

March Monthly Compliance Report

Solid Waste Permit #498
Bristol Integrated Solid Waste Management Facility
2655 Valley Drive
Bristol, VA 24201
(276) 645-7233

SCS ENGINEERS

02218208.05-18 | April 10, 2023

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INTRODUCTION

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) in accordance with item 8 in Appendix B of the Consent Decree between the City and VDEQ. This report covers the Solid Waste Permit (SWP) #498 Landfill during the month of March.

1.0 LEACHATE PUMP STATION

The City is in the process of repairing the pumps and addressing other concerns related to the leachate pump station. The steps taken by the City are outlined in the following sections.

1.1 FLOATING MATERIAL

On July 6, 2022 SCS received the results of samples taken from the Solid Waste Permit 498 Wet Well on May 25, 2022. Based on SCS' review of the data, the data indicated the liquid is non-hazardous. SCS submitted a letter to the City on July 7, 2022 with SCS' review of the data and the underlying lab analysis. A copy of this letter was included in the October Monthly Compliance Report for the SWP #498 Landfill.

As described in the October Monthly Compliance Report for the SWP #498 Landfill, the floating material in the wet well was resolved.

1.2 PUMP REPLACEMENT

The City contracted with Buchanan Pump Service (Buchanan) to complete repairs to the pumps and infrastructure at the 498 pump station. Buchanan completed repairs to one pump (in addition to the pump currently operating at the pump station). Buchanan has ordered a replacement for the third pump and confirmed that the current electrical infrastructure will support the proposed pump. Buchanan is now in the process of procuring another pump that will operate utilizing the existing electrical infrastructure.

1.3 ALARM/NOTIFICATION SYSTEM

The alarm system at the SWP #498 Landfill pump station is currently functional and sending alerts to landfill staff via text message. On March 30, 2023, the City directed SCS Remote Monitoring and Control (SCS-RMC) to implement a cloud based recordkeeping system for leachate flows from the SWP #498 Landfill pump station. Based on current lead times on equipment, installation of the equipment necessary to implement the system will occur in June of 2023.

2.0 COVER INTEGRITY AND EXPOSED WASTES

The sections below describe steps taken by the City to address cover integrity and exposed wastes.

2.1 INTERMEDIATE COVER

City staff estimate that intermediate cover has been placed on more than 85 percent of the landfill area. The slopes of the landfill continue to present challenging conditions for the City. During the

month of March the City was able to clear slopes to begin the process of placing additional intermediate cover. A photo of City staff clearing vegetation from the slopes of the SWP #498 Landfill is shown in Figure 1. During the month of April the City will perform a soil thickness verification investigation to determine if any areas of the landfill need additional soil cover.

Figure 1. Removal of Vegetation from Landfill Side Slopes



2.2 SURFACE EMISSIONS MONITORING

On March 15, 2023, SCS performed surface emissions monitoring on the landfill. The monitoring was performed in accordance with the site-specific GCCS Design Plan, the facility's Title V Permit, the requirements of 40 CFR 63.1960(c) and (d), 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 all applicable areas of the Permit No. 498 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.

VDEQ will be copied on a letter outlining the results at a later date. Table 1 summarizes the results of the monitoring event.

Table 1. Summary of March Surface Emissions Monitoring

Description	March 15, 2023
Number of Points Sampled	68
Number of Points in Serpentine Route	65
Number of Points at Surface Cover Penetrations	3
Number of Exceedances	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

These results are consistent with the SEM performed in October and December 2022 in which no exceedances were detected.

3.0 GAS COLLECTION

The City has taken steps to optimize gas collection and minimize air intrusion as outlined in the sections below.

3.1 SYSTEM OPTIMIZATION

The SWP #498 Landfill is approximately 12.0 acres and is located south of the SWP #221 Landfill and east of the SWP #588 Landfill. As of September 2022, mining in Permit #498 has concluded. The majority of the SWP #498 Landfill does not have an active LFG collection system, due to mining operations which have occurred since waste placement was completed. The current system includes three vertical wells (EW-19, EW-20, and EW-21) and a condensate trap (CT-1) at the low point. Field reconnaissance efforts in September/October 2022 identified that the header pipe serving the three wells had been severed, blocked, or otherwise compromised. Vacuum was restored to EW-19 in November 2022. As of January 18, 2023, the blocked header piping was replaced, restoring vacuum to wells EW-20 and -21.

