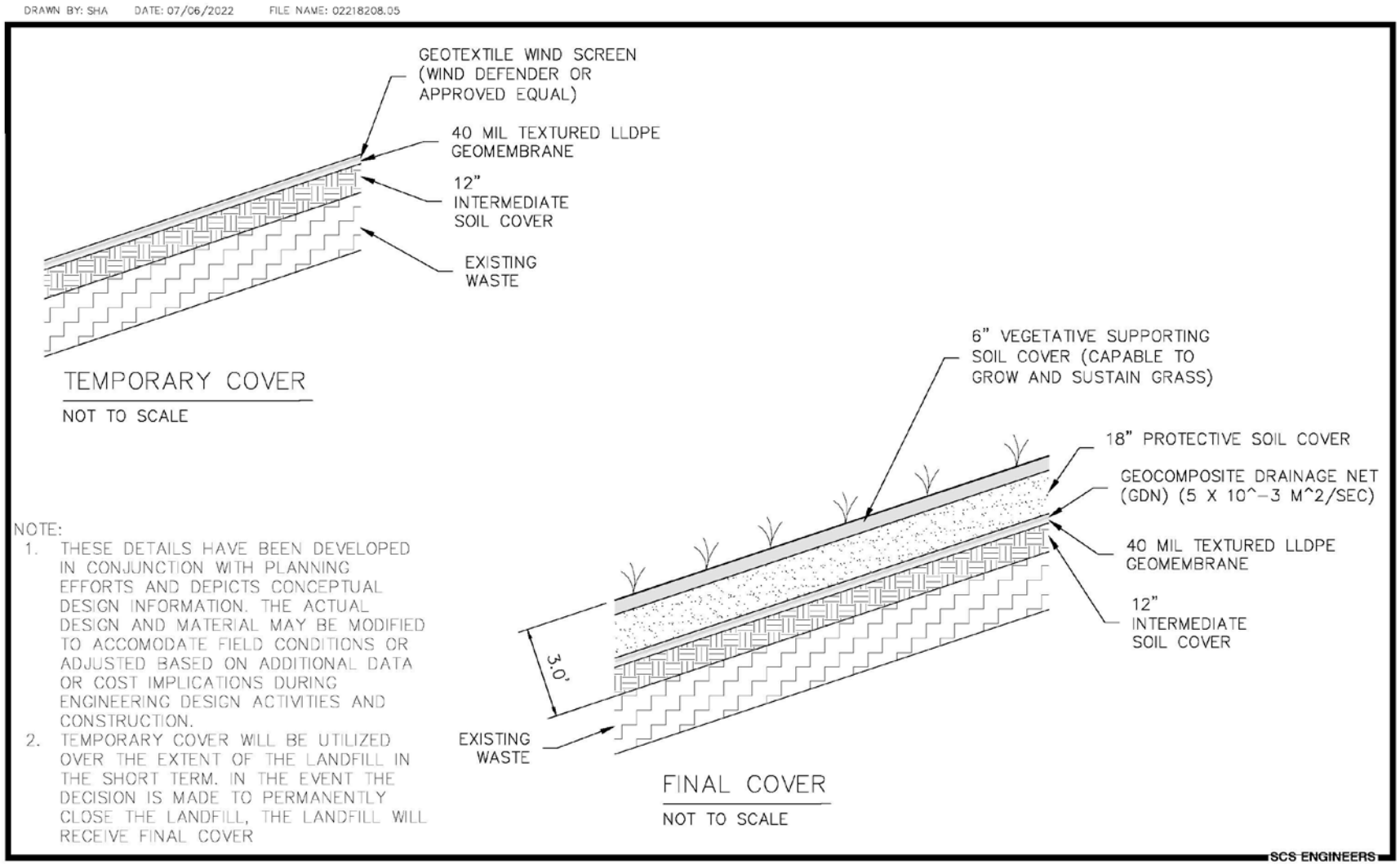


FIGURE 2 - TEMPORARY & FINAL COVER DETAILS

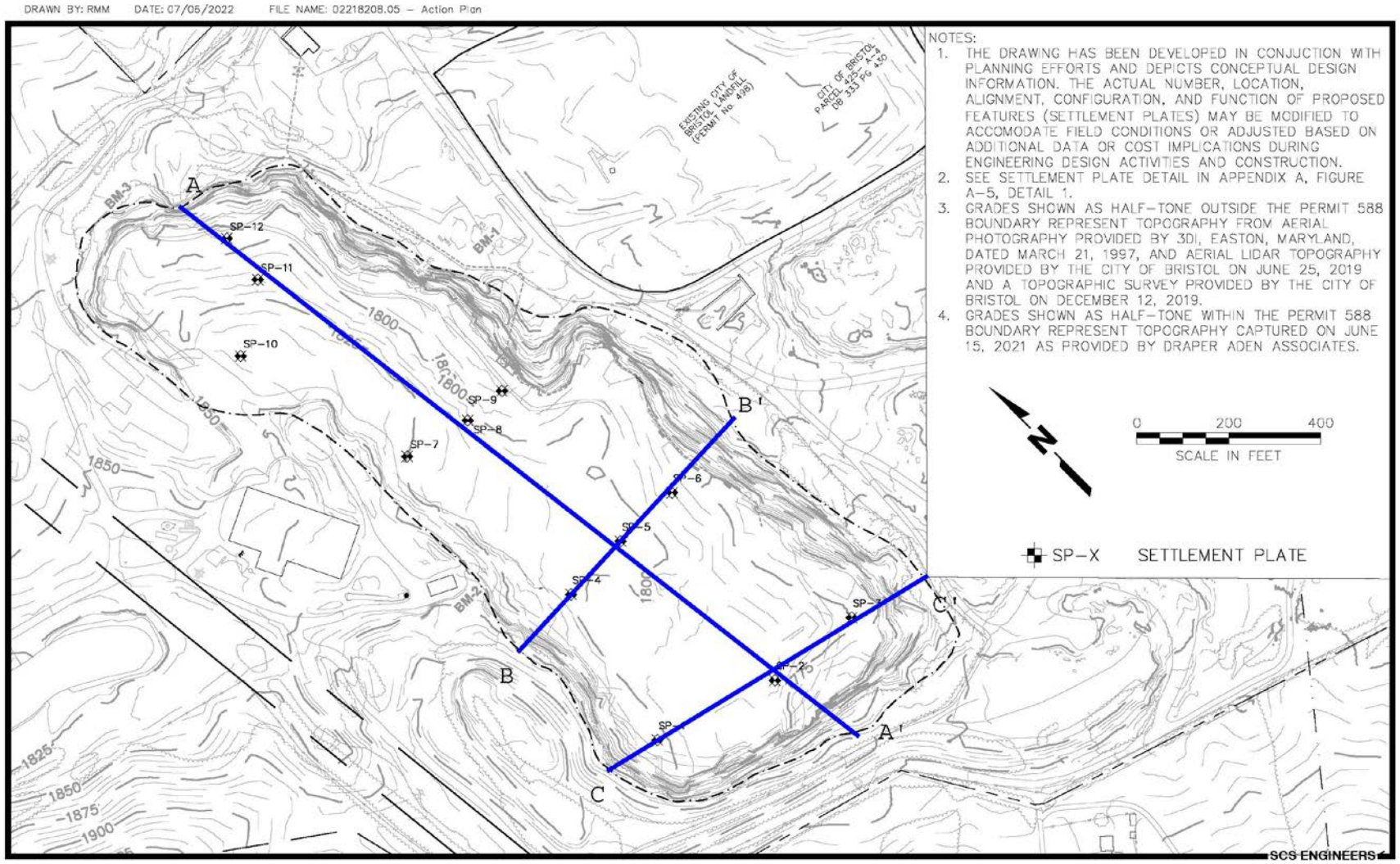


Figure 3 - Settlement Plate and Section Locations

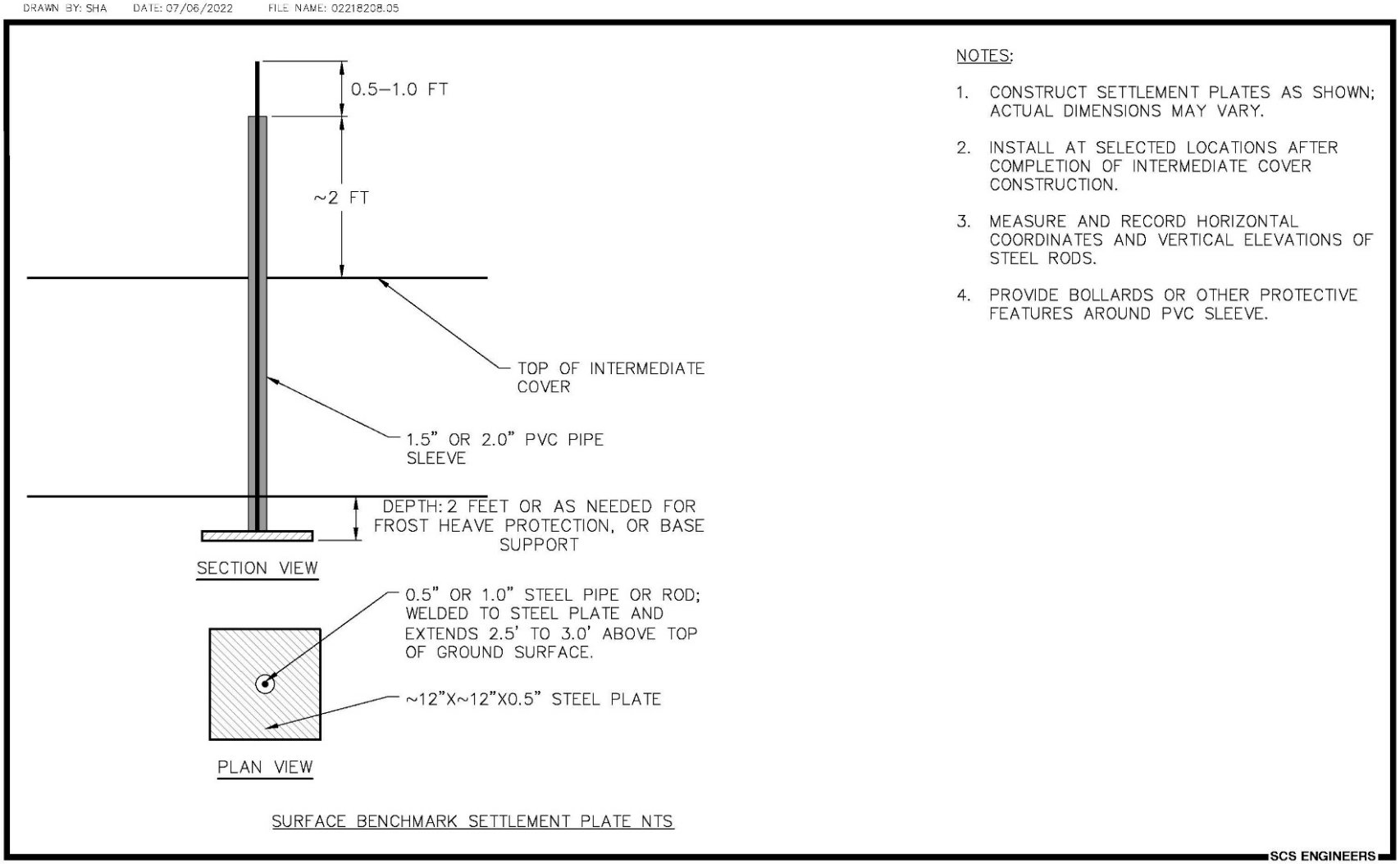


FIGURE 4 - SETTLEMENT PLATE DETAILS

Appendix E

Monthly Topography Analysis

LEGEND

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

NOTES:

1. GRADES SHOWN AS DASHED CONTOUR LINES REPRESENT THE TOPOGRAPHY CAPTURED ON OCTOBER 7, 2022 BY NV5 (FORMERLY QUANTUM SPATIAL).
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'

SHEET TITLE: OCTOBER 2022 SITE TOPOGRAPHY

PROJECT TITLE:

MONTHLY TOPOGRAPHY ANALYSIS
SOLID WASTE PERMIT #588

NO.	REVISION	DATE

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

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

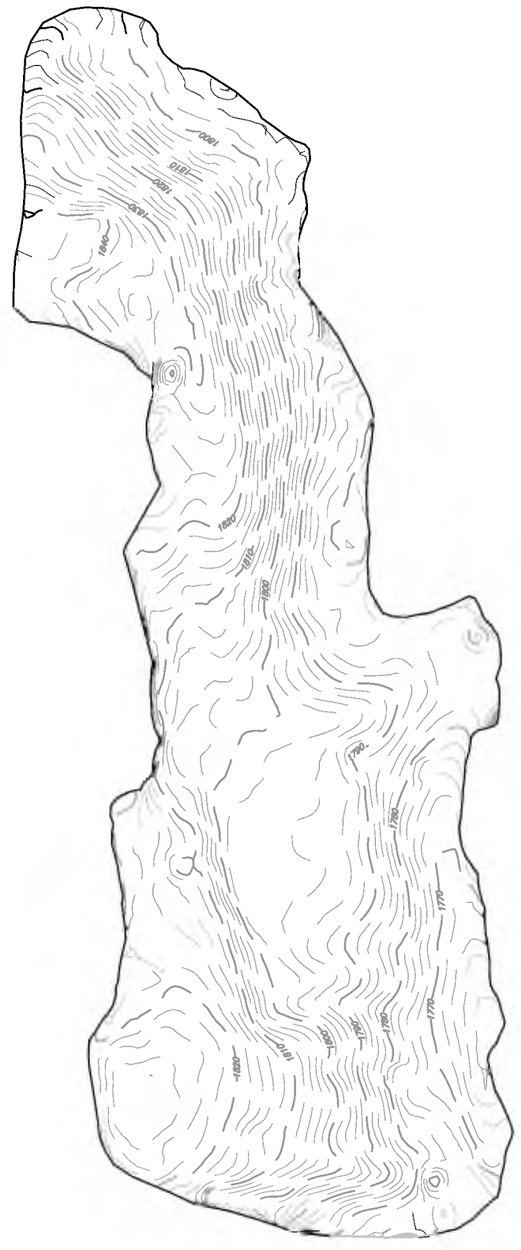
PROJ. NO			
DES. BY	SRB	CHK. BY	SRB
DRN. BY	SRB	APP. BY	CJW
		S/A RVW BY:	CJW

CADD FILE:

DATE: 12/9/2022

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 NOVEMBER 8, 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
NOVEMBER 8, 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.
53 SOUTH MAIN ST.; SUITE A - MEDFORD, NJ 08055
PH. (609) 654-4000 SCSENGINEERS.COM

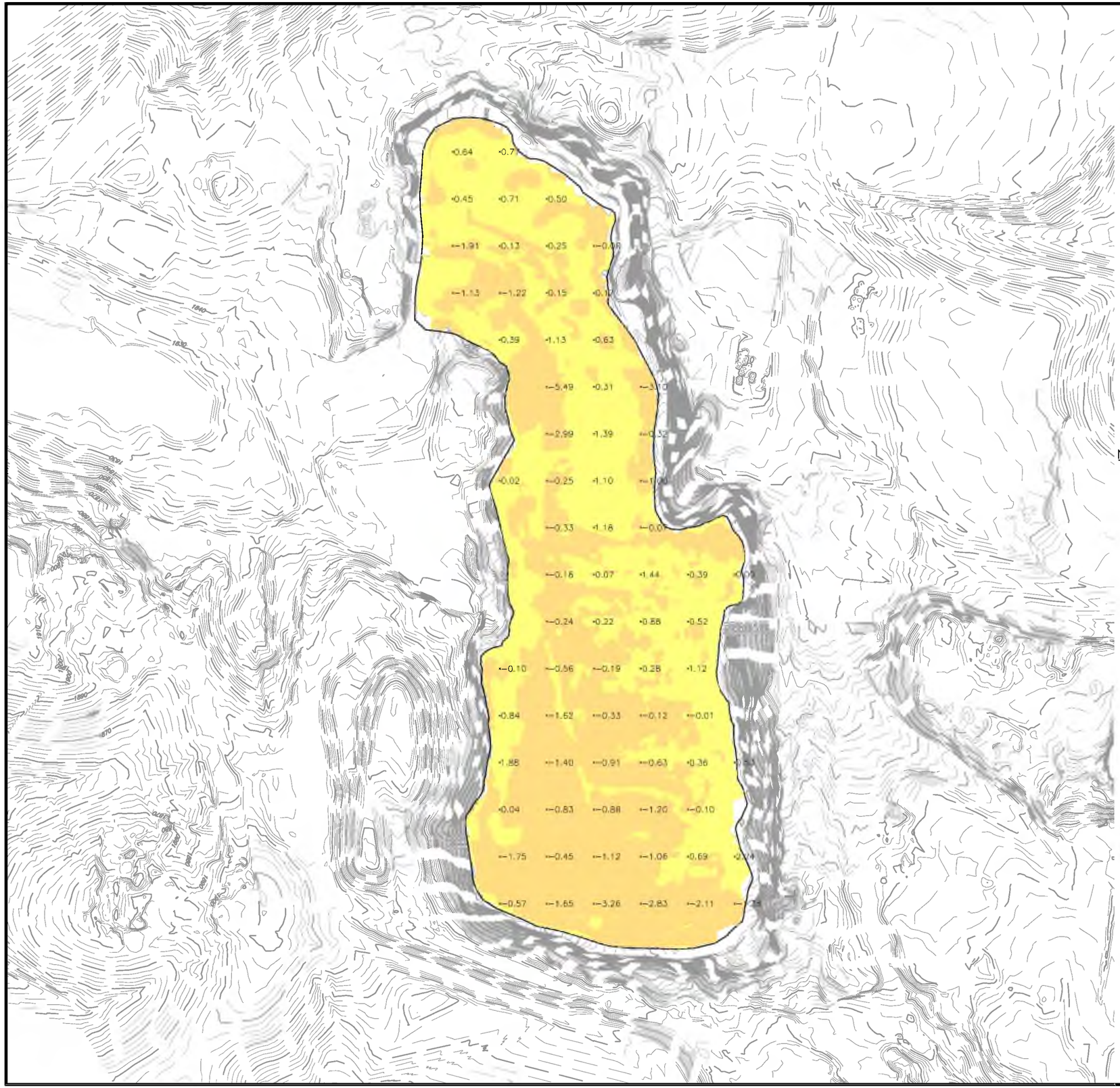
PROJ. NO	DWN BY: SRB	Q/A REVIEW BY: CJW
	CHK BY: CJW	APP BY: CJW
DSN BY: SRB		

CADD FILE:

DATE: 12/9/2022

SCALE: 1"=100'

DRAWING NO.
2 of **5**



Elevations		
Color	Min. Elevation	Max. Elevation
	-20.00'	-10.00'
	-10.00'	0.00'
	0.00'	10.00'
	10.00'	20.00'

Volume

Base Surface	10-7-22 FLYOVER
Comparison Surface	11-8-22 FLYOVER
Cut Volume	15487.07 Cu. Yd.
Fill Volume	8248.39 Cu. Yd.
Net Cut	7238.69 Cu. Yd.

NOTES:

1. THE ELEVATION CHANGES ARE CALCULATED BETWEEN THE AREIAL TOPOGRAPHY DATA CAPTURED ON OCTOBER 7, 2022 BY NV5 (FORMERLY QUANTUM SPATIAL) AND THE AERIAL TOPOGRAPHY DATA CAPTURED ON NOVEMBER 8, 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. THE HORIZONTAL DATUM IS STATE PLANE VIRGINIA SOUTH ZONE NAD-83 (2011)
4. THE VERTICAL DATUM IS BASED UPON NAVD-88

LEGEND

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

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

NO.	REVISION	DATE

SHEET TITLE
VOLUME CHANGE NOVEMBER 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.	DWN BY	DES BY	QA/QC BY
02218208.05	SRB	CJW	CJW
SCALE	SRB	CJW	CJW

CADD FILE:

DATE
12/9/2022

SCALE:
1"=100'

DRAWING NO.
3 of 5

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 VIRTICAL 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 | DWN. BY: SRB | QA/QC BY: CJW
DSN. BY: SRB | CHK. BY: CJW | APP. BY: CJW

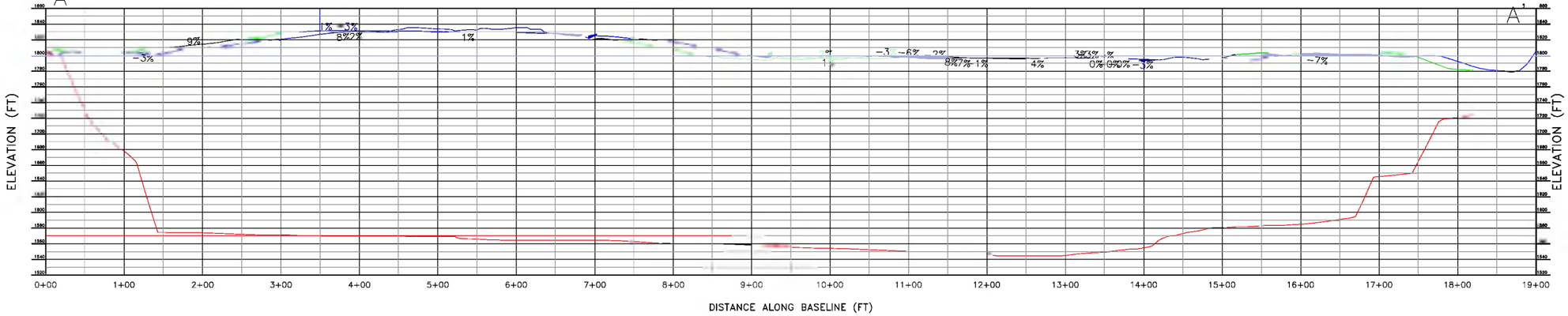
CADD FILE:

DATE: 12/9/2022

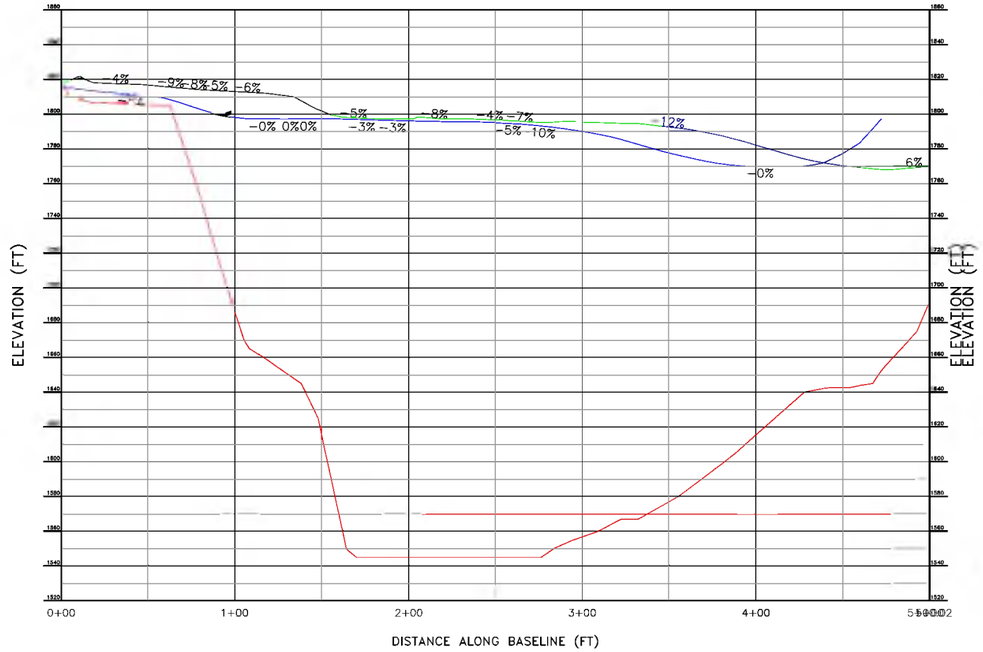
SCALE: 1"=100'

