National Pollutant Discharge Elimination System

MUNICIPAL SEPARATE STORM SEWER SYSTEM
DISCHARGE PERMIT NUMBER: MD0068365
STATE DISCHARGE NUMBER: 11-DP-3322

CHARLES COUNTY, MD
ANNUAL REPORT
JULY 2021 - JUNE 2022

Prepared for:
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Water and Science Administration
1800 Washington Boulevard
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GEODATABASE

2022_Charles_County_README_MS4_Geodatabase.docx

2022_Charles_County_Stormwater_Infrastructure.gdb

Feature Classes
Streams
Streams_HydroJunctions
swFlow
swPipes
swStructures

2022_Charles_County_MDE_NPDES_MS4.mdb

Feature Classes			
QuarterlyGradingPermit	RestBMP	OutfallDrainageArea
AlternateBMPPoint	BMPPOI	BMPDrainageArea
Outfall	MonitoringSite	MonitoringDrainageArea
MunicipalFacilities	AlternateBMPLine	AlternateBMPPolygon

Executive Summary

Charles County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit was issued to the County on December 26, 2014 and expired on December 25, 2019. In an August 8, 2020 letter, the Maryland Department of Environment (MDE) administratively extended permit coverage until a new permit is issued.

This report covers a 12-month period from July 1, 2021 through June 30, 2022, which is Fiscal Year (FY) 2022. Highlights from the permit year include:

Capital Programs

- Construction management of three stream restoration projects.

Financial Programs

- Stormwater Remediation Fee increase from $115 to $127per improved parcel, increasing the Watershed and Protection Fund FY 2023 budget to $6.78 million.

Operational Programs

- Street sweeping of 1,156 lane miles and removing 55.19 tons of debris from the storm drainage system. Repairing County owned inlets at a cost of $396,373.

- Septic pump-out reimbursements for 857 applications as part of bringing public attention to the importance of routine septic maintenance.

- Watershed Restoration and Outreach grant awards to two organizations: the University of Maryland Environmental Finance Center titled, "Connecting Charles County Residences with Resources for Proper BMP Maintenance," and the Interfaith Partners for the Chesapeake Bay titled, "Accelerating Watershed Restoration with Faith-Based Action." Two additional Community Engagement and Restoration Awards were made to the Cobb Island Citizens Association for Invasive Plant Removal Using Goats, and the Neighborhood Creative Arts Center to support NatureFest 2022 held at Tilghman Lake Park on April 30, 2022.

Planning Programs

- Eighteenth year of the biological, chemical, and physical stream monitoring on a tributary to Mattawoman Creek, referred to as the Acton-Hamilton location.

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I. Identification

Permit Number: 11-DP-3322 MD0068365

Permit Area: The permit covers all stormwater discharges from the municipal separate storm sewer system (MS4) owned or operated by Charles County, Maryland.

Effective Dates: December 26, 2014 thru December 25, 2019 (The original permit was modified November 8, 2019 and then administratively extended by MDE until a new permit is issued.)

FY 2022 Status

Charles County, Maryland has been operating its municipal separate storm sewer system (MS4) under a National Pollutant Discharge Elimination System (NPDES) MS4 permit since 1997, when the first five year permit was issued by the Maryland Department of Environment, Water Management Administration (MDE/WMA). On July 31, 2002, the County was issued a second, five-year permit. Each permit issuance or renewal is referred to as a generation, for example, first generation, second generation, and so on. The County's first and second generation permits covered stormwater discharges from the MS4 within the Development District, which is the County's urban area.

The third generation, five-year MS4 permit was issued on December 26, 2014, which expanded permit coverage to the entire county and added significant permit conditions. New conditions included expanding the Geographical Information System (GIS) data countywide, restoring 20 percent of the County's untreated impervious surface area countywide, and preparing watershed restoration plans to address total maximum daily loads (TMDLs) for both local waterways and the Chesapeake Bay.

The County's third generation permit was modified on November 8, 2019 to add Part IV.E.3 titled, "Nutrient Trading." This new section allows the County to acquire total nitrogen, total phosphorus and total suspended solids credits in accordance with the requirements of the Maryland Water Quality Trading and Offset Program for purposes of meeting the 20 percent impervious surface area restoration requirement of the permit.

As part of this comprehensive water quality control permit, the County is required to report to the Maryland Department of the Environment, Water Management Administration (MDE/WMA) annually regarding the status and progress of the permit conditions. The annual reports are based on State/County fiscal year and are due on the anniversary date of the permit.

This report summarizes the actions taken by the County to fulfill the requirements of the NPDES permit. Following each permit condition is a description of the work completed during the reporting year.

II. Definitions

Terms used in this permit are defined in relevant chapter of the Code of federal Regulations (CFR) or the Code of Maryland Regulations (COMAR). Terms not defined in CFR or COMAR shall have the meanings attributed by common use unless the context in which they are used clearly requires a different meaning.

III. Water Quality

The permittee must manage, implement, and enforce a stormwater management program in accordance with the Clean Water Act (CWA) and corresponding National Pollutant Discharge Elimination System (NPDES) regulations, 40 CFR Part 122.

Compliance with conditions in Parts IV through VII of the permit shall constitute compliance with Subsection 402(p)(3)(B)(iii) of the CWA and adequate progress toward compliance with Maryland's receiving water quality standards and U.S. Environmental Protection Agency (EPA) approved stormwater waste load allocations (WLAs) for this permit term.

IV.A. Permit Administration

Overview of Permit Conditions

1. *Charles County shall designate an individual to act as liaison with MDE for implementation of this permit. The County shall provide the coordinator's name, title, address, phone number, and e-mail address. Additionally, the County shall submit in its annual reports to MDE, including an organizational chart detailing personnel and group responsible for major NPDES program tasks in this permit. MDE shall be notified of any changes in personnel or organization relative to NPDES tasks.*

FY 2022 Status

Listed below are the County's liaisons to MDE for permit implementation. The contact information for the FY 2022 liaisons is listed below.

Liaisons' address:

Charles County Planning Division
200 Baltimore Street,
La Plata, MD 20646

Liaisons' Phone and E-mail Contact Information:

James Campbell, Planning Director
301-645-0598 (P), CampbelJ@CharlesCountyMD.gov

Alicia Afroilan, Engineering Supervisor
301-396-5238 (P), AfroilaA@CharlesCountyMD.gov

Karen Wiggen, Planner III
301-645-0683 (P), WiggenK@CharlesCountyMD.gov

Organizational Chart:

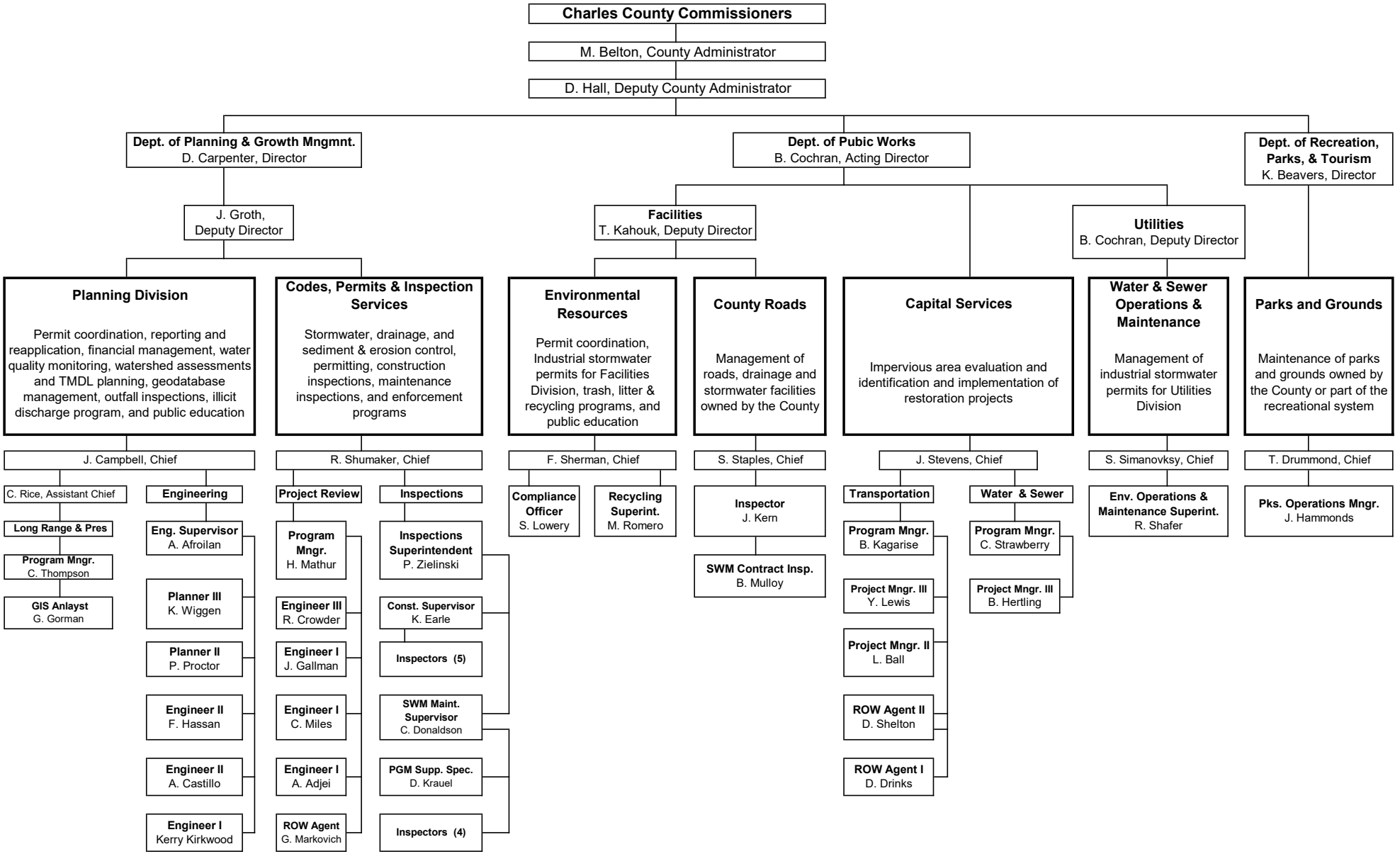
The NPDES program tasks in this permit are divided between three departments in Charles County: Planning and Growth Management (PGM), Public Works (DPW) and Recreation, Parks and Tourism (RPT). These departments coordinate with other departments, such as the County's Attorney's Office and the Department of Fiscal and Administrative Services, as necessary to implement the permit.

PGM's responsibilities primarily include the stormwater and erosion and sediment control permitting programs, development of stormwater infrastructure geographic information system (GIS), managing the County's data in the MDE geodatabase, monitoring water quality, performing watershed assessments, watershed restoration planning, managing the illicit discharge elimination and detection program, managing the septic pump-out program, and public outreach. DPW's responsibilities primarily include implementing the capital restoration projects, maintenance of County owned right-of-ways, maintenance of the public drainage system, implementation of stormwater pollution prevention plans for County owned industrial properties, the litter and floatables program, and public outreach. RPT's responsibilities include maintenance of County owned parks and grounds.

In FY 2021 the Charles County Commissioners introduced and adopted Bill No. 2020-07 adding Chapter 299 and Resilience Authority Sections 299.01 through 299.15 to the *Code of Charles County, Maryland*. The purpose stated in Section 299.01 is, "The Resilience Authority of Charles County will undertake and support resilience infrastructure projects, that mitigate the effects of climate change by offering a range of financing structures, forms, and techniques that leverages public and private investment and stimulates demand for resilience infrastructure projects throughout Charles County." The Board was appointed in February 2021 and a Climate Resilience and Sustainability Officer was hired by the Department of Planning and Growth Management to begin in FY 2022.

The following organizational chart details personnel and divisions responsible for major NPDES program tasks in this permit.

FY 2022 NPDES MS4 Organizational Chart



IV.B. Legal Authority

Overview of Permit Conditions

Charles County shall maintain adequate legal authority, in accordance with NPDES regulations 40 CFR 122.26(d)(2)(I), throughout the term of this permit. In the event that any provision of its legal authority is found to be invalid, the County shall make the necessary changes to maintain adequate legal authority.

FY 2022 Status

The County will maintain adequate legal authority throughout the term of this permit, and in the event that any provision of its legal authority is found to be invalid, the County will make the necessary changes to maintain adequate legal authority.

IV.C. Source Identification

Overview of Permit Conditions

Sources of pollutants in stormwater runoff shall be identified and linked to specific water quality impacts on a watershed basis. Annual reporting of these data has been provided within the County's Development District for the previous permit. Because identification of water quality impacts in impaired watersheds outside of the Development District is necessary, this reporting is expanded to the entire permit area to support ongoing efforts in watershed restoration plans. This information shall be compiled and updated annually. By the end of the permit, the County shall provide the following data for all watersheds within the permit area in geographic information system (GIS) format with associated tables as required in Part V. of this permit:

1. *Storm drain system: infrastructure, major outfalls, inlets, and associated drainage areas;*
2. *Industrial and commercial sources: industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants;*
3. *Urban best management practices (BMPs): stormwater management facility data including outfall locations and delineated drainage areas;*
4. *Impervious surfaces: public and private land use delineated, controlled and uncontrolled impervious areas based on, at minimum, Maryland's hierarchical eight-digit sub-basins;*
5. *Monitoring locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the 2000 Maryland Stormwater Design Manual; and*
6. *Water quality improvement projects: projects proposed, under construction, and completed with associated drainage areas delineated.*

FY 2022 Status

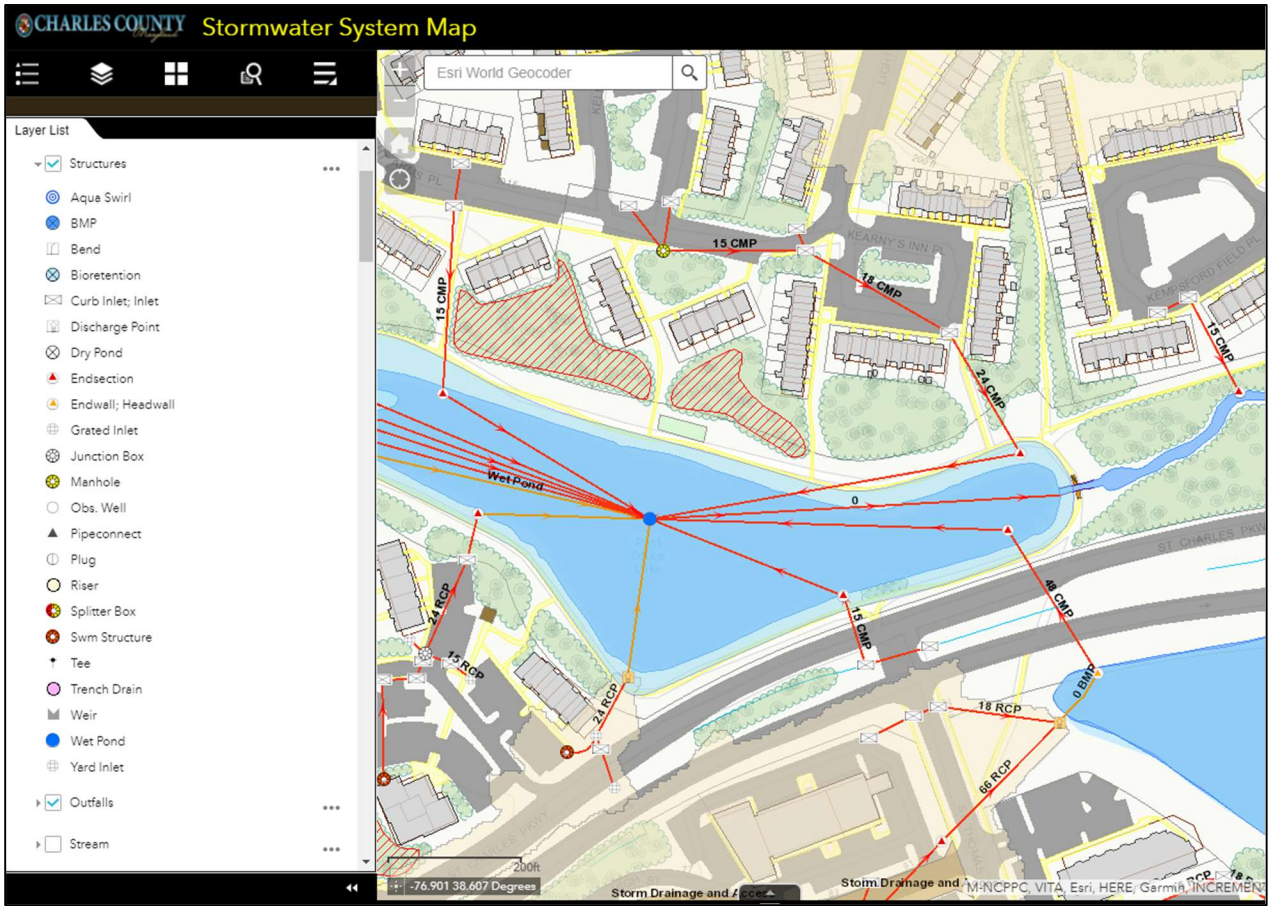
In anticipation of MDE expanding the County's NPDES MS4 Permit countywide, Charles County began compiling the above listed GIS data for areas outside of the Development District in FY 2012. The expanded GIS data coverage has proven to be a significant resource to the County for public storm drain and stormwater best management practice (bmp) maintenance, stormwater permitting reviews, environmental permitting reviews, stormwater facility maintenance inspections, and watershed restoration planning.

In an effort to provide the stormwater data on a platform that would be easily accessible by County maintenance providers, permit reviewers and inspectors in the office or in the field, a Stormwater System Map internet application was established in 2013, with staff trainings occurring annually from 2014-2017. As of FY 2016, the County hosts the web application.

Stormwater Data and Tools

The County's Stormwater System Map internet application capabilities include:

- trace tool used to trace flow in a drainage system upstream for identifying potential sources of illicit discharges;
- bmp locator tool using local bmp identification numbers;
- street locator tool using bmp addresses;
- links to stormwater management, drainage and forest conservation easement documents, used to view easements of record;
- micro-bmp tool used to view approved permit plans for micro-bmps;
- inspection tool used to identify status of stormwater bmp inspections;
- 2014, 2017 and 2020 aerial imagery for comparison, 2020 imagery added in FY 2022;
- link from the project site to the construction/as-built drawings for the project (added in FY 2017); and
- major outfall search tool and photos (added in FY 2017).



MDE's NPDES MS4 Geodatabase Design and User's Guide

Early in 2015, MDE released the *NPDES MS4 Geodatabase Design and User's Guide Versions 1.0* and *1.1*. Revisions were subsequently reflected in Version 1.2, released in May 2017.

In November 2021, MDE released a *Draft Supplement to the Geodatabase Design and User's Guide (Version 1.2 Draft Updates)*. The corresponding geodatabase updates were included in Version 2, released in March 2022. County staff has determined a schedule to convert existing data into the new schema beginning in January 2023. In the interim, data updates continue by using replica databases and data check-out systems for data modifications. These processes allow multiple users, including the County and consultants, to continually modify the data, while having the latest information.

MDE's MS4 Geodatabase format includes the following (12) feature classes and (23) tables:

- **Permit Administration:** *Permit Information table*;
- **Source Identification:** *Outfall feature class; Outfall Drainage Area feature class; BMP Point of Investigation feature class; BMP table; BMP Drainage Area feature class; Impervious Surface table; Monitoring Site feature class; Monitoring Drainage Area feature class; Alternate BMP Line feature class; Stream Restoration Protocols table; Shoreline Management Practices table; Alternate BMP Point feature class; Alternate BMP Polygon feature class; and Restoration BMP feature class*;
- **Management Programs:** *Stormwater Management Program table; BMP Inspections table; Alternate BMP Line Inspections table; Alternate BMP Point Inspections table; Alternate BMP Polygon Inspection table; Restoration BMP Inspection table; Erosion and Sediment Control Program table; Quarterly Grading Permits feature class; Quarterly Grading Permit Information table; Responsible Personnel Certification Information table; Illicit Discharge Detection and Elimination Program table; Municipal Facilities feature class; and Chemical Application table.*
- **Restoration Plans and Total Maximum Daily Loads:** *Countywide Stormwater Watershed Assessment table; and Local Stormwater Watershed Assessment table.*
- **Assessment of Controls:** *Chemical Monitoring table; Local Concern Monitoring table; and Biological Monitoring table.*
- **Program Funding:** *Fiscal Analysis table.*
- **Narrative Files:** *Documents, Charts and Reports table.*

This annual report includes the MS4 Geodatabase prepared according to MDE's *User's Guide Version 1.2*. The Storm Drain System data is also included with this annual report as a separate geodatabase. Following is an overview of the geodatabase components and updates made this year.

- **Storm Drain System:** The FY 2020 data was revised to separate pipes and culverts from open channel and flow features. In FY 2022 the dataset includes 29,132 pipe and culverts and 51,277 drainage related structures. The storm drain system is provided separate from the MS4 Geodatabase with the exception of the outfalls and outfall drainage areas, which are included in the MS4 Geodatabase.

- **Industrial and Commercial Sources:** MDE noted on the question and answer spreadsheet, referenced above that this information is to be captured in the Municipal Facilities feature class of the geodatabase. Charles County has three municipal facilities with industrial stormwater permits, which have been added to the MS4 Geodatabase. A narrative summary of the data is included in Part IV.D.5. of this report.