The buried wastes in SWP #498 Landfill Area is greater than 25 years old, thus, the rate and quantity of decomposition gas production has declined significantly compared to the rate and quantity of LFG generated in more recently buried wastes. Accordingly, the methane concentration tends to be substantially lower, the oxygen and nitrogen concentrations tend to be substantially greater, and the quantity of LFG collected declines substantially compared to the years immediately after waste placement. Furthermore, much of the organic wastes in the upper layer have likely decomposed aerobically (i.e., were composted) because of the mining operations. There is no historical evidence of elevated temperatures in SWP #498; however, the methane-to-carbon dioxide ratio measured in the wellheads can sometimes be less than 1 due to the fact that the wastes are becoming biochemically stabilized (meaning organic wastes have been more fully decomposed) and the rate of

methanogenesis has declined. Also, the #498 Landfill Area is not believed to be a significant source of odors.

Extraction wells EW-16, -17, -18, and -23 are perimeter migration control wells affiliated with Permit #498. Low-flow 1-inch well heads were installed on extraction wells EW-16, -17, and -18. These wells were monitored and adjusted as needed to control migration.

3.2 OPTIMIZATION PLAN AND REPORTING

3.2.1 Optimization Plan

On December 1, 2022, on behalf of the City, SCS submitted a plan that provides for means and methods for optimizing the performance of the existing gas extraction system in the Solid Waste Permit #498 landfill. Additional details about that plan were included along with a copy of the plan in the November Monthly Compliance Report for the SWP #498 Landfill.

3.2.2 Optimization Actions

During the month of January 2022 actions were taken to implement the submitted Optimization Plan. The actions taken at the SWP #498 Landfill in accordance with the plan were summarized in the January Monthly Compliance Report for the SWP #498 Landfill.

3.2.3 Monthly Wellhead Monitoring

On March 1, 2023; March 7, 2023; and March 13, 2023, SCS-FS visited the landfill and performed monitoring of the landfill gas wells. The results of the monthly monitoring were submitted to VDEQ on April 5, 2023 and are included in Appendix A.

4.0 GRADING, GEOMETRIC CONFIGURATION AND GAS EXPANSION

The City has taken the steps outlined in the sections below to grade the surface of the SWP #498 Landfill to an appropriate geometric configuration to allow for final closure.

4.1 CLOSURE AND LFGCCS PLAN

SCS prepared plans on the City's behalf for closing and installing final cover on the Solid Waste Permit #498. The plans also include a comprehensive gas collection and control system and comprehensive stormwater management plan. These drawings along with supporting information to facilitate a modification to the facility's Solid Waste Permit were submitted on January 31, 2023 and February 24, 2023.

The City, through SCS, collected topographic data of the SWP #498 Landfill using photogrammetric methods via an unmanned aerial vehicle (UAV or drone). On March 9, 2023 the flight was completed and the topographic data collected. A composite photo of the landfill generated from data collected during the flight is show in Figure 2. The additional topographic data will allow SCS to estimate the impacts of intermediate cover soil volumes on the final grading plan.

Figure 2. Aerial Photo of the SWP #498 Landfill



On March 10, 2023 SCS and the City received VDEQ's comments on the proposed permit modification. SCS is preparing revisions and a response to VDEQ's comments. On March 24, 2023 SCS discussed the comments with VDEQ and received additional clarifications via a conference call.

4.2 FINAL COVER AND LFGCCS INSTALLATION

The drawings described in Section 4.1 will be used as the basis of bid drawings used for procurement of a contractor to complete final cover and LFGCCS installation. The drawings used for the purposes of bidding, procurement and construction of the final closure, gas collection system, and stormwater controls will generally conform to the layout and details in the attached drawings. In addition to the drawings SCS will prepare a detailed project manual including technical

specifications. SCS will also continue to work with VDEQ to complete the permit modification incorporating the revised closure design into the facility's solid waste permit.