DRAWING NO.
4 of **5**

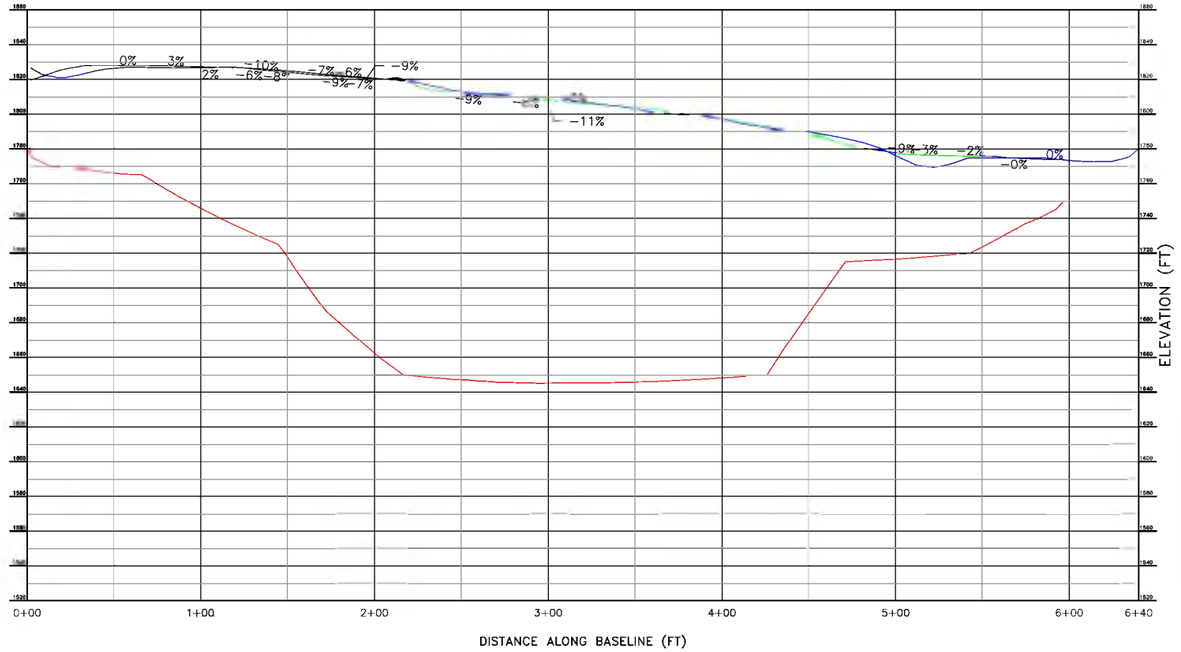
LONGITUDINAL PROFILE ALIGNMENT A



LONGITUDINAL PROFILE ALIGNMENT B



LONGITUDINAL PROFILE ALIGNMENT C



LEGEND

- BOTTOM LINER GRADES
- OCTOBER 2022 FLYOVER TOPO
- NOVEMBER 2022 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
DSN. BY: SRB
DWN. BY: SRB
CHK. BY: CJW
G/A REV. BY: CJW
APP. BY: CJW

CADD FILE:

DATE: 11/21/2022

SCALE: 1"=100'

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

Appendix F

Sample Collection Log and Lab Report

Appendix F

Sample Collection Log and Lab Report

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	not pumping								
EW-51	no pump installed								
EW-52	not pumping								
EW-53	not pumping								
EW-54	not pumping								
EW-55	not pumping								
EW-56	no pump installed								
EW-57	not pumping								
EW-58	not pumping								
EW-59	11/16/2022	17:45	38.0	8.18	24.61	1.85	45.8	>1100	Black
EW-60	not pumping								
EW-61	11/16/2022	13:45	41.8	7.49	15.94	0.27	-142.9	>1100	Black
EW-62	not pumping								
EW-63	not pumping								
EW-64	not pumping								
EW-65	11/16/2022	11:25	30.5	8.37	20.31	0.27	-143.6	>1100	Black
EW-67	not pumping								
EW-68	not pumping								

Sampler: L. Howard (SCS)
Log Checked By: J. Robb (SCS)
Samples Shipped By: Courier
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 22K1011

Client Name:	SCS Engineers-Winchester 296 Victory Road Winchester, VA 22602	Date Received:	November 18, 2022 8:00
		Date Issued:	December 6, 2022 12:51
		Project Number:	02218206.15
Submitted To:	Jennifer Robb	Purchase Order:	
Client Site I.D.:	Bristol landfill		

Enclosed are the results of analyses for samples received by the laboratory on 11/18/2022 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
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Richmond, VA 23237
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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol landfill
Submitted To: Jennifer Robb

Date Issued: 12/6/2022 12:51:59PM

Laboratory Sample ID: **22K1011-01** **Client Sample ID:** **EW-65**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	01	SW6010D	1.30		0.0200	0.0400	1	mg/L
Barium	01	SW6010D	0.360		0.0100	0.0200	1	mg/L
Chromium	01	SW6010D	0.354		0.0160	0.0200	1	mg/L
Lead	01	SW6010D	0.0170	J	0.0120	0.0200	1	mg/L
Mercury	01	SW7470A	0.00053		0.00040	0.00040	1	mg/L
Nickel	01	SW6010D	0.1730		0.0140	0.0200	1	mg/L
Zinc	01	SW6010D	0.694		0.0200	0.0200	1	mg/L
2-Butanone (MEK)	01	SW8260D	1140		30.0	100	10	ug/L
Acetone	01	SW8260D	4420		70.0	100	10	ug/L
Benzene	01	SW8260D	50.4		4.00	10.0	10	ug/L
Ethylbenzene	01	SW8260D	16.2		4.00	10.0	10	ug/L
Tetrahydrofuran	01	SW8260D	176		100	100	10	ug/L
Toluene	01	SW8260D	32.8		5.00	10.0	10	ug/L
Xylenes, Total	01	SW8260D	37.8		10.0	30.0	10	ug/L
Ammonia as N	01RE1	EPA350.1 R2.0	1380		50.0	50.0	500	mg/L
BOD	01	SM22 5210B-2011	5140		0.2	2.0	1	mg/L
COD	01	SM22 5220D-2011	10800		1000	1000	100	mg/L
Nitrate+Nitrite as N	01	SM22 4500-NO3F-2011	0.33		0.10	0.10	1	mg/L
TKN as N	01RE1	EPA351.2 R2.0	1470		20.0	50.0	100	mg/L
Total Recoverable Phenolics	01	SW9065	3.00		0.300	0.500	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol landfill
Submitted To: Jennifer Robb

Date Issued: 12/6/2022 12:51:59PM

Laboratory Sample ID: **22K1011-02** **Client Sample ID:** **EW-61**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	02	SW6010D	0.464		0.0200	0.0400	1	mg/L
Barium	02	SW6010D	0.485		0.0100	0.0200	1	mg/L
Chromium	02	SW6010D	0.112		0.0160	0.0200	1	mg/L
Mercury	02	SW7470A	0.00169		0.00040	0.00040	1	mg/L
Nickel	02	SW6010D	0.1344		0.0140	0.0200	1	mg/L
Zinc	02	SW6010D	0.0320		0.0200	0.0200	1	mg/L
2-Butanone (MEK)	02RE1	SW8260D	15600		300	1000	100	ug/L
Acetone	02RE1	SW8260D	38300		700	1000	100	ug/L
Benzene	02	SW8260D	2860		4.00	10.0	10	ug/L
Ethylbenzene	02	SW8260D	194		4.00	10.0	10	ug/L
Tetrahydrofuran	02RE1	SW8260D	8530		1000	1000	100	ug/L
Toluene	02	SW8260D	214		5.00	10.0	10	ug/L
Xylenes, Total	02	SW8260D	185		10.0	30.0	10	ug/L
Ammonia as N	02RE1	EPA350.1 R2.0	1400		50.0	50.0	500	mg/L
BOD	02	SM22 5210B-2011	5860		0.2	2.0	1	mg/L
COD	02	SM22 5220D-2011	9790		1000	1000	100	mg/L
Nitrate+Nitrite as N	02	SM22 4500-NO3F-2011	0.16		0.10	0.10	1	mg/L
TKN as N	02RE1	EPA351.2 R2.0	1290		20.0	50.0	100	mg/L
Total Recoverable Phenolics	02	SW9065	5.68		0.300	0.500	1	mg/L

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Analysis Detects Report

Client Name: SCS Engineers-Winchester
Client Site ID: Bristol landfill
Submitted To: Jennifer Robb

Date Issued: 12/6/2022 12:51:59PM

Laboratory Sample ID: **22K1011-03** **Client Sample ID:** **EW-59**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Arsenic	03	SW6010D	0.863		0.0200	0.0400	1	mg/L
Barium	03	SW6010D	0.871		0.0100	0.0200	1	mg/L
Chromium	03	SW6010D	0.208		0.0160	0.0200	1	mg/L
Nickel	03	SW6010D	0.0866		0.0140	0.0200	1	mg/L
2-Butanone (MEK)	03	SW8260D	3510		30.0	100	10	ug/L
Acetone	03RE1	SW8260D	16100		700	1000	100	ug/L
Benzene	03	SW8260D	7.40	J	4.00	10.0	10	ug/L
Tetrahydrofuran	03	SW8260D	309		100	100	10	ug/L
Ammonia as N	03	EPA350.1 R2.0	1560		50.0	50.0	500	mg/L
BOD	03	SM22 5210B-2011	15700		0.2	2.0	1	mg/L
COD	03	SM22 5220D-2011	23500		2000	2000	200	mg/L
Nitrate+Nitrite as N	03	SM22 4500-NO3F-2011	2.91		0.10	0.10	1	mg/L
TKN as N	03RE1	EPA351.2 R2.0	2110		50.0	125	250	mg/L
Total Recoverable Phenolics	03	SW9065	28.8		0.750	1.25	1	mg/L

Laboratory Sample ID: **22K1011-04** **Client Sample ID:** **Trip Blank**

Parameter	Samp ID	Reference Method	Sample Results	Qual	LOD	LOQ	Dil. Factor	Units
Acetone	04	SW8260D	9.36	J	7.00	10.0	1	ug/L

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

Enthalpy Analytical
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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW-65	22K1011-01	Ground Water	11/16/2022 11:25	11/18/2022 08:00
EW-61	22K1011-02	Ground Water	11/16/2022 13:45	11/18/2022 08:00
EW-59	22K1011-03	Ground Water	11/16/2022 17:45	11/18/2022 08:00
Trip Blank	22K1011-04	Waste Water	11/14/2022 16:10	11/18/2022 08:00
Trip Blank	22K1011-05	Waste Water	11/14/2022 16:10	11/18/2022 08:00

Final COA reissued on 12/6/2022 to attach subcontract results to final COA as it was not properly generating.

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Certificate of Analysis

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

Date Issued: 12/6/2022 12:51:59PM

Client Sample ID: **EW-65** **Laboratory Sample ID:** **22K1011-01**

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	11/22/2022 14:15	11/23/2022 01:42	BLOD		0.0100	0.0200	1	mg/L	AB
Arsenic	01	7440-38-2	SW6010D	11/22/2022 14:15	11/23/2022 01:42	1.30		0.0200	0.0400	1	mg/L	AB
Barium	01	7440-39-3	SW6010D	11/22/2022 14:15	11/23/2022 01:42	0.360		0.0100	0.0200	1	mg/L	AB
Cadmium	01	7440-43-9	SW6010D	11/22/2022 14:15	11/23/2022 01:42	BLOD		0.0040	0.0080	1	mg/L	AB
Chromium	01	7440-47-3	SW6010D	11/22/2022 14:15	11/23/2022 01:42	0.354		0.0160	0.0200	1	mg/L	AB
Copper	01	7440-50-8	SW6010D	11/22/2022 14:15	11/23/2022 01:42	BLOD		0.0160	0.0200	1	mg/L	AB
Mercury	01	7439-97-6	SW7470A	12/05/2022 08:55	12/05/2022 14:08	0.00053		0.00040	0.00040	1	mg/L	ACM
Nickel	01	7440-02-0	SW6010D	11/22/2022 14:15	11/23/2022 01:42	0.1730		0.0140	0.0200	1	mg/L	AB
Lead	01	7439-92-1	SW6010D	11/22/2022 14:15	11/23/2022 01:42	0.0170	J	0.0120	0.0200	1	mg/L	AB
Selenium	01	7782-49-2	SW6010D	11/22/2022 14:15	11/23/2022 01:42	BLOD		0.0800	0.100	1	mg/L	AB
Zinc	01	7440-66-6	SW6010D	11/22/2022 14:15	11/23/2022 01:42	0.694		0.0200	0.0200	1	mg/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	01	78-93-3	SW8260D	11/21/2022 00:00	11/21/2022 18:02	1140		30.0	100	10	ug/L	RJB
Acetone	01	67-64-1	SW8260D	11/21/2022 00:00	11/21/2022 18:02	4420		70.0	100	10	ug/L	RJB
Benzene	01	71-43-2	SW8260D	11/21/2022 00:00	11/21/2022 18:02	50.4		4.00	10.0	10	ug/L	RJB
Ethylbenzene	01	100-41-4	SW8260D	11/21/2022 00:00	11/21/2022 18:02	16.2		4.00	10.0	10	ug/L	RJB
Toluene	01	108-88-3	SW8260D	11/21/2022 00:00	11/21/2022 18:02	32.8		5.00	10.0	10	ug/L	RJB
Xylenes, Total	01	1330-20-7	SW8260D	11/21/2022 00:00	11/21/2022 18:02	37.8		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	01	109-99-9	SW8260D	11/21/2022 00:00	11/21/2022 18:02	176		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*01*	*104 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 18:02*							
Surr: 4-Bromofluorobenzene (Surr)	*01*	*98.8 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 18:02*							
Surr: Dibromofluoromethane (Surr)	*01*	*106 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:02*							
Surr: Toluene-d8 (Surr)	*01*	*101 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:02*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*01RE1*	*97.0 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 18:27*							
Surr: 4-Bromofluorobenzene (Surr)	*01RE1*	*102 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 18:27*							

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-65** **Laboratory Sample ID:** **22K1011-01**

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*	*101 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:27*							
Surr: Toluene-d8 (Surr)	*01RE1*	*101 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:27*							
Semivolatile Organic Compounds by GCMS												
Anthracene	01	120-12-7	SW8270E	11/21/2022 09:00	11/21/2022 22:09	BLOD		46.7	93.5	10	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*01*	*121 %*	*5-136*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Surr: 2-Fluorobiphenyl (Surr)	*01*	*55.4 %*	*9-117*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Surr: 2-Fluorophenol (Surr)	*01*	*47.0 %*	*5-60*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Surr: Nitrobenzene-d5 (Surr)	*01*	*91.0 %*	*5-151*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Surr: Phenol-d5 (Surr)	*01*	*37.3 %*	*5-60*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Surr: p-Terphenyl-d14 (Surr)	*01*	*40.8 %*	*5-141*	*11/21/2022 09:00*	*11/21/2022 22:09*							
Wet Chemistry Analysis												
Ammonia as N	01RE1	7664-41-7	EPA350.1 R2.0	11/21/2022 15:52	11/21/2022 15:52	1380		50.0	50.0	500	mg/L	MKS
BOD	01	E1640606	SM22 5210B-2011	11/18/2022 11:24	11/18/2022 11:24	5140		0.2	2.0	1	mg/L	LAM
COD	01	NA	SM22 5220D-2011	11/28/2022 10:00	11/28/2022 10:00	10800		1000	1000	100	mg/L	MGC
Nitrate+Nitrite as N	01	E701177	SM22 4500-NO3F-2011	11/28/2022 14:36	11/28/2022 14:36	0.33		0.10	0.10	1	mg/L	FIR
Total Recoverable Phenolics	01	NA	SW9065	11/28/2022 10:30	11/28/2022 17:15	3.00		0.300	0.500	1	mg/L	MAH
TKN as N	01RE1	E17148461	EPA351.2 R2.0	12/01/2022 16:39	12/01/2022 16:39	1470		20.0	50.0	100	mg/L	FIR

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-61** **Laboratory Sample ID:** **22K1011-02**

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	11/22/2022 14:15	11/23/2022 01:46	BLOD		0.0100	0.0200	1	mg/L	AB
Arsenic	02	7440-38-2	SW6010D	11/22/2022 14:15	11/23/2022 01:46	0.464		0.0200	0.0400	1	mg/L	AB
Barium	02	7440-39-3	SW6010D	11/22/2022 14:15	11/23/2022 01:46	0.485		0.0100	0.0200	1	mg/L	AB
Cadmium	02	7440-43-9	SW6010D	11/22/2022 14:15	11/23/2022 01:46	BLOD		0.0040	0.0080	1	mg/L	AB
Chromium	02	7440-47-3	SW6010D	11/22/2022 14:15	11/23/2022 01:46	0.112		0.0160	0.0200	1	mg/L	AB
Copper	02	7440-50-8	SW6010D	11/22/2022 14:15	11/23/2022 01:46	BLOD		0.0160	0.0200	1	mg/L	AB
Mercury	02	7439-97-6	SW7470A	12/05/2022 08:55	12/05/2022 14:11	0.00169		0.00040	0.00040	1	mg/L	ACM
Nickel	02	7440-02-0	SW6010D	11/22/2022 14:15	11/23/2022 01:46	0.1344		0.0140	0.0200	1	mg/L	AB
Lead	02	7439-92-1	SW6010D	11/22/2022 14:15	11/23/2022 01:46	BLOD		0.0120	0.0200	1	mg/L	AB
Selenium	02	7782-49-2	SW6010D	11/22/2022 14:15	11/23/2022 01:46	BLOD		0.0800	0.100	1	mg/L	AB
Zinc	02	7440-66-6	SW6010D	11/22/2022 14:15	11/23/2022 01:46	0.0320		0.0200	0.0200	1	mg/L	AB
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	02RE1	78-93-3	SW8260D	11/21/2022 00:00	11/21/2022 19:19	15600		300	1000	100	ug/L	RJB
Acetone	02RE1	67-64-1	SW8260D	11/21/2022 00:00	11/21/2022 19:19	38300		700	1000	100	ug/L	RJB
Benzene	02	71-43-2	SW8260D	11/21/2022 00:00	11/21/2022 18:53	2860		4.00	10.0	10	ug/L	RJB
Ethylbenzene	02	100-41-4	SW8260D	11/21/2022 00:00	11/21/2022 18:53	194		4.00	10.0	10	ug/L	RJB
Toluene	02	108-88-3	SW8260D	11/21/2022 00:00	11/21/2022 18:53	214		5.00	10.0	10	ug/L	RJB
Xylenes, Total	02	1330-20-7	SW8260D	11/21/2022 00:00	11/21/2022 18:53	185		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	02RE1	109-99-9	SW8260D	11/21/2022 00:00	11/21/2022 19:19	8530		1000	1000	100	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*02*		*104 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 18:53*						
Surr: 4-Bromofluorobenzene (Surr)	*02*		*96.9 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 18:53*						
Surr: Dibromofluoromethane (Surr)	*02*		*104 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:53*						
Surr: Toluene-d8 (Surr)	*02*		*98.0 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 18:53*						
Surr: 1,2-Dichloroethane-d4 (Surr)	*02RE1*		*104 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 19:19*						
Surr: 4-Bromofluorobenzene (Surr)	*02RE1*		*95.7 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 19:19*						

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Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-61** **Laboratory Sample ID:** **22K1011-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
Surr: Dibromofluoromethane (Surr)	*02RE1*	*105 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 19:19*							
Surr: Toluene-d8 (Surr)	*02RE1*	*104 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 19:19*							
Semivolatile Organic Compounds by GCMS												
Anthracene	02	120-12-7	SW8270E	11/21/2022 09:00	11/21/2022 22:44	BLOD		46.7	93.5	10	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*02*	*89.9 %*	*5-136*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Surr: 2-Fluorobiphenyl (Surr)	*02*	*39.4 %*	*9-117*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Surr: 2-Fluorophenol (Surr)	*02*	*20.0 %*	*5-60*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Surr: Nitrobenzene-d5 (Surr)	*02*	*53.0 %*	*5-151*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Surr: Phenol-d5 (Surr)	*02*	*39.1 %*	*5-60*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Surr: p-Terphenyl-d14 (Surr)	*02*	*10.4 %*	*5-141*	*11/21/2022 09:00*	*11/21/2022 22:44*							
Wet Chemistry Analysis												
Ammonia as N	02RE1	7664-41-7	EPA350.1 R2.0	11/21/2022 15:52	11/21/2022 15:52	1400		50.0	50.0	500	mg/L	MKS
BOD	02	E1640606	SM22 5210B-2011	11/18/2022 13:19	11/18/2022 13:19	5860		0.2	2.0	1	mg/L	LAM
COD	02	NA	SM22 5220D-2011	11/28/2022 10:00	11/28/2022 10:00	9790		1000	1000	100	mg/L	MGC
Nitrate+Nitrite as N	02	E701177	SM22 4500-NO3F-2011	11/28/2022 14:36	11/28/2022 14:36	0.16		0.10	0.10	1	mg/L	FIR
Total Recoverable Phenolics	02	NA	SW9065	11/28/2022 10:30	11/28/2022 17:15	5.68		0.300	0.500	1	mg/L	MAH
TKN as N	02RE1	E17148461	EPA351.2 R2.0	12/01/2022 16:39	12/01/2022 16:39	1290		20.0	50.0	100	mg/L	FIR

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Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-59** **Laboratory Sample ID:** **22K1011-03**

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	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0100	0.0200	1	mg/L	AB
Arsenic	03	7440-38-2	SW6010D	11/22/2022 14:15	11/23/2022 01:52	0.863		0.0200	0.0400	1	mg/L	AB
Barium	03	7440-39-3	SW6010D	11/22/2022 14:15	11/23/2022 01:52	0.871		0.0100	0.0200	1	mg/L	AB
Cadmium	03	7440-43-9	SW6010D	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0040	0.0080	1	mg/L	AB
Chromium	03	7440-47-3	SW6010D	11/22/2022 14:15	11/23/2022 01:52	0.208		0.0160	0.0200	1	mg/L	AB
Copper	03	7440-50-8	SW6010D	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0160	0.0200	1	mg/L	AB
Mercury	03	7439-97-6	SW7470A	12/05/2022 08:55	12/05/2022 14:13	BLOD		0.00080	0.00080	1	mg/L	ACM
Nickel	03	7440-02-0	SW6010D	11/22/2022 14:15	11/23/2022 01:52	0.0866		0.0140	0.0200	1	mg/L	AB
Lead	03	7439-92-1	SW6010D	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0120	0.0200	1	mg/L	AB
Selenium	03	7782-49-2	SW6010D	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0800	0.100	1	mg/L	AB
Zinc	03	7440-66-6	SW6010D	11/22/2022 14:15	11/23/2022 01:52	BLOD		0.0200	0.0200	1	mg/L	AB

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Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-59** **Laboratory Sample ID:** **22K1011-03**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	03	78-93-3	SW8260D	11/21/2022 00:00	11/21/2022 19:44	3510		30.0	100	10	ug/L	RJB
Acetone	03RE1	67-64-1	SW8260D	11/21/2022 00:00	11/21/2022 20:11	16100		700	1000	100	ug/L	RJB
Benzene	03	71-43-2	SW8260D	11/21/2022 00:00	11/21/2022 19:44	7.40	J	4.00	10.0	10	ug/L	RJB
Ethylbenzene	03	100-41-4	SW8260D	11/21/2022 00:00	11/21/2022 19:44	BLOD		4.00	10.0	10	ug/L	RJB
Toluene	03	108-88-3	SW8260D	11/21/2022 00:00	11/21/2022 19:44	BLOD		5.00	10.0	10	ug/L	RJB
Xylenes, Total	03	1330-20-7	SW8260D	11/21/2022 00:00	11/21/2022 19:44	BLOD		10.0	30.0	10	ug/L	RJB
Tetrahydrofuran	03	109-99-9	SW8260D	11/21/2022 00:00	11/21/2022 19:44	309		100	100	10	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*03*	*108 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 19:44*							
Surr: 4-Bromofluorobenzene (Surr)	*03*	*101 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 19:44*							
Surr: Dibromofluoromethane (Surr)	*03*	*108 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 19:44*							
Surr: Toluene-d8 (Surr)	*03*	*102 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 19:44*							
Surr: 1,2-Dichloroethane-d4 (Surr)	*03RE1*	*114 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 20:11*							
Surr: 4-Bromofluorobenzene (Surr)	*03RE1*	*98.7 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 20:11*							
Surr: Dibromofluoromethane (Surr)	*03RE1*	*106 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 20:11*							
Surr: Toluene-d8 (Surr)	*03RE1*	*107 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 20:11*							
Semivolatile Organic Compounds by GCMS												
Anthracene	03	120-12-7	SW8270E	11/22/2022 09:30	11/23/2022 01:39	BLOD		93.5	187	20	ug/L	MGG
Surr: 2,4,6-Tribromophenol (Surr)	*03*	*%*	*5-136*	*11/22/2022 09:30*	*11/23/2022 01:39*							*DS*
Surr: 2-Fluorobiphenyl (Surr)	*03*	*6.00 %*	*9-117*	*11/22/2022 09:30*	*11/23/2022 01:39*							*DS*
Surr: 2-Fluorophenol (Surr)	*03*	*5.60 %*	*5-60*	*11/22/2022 09:30*	*11/23/2022 01:39*							
Surr: Nitrobenzene-d5 (Surr)	*03*	*4.80 %*	*5-151*	*11/22/2022 09:30*	*11/23/2022 01:39*							*DS*
Surr: Phenol-d5 (Surr)	*03*	*18.0 %*	*5-60*	*11/22/2022 09:30*	*11/23/2022 01:39*							
Surr: p-Terphenyl-d14 (Surr)	*03*	*2.80 %*	*5-141*	*11/22/2022 09:30*	*11/23/2022 01:39*							*DS*