- **Urban Best Management Practices (BMPs):** The County continued to work through its digital and paper files to expand and improve the County's stormwater GIS coverage countywide. The FY 2022 total is 7,888 active stormwater BMPs (2,975 Macro and 4,913 Micro BMPs). A narrative summary of the BMP data is included in Part IV.D.1. of this report.

- **Impervious Surfaces:** In 2013, the County first delineated impervious surface polygons based on 2011 aerial photographs. In FY 2015, 11,586 gravel parking areas and dirt roads were added to the polygon data. Also in 2015, the County completed an impervious surface analysis of controlled acres based on era of stormwater management provided. A discussion of this analysis is included in Part IV.E.2.a. of this report. This data has since been revised and provided separately to MDE in August 2016 and May 2017.

- **Monitoring Locations:** A total of 25 stations are included in the MS4 Geodatabase, some of which are no longer being used, but are maintained for historical purposes. A narrative summary of monitoring data is included in Part IV.F. of this report.

- **Water Quality Improvement Projects:** Stormwater management best management practices that are completed, under construction and proposed, have been added to the Restoration BMP feature class and shown as points according to the *User's Guide*. Additional water quality improvement projects have been included under Alternate BMP lines (streams, shoreline and outfall stabilizations), Alternate BMP points (septic upgrades and rain barrels), and Alternate BMP polygons (street sweeping, inlet cleaning and tree planting) according to the *User's Guide*. A narrative summary of the water quality improvement projects is included in Part IV.E.2.a. of this report.

IV.D. Management Programs

Overview of Permit Conditions

The following management programs shall be implemented in areas served by the County's MS4. These management programs are designed to control stormwater discharges to the maximum extent practicable (MEP) and are to be maintained for the term of the permit. Additionally, these programs are to be integrated with other permit requirements to promote a comprehensive adaptive approach toward solving water quality problems. The County shall modify these programs according to needed program improvements identified as a result of periodic evaluations by MDE.

1. Stormwater Management

An acceptable stormwater program shall continue to be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. County activities shall include following items a-d.

a. Stormwater Management activities to implement the latest version of the 2000 Maryland Stormwater Design Manual include:

i. Complying with the Stormwater Management Act of 2007 (Act) by implementing Environmental Site Design (ESD) to the MEP for new and redevelopment projects;
ii. Tracking the progress toward satisfying the requirements of the Act and identifying and reporting annually the problems and modifications necessary to implement ESD to the MEP; and
iii. Reporting annually the modifications that have or need to be made to all ordinances, regulations, and new development plan review and approval processes to comply with the requirements of the Act.

FY 2022 Status

Per the Maryland Stormwater Management Act of 2007, which requires use of environmental site design to the maximum extent practicable, the County adopted new stormwater regulations on July 13, 2010. These regulations went into effect on August 1, 2010. The Notice on the adoption of the Stormwater Management and Storm Drainage Ordinances, including Procedures on Requesting an Administrative Waiver, was included in the 2011 NPDES MS4 Annual Report. Since that time, no modifications have been made to these Ordinances.

The County continues to implement the stormwater management design policies, principles, methods, and practices found in the 2000 Maryland Stormwater Design Manual and COMAR 26.17.02.

b. Stormwater Management implementation information to be maintained on MDE's database and submitted annually:

i. Number of Concept, Site Development, and Final Plans received. Plans that are re-submitted as a result of revision or in response to comments should not be considered as a separate project:
ii. Number of redevelopment projects received;
iii. Number of stormwater exemptions issued; and
iv. Number and type of waivers received and issued, including those for quantity control, quality control, or both. Multiple requests for waivers may be received for a single project and each should be counted separately whether part of the same project or plan. The total number of waivers requested and granted qualitative and quantitative control shall be documented.

FY 2022 Status

Since the County's adoption of the stormwater management regulations (August 1, 2010) requiring environmental site design (ESD) to the maximum extent practicable (MEP), through FY 2022, a total of 434 projects have submitted Concept SWM Plans, which is Step 1 of the regulation. During that same time period, 341 projects have also submitted Site SWM Plans, which is Step 2 of the regulation.

Table 1: Stormwater Management Concept and Site Plans, Total since August 1, 2010

Fiscal Yr	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*Total*
CSWM (Step 1)	*27*	*38*	*33*	*39*	*42*	*45*	*44*	*39*	*29*	*25*	*38*	*434*
SSWM (Step 2)	*27*	*21*	*25*	*30*	*26*	*35*	*32*	*54*	*23*	*25*	*27*	*341*
Total	*54*	*59*	*58*	*69*	*68*	*80*	*76*	*93*	*52*	*50*	*65*	*775*

For the FY 2022 time period, the County received 35 new Development Services Permit submissions (these permit submissions may also include the Final Stormwater Management Plans, which is the Step 3 of the regulation).

For FY 2022 time period, 5 redevelopment projects were received under a Concept SWM Plan application; 4 redevelopment projects were received under a Site SWM Plan application. The redevelopment applications received were:

Table 2: Redevelopment Concept and Site SWM Plans

Concept SWM Plan Number	Name	Site SWM Plan Number	Name
CSWM-210016	Chick-fil-A Waldorf	SSWM-210022	Chick-fil-A Waldorf
CSWM-210018	2215 Crain Highway	SSWM-220012	McDonald's Waldorf
CSWM-210026	AutoZone Bryan's Road	SSWM-220019	Dash-In Glymont
CSWM-220005	Dash-In Glymont	SSWM-220020	2215 Crain Highway
CSWM-220009	Dash-In Bryan's Road		

There were 28 stormwater management plans that had received final approval and the associated development services permits were subsequently issued in FY 2022 (some of these issued permits were plan revisions). A table of FY 2022 issued SWM permits follows.

Table 3: Final Approved Stormwater Management Plan Permits in Fiscal Year 2022

DSP 190019	DSP 200050	DSP 210010	DSP 210024	DSP 210045
DSP 190055	DSP 200053	DSP 210011	DSP 210025	DSP 220012
DSP 200001	DSP 200057	DSP 210013	DSP 210028	DSP 220015
DSP 200012	DSP 210001	DSP 210015	DSP 210032	VR 00180011
DSP 200022	DSP 210006	DSP 210018	DSP 210034	
DSP 200039	DSP 210009	DSP 210023	DSP 210039	

For the FY 2022 time period, the County did not issue any Administrative Waivers for quality and quantity. No qualitative or quantitative waivers were granted during FY 2022 period.

Table 4: As-Builts Approved In Fiscal Year 2022

Permit Number	Approval Date
VI_180002	08/13/2021
VC_170074	08/25/2021
VC_180003	11/29/2021
VR_100027	12/08/2021
VC_180010	02/25/2022
VR_70103	02/28/2022
DSP 200016	03/10/2022
VC_180008	03/30/2022
VR_140037	06/06/2022

a. *Stormwater Management construction inspection information is to be maintained according to COMAR 26.17.02 for all ESD treatment practices and structural stormwater management facilities including the number of inspections conducted and violation notices issued by Charles County.*

FY 2022 Status

In accordance with COMAR 26.17.02.10 Construction Inspection and Enforcement, County personnel perform the various inspections, as outlined for the ESD treatment practices and structural stormwater management facilities. The County also reviews the as-built plans and certifications, including the submission of the Notice of Construction Completion Forms, which were previously updated to collect the technical data associated with each device/facility that are provided to the Charles County Soil Conservation District.

In January 2019, Charles County Department of Planning and Growth Management fully transitioned to a permit management software system called EnerGov. This system schedules and tracks review and inspection activities associated with all types of construction permits. The EnerGov module provides a location in each permit file to store photos, permit drawings, reports, data forms, and documents such as inspection reports, violation notices, and letters.

The number of stormwater management facility construction inspections is shown on the following table. The inspections of residential micro-stormwater practice inspections count as one per permit, even if there are multiple stormwater practices per permit. There were no stormwater construction violations or stop work orders.

Table 5: Stormwater Best Management Practice (BMP) Construction Inspections

	FY 2020	FY 2021	FY 2022
Development Services Permits (DSP) (BMPs not on Residential Lots)	571	363	286
Residential Permits (RESD) (BMPs on Private Residential Lots)	1,182	1,080	1,361
Construction Violations (Stop Work Orders)	0	0	0

b. *Stormwater Management preventative maintenance inspections to be conducted according to COMAR 26.17.02, of all ESD treatment systems and structural stormwater management facilities at least on a triennial basis. Documentation identifying the ESD systems and structural stormwater management facilities inspected, the number of maintenance inspections, follow-up inspections, the enforcement actions used to ensure compliance, the maintenance inspection schedules, and any other relevant information shall be submitted in the County's annual reports.*

FY 2022 Status

The County continues conducting preventative maintenance inspections of all stormwater management (SWM) devices on a triennial basis. In FY 2021 inspections were expanded to include Charles County Government and Public School owned BMPs located in the Towns of La Plata and Indian Head.

In February 2020, the SWM Maintenance Inspections fully transitioned to the new EnerGov software. Since then, each existing and new major stormwater BMP is assigned a Stormwater Management Maintenance (SWMM) permit number in EnerGov. Residential micro-stormwater practices are inspected under the original construction permit number and not assigned a separate SWMM permit. This is because the multiple micro-BMPs are inspected together under a single inspection entry whereas the major stormwater BMPs are inspected and tracked individually.

Table 6: SWM Maintenance Permits for BMPs Entered in EnerGov for Inspection

	Jan 1, 2020 – June 30, 2021	**July 1, 2021 – June 30, 2022**
# SWMM Permits Entered	1,484	1,322

Maintenance inspection photos and reports are recorded directly into the EnerGov software module on electronic field tablets during the inspection of each BMP. If necessary, certified letters are sent to initiate compliance and these are also saved within the individual inspection file within EnerGov. A copy of the maintenance inspection checklist is in Appendix B.

The EnerGov software provides the following options for each inspection result: “Pass” or “Re-inspection Required”. Inspections with “Pass” results are recorded as “Pass” and the inspections with “Re-inspection Required” results are recorded as “Fail” in the MS4 Geodatabase. It should be noted that the reasons for “Re-inspection Required” vary widely and include not being able to access the site, needing minor maintenance, and structural failure. Therefore, a “Fail” in the MS4 geodatabase does not indicate severity of the situation. Owners are notified that maintenance is required and re-inspections are scheduled on the timeframe determined suitable by the inspector. If the owners do not rectify the situation, the cases are referred to the County Attorney’s Office for enforcement. No cases were referred for enforcement in FY 2022.

Table 7: SWM Maintenance Inspections for BMPS not on Residential Lots

	FY 2021	**FY 2022**
Total Inspections	1,378	1,547
Failed Inspections	242	345
Total BMPs Inspected	1,163	1,371
Noncompliant BMPs	154 (13%)	203 (15%)

Table 8: SWM Maintenance Inspections for BMPs on Private Residential Lots

	FY 2021	FY 2022
Total Inspections	3,009	219
Failed Inspections	463	101
Total Private Residential Lots Inspected	2,590	178
Lots w/Noncompliant BMPs	326 (13%)	44 (25%)

Table 9: SWM Maintenance Inspections for Restoration BMPs

	FY 2021	FY 2022
Total Inspections	32	1
Failed Inspections	0	1
Noncompliant BMPs	0	1

The data in this section is captured is included in the enclosed MS4 Geodatabase as follows:

- Number of various types of stormwater plan reviews, and construction inspections are in the *SWM Table*,
- New development and restoration BMPs are in the *BMP and Restoration BMP Tables,* respectively, and
- BMP Maintenance inspections are in the *BMP Inspections* and *Restoration BMP Inspections Table.*

Stormwater Maintenance Inspection Process Updates in EnerGov

The EnerGov software began use for scheduling and tracking stormwater maintenance inspections in February 2020. Processes for adding BMP inspections into the EnerGov queue:

1) Active historic BMPs and new BMPs must be manually entered into EnerGov. This continues to be the process.
2) As new BMPs are constructed, staff has been scheduling the future 1-year inspections once the final construction inspections pass. Notification of final construction inspection pass is via e-mail from the construction inspection staff.
3) After the 1-year, the initial 3-year inspection is manually scheduled. Thereafter once a 3-year inspection passes, the EnerGov automatically schedules the next 3-year inspection. If an inspection fails, the inspector manually enters the next requested inspection date.
4) Private Residential BMPs are often built under multiple permits, such as house, garage, pool, deck, etc. A maintenance inspection is tracked for each permit in EnerGov.

Several improvements to entering data from the EnerGov into the MS4 geodatabase have also occurred.

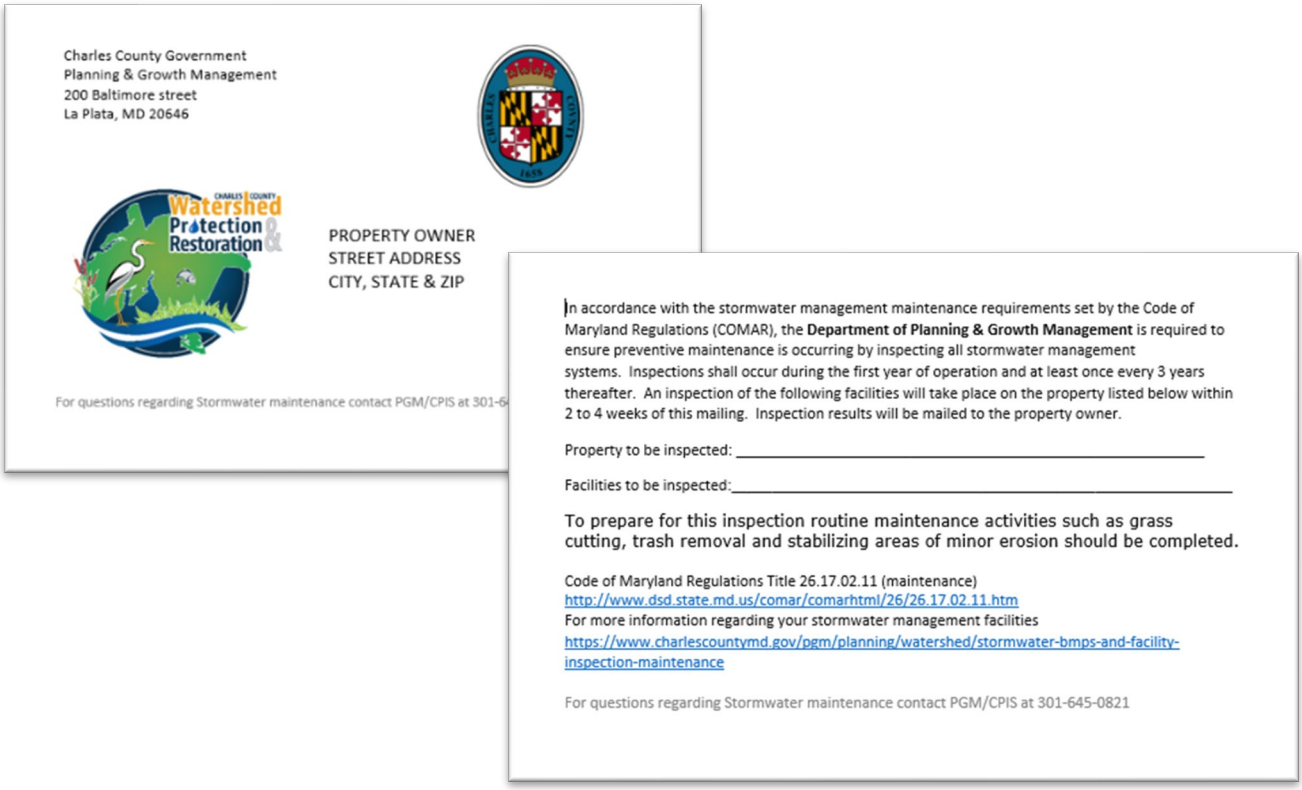
1) EnerGov quarterly reports of fully constructed BMP permits passing final construction inspection (aka 'finaled') are used to add new BMPs to the geodatabase records.
2) EnerGov quarterly reports of BMP maintenance inspections are used for data entry and cleanup over the reporting year.
3) New EnerGov Inspection Numbers are matched with existing inspection numbers to ensure no duplicate inspections are entered into the MS4 geodatabase. This is to resolve issues of EnerGov creating duplicate inspection records in the quarterly reports, which may be due to the BMP crossing property boundaries or other reasons.
4) SWMM Permit numbers have been added to the County's MS4 geodatabase schema.
5) Inspection records within the geodatabase are matched by BMP_ID and re-inspections are manually collapsed into the line item of the original "Fail" inspection. If a BMP has "Fail" on re-inspection, the third inspection is entered on a new line item, and the process is repeated. The collapsing process ceased midway in FY 2022 due to MDE's new schema released in March 2022, that collects each inspection as a separate line.

EnerGov processes that staff continues to work through in FY 2022 and into FY 2023:

1) More than one maintenance inspection may be scheduled back-to-back for the same BMP due to call-in requests by residents, to add additional data, or because the tablets did not sync with the EnerGov. In the case of the tablets not syncing, the inspector notes the prior inspector and date of the recently passed inspection and marks as 'passed' again. These 'extra' passed inspections have been teased out of the MS4 geodatabase *BMP Inspections Table* prior to submittal.
2) When a BMP is revised under a subsequent project permit, often the BMP will be in the inspection queue under both project permits and thus have repeated inspections. When these are found one of the duplicate BMP records is 'completed' (aka closed) in EnerGov and removed from the MS4 geodatabase *BMP Inspections Table*.
3) The EnerGov provides a data line for entering the entity maintaining each BMP. For example, private entity, Department of Public Works, Volunteer Fire Department, or Board of Education. However, this data has not yet been entered, but would be helpful if completed so lists of BMPs can be run and provided to the responsible entity for their awareness of new BMPs to be included under their maintenance programs.
4) BMP inspections that have been associated with multiple or incorrect property ID's in EnerGov need to be corrected. This likely needs to be done by a software manager.
5) EnerGov software may create multiple SWMM permit numbers for the same BMP, likely due to an internal saving process occurring during data entry and can only be corrected by a software manager. Several have been identified for correction.
6) An EnerGov report has been created that will pull the next inspection date for all BMPs to verify that all 'submitted' (aka active) BMPs are in the queue for a future inspection.

Inspection Notification for Private Residential Lot Owners

The Stormwater Maintenance Inspections postcard mailer started being used in May 2019 for pre-notification to homeowners that a County inspection would be held within 2-4 weeks and that access to their property is needed. A door hanger was also developed to let the homeowners know if a BMP issue was found during the inspection and to expect a follow-up letter from the County. The feedback on the pre-notification and the door hanger has been positive. Following are images of the postcard.



Requirement for Disclosure of Private On-Site SWM Facilities

In FY 2021 the Charles County Department of Planning and Growth Management instituted a process of disclosing to future homeowners their maintenance responsibilities regarding on-site micro scale stormwater management practices. Following is the explanatory notice.

In FY 2022 staff is considering ways to ensure homeowners are aware of the location and types of micro scale stormwater management practices on their property and under their responsibility. Additionally, outreach and educational information is conveyed to homeowners as described in Part IV.D.6 of this report.

Charles County Department of Planning and Growth Management

NOTICE

NOTICE #: 21-02 NOTICE RELEASE DATE: 2/22/2021 CONTACT: Paul Zielinski: 301-645-0519
ZielinsP@CharlesCountyMD.gov

Single & Multiple Lot Inspection and Maintenance of Private On-Site Stormwater Management Facilities Declaration of Covenants Disclosure Form

All residential building permits which provide private on-site stormwater management (SWM) facilities, non-structural SWM devices, and/or Environmental Site Design (ESD) devices, are required to have an executed and recorded agreement which outlines the responsibilities of maintenance and inspections for the practice. The document is necessary in order to comply with the County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. The document is recorded prior to issuance of the associated permit.

Also, the recorded Declaration of Covenants requires current and future owners to maintain the facilities and keep them in proper working condition in accordance with the approved design standards and applicable laws, rules, and regulations of the Maryland Department of the Environment (MDE). The facilities shall not be altered without prior written approval from the County and the County retains the right to perform periodic inspections of the facilities.

It is the responsibility of the seller(s) to disclose all information regarding the Single & Multiple Lot Inspection and Maintenance of Private On-Site Stormwater Management Facilities to the buyer(s). In order to provide awareness to the citizens regarding responsibilities associated with newly permitted residential projects with stormwater management, a disclosure form must be completed prior to issuance of a Certificate of Use and Occupancy. Copies of the required disclosure form can be obtained at the Charles County Government Building; Codes, Permits & Inspection Services Division, or by visiting our Forms at https://bit.ly/3arndqq.

This change will be effective on the release date of this notice.

Should you have any questions on the application process, please contact the Department of Planning & Growth Management at (301) 645-0692.

Those citizens with special needs, please contact the Charles County Department of Planning and Growth Management, voice phone number (301)645-05400 or Maryland Relay Services TDD 1-800-735-2258.

Charles County Department of Planning and Growth Management • 200 Baltimore Street, La Plata, MD 20646
301-645-0692 • MD Relay Service: 7-1-1 (TDD: 1-800-735-2258) • www.CharlesCountyMD.gov

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall continue to be maintained and implemented in accordance with Environmental Article, Title 4, Subtitle 1, Annotated Code of Maryland. County activities shall include the following items A-D.

a. Implementing program improvements identified in any MDE evaluation of the County's erosion and sediment control enforcement authority.

FY 2022 Status

Every two years, MDE performs field reviews of active construction sites to review the County's implementation of the erosion and sediment control program. The County's current delegated program authority was renewed on March 14, 2022 to extend through June 30, 2024.

b. Ensure that construction site operators have received training regarding erosion and sediment control compliance and hold a valid Responsible Personnel Certification as required by MDE.