5.0 LEACHATE SEEPS AND PONDING

The sections below outline the steps taken by the City to address leachate seeps and ponding.

5.1 PERIODIC INSPECTIONS

The City initiated a process of tracking precipitation events that have the potential to create ponding and leachate seeps. Inspections are made following events that exceed 0.25 inches as recorded by the on-site weather station. For the purposes of these inspections, if precipitation is continuous for at least 8 hours during a storm that lasts multiple days, that storm will be considered a single event requiring a single inspection. After each such event, City personnel will inspect the landfill for ponding and leachate seeps. Locations of ponding and seeps will be marked in the field.

The City performed inspections as appropriate during the month of March. Section 6 describes the self-inspection logs that were used to record observations during the inspections. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records. Completed inspection forms are available for VDEQ to review upon request.

5.2 COMPLETION OF WORK ACTIVITIES

During the month of March, the City continued the process of addressing the conditions, identified in the inspections described in Section 5.1, as requiring remediation. These actions are performed as part of intermediate cover placement and grading activities. The City will also address any conditions that require remedial actions identified in future inspections.

6.0 STORMWATER DRAINAGE AND MANAGEMENT

The sections below outline the steps by the City to improve stormwater management and drainage.

6.1 STORMWATER MANAGEMENT PLAN

As noted in Section 4.1 the plans that SCS prepared for Closure of SWP #498 included measures to address stormwater management on the landfill. The stormwater management plans were discussed and included in the January Monthly Compliance Report for the SWP #498 landfill.

6.2 CLEANOUT OF STORMWATER DIVERSION CHANNEL/TRENCH BERM

Clean-out of the stormwater diversion channel/trench berm was completed in February. The clean-out of the stormwater diversion channel/trench berm was discussed in the February Monthly Compliance Report for the SWP #498 Landfill. On March 15, 2023 SCS submitted a letter to VDEQ verifying completion of the stormwater diversion channel/trench berm clean-out. A copy of that letter and supporting documentation is included in Appendix B.

7.0 SELF-INSPECTION AND RECORDKEEPING

SCS prepared two self-inspection log templates, the Stormwater Management Inspection Log and the Daily Landfill Inspection Log. SCS provided updated self-inspection logs for SWP 498 to the City and VDEQ and completed self-inspection training with facility staff on November 30, 2022.

7.1 UPDATED SELF-INSPECTION LOGS


Copies of updated self-inspection log templates were submitted to VDEQ on November 30, 2022. Details about these log and the intended inspection process were detailed in the November Monthly Compliance Report for the SWP #498 Landfill. Copies of the log templates are also included in that report.

7.2 FACILITY TRAINING

On November 30, 2022, SCS personnel, Ryan Mahon, met members of the Facility staff to complete self-inspection training. A summary of this training and a record of attendees was included in the November Monthly Compliance Report for the SWP #498 Landfill.

7.3 SELF-INSPECTION AND RECORDKEEPING ASSIGNMENTS

Completed inspections will be held on-site at the facility office available for review by VDEQ upon request. Currently, self-inspections are being completed by Jonathan Hayes. Dave Cochran will serve as the primary alternate for inspections with the other members of the staff trained on inspection procedures filling in as needed. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records.