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Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **EW-59** **Laboratory Sample ID:** **22K1011-03**

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	11/23/2022 13:13	11/23/2022 13:13	1560		50.0	50.0	500	mg/L	MKS
BOD	03	E1640606	SM22 5210B-2011	11/18/2022 13:24	11/18/2022 13:24	15700		0.2	2.0	1	mg/L	LAM
COD	03	NA	SM22 5220D-2011	11/28/2022 10:00	11/28/2022 10:00	23500		2000	2000	200	mg/L	MGC
Nitrate+Nitrite as N	03	E701177	SM22 4500-NO3F-2011	11/28/2022 14:36	11/28/2022 14:36	2.91		0.10	0.10	1	mg/L	FIR
Total Recoverable Phenolics	03	NA	SW9065	11/28/2022 10:30	11/28/2022 17:15	28.8		0.750	1.25	1	mg/L	MAH
TKN as N	03RE1	E17148461	EPA351.2 R2.0	12/01/2022 16:39	12/01/2022 16:39	2110		50.0	125	250	mg/L	FIR

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Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **22K1011-04**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	LOD	LOQ	DF	Units	Analyst
Volatile Organic Compounds by GCMS												
2-Butanone (MEK)	04	78-93-3	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	04	67-64-1	SW8260D	11/21/2022 00:00	11/21/2022 13:21	9.36	J	7.00	10.0	1	ug/L	RJB
Benzene	04	71-43-2	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	04	100-41-4	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	04	108-88-3	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	04	1330-20-7	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	04	109-99-9	SW8260D	11/21/2022 00:00	11/21/2022 13:21	BLOD		10.0	10.0	1	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*04*	*96.3 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 13:21*							
Surr: 4-Bromofluorobenzene (Surr)	*04*	*98.6 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 13:21*							
Surr: Dibromofluoromethane (Surr)	*04*	*100 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 13:21*							
Surr: Toluene-d8 (Surr)	*04*	*105 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 13:21*							

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Client Sample ID: **Trip Blank** **Laboratory Sample ID:** **22K1011-05**

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	11/21/2022 00:00	11/21/2022 13:47	BLOD		3.00	10.0	1	ug/L	RJB
Acetone	05	67-64-1	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		7.00	10.0	1	ug/L	RJB
Benzene	05	71-43-2	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		0.40	1.00	1	ug/L	RJB
Ethylbenzene	05	100-41-4	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		0.40	1.00	1	ug/L	RJB
Toluene	05	108-88-3	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		0.50	1.00	1	ug/L	RJB
Xylenes, Total	05	1330-20-7	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		1.00	3.00	1	ug/L	RJB
Tetrahydrofuran	05	109-99-9	SW8260D	11/21/2022 00:00	11/21/2022 13:47	BLOD		10.0	10.0	1	ug/L	RJB
Surr: 1,2-Dichloroethane-d4 (Surr)	*05*	*86.8 %*	*70-120*	*11/21/2022 00:00*	*11/21/2022 13:47*							
Surr: 4-Bromofluorobenzene (Surr)	*05*	*97.4 %*	*75-120*	*11/21/2022 00:00*	*11/21/2022 13:47*							
Surr: Dibromofluoromethane (Surr)	*05*	*91.6 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 13:47*							
Surr: Toluene-d8 (Surr)	*05*	*103 %*	*70-130*	*11/21/2022 00:00*	*11/21/2022 13:47*							

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Client Site I.D.: Bristol landfill
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Metals (Total) by EPA 6000/7000 Series Methods - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0920 - EPA200.2/R2.8										
Blank (BFK0920-BLK1)				Prepared & Analyzed: 11/22/2022						
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 (BFK0920-BS1)				Prepared & Analyzed: 11/22/2022						
Arsenic	1.00	0.0400	mg/L	1.00		100	80-120			
Barium	1.04	0.0200	mg/L	1.00		104	80-120			
Cadmium	1.06	0.0080	mg/L	1.00		106	80-120			
Chromium	1.08	0.0200	mg/L	1.00		108	80-120			
Copper	1.07	0.0200	mg/L	1.00		107	80-120			
Lead	1.07	0.0200	mg/L	1.00		107	80-120			
Nickel	1.055	0.0200	mg/L	1.00		106	80-120			
Selenium	1.04	0.100	mg/L	1.00		104	80-120			
Silver	0.199	0.0200	mg/L	0.200		99.4	80-120			
Zinc	1.06	0.0200	mg/L	1.00		106	80-120			
Matrix Spike (BFK0920-MS1)	**Source: 22K1068-06**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Arsenic	1.24	0.0400	mg/L	1.00	0.155	109	75-125			
Barium	1.80	0.0200	mg/L	1.00	0.785	102	75-125			

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

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0920 - EPA200.2/R2.8										
Matrix Spike (BFK0920-MS1)	**Source: 22K1068-06**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Cadmium	1.06	0.0080	mg/L	1.00	BLOD	106	75-125			
Chromium	1.14	0.0200	mg/L	1.00	0.0875	105	75-125			
Copper	1.04	0.0200	mg/L	1.00	BLOD	104	75-125			
Lead	1.03	0.0200	mg/L	1.00	BLOD	103	75-125			
Nickel	1.066	0.0200	mg/L	1.00	0.0180	105	75-125			
Selenium	1.04	0.100	mg/L	1.00	BLOD	104	75-125			
Silver	0.200	0.0200	mg/L	0.200	BLOD	99.9	75-125			
Zinc	1.04	0.0200	mg/L	1.00	BLOD	104	75-125			
Matrix Spike (BFK0920-MS2)	**Source: 22K1094-01**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Arsenic	1.04	0.0400	mg/L	1.00	BLOD	104	75-125			
Barium	1.08	0.0200	mg/L	1.00	0.0757	101	75-125			
Cadmium	1.05	0.0080	mg/L	1.00	BLOD	105	75-125			
Chromium	1.06	0.0200	mg/L	1.00	BLOD	106	75-125			
Copper	1.11	0.0200	mg/L	1.00	0.0740	104	75-125			
Lead	1.05	0.0200	mg/L	1.00	0.0197	103	75-125			
Nickel	1.075	0.0200	mg/L	1.00	0.0202	105	75-125			
Selenium	1.01	0.100	mg/L	1.00	BLOD	101	75-125			
Silver	0.201	0.0200	mg/L	0.200	BLOD	101	75-125			E
Zinc	1.38	0.0200	mg/L	1.00	0.367	101	75-125			
Matrix Spike Dup (BFK0920-MSD1)	**Source: 22K1068-06**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Arsenic	1.23	0.0400	mg/L	1.00	0.155	108	75-125	0.706	20	
Barium	1.80	0.0200	mg/L	1.00	0.785	101	75-125	0.174	20	
Cadmium	1.07	0.0080	mg/L	1.00	BLOD	107	75-125	0.756	20	
Chromium	1.13	0.0200	mg/L	1.00	0.0875	105	75-125	0.225	20	

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

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

Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0920 - EPA200.2/R2.8										
Matrix Spike Dup (BFK0920-MSD1)	**Source: 22K1068-06**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Copper	1.05	0.0200	mg/L	1.00	BLOD	105	75-125	0.864	20	
Lead	1.05	0.0200	mg/L	1.00	BLOD	105	75-125	1.31	20	
Nickel	1.078	0.0200	mg/L	1.00	0.0180	106	75-125	1.11	20	
Selenium	1.02	0.100	mg/L	1.00	BLOD	102	75-125	1.77	20	
Silver	0.201	0.0200	mg/L	0.200	BLOD	101	75-125	0.720	20	E
Zinc	1.04	0.0200	mg/L	1.00	BLOD	104	75-125	0.187	20	
Matrix Spike Dup (BFK0920-MSD2)	**Source: 22K1094-01**			Prepared: 11/22/2022 Analyzed: 11/23/2022						
Arsenic	1.03	0.0400	mg/L	1.00	BLOD	103	75-125	1.51	20	
Barium	1.07	0.0200	mg/L	1.00	0.0757	99.2	75-125	1.60	20	
Cadmium	1.03	0.0080	mg/L	1.00	BLOD	103	75-125	1.35	20	
Chromium	1.05	0.0200	mg/L	1.00	BLOD	105	75-125	0.330	20	
Copper	1.09	0.0200	mg/L	1.00	0.0740	102	75-125	1.66	20	
Lead	1.03	0.0200	mg/L	1.00	0.0197	101	75-125	2.08	20	
Nickel	1.060	0.0200	mg/L	1.00	0.0202	104	75-125	1.40	20	
Selenium	1.02	0.100	mg/L	1.00	BLOD	102	75-125	1.23	20	
Silver	0.196	0.0200	mg/L	0.200	BLOD	98.1	75-125	2.68	20	
Zinc	1.36	0.0200	mg/L	1.00	0.367	99.7	75-125	1.20	20	
Batch BFL0136 - SW7470A										
Blank (BFL0136-BLK1)				Prepared & Analyzed: 12/05/2022						
Mercury	ND	0.00020	mg/L							
Matrix Spike (BFL0136-MS1)	**Source: 22K1067-02**			Prepared & Analyzed: 12/05/2022						
Mercury	0.00288	0.00020	mg/L	0.00250	0.00033	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 BFL0136 - SW7470A										
Matrix Spike Dup (BFL0136-MSD1)	**Source: 22K1067-02**			Prepared & Analyzed: 12/05/2022						
Mercury	0.00284	0.00020	mg/L	0.00250	0.00033	100	80-120	1.40	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 BFK0850 - SW5030B-MS										
Blank (BFK0850-BLK1)				Prepared & Analyzed: 11/21/2022						
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							
Tetrahydrofuran	ND	10.0	ug/L							
Surr: 1,2-Dichloroethane-d4 (Surr)	*46.8*		ug/L	*50.0*		*93.6*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*47.8*		ug/L	*50.0*		*95.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*48.5*		ug/L	*50.0*		*97.0*	*70-130*			
Surr: Toluene-d8 (Surr)	*49.2*		ug/L	*50.0*		*98.5*	*70-130*			
LCS (BFK0850-BS1)				Prepared & Analyzed: 11/21/2022						
1,1,1,2-Tetrachloroethane	40.8	0.4	ug/L	50.0		81.6	80-130			
1,1,1-Trichloroethane	46.2	1	ug/L	50.0		92.4	65-130			
1,1,2,2-Tetrachloroethane	40.0	0.4	ug/L	50.0		80.0	65-130			
1,1,2-Trichloroethane	44.3	1	ug/L	50.0		88.6	75-125			
1,1-Dichloroethane	45.2	1	ug/L	50.0		90.3	70-135			
1,1-Dichloroethylene	40.7	1	ug/L	50.0		81.4	70-130			
1,1-Dichloropropene	46.3	1	ug/L	50.0		92.6	75-135			
1,2,3-Trichlorobenzene	46.7	1	ug/L	50.0		93.4	55-140			
1,2,3-Trichloropropane	43.2	1	ug/L	50.0		86.4	75-125			
1,2,4-Trichlorobenzene	48.0	1	ug/L	50.0		96.0	65-135			
1,2,4-Trimethylbenzene	49.8	1	ug/L	50.0		99.6	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	45.4	1	ug/L	50.0		90.8	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 BFK0850 - SW5030B-MS										
LCS (BFK0850-BS1)				Prepared & Analyzed: 11/21/2022						
1,2-Dibromoethane (EDB)	45.9	1	ug/L	50.0		91.8	80-120			
1,2-Dichlorobenzene	43.7	0.5	ug/L	50.0		87.4	70-120			
1,2-Dichloroethane	45.0	1	ug/L	50.0		90.0	70-130			
1,2-Dichloropropane	44.6	0.5	ug/L	50.0		89.2	75-125			
1,3,5-Trimethylbenzene	46.8	1	ug/L	50.0		93.5	75-125			
1,3-Dichlorobenzene	45.9	1	ug/L	50.0		91.9	75-125			
1,3-Dichloropropane	43.7	1	ug/L	50.0		87.3	75-125			
1,4-Dichlorobenzene	44.6	1	ug/L	50.0		89.1	75-125			
2,2-Dichloropropane	49.3	1	ug/L	50.0		98.5	70-135			
2-Butanone (MEK)	44.6	10	ug/L	50.0		89.1	30-150			
2-Chlorotoluene	48.1	1	ug/L	50.0		96.2	75-125			
2-Hexanone (MBK)	42.3	5	ug/L	50.0		84.5	55-130			
4-Chlorotoluene	49.0	1	ug/L	50.0		98.0	75-130			
4-Isopropyltoluene	46.5	1	ug/L	50.0		93.0	75-130			
4-Methyl-2-pentanone (MIBK)	48.0	5	ug/L	50.0		96.1	60-135			
Acetone	41.2	10	ug/L	50.0		82.5	40-140			
Benzene	46.7	1	ug/L	50.0		93.4	80-120			
Bromobenzene	44.4	1	ug/L	50.0		88.7	75-125			
Bromochloromethane	44.2	1	ug/L	50.0		88.5	65-130			
Bromodichloromethane	47.2	0.5	ug/L	50.0		94.3	75-120			
Bromoform	41.6	1	ug/L	50.0		83.3	70-130			
Bromomethane	48.1	1	ug/L	50.0		96.1	30-145			
Carbon disulfide	41.6	10	ug/L	50.0		83.3	35-160			
Carbon tetrachloride	45.9	1	ug/L	50.0		91.7	65-140			
Chlorobenzene	45.2	1	ug/L	50.0		90.4	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 BFK0850 - SW5030B-MS										
LCS (BFK0850-BS1)				Prepared & Analyzed: 11/21/2022						
Chloroethane	44.4	1	ug/L	50.0		88.8	60-135			
Chloroform	44.1	0.5	ug/L	50.0		88.1	65-135			
Chloromethane	43.9	1	ug/L	50.0		87.8	40-125			
cis-1,2-Dichloroethylene	45.8	1	ug/L	50.0		91.5	70-125			
cis-1,3-Dichloropropene	33.9	1	ug/L	50.0		67.7	70-130			L
Dibromochloromethane	44.7	0.5	ug/L	50.0		89.3	60-135			
Dibromomethane	40.8	1	ug/L	50.0		81.7	75-125			
Dichlorodifluoromethane	43.2	1	ug/L	50.0		86.5	30-155			
Ethylbenzene	46.5	1	ug/L	50.0		93.0	75-125			
Hexachlorobutadiene	45.5	0.8	ug/L	50.0		91.0	50-140			
Isopropylbenzene	44.2	1	ug/L	50.0		88.4	75-125			
m+p-Xylenes	87.3	2	ug/L	100		87.3	75-130			
Methylene chloride	44.4	4	ug/L	50.0		88.7	55-140			
Methyl-t-butyl ether (MTBE)	42.7	1	ug/L	50.0		85.4	65-125			
Naphthalene	46.9	1	ug/L	50.0		93.8	55-140			
n-Butylbenzene	49.9	1	ug/L	50.0		99.7	70-135			
n-Propylbenzene	48.1	1	ug/L	50.0		96.2	70-130			
o-Xylene	45.1	1	ug/L	50.0		90.1	80-120			
sec-Butylbenzene	49.6	1	ug/L	50.0		99.2	70-125			
Styrene	46.6	1	ug/L	50.0		93.1	65-135			
tert-Butylbenzene	45.8	1	ug/L	50.0		91.7	70-130			
Tetrachloroethylene (PCE)	73.2	1	ug/L	50.0		146	45-150			
Toluene	43.8	1	ug/L	50.0		87.7	75-120			
trans-1,2-Dichloroethylene	45.5	1	ug/L	50.0		91.1	60-140			
trans-1,3-Dichloropropene	42.5	1	ug/L	50.0		85.0	55-140			

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Client Site I.D.: Bristol landfill
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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 BFK0850 - SW5030B-MS										
LCS (BFK0850-BS1)				Prepared & Analyzed: 11/21/2022						
Trichloroethylene	47.6	1	ug/L	50.0		95.1	70-125			
Trichlorofluoromethane	43.4	1	ug/L	50.0		86.8	60-145			
Vinyl chloride	48.0	0.5	ug/L	50.0		96.0	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*48.0*		ug/L	*50.0*		*96.0*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.5*		ug/L	*50.0*		*99.0*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.5*		ug/L	*50.0*		*101*	*70-130*			
Surr: Toluene-d8 (Surr)	*48.7*		ug/L	*50.0*		*97.4*	*70-130*			
Matrix Spike (BFK0850-MS1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
1,1,1,2-Tetrachloroethane	44.3	0.4	ug/L	50.0	BLOD	88.6	80-130			
1,1,1-Trichloroethane	47.4	1	ug/L	50.0	BLOD	94.8	65-130			
1,1,2,2-Tetrachloroethane	42.8	0.4	ug/L	50.0	BLOD	85.5	65-130			
1,1,2-Trichloroethane	50.7	1	ug/L	50.0	BLOD	101	75-125			
1,1-Dichloroethane	46.3	1	ug/L	50.0	BLOD	92.6	70-135			
1,1-Dichloroethylene	37.5	1	ug/L	50.0	BLOD	75.0	50-145			
1,1-Dichloropropene	45.3	1	ug/L	50.0	BLOD	90.6	75-135			
1,2,3-Trichlorobenzene	49.3	1	ug/L	50.0	BLOD	98.6	55-140			
1,2,3-Trichloropropane	44.6	1	ug/L	50.0	BLOD	89.2	75-125			
1,2,4-Trichlorobenzene	50.0	1	ug/L	50.0	BLOD	100	65-135			
1,2,4-Trimethylbenzene	53.4	1	ug/L	50.0	0.84	105	75-130			
1,2-Dibromo-3-chloropropane (DBCP)	47.0	1	ug/L	50.0	BLOD	94.1	50-130			
1,2-Dibromoethane (EDB)	48.9	1	ug/L	50.0	BLOD	97.8	80-120			
1,2-Dichlorobenzene	47.4	0.5	ug/L	50.0	BLOD	94.8	70-120			
1,2-Dichloroethane	46.2	1	ug/L	50.0	BLOD	92.4	70-130			
1,2-Dichloropropane	46.5	0.5	ug/L	50.0	BLOD	93.0	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 BFK0850 - SW5030B-MS										
Matrix Spike (BFK0850-MS1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
1,3,5-Trimethylbenzene	48.5	1	ug/L	50.0	BLOD	97.0	75-124			
1,3-Dichlorobenzene	48.7	1	ug/L	50.0	BLOD	97.4	75-125			
1,3-Dichloropropane	48.2	1	ug/L	50.0	BLOD	96.5	75-125			
1,4-Dichlorobenzene	47.0	1	ug/L	50.0	0.65	92.6	75-125			
2,2-Dichloropropane	50.7	1	ug/L	50.0	BLOD	101	70-135			
2-Butanone (MEK)	62.7	10	ug/L	50.0	21.5	82.3	30-150			
2-Chlorotoluene	51.5	1	ug/L	50.0	BLOD	103	75-125			
2-Hexanone (MBK)	45.1	5	ug/L	50.0	BLOD	90.2	55-130			
4-Chlorotoluene	51.9	1	ug/L	50.0	BLOD	104	75-130			
4-Isopropyltoluene	50.4	1	ug/L	50.0	0.72	99.4	75-130			
4-Methyl-2-pentanone (MIBK)	57.2	5	ug/L	50.0	BLOD	114	60-135			
Acetone	112	10	ug/L	50.0	71.9	80.7	40-140			
Benzene	64.9	1	ug/L	50.0	18.2	93.6	80-120			
Bromobenzene	46.3	1	ug/L	50.0	BLOD	92.6	75-125			
Bromochloromethane	45.5	1	ug/L	50.0	BLOD	91.0	65-130			
Bromodichloromethane	49.3	0.5	ug/L	50.0	BLOD	98.6	75-136			
Bromoform	44.3	1	ug/L	50.0	BLOD	88.6	70-130			
Bromomethane	46.6	1	ug/L	50.0	BLOD	93.3	30-145			
Carbon disulfide	53.4	10	ug/L	50.0	BLOD	107	35-160			
Carbon tetrachloride	48.0	1	ug/L	50.0	BLOD	95.9	65-140			
Chlorobenzene	47.6	1	ug/L	50.0	BLOD	95.1	80-120			
Chloroethane	45.0	1	ug/L	50.0	BLOD	90.0	60-135			
Chloroform	49.0	0.5	ug/L	50.0	4.30	89.4	65-135			
Chloromethane	45.1	1	ug/L	50.0	BLOD	90.2	40-125			
cis-1,2-Dichloroethylene	44.6	1	ug/L	50.0	BLOD	89.2	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 BFK0850 - SW5030B-MS										
Matrix Spike (BFK0850-MS1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
cis-1,3-Dichloropropene	36.2	1	ug/L	50.0	BLOD	72.4	47-136			
Dibromochloromethane	47.4	0.5	ug/L	50.0	BLOD	94.9	60-135			
Dibromomethane	42.2	1	ug/L	50.0	BLOD	84.4	75-125			
Dichlorodifluoromethane	45.4	1	ug/L	50.0	BLOD	90.7	30-155			
Ethylbenzene	51.1	1	ug/L	50.0	2.70	96.7	75-125			
Hexachlorobutadiene	46.7	0.8	ug/L	50.0	BLOD	93.3	50-140			
Isopropylbenzene	45.7	1	ug/L	50.0	BLOD	91.5	75-125			
m+p-Xylenes	90.2	2	ug/L	100	1.24	88.9	75-130			
Methylene chloride	45.3	4	ug/L	50.0	BLOD	90.6	55-140			
Methyl-t-butyl ether (MTBE)	45.6	1	ug/L	50.0	BLOD	91.1	65-125			
Naphthalene	52.0	1	ug/L	50.0	0.99	102	55-140			
n-Butylbenzene	52.7	1	ug/L	50.0	BLOD	105	70-135			
n-Propylbenzene	50.6	1	ug/L	50.0	BLOD	101	70-130			
o-Xylene	45.8	1	ug/L	50.0	0.77	90.0	80-120			
sec-Butylbenzene	52.4	1	ug/L	50.0	BLOD	105	70-125			
Styrene	47.8	1	ug/L	50.0	BLOD	95.5	65-135			
tert-Butylbenzene	50.1	1	ug/L	50.0	BLOD	100	70-130			
Tetrachloroethylene (PCE)	75.3	1	ug/L	50.0	BLOD	151	51-231			
Toluene	46.2	1	ug/L	50.0	1.52	89.4	75-120			
trans-1,2-Dichloroethylene	45.2	1	ug/L	50.0	BLOD	90.3	60-140			
trans-1,3-Dichloropropene	46.4	1	ug/L	50.0	BLOD	92.9	55-140			
Trichloroethylene	51.7	1	ug/L	50.0	BLOD	103	70-125			
Trichlorofluoromethane	43.0	1	ug/L	50.0	BLOD	86.1	60-145			
Vinyl chloride	47.7	0.5	ug/L	50.0	BLOD	95.4	50-145			
Surr: 1,2-Dichloroethane-d4 (Surr)	*49.6*		ug/L	*50.0*		*99.2*	*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 BFK0850 - SW5030B-MS										
Matrix Spike (BFK0850-MS1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
Surr: 4-Bromofluorobenzene (Surr)	*48.8*		ug/L	*50.0*		*97.5*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*50.6*		ug/L	*50.0*		*101*	*70-130*			
Surr: Toluene-d8 (Surr)	*50.4*		ug/L	*50.0*		*101*	*70-130*			
Matrix Spike Dup (BFK0850-MSD1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
1,1,1,2-Tetrachloroethane	42.8	0.4	ug/L	50.0	BLOD	85.6	80-130	3.44	30	
1,1,1-Trichloroethane	44.3	1	ug/L	50.0	BLOD	88.6	65-130	6.74	30	
1,1,2,2-Tetrachloroethane	43.0	0.4	ug/L	50.0	BLOD	86.0	65-130	0.537	30	
1,1,2-Trichloroethane	49.6	1	ug/L	50.0	BLOD	99.3	75-125	2.09	30	
1,1-Dichloroethane	43.8	1	ug/L	50.0	BLOD	87.5	70-135	5.64	30	
1,1-Dichloroethylene	36.2	1	ug/L	50.0	BLOD	72.4	50-145	3.50	30	
1,1-Dichloropropene	43.8	1	ug/L	50.0	BLOD	87.5	75-135	3.39	30	
1,2,3-Trichlorobenzene	47.5	1	ug/L	50.0	BLOD	95.0	55-140	3.78	30	
1,2,3-Trichloropropane	44.6	1	ug/L	50.0	BLOD	89.1	75-125	0.0897	30	
1,2,4-Trichlorobenzene	48.5	1	ug/L	50.0	BLOD	97.0	65-135	3.11	30	
1,2,4-Trimethylbenzene	50.4	1	ug/L	50.0	0.84	99.1	75-130	5.86	30	
1,2-Dibromo-3-chloropropane (DBCP)	46.2	1	ug/L	50.0	BLOD	92.4	50-130	1.82	30	
1,2-Dibromoethane (EDB)	45.2	1	ug/L	50.0	BLOD	90.4	80-120	7.88	30	
1,2-Dichlorobenzene	45.6	0.5	ug/L	50.0	BLOD	91.1	70-120	3.98	30	
1,2-Dichloroethane	44.1	1	ug/L	50.0	BLOD	88.2	70-130	4.65	30	
1,2-Dichloropropane	47.3	0.5	ug/L	50.0	BLOD	94.6	75-125	1.66	30	
1,3,5-Trimethylbenzene	46.3	1	ug/L	50.0	BLOD	92.7	75-124	4.58	30	
1,3-Dichlorobenzene	45.7	1	ug/L	50.0	BLOD	91.4	75-125	6.27	30	
1,3-Dichloropropane	47.3	1	ug/L	50.0	BLOD	94.5	75-125	2.05	30	
1,4-Dichlorobenzene	45.0	1	ug/L	50.0	0.65	88.7	75-125	4.29	30	