FY 2022 Status

County sediment and erosion control inspection staff continues to verify that site operators hold valid Responsible Certification as required by MDE.

c. Program activity shall be recorded on MDE's annual report database and submitted as required in Part V of the permit.

FY 2022 Status

The following information is included in the enclosed MS4 geodatabase in *the Erosion Sediment Control Table.*

Table 10: Erosion and Sediment Control Table for Fiscal Years 2018 - 2022

Fiscal Year	2018	2019	2020	2021	2022
Number of Grading Permits Issued	1,226	1,039	701	1,099	1,238
Number Grading Permits Active (overall)	1,553	1,398	1,295	1,417	1,307
Disturbed Area for Active Grading Permits	4,322	3,619	4,498	3,845	4,125
Number of Other Permits Issued	33	16	22	28	24
Number of Other Active Permits (overall)	91	40	46	31	50
Disturbed Area for Other Active Permits	3,934	3,631	2,845	1,767	1,732
Number of Sediment Control Inspectors	6	5.25 FTE	4	4	5.25
Number of Supervisors	2	2	1	1	1
Number of Sediment Control Inspections	6,381	6,747	8,053	5,624	6,372
Number of Stop Work Orders Issued	33	53	23	15	16
Number of Fines Collected	33	30	23	15	16
Amount of Fines Collected	$14,757	$24,327	$11,109	$7,530	$8,302
Number of Violations	33	30	23	24	16
Number of Court Cases	0	0	0	0	0
Number of Sediment Control Complaints Received	51	11	12	40	32

d. *Reporting quarterly, information regarding earth disturbances exceeding one acre or more. Quarters shall be based on calendar year and submittals shall be made within 30 days following each quarter. The information submitted shall cover permitting activity for the preceding three months.*

FY 2022 Status

The required quarterly data has been provided to MDE in FY 2022. The following information summarizes the number of entries in the enclosed MS4 Geodatabase in the *Quarterly Grading Permit Feature Class* and *Quarterly Grading Permit Information Table*.

Table 11: Construction Permits Issued for Earth Disturbances > 1 Acre Fiscal Years 2018-2022

Fiscal Year	2018	2019	2020	2021	2022
Development Services Permits	17	22	27	33	35
Residential Permits	7	3	6	2	7

3. Illicit Discharge Detection and Elimination

An inspection and enforcement program shall be implemented to ensure that all discharges to and from the MS4 that are not composed entirely of stormwater are either permitted by MDE or eliminated. Activities include:

a. Field screening at least 100 outfalls annually. Each outfall having a discharge shall be sampled using a chemical test kit. Within one year of permit issuance, an alternative program may be submitted for MDE approval that methodically identifies, investigates, and eliminates illegal connections to the County's storm drain system;

b. Conducting annual visual surveys of commercial and industrial areas for discovering, documenting, and eliminating pollutant sources. Areas surveyed shall be reported annually.

c. Maintaining a program to address and, if necessary, respond to illegal discharges, dumping, and spills;

d. Using appropriate enforcement procedures for investigating and eliminating illicit discharges, illegal dumping, and spills. Significant discharges shall be reported to MDE for enforcement and/or permitting; and

e. Reporting discharge detection and elimination activities as specified in Part V. of the permit.

FY 2022 Status

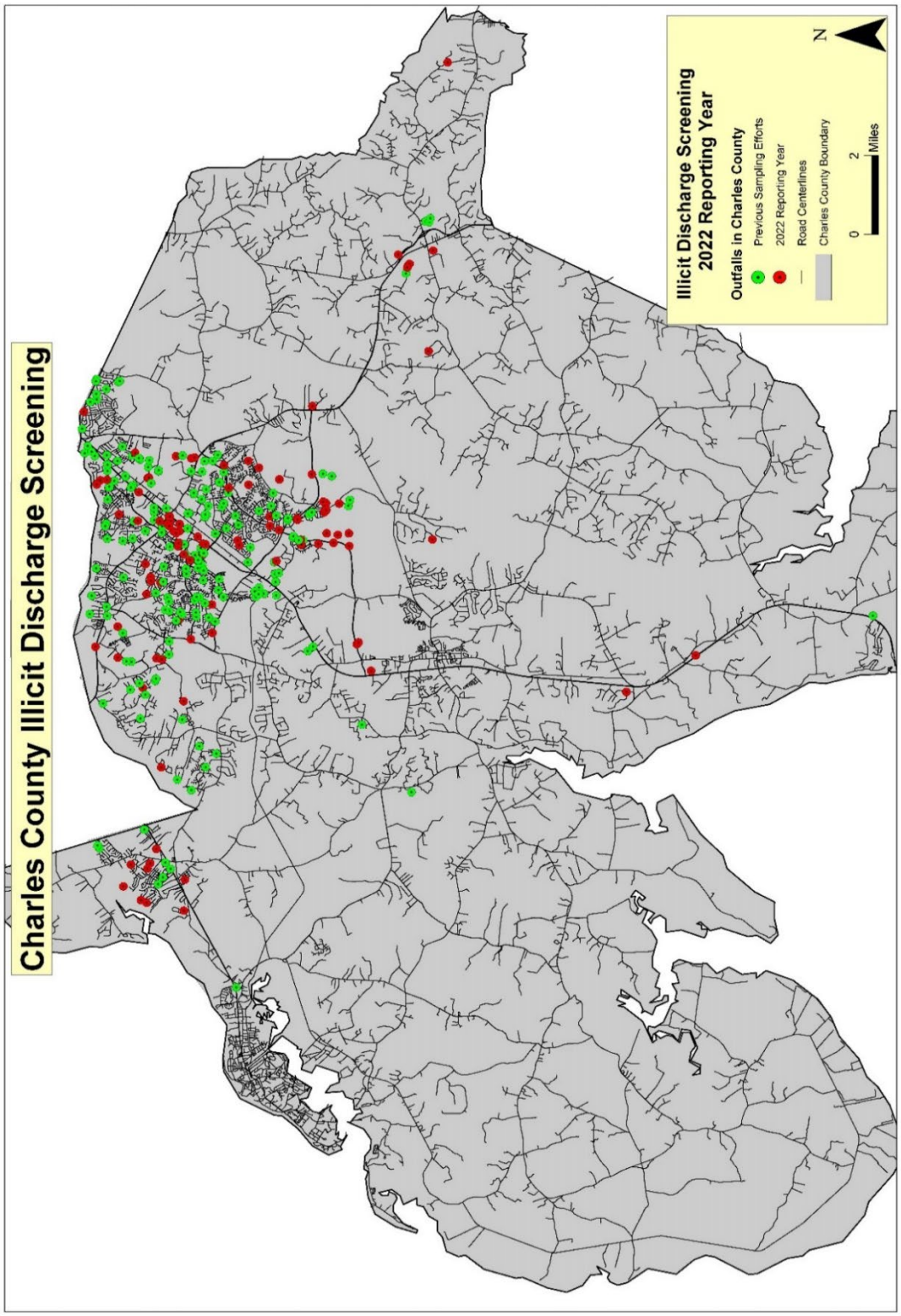
Illicit Connection Detection Field Screening

During the FY 2022 screening, 105 sites were inspected. This includes 12 draining industrial areas, 33 draining commercial areas, and 60 draining residential areas. A map of the outfalls sampled follows on page 22.

For the 2022 reporting year, previously mapped outfalls that were not sampled during the 2020 and 2021 reporting years were selected for sampling. In addition, seventeen new outfalls were added to the major outfall inventory in the 2022 reporting year. Thirteen of these outfalls drain residential areas, two drain commercial areas, and tow drain industrial areas.

The screening was conducted in June of 2022. A two-person field crew visited each site following 72-hours of dry weather. The physical condition of each site was recorded on field sheets. If a dry-weather flow was present, a sample was taken and tested with a Hach chemical test kit. Tests were conducted for pH, detergents, chlorine, copper, phenols, temperature, ammonia nitrogen and nitrate nitrogen. When a chemical test was conducted, and the results showed a high concentration for any contaminant, the site was retested after 4 hours but within 24 hours to verify the results.

Figure 5: Charles County Illicit Discharge Screening Map



The results of the chemical test performed were compared with the accepted statewide averages described in *Dry Weather Flow and Illicit Discharges in Maryland Storm Drain Systems* (MDE, 1997). Using the statewide averages, the 1997 study provides a threshold for each constituent, based on watershed land use. The results from the chemical tests performed during the 2022-reporting year were compared with this threshold to determine which results are considered abnormal for each constituent, and to make recommendations as to which storm drain systems should be investigated further as having possible illicit connections. The thresholds listed were 0.4 ppm for chlorine, 0.17 for phenols, 0.21 for copper, and 0.5 ppm for detergents. No state-approved threshold limit exists for ammonia. Based on EPA and USGS documentation, a value of 2.0 ppm appears reasonable. This is consistent with the high outlying values found in previous screening efforts. Review of past data shows that typical pH values in Charles County fall outside the standard threshold range of 6.5 to 8.5. Therefore, for the 2022 reporting year, the following thresholds were used to determine if an upstream investigation was necessary:

- pH outside the range 5.5-8.5
- >0.5 ppm Detergents
- >0.4 ppm Chlorine
- >0.17 ppm Phenols
- >0.21 ppm Copper
- >2.0 ppm Ammonia

When a confirmed high concentration of a contaminant was found, field crews followed the storm drain system upstream attempting to locate the source of the contamination. Additional tests at upstream structures were conducted as needed to track the contamination upstream to the source, especially where two systems converged. For any outfall with flow, a brief inspection of the storm drain system is performed to indicate the source of the discharge.

All data collected during the illicit discharge screening is recorded in the enclosed MS4 geodatabase in the *IDDE Table*.

The results show that, of the 105 sites, 27 had observed flow. Of these, 8 had observed flow that was too small for a sample to be collected. For these outfalls, observed flow is set to 'no' and water temperature and CFS flow are not filled out in the geodatabase since a sample is not collected. Of the remaining 19 sites where flow was able to be collected, four had detectable chlorine below the threshold limit. Six outfalls had detectable ammonia below the threshold limit.

No concentrations of detergents, phenols, or copper were detected at the sites where flow was able to be collected. PH levels were within historical ranges for all outfalls sampled.

Metal corrosion was present at 9 outfalls and 70 outfalls were found to either be backwatered

or submerged. Other issues encountered at 9 outfalls included accessibility, endsection separation/damage, and pipe compression. Moderate erosion was occurring at four outfalls.

Algae was found at 18 outfalls, which may indicate excessive nutrients in the water. Outfall #56 had a rancid-sour odor. Three sites had discoloration in the flow; this was attributed to natural causes such as iron flocculent. All sites inspected had acceptable clarity.

Sediment and iron flocculent deposits were found at many sites.

The screening results are listed in the following table.

Table 12: Field Screening Results for Priority Outfalls

Outfall #	Problem
#108	Pipe corrosion and pipe damage.
#268	Pipe corroded through and endsection blown off.
#285	Pipe and endsection corroded through.
#59	Pipe corroded through.
#352	Pipe corroded through.

Commercial and Industrial Visual Surveys

During the FY 2022 screening, several portions of the County including MD 210 from Bryans Road to Indian Head, Port Tobacco, MD 5 north of Hughesville, and US 301 in St. Charles and south of La Plata were targeted for visual surveys. The visual surveys were conducted in late June 20221 and 485 tax parcels were visually assessed in the field. The map on the following page shows the survey locations.

For the FY 2022 screenings, the approach to selecting, tracking, and inspecting commercial and industrial surveys was continued from FY 2021. The ISA_PARCEL shapefile was utilized to determine tax parcels within the County that had commercial or industrial land uses. Commercial and industrial tax parcels were selected from this shapefile and field maps with parcel account numbers were generated for the targeted areas as shown on the Figure 7.

Figure 6: Visual Survey of Commercial/Industrial Landuse Map

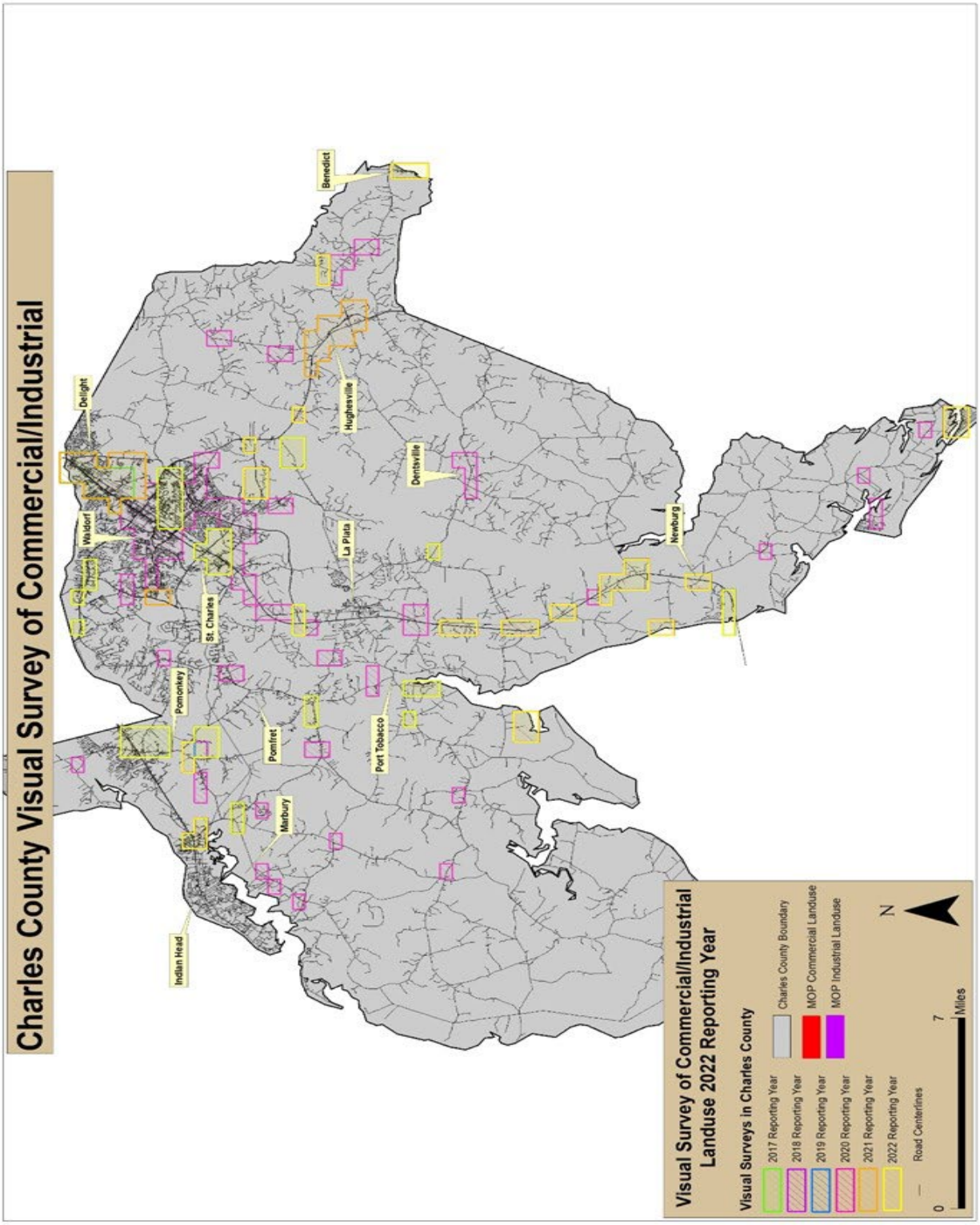
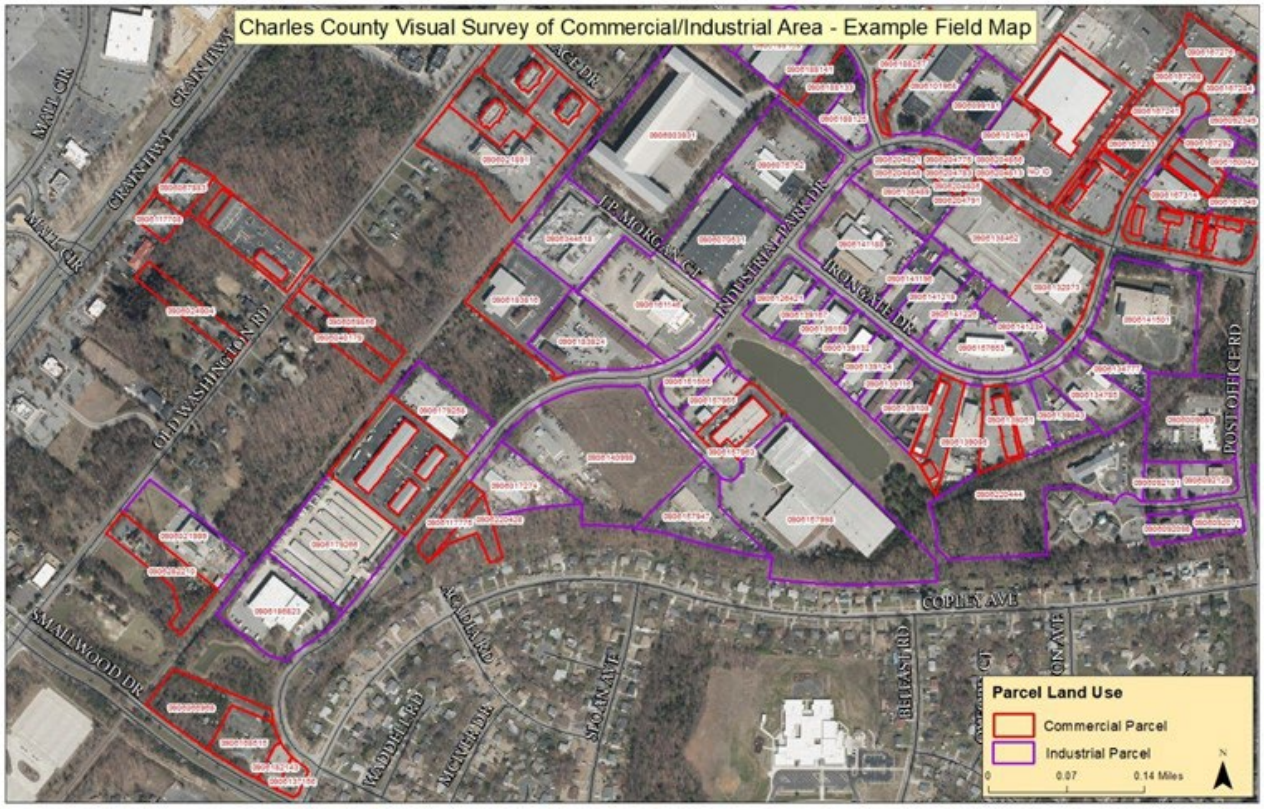


Figure 7: Commercial/Industrial Areas – Example Field Map



Tracking of inspected tax parcels will be completed using the ISA_PARCEL shapefile to ensure all commercial and industrial properties are inspected over the permit term.

The survey uses a modified Center for Watershed Protection (CWP) Hotspot Site Investigation Sheet (HSI), which can be found as an attachment to the County's Standard Operating Procedure in Appendix C of the FY 2021 MS4 Annual Report. The modified HSI form contains the most common items that inspectors find in the field, including vehicle operations, storage of outdoor materials, waste operations, and facility management. Each tax parcel identified on the field maps was visually assessed from a vehicle or on foot depending on access and safety. If no visible practices or conditions that would produce pollution to nearby storm drain inlets or watersheds are observed, then a Charles County Hotspot Site Investigation Sheet is not filled out, but the field map is marked to show the tax parcel was surveyed. If visible practices or conditions that would produce pollution to nearby storm drain inlets or watersheds are observed, then field crews document the conditions by recording tax parcel number, address/location, business name, property owner (if available), notes, and pictures on a Charles County Hotspot Site Investigation Sheet and mark the field map to show the tax parcel was surveyed.

Within the targeted areas, 27 businesses and one private home were documented as having practices or conditions that would produce pollution to nearby storm drain inlets or watersheds in 2022. The practices or conditions found at the businesses included poor trash and grease dumpster management, storing drums and other containers of fluids and chemicals outside without secondary containment and not containing vehicle wash water. Detailed reports for each can be found in Appendix C and enforcement activity is described in the following section.

Enforcement Activities

Per the Illicit Discharge and Detection Elimination Standard Operation Procedures, the County tracks the investigations using an assigned case number. Case numbers use 'ILLD' to indicate a suspected illicit discharge and 'VIOL' to indicate a violation had been issued.

One-hundred cases were reported and investigated between December 2021 and November 2022. Of those, 28 cases originated from the spring survey, 37 reports from staff, and 35 complaints from the public (13 through the hotline, 8 submitted online, and 14 from the County's Citizen Response Office). See Appendix C for a summary of all investigations and action updates (noted as UPDATE) on investigations that are still ongoing from December 2021 and prior.

Standard Operating Procedure

The Illicit Discharge and Detection Elimination Standard Operating Procedure (SOP) was most recently updated in 2021 and will be updated again in 2023 to clarify what an illicit discharge is with a reference to the Center for Watershed Protection's *IDDE Guidance Manual* and to incorporate any changes necessary to reflect upgrades to the County's case management software system.

Proposed Program Improvements

A potential future improvement to the IDDE program would be to revise the selection of outfalls for screening to only include commercial and industrial outfalls. Historically, the County has included residential major outfalls for field screening efforts. Shifting away from residential areas would allow for more focus on commercial and industrial areas each year where the likelihood of pollution is higher.