Appendix A
March Monthly Wellhead Monitoring Data

Bristol Virginia Landfill - Well Data - 01/01/2023 to 03/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	Init Temp (F)	System Pressure ("H2O)	Comments
16	1/5/2023 13:14	32.4	35.0	0.0	32.6	-22.8	-22.8	56.3	-24.2	
16	2/1/2023 13:49	61.2	37.3	0.1	1.4	-8.9	-8.9	55.6	-23.9	Increased Flow/Vacuum
16	2/1/2023 13:50	60.7	37.9	0.0	1.4	-21.1	-21.1	46.0	-21.1	
16	3/1/2023 10:16	49.3	32.4	1.9	16.4	-1.7	-1.7	65.8	-21.1	No Change
16	3/13/2023 11:30	52.0	34.5	1.9	11.6	-8.6	-9.3	51.6	-22.8	Increased Flow/Vacuum
17	1/5/2023 13:16	56.3	38.1	0.0	5.6	-24.5	-24.5	63.8	-24.6	
17	2/1/2023 13:52	55.6	37.0	0.0	7.4	-23.9	-23.8	44.3	-23.6	Increased Flow/Vacuum
17	3/1/2023 10:20	57.7	42.3	0.0	0.0	-1.1	-2.2	66.2	-20.9	Increased Flow/Vacuum
17	3/13/2023 11:33	43.7	32.1	3.3	20.9	-22.9	-22.9	47.0	-22.8	No Change
18	1/5/2023 13:26	47.9	38.0	0.0	14.1	-17.2	-17.1	66.7	-24.2	
18	2/1/2023 13:31	62.0	38.0	0.0	0.0	-0.3	-0.3	54.5	-23.9	Increased Flow/Vacuum
18	3/1/2023 10:25	56.9	36.7	0.0	6.4	-0.1	-0.8	73.4	-20.9	Increased Flow/Vacuum
18	3/13/2023 11:37	54.6	37.8	1.3	6.3	-8.6	-10.4	53.9	-22.9	Increased Flow/Vacuum
19	1/6/2023 08:13	3.3	14.1	3.7	78.9	-17.8	-17.8	41.3	-24.1	
19	2/1/2023 13:42	5.5	3.0	18.5	73.0	-12.7	-11.0	47.1	-23.9	
19	3/1/2023 10:31	76.4	23.6	0.0	0.0	-11.3	-17.1	70.2	-20.7	Increased Flow/Vacuum
19	3/7/2023 13:29	8.7	2.0	20.1	69.2	-21.4	-21.4	70.7	-21.0	Decreased Flow/Vacuum
19	3/13/2023 11:42	79.2	20.5	0.3	0.0	-0.4	-15.6	54.4	-22.8	Increased Flow/Vacuum
20	1/25/2023 11:38	8.6	10.6	6.0	74.8	-0.1	-0.4	68.4		Closed Valve > 1 Turn
20	2/1/2023 13:35	5.1	11.7	9.2	74.0	-20.1	-20.1	64.7		Closed Valve > 1 Turn
20	3/1/2023 10:35	2.6	6.7	13.1	77.6	-20.5	-17.7	65.4		
21	1/25/2023 11:41	7.0	5.7	15.9	71.4	-1.4	-1.4	63.2		Closed Valve > 1 Turn
21	2/1/2023 13:38	4.3	5.0	18.2	72.5	-1.2	-1.2	58.4		Closed Valve > 1 Turn
21	3/1/2023 10:41	4.0	4.0	17.6	74.4	-11.5	-11.6	64.6		
23	1/5/2023 13:20	0.1	0.6	20.6	78.7	-0.1	-0.1	57.9	-24.4	
23	2/1/2023 13:55	0.8	2.2	21.0	76.0	0.0	0.0	45.2	-18.3	
23	3/1/2023 10:11	0.3	1.2	20.4	78.1	-0.1	-0.1	63.7	-21.3	No Change



Appendix B

Stormwater Diversion Channel/Trench Berm Clean-Out and Stabilization Verification Letter

March 15, 2023
File No. 02218208.17

Mr. Jonathan Chapman
Enforcement Specialist
VA DEQ – Southwest Regional Office
355-A Deadmore Street
Abingdon, Virginia

Subject: Stormwater Diversion Channel/Trench Berm Clean-out and Stabilization
Integrated Solid Waste Management Facility – Solid Waste Permit #498
Bristol, Virginia

Dear Mr.Chapman:

SCS Engineers (SCS) is submitting this letter on behalf of the City of Bristol, Virginia (City) to provide documentation to the Virginia Department of Environmental (VDEQ or Department) that clean-out of the stormwater diversion channel and trench berm is complete. The stormwater diversion channel and trench berm has also been stabilized using erosion control matting and aggregate. This letter is intended to meet the requirements of with item 6.ii in Appendix B of the Consent Decree between the City and VDEQ.