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Certificate of Analysis

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Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
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 BFK0850 - SW5030B-MS										
Matrix Spike Dup (BFK0850-MSD1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
2,2-Dichloropropane	49.5	1	ug/L	50.0	BLOD	98.9	70-135	2.52	30	
2-Butanone (MEK)	68.4	10	ug/L	50.0	21.5	93.7	30-150	8.72	30	
2-Chlorotoluene	47.3	1	ug/L	50.0	BLOD	94.7	75-125	8.40	30	
2-Hexanone (MBK)	43.5	5	ug/L	50.0	BLOD	87.0	55-130	3.68	30	
4-Chlorotoluene	48.3	1	ug/L	50.0	BLOD	96.6	75-130	7.19	30	
4-Isopropyltoluene	47.7	1	ug/L	50.0	0.72	94.0	75-130	5.48	30	
4-Methyl-2-pentanone (MIBK)	57.3	5	ug/L	50.0	BLOD	115	60-135	0.210	30	
Acetone	125	10	ug/L	50.0	71.9	106	40-140	10.6	30	
Benzene	62.8	1	ug/L	50.0	18.2	89.3	80-120	3.35	30	
Bromobenzene	46.1	1	ug/L	50.0	BLOD	92.2	75-125	0.455	30	
Bromochloromethane	46.0	1	ug/L	50.0	BLOD	92.1	65-130	1.20	30	
Bromodichloromethane	53.1	0.5	ug/L	50.0	BLOD	106	75-136	7.40	30	
Bromoform	44.7	1	ug/L	50.0	BLOD	89.4	70-130	0.809	30	
Bromomethane	45.4	1	ug/L	50.0	BLOD	90.8	30-145	2.74	30	
Carbon disulfide	52.9	10	ug/L	50.0	BLOD	106	35-160	1.05	30	
Carbon tetrachloride	46.1	1	ug/L	50.0	BLOD	92.2	65-140	3.98	30	
Chlorobenzene	45.8	1	ug/L	50.0	BLOD	91.5	80-120	3.88	30	
Chloroethane	43.1	1	ug/L	50.0	BLOD	86.2	60-135	4.33	30	
Chloroform	48.0	0.5	ug/L	50.0	4.30	87.3	65-135	2.08	30	
Chloromethane	42.6	1	ug/L	50.0	BLOD	85.3	40-125	5.61	30	
cis-1,2-Dichloroethylene	44.4	1	ug/L	50.0	BLOD	88.9	70-125	0.404	30	
cis-1,3-Dichloropropene	38.0	1	ug/L	50.0	BLOD	76.0	47-136	4.85	30	
Dibromochloromethane	49.2	0.5	ug/L	50.0	BLOD	98.5	60-135	3.70	30	
Dibromomethane	44.0	1	ug/L	50.0	BLOD	88.0	75-125	4.25	30	
Dichlorodifluoromethane	43.1	1	ug/L	50.0	BLOD	86.2	30-155	5.11	30	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0850 - SW5030B-MS										
Matrix Spike Dup (BFK0850-MSD1)	**Source: 22K1068-03**			Prepared & Analyzed: 11/21/2022						
Ethylbenzene	49.1	1	ug/L	50.0	2.70	92.7	75-125	3.99	30	
Hexachlorobutadiene	45.3	0.8	ug/L	50.0	BLOD	90.6	50-140	2.96	30	
Isopropylbenzene	44.0	1	ug/L	50.0	BLOD	87.9	75-125	3.95	30	
m+p-Xylenes	88.6	2	ug/L	100	1.24	87.4	75-130	1.78	30	
Methylene chloride	44.5	4	ug/L	50.0	BLOD	88.9	55-140	1.83	30	
Methyl-t-butyl ether (MTBE)	44.6	1	ug/L	50.0	BLOD	89.1	65-125	2.26	30	
Naphthalene	50.5	1	ug/L	50.0	0.99	99.1	55-140	2.91	30	
n-Butylbenzene	49.0	1	ug/L	50.0	BLOD	98.0	70-135	7.26	30	
n-Propylbenzene	46.5	1	ug/L	50.0	BLOD	93.0	70-130	8.55	30	
o-Xylene	43.3	1	ug/L	50.0	0.77	85.1	80-120	5.41	30	
sec-Butylbenzene	48.7	1	ug/L	50.0	BLOD	97.4	70-125	7.41	30	
Styrene	45.4	1	ug/L	50.0	BLOD	90.7	65-135	5.13	30	
tert-Butylbenzene	46.0	1	ug/L	50.0	BLOD	92.0	70-130	8.59	30	
Tetrachloroethylene (PCE)	70.6	1	ug/L	50.0	BLOD	141	51-231	6.35	30	
Toluene	46.5	1	ug/L	50.0	1.52	90.0	75-120	0.647	30	
trans-1,2-Dichloroethylene	44.4	1	ug/L	50.0	BLOD	88.8	60-140	1.70	30	
trans-1,3-Dichloropropene	46.1	1	ug/L	50.0	BLOD	92.1	55-140	0.800	30	
Trichloroethylene	50.5	1	ug/L	50.0	BLOD	101	70-125	2.23	30	
Trichlorofluoromethane	40.2	1	ug/L	50.0	BLOD	80.3	60-145	6.95	30	
Vinyl chloride	44.8	0.5	ug/L	50.0	BLOD	89.7	50-145	6.18	30	
Surr: 1,2-Dichloroethane-d4 (Surr)	*51.4*		ug/L	*50.0*		*103*	*70-120*			
Surr: 4-Bromofluorobenzene (Surr)	*49.9*		ug/L	*50.0*		*99.8*	*75-120*			
Surr: Dibromofluoromethane (Surr)	*51.6*		ug/L	*50.0*		*103*	*70-130*			
Surr: Toluene-d8 (Surr)	*51.4*		ug/L	*50.0*		*103*	*70-130*			

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Semivolatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0845 - SW3510C/EPA600-MS										
Blank (BFK0845-BLK1)				Prepared & Analyzed: 11/21/2022						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*64.6*		ug/L	*100*		*64.6*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*34.4*		ug/L	*50.0*		*68.7*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*37.2*		ug/L	*100*		*37.2*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*30.8*		ug/L	*50.0*		*61.7*	*5-151*			
Surr: Phenol-d5 (Surr)	*22.8*		ug/L	*100*		*22.8*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*49.8*		ug/L	*50.0*		*99.5*	*5-141*			
LCS (BFK0845-BS1)				Prepared & Analyzed: 11/21/2022						
1,2,4-Trichlorobenzene	31.3	10.0	ug/L	50.0		62.6	57-130			
1,2-Dichlorobenzene	30.0	10.0	ug/L	50.0		60.0	22-115			
1,3-Dichlorobenzene	29.1	10.0	ug/L	50.0		58.2	22-112			
1,4-Dichlorobenzene	32.5	10.0	ug/L	50.0		65.1	13-112			
2,4,6-Trichlorophenol	32.8	10.0	ug/L	50.0		65.6	52-129			
2,4-Dichlorophenol	31.0	10.0	ug/L	50.0		62.1	53-122			
2,4-Dimethylphenol	31.3	5.00	ug/L	50.0		62.6	42-120			
2,4-Dinitrophenol	26.5	50.0	ug/L	50.0		53.0	48-127			
2,4-Dinitrotoluene	39.6	10.0	ug/L	50.0		79.1	10-173			
2,6-Dinitrotoluene	35.4	10.0	ug/L	50.0		70.7	68-137			
2-Chloronaphthalene	34.9	10.0	ug/L	50.0		69.8	65-120			
2-Chlorophenol	31.1	10.0	ug/L	50.0		62.1	36-120			
2-Nitrophenol	34.3	10.0	ug/L	50.0		68.6	45-167			
3,3'-Dichlorobenzidine	22.3	10.0	ug/L	50.0		44.7	10-213			
4,6-Dinitro-2-methylphenol	36.5	50.0	ug/L	50.0		73.0	53-130			
4-Bromophenyl phenyl ether	33.0	10.0	ug/L	50.0		66.0	65-120			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0845 - SW3510C/EPA600-MS										
LCS (BFK0845-BS1)				Prepared & Analyzed: 11/21/2022						
4-Chlorophenyl phenyl ether	31.2	10.0	ug/L	50.0		62.5	38-145			
4-Nitrophenol	10.5	50.0	ug/L	50.0		21.0	13-129			
Acenaphthene	35.1	10.0	ug/L	50.0		70.3	60-132			
Acenaphthylene	36.9	10.0	ug/L	50.0		73.8	54-126			
Anthracene	41.7	10.0	ug/L	50.0		83.4	43-120			
Benzidine	ND	50.0	ug/L	50.0			12-309			L
Benzo (a) anthracene	42.0	10.0	ug/L	50.0		84.0	42-133			
Benzo (a) pyrene	47.3	10.0	ug/L	50.0		94.5	32-148			
Benzo (b) fluoranthene	52.0	10.0	ug/L	50.0		104	42-140			
Benzo (g,h,i) perylene	32.1	10.0	ug/L	50.0		64.1	10-195			
Benzo (k) fluoranthene	49.4	10.0	ug/L	50.0		98.9	25-146			
bis (2-Chloroethoxy) methane	30.1	10.0	ug/L	50.0		60.1	49-165			
bis (2-Chloroethyl) ether	30.8	10.0	ug/L	50.0		61.7	43-126			
2,2'-Oxybis (1-chloropropane)	34.6	10.0	ug/L	50.0		69.1	63-139			
bis (2-Ethylhexyl) phthalate	44.0	10.0	ug/L	50.0		88.0	29-137			
Butyl benzyl phthalate	42.2	10.0	ug/L	50.0		84.4	10-140			
Chrysene	45.9	10.0	ug/L	50.0		91.7	44-140			
Dibenz (a,h) anthracene	37.5	10.0	ug/L	50.0		75.0	10-200			
Diethyl phthalate	40.7	10.0	ug/L	50.0		81.4	10-120			
Dimethyl phthalate	40.8	10.0	ug/L	50.0		81.5	10-120			
Di-n-butyl phthalate	39.6	10.0	ug/L	50.0		79.3	10-120			
Di-n-octyl phthalate	71.0	10.0	ug/L	50.0		142	19-132			L
Fluoranthene	49.1	10.0	ug/L	50.0		98.1	43-121			
Fluorene	36.4	10.0	ug/L	50.0		72.8	70-120			
Hexachlorobenzene	43.8	1.00	ug/L	50.0		87.6	10-142			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0845 - SW3510C/EPA600-MS										
LCS (BFK0845-BS1)				Prepared & Analyzed: 11/21/2022						
Hexachlorobutadiene	32.5	10.0	ug/L	50.0		65.0	38-120			
Hexachlorocyclopentadiene	24.8	10.0	ug/L	50.0		49.7	10-76			
Hexachloroethane	30.6	10.0	ug/L	50.0		61.2	55-120			
Indeno (1,2,3-cd) pyrene	37.2	10.0	ug/L	50.0		74.5	10-151			
Isophorone	26.5	10.0	ug/L	50.0		53.0	47-180			
Naphthalene	36.5	5.00	ug/L	50.0		73.0	36-120			
Nitrobenzene	33.0	10.0	ug/L	50.0		65.9	54-158			
n-Nitrosodimethylamine	17.6	10.0	ug/L	50.0		35.1	10-85			
n-Nitrosodi-n-propylamine	32.4	10.0	ug/L	50.0		64.7	14-198			
n-Nitrosodiphenylamine	28.6	10.0	ug/L	50.0		57.2	12-97			
p-Chloro-m-cresol	31.5	10.0	ug/L	50.0		63.1	10-142			
Pentachlorophenol	28.7	20.0	ug/L	50.0		57.3	38-152			
Phenanthrene	45.7	10.0	ug/L	50.0		91.5	65-120			
Phenol	11.1	10.0	ug/L	50.5		21.9	17-120			
Pyrene	45.0	10.0	ug/L	50.0		89.9	70-120			
Pyridine	21.0	10.0	ug/L	50.0		42.0	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*77.6*		ug/L	*100*		*77.6*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*37.7*		ug/L	*50.0*		*75.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*38.6*		ug/L	*100*		*38.6*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*35.0*		ug/L	*50.0*		*70.0*	*5-151*			
Surr: Phenol-d5 (Surr)	*26.3*		ug/L	*100*		*26.3*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*48.3*		ug/L	*50.0*		*96.6*	*5-141*			
Batch BFK0934 - SW3510C/EPA600-MS										
Blank (BFK0934-BLK1)				Prepared & Analyzed: 11/22/2022						

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Blank (BFK0934-BLK1)				Prepared & Analyzed: 11/22/2022						
Anthracene	ND	10.0	ug/L							
Surr: 2,4,6-Tribromophenol (Surr)	*64.2*		ug/L	*100*		*64.2*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*31.2*		ug/L	*50.0*		*62.5*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*28.5*		ug/L	*100*		*28.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*30.1*		ug/L	*50.0*		*60.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*23.1*		ug/L	*100*		*23.1*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*44.5*		ug/L	*50.0*		*88.9*	*5-141*			
LCS (BFK0934-BS1)				Prepared & Analyzed: 11/22/2022						
1,2,4-Trichlorobenzene	28.1	10.0	ug/L	50.0		56.1	57-130			L
1,2-Dichlorobenzene	24.9	10.0	ug/L	50.0		49.9	22-115			
1,3-Dichlorobenzene	23.4	10.0	ug/L	50.0		46.9	22-112			
1,4-Dichlorobenzene	26.1	10.0	ug/L	50.0		52.3	13-112			
2,4,6-Trichlorophenol	37.8	10.0	ug/L	50.0		75.5	52-129			
2,4-Dichlorophenol	34.4	10.0	ug/L	50.0		68.8	53-122			
2,4-Dimethylphenol	34.4	5.00	ug/L	50.0		68.8	42-120			
2,4-Dinitrophenol	33.8	50.0	ug/L	50.0		67.6	48-127			
2,4-Dinitrotoluene	43.5	10.0	ug/L	50.0		87.0	10-173			
2,6-Dinitrotoluene	40.6	10.0	ug/L	50.0		81.2	68-137			
2-Chloronaphthalene	37.0	10.0	ug/L	50.0		74.0	65-120			
2-Chlorophenol	33.1	10.0	ug/L	50.0		66.3	36-120			
2-Nitrophenol	37.0	10.0	ug/L	50.0		74.1	45-167			
3,3'-Dichlorobenzidine	24.8	10.0	ug/L	50.0		49.6	10-213			
4,6-Dinitro-2-methylphenol	41.1	50.0	ug/L	50.0		82.2	53-130			
4-Bromophenyl phenyl ether	36.9	10.0	ug/L	50.0		73.8	65-120			

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Batch BFK0934 - SW3510C/EPA600-MS										
LCS (BFK0934-BS1)				Prepared & Analyzed: 11/22/2022						
4-Chlorophenyl phenyl ether	34.8	10.0	ug/L	50.0		69.7	38-145			
4-Nitrophenol	15.2	50.0	ug/L	50.0		30.5	13-129			
Acenaphthene	38.7	10.0	ug/L	50.0		77.5	60-132			
Acenaphthylene	40.2	10.0	ug/L	50.0		80.4	54-126			
Anthracene	46.9	10.0	ug/L	50.0		93.8	43-120			
Benzidine	ND	50.0	ug/L	50.0			12-309			L
Benzo (a) anthracene	44.3	10.0	ug/L	50.0		88.7	42-133			
Benzo (a) pyrene	48.2	10.0	ug/L	50.0		96.4	32-148			
Benzo (b) fluoranthene	50.0	10.0	ug/L	50.0		100	42-140			
Benzo (g,h,i) perylene	30.3	10.0	ug/L	50.0		60.6	10-195			
Benzo (k) fluoranthene	51.5	10.0	ug/L	50.0		103	25-146			
bis (2-Chloroethoxy) methane	34.2	10.0	ug/L	50.0		68.4	49-165			
bis (2-Chloroethyl) ether	33.0	10.0	ug/L	50.0		65.9	43-126			
2,2'-Oxybis (1-chloropropane)	35.0	10.0	ug/L	50.0		70.1	63-139			
bis (2-Ethylhexyl) phthalate	43.8	10.0	ug/L	50.0		87.6	29-137			
Butyl benzyl phthalate	41.3	10.0	ug/L	50.0		82.6	10-140			
Chrysene	45.2	10.0	ug/L	50.0		90.5	44-140			
Dibenz (a,h) anthracene	37.2	10.0	ug/L	50.0		74.3	10-200			
Diethyl phthalate	45.0	10.0	ug/L	50.0		90.1	10-120			
Dimethyl phthalate	45.9	10.0	ug/L	50.0		91.7	10-120			
Di-n-octyl phthalate	61.6	10.0	ug/L	50.0		123	19-132			
Fluoranthene	50.6	10.0	ug/L	50.0		101	43-121			
Fluorene	41.5	10.0	ug/L	50.0		83.0	70-120			
Hexachlorobenzene	46.7	1.00	ug/L	50.0		93.4	10-142			
Hexachlorobutadiene	27.7	10.0	ug/L	50.0		55.5	38-120			

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
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 BFK0934 - SW3510C/EPA600-MS										
LCS (BFK0934-BS1)				Prepared & Analyzed: 11/22/2022						
Hexachlorocyclopentadiene	25.7	10.0	ug/L	50.0		51.4	10-76			
Hexachloroethane	24.2	10.0	ug/L	50.0		48.5	55-120			L
Indeno (1,2,3-cd) pyrene	36.4	10.0	ug/L	50.0		72.8	10-151			
Isophorone	29.3	10.0	ug/L	50.0		58.6	47-180			
Naphthalene	34.5	5.00	ug/L	50.0		69.0	36-120			
Nitrobenzene	34.7	10.0	ug/L	50.0		69.4	54-158			
n-Nitrosodimethylamine	17.2	10.0	ug/L	50.0		34.4	10-85			
n-Nitrosodi-n-propylamine	34.9	10.0	ug/L	50.0		69.8	14-198			
n-Nitrosodiphenylamine	32.3	10.0	ug/L	50.0		64.6	12-97			
p-Chloro-m-cresol	36.3	10.0	ug/L	50.0		72.7	10-142			
Pentachlorophenol	33.8	20.0	ug/L	50.0		67.5	38-152			
Phenanthrene	50.0	10.0	ug/L	50.0		100	65-120			
Phenol	15.4	10.0	ug/L	50.5		30.5	17-120			
Pyrene	45.5	10.0	ug/L	50.0		91.0	70-120			
Pyridine	30.6	10.0	ug/L	50.0		61.2	10-103			
Surr: 2,4,6-Tribromophenol (Surr)	*84.9*		ug/L	*100*		*84.9*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*41.9*		ug/L	*50.0*		*83.8*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*44.1*		ug/L	*100*		*44.1*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*36.6*		ug/L	*50.0*		*73.2*	*5-151*			
Surr: Phenol-d5 (Surr)	*28.8*		ug/L	*100*		*28.8*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*47.8*		ug/L	*50.0*		*95.6*	*5-141*			
Matrix Spike (BFK0934-MS1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
1,2,4-Trichlorobenzene	26.7	10.0	ug/L	49.5	BLOD	53.9	44-142			
1,2-Dichlorobenzene	23.5	10.0	ug/L	49.5	BLOD	47.5	22-115			

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Matrix Spike (BFK0934-MS1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
1,3-Dichlorobenzene	22.5	10.0	ug/L	49.5	BLOD	45.4	22-112			
1,4-Dichlorobenzene	26.1	10.0	ug/L	49.5	BLOD	52.7	13-112			
2,4,6-Trichlorophenol	31.9	10.0	ug/L	49.5	BLOD	64.5	37-144			
2,4-Dichlorophenol	30.7	10.0	ug/L	49.5	BLOD	62.1	39-135			
2,4-Dimethylphenol	29.9	5.00	ug/L	49.5	BLOD	60.3	32-120			
2,4-Dinitrophenol	26.1	50.0	ug/L	49.5	BLOD	52.7	39-139			
2,4-Dinitrotoluene	37.5	10.0	ug/L	49.5	BLOD	75.8	10-191			
2,6-Dinitrotoluene	34.8	10.0	ug/L	49.5	BLOD	70.3	50-158			
2-Chloronaphthalene	31.3	10.0	ug/L	49.5	BLOD	63.2	60-120			
2-Chlorophenol	29.4	10.0	ug/L	49.5	BLOD	59.4	23-134			
2-Nitrophenol	32.2	10.0	ug/L	49.5	BLOD	65.0	29-182			
3,3'-Dichlorobenzidine	20.7	10.0	ug/L	49.5	BLOD	41.8	10-262			
4,6-Dinitro-2-methylphenol	33.6	50.0	ug/L	49.5	BLOD	67.9	10-181			
4-Bromophenyl phenyl ether	32.9	10.0	ug/L	49.5	BLOD	66.5	53-127			
4-Chlorophenyl phenyl ether	30.0	10.0	ug/L	49.5	BLOD	60.5	25-158			
4-Nitrophenol	12.6	50.0	ug/L	49.5	BLOD	25.4	10-132			
Acenaphthene	32.4	10.0	ug/L	49.5	BLOD	65.4	47-145			
Acenaphthylene	33.8	10.0	ug/L	49.5	BLOD	68.2	33-145			
Anthracene	39.9	10.0	ug/L	49.5	BLOD	80.7	27-133			
Benzidine	ND	50.0	ug/L	49.5	BLOD		12-309			M
Benzo (a) anthracene	38.8	10.0	ug/L	49.5	BLOD	78.4	33-143			
Benzo (a) pyrene	41.4	10.0	ug/L	49.5	BLOD	83.6	17-163			
Benzo (b) fluoranthene	44.2	10.0	ug/L	49.5	BLOD	89.2	24-159			
Benzo (g,h,i) perylene	27.3	10.0	ug/L	49.5	BLOD	55.2	10-219			
Benzo (k) fluoranthene	44.5	10.0	ug/L	49.5	BLOD	90.0	11-162			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Matrix Spike (BFK0934-MS1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
bis (2-Chloroethoxy) methane	28.9	10.0	ug/L	49.5	BLOD	58.4	33-184			
bis (2-Chloroethyl) ether	29.0	10.0	ug/L	49.5	BLOD	58.5	12-158			
2,2'-Oxybis (1-chloropropane)	31.2	10.0	ug/L	49.5	BLOD	63.0	36-166			
bis (2-Ethylhexyl) phthalate	39.1	10.0	ug/L	49.5	BLOD	79.0	10-158			
Butyl benzyl phthalate	37.7	10.0	ug/L	49.5	BLOD	76.1	10-152			
Chrysene	39.2	10.0	ug/L	49.5	BLOD	79.1	17-169			
Dibenz (a,h) anthracene	33.0	10.0	ug/L	49.5	BLOD	66.8	10-227			
Diethyl phthalate	37.9	10.0	ug/L	49.5	BLOD	76.6	10-120			
Dimethyl phthalate	38.7	10.0	ug/L	49.5	BLOD	78.2	10-120			
Di-n-butyl phthalate	42.8	10.0	ug/L	49.5	BLOD	86.5	10-120			
Di-n-octyl phthalate	55.7	10.0	ug/L	49.5	BLOD	113	10-146			
Fluoranthene	42.7	10.0	ug/L	49.5	BLOD	86.3	26-137			
Fluorene	34.8	10.0	ug/L	49.5	BLOD	70.3	59-121			
Hexachlorobenzene	42.3	1.00	ug/L	49.5	BLOD	85.5	10-152			
Hexachlorobutadiene	27.6	10.0	ug/L	49.5	BLOD	55.7	24-120			
Hexachlorocyclopentadiene	21.1	10.0	ug/L	49.5	BLOD	42.6	10-90			
Hexachloroethane	23.9	10.0	ug/L	49.5	BLOD	48.2	40-120			
Indeno (1,2,3-cd) pyrene	32.4	10.0	ug/L	49.5	BLOD	65.4	10-171			
Isophorone	24.6	10.0	ug/L	49.5	BLOD	49.6	21-196			
Naphthalene	31.3	5.00	ug/L	49.5	BLOD	63.3	21-133			
Nitrobenzene	30.5	10.0	ug/L	49.5	BLOD	61.7	35-180			
n-Nitrosodimethylamine	15.0	10.0	ug/L	49.5	BLOD	30.3	10-85			
n-Nitrosodi-n-propylamine	30.5	10.0	ug/L	49.5	BLOD	61.6	10-230			
n-Nitrosodiphenylamine	27.7	10.0	ug/L	49.5	BLOD	55.9	12-111			
p-Chloro-m-cresol	31.6	10.0	ug/L	49.5	BLOD	63.8	10-127			