4. Litter and Floatables

Charles County is required to address problems associated with litter and floatables in waterways that adversely affect water quality. Charles County needs to evaluate current litter control problems associated with discharges from its storm drain system and develop and implement a public outreach and education program as needed on a watershed by watershed basis.

a. *As part of Charles County's watershed assessments under Part IV.E.1 of this permit, Charles County will identify all litter control programs and identify potential sources, ways of elimination, and opportunities for overall improvement.*

b. *Within one year of permit issuance, as part of the public education program described in Part IV.D.6, Charles County will develop and implement a public education and outreach program to reduce littering and increase recycling. This includes:*

- *i.* *Educating the public on the importance of reducing, reusing, and recycling;*
- *ii.* *Disseminating information by using signs, articles, and other media outlets; and*
- *iii.* *Promoting educational programs in schools, businesses, community associations, etc.*
- *iv.* *Evaluating annually the effectiveness of the education program.*
- v. *Submit annually, a report which details progress toward implementing the public education and outreach program. The report shall describe the status of public outreach efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.*

FY 2022 Status

Litter Control Programs

The Charles County Department of Public Works, Environmental Resources Division, (DPW) has multiple litter control programs that have proven to be effective in combating litter.

The litter control crews routinely patrol the litter hot spots in the County, as well as respond to citizen complaints. In addition to the County-staffed litter crews, a contractor conducts daily cleanings for priority roads. The FY 2023 budget for the litter contractor crew increased to $200,000. In FY 2022, both contracted and County-staffed crews removed 199.33 tons of litter from the roads. Due to the closure of the Southern Maryland Pre-Release Unit in April of 2021, Litter Control crews are comprised of part time Charles County employees. In FY 2023, full time Litter Control positions are to be added.

The Adopt-A-Road program allows residents to volunteer to clean up their County roads. A sign is placed on the adopted road in recognition of the group/individual that adopted it. The program had 85 roads adopted and 156 cleanings had been reported in FY 2022. Some inactive groups were removed from the program in order to attract more participatory groups.

The Potomac River Watershed Cleanup is scheduled in April every year. This popular event saw 10 volunteer groups conducting cleanups throughout the County. More than 16 tons of litter and debris were removed from waterways. The

County and local watershed organizations continue to supply bags, vests, and litter grabbers, and provided trash removal for the cleanup groups.

In May of 2022, Charles County hosted its second Charles County Community Cleanup. Residents and businesses were encouraged to select a community or public space to clean and beautify. Sixteen volunteer groups participated in the event, removing nearly 6 tons of debris and litter from area public space.

Litter Control Public Education

DPW has increased their efforts to educate the public on the importance of reducing, reusing, and recycling in numerous ways. DPW has adapted their outreach approach. A brochure was mailed to 60,000 residents in their tax bill regarding household hazardous waste (HHW) recycling and the benefits of grasscycling. Rather than newspaper advertisements or press releases, DPW boosted more social media advertisements, aired a commercial on Comcast and at the local movie theatre, and posted to two prominent billboards along Route 301. There were nearly 40 social media posts and videos in FY 2022. Recycling and Litter Control staff were interviewed for four segments of the Charles County YouTube Channel show titled "Your Charles County".

DPW continued offering monthly onsite, secure paper shredding. Residents are required to register for the events in advance. These events shredded and recycled 26 tons of personal documents. The budget for all public outreach and education was $79,600 including printing, marketing, community promotions, Geo-bin (composting bin) costs, and rain barrel subsidy. Rain barrels are provided to registered residents at workshops at a reduced cost to capture rain water for recommended usage.

In FY 2022, the County maintained its annual budget of $90,500 for household hazardous waste collection days. This contracted service provides residents a drop-off location on the first Saturday each month.

Effectiveness of Litter Control Efforts

The latest finalized waste diversion rate is for Calendar Year 2020, which was 41.89%. The County has surpassed the State mandated 35% recycling rate for numerous years.

5. Property Management and Maintenance

a. Charles County shall ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned municipal facility requiring NPDES stormwater general permit coverage. The status of pollution prevention plan development and implementation for each County-owned municipal facility shall be reviewed, documented, and submitted to MDE annually.

b. The County shall implement a program to reduce pollutants associated with maintenance activities at County-owned facilities including parks, roadways, and parking lots. The maintenance program shall include these or MDE-approved alternate activities:

i. Street sweeping;
ii. Inlet inspection and cleaning;
iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;
iv. Reducing the use of winter weather deicing materials, equipment calibration, employee training, and effective decision-making; and
v. Ensuring that all County staff receives adequate training in pollution prevention and good housekeeping practices.

The County shall report annually on the changes in any maintenance practices and the overall pollutant reductions resulting from the maintenance program. Within one year of permit issuance, an alternative maintenance program may be submitted for MDE approval indicating the activities to be undertaken and associated pollutant reductions.

FY 2022 Status

County-Owned Facilities with Industrial Stormwater Permits

As of FY 2022, three County-owned municipal facilities require the NPDES industrial stormwater permit coverage. These facilities are the Charles County Wastewater Treatment Plant (WWTP), the Sanitary Landfill #2, and the Department of Public Works (DPW) campus. All three facilities have active SWPPPs (Stormwater Pollution Prevention Plans). We are awaiting finalized versions of the 20-SW permits.

At all three facilities, routine inspections are conducted. At a minimum, on a quarterly basis, quarterly visual assessments and routine facility inspections are completed. Monthly, non-stormwater discharge assessments and routine monthly inspections (focused on spill prevention) are conducted. There are also annual staff trainings and comprehensive site evaluations completed. More information is under the Staff Training section below.

The Municipal Facilities Narratives are in Appendix D, and the *Municipal Facilities Table* is included in the enclosed MS4 Geodatabase.

Street Sweeping

In FY 2022, the Roads Division (Roads) swept 1,156 miles of Charles County roadways, mostly within high traffic and residential areas. The hired contractor typically uses one to three trucks when they mobilize and typically use a 2006 or 2016 Freightliner Broom Bear sweeper. Tonnage collected from sweeping was 157 tons and the FY 2022 budget for street sweeping remains at $100,000.00. Roads requests a 10% increase for all line items every budget year regarding the Watershed Protection and Restoration Fund.

Table 13: Street Sweeping

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Miles Swept	403.18	422.53	430.7	403.5	430.7	522.47	1,156
Debris Removed (tons)	213.1	192	167	174	94.6	46.5	157
Contractual Expenses	$50,682	$50,705	$99,900	$83,790	$101,250	$99,000	$98,500

Inlet Inspection, Repair, Cleaning, and Marking

The weight of material removed from storm drain inlets cleanings was 55.19 tons. FY 2022 budget for inlet cleaning was $120,000 with an additional $319,996 for inlet and catch basin inspections. Inlet repairs totaled over $396,000. Actual expenditures vary from budgeted amounts. Budgets FY 2022 are indicated in the following tables.

Table 14: Stormwater Pipe and Inlet Cleaning

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Pipes/Inlets Vacuumed	297/189	75/46	88/82	51/68	81/69	77/46	59/31
Debris Removed (tons)	57.4	30.6	29.5	114.3	155.4	319.2	55.19
Contractual Expenses	$74,930	$77,399	$89,628	$97,920	$119,922	$119,491	$119,754

Table 15: Stormwater Inlet Inspections and Repairs

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Inlets Repaired	75	70	24	44	53	9	36
Contractual Inlet Inspection Expenses	$67,021	$63,414	$210,810	$210,277	$270,580	$274,349	$316,777
Inlet Repairs (in sq. ft.)	--	--	--	--	--	2,345	1,375
Contractual Inlet Repair Expenses	--	--	--	--	--	$557,410	$396,373

See Part IV.D.6 Public Education for information on the Storm Inlet Marking program.

The *Alternate BMP Polygons* feature class containing inlet cleaning information, is in the enclosed MS4 Geodatabase.

County Owned Stormwater Management Facility Inspection and Maintenance

The County owns and maintains approximately 500 stormwater management facilities for the purposes of managing stormwater runoff from County roads, parking areas and buildings. These facilities must be inspected and maintained on a regular basis to ensure proper functioning.

The intent of providing annual maintenance for these facilities is for consistent performance and to reduce costly repairs. Facility repairs are typically per Planning and Growth Management's stormwater maintenance triennial inspection findings.

Table 16: County Owned Stormwater Management Facility Inspection and Maintenance

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
# Facilities	55	8	302	335	360	341	393
Expenses (Contractual)	$86,000	$86,001	$265,432	$370,209	$342,321	$347,209	$342,845

Mosquito Control expenses associated with County owned property are funded by the Watershed Protection and Restoration Fund since FY 2018 as they are part of maintaining the stormwater management systems. FY 2018 expenses were $4,000, and for FY 2019 and FY 2020 expenses are $6,000 for each year. In FY 2021 expenses increased to $16,000 annually.

County Owned Stream Restoration and Shoreline Stabilization Projects

In FY 2020 the Department of Public Works (DPW) began conducting year-two and beyond

inspections for all completed shoreline stabilization and stream restoration projects that are constructed by the Capital Services Division. As part of each project's completion, Capital Services conducts necessary inspections and monitoring for the year following the project's completion. DPW conducts any maintenance and inspections thereafter.

In FY 2022, the cost for monitoring and inspecting shoreline stabilization projects and stream restoration projects totaled $49,988. This cost is expected to incrementally increase every fiscal year as more projects are completed. FY 2023's budget for this task is currently $95,500.

Table 17: County Owned Shoreline Stabilization and Stream Restoration Monitoring

	FY 2021	FY 2022	FY 2023
# Shoreline Stabilizations	2	2	TBD
# Stream Restorations	2	2	TBD
Contractual Expense	$62,600	$49,988	$95,500 (budgeted)

Vegetation Management

In FY 2022, Roads used a contractor to apply approximately 476 gallons of herbicide to four County-maintained highways. The contractor used the 1.5% ratio at 2 oz of Round-Up® per gallon. Roads does not apply any other chemicals or pollutants for roadway vegetative management.

The Parks and Grounds Division (Parks) is responsible for maintaining all parks, sport facilities, and lawn care surrounding government buildings within the County. In FY 2015, Parks converted from a quick release to slow-release fertilizer for all applications. Coated/slow-release carrier minimized risk of fertilizer moving into ground and surface water through and less likelihood of runoff. Also, the use of slow-release fertilizer has reduced the frequency of grass mowing. Parks has also stopped the usage of fertilizer that contains phosphorus entirely. The latest saturated soil analysis was conducted on May 7, 2019. In FY 2022, Parks used eight gallons of Buccaneer (EPA #: 55467-9), an herbicide, on County property.

The White Plains Golf Course is managed independently of the other County parks. In FY 2022, 193 gallons of herbicide/pesticide was applied, as well as 2.5 tons of fertilizer over the 30 acres of turfgrass.

Winter Weather Deicing

Rather than spreading salt throughout the storm event, Roads Division waits until the storm has nearly passed to plow and spread salt to increase its effectiveness and decrease runoff. In FY 2022, Roads staff was mobilized for seven storm events and applied 3,800 tons of salt to

roadways. No pretreatment compounds are used on County roads, such as magnesium chloride and potassium chloride. Roads strictly uses sodium chloride salt when necessary.

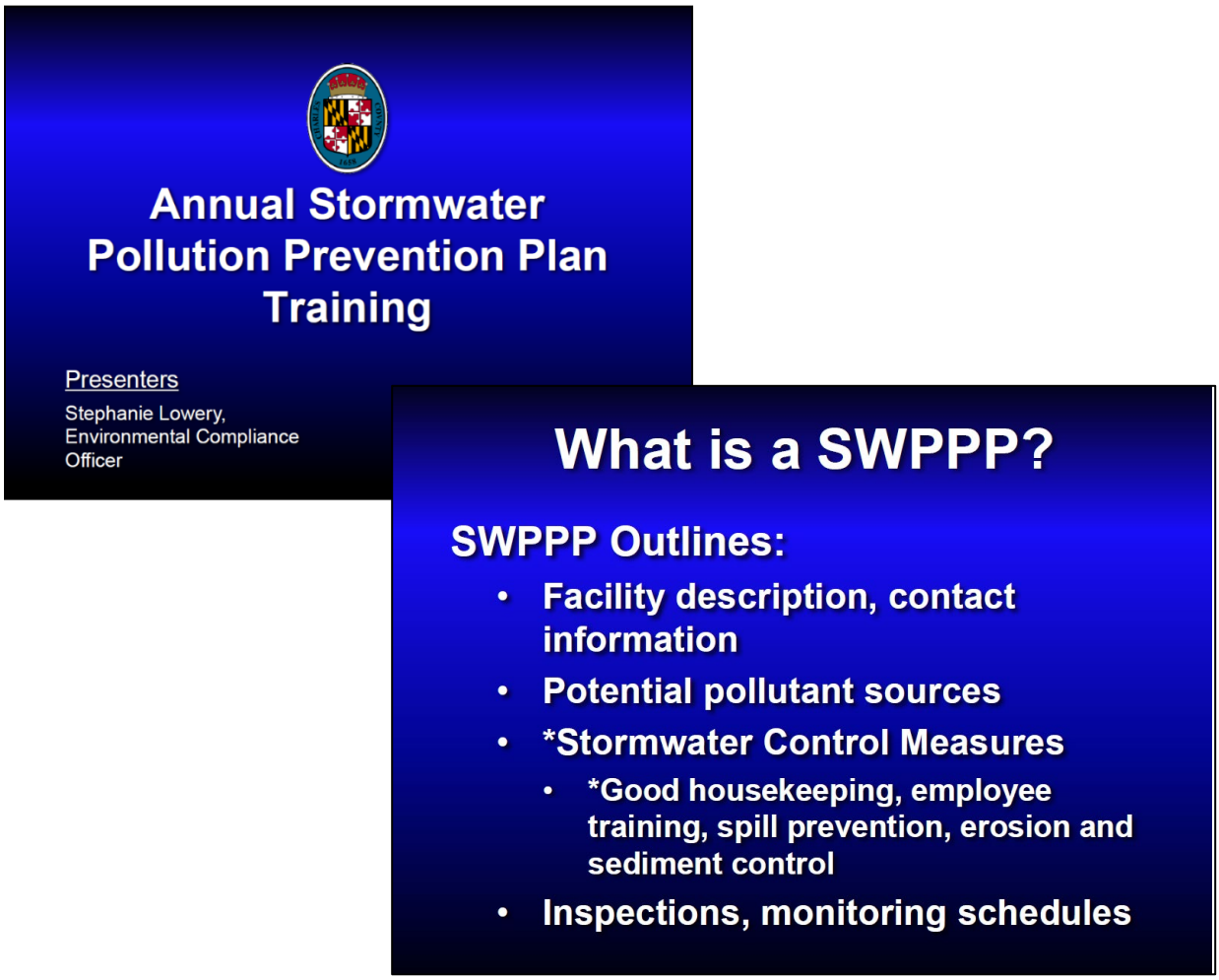
Salt spreaders are calibrated before and after their use to ensure they work effectively. Staff is also trained on proper salt-spreading techniques and usage before the beginning of each winter season. During the pandemic, a pre-season meeting was not held, but information packets on the County's salt-spreading policies and proper equipment calibration were included in contractors' paperwork. If needed, the staff and/or individual contractors are trained throughout the season, depending on the severity of winter weather and their adherence to County policies. Snow supervisors and their contractors know they must remove any excess salt from County roadways after a winter weather event. If any policy is violated, the contractor will not be allowed to continue their snow contract with the County.

Roads is exploring a salt-tracking barcode scanner cell phone application where any person using salt from one of the County's domes will have to scan the amount of salt taken and returned. This way, if salt is improperly applied, the specific contractor can be re-trained or removed from the program.

Parks uses a de-icing compound called "Quad-Release", which is a blend of magnesium chloride, calcium chloride, sodium chloride, and potassium chloride on pedestrian walkways and parking lots. While Parks cannot eliminate the use of this product due to public safety concerns, staff has been trained to reduce the amount used whenever possible. This included the following direction: shovel first prior to applying material, apply the recommended amount or less during large winter events, and close lesser-used walkways. Parks will also sweep sidewalks after the storm is over. Parks applied 7,000 pounds of Quad-Release snow melt on sidewalks and parking lots throughout the winter season in FY 2022. An additional 2,000 pounds of salt was applied to the White Plains Golf Course.

Staff Training in Pollution Prevention and Good Housekeeping Practices

Per the Charles County Department of Public Work's (DPW) Stormwater Pollution Prevention Plans (SWPPP), all applicable staff is trained annually on, but not limited to: spill prevention and control, proper fueling procedures, general good housekeeping practices, waste recycling, and used oil management. A PowerPoint presentation is developed and presented by the Environmental Compliance Manager to discuss the topics, as well as any specific examples of how to improve DPW's housekeeping practices. A recorded PowerPoint presentation is played at the employee's convenience by a completion due date. A record of all employees who completed these trainings is kept with the SWPPP. Divisions of the Department of Public Works received their annual SWPPP training in March and April 2022. Example training slides are shown below.



The Mattawoman Wastewater Treatment Plant (WWTP) conducted their annual SWPPP training in December 2021 and have their upcoming training scheduled for December 2022.

The Mattawoman Wastewater Treatment Plant SWPPP team takes applicable staff on their routine facility inspection and discusses good housekeeping practices. The SWPPP team also discusses spill response, which covers the gates to lock in an emergency and the locations of all spill kits.

Mattawoman is undergoing major upgrades and with the construction activities at the facility and the greater possibilities of fuel/oil contamination from equipment leaks. Observation of any incidents of this nature was stressed so remediation can take place if necessary. Erosion control that has been put in place for these construction activities is inspected regularly by the County Inspectors. In addition to this service, the SWPPP team members at the facility also inspect these sediment controls as part of their inspections.

6. Public Education

a. Maintain a compliance hotline or similar mechanism for public reporting of water quality complaints, included suspected illicit discharges, illegal dumping, and spills.

b. Provide information to inform the general public about the benefits of:

i. Increasing water conservation;
ii. Residential and community stormwater management implementation and facility maintenance;
iii. Proper erosion and sediment control practices;
iv. Increasing proper disposal of household hazardous waste;
v. Improving lawn care and landscape management (e.g., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.)
vi. Residential car care and washing; and
vii. Proper pet waste management.

c. Provide information regarding the following water quality issues to the regulated community when requested:

i. NPDES permitting requirements;
ii. Pollution prevention plan development;
iii. Proper housekeeping; and
iv. Spill prevention and response.

FY 2022 Status

The Public Education program continued to develop and grow in FY 2022. Outreach efforts included:

1. Phone, email, and online reporting by the public for suspected illicit discharges and drainage concerns
2. County-wide website, social media, email, newspaper, tax bill inserts, smart apps, County government television (live stream and video on demand)
3. Cable TV, streaming, and digital media Public Service Announcements (PSAs)
4. Radio PSAs
5. Movie Theater PSA including Internet digital media advertising on desktops and mobile devices

6. Public meetings, public hearings, County Fair
7. Citizens' Academy
8. Rain barrel and composting workshops
9. Septic system maintenance webinars
10. Household hazardous waste collection days, shredding events, community cleanup events
11. Chesapeake Bay Trust Outreach and Restoration Grant Program awards
12. Student and youth outreach
13. Storm Drain Stenciling/Marking Program
14. Homeowners Association (HOA) and new homebuyers' outreach
15. Septic Pump-Out Reimbursement Program
16. Pollution prevention guidance for businesses

Charles County Watershed Protection and Restoration Program - Logo

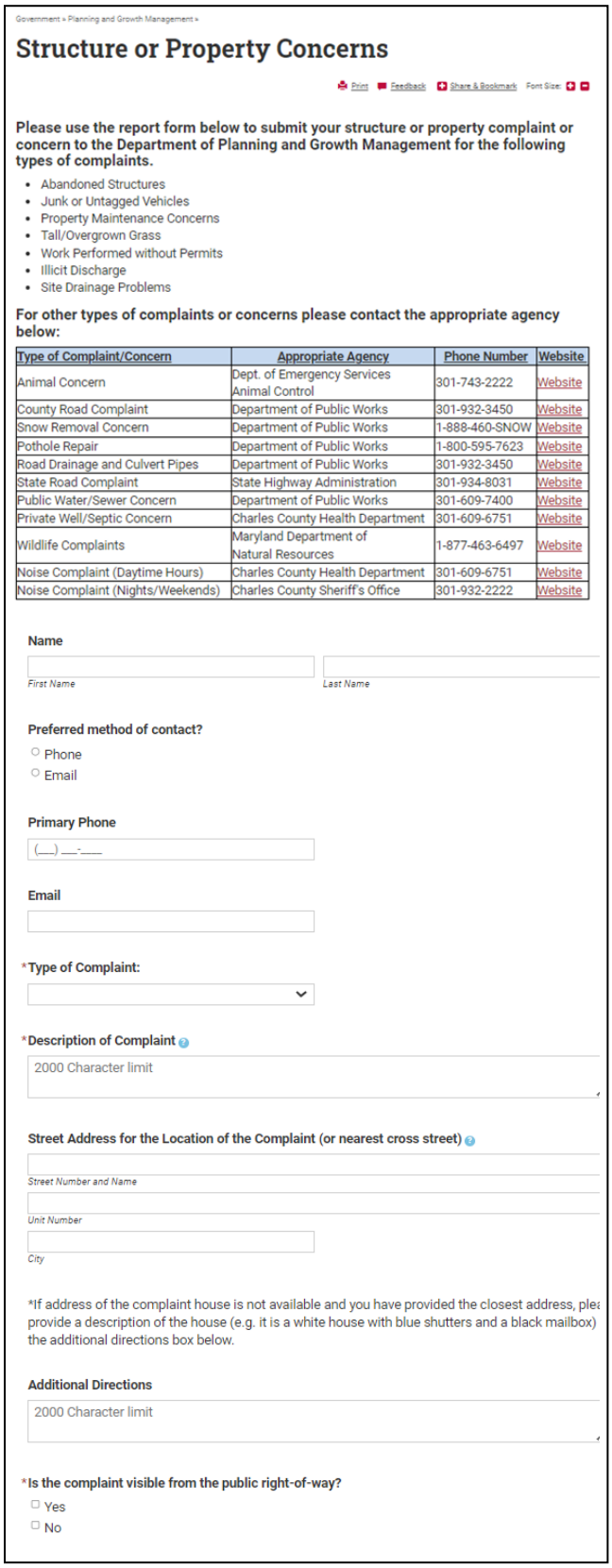
Charles County's Watershed Protection and Restoration Program (WPRP) logo continues to serve as a branding mechanism for the program. The logo was developed in FY 2015 to project a united program whose staff is spread amongst two departments and several divisions. The logo can be seen on the program's web pages, outreach guidance documents, engineered drawings for restoration projects, brochures, and outreach presentations. The logo served as the program's brand on PSAs during FY 2022 including cable television, digital media, and movie theater spots. The logo is featured on promotional merchandise handed out at community and outreach events used to promote the program and increase interest in stormwater management and watershed stewardship.