Based on our discussions with the City staff and field observations, SCS understands that the stormwater diversion channel and trench berm on the northern and eastern sides of the Solid Waste Permit (SWP) #498 landfill has been cleaned out. The stormwater diversion channel and trench berm has been stabilized using a combination of erosion control matting and aggregate. A drawing dated February 10, 2023 prepared by SCS Engineers showing the general arrangement of stabilization features is included with this letter.

SCS' Project Manager visited the SWP #498 Landfill on February 24, 2023 to observe the progress of the clean-out and stabilization efforts. A second site visit was conducted on March 9, 2023 to document the completed repair and stabilization. A copy of a field report and photo log from both visits is included with this letter.

The City will continue to perform periodic inspections of the SWP #498 Landfill including the stormwater diversion channel and trench berm after major precipitation events. Stormwater diversion channel and trench berm maintenance will be performed as required per the inspection findings.



Mr. Jonathan Chapman

March 15, 2023

Page 2

If you have questions, please contact either of the undersigned at the letterhead address.

Sincerely,



Charles J. Warren, PE
Project Manager
SCS Engineers

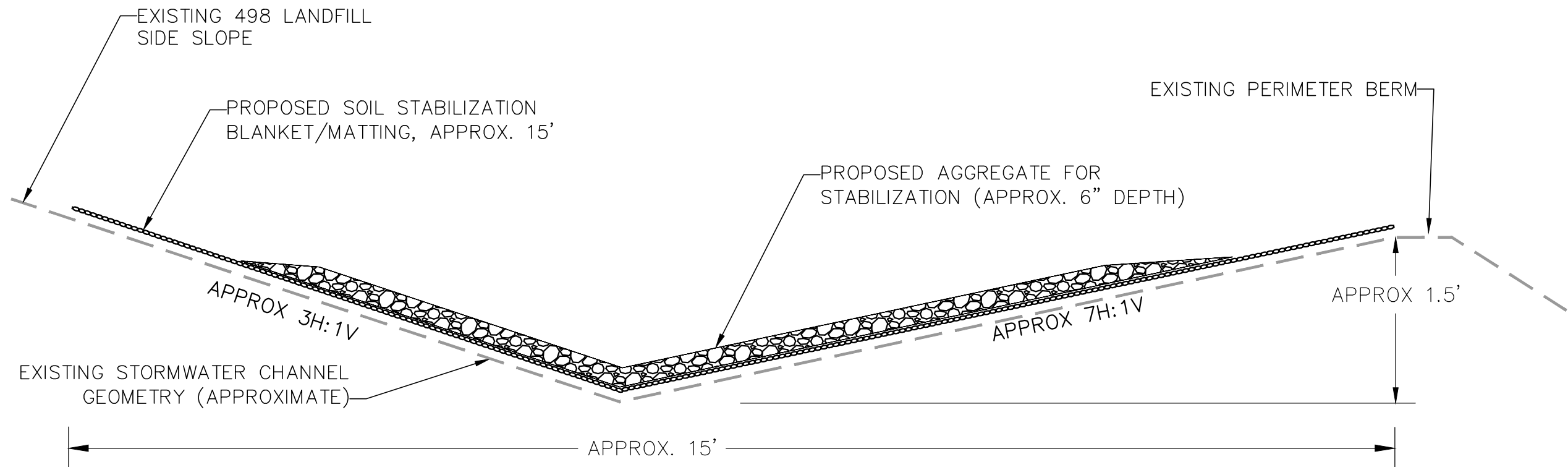


Thomas R. Williams
Project Engineer
SCS Engineers

CJW/TRW

cc: Randall Eads, City of Bristol
Mike Martin, City of Bristol
Joey Lamie, City of Bristol
Jake Chandler, City of Bristol
Jon Hayes, City of Bristol
Jeff Hurst, VDEQ
Susan Blalock, VDEQ
Stacy Bowers, VDEQ
Daniel Scott, VDEQ

Encl. Stormwater Conveyance Channel Repair – February 10, 2023
Daily Field Report and Photo Log – February 24, 2023
Daily Field Report and Photo Log – March 9, 2023



NOTES:

1. REMOVE EXCESS SEDIMENT FROM THE CHANNEL PRIOR TO THE INSTALLATION OF THE SOIL STABILIZATION BLANKETS/MATTING.
2. INSTALL BLANKETS/MATTING IN ACCORDANCE WITH SECTION 3.36 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. USE STAKES, STAPLES, AND PINS AS DIRECTED BY THE APPLICABLE PLATE.