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Semivolatile Organic Compounds by GCMS - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Matrix Spike (BFK0934-MS1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
Pentachlorophenol	31.6	20.0	ug/L	49.5	BLOD	63.8	14-176			
Phenanthrene	43.0	10.0	ug/L	49.5	BLOD	86.8	54-120			
Phenol	10.4	10.0	ug/L	50.0	BLOD	20.8	10-120			
Pyrene	40.2	10.0	ug/L	49.5	BLOD	81.2	52-120			
Pyridine	26.2	10.0	ug/L	49.5	BLOD	52.9	10-110			
Surr: 2,4,6-Tribromophenol (Surr)	*76.5*		ug/L	*99.0*		*77.3*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*34.3*		ug/L	*49.5*		*69.4*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*38.4*		ug/L	*99.0*		*38.8*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*31.9*		ug/L	*49.5*		*64.4*	*5-151*			
Surr: Phenol-d5 (Surr)	*24.0*		ug/L	*99.0*		*24.2*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*38.6*		ug/L	*49.5*		*78.0*	*5-141*			
Matrix Spike Dup (BFK0934-MSD1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
1,2,4-Trichlorobenzene	23.1	10.0	ug/L	48.1	BLOD	48.0	44-142	14.5	20	
1,2-Dichlorobenzene	20.3	10.0	ug/L	48.1	BLOD	42.2	22-115	14.7	20	
1,3-Dichlorobenzene	19.1	10.0	ug/L	48.1	BLOD	39.8	22-112	16.2	20	
1,4-Dichlorobenzene	22.6	10.0	ug/L	48.1	BLOD	47.0	13-112	14.2	20	
2,4,6-Trichlorophenol	30.8	10.0	ug/L	48.1	BLOD	64.1	37-144	3.58	20	
2,4-Dichlorophenol	28.6	10.0	ug/L	48.1	BLOD	59.6	39-135	7.07	20	
2,4-Dimethylphenol	28.2	5.00	ug/L	48.1	BLOD	58.6	32-120	5.72	20	
2,4-Dinitrophenol	27.0	50.0	ug/L	48.1	BLOD	56.1	39-139	3.22	20	
2,4-Dinitrotoluene	38.7	10.0	ug/L	48.1	BLOD	80.4	10-191	2.99	20	
2,6-Dinitrotoluene	34.2	10.0	ug/L	48.1	BLOD	71.1	50-158	1.88	20	
2-Chloronaphthalene	29.7	10.0	ug/L	48.1	BLOD	61.8	60-120	5.10	20	
2-Chlorophenol	28.1	10.0	ug/L	48.1	BLOD	58.4	23-134	4.59	20	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Matrix Spike Dup (BFK0934-MSD1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
2-Nitrophenol	29.7	10.0	ug/L	48.1	BLOD	61.8	29-182	8.01	20	
3,3'-Dichlorobenzidine	22.2	10.0	ug/L	48.1	BLOD	46.2	10-262	6.90	20	
4,6-Dinitro-2-methylphenol	35.8	50.0	ug/L	48.1	BLOD	74.5	10-181	6.40	20	
4-Bromophenyl phenyl ether	32.5	10.0	ug/L	48.1	BLOD	67.5	53-127	1.41	20	
4-Chlorophenyl phenyl ether	29.0	10.0	ug/L	48.1	BLOD	60.2	25-158	3.42	20	
4-Nitrophenol	12.6	50.0	ug/L	48.1	BLOD	26.2	10-132	0.326	20	
Acenaphthene	31.1	10.0	ug/L	48.1	BLOD	64.8	47-145	3.82	20	
Acenaphthylene	32.8	10.0	ug/L	48.1	BLOD	68.2	33-145	3.04	20	
Anthracene	41.9	10.0	ug/L	48.1	BLOD	87.1	27-133	4.73	20	
Benzidine	ND	50.0	ug/L	48.1	BLOD		12-309		20	M
Benzo (a) anthracene	41.9	10.0	ug/L	48.1	BLOD	87.1	33-143	7.55	20	
Benzo (a) pyrene	47.1	10.0	ug/L	48.1	BLOD	97.9	17-163	12.8	20	
Benzo (b) fluoranthene	49.6	10.0	ug/L	48.1	BLOD	103	24-159	11.6	20	
Benzo (g,h,i) perylene	28.3	10.0	ug/L	48.1	BLOD	58.8	10-219	3.28	20	
Benzo (k) fluoranthene	51.1	10.0	ug/L	48.1	BLOD	106	11-162	13.7	20	
bis (2-Chloroethoxy) methane	27.6	10.0	ug/L	48.1	BLOD	57.3	33-184	4.79	20	
bis (2-Chloroethyl) ether	27.5	10.0	ug/L	48.1	BLOD	57.2	12-158	5.21	20	
2,2'-Oxybis (1-chloropropane)	28.2	10.0	ug/L	48.1	BLOD	58.7	36-166	9.99	20	
bis (2-Ethylhexyl) phthalate	44.6	10.0	ug/L	48.1	BLOD	92.9	10-158	13.2	20	
Butyl benzyl phthalate	42.9	10.0	ug/L	48.1	BLOD	89.2	10-152	12.9	20	
Chrysene	44.9	10.0	ug/L	48.1	BLOD	93.4	17-169	13.6	20	
Dibenz (a,h) anthracene	34.6	10.0	ug/L	48.1	BLOD	72.1	10-227	4.71	20	
Diethyl phthalate	39.2	10.0	ug/L	48.1	BLOD	81.5	10-120	3.30	20	
Dimethyl phthalate	38.8	10.0	ug/L	48.1	BLOD	80.7	10-120	0.295	20	
Fluoranthene	47.9	10.0	ug/L	48.1	BLOD	99.7	26-137	11.5	20	

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Enthalpy Analytical

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0934 - SW3510C/EPA600-MS										
Matrix Spike Dup (BFK0934-MSD1)	**Source: 22K1067-02**			Prepared & Analyzed: 11/22/2022						
Fluorene	34.3	10.0	ug/L	48.1	BLOD	71.4	59-121	1.40	20	
Hexachlorobenzene	42.1	1.00	ug/L	48.1	BLOD	87.7	10-152	0.455	20	
Hexachlorobutadiene	24.2	10.0	ug/L	48.1	BLOD	50.4	24-120	12.9	20	
Hexachlorocyclopentadiene	19.2	10.0	ug/L	48.1	BLOD	40.0	10-90	9.22	20	
Hexachloroethane	20.2	10.0	ug/L	48.1	BLOD	41.9	40-120	16.8	20	
Indeno (1,2,3-cd) pyrene	34.3	10.0	ug/L	48.1	BLOD	71.4	10-171	5.90	20	
Isophorone	23.3	10.0	ug/L	48.1	BLOD	48.5	21-196	5.17	20	
Naphthalene	27.8	5.00	ug/L	48.1	BLOD	57.8	21-133	12.0	20	
Nitrobenzene	28.8	10.0	ug/L	48.1	BLOD	60.0	35-180	5.72	20	
n-Nitrosodimethylamine	13.4	10.0	ug/L	48.1	BLOD	27.8	10-85	11.3	20	
n-Nitrosodi-n-propylamine	29.0	10.0	ug/L	48.1	BLOD	60.4	10-230	4.89	20	
n-Nitrosodiphenylamine	28.4	10.0	ug/L	48.1	BLOD	59.1	12-111	2.71	20	
p-Chloro-m-cresol	30.1	10.0	ug/L	48.1	BLOD	62.6	10-127	4.79	20	
Pentachlorophenol	31.9	20.0	ug/L	48.1	BLOD	66.3	14-176	0.947	20	
Phenanthrene	44.2	10.0	ug/L	48.1	BLOD	91.9	54-120	2.69	20	
Phenol	9.48	10.0	ug/L	48.6	BLOD	19.5	10-120	9.40	20	
Pyrene	46.1	10.0	ug/L	48.1	BLOD	95.9	52-120	13.7	20	
Pyridine	26.8	10.0	ug/L	48.1	BLOD	55.7	10-110	2.27	20	
Surr: 2,4,6-Tribromophenol (Surr)	*74.2*		ug/L	*96.2*		*77.1*	*5-136*			
Surr: 2-Fluorobiphenyl (Surr)	*32.7*		ug/L	*48.1*		*68.1*	*9-117*			
Surr: 2-Fluorophenol (Surr)	*25.4*		ug/L	*96.2*		*26.5*	*5-60*			
Surr: Nitrobenzene-d5 (Surr)	*29.3*		ug/L	*48.1*		*61.0*	*5-151*			
Surr: Phenol-d5 (Surr)	*21.9*		ug/L	*96.2*		*22.8*	*5-60*			
Surr: p-Terphenyl-d14 (Surr)	*45.7*		ug/L	*48.1*		*95.0*	*5-141*			

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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 BFK0801 - No Prep Wet Chem										
Blank (BFK0801-BLK1)				Prepared & Analyzed: 11/18/2022						
BOD	ND	2.0	mg/L							
LCS (BFK0801-BS1)				Prepared & Analyzed: 11/18/2022						
BOD	206	2	mg/L	198		104	84.6-115.4			
Duplicate (BFK0801-DUP1)	**Source: 22K1013-01**			Prepared & Analyzed: 11/18/2022						
BOD	56.8	2.0	mg/L		56.5			0.530	20	
Batch BFK0861 - No Prep Wet Chem										
Blank (BFK0861-BLK1)				Prepared & Analyzed: 11/21/2022						
Ammonia as N	ND	0.10	mg/L							
LCS (BFK0861-BS1)				Prepared & Analyzed: 11/21/2022						
Ammonia as N	2.11	0.1	mg/L	2.00		105	90-110			
Matrix Spike (BFK0861-MS1)	**Source: 22K0802-01**			Prepared & Analyzed: 11/21/2022						
Ammonia as N	2.16	0.10	mg/L	2.00	BLOD	108	89.3-131			
Matrix Spike (BFK0861-MS2)	**Source: 22K0993-01**			Prepared & Analyzed: 11/21/2022						
Ammonia as N	2.12	0.10	mg/L	2.00	BLOD	106	89.3-131			
Matrix Spike Dup (BFK0861-MSD1)	**Source: 22K0802-01**			Prepared & Analyzed: 11/21/2022						
Ammonia as N	2.19	0.10	mg/L	2.00	BLOD	109	89.3-131	1.33	20	
Matrix Spike Dup (BFK0861-MSD2)	**Source: 22K0993-01**			Prepared & Analyzed: 11/21/2022						
Ammonia as N	2.19	0.10	mg/L	2.00	BLOD	110	89.3-131	3.34	20	

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Wet Chemistry Analysis - Quality Control

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK0981 - No Prep Wet Chem										
Blank (BFK0981-BLK1)				Prepared & Analyzed: 11/23/2022						
Ammonia as N	ND	0.10	mg/L							
LCS (BFK0981-BS1)				Prepared & Analyzed: 11/23/2022						
Ammonia as N	1.98	0.1	mg/L	2.00		99.2	90-110			
Matrix Spike (BFK0981-MS1)	**Source: 22K1168-03**			Prepared & Analyzed: 11/23/2022						
Ammonia as N	1.98	0.10	mg/L	2.00	BLOD	99.2	89.3-131			
Matrix Spike (BFK0981-MS2)	**Source: 22K1179-01**			Prepared & Analyzed: 11/23/2022						
Ammonia as N	2.12	0.10	mg/L	2.00	BLOD	106	89.3-131			
Matrix Spike Dup (BFK0981-MSD1)	**Source: 22K1168-03**			Prepared & Analyzed: 11/23/2022						
Ammonia as N	1.99	0.10	mg/L	2.00	BLOD	99.7	89.3-131	0.553	20	
Matrix Spike Dup (BFK0981-MSD2)	**Source: 22K1179-01**			Prepared & Analyzed: 11/23/2022						
Ammonia as N	2.15	0.10	mg/L	2.00	BLOD	107	89.3-131	1.31	20	
Batch BFK1020 - No Prep Wet Chem										
Blank (BFK1020-BLK1)				Prepared & Analyzed: 11/28/2022						
COD	ND	10.0	mg/L							
LCS (BFK1020-BS1)				Prepared & Analyzed: 11/28/2022						
COD	52.1	10.0	mg/L	50.0		104	88-119			
Matrix Spike (BFK1020-MS1)	**Source: 22K0966-02**			Prepared & Analyzed: 11/28/2022						
COD	79.0	10.0	mg/L	50.0	29.8	98.3	72.4-130			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK1020 - No Prep Wet Chem										
Matrix Spike Dup (BFK1020-MSD1)	**Source: 22K0966-02**			Prepared & Analyzed: 11/28/2022						
COD	75.7	10.0	mg/L	50.0	29.8	91.7	72.4-130	4.29	20	
Batch BFK1032 - No Prep Wet Chem										
Blank (BFK1032-BLK1)				Prepared & Analyzed: 11/28/2022						
Nitrate+Nitrite as N	ND	0.10	mg/L							
LCS (BFK1032-BS1)				Prepared & Analyzed: 11/28/2022						
Nitrate+Nitrite as N	2.65	0.1	mg/L	2.50		106	90-110			
Matrix Spike (BFK1032-MS1)	**Source: 22K1228-01**			Prepared & Analyzed: 11/28/2022						
Nitrate+Nitrite as N	3.09	0.1	mg/L	2.50	0.68	96.5	90-110			
Matrix Spike Dup (BFK1032-MSD1)	**Source: 22K1228-01**			Prepared & Analyzed: 11/28/2022						
Nitrate+Nitrite as N	3.13	0.1	mg/L	2.50	0.68	98.1	90-110	1.28	20	
Batch BFK1053 - No Prep Wet Chem										
Blank (BFK1053-BLK1)				Prepared & Analyzed: 11/28/2022						
Total Recoverable Phenolics	ND	0.050	mg/L							
LCS (BFK1053-BS1)				Prepared & Analyzed: 11/28/2022						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500		90.4	80-120			
Matrix Spike (BFK1053-MS1)	**Source: 22K1159-02**			Prepared & Analyzed: 11/28/2022						
Total Recoverable Phenolics	0.45	0.050	mg/L	0.500	BLOD	90.4	70-130			

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Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BFK1053 - No Prep Wet Chem										
Matrix Spike Dup (BFK1053-MSD1)	**Source: 22K1159-02**			Prepared & Analyzed: 11/28/2022						
Total Recoverable Phenolics	0.42	0.050	mg/L	0.500	BLOD	84.0	70-130	7.34	20	
Batch BFL0064 - No Prep Wet Chem										
Blank (BFL0064-BLK1)				Prepared & Analyzed: 12/01/2022						
TKN as N	ND	0.50	mg/L							
LCS (BFL0064-BS1)				Prepared & Analyzed: 12/01/2022						
TKN as N	10.3	0.50	mg/L	10.0		103	90-110			
Matrix Spike (BFL0064-MS1)	**Source: 22K1280-03**			Prepared & Analyzed: 12/01/2022						
TKN as N	10.2	0.50	mg/L	10.0	0.71	94.7	90-110			
Matrix Spike (BFL0064-MS2)	**Source: 22K1026-06**			Prepared & Analyzed: 12/01/2022						
TKN as N	10.4	0.50	mg/L	10.0	0.51	99.0	90-110			
Matrix Spike Dup (BFL0064-MSD1)	**Source: 22K1280-03**			Prepared & Analyzed: 12/01/2022						
TKN as N	10.7	0.50	mg/L	10.0	0.71	99.7	90-110	4.76	20	
Matrix Spike Dup (BFL0064-MSD2)	**Source: 22K1026-06**			Prepared & Analyzed: 12/01/2022						
TKN as N	10.7	0.50	mg/L	10.0	0.51	102	90-110	2.53	20	

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Analytical Summary

22K1011-01	Subcontract
22K1011-02	Subcontract
22K1011-03	Subcontract

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.2/R2.8**	
22K1011-01	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
22K1011-02	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
22K1011-03	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
22K1011-01	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
22K1011-02	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
22K1011-03	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
22K1011-01	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
22K1011-01RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
22K1011-02	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
22K1011-02RE1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
22K1011-03	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
22K1011-01	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
22K1011-02	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
22K1011-03	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
22K1011-01	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
22K1011-02	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
22K1011-03	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
22K1011-01	0.500 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
22K1011-02	0.500 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184

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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**	
22K1011-03	0.200 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
22K1011-01	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
22K1011-01RE1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
22K1011-02	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
22K1011-02RE1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
22K1011-03	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
22K1011-03RE1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
22K1011-01	1070 mL / 1.00 mL	SW8270E	BFK0845	SFK0842	AI20131
22K1011-02	1070 mL / 1.00 mL	SW8270E	BFK0845	SFK0842	AI20131
22K1011-03	1070 mL / 1.00 mL	SW8270E	BFK0934	SFK0957	AI20131

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
22K1011-01	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-01RE1	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-02	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-02RE1	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-03	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-03RE1	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-04	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
22K1011-05	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	

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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**	
22K1011-01	10.0 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029
22K1011-02	10.0 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029
22K1011-03	5.00 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029

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QC Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**EPA200.2/R2.8**	
BFK0920-BLK1	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
BFK0920-BS1	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
BFK0920-MS1	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
BFK0920-MS2	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
BFK0920-MSD1	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127
BFK0920-MSD2	25.0 mL / 50.0 mL	SW6010D	BFK0920	SFK0885	AK20127

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BFK0801-BLK1	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
BFK0801-BS1	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
BFK0801-DUP1	300 mL / 300 mL	SM22 5210B-2011	BFK0801	SFK0915	
BFK0861-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0861-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0861-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0861-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0861-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0861-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0861	SFK0807	AK20125
BFK0981-BLK1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK0981-BS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK0981-MRL1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK0981-MS1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK0981-MS2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141

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Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
BFK0981-MSD1	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK0981-MSD2	6.00 mL / 6.00 mL	EPA350.1 R2.0	BFK0981	SFK0912	AK20141
BFK1020-BLK1	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
BFK1020-BS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
BFK1020-MS1	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
BFK1020-MSD1	2.00 mL / 2.00 mL	SM22 5220D-2011	BFK1020	SFK0976	AK20081
BFK1032-BLK1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
BFK1032-BS1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
BFK1032-MRL1	5.00 mL / 5.00 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
BFK1032-MS1	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
BFK1032-MSD1	10.0 mL / 10.0 mL	SM22 4500-NO3F-2011	BFK1032	SFK0968	AK20154
BFK1053-BLK1	5.00 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
BFK1053-BS1	5.00 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
BFK1053-MS1	5.00 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
BFK1053-MSD1	5.00 mL / 10.0 mL	SW9065	BFK1053	SFK0994	AI20184
BFL0064-BLK1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-BS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-MRL1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-MS1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-MS2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-MSD1	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015
BFL0064-MSD2	25.0 mL / 25.0 mL	EPA351.2 R2.0	BFL0064	SFL0075	AL20015

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BFK0845-BLK1	1000 mL / 1.00 mL	SW8270E	BFK0845	SFK0847	AI20189
BFK0845-BS1	1000 mL / 1.00 mL	SW8270E	BFK0845	SFK0847	AI20189
BFK0934-BLK1	1000 mL / 1.00 mL	SW8270E	BFK0934	SFK0910	AI20189

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Semivolatile Organic Compounds by GCMS			**Preparation Method:**	**SW3510C/EPA600-MS**	
BFK0934-BS1	1000 mL / 1.00 mL	SW8270E	BFK0934	SFK0910	AI20189
BFK0934-MS1	1010 mL / 1.00 mL	SW8270E	BFK0934	SFK0910	AI20189
BFK0934-MSD1	1040 mL / 1.00 mL	SW8270E	BFK0934	SFK0910	AI20189

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Volatile Organic Compounds by GCMS			**Preparation Method:**	**SW5030B-MS**	
BFK0850-BLK1	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
BFK0850-BS1	5.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
BFK0850-MS1	1.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160
BFK0850-MSD1	1.00 mL / 5.00 mL	SW8260D	BFK0850	SFK0799	AJ20160

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Metals (Total) by EPA 6000/7000 Series Methods			**Preparation Method:**	**SW7470A**	
BFL0136-BLK1	20.0 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029
BFL0136-BS1		SW7470A	BFL0136	SFL0142	AL20029
BFL0136-MS1	20.0 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029
BFL0136-MSD1	20.0 mL / 20.0 mL	SW7470A	BFL0136	SFL0142	AL20029

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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-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
SW8260D in Non-Potable Water	
2-Butanone (MEK)	VELAP,NCDEQ,PADEP,WVDEP

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

Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM
Client Site I.D.: Bristol landfill
Submitted To: Jennifer Robb

Certified Analyses included in this Report

Analyte	Certifications
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	12/31/2022
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	11/30/2022

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Qualifiers and Definitions

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

ENTHALPY ANALYTICAL

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

Chain of Custody
Effective: Mar 10, 2021

CHAIN OF CUSTODY

COMPANY NAME: SCS Engineers	INVOICE TO: SCS Reston	PROJECT NAME/Quote #: Bristol Landfill
CONTACT: Jon Robb	INVOICE CONTACT: Jon Robb	SITE NAME:
ADDRESS: 216 Victory Road, Winchester VA 22602	INVOICE ADDRESS:	PROJECT NUMBER: 02215206.15
PHONE #: 703-471-6150	INVOICE PHONE #:	P.O. #:
FAX #:	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): Logan Havard	SAMPLER SIGNATURE:	Turn Around Time: Circle (10) 5 Days or _Day(s)

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

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE): Ammonia, BOD, COD, Nitrate, Nitrite	TKN	SVOC: Anthracene	Total Recoverable Phenolics	Total Metals See List	Volatile Fatty Acids: see list	VOCs: See List		COMMENTS
1) EW-65	X					111622	1125		WW	11	—	—	—	—	—	—	—		
2) EW-61	X					111622	1345		WW	11	—	—	—	—	—	—	—		
3) EW-59	X					111622	1745		WW	11	—	—	—	—	—	—	—		
4) Trip Blank	X					111422	1610		DI	2							X		unpreserved
5) Trip Blank	X					111422	1610		DI	2							X		HCl
6)																			
7)																			1.5
8)																			277
9)																			Ice
10)																			Sealed

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

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

RELINQUISHED:	DATE / TIME 111722/1100	RECEIVED: LCM	DATE / TIME
RELINQUISHED: LCM	DATE / TIME	RECEIVED:	DATE / TIME
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 **22K1011**
City of Bristol Semi-Annual
Recd: 11/17/2022 Due: 12/05/2022

v130325002

EA COC_V210310.XLS

Terms and Conditions

I. Enthalpy Terms and Conditions (Standard)

I. SCOPE

Any orders received by Enthalpy Analytical, LLC or its affiliates (Enthalpy), by a purchaser of laboratory, consulting or sampling services (Client) will be governed by these Standard Terms and Conditions, including orders made by delivery of samples or by phone or in person which have not been confirmed in writing, unless otherwise agreed to in a written contract. In the absence of any written contract between Enthalpy and Client, any order placed by Client constitutes Client's acceptance of Enthalpy's offer to provide services subject to these Standard Terms and Conditions and an agreement to be bound by the terms hereof. No contrary or additional terms and conditions expressed by Client, orally or in writing, shall be deemed to be accepted by Enthalpy or part of the contract created by acceptance of Enthalpy's offer unless accepted by Enthalpy in writing.

II. ORDERS AND ACCEPTANCE OF SAMPLES

A Client may order services by submitting a written chain of custody – record/order to Enthalpy or by submitting a purchase order in writing or by telephone or in person and subsequently confirmed in writing (an "Order"). For any Order to be valid, it must contain sufficient specification to enable Enthalpy to fulfill client's requirements. Any requests for additional services on samples that have been accepted by Enthalpy will be treated as a new order and may require changes to pricing and may postpone any estimated delivery dates accordingly. For purposes of these Standard Terms and Conditions, "services" shall mean all work to be performed for Client including provision of any equipment and/or materials to be furnished by Enthalpy.