The following matrix illustrates Charles County's MS4 permit public education coverage.

Charles County Phase 1 MS4

Public Education Coverage

PUBLIC EDUCATION TOOL / PERMIT CONDITION	Telephone & Hotline	Online Form	Mobile App	Website	MDE Website	Mailed Letters	Inspection	Brochure	Workshop & Training	HOA Meetings	Schools	County Fair	Citizens Academy	Radio PSA	Video PSA	Rebate	CBT Grant	Adopt-A-Road	Storm Drain Marking	River Cleanup	Household Haz Waste Day	Shred-It Event	Comm Cleanup
Public Reporting Of Water Quality Complaints	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓		✓		✓		✓	✓	✓		
Water Conservation				✓				✓	✓	✓	✓	✓	✓										
Stormwater Management	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓			✓
Erosion and Sediment Control	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓					
Household Hazardous Waste	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓		✓
Septic Systems	✓	✓		✓		✓		✓	✓	✓	✓	✓	✓			✓							
Lawn Care & Landscape Management			✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
Rain Barrels & Rain Gardens		✓		✓			✓	✓	✓	✓	✓	✓	✓			✓	✓					✓	
Herbicides & Pesticides & Fertilizer				✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓		
Ice Control & Salt Use				✓	✓	✓			✓	✓	✓	✓	✓	✓				✓					
Yard Waste & Composting			✓	✓		✓		✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓			✓
Vehicle Care & Washing	✓	✓		✓	✓	✓	✓			✓	✓		✓		✓				✓		✓		✓
Pet Waste	✓	✓		✓			✓	✓		✓	✓	✓	✓	✓	✓				✓				✓
NPDES Requirements				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	BUSINESS PERMITS			
Pollution Prevention Plans					✓	✓	✓	✓	✓						✓								
Proper Housekeeping					✓	✓	✓	✓	✓		✓	✓	✓		✓								
Spill Prevention & Response	✓	✓			✓	✓	✓	✓	✓						✓								



Government » Planning and Growth Management »

Structure or Property Concerns

Print Feedback Share & Bookmark Font Size:

Please use the report form below to submit your structure or property complaint or concern to the Department of Planning and Growth Management for the following types of complaints.

- Abandoned Structures
- Junk or Untagged Vehicles
- Property Maintenance Concerns
- Tall/Overgrown Grass
- Work Performed without Permits
- Illicit Discharge
- Site Drainage Problems

For other types of complaints or concerns please contact the appropriate agency below:

Type of Complaint/Concern	Appropriate Agency	Phone Number	Website
Animal Concern	Dept. of Emergency Services Animal Control	301-743-2222	Website
County Road Complaint	Department of Public Works	301-932-3450	Website
Snow Removal Concern	Department of Public Works	1-888-460-SNOW	Website
Pothole Repair	Department of Public Works	1-800-595-7623	Website
Road Drainage and Culvert Pipes	Department of Public Works	301-932-3450	Website
State Road Complaint	State Highway Administration	301-934-8031	Website
Public Water/Sewer Concern	Department of Public Works	301-609-7400	Website
Private Well/Septic Concern	Charles County Health Department	301-609-6751	Website
Wildlife Complaints	Maryland Department of Natural Resources	1-877-463-6497	Website
Noise Complaint (Daytime Hours)	Charles County Health Department	301-609-6751	Website
Noise Complaint (Nights/Weekends)	Charles County Sheriff's Office	301-932-2222	Website

Name

First Name Last Name

Preferred method of contact?

Phone
Email

Primary Phone

(___) ___-____

Email

***Type of Complaint:**

***Description of Complaint**

2000 Character limit

Street Address for the Location of the Complaint (or nearest cross street)

Street Number and Name

Unit Number

City

*If address of the complaint house is not available and you have provided the closest address, ple provide a description of the house (e.g. it is a white house with blue shutters and a black mailbox) the additional directions box below.

Additional Directions

2000 Character limit

***Is the complaint visible from the public right-of-way?**

Yes
No

Illicit Discharge Detection and Elimination Program (IDDE)

Public Education and Reporting

The WPRP webpage features information on the IDDE Program. The webpage explains what IDDE is, describes Charles County's program, and explains how to report an illicit discharge either by telephone or online. The website also displays links to the following: 1) business and homeowner's guidance to Charles County's IDDE program; and/or 2) pollution prevention guidance brochures for specific business types. The brochures were also distributed to citizens and businesses via mail and handed out during inspections and outreach events. Citizens used the IDDE online reporting webform (*Structure or Property Concern*) for reporting suspected illicit discharges and/or activities with the potential to pollute listed as dumping, junk/untagged vehicles, property maintenance concerns, construction work without permits, or site drainage problems—many of which could have detrimental effects to surface water if left unchecked. The County's webform remains available for anyone to report suspected illicit discharges and allows for uploading up to five photographs per complaint. The bulk of illicit discharges that were reported in FY 2022 were from County staff (sixty-five) and the majority of those were related to commercial and industrial

Table 18: Total Suspected Illicit Discharges Reported in FY 2022

Reported	Who
65	**Inspectors**
13	**Public Hotline**
22	**Public Webform**
TOTAL: 100	

properties. Citizens also reported suspected illicit discharges either by telephone/hotline or online.

Illicit Discharge from commercial dumpster

When an illicit discharge (or potential for a discharge) to the storm drain system is found during an inspection, the County inspector speaks with the property owner or an on-site representative; however, if they are not present, the inspector writes a detailed note and their contact information on a door hangar to be placed on the front entrance. Educational material were attached to inspection reports and violation notices mailed to business/property owners and managers. The material includes the County's *Illicit Discharges Affect Everyone . . . Even You! A Business and Homeowners Guide to Charles County's IDDE Program*, rack cards (see below), and if applicable, State or EPA guidance, and information on Maryland NPDES individual permits.

Table 19: IDDE - A Grate Concern Runs on CCGTV by FY

Fiscal Year	# Runs
FY 2016	365
FY 2017	540
FY 2018	360
FY 2019	280
FY 2020	322
FY 2021	360
FY 2022	360

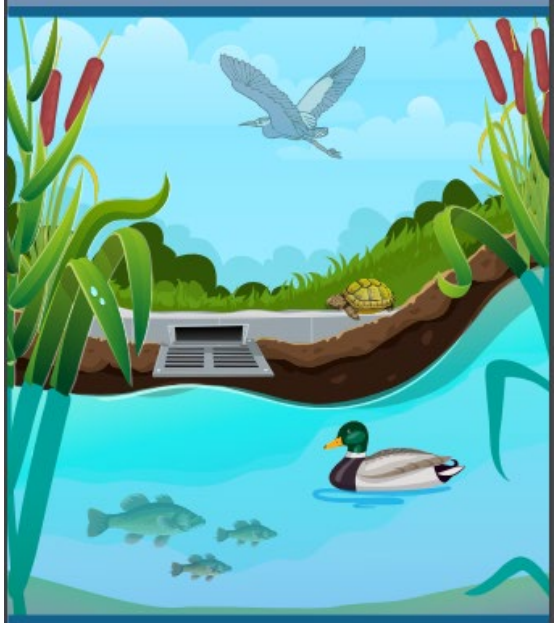
In FY 2022, Charles County distributed two-sided 4 x 9 in. rack cards for the purpose of educating local businesses on how to prevent stormwater pollution and illicit discharges into the County's storm drain system/surface waters from various activities related to: 1) Automotive Businesses; 2) Dumpsters; 3) Restaurants; and 4) Outdoor Storage. The cards list recommendations of good housekeeping practices and pollution prevention methods by business-type with photographs showing correct and incorrect examples.

During FY 2022, the video titled *IDDE: A Grate Concern* (Excal Visual, Inc.) ran 360 times during on the Charles County Government TV station (CCGTV) and had 44 views on Charles County Government YouTube channel. The video can be viewed here https://youtu.be/gX5j6wlHZb8 .

For more information on the County's IDDE Program, see Section IV.D.3.

ILLICIT DISCHARGES AFFECT EVERYONE... EVEN YOU!

A BUSINESS AND HOMEOWNERS GUIDE TO CHARLES COUNTY'S IDDE PROGRAM



Charles County Government
Dept. of Planning & Growth Management
www.CharlesCountyMD.gov/Watershed

ILLICIT DISCHARGES AFFECT EVERYONE... EVEN YOU!

A BUSINESS AND HOMEOWNERS GUIDE TO CHARLES COUNTY'S IDDE PROGRAM

What is the Charles County Illicit Discharge Detection and Elimination (IDDE) Program

Under its National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit, Charles County Government is required to implement an inspection and enforcement program to ensure all discharges to and from the municipal separate storm sewer system (MS4) that are not composed entirely of stormwater are either permitted by the Maryland Department of the Environment (MDE) or eliminated.

Charles County Government conducts an annual random screening of storm drain outfalls as well as a routine survey of commercial and industrial watersheds. The overall goal of the IDDE program is to identify illegal dumping activities, unauthorized storage of materials and illicit discharges. By identifying such activities and having specific reports of a violation, the county proceeds with efforts to remove such unpermitted discharges.

Learn more:

www.CharlesCountyMD.gov/Watershed (Click on Pollution)

What is an Illicit Discharge?

Illicit discharges are generally any discharge into a storm drain system that is not entirely composed of rain water. Unlike wastewater which flows to a wastewater treatment plant, stormwater generally flows to waterways without any additional treatment. Illicit discharges often include pathogens, oil, grease, litter, surfactants, and various toxic chemicals that pollute our waterways that are used for recreation and drinking water.

Penalties for Illicit Discharges

Illicit discharges are a serious offense that can result in criminal prosecution. Every case of illicit discharge is investigated. Persons responsible for illicit discharges are subject to civil fines and possible criminal prosecution.

What is Illegal Dumping?

Illegal dumping is anyone depositing solid waste at a location other than a legally accepted facility. Illegal dumping is a serious problem that requires the county to relinquish funds for investigation, clean-up and enforcement.

Penalties for Illegal Dumping

Illegal dumping is a serious offense that can result in criminal prosecution. Every case of illicit discharge is investigated. Illegal dumpers are subject to civil fines and possible criminal prosecution.

Examples of Illicit Discharges

- Any induction of non-stormwater to the ground or into the storm drain.
- Sanitary waste water.
- Septic tank effluent.
- Car wash waste waters.
- Motor oil disposal.
- Radiator flushing disposal.
- Laundry waste waters.
- Auto or household toxic chemical disposal.
- Restaurant grease or cooking oil.
- Leaves or yard waste.

Examples of Illegal Dumping

- Disposing of your trash in dumpsters or containers you do not own.
- Disposing of trash along public roadways, vacant lots, fields, woods, stream valleys, parks or any other unacceptable location.
- Dumping chemicals, pesticide's, used automotive fluids or other chemical liquids into storm drains, water ways, or on the ground.
- Burning solid waste.
- Improperly disposing of yard waste over your property line or nearby woods.
- Burying solid waste.
- Dropping off solid waste at any location other than a regulated, legally accepted facility, dump, transfer station, or convenience center.

Reporting of Illegal Dumping or Illicit Discharges

- If you suspect an illicit discharge is being released into the storm sewer system, contact the Charles County Government at 301-645-0692 (Monday through Friday 8 a.m. to 4:30 p.m.).
- If you suspect an illicit discharge is going into the storm sewer system during non-business hours, please call the Maryland Department of the Environment's toll-free 24-Hour emergency number for pollution problems in Maryland at 866-633-4686 (or 866-MDE-GOTO).
- Submit complaint online: **www.CharlesCountyMD.gov/Watershed** (click on Pollution, and then Report a Suspected Illicit Discharge)
- When reporting, try to include the following:
- Date and time of incident.
- Location of dumping or discharge.
- Digital photos and/or description of incident observed.
- Vehicle and license plate information if involved.

How **Businesses** Can Help Keep Illicit Discharges Out of Our Waterways:

Keep water from contacting work areas – work areas can be contaminated by raw materials, liquids, grease, waste oil, heavy metals, or other fluids. Stormwater runoff flows across work areas and picks up these contaminants.

To keep from discharging contaminated stormwater:

- Keep stormwater runoff from contacting any industrial areas, either indoors or out.
- Install roofs or move industrial operations indoors.
- Avoid hosing down outdoor work areas or washing commercial vehicles where the wastewater will enter the storm sewer system.

Keep contaminants off surfaces that will come into contact with stormwater:

- Control leaks and spills – Clean them up, even if only minor.
- Review operating routines to ensure adequate requirements are met to eliminate potential for contamination on surfaces.
- Regularly check equipment for exposed or leaking parts.
- Minimize the use of chemicals. When needed, make sure you are using the right product in the right amount by following all label instructions. Dispose of any waste and empty containers properly.

Educate employees about how to prevent stormwater pollution:

- Develop required standard operating procedures such as proper equipment washing.
- Provide training to employees on the importance of following the procedures so they understand why they are being asked to change their methods.
- Post signs as reminders to close covers and protect storage containers, including dumpsters.
- Let your customers know the efforts you are making to minimize waste and eliminate potential pollution sources.

How **Homeowners** Can Help Keep Illicit Discharges Out of Our Waterways:

- Used oil, antifreeze, or batteries should be recycled. Be sure to check your vehicle on a regular basis for leaks, and clean up any spills with an absorbent that can be swept up and disposed of properly.
- Either wash your car on the grass, so the waste water filters through the soil, or take your car to a commercial wash that sends their water to a wastewater treatment plant.
- Grass clippings and yard waste should be swept away from storm drains after mowing and cutting to either be composted or taken to a proper disposal location.
- Bag or scoop your pet's waste and dispose of it properly.
- Many household products are considered hazardous waste and should be disposed of properly. Charles County Government offers regularly scheduled Household Hazardous Waste Collection days. Details: **www.CharlesCountyMD.gov/HHW** or call 301-932-3599.

Charles County Government
Department of Planning & Growth Management
200 Baltimore Street • La Plata, Maryland 20646
301-645-0692 • MD Relay: 711 (TDD: 1-800-735-2258)
Equal Opportunity County

Learn more at…

www.CharlesCountyMD.gov/Watershed

About Charles County Government

The mission of Charles County Government is to provide our citizens the highest quality service possible in a timely, efficient and courteous manner. To achieve this goal, our government must be operated in an open and accessible atmosphere, be based on comprehensive long- and short-term planning and have an appropriate managerial organization tempered by fiscal responsibility. We support and encourage efforts to grow a diverse workplace. Charles County is a place where all people thrive and businesses grow and prosper; where the preservation of our heritage and environment is paramount; where government services to its citizens are provided at the highest level of excellence; and where the quality of life is the best in the nation.

It is the policy of Charles County to provide equal employment opportunity to all persons regardless of race, color, sex, age, national origin, religious or political affiliation or opinion, disability, marital status, sexual orientation, genetic information, gender identity or expression, or any other status protected by law.

Charles County Pollution Prevention Practices

AUTOMOTIVE BUSINESSES

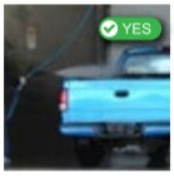
In order to manage stormwater runoff pollution, Charles County implemented the **Illicit Discharge Detection and Elimination Program** in 2001. Stormwater runoff is a result of a rain or snow event flowing over impervious surfaces like streets, sidewalks, and parking lots. This **stormwater runoff** conveys pollutants associated with vehicle maintenance, pet waste, lawn care, and litter into the storm drain system leading directly to our local waterways. When materials like used oil, trash juice from dumpsters, chemicals, or other hazardous materials are discharged, intentionally or unintentionally, into the storm water sewer system, this is considered an **illicit discharge**. Charles County is charged with the responsibility to discover, document, and eliminate these sources of stormwater pollution.

Help Charles County Prevent Stormwater Pollution

Keep garbage can and dumpster lids **closed**, and the area free of debris. Ensure that the dumpster is in proper working condition (i.e., no leaks, or seal damage).

Immediately clean up any oil, chemical, or non-stormwater spill using **dry methods** like kitty litter. Properly dispose of the cleanup material after absorbance.

Label liquid storage containers and place on spill pallets to catch any leaks or spills. Store containers **inside** or under cover to prevent exposure to stormwater.



Ensure vehicles are cleaned in a **wash bay** that either recycles used water or drains to a sanitary sewage system. Do not allow wash water to enter a storm drain or the environment.

To report a concern about pollutants or possible illegal dumping into the storm drain system, contact the Department of Planning & Growth Management: 301-646-0692

Charles County Pollution Prevention Practices

OUTDOOR STORAGE

Properly label and cover potentially hazardous materials, such as used oil, paints, detergents, or antifreeze in appropriate containers with secondary containment.

Ensure all outdoor containers have lids and are kept closed when not in use.

Cover outdoor work areas and piles of loose materials (i.e., sand, salt) to prevent contaminated runoff from reaching storm drains.

Move any activities which have the potential for pollution indoors.

Help Charles County Prevent Stormwater Pollution

Pollution Prevention Practices is a publication of the Charles County Watershed Protection & Restoration Program. For additional information, visit online or contact us by phone or email.

301-645-0692 • PGM@CharlesCountyMD.gov

www.CharlesCountyMD.gov/Watershed

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Charles County Pollution Prevention Practices

DUMPSTERS

In order to manage stormwater runoff pollution, Charles County implemented the **Illicit Discharge Detection and Elimination Program** in 2001. Stormwater runoff is a result of a rain or snow event flowing over impervious surfaces like streets, sidewalks, and parking lots. This **stormwater runoff** conveys pollutants associated with vehicle maintenance, pet waste, lawn care, and litter into the storm drain system leading directly to our local waterways. When materials like used oil, trash juice from dumpsters, chemicals, or other hazardous materials are discharged, intentionally or unintentionally, into the storm water sewer system, this is considered an **illicit discharge**. Charles County is charged with the responsibility to discover, document, and eliminate these sources of stormwater pollution.

Help Charles County Prevent Stormwater Pollution

Why is dumpster maintenance important?

Unmaintained dumpsters can…

- **Contaminate** stormwater runoff
- **Pollute** our waterways
- **Hurt** our wildlife
- **Harm** our environment

What do I need to do?

- **Train** employees to close all dumpster lids after every use. Post dumpster maintenance tips.
- **Fix** damaged or broken lids, and replace dumpsters that leak.
- **Sweep** litter into a trash receptacle.
- **Inspect** the area around dumpsters regularly to ensure it is clean.
- **Dispose** of grease and hazardous waste (i.e., oil, batteries, electronics) by using separate containers.

What should I NOT do?

- **Do not** overfill dumpsters.
- **Do not** dispose of liquids or allow leakage.
- **Do not** pressure wash, hose, or sweep debris or spills into the storm drain.
- **Do not** leave lids open so rainwater can get into the dumpster.
- **Do not** wash the dumpster area with detergents.

To report a concern about pollutants or possible illegal dumping into the storm drain system, contact the Department of Planning & Growth Management: 301-646-0692

Charles County Pollution Prevention Practices

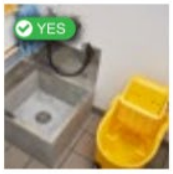
RESTAURANTS

In order to manage stormwater runoff pollution, Charles County implemented the **Illicit Discharge Detection and Elimination Program** in 2001. Stormwater runoff is a result of a rain or snow event flowing over impervious surfaces like streets, sidewalks, and parking lots. This **stormwater runoff** conveys pollutants associated with vehicle maintenance, pet waste, lawn care, and litter into the storm drain system leading directly to our local waterways. When materials like used oil, trash juice from dumpsters, chemicals, or other hazardous materials are discharged, intentionally or unintentionally, into the storm water sewer system, this is considered an **illicit discharge**. Charles County is charged with the responsibility to discover, document, and eliminate these sources of stormwater pollution.

Help Charles County Prevent Stormwater Pollution

Keep garbage can and dumpster **lids closed**, and the area free of debris. Ensure that the dumpster is in proper working condition (i.e., no leaks, or seal damage).

Immediately clean up any oil, chemical, or other liquid spill using **dry methods** like kitty litter. Properly dispose of the cleanup material after absorbance.