STORMWATER CONVEYANCE CHANNEL REPAIR
NOT TO SCALE

SCS ENGINEERS

FIELD REPORT

Project Name: SWP #498 – Stormwater Channels

Project No.: 02218208.17

Task: 1

Contractor: City of Bristol, Virginia Public Works

Client: City of Bristol, Virginia

SCS Personnel: Charles Warren

Prepared By: Charles Warren

Site Hours: 1

Date: February 24, 2023

Weather: Cold, windy, sunny, high around 60

Observations:

- On-site at 8:15am. Approx. 50°F, mostly sunny
- Observed progress of Stormwater Diversion Channel / Trench Berm clean-out and stabilization.

PHOTO LOG 02/24/2023



Stormwater diversion channel and trench berm prior to clean-out and stabilization.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed.

PHOTO LOG 02/24/2023



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.

PHOTO LOG 02/24/2023



Stormwater diversion channel and trench berm prior to clean-out and stabilization.

SCS ENGINEERS

FIELD REPORT

Project Name: SWP #498 – Stormwater Channels

Project No.: 02218208.17

Task: 1

Contractor: City of Bristol, Virginia Public Works

Client: City of Bristol, Virginia

SCS Personnel: Charles Warren

Prepared By: Charles Warren

Site Hours: 1

Date: March 9, 2023

Weather: Cold, windy, sunny, high around 60

Observations:

- On-site at 1:15pm. Approx. 60° F, mostly sunny
- Observed conditions of Stormwater Diversion Channel / Trench Berm after clean-out and stabilization.

PHOTO LOG 03/09/2023



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.

PHOTO LOG 03/09/2023



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.

PHOTO LOG 03/09/2023



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.

PHOTO LOG 03/09/2023



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.



Stormwater diversion channel and trench berm with sediment removed, erosion control matting in place, and aggregate placed & spread.

Midlothian, VA

PROJECT: City Bristol, LF Engineering, ISWMF, VA 02218208.05 DATE: 4/10/2023

SUBJECT: March Monthly Compliance Reports SWP #588, SWP #498, & SWP #221 TRANSMITTAL ID: 00012

PURPOSE: For Record VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
Charles Warren Midlothian, VA	SCS Engineers	CWarren@scsengineers.com	+1-804-486-1903

TO

NAME	COMPANY	EMAIL	PHONE
Jonathan Chapman 355-A Deadmore Street Abingdon VA 24210 United States	Virginia Department of Environmental Quality	Jonathan.chapman@deq.virginia.gov	

REMARKS: Jonathan,
In accordance with Item 8.iii of Appendix A and Item 8 of Appendix B of the Consent Decree between the City and VDEQ, SCS is submitting the Monthly Compliance Reports for the Solid Waste Permit #588, #498, and #221 Landfills on behalf of the City of Bristol, Virginia. The reports can be downloaded using the links below. Please note that the data from monthly gas monitoring of leachate collection components (Item 1.i of Appendix A), sampling and analysis of dual extraction wells (Item 4.ii of Appendix A), and topographic survey (Item 5.ii of Appendix A) are contained within the Solid Waste Permit #588 report. Let us know if you have questions about the contents of these reports.
Regards,
Charles

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	4/10/2023	March 2023 Compliance Report - SWP 588.pdf	
1	4/10/2023	March Compliance Report - SWP 498.pdf	
1	4/10/2023	March Compliance Report - SWP 221.pdf	

Transmittal

DATE: 4/10/2023
TRANSMITTAL ID: 00012

COPIES:

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