III. COMPENSATION

Client shall pay Enthalpy in accordance with Enthalpy's applicable price schedule in effect in the area of operations on the date the services were rendered or as otherwise agreed to in any written price quote by Enthalpy. Prices are subject to change at any time without notice.

Payment of all invoices is due within 30 days of the invoice date. Any disputes regarding invoices must be provided to Enthalpy in writing within 30 days of the invoice date. Any invoice which remains outstanding after the due date may be charged a late fee of $50, in addition to being subject to interest at the lesser of the maximum amount permitted by law or 1.5% per month on the unpaid balance. Client shall be responsible for the reasonable costs of collection (by legal proceeding or collection agency) of any late payments.

In the event Client fails to make timely payment of its invoices, Enthalpy reserves the right to pursue all appropriate remedies, including but not limited to withholding delivery of data, suspension of work or otherwise, without recourse.

Payment is not contingent on payment from any another party.

IV. CLIENT RESPONSIBILITY; HOLDING TIMES

Prior to Enthalpy's acceptance of any samples, the entire risk of loss or damage to samples remains with Client, except where Enthalpy provides courier service. In no event will Enthalpy be liable or responsible for the actions or inactions of any carrier shipping or delivering any sample to or from any Enthalpy premises. Client is responsible for the proper packaging, labeling, transportation and delivery of any hazardous materials in accordance with all applicable laws and represents and warrants to Enthalpy that all samples sent to Enthalpy are safe and in stable condition. Client shall be responsible for, and indemnifies Enthalpy against all losses, costs, damages, liabilities and injuries that may be caused or incurred by Enthalpy or its personnel or representatives by Client's sample or sampling site conditions, including damage to persons or property.

All samples/materials delivered to Enthalpy must be in a condition that allows for the preparation of reports and analysis. Enthalpy reserves the right to refuse or revoke acceptance of any sample delivery which, in the sole judgement of Enthalpy is insufficient for sampling purposes, poses any risk of handling, transport or processing for any health, safety or environmental concerns, or which holding times cannot be met based on the deadlines set forth herein (or as otherwise may be required.)

Samples and all relevant materials must be received by 3 p.m. on weekdays in order to be processed on the date of delivery/receipt. Enthalpy is not responsible for holding times that are exceeded because samples are delivered on weekends, holidays or after 3 p.m. on weekdays without prior notification or acceptance. For holding times of 48 hours or less, same-day delivery is required to guarantee holding times. For samples with short holding times (i.e. 7 days or less), samples must be received by Enthalpy no more than 48 hours after sampling to ensure that holding times can be met. For all other analyses with holding times of 14 days or less, samples must be received by Enthalpy within 96 hours of collection to ensure that holding times can be met.

Client shall be responsible for the repair or replacement cost, as applicable, of any sample collection containers rented or loaned to Client by Enthalpy in the event of damage, loss or delay in the timely return of such containers.

V. CHANGE ORDERS; CANCELLATION

Changes to any Order (including scope of work, specifications and timelines) may be initiated by Client after sample delivery acceptance. Any such changes will be documented in writing and may result in a change of cost and turnaround time commitment. Enthalpy's acceptance of any such requested changes is contingent upon operational capacity and technical feasibility.

Client may suspend or cancel any order for services or supplies at any time; provided, however, that in the event of any such cancellation, Client shall remain responsible for payment for all services or supplies rendered and any out-of-pocket expenses incurred by Enthalpy in accordance with Article III hereof, each through the date of cancellation or suspension.

VI. SAMPLE RETENTION

Unless otherwise agreed to in writing by Enthalpy, all samples shall be retained for a period of at least thirty (30) days after analysis and/or reporting is complete, except for gas-phase and short hold (<7 day analysis window) samples which will be retained for a period of ten (10) days after analysis and/or reporting is complete. Pre-arranged long term storage will be subject to additional charges. Samples may be discarded or destroyed at the expiration of the applicable retention period (or such other date as agreed to in writing between Enthalpy and Client) without further notice. Client may request the return of unused sample materials prior to the scheduled disposal, and such samples shall be returned to the Client at Client's sole expense and risk; furthermore the lab may impose additional fees for surplus sample disposal or returning samples to the Client.

VII. DELIVERY DATES; RUSH ANALYSIS

To the extent provided by Enthalpy, delivery dates and turn-around times are estimates which may be changed as reasonably necessary and do not constitute a commitment by Enthalpy. If and when estimated delivery dates are provided by Enthalpy, Enthalpy shall use commercially reasonable efforts to meet such estimated deadlines.

Rush analyses may be available for certain services for an additional charge and must be arranged in advanced. If, as a result of unforeseen circumstances, the rush turnaround times cannot be met, normal pricing will apply.

VIII. LIMITED WARRANTIES AND LIMITATION OF LIABILITY

Enthalpy represents and warrants to Client that:

(a) Analyses, interpretations and conclusions are prepared with a commercially reasonable degree of care, but cannot be guaranteed as correct or absolute;

(b) it holds all licenses and certifications required to perform services; provided, however, that any requirements specific to Client's requested services are provided to Enthalpy prior to acceptance of samples; and

(c) it will use analytical methodologies in substantial conformity with published test methods. Enthalpy has implemented such methods in its Quality Manuals and standard operating procedures, as required. Enthalpy reserves the right to deviate from any such methodologies as necessary or appropriate, based on Enthalpy's reasonable judgment, which deviations, if any, will be made on a basis consistent with recognized industry standards and/or Enthalpy's quality manuals.

Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Enthalpy will be limited to repeating any services performed; provided, however, that Client shall be responsible for providing any additional samples necessary to repeating such services. If resampling is necessary, Enthalpy's liability for resampling costs will be limited to the lesser of $5,000 and the actual cost of resampling.

Enthalpy purchases supplies from vendors that are provided to customers for the collection of laboratory samples. Enthalpy is not responsible for their malfunction or substandard performance.

Enthalpy (together with its employees, representatives, officers, directors, agents and affiliates) shall be liable only for the proven direct and immediate damage caused by Enthalpy's gross negligence or willful misconduct in connection with the performance of services in connection with an order; provided, that, unless otherwise provided under applicable law, Enthalpy must receive written notice of any claims of such losses within six (6) months of the date of Client's knowledge of relevant claims. Enthalpy's liability for any and all causes of action arising hereunder (whether based in contract, tort, negligence, strict liability or otherwise), shall be limited to the lesser of (a) the amount paid by Client for the services and (b) $25,000. Under no circumstances shall Enthalpy be liable for any indirect, consequential, special, incidental or punitive damages, including loss of use, lost profits or otherwise.

IX. REPEATED ANALYSIS/CONFIRMATIONS

Client may provide objections to any test results within thirty (30) days of Client's receipt of results. Any reanalysis requested by Client which generates results consistent with the original results shall be at Client's sole cost and expense. A repeated analysis will only be possible if Enthalpy has sufficient quantities of original samples available when the Client objection is received. To the extent original samples are not available or are not sufficient in quantity for reanalysis, Client will be required to pay all costs, including sampling, transportation, analytical and disposal costs incurred in connection with repeated analysis.

X. CONFIDENTIALITY; REPORTS

Any reports, data and information provided by Enthalpy to Client is for the exclusive use of Client. Enthalpy will not disclose client data to any third party (including regulatory agencies, unless required by law) without notification of and consent from client.

All original computations, reports, and other documents and plans prepared pursuant to these Standard Terms and Conditions are and remain the property of Enthalpy as instruments of service; provided however, that reproducible copies will be provided to Client upon a written request from Client. Such reports shall not be reproduced, except in full, without the written approval of Enthalpy. Client agrees it will not use any such documents or materials for any other than their original intended purpose without the prior written approval of Enthalpy.

XI. FORCE MAJEURE

Enthalpy shall not be responsible in any way for errors, damage, delay or failure to perform any services due to unforeseen circumstances or causes beyond its control, or which result from compliance with any governmental requests or laws and/or regulations.

XII. INSURANCE

At all times during the performance of services, Enthalpy shall maintain the following minimum insurance:

1. Commercial general liability including bodily injury, property damage, owners and contractors protective, products/completed operations, contractual and personal injury. The combined single limit for bodily injury and property damage shall not be less than $1,000,000.
2. Automobile bodily injury and property damage liability insurance covering owned, non-owned, and hired cars. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.
3. Statutory worker's compensation and employers' liability insurance as required by state law.
4. Professional liability insurance with limits of not less then $1,000,000.

XIII. NO BENEFIT FOR THIRD PARTIES; NO RIGHT OF RELIANCE

Enthalpy shall not be responsible or liable for Client's use of or reliance on the data, information or reports furnished by Enthalpy. No right or benefit is conferred on, nor any contractual relationship intended or established with any other person or entity. No such person or entity shall be entitled to rely on Enthalpy's performance of its services hereunder.

XIV. INDEPENDENT CONTRACTOR

The relationship between the parties is that of independent contractors. Nothing contained in these Standard Terms and Conditions shall be construed as creating any agency, partnership, joint venture or other form of joint enterprise, employment or fiduciary relationship between the parties, and neither party shall have authority to contract for or bind the other party in any manner whatsoever.

XV. MISCELLANEOUS PROVISIONS

These Standard Terms and Conditions are binding on the heirs, successors, and assigns of the parties hereto.

These Standard Terms and Conditions represent the entire understanding of Client and Enthalpy as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. These Standard Terms and Conditions may not be modified or altered except in writing signed by both parties.

These Standard Terms and Conditions shall be administered and interpreted under the laws of the state in which the Enthalpy office primarily performing the services is located. Jurisdiction of litigation arising from these Standard Terms and Conditions shall be in that state.

The Client acknowledges that any litigation between Client, or its client, and third parties may require Enthalpy to spend time responding to discovery requests. Client agrees to pay Enthalpy for time and expenses at a rate of $200 per hour incurred in discovery relating to such litigation including, without limitation, depositions, the production of documents, and consultations with Client's counsel.

If any part of these Standard Terms and Conditions is found to be in conflict with applicable laws, such part shall be inoperative, null and void insofar as it is in conflict with said laws, but the remainder of these Terms and Conditions shall be in full force and effect.

These Standard Terms and Conditions may be modified at any time by Enthalpy, without prior notice to Client. Any order placed by Client constitutes Client's acceptance of Enthalpy's offer to provide services subject to these (or subsequently issued) Standard Terms and Conditions and an agreement to be bound by the terms hereof or thereof.

ENTHALPY ANALYTICAL

Sample Preservation Log

Order ID 22K1011 Date Performed: 11/18/22 Analyst Performing Check: CSB

Sample ID	Container ID	Metals pH as Received	Metals pH as Received	Metals Final pH	Cyanide pH as Received	Cyanide pH as Received	Cyanide Final pH	Sulfide pH as Received	Sulfide pH as Received	Sulfide Final pH	Ammonia pH as Received	Ammonia pH as Received	Ammonia Final pH	TKN pH as Received	TKN pH as Received	TKN Final pH	Phos, Tot pH as Received	Phos, Tot pH as Received	Phos, Tot Final pH	NO3+NO2 pH as Received	NO3+NO2 pH as Received	NO3+NO2 Final pH	DRO pH as Received	DRO pH as Received	DRO Final pH	Pesticide (8081/608/508) PCB DW only Received Res. Cl	Pesticide Received Res. Cl	Pesticide final + or -	SVOC (525/8270/625) Received Res. Cl	SVOC Received Res. Cl	SVOC final + or -	CrVI * ** Received pH	CrVI * ** Final pH	Pest/PCB (508) / SVOC(525) pH as Received	Pest/PCB (508) / SVOC(525) pH as Received	Pest/PCB (508) / SVOC(525) Final pH	COD pH as Received	COD pH as Received	COD Final pH	Phenolics pH as Received	Phenolics pH as Received	Phenolics Final pH
		< 2	Other		> 12	Other		> 9	Other		< 2	Other		< 2	Other		< 2	Other		< 2	Other		< 2	Other		+	-	+ or -	+	-	+ or -			< 2	Other		< 2	Other		< 2	Other	
01	A		8	<2																																						
01	B										8	<2		8	<2					8	<2																		8	<2	
01	F																																						8	<2	
01	G																												+		−										
02	A		8	<2																																					
02	B										8	<2		8	<2					8	<2																		8	<2	
02	F																																						8	<2	
02	G																												+		−										
03	A		8	<2																																					
03	B										6	<2		6	<2					6	<2																		6	<2	
03	F																																						6	<2	
03	G																												+		−										

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

* *pH must be adjusted between 9.3 - 9.7*

H2SO4 ID: 2I03036 Na2S2O3 ID: _____ Buffer Sol'n ID: _____

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

Metals were received with pH = 8. HNO3 was added at 1322 on 18 Nov 2022 by DLJ in the Log-In room to bring pH= <2.

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

) WHEN PRINTED
servation Log 12_0

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

Certificate of Analysis

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

Date Issued: 12/6/2022 12:51:59PM

ENTHALPY ANALYTICAL

Enthalpy Analytical
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Certificate of Analysis

Client Name: SCS Engineers-Winchester

Date Issued: 12/6/2022 12:51:59PM

Client Site I.D.: Bristol landfill

Submitted To: Jennifer Robb

Laboratory Order ID: 22K1011

Sample Conditions Checklist

Samples Received at:	**1.50°C**
How were samples received?	Logistics Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	Yes
Are all volatile organic and TOX containers free of headspace?	Yes
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	Yes
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	No

Samples logged as Ground water and for the gorund water methods per Jennifer Robb via email
Samples are too dark to chlorine check and have been decholrinated out of precautions.

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Certificate of Analysis

Client Name: SCS Engineers-Winchester
Date Issued: 12/6/2022 12:51:59PM

Client Site I.D.: Bristol landfill

Submitted To: Jennifer Robb

Samples preserved with sulfuric acid for EW-59 were received at a pH of 6.
Samples have been adjusted in the lab to less than 2.
Samples preserved with sulfuric acid for EW-61 and EW-65 were received at a pH of 8. Samples have been adjusted in the lab to less than 2.
Jennifer Robb notified via email.
MNM 11/18/22 1436

LELAP Certificate Number: 01955
A2LA Accredited (DoD ELAP-QSM 5.4) Certificate Number: 6429.01

ANALYTICAL RESULTS

PERFORMED BY

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

Report Date 11/30/2022

Report # 222112259

Project 22K1011

Samples Collected 11/16/22

Deliver To	*Additional Recipients*
Jennifer Sult Air Water and Soil Labs 1941 Reymet Road Richmond, VA 23237 804 358 8295	Katrina Cooke, Air Water and Soil Labs

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.

Authorized Signature
Pace Gulf Coast Report 222112259

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: Air Water and Soil Labs - Richmond, VA **Report:** 222112259

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.

This report is being reissued on 11/30/22 to correct the project number to read 22K1011.

This report supersedes and replaces any prior reports issued under this workorder

No anomalies were found for the analyzed sample(s).

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22211225901	22K1011: EW-65	Water	11/16/22 11:25	11/22/22 09:13
22211225902	22K1011: EW-61	Water	11/16/22 13:45	11/22/22 09:13
22211225903	22K1011: EW-59	Water	11/16/22 17:45	11/22/22 09:13

Detect Summary

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

		AM23G				
Lab ID	**Client ID**	**Parameter**	**Units**	**Result**	**Dil.**	**%Moist**
22211225901	22K1011: EW-65	Acetic Acid	mg/L	150J	500	NA
22211225901	22K1011: EW-65	Propionic Acid	mg/L	73J	500	NA
22211225902	22K1011: EW-61	Acetic Acid	mg/L	1600	200	NA
22211225902	22K1011: EW-61	Butyric Acid	mg/L	430	200	NA
22211225902	22K1011: EW-61	i-Pentanoic Acid	mg/L	51J	200	NA
22211225902	22K1011: EW-61	Pentanoic Acid	mg/L	24J	200	NA
22211225902	22K1011: EW-61	Propionic Acid	mg/L	620	200	NA
22211225902	22K1011: EW-61	Pyruvic Acid	mg/L	46J	200	NA
22211225903	22K1011: EW-59	Acetic Acid	mg/L	3500	500	NA
22211225903	22K1011: EW-59	Butyric Acid	mg/L	830	500	NA
22211225903	22K1011: EW-59	Pentanoic Acid	mg/L	160J	500	NA
22211225903	22K1011: EW-59	Propionic Acid	mg/L	1600	500	NA
22211225903	22K1011: EW-59	Pyruvic Acid	mg/L	98J	500	NA

Sample Results

22K1011: EW-65

Collect Date 11/16/2022 11:25 | Lab ID 22211225901
Receive Date 11/22/2022 09:13 | 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	11/24/22 10:08	754583	LHM	NA

CAS#	Parameter	Result	DL	LOQ	Units
64-19-7	Acetic Acid	150J	62	250	mg/L
107-92-6	Butyric Acid	250 U	29	250	mg/L
142-62-1	Hexanoic Acid	250 U	29	250	mg/L
646-07-1	i-Hexanoic Acid	250 U	28	250	mg/L
503-74-2	i-Pentanoic Acid	250 U	30	250	mg/L
50-21-5	Lactic Acid	250 U	27	250	mg/L
109-52-4	Pentanoic Acid	250 U	28	250	mg/L
79-09-4	Propionic Acid	73J	27	250	mg/L
127-17-3	Pyruvic Acid	250 U	30	250	mg/L

22K1011: EW-61

Collect Date 11/16/2022 13:45 | Lab ID 22211225902
Receive Date 11/22/2022 09:13 | 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	200	11/24/22 10:30	754583	LHM	NA

CAS#	Parameter	Result	DL	LOQ	Units
64-19-7	Acetic Acid	1600	25	100	mg/L
107-92-6	Butyric Acid	430	12	100	mg/L
142-62-1	Hexanoic Acid	100 U	12	100	mg/L
646-07-1	i-Hexanoic Acid	100 U	11	100	mg/L
503-74-2	i-Pentanoic Acid	51J	12	100	mg/L
50-21-5	Lactic Acid	100 U	11	100	mg/L
109-52-4	Pentanoic Acid	24J	11	100	mg/L
79-09-4	Propionic Acid	620	11	100	mg/L
127-17-3	Pyruvic Acid	46J	12	100	mg/L

22K1011: EW-59

Collect Date 11/16/2022 17:45 | Lab ID 22211225903
Receive Date 11/22/2022 09:13 | 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	11/24/22 10:51	754583	LHM	NA

CAS#	Parameter	Result	DL	LOQ	Units
64-19-7	Acetic Acid	3500	62	250	mg/L
107-92-6	Butyric Acid	830	29	250	mg/L
142-62-1	Hexanoic Acid	250 U	29	250	mg/L
646-07-1	i-Hexanoic Acid	250 U	28	250	mg/L
503-74-2	i-Pentanoic Acid	250 U	30	250	mg/L
50-21-5	Lactic Acid	250 U	27	250	mg/L
109-52-4	Pentanoic Acid	160J	28	250	mg/L

Sample Results

22K1011: EW-59	Collect Date	11/16/2022 17:45	Lab ID	22211225903
	Receive Date	11/22/2022 09:13	Matrix	Water

AM23G (Continued)

*Results and limits are adjusted for dilution.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	500	11/24/22 10:51	754583	LHM	NA

CAS#	Parameter	Result	DL	LOQ	Units
79-09-4	Propionic Acid	1600	27	250	mg/L
127-17-3	Pyruvic Acid	98J	30	250	mg/L

General Chemistry QC Summary

Analytical Batch	Client ID	MB754583		LCS754583				LCSD754583				
754583	Lab ID	2424189		2424190				2424191				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	11/24/22 02:57		11/24/22 02:35				11/24/22 11:13				
	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	2.0	98	70 - 130	2.0	2.0	99	1	20
Butyric Acid	107-92-6	0.50U	0.50	2.0	2.1	104	70 - 130	2.0	2.1	105	0	20
Hexanoic Acid	142-62-1	0.50U	0.50	2.0	2.1	103	70 - 130	2.0	1.9	98	5	20
i-Hexanoic Acid	646-07-1	0.50U	0.50	2.0	2.0	100	70 - 130	2.0	2.1	103	2	20
i-Pentanoic Acid	503-74-2	0.50U	0.50	2.0	1.9	98	70 - 130	2.0	2.1	103	5	20
Lactic Acid	50-21-5	0.50U	0.50	2.0	1.9	95	70 - 130	2.0	2.0	99	4	20
Pentanoic Acid	109-52-4	0.50U	0.50	2.0	2.0	101	70 - 130	2.0	2.1	103	2	20
Propionic Acid	79-09-4	0.50U	0.50	2.0	2.1	104	70 - 130	2.0	2.1	106	2	20
Pyruvic Acid	127-17-3	0.50U	0.50	2.0	1.9	97	70 - 130	2.0	1.9	95	2	20

AIR WATER & SOIL LABORATORIES, INC.

Pace - ~~Florida~~ Gulf Coast
7979 Innovation Park Dr
Baton Rouge, LA 70820

19
RICHMON
(80

Client ID: AWS-R - Air Water and Soil Labs - Richmond, VA
SDG: 222112259
PM: RWe

CHAIN OF CUSTODY

COMPANY NAME: Air, Water & Soil Labs, INC	INVOICE TO: AWS LABS	PROJECT NAME/Quote #: 22K1011
CONTACT:	INVOICE CONTACT: Jennifer Sult	SITE NAME: 22K1011
ADDRESS:1941 Reymet Rd, Richmond, VA 23237	INVOICE ADDRESS:	PROJECT NUMBER: 22K1011
PHONE #: 804-358-8295	INVOICE PHONE #:	P.O. #: 037149
FAX #:804-358-8297	EMAIL: support@awslabs.com	Pretreatment Program:
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 Time: 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) Volatile Fatty Acids - See attached list							
1) 22K1011: EW-65	X					11/16/22	1125		GW	2	X							
2) 22K1011:EW-61	X					11/16/22	1345		GW	2	X							
3) 22K1011:EW-59	X					44881	1745		GW	2	X							
4)																		
5)																		
6)																		
7)																		
8)																		
9)																		
10)																		

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

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

1
2
3

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
JH	11/21/22 1450	FedEx Express	11/21/22 1450
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
FedEx	11-22-22 0913		11-22-22 0913
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

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

LAB USE ONLY COOLER TEMP 5.8E38 °C

7705 5584 8263

Pace Florida

Pace Analytical

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP 222112259	
Client PM RWe AWS-R - Air Water and Soil Labs - Richmond, VA	**Transport Method** FEDEX
Profile Number 284518	**Received By** Roberts, George S.
Line Item(s) 2 - LLVFAs	**Receive Date(s)** 11/22/22

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
770555848263		5.8

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.6

Page 1 of 1

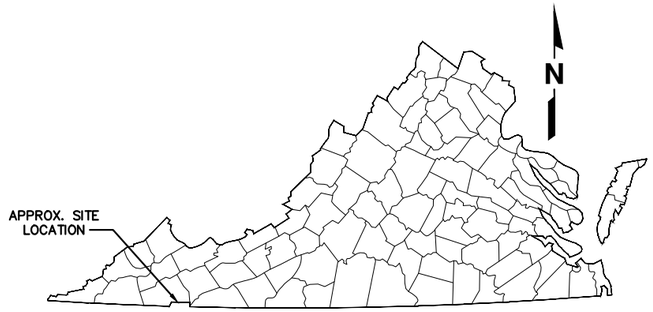
Appendix G

Landfill Temperature Monitoring System Drawings

CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
LANDFILL TEMPERATURE MONITORING SYSTEM DRAWINGS

2125 SHAKESVILLE RD
BRISTOL, VA 24201

BRISTOL ISWMF AERIAL PHOTO



VIRGINIA

PREPARED BY:
SCS ENGINEERS
15521 MIDLOTHIAN TURNPIKE
SUITE 305
MIDLOTHIAN, VA 23113-7313

LIST OF DRAWINGS

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
07/06/2022
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