Use **indoor sinks** or floor drains to clean floor mats and empty dirty mop water. **Do not** dispose of any wash water outdoors or into the storm drains.

Keep grease dumpster and used oil container **lids closed** at all times when not in use. Using a closed container to prevent spills, **transport** used cooking oil to grease dumpster after it has cooled.

To report a concern about pollutants or possible illegal dumping into the storm drain system, contact the Department of Planning & Growth Management: 301-646-0692

CCGTV, Website, Social Media, Email, Newspaper, Podcast & Mail

CCGTV

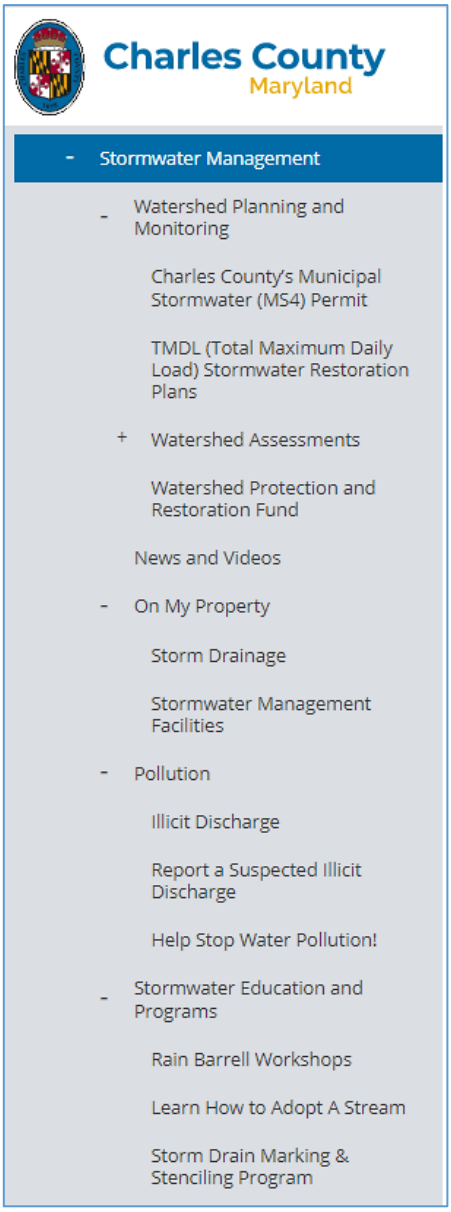
Charles County Government Television (CCGTV) is the government local access channel for Charles County, Maryland. CCGTV is available on Comcast/95 and Verizon FIOS/10 as well as streaming via AppleTV, Roku and the internet. The channel broadcasted live meetings of the Board of County Commissioners, as well as Public Hearings. CCGTV also produces original programming to highlight county programs and events. In FY 2022, CCGTV won a National Association of Counties Achievement Award and two Telly Awards. A schedule and video on demand library remain available through https://www.charlescountymd.gov/services/media-services/charles-county-government-television.

Website: www.CharlesCountyMD.gov/watershed

In FY 2022, Charles County's WPRP continued to update webpages, add new content and improve design and ease-of-use. Staff aims to achieve the following goals by keeping web content current and easily accessible for the WPRP:

1. Encourage interest in the WPRP.
2. Increase public awareness of the County's efforts regarding watershed protection, stormwater management and MS4 permit compliance.
3. Educate citizens and business owners on the basics of watershed, stormwater, and stormwater management concepts.
4. Convey the role of citizens in achieving improved water quality.
5. Increase transparency of the program.

The WPRP webpages continue to be featured under the Department of Planning and Growth Management (PGM) and the Department of Public Works (DPW) websites. Information is organized and presented under four major categories on the PGM homesite: 1) Education & Programs; 2) News and Videos; 3) Planning & Monitoring; and 4) Pollution. In addition, interactive online tools and webforms continue to be available on the website. Examples are shown on the following pages.



Government » Planning and Growth Management » Stormwater Management » Pollution »

Help Stop Water Pollution!

Font Size: Share & Bookmark Feedback Print

Water pollution is defined as the contamination of water bodies, including lakes, rivers, oceans, aquifers and groundwater. Humans and wildlife depend on clean water to survive, it is essential to sustain life. Access to clean water is one of the largest global health risks. When water becomes unfit for drinking and recreation, human and wildlife populations suffer. Water pollution does not only affect people around the world, it affects our local communities. Sources of water pollution in Charles County include:

- Automotive Fluids, Oils, Grease, Industrial Waste, and Paint
- Yard Waste and Litter
- Pesticides, Fertilizers, and Road Salt
- Pet Waste
- Leaking or Overflowing Sewage Pipes

Protecting water quality can be accomplished by everyone. Click on the areas below to find out how you can help.

Lawn Care and Landscape Management ›

Proper Car Care and Washing ›

Proper Disposal of Household Hazardous Waste ›

Proper Pet Waste Management ›

Rain Barrels and Workshops ›

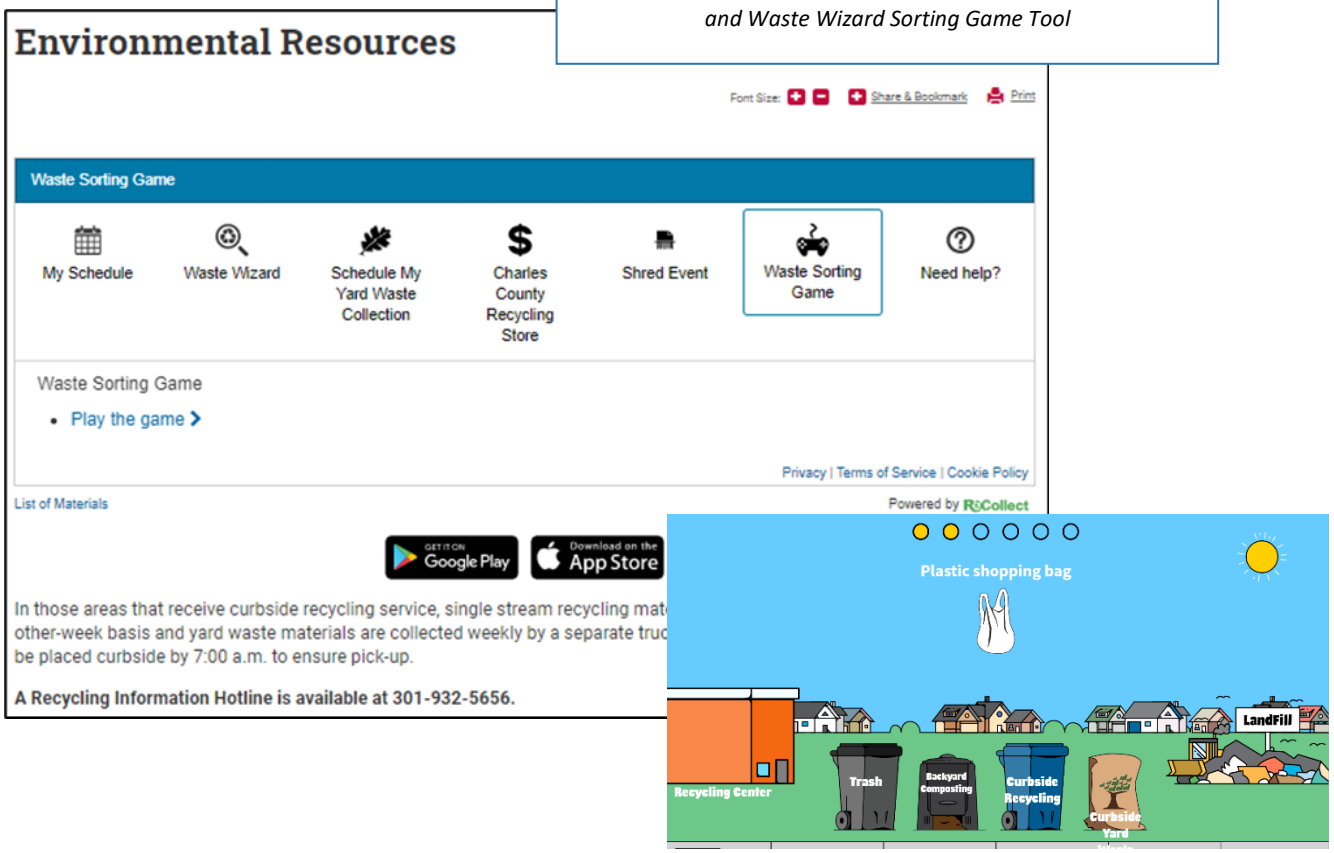
Rain Garden ›

Restaurants Pollution Prevention ›

Dumpster Maintenance ›

Storm Drain Stenciling/Marking Program ›

DPW's Environmental Resource's Downloadable Mobile Apps and Waste Wizard Sorting Game Tool



The WPRP continues to use Google Analytics to track traffic to its websites. Between July 1, 2021, and June 30, 2022, there were 28,754 unique views to MS4 permit program and WPRP webpages. The Table 18 shows a breakdown of unique views for eight categories. Unique views rather than total views are being reported in FY 2022 to get a count that does not include repeat views by the same user in one session and provides a more accurate count of audience size.

Table 20: Website Unique Views in FY 2022

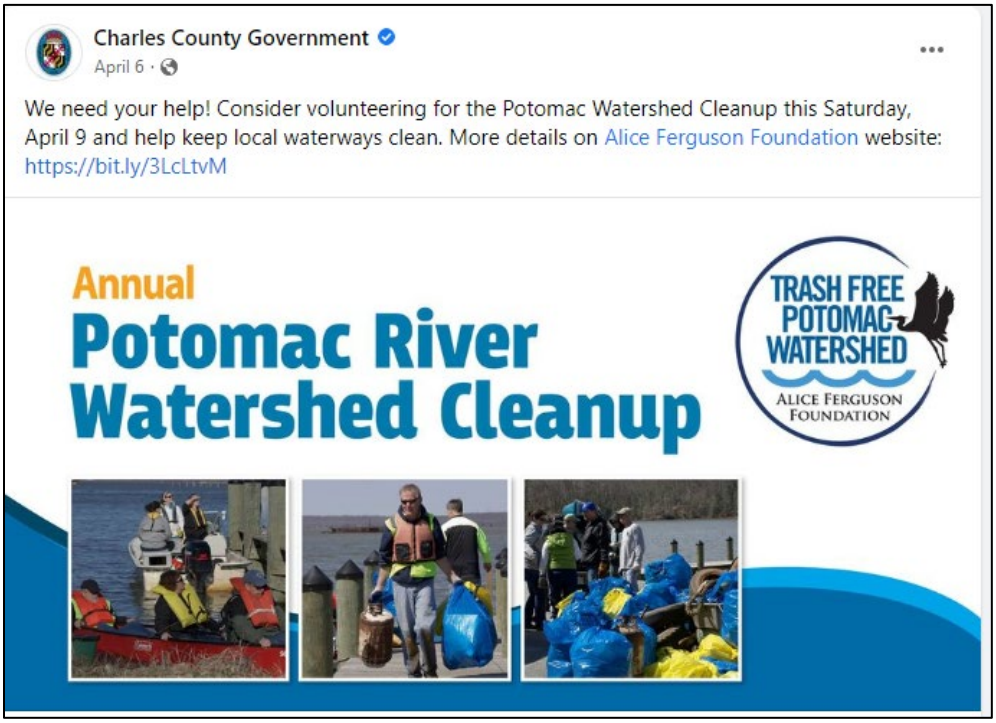
CATEGORY	VIEWS	INCLUDES
Stormwater	6,579	1,000 views of WPRP Outreach & Education pages 1,372 views of *Rain Barrel & Composting Workshop* pages 142 views of the *Storm Drain Marking & Stenciling* pages
Septic	6,070	4,200 views of Septic System Reimbursement Programs 470 views to Septic Tier Maps 1,300 views of educational information on septic system maintenance
Report a Structure	2,241	102 users directed from the *Report a Suspected Illicit Discharge* page
Hazardous Waste	5,880	Provides Household Hazardous Waste & Used Oil collection information
Shred Events	4,834	Provides registration information for Shred events
Cleanup Events	1,594	Provides registration information & event times and locations
Recycle	1,000	Provides information on the recycling program
Adopt-A-Road	556	Application to adopt a road and report a cleanup
TOTAL	28,754	

Social Media: The WPRP uses social media to reach out to citizens and promote the WPRP. Workshops, community events proposed regulations, public hearings, and Citizen's Academy were shared on Facebook, Twitter, and YouTube to build public awareness, increase participation, and make registration easy.

The Charles County Government Facebook page has 18,000-plus followers (an increase of 1,000 from FY 2021), the @CharlesCoMD Twitter handle has 5,714 followers (400 more than last year), and the Charles County Government YouTube channel has 4,830 subscribers (160 more than the previous year).

Charles County Government improves community communication through their YouTube channel. This visual, social medium has become a successful outreach tool that informs and entertains. The YouTube channel introduces County leaders and provides information on local programs, events, proposals, services, and local places of interest. Health, safety, education, history, tourism, parks and recreation, economic opportunities, utilities, waste management, infrastructure, and the environment were some of the topics covered. New videos were consistently uploaded from various County government departments and local community groups. The channel has 4,830 subscribers and features over 400 videos organized in twenty-one playlists. All seven WPRP public service announcements (PSAs) are featured on the channel (with 236 views) in FY 2022. Also, the County's YouTube channel series, *Your Charles County*, featured a WPRP sponsored event on Cobb Island this past year. (https://youtu.be/BVQeZ6AfJIA)

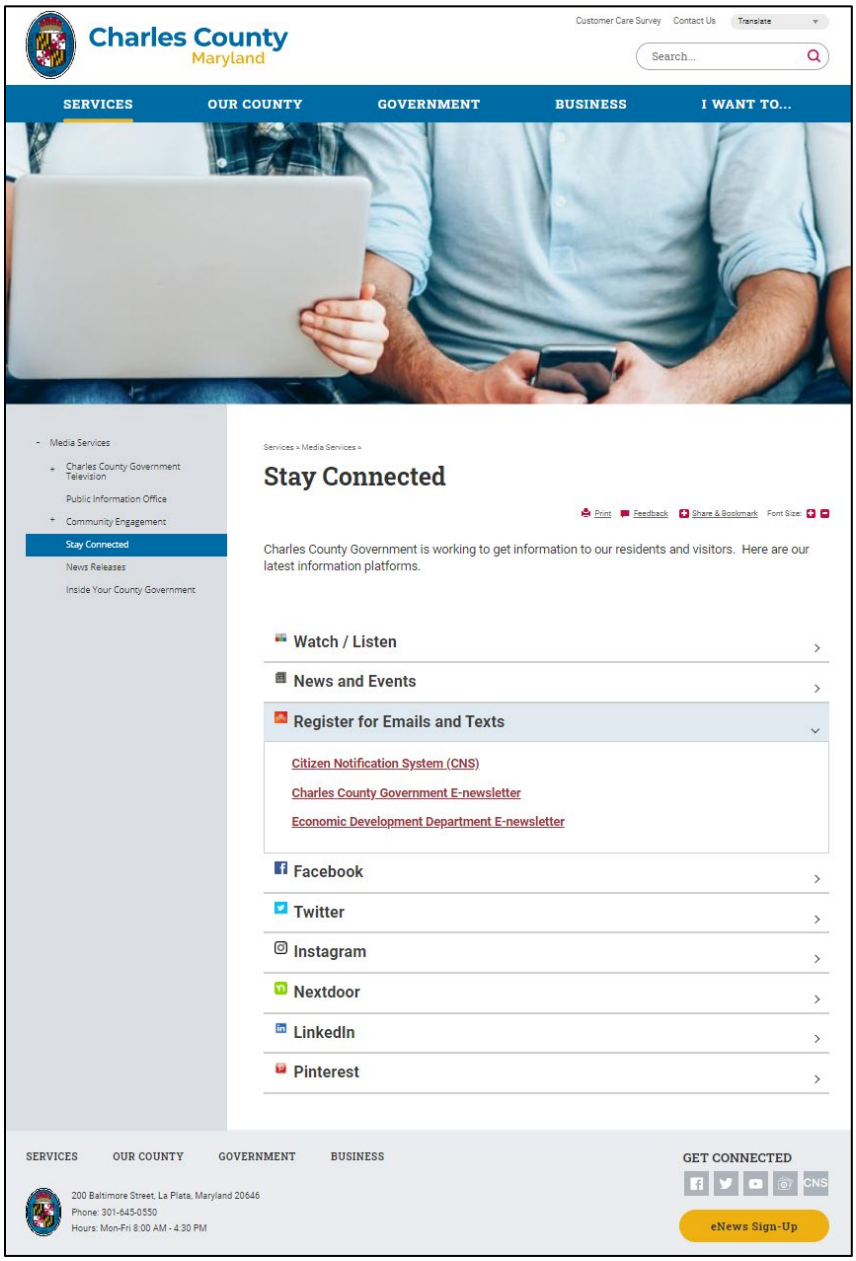

Charles County Government
July 18 ·
Hear about how goats are helping clear invasive plants in Cobb Island and protect our watershed
If you are interested in applying for one of these grants, learn more by watching here!
YOUTUBE.COM
Your Charles County-Goats on Cobb Island
Find out how goats can protect the watershed and our water supply.


Charles County Government
April 6 ·
We need your help! Consider volunteering for the Potomac Watershed Cleanup this Saturday, April 9 and help keep local waterways clean. More details on Alice Ferguson Foundation website: https://bit.ly/3LcLtvM
Annual
Potomac River
Watershed Cleanup
TRASH FREE POTOMAC WATERSHED
ALICE FERGUSON FOUNDATION

E-News: In FY 2022, Charles County citizens stayed connected and engaged with County news, updates, and events through the weekly Charles County Government e-newsletter sent directly to their email. All citizens, especially new residents, are encouraged to register for the e-newsletter by WPRP staff and on CCGTV by visiting the County's Stay Connected webpage at https://www.charlescountymd.gov/services/media-services/get-connected or by calling the County's Public Information Office at 301-645-0580.

News Releases/Newspapers: News releases from the Charles County Media Services Division alerted citizens about upcoming WPRP events, trainings, grants, and hearings. All News Releases were published in local southern Maryland newspapers, posted on Charles County Government social media outlets, and emailed to individuals who registered to the County's e-news distribution. News Releases advertise rain barrel workshops, yard waste collection for composting, hazardous waste collection days, shred events, grant programs, public meetings, hearings, and other WPRP announcements.

Shown on the following page are two News Release examples announcing: 1) Rain Barrel and Composting workshops; and 2) a Free Scrap Tire Collection Event.



Charles County Government
NewsRelease

FOR IMMEDIATE RELEASE
News Release #2022-110
Monday, Sept. 26, 8:30 a.m.

FOR MEDIA INQUIRIES ONLY:
Donna Fuqua, Public Information Specialist
Phone: 301-885-2779 | PressRoom@CharlesCountyMD.gov

Rain Barrel and Compost Workshops to be Held Oct. 22

The Department of Public Works is partnering with the Nanjemoy Creek Environmental Education Center and the University of Maryland Extension to host a rain barrel and compost workshop event. This event will be held on Saturday, Oct. 22, in the Public Works Facilities Building parking lot (10430 Audie Lane, La Plata). Workshops are 9 a.m. and 10:30 a.m. Register at www.CharlesCountyMD.gov/Outreach. Advanced registration is required. The deadline for online registration is Wednesday, Oct. 19 and mail-in registration is Wednesday, Oct. 12.

Rain Barrel Workshop

- Take home a rain barrel and learn proper in-home installation techniques, practical uses for rain barrels, and how to reduce the impact of runoff on local waterways.
- Become eligible for a stormwater remediation fee credit. Residents within the Town of La Plata and the Town of Indian Head are not eligible to receive the Stormwater Remediation Fee Credit.
- For more information, contact Jackie Takacs at 240-393-6508 or jtakacs@umd.edu or Keith Roumfort at 301-932-3440.

Composting Workshop

- In this hands-on workshop, participants will learn the basics of home composting and get instructions on making a wire bin at home. Charles County registrants can receive a free plastic GEOBIN®.
- For more information, call Meg Romero at 301-932-3599.

Citizens with special needs may contact the Maryland Relay Service at 711, or Relay Service TDD: 800-735-2258.

Charles County Government
NewsRelease

FOR IMMEDIATE RELEASE
News Release #2022-100
Thursday, Sept. 8, 2022, 9:10 a.m.

FOR MEDIA INQUIRIES ONLY:
Donna Fuqua, Public information Specialist
Phone: 301-885-2779 | PressRoom@CharlesCountyMD.gov

Free Scrap Tire Disposal Event for Charles County Citizens

The Charles County Environmental Resources Division invites residents to get rid of scrap tires free of charge at the Scrap Tire Drop-off Day event on Saturday, Oct. 8. Collection times are 2 p.m. – 5 p.m. at the Charles County Landfill (12305 Billingsley Road, Waldorf).

Charles County residents may recycle up to 10 scrap tires from passenger, light truck, and agricultural vehicles. This disposal event is not available to commercial vehicles and businesses. Each person dropping off tires should be prepared to show proof of residency, one visit per resident. In addition to scrap tires being unsightly, scrap tire piles can spark fires and are ideal breeding grounds for mosquitoes.

Please note that the Charles County Landfill and Recycling Center will be closed at 2 p.m. and will only accept scrap tires at that time. The Piney Church Mulch Facility (5370 Piney Church Road, Waldorf) will close at 2 p.m. to assist with this event.

For more information, visit www.CharlesCountyMD.gov/scraptireday or call the Charles County Department of Public Works, Environmental Resources Division at 301-932-3599. Citizens with special needs may contact the Maryland Relay Service at 711, or Relay Service TDD: 800-735-2258.

Podcast – Inside Your County Government: **Keeping Our Waterways Clean**

In FY 2022, a Charles County media production intern from Southern Maryland College met with WPRP staff to record a podcast entitled, *Keeping Our Waterways Clean*. Listeners learn what Charles County and others are doing to protect our streams and rivers from pollution. The Charles County MS4 Permit Coordinator discusses the differences between point source and nonpoint source water pollution and how stormwater pollution from developments, streets, deicing, and failing septic systems is being controlled. The WPRP Education and Outreach Coordinator explains how soap, cleaners, fertilizers, pesticides, oil, gasoline, and pet waste can have negative impacts on aquatic life and what citizens should do to protect waterways and aquatic life.

The County's Recycling and Litter Control Superintendent also provides detailed information on the negative impacts litter has on the community and the environment, the difficulties preventing litter from polluting our waterways, and the impact COVID did, and did not, have on the County's litter control program.

The episode is part of a series of podcasts, *Inside Your County Government*. This episode was uploaded on March 18, 2022 to the Charles County's Podcast Channel. The podcast can be heard at the following link: https://podcast.charlescountymd.gov/209287/10273633-keeping-our-waterways-clean

Tax Bill Inserts

In the summers of 2021 and again in 2022, the County's tax bill mail-out included a mailer with instructions to County residents on how to use the *Charles County Recycles* App. On the back of the mailer, information was provided about free, monthly Household Hazardous Waste collection events for County residents.

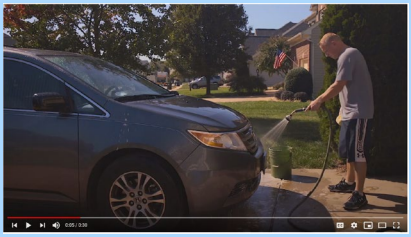
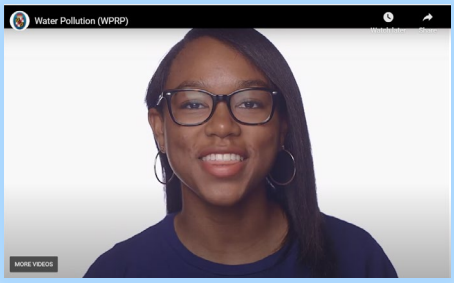

Are you using the Charles County Recycles App?
Fast, Up-To-Date Recycling Details Right at Your Fingertips
Intstall our app Charles County Recycles to your smartphone, or check our website at: www.CharlesCountyMD.gov/Recycling
CHARLES COUNTY RECYCLES
• Sign up for Reminder Notifications and schedule change alerts.
• Visit the Wizard to discover proper methods to dispose of many items.
• Play our game What Goes Where and learn more about recycling in Charles County.
• Schedule your Yard Waste collection.
• Purchase Tag-A-Bag Tickets to be mailed directly to your residence.
• Check for Special Events like the next Shred Event.
• Search for the nearest drop-off Recycling Center.
Charles County Environmental Resoures
10430 Audie Lane, La Plata, MD 20646 • 301-932-5656
MD Relay: 7-1-1 (TDD: 1-800-735-2258) • Equal Opportunity Employer

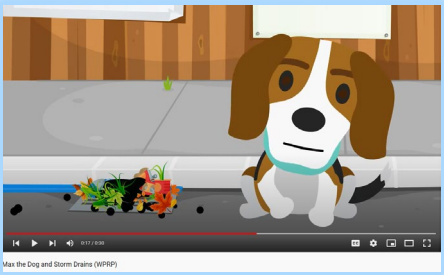

Charles County Government
HOUSEHOLD HAZARDOUS WASTE
HHW events are held year round … January–December!
Events are FREE OF CHARGE to Charles County residents.
1st Saturday of Each Month • 9 a.m. to 3 p.m.
Department of Public Works • 10430 Audie Lane, La Plata, MD
Sign up online for CNS to receive notice of inclement weather delays.
Learn more about the Household Hazardous Waste Program at:
www.CharlesCountyMD.gov/HHW
Charles County Environmental Resoures
10430 Audie Lane, La Plata, MD 20646 • 301-932-3599
Maryland Relay: 7-1-1 (Relay TDD: 1-800-735-2258) • Equal Opportunity Employer

Public Service Announcements

The WPRP airs Public Service Announcement (PSA) commercials that serve as an effective visual medium to educate citizens of all ages on the origins of nonpoint source water pollution and how to protect water quality with the catchphrase "Be the Solution to Water Pollution." All seven PSAs listed in Table 19 continue to be an important part of the County's public outreach effort and were shown on cable television, Charles County Government television (CCGTV), Charles County YouTube channel, digital streaming devices, big-screen movie theater and lobby, and radio. They were also embedded on the Stormwater Management - News and Videos webpage. The number of views in FY 2022 for each PSA are shown in Table 19.

Table 21: Public Service Announcements Statistics in FY 2022

#	PSA	Video	Link
1	Where our water pollution comes from		https://www.youtube.com/watch?v=9IE2TKv0PFg&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=6 TV Spots: 781 TV Views: 66,965 Digital Views: 36,764
2	Take Responsibility for Water Pollution		https://www.youtube.com/watch?v=RkP7vDv5xgU&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2 TV Spots: 781 TV Views: 66,965 Digital Views: 36,764
3	Max the Dog and Pet Waste		https://www.youtube.com/watch?v=y-IjVAw_SaI&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=2 TV Spots: 781 TV Views: 66,965 Digital Views: 36,764

4	Lawn Care & Using Fertilizers		https://www.youtube.com/watch?v=islMrwMpnPU&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=3 CC YouTube views: 53
5	How the Storm Drain Works		https://www.youtube.com/watch?v=4XfrHMxJZcM&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=4 Movie Theater Plays: 144 Movie Theater Lobby: 9,538 Streaming Device views: 131,267
6	Max the Dog & Lawn Waste		https://www.youtube.com/watch?v=5DDw0Bjoo4Y&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=5 TV Spots: 781 TV Views: 66,965 Digital Views: 36,764
7	Illicit Discharge Detection & Elimination		https://www.youtube.com/watch?v=gX5j6wlHZb8&list=PLYKfJ608FjL9iMMhiTn5kjvWv8sDNmoz2&index=7 CC YouTube view: 44 CCGTV: https://www.CharlesCountyMD.gov/our-county/ccgtv-live-stream CCGTV Spots: 360

COMCAST Spotlight

The WPRP TV and Digital Media campaign through Comcast Spotlight continued in FY 2022. PSAs # 1, 2, 3, and 6 (see Table 19) were aired on Comcast cable, Spotlight Streaming Video, and Verizon Fios throughout FY 2022. The spots were aired on major networks including high profile programs such as, Monday Night Football, Disney-XD, History Channel, Animal Planet, Tru TV, MSNBC, CNN, and others. In total 3,126 cable spots (with 267,862 impressions) and 147,058 in-stream (video-on-demand) impressions were delivered to Charles County customers in FY 2022.

Table 22: COMCAST Campaign Statistics in FY 2022

Video Summary for Charles County Watershed Protection & Restoration

Optimized TV campaign targeting your audience efficiently and effectively

Flight Dates	9/1/21-6/12/22
TV Impressions	267,862
Streaming Impressions	147,058
Spots	3,126
Reach & Frequency	93% & 6.7x
Annual Investment	$18,865.75

Demographic Profile

Age Groups	
Persons 17 and under	24.2%
Adults 18-34	21.2%
Adults 35-54	29.8%
Adults 55+	24.8%
Education	
Attended College+	60.5%
Marital Status	
Single (Never Married)	31.3%
Married	52.2%
Divorced/Separated/Widowed	16.6%
Household Income	
$30,000-$49,999	10.9%
$50,000-$74,999	14.3%
$75,000-$99,999	14.3%
$100,000+	48.5%
Housing Units & Family Type	
% Owner Occupied Units	73.2%
% of HH with Children	38.6%
Race	
White	49.1%
Asian	2.9%
Black/African American	41.6%
Other	6.4%

Communities Served

- Bel Alton
- Benedict
- Bryans Road
- Bryantown
- Charlotte Hall
- Cobb Island
- Hughesville
- Indian Head
- Issue
- La Plata
- Marbury
- Newburg
- Pomfret
- Port Tobacco
- Waldorf
- White Plains

Movie Theater PSA

In July of 2021, the WPRP partnered with National Cinemedia, LLC, which coordinates advertising for the AMC movie theater at the St. Charles Town Center in Waldorf. For eight weeks between July and September of 2021, *How the Storm Drain Works* PSA with Max the Dog was played on the big screen 1,441 times and in the theater lobby for a total 9,538 plays. The PSA shows Max the Dog demonstrate where rain goes when it enters our storm drains and why rain should be the only thing that goes into storm drains. This PSA was also viewed 131,267 times on devices of movie patrons who use the *Noovie* streaming service.

Table 23: NCM and Noovie Campaign Statistics for FY 2022

Audit Summary

Report Finished: 9/15/2021 9:30:43 AM

Charles County WPRP Cinema Campaign

7/19/2021 - 9/12/2021

NCM

Theater #	Theater Name	Location	# of Plays
AMC2794	St Charles Town Ctr 9, Waldorf MD	Lobby	9,538
AMC2794	St Charles Town Ctr 9, Waldorf MD	Auditorium	1,441
Total			**10,979**

noovie

Campaign Details

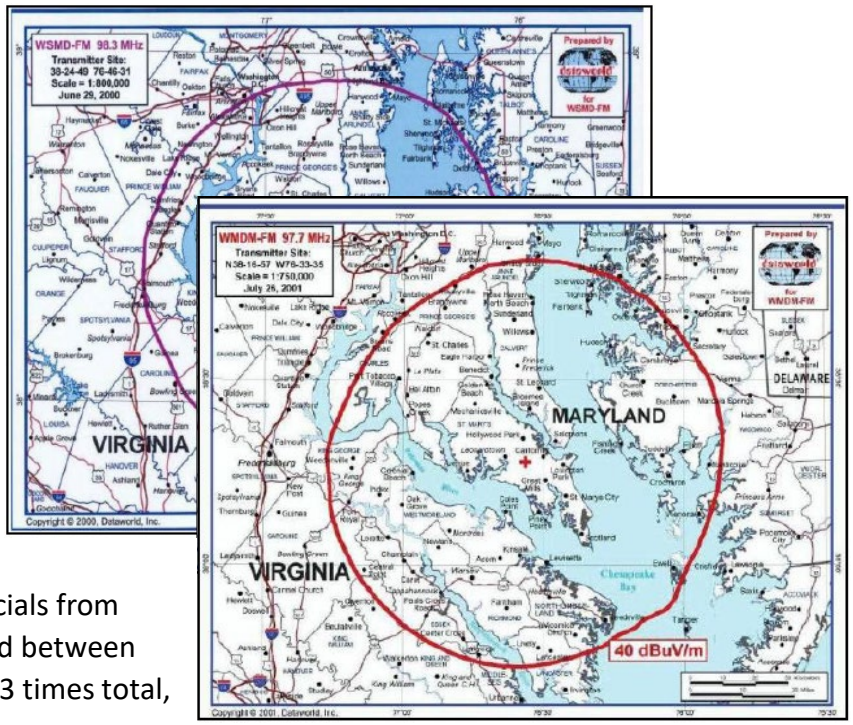
ADVERTISER	Charles County Government Watershed Prot…
PROPOSAL NUMBER	2104-0161
CONTRACTED MEDIA SPEND	$3,500
CONTRACTED IMPRESSIONS	125,000
CAMPAIGN DATES	07/19/2021 — 09/12/2021

Campaign Performance

131,267	$3,675.48	104,931	79.94%	105
Delivered Impressions	Delivered Media	Video Completes	VCR	Pacing Index

SOMAR Communications

The WPRP airs PSA commercials on radio stations broadcasted by Southern Maryland Radio (SOMAR) Communications, Inc. of Lexington Park, Maryland. SOMAR is a local radio network serving southern Maryland with three stations: WSMD STAR 98.3 FM (Pop), WKIK 102.9 FM/WKIK 560 AM (Mainstream Country), and WMDM 97.7 FM (Classic Rock). These three stations encompass a wide range of music genres, thereby appealing to a wide listening audience.



The WPRP aired three PSA radio commercials from January to April of 2022. The spots rotated between SOMAR's three stations for ten weeks, 283 times total,

with sixty percent airing during peak drive time (5:30am-10am; 3pm-7pm).

In addition, a Spanish language version of the PSA commercial, *Use Less Salt*, ran on the contemporary pop music station WSMD STAR 98.3 FM (*All the Hits, All the Time).* The script was read by a Latino radio personality.

Radio Public Service Announcement Scripts:

Use Menos Sal (Español)

Propietarios de viviendas y empresas: ¡Ahorren dinero y protejan el medio ambiente utilizando menos sal este invierno!

1. *Use sal solo cuando una tormenta sea inminente*
2. *Si la tormenta no ocurre, recoja la sal no utilizada para usarla más tarde.*
3. *Solo use sal donde sea absolutamente necesario y aplique la menor cantidad de sal necesaria.*
4. *Distribuya uniformemente la sal*
5. *Nunca deje pilas adicionales de sal y barra los derrames.*

6. No ponga sal encima de la nieve, quite la nieve primero con una pala.
7. En hielo más grueso, use arena o arena para gatos natural para mayor tracción.
8. Considere el uso de anticongelantes sin cloruro.
9. Y recuerde guardar la sal en un lugar seco y cubierto.

¡JUNTOS PODEMOS SER LA SOLUCIÓN A LA CONTAMINACIÓN DEL AGUA!
VAYA A CHARLESCOUNTYMD.GOV/WATERSHED PARA OBTENER MÁS INFORMACIÓN.
Un mensaje del Programa DE Protección y Restauración de Cuencas del Condado de Charles.

Use Less Salt (English)

Homeowners and businesses — save money and the environment by using less salt this winter!

1. Use salt only when a storm is imminent
2. If the storm doesn't happen, sweep-up any unused salt for later use.
3. Only use salt where it's absolutely needed and apply the least amount necessary.
4. Evenly distribute, never leave extra piles, and sweep up any spills.
5. On thicker ice, use sand or natural cat litter for added traction.
6. Consider using chloride-free deicers.
7. AND remember to store salt in a dry, covered area.

Together we can all be the solution to water pollution!

Go to CharlesCountyMD.gov/watershed to learn more. A message from the Charles County Watershed Protection & Restoration Program.

Yard Runoff - Kid & Dad

Kid: Hey dad, look at the rain running off our yard, where does it go?
Dad: Well, stormwater runs off our property into storm drains. Then it flows into our streams and rivers.
Kid: Geez, it must get really dirty.
Dad: Yup, runoff can have all sorts of stuff in it. Like oil from our cars, and fertilizers and pesticides from our yards.
Kid: And animal poop?
Dad: Even animal poop.
Kid: Ewww, all that goes to the river where we fish and swim? What can we do?
Dad: Well, you can pick up after our pets. I can maintain our cars so there's no leaks. And use

less chemicals on our yard.
Kid: We shouldn't leave trash in the street either.
Dad: That's right! Keeping stormwater clean is important to all of us. We can ALL be the solution to water pollution.
Kid: Even kids!

Go to CharlesCountyMD.gov/watershed to learn more. A message from the Charles County Watershed Protection & Restoration Program.

Yard Waste

Want to do your part to help the environment? Start in your own backyard!

When we mow our lawns, blow the clippings, and leaves into the street and forget about them. Right?

But they don't just stay there.

Yard waste absorbs oil and dirt from the road surface before being washed into the storm drain. Then it globs together, starts to decompose and clogs the drains which causes backups and flooding. But it doesn't end there.

The yard waste glob continues to pick up sediment, bacteria, and garbage as it moves through the storm drain. When it reaches our waterways it causes pollution, algae blooms, and safety concerns.

So next time you mow your lawn, rake the clippings back onto the lawn. Keep them out of ditches and gutters. And for leaves, weeds, and branches, either bag them for pick-up or put them in a compost bin.

A message from Charles County Government Watershed Protection and Restoration Program. Visit CharlesCountyMD.gov/watershed to learn more.

Outreach Events

Rain Barrel & Composting Workshops

PGM and DPW personnel in collaboration with the University of Maryland (UMD) Extension and Nanjemoy Creek Environmental Education Center personnel held rain barrel and composting workshops in FY 2022. Due to increasing levels of interest and the relaxing of COVID restrictions for in-person gatherings, three workshops were held: 1) October 16, 2021; 2) April 23, 2022; and 3) July 30, 2022. (Details of the July 30, 2022 workshop will provided in next year's annual report for FY 2023). During the day of each workshop, two rain barrel sessions and two composting sessions were held for a total of six rain barrel sessions and six composting sessions for FY 2022. All were well attended (see Table 24).

Rain barrels were made available for purchase only to attendees of the workshop ($30.00 for Charles County residents, $65.00 for non-Charles County residents). Composting bins were handed out to all who registered and attended the composting workshops, free of charge.

Applications to the County's Stormwater Remediation Fee rebate program were made available at the end of every rain barrel session to County residents. Several questions were answered about the rules of the rebate program and the purpose of the Charles County stormwater remediation fee. Various WPRP promotional items and educational materials were available free of charge to everyone. The educational materials covered topics such as water pollution prevention at home and work, stormwater impacts, stormwater management, and best maintenance practices for stormwater facilities.

Table 24: Rain Barrel and Composting Workshop Attendance in FY 2022

Workshop Date	Rain Barrels		Composting	
	Barrels Purchased	Attendance	Bins Purchased	Attendance
10/16/2021	35	31	27	27
4/23/2022	70	58	38	38
Total	**105**	**89**	**65**	**65**

Rain Barrel Workshop

Looking to Conserve Water and Do Something Good for the Environment?

Why not install a rain barrel . . . or two!

Actual Rain Barrel

The Charles County Government and University of Maryland Extension are pleased to offer a workshop on the practical uses for rain barrels and how they reduce the impact of runoff on our local waterways and Chesapeake Bay.

Date: Saturday, July 30, 2022
Time: 9:00am & 10:30am
Place: 10430 Audie Lane, La Plata, MD 20646

Participants will have the opportunity to purchase pre-assembled rain barrels and learn the technique for later installation at home to become eligible for a tax deduction. Workshops are 45 minutes in length.

Pre-registration Required - Space Limited
For more information contact Jackie Takacs, 240-393-6508 or Keith Roumfort, 301-932 -3440. Register using the form below or go online*at https://extension.umd.edu/resource/rain-barrel-workshop.

* additional service fees associated with online registrations

Mail in Registration Post marked July 22, Online Registration closes July 27, 2022

Rain Barrel Registration

Name: _____

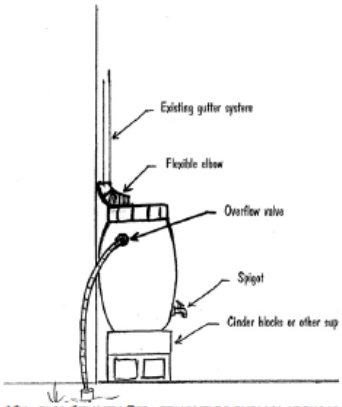
Address: _____

Phone: _____ Email: _____

Please Choose From the Following Workshop Times:

☐ 9:00am ☐ 10:30am

Mail in Registration Post Marked July 22



☐ I am interested in learning about rain barrels but I DO NOT want a rain barrel at this time	No Charge
☐ Rain Barrel - Charles County Resident	$30.00*
☐ Rain Barrel - Non-Charles County Resident	$65.00
☐ Option: Flexible Downspout Connector Circle Color Choice: White Green Lt. Brown Dk. Brown	$10.00
☐ Option: Watering Can Spigot	$8.00
Total	_____

*Charles County Department of Public Works is providing a discount to county residents for participating in this program. You must be present at a workshop to receive the discount. The discount does not apply to residents of the Town of La Plata or the Town of Indian Head.

small print:
*If you would like to order more than one rain barrel please indicate that on the form and adjust payment accordingly. *You must register in advance to guarantee rain barrel availability on the day of the workshop.*Your property is eligible for a credit on the Stormwater Remediation Fee after installing two or more barrels.* Rain Barrels are 55-gallons in size and white in color (see photo at top of registration).

Please make checks payable to: University of Maryland

University of Maryland Extension

Please Detach and Return Registration form to:
CMREC - 2005 Largo Road, Upper Marlboro, MD 20774-8508
ATTN: Jackie Takacs

"The University of Maryland is an Equal Opportunity Employer and Equal Access Programs"
"La Universidad de Maryland es una institución con igualdad de oportunidades de empleo y con igualdad de acceso a programas."