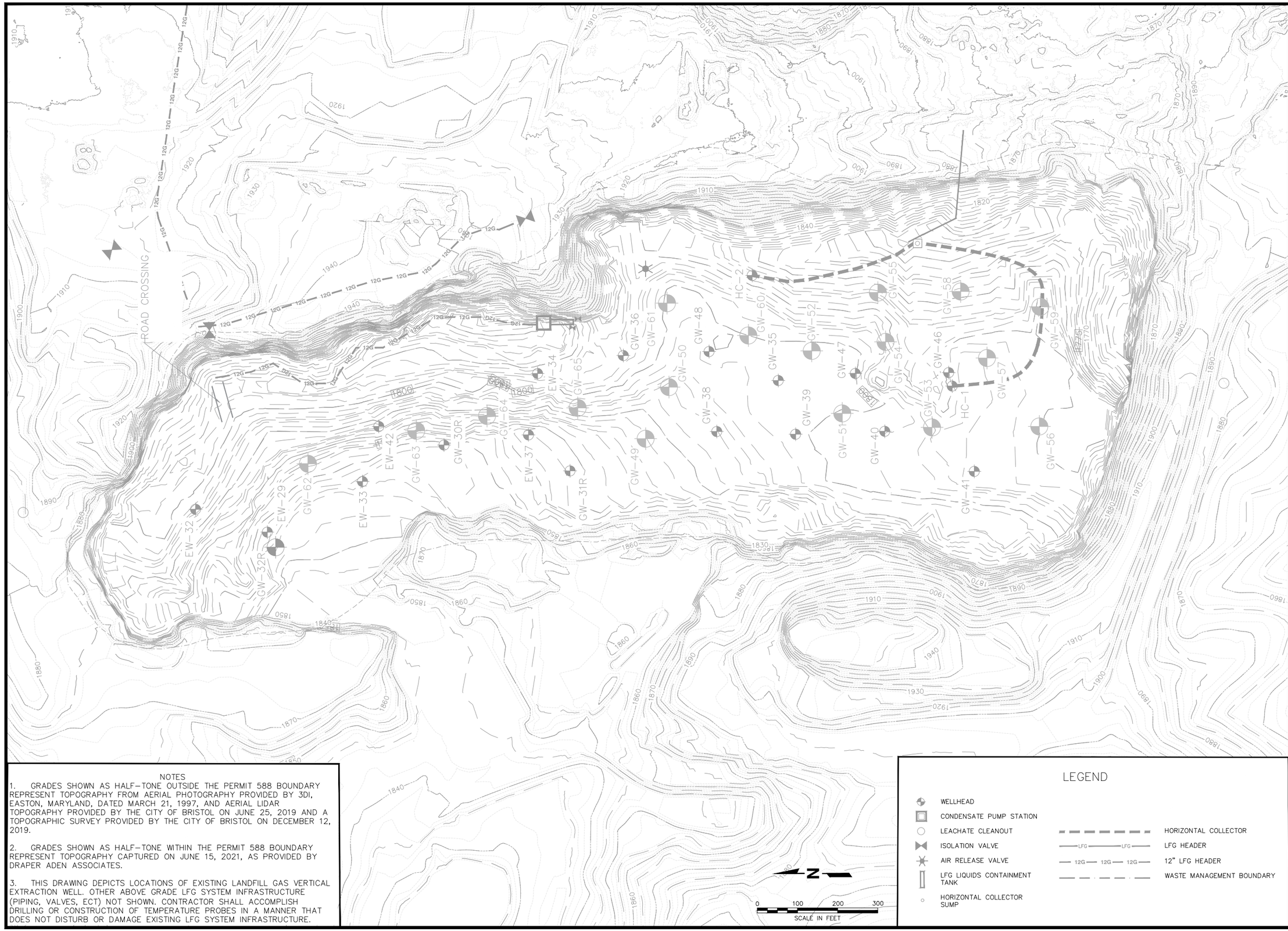
SHEET TITLE: COVER SHEET
PROJECT TITLE: LANDFILL TEMPERATURE MONITORING SYSTEM INSTALLATION

CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
BRISTOL, VA 24201

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

PROJ. NO.	DWN. BY:	Q/A R/W BY:
02218208.12	LLH	RED
DSN. BY:	CHK. BY:	APP. BY:
DBK	DBK	RED

CADD FILE:
DATE:
SCALE: NO SCALE
DRAWING NO. 1 of 5



NOTES

1. GRADES SHOWN AS HALF-TONE OUTSIDE THE PERMIT 588 BOUNDARY REPRESENT TOPOGRAPHY FROM AERIAL PHOTOGRAPHY PROVIDED BY 3DI, EASTON, MARYLAND, DATED MARCH 21, 1997, AND AERIAL LIDAR TOPOGRAPHY PROVIDED BY THE CITY OF BRISTOL ON JUNE 25, 2019 AND A TOPOGRAPHIC SURVEY PROVIDED BY THE CITY OF BRISTOL ON DECEMBER 12, 2019.

2. GRADES SHOWN AS HALF-TONE WITHIN THE PERMIT 588 BOUNDARY REPRESENT TOPOGRAPHY CAPTURED ON JUNE 15, 2021, AS PROVIDED BY DRAPER ADEN ASSOCIATES.

3. THIS DRAWING DEPICTS LOCATIONS OF EXISTING LANDFILL GAS VERTICAL EXTRACTION WELL. OTHER ABOVE GRADE LFG SYSTEM INFRASTRUCTURE (PIPING, VALVES, ECT) NOT SHOWN. CONTRACTOR SHALL ACCOMPLISH DRILLING OR CONSTRUCTION OF TEMPERATURE PROBES IN A MANNER THAT DOES NOT DISTURB OR DAMAGE EXISTING LFG SYSTEM INFRASTRUCTURE.

LEGEND

- WELLHEAD
- CONDENSATE PUMP STATION
- LEACHATE CLEANOUT
- ISOLATION VALVE
- AIR RELEASE VALVE
- LFG LIQUIDS CONTAINMENT TANK
- HORIZONTAL COLLECTOR SUMP
- HORIZONTAL COLLECTOR
- LFG HEADER
- 12" LFG HEADER
- WASTE MANAGEMENT BOUNDARY

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
07/06/2022
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

SHEET TITLE
EXISTING CONDITIONS

PROJECT TITLE
LANDFILL TEMPERATURE MONITORING SYSTEM INSTALLATION

CLIENT
CITY OF BRISTOL INTEGRATED WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
BRISTOL, VA 24201

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

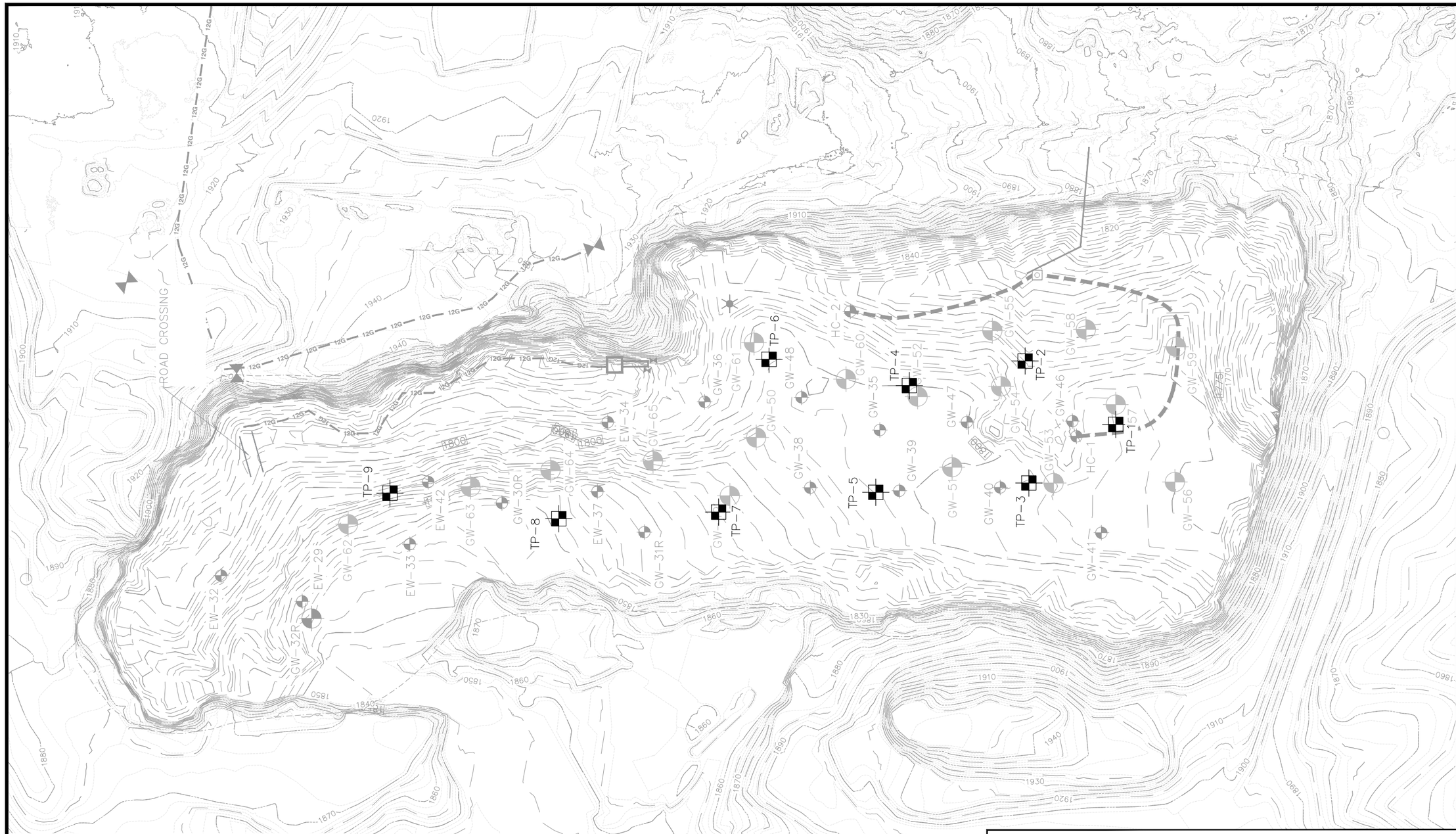
PROJ. NO.	DWN. BY:	D/A R/W BY:
02218208.12	LLH	RED
DSN. BY:	CHK. BY:	APP. BY:
DBK	DBK	RED

CADD FILE:

DATE: 07/06/2022

SCALE: 1" = 100'

DRAWING NO.
2 of **5**



NOTES

1. GRADES SHOWN AS HALF-TONE OUTSIDE THE PERMIT 588 BOUNDARY REPRESENT TOPOGRAPHY FROM AERIAL PHOTOGRAPHY PROVIDED BY 3DI, EASTON, MARYLAND, DATED MARCH 21, 1997, AND AERIAL LIDAR TOPOGRAPHY PROVIDED BY THE CITY OF BRISTOL ON JUNE 25, 2019 AND A TOPOGRAPHIC SURVEY PROVIDED BY THE CITY OF BRISTOL ON DECEMBER 12, 2019.

2. GRADES SHOWN AS HALF-TONE WITHIN THE PERMIT 588 BOUNDARY REPRESENT TOPOGRAPHY CAPTURED ON JUNE 15, 2021, AS PROVIDED BY DRAPER ADEN ASSOCIATES.

3. THIS DRAWING HAS BEEN DEVELOPED FOR CONSTRUCTION. HOWEVER, INFORMATION. THE ACTUAL NUMBER, LOCATION, ALIGNMENT, CONFIGURATION, AND FUNCTION OF PROPOSED FEATURES AND INFRASTRUCTURE MAY BE MODIFIED TO ACCOMMODATE FIELD CONDITIONS OR ADJUSTED BASED ON ADDITIONAL DATA OR COST IMPLICATIONS DURING CONSTRUCTION AS APPROVED BY THE ENGINEER.

LEGEND

- EXISTING LFG WELLHEAD– VINTAGE 2021
- EXISTING LFG WELLHEAD– VINTAGE 2017
- PROPOSED TEMPERATURE MONITORING PROBE
- EXISTING AIR RELEASE VALVE
- EXISTING ISOLATION VALVE
- EXISTING CONDENSATE PUMP STATION
- EXISTING HORIZONTAL COLLECTOR SUMP
- EXISTING LFG LIQUIDS CONTAINMENT TANK
- EXISTING HORIZONTAL COLLECTOR
- EXISTING LFG HEADER
- EXISTING 12" LFG HEADER
- BUILDING
- WASTE MANAGEMENT BOUNDARY

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
07/06/2022
PROFESSIONAL ENGINEER

NO.	REVISION	DATE

SHEET TITLE
TEMPERATURE PROBE

PROJECT TITLE
LANDFILL TEMPERATURE MONITORING SYSTEM INSTALLATION

CLIENT
CITY OF BRISTOL INTEGRATED WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
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

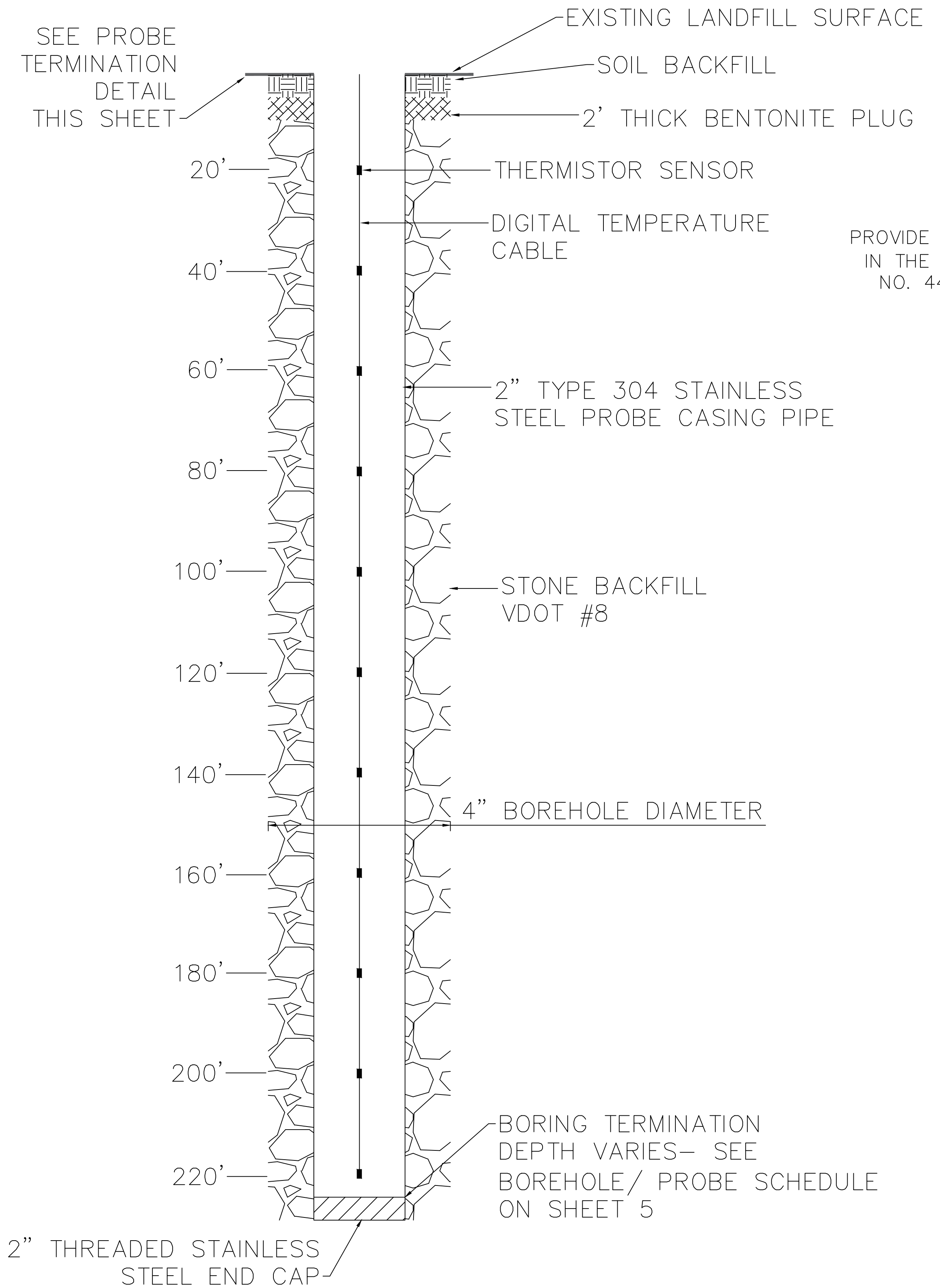
PROJ. NO.	DWN. BY:	D/A R/W BY:
02218208.12	LLH	RED
DSK. BY:	CHK. BY:	APP. BY:
DBK	DBK	RED

CADD FILE:

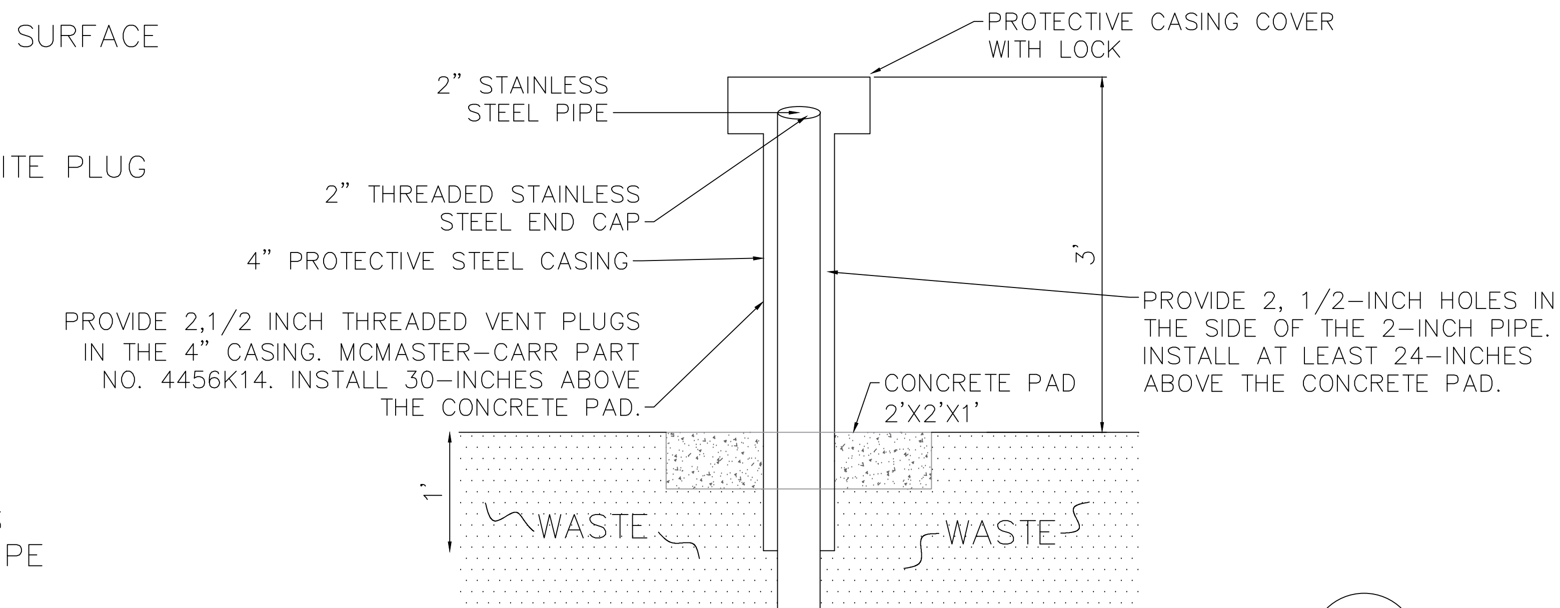
DATE: 07/06/2022

SCALE: 1" = 100'

DRAWING NO.
3 of **5**

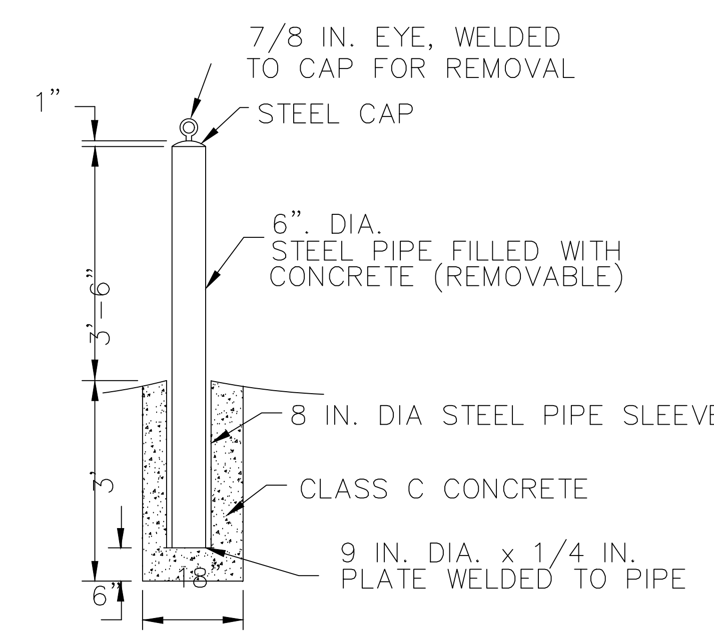


TEMPERATURE PROBE AND BORING DETAIL (1 — 3 | 4)
NOT TO SCALE



PROBE TERMINATION APPARATUS DETAIL (2 — 3 | 4)
NOT TO SCALE

1. INSTALL THREE BOLLARDS IN AN ISOLATERAL TRIANGLE WITH THE PROBE AT THE CENTER. EXACT POSITION OF BOLLARDS TO BE FIELD DETERMINED BY ENGINEER.
2. FURNISH AND INSTALL A CORD GRIP WITH STRAIN RELIEF IN THE 2-INCH CAP, MCMASTER-CARR PART NO. 7458K33. CAP SHALL BE LOOSELY ATTACHED TO THE PIPE, NO MORE THAN 1/4 TURN.
3. PROVIDE 5 FOOT LENGTH OF ARMORED DTC EXTENDING BEYOND THREADED END CAP FOR TERMINATION FITTING.
4. FURNISH AND INSTALL A CORD GRIP IN THE 4-INCH CAP. MCMASTER-CARR, MODEL NO. 7680K14.
5. INSTALL THE DTC WITH SUFFICIENT SLACK BETWEEN THE CORD GRIPS TO ENABLE INSTALLATION AND REMOVAL OF THE CAPS.



BOLLARD DETAIL (3 — 3 | 4)
NOT TO SCALE

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
07/06/2022
PROFESSIONAL ENGINEER

NO.	REVISION	DATE
1	ADDITIONAL DETAILS	7/15/22

SHEET TITLE: DETAILS

PROJECT TITLE: LANDFILL TEMPERATURE MONITORING SYSTEM INSTALLATION

CLIENT: CITY OF BRISTOL INTEGRATED WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
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. 02218208.12 | DSN. BY: LLH | Q/A RVW BY: RED
DSN. BY: DBK | CHK. BY: DBK | APP. BY: RED

CADD FILE:

DATE: 07/06/2022

SCALE: NO SCALE

DRAWING NO. 4 of 5

BRISTOL BOREHOLE/ PROBE SCHEDULE

Proposed Well ID	Northing	Easting	Assumed Surface Elevation (MSL)	Surveyed Surface Elevation (MSL)	Estimation of Top of Liner System Elevation (MSL)	Assumed Waste Depth (ft)	**Proposed Boring Depth (ft)**
TP-1	3397936.81	10412346.63	1794.00	---	1587	207.0	**182**
TP-2	3398077.82	10412445.28	1784.00	---	1617	167.0	**142**
TP-3	3398071.96	10412255.46	1798.00	---	1553	245.0	**220**
TP-4	3398257.96	10412407.01	1800.00	---	1575	225.0	**200**
TP-5	3398310.09	10412241.03	1802.00	---	1550	252.0	**227**
TP-6	3398476.17	10412447.89	1802.00	---	1558	244.0	**219**
TP-7	3398554.55	10412210.26	1814.00	---	1556	258.0	**233**
TP-8	3398803.21	10412199.95	1828.00	---	1575	253.0	**228**
TP-9	3399065.89	10412239.78	1816.00	---	1575	241.0	**216**
						TOTAL BORING DEPTH (ft)=	1867

Notes:

1. All Values are units of Feet.
2. Owner's surveyor shall survey and stake probe locations prior to drilling. Probe locations may be adjusted by the engineer or owner prior to drilling.
3. Assumed Surface Elevation for the proposed probe is based on topography created from a surface dated 6/15/2021 provided by DAA.
4. Driller to drill down to proposed boring depth as shown in probe schedule on this sheet.
5. Probe pipe material shall be 2-inch diameter type 304 stainless steel solid- wall pipe.