Wednesday Water Webinars

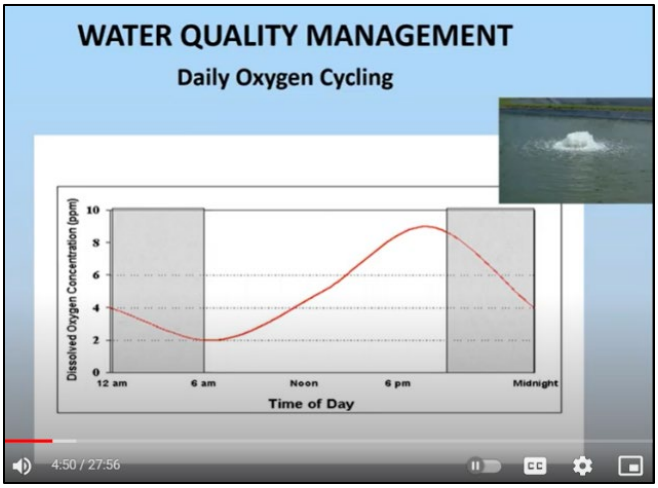
In 2022, the UMD Extension staff educated the community on proper septic system maintenance, well water protection, and pond management with a series of *Wednesday Water Webinar*. The workshops were virtual, one-hour sessions, held on the third Wednesdays of the month, and were well attended as shown in Table 23. All ten webinars were taught by Dr. Andrew Lazur through Zoom and recorded. The recordings were uploaded to https://extension.umd.edu/resource/wednesday-water-webinars-recorded and https://www.youtube.com/playlist?list=PLlYVlIyavc0sIbpBtYtRy-IS_W4QDbFFs .

Holding the seminars online allowed citizens to attend without the need to travel and the format of the webinar allowed for class participation. WPRP staff referred new several septic system owners to the recordings of Dr. Lazur's septic webinars that are uploaded to the UMD and Charles County Extension YouTube channel.

Table 25: Wednesday Water Webinars in FY 2022

Title	Month	No. of Attendees*	No. of Views for Recordings
Aquatic Plant Management in Ponds	Jun	15	63
How a Septic System Works	May	9	66
Simple Steps to Protect your Water Well	Apr	17	102
Septic System Maintenance	Mar	18	52
Warning Signs that a Septic System Is Not Working Effectively	Jan	17	42
Top Contaminants in Well Water	Dec	7	116
Types of Septic Systems	Nov	8	189
Top Things to Know about Septic Systems	Sep	28	10
Drinking Water Treatment 101	Oct	10	37
Prolonging the Life of Your Septic System	July	26	46
	TOTAL	**155**	**713**

*Includes Charles, St. Mary's & Calvert Counties



Shred/Household Hazardous Waste Collection/Cleanup Events

Eight Charles County shred events were held by DPW throughout FY 2022. These free events provide citizens the opportunity to recycle paper documents securely. During the year, approximately 720 vehicles delivered a total of 26.15 tons of paper.

Table 26: FY 2022 Hazardous Waste Collection:
No. Households

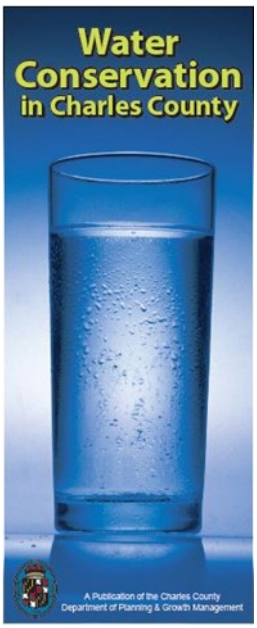
Jul	187
Aug	242
Sep	185
Oct	190
Nov	213
Dec	184
Jan	52
Feb	52
Mar	137
Apr	185
May	150
Jun	205
TOTAL:	1,982

Also in FY 2022, a total of 1,982 households participated in Charles County household hazardous waste collection events. These monthly collection events provide citizens a safe and responsible method to dispose of hazardous waste including pesticides, herbicides, fertilizer, gasoline, oil-based paint, cleaning supplies, pool chemicals, fluorescent lights, mercury thermometers, and other poisons found in the home. Residents were instructed to correctly label any container that did not have a readable-original label.

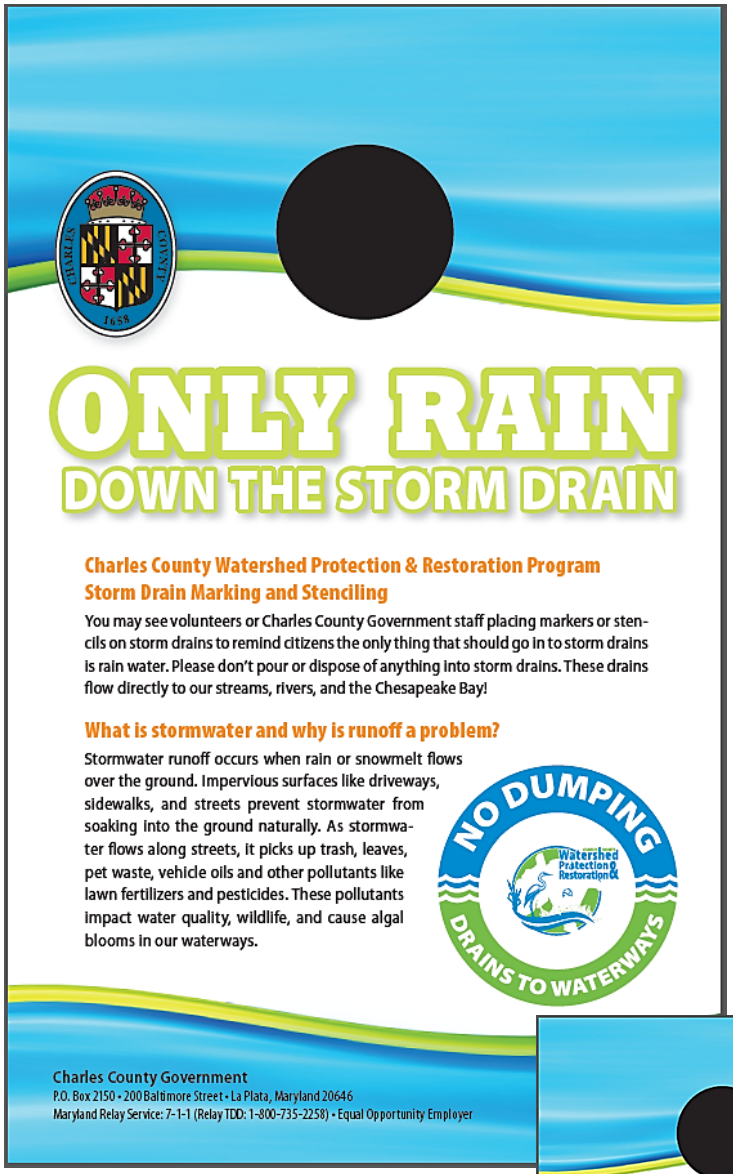
Charles County volunteers are the driving force behind community cleanup events. Volunteers see firsthand the detrimental impacts litter has on waterways, wildlife, and the environment within their watershed and are committed to be part of the solution.

In FY 2022, Charles County held their second annual countywide community cleanups, the Charles County Community Cleanup. Residents and businesses were encouraged to select a community or public space to clean and beautify. Sixteen volunteer groups participated in the one-day event, removing nearly six tons of debris and litter from neighborhoods, communities, and parks. During the month of April, county citizens also participated in the Potomac River Watershed Cleanup collecting over sixteen tons of trash and marine debris from ten locations along County waterways. In addition, through the County's Adopt-A-Road program, Charles County volunteers completed 156 cleanup events along adopted roadways.

Educational Materials – Brochures



Door Hangers

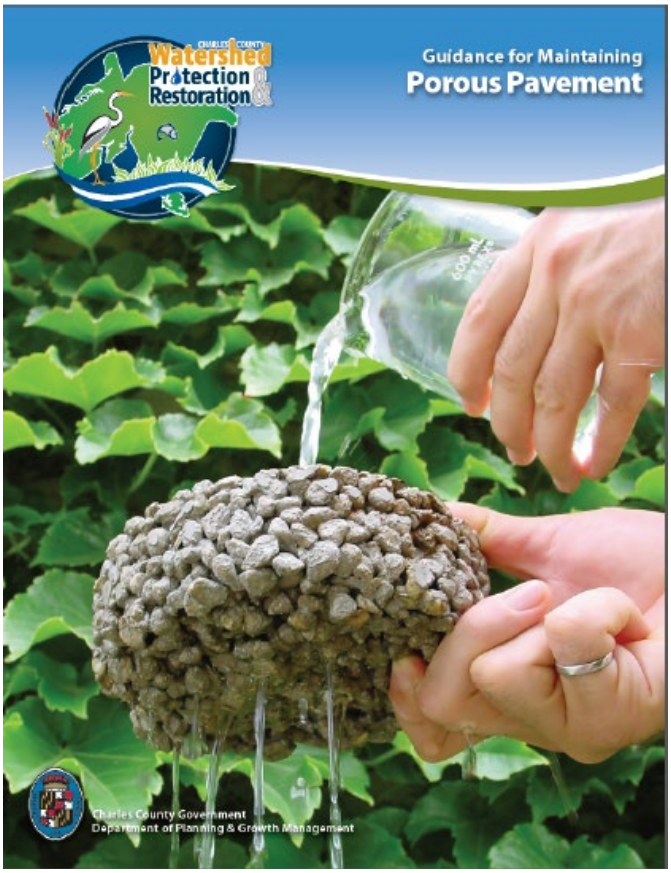


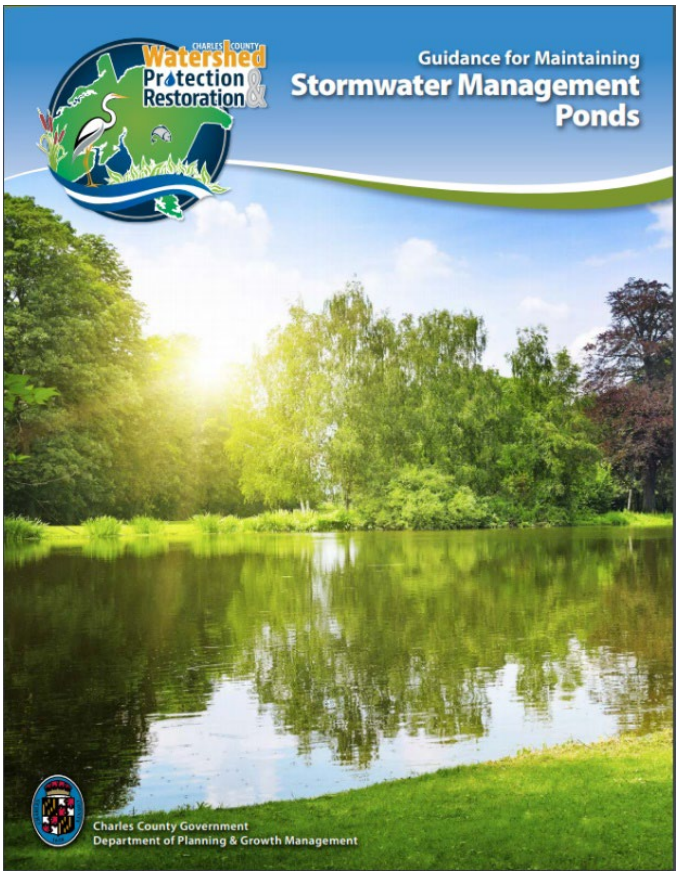
Residential and Community Stormwater Management Implementation and Facility Maintenance Outreach

The WPRP and stormwater inspection staff continued to be available to homeowners and HOAs to answer questions and provide guidance on stormwater treatment facilities and practices. Staff also distributed guidance brochures on stormwater management implementation and facility maintenance for:

- *Stormwater Management Ponds* (English & Spanish)
- *Rain Gardens, Bioswales, and Micro-Bioretention*
- *Porous Pavement,* and
- *Dry Wells*

The booklets describe in detail the purpose of the stormwater facilities and how to properly maintain them. They were distributed at HOA meetings, community walkthroughs, trainings/workshops, and at public events such as the County Fair and Citizen's Academy. They also remain available online on the PGM Stormwater Management Facilities webpage.





County stormwater inspectors distributed large quantities of these guidance booklets in FY 2022 (approximately 2,000) to property owners and HOAs during initial and triennial inspections. If a homeowner is not present during an inspection, inspectors provide inspection results and contact information using the door hanger, shown here.

Stormwater Management Facilities

Font Size: Share & Bookmark Feedback Print

Stormwater management facilities are used to:

- Capture stormwater runoff from impervious surfaces, like roads, rooftops, parking areas, and driveways to prevent downstream flooding and allow time for natural infiltration underground.
- Remove pollutants from stormwater runoff before the water is discharged into local streams.

These facilities include rain gardens, bioswales, micro-bioretention facilities, drywells, porous pavement, grass channels, ponds and other structural and non-structural stormwater management facilities. If they are functioning correctly, stormwater facilities help slow down stormwater and remove pollutants before the water is discharged into local streams.

Who Is Responsible For Maintenance?

Privately maintained stormwater management facilities are maintained by the facility owner. The county does not have direct maintenance responsibility.

However, Charles County is still responsible under state and federal stormwater permits for ensuring that the facilities remain in place, operate properly and are functional. To this end the county has established an inspection schedule for all privately maintained facilities, together with reporting and enforcement procedures for communicating inspection results to facility owners and gaining maintenance compliance.

Which Codes Determine Maintenance Responsibility?

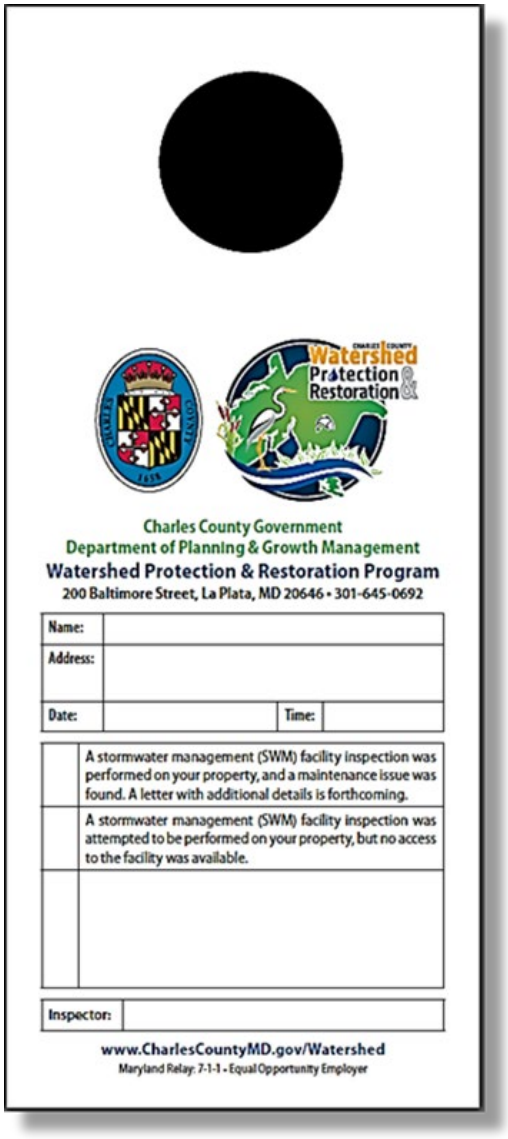
Chapter 274-53 of The Code of Charles County, Maryland **"Responsibility of owner or occupant".**

"The owner of any property containing a stormwater management system, or any other person or agent in control of such property, shall perform or cause to be performed preventive maintenance of all completed ESD treatment practices and structural stormwater management systems to ensure proper functioning."

Charles County, MD / Division 2: Code of Ordinances and Resolutions / Part II: General Legislation / Stormwater Management

Can I Remove the Stormwater Management Facility on My Property?

No, you cannot remove these facilities if they have been required by Charles County as part of your building installation. The County maintains a database of all required stormwater management structures and is required to inspect the facilities every three (3) years ensuring that the facilities remain in place, are properly operated, and functional.



Mantenimiento 101

Lista de verificación de mantenimiento constante

Cortar el césped y el manejo de la vegetación son tareas de mantenimento frecuentemente descuidadas para los estaques. Cortar el césped y controlar la vegetación puede reducir o eliminar los problemas de mantenimiento estructurales.

1. Cortar el césped

Corte el césped en las siguientes áreas **al menos dos veces al año**:

- Pendientes superiores y aguas abajo de la presa
- Pendientes aguas arriba de la presa (estanques secos)
- 25 pies alrededor de la estructura de control (estanques secos)
- Canales de entrada, alrededor de cabeceras y tuberías dentro del área del estanque
- Canal de salida

Los estanques húmedos diseñados con componentes recreativos o estéticos requieren un corte más frecuente, **cada 1 a 3 semanas** durante los meses más cálidos.

2. Manejo de la vegetación

Los árboles y la vegetación leñosa deben eliminarse de las siguientes áreas **al menos dos veces por año**:

- Pendientes superiores, aguas arriba, y aguas abajo de la presa
- Canales de entrada y salida
- 25 pies alrededor de la estructura de control
- Canales, cabeceras, y tuberías en el área del estanque

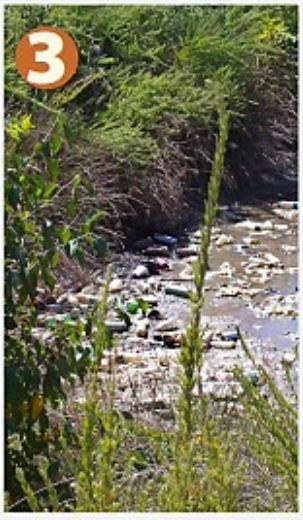
3. Eliminar basura y escombros

Realice la remoción de basura y escombros **mensualmente** en las siguientes áreas:

- Dentro y alrededor del estanque
- Dentro y alrededor del estante de basura en la estructura de control

4. Eliminar fuentes de contaminación

Conozca las fuentes de contaminación en su propiedad y trate de reducirlas o eliminarlas.

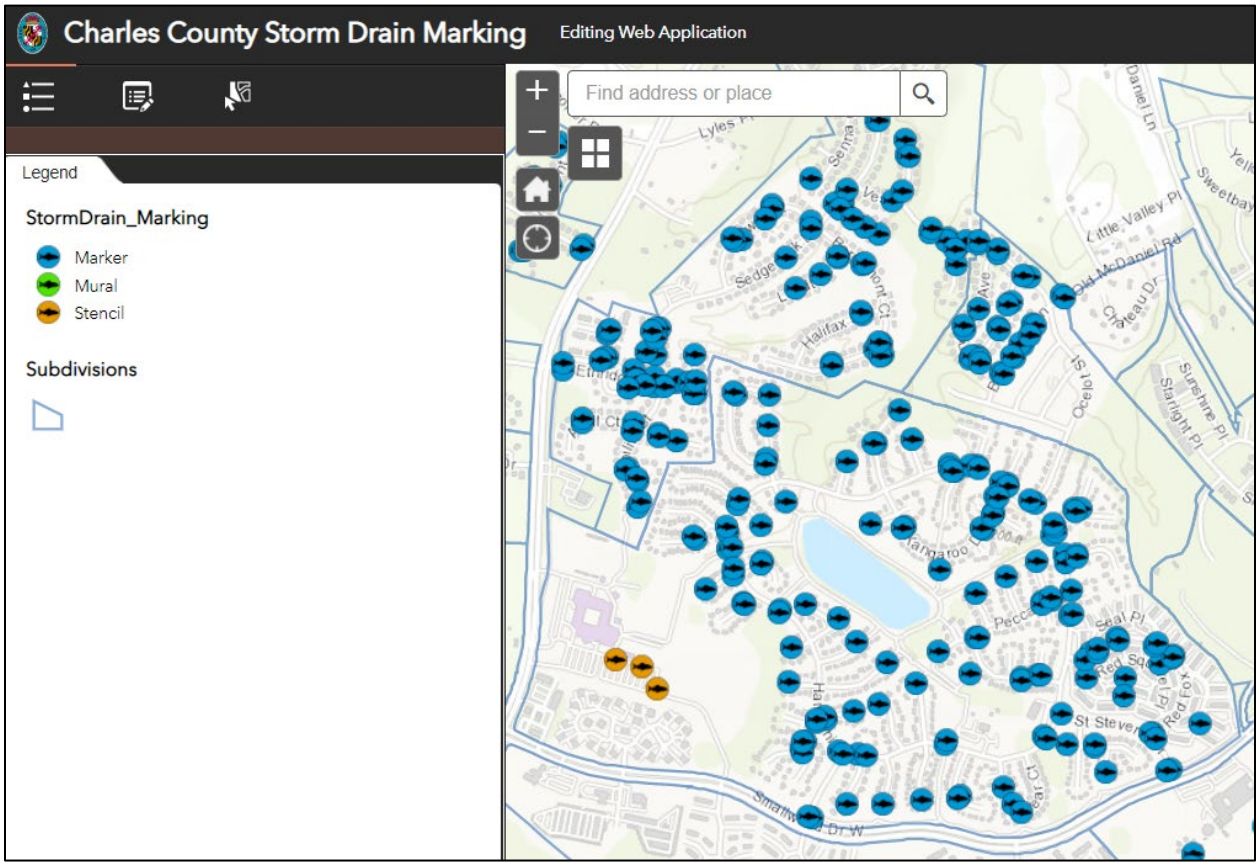


Página 4

Storm Drain Stenciling/Marking Program

The WPRP Storm Drain Stenciling/Marking Program continued in FY 2022. Since 2017, this volunteer-based program helps raise awareness about stormwater pollution and encourages stewardship in Charles County communities. Volunteer groups choose whether to use stencil kits and paint (on loan from the WPRP staff) or to install aluminum storm drain markers with special adhesive. The markers are preprinted with "NO DUMPING, DRAINS TO WATERWAY."

After projects are complete, the marked or stenciled storm drain locations are uploaded to a GIS map dedicated to the program. An example is shown below. Stenciled storm drain locations appear as a yellow circle and locations of storm drains that have been marked in the field with an aluminum marker are shown in blue. No storm drains were stenciled In FY 2022; however, 1,328 aluminum storm drain markers were installed in 26 subdivisions by