Approval Signatures:

Driller: _____ Contractor:_____

Owner: _____ CQA Engineer:_____

COMMONWEALTH OF VIRGINIA
Robert E. Dick
Lic. No. 024815
07/06/2022
PROFESSIONAL ENGINEER

NO. | REVISION | DATE

SHEET TITLE: BOREHOLE/ PROBE SCHEDULE

PROJECT TITLE: LANDFILL TEMPERATURE MONITORING SYSTEM INSTALLATION

CLIENT: CITY OF BRISTOL INTEGRATED WASTE MANAGEMENT FACILITY
2125 SHAKESVILLE RD
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. 02218208.12 | DSN. BY: DBK | DWN. BY: LLH | CHK. BY: DBK | Q/A PWF BY: RED | APP. BY: RED

CADD FILE:

DATE: 07/06/2022

SCALE: NO SCALE

DRAWING NO. 5 of 5

Appendix H

Landfill Temperature Monitoring System Drill Logs

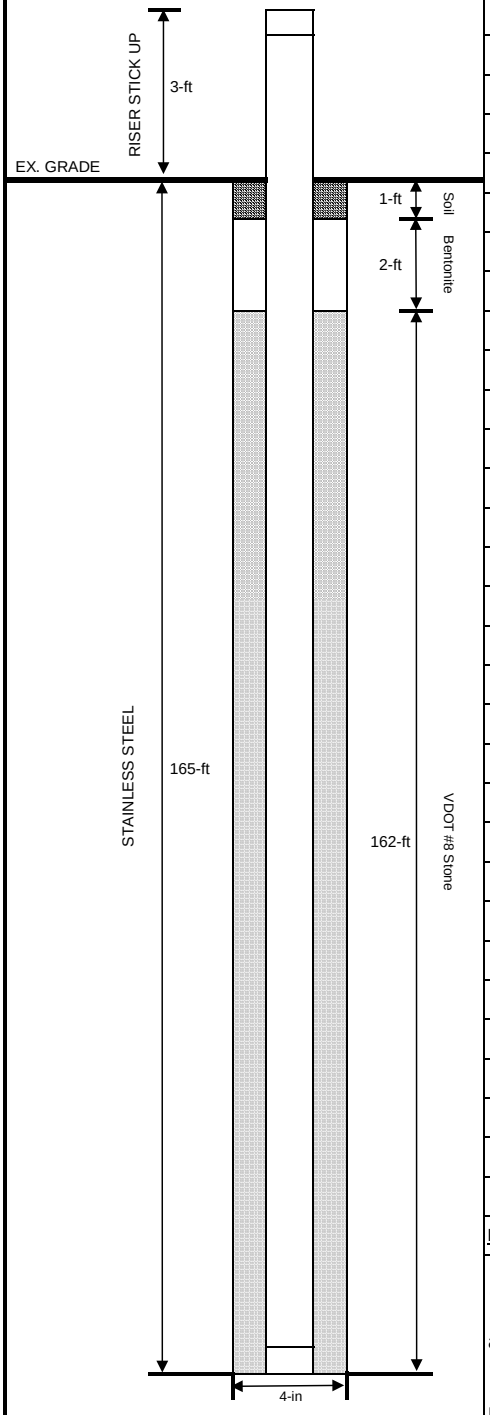
SCS ENGINEERS

2520 Whitehall Park Drive, Suite 450
Charlotte, NC 28273
Phone: (704) 504-3107

TEMPERATURE PROBE

TP-1

DRILLING COMPANY:	Connelly Drilling & Associates		
DRILLER NAME:	Evan Way		
LOGGED BY:	Sean Tavel		
SITE NAME:	City of Bristol	**NORTHING:**	3,397,938.65
SITE LOCATION:	Bristol, VA	**EASTING:**	10,412,349.80
PROJECT NO:	02218208.12	**GROUND ELEVATION:**	1806.6-ft
DRILLING DATE:	10/26/2022		
BORE DEPTH:	180-ft		
PROBE CASING:	2-in Stainless Steel		



WASTE DECRIPTION

Depth [ft]	Temp. [°F]	Moisture Content	Decomp. Scale	Waste Composition
0-10	-	-	-	Soil, Wood, Plastic, Metal
11-20	82	-	-	Wood, Metal, Plastic, Paper
21-30	-	-	-	Rock, Mulch, Paper
31-40	97	-	-	Plastic, Paper, Mulch
41-50	-	-	-	Paper, Metal, Aluminum
51-60	97	-	-	Plastic, Mulch, Metal
61-70	-	-	-	Plastic, Wood, Cardboard
71-80	99	-	-	Paper, Plastic, Wood
81-90	-	-	-	Plastic, Paper, Wood
91-100	148	-	-	Plastic, Wood, Styrofoam
101-110	-	-	-	Plastic, Wood, Cardboard
111-120	155	-	-	Plastic, Wood, Textile
121-130	-	-	-	Plastic, Mulch, Metal
131-140	162	-	-	Plastic, Organics, Ceramics
141-150	-	-	-	Metal, Soil, Wire
151-160	167	-	-	Metal, Soil, Wire
161-170	-	-	-	Rock, Glass, Metal
171-180	130	-	-	Organics

NOTES:

· 10/26/2022 - Drilling began at 1330 (0-ft) and ended 1837 (60-ft).
· 10/27/2022 - Drilling began at 0722 (60-ft) and ended 1715 (140-ft).
· 10/28/2022 - Drilling began at 0730 (140-ft) and ended 0815 (140-ft). Drilling ceases due to hazardous working atmosphere.
· 10/31/2022 - Drilling began at 0821 (140-ft) and ended 1751 (160-ft). Drilling ceases due to projectile liquids.
· 11/01/2022 - Drilling began at 0805 (160-ft) and ended 1305 (180-ft). Drilling ceases due to projectile liquids. Bob Dick (SCS Engineers) approves drilling stoppage and attempt to install probe at current depth of 180-ft.
· Probe could not be advanced to 180-ft. Installed at 165-ft.
· Moisture and decompostion content not recorded. Recorded on every probe hereafter.

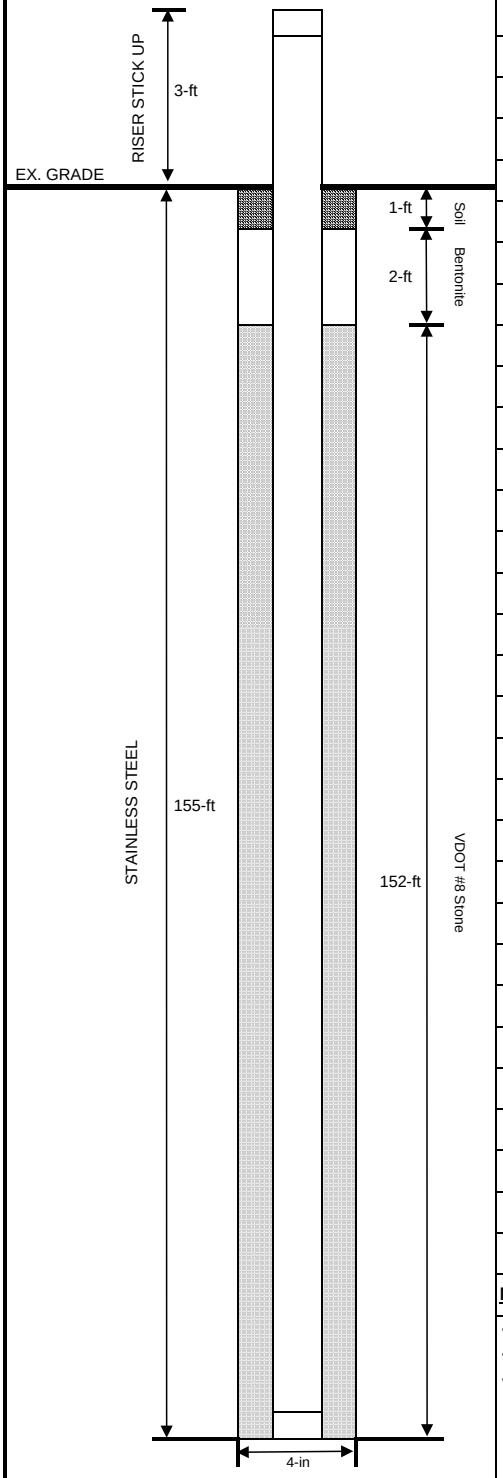
SCS ENGINEERS

2520 Whitehall Park Drive, Suite 450
Charlotte, NC 28273
Phone: (704) 504-3107

TEMPERATURE PROBE

TP-2

DRILLING COMPANY:	Connelly Drilling & Associates		
DRILLER NAME:	Evan Way		
LOGGED BY:	Sean Tavel		
SITE NAME:	City of Bristol	**NORTHING:**	3,398,072.16
SITE LOCATION:	Bristol, VA	**EASTING:**	10,412,435.17
PROJECT NO:	02218208.12	**GROUND ELEVATION:**	1788.9-ft
DRILLING DATE:	11/7/2022		
BORE DEPTH:	160-ft		
PROBE CASING:	2-in Stainless Steel		



WASTE DECRIPTION

Depth [ft]	Temp. [ºF]	Moisture Content	Decomp. Scale	Waste Composition
0-10	-	Dry	Little	Plastic Soil Aluminum
11-20	104	Dry	Little	Plastic Wood Paper
21-30	-	Dry	Little	Plastic Aluminum Paper
31-40	105	Dry	Little	Plastic Wood
41-50	-	Damp	Little	Plastic Wood Metal
51-60	124	Damp	Little	Plastic Mulch Cardboard
61-70	-	Damp	Some	Plastic Styrofoam Paper
71-80	131	Damp	Some	Plastic Wood
81-90	-	Damp	Some	Plastic Metal
91-100	137	Damp	Some	Plastic Textile Metal
101-110	-	Damp	Some	Plastic Wood
111-120	142	Wet	Some	Plastic Wood
121-130	-	Wet	Moderate	Soil Glass Wood
131-140	153	Dry	Moderate	Rock Cardboard
141-150	-	Damp	Moderate	Rock Cardboard
151-160	133	Dry	Moderate	Metal Cardboard Rock

NOTES:

· 11/07/2022 - Drilling began at 1815 (0-ft) and ended 1845 (20-ft).
· 11/08/2022 - Drilling began at 0630 (20-ft) and ended 1350 (160-ft).
· Probe could not be advanced to 160-ft. Installed at 155-ft.

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Charlotte, NC 28273
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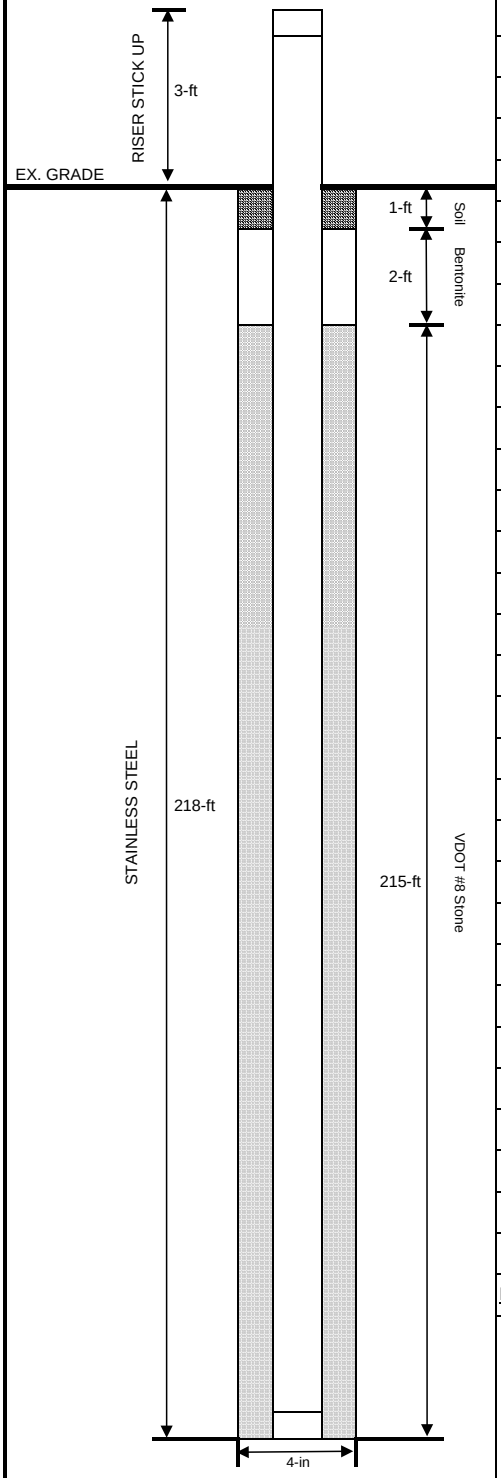
TEMPERATURE PROBE

TP-3

DRILLING COMPANY:	Connelly Drilling & Associates		
DRILLER NAME:	Evan Way		
LOGGED BY:	Sean Tavel		
SITE NAME:	City of Bristol	**NORTHING:**	3,398,061.26
SITE LOCATION:	Bristol, VA	**EASTING:**	10,412,296.38
PROJECT NO:	02218208.12	**GROUND ELEVATION:**	1801.2-ft
DRILLING DATE:	11/9/2022		
BORE DEPTH:	225-ft		
PROBE CASING:	2-in Stainless Steel		



WASTE DECRIPTION

Depth [ft]	Temp. [ºF]	Moisture Content	Decomp. Scale	Waste Composition
0-10	-	Dry	Little	Plastic Rock
11-20	104	Dry	Little	Plastic Wood
21-30	-	Dry	Little	Plastic Wood
31-40	108	Damp	Little	Plastic Wood Paper
41-50	-	Damp	Little	Plastic Wood Metal
51-60	115	Damp	Little	Plastic Wood Metal
61-70	-	Damp	Some	Plastic Wood Cardboard
71-80	120	Damp	Some	Plastic Wood Cardboard
81-90	-	Damp	Some	Plastic Wood Metal
91-100	124	Damp	Some	Plastic Metal Styrofoam
101-110	-	Damp	Some	Plastic Metal Styrofoam
111-120	137	Damp	Some	Plastic Mulch Rock
121-130	-	Dry	Some	Plastic Rock Metal Glass
131-140	150	Dry	Some	Plastic Concrete
141-150	-	Dry	Some	Rock Metal Mulch
151-160	167	Damp	Moderate	Rock Metal Mulch
161-170	-	Damp	Moderate	Plastic Metal Rock
171-180	186	Damp	Moderate	Plastic Metal Rock
181-190	-	Damp	Moderate	Metal Cardboard Wood
191-200	N/A	Damp	Moderate	Metal Rock
201-210	-	Damp	Moderate	Metal Rock Styrofoam
211-220	148	Damp	Moderate	Metal Fabric Rock

NOTES:

· 11/09/2022 - Drilling began at 0640 (0-ft) and ended 1700 (190-ft).
· 11/10/2022 - Drilling began at 0630 (190-ft) and ended 1030 (225-ft).
· Probe could not be advanced to 225-ft. Installed at 218-ft.

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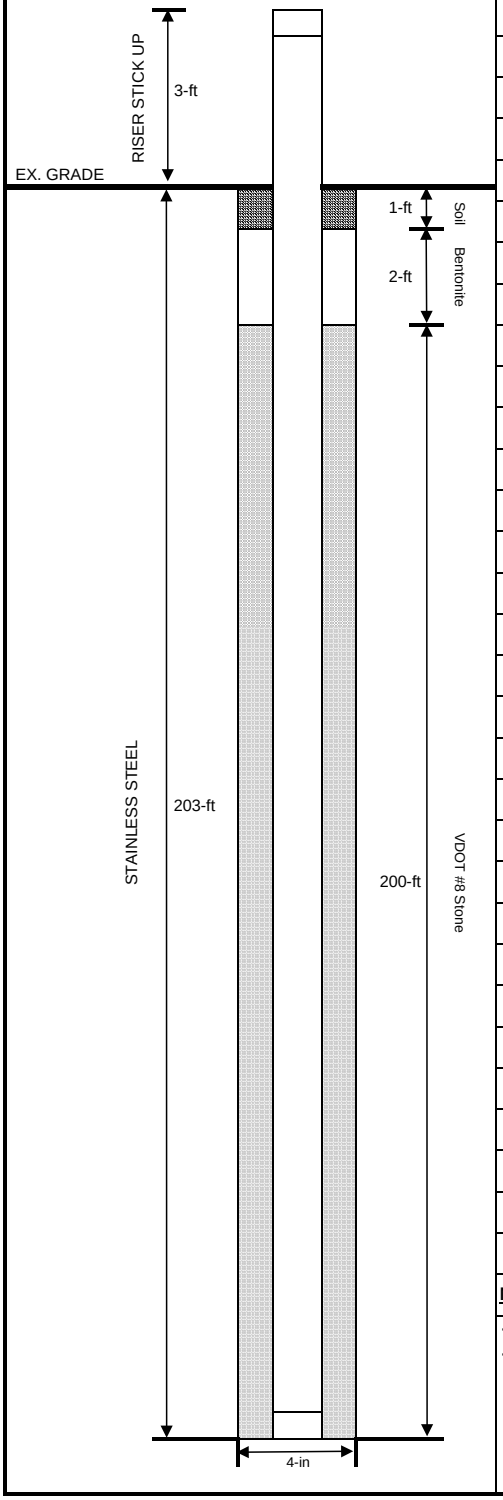
TEMPERATURE PROBE

TP-4

DRILLING COMPANY:	Connelly Drilling & Associates	**SITE NAME:**	City of Bristol
DRILLER NAME:	Evan Way	**SITE LOCATION:**	Bristol, VA
LOGGED BY:	Sean Tavel	**PROJECT NO:**	02218208.12
DRILLING DATE:	11/16/2022	**NORTHING:**	3,398,262.86
BORE DEPTH:	203-ft	**EASTING:**	10,412,404.41
PROBE CASING:	2-in Stainless Steel	**GROUND ELEVATION:**	1794-ft



WASTE DECRIPTION

Depth [ft]	Temp. [ºF]	Moisture Content	Decomp. Scale	Waste Composition
0-10	-	Dry	Little	Plastic, Soil, Wood
11-20	93	Dry	Little	Plastic, Rock, Paper
21-30	-	Damp	Little	Plastic, Wood, Textile
31-40	115	Damp	Some	Plastic, Wood, Rock
41-50	-	Damp	Some	Plastic, Wood, Rock
51-60	132	Wet	Some	Plastic, Wood, Paper, Cardboard
61-70	-	Damp	Some	Plastic, Wood, Metal
71-80	144	Damp	Some	Plastic, Wood, Metal
81-90	-	Wet	Moderate	Plastic, Wood, Organics
91-100	180	Damp	Some	Plastic, Cardboard, Aluminum, Rock, Mulch
101-110	-	Dry	Little	Rock, Metal, Wood, Fabric
111-120	182	Damp	Little	Plastic, Wood, Rock, Metal
121-130	-	Damp	Little	Plastic, Wood, Rock, Metal
131-140	133	Damp	Little	Plastic, Wood, Rock, Metal
141-150	-	Dry	Little	Plastic, Rock, Soil
151-160	150	Dry	Little	Plastic, Rock, Soil
161-170	-	Dry	Little	Plastic, Rock, Soil
171-180	182	Dry	Little	Plastic, Wood, Rock, Metal
181-190	-	Damp	Some	Plastic, Wood, Rock, Metal
191-200	182	Damp	Little	Plastic, Rock, Textile, Soil

NOTES:

· 11/16/2022 - Drilling began at 0620 (0-ft) and ended 1400 (140-ft).
· 11/17/2022 - Drilling began at 0700 (140-ft) and ended 1100 (203-ft).

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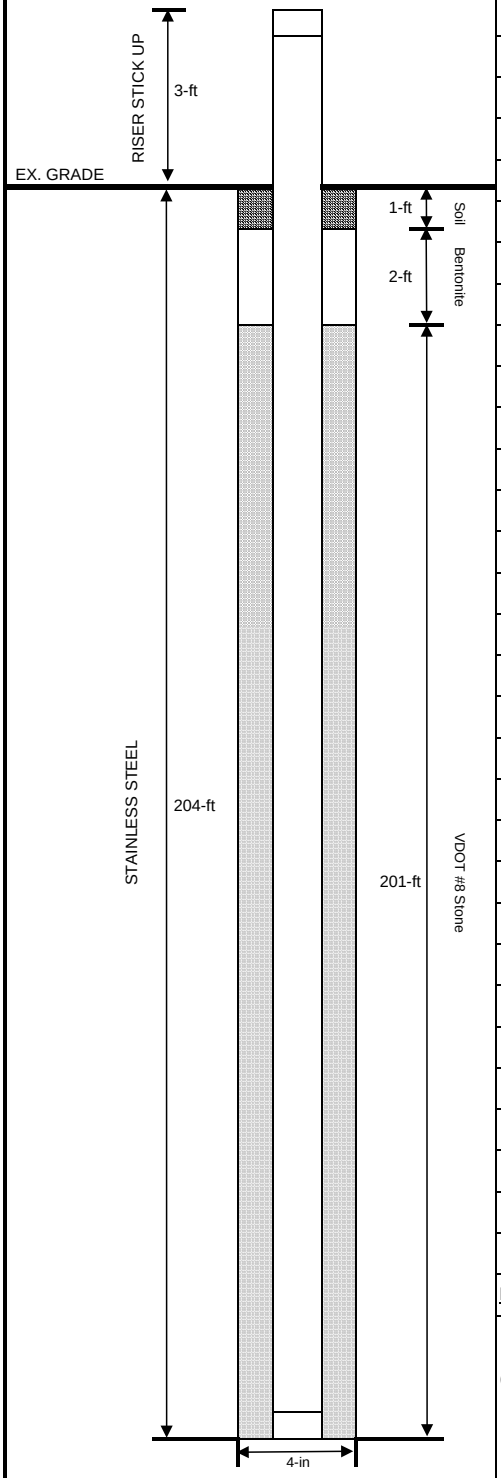
Charlotte, NC 28273
Phone: (704) 504-3107

TEMPERATURE PROBE

TP-5

DRILLING COMPANY:	Connelly Drilling & Associates		
DRILLER NAME:	Evan Way		
LOGGED BY:	Sean Tavel		
SITE NAME:	City of Bristol	**NORTHING:**	3,398,261.84
SITE LOCATION:	Bristol, VA	**EASTING:**	10,412,244.35
PROJECT NO:	02218208.12	**GROUND ELEVATION:**	1797.5-ft
DRILLING DATE:	11/14/2022		
BORE DEPTH:	204-ft		
PROBE CASING:	2-in Stainless Steel		



WASTE DECRIPTION

Depth [ft]	Temp. [ºF]	Moisture Content	Decomp. Scale	Waste Composition		
0-10	-	Dry	Little	Plastic	Wood	Cardboard
11-20	87	Dry	Little	Plastic	Wood	Cardboard
21-30	-	Damp	Little	Plastic	Wood	Paper
31-40	124	Damp	Little	Plastic	Wood	Paper
41-50	-	Damp	Little	Plastic	Wood	Paper
51-60	131	Damp	Little	Plastic	Wood	Paper
61-70	-	Damp	Little	Plastic	Wood	Paper
71-80	139	Wet	Some	Plastic	Wood	Textile
81-90	-	Damp	Some	Plastic	Rock	Mulch
91-100	145	Damp	Some	Plastic	Rock	Mulch
101-110	-	Damp	Some	Rock	Soil	Metal
111-120	168	Damp	Some	Plastic	Rock	Metal
121-130	-	Damp	Much	Plastic	Rock	
131-140	171	Damp	Much	Plastic	Rock	
141-150	-	Damp	Much	Rock	Glass	Soil
151-160	170	Damp	Much	Rock		
161-170	-	Dry	Some	Rock	Metal	Glass
171-180	169	Dry	Some	Rock	Metal	Glass
181-190	-	Dry	Little	Metal	Wire	Wood
191-200	162	Wet	Much	Rock	Mulch	Metal

NOTES:

· 11/14/2022 - Drilling began at 0700 (0-ft) and ended 1620 (204-ft).
· Sean Tavel (SCS Engineers) mistakenly thought TP-5 was TP-4 resulting in TP-5 being drilled to the designed depth of TP-4. Designed depth for TP-5 was originally 227-ft.

SCS ENGINEERS

Transmittal

Midlothian, VA

PROJECT:	City Bristol, LF Engineering, ISWMF, VA 02218208.05	DATE:	12/9/2022
SUBJECT:	Monthly Reports SWP#588, 498, & 221	TRANSMITTAL ID:	00006
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,

The Monthly Reports of the Solid Waste Permit #588, 498, and 221 landfills can be downloaded using the links below. Please note that the data from monthly gas monitoring of leachate collection components, sampling and analysis of dual extraction wells, and topographic survey are contained within the Solid Waste Permit #588 report. Records of self-inspection training, self-inspection responsibilities, and an update to record keeping procedures for the Solid Waste Permit #498 Landfill are contained withing the Solid Waste Permit #498 report. Let us know if you have questions about the contents of these reports.

Regards,
Charles

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	12/9/2022	November Compliance Report - SWP 221.pdf	
1	12/9/2022	November Compliance Report - SWP 498.pdf	
1	12/9/2022	November Compliance Report - SWP 588.pdf	

Transmittal

DATE: 12/9/2022
TRANSMITTAL ID: 00006

COPIES:

Bob Dick	(SCS Engineers)
Brandon King	(SCS Engineers)
Charles Warren	(SCS Engineers)
Crystal Bazyk	(Virginia Department of Environmental Quality)
Jacob Chandler	(Bristol, VA, City of)
Jennifer Robb	(SCS Engineers)
Jeffery Hurst	(Virginia Department of Environmental Quality)
Tom Lock	(SCS Field Services)
Michael Gibbons	(SCS Engineers)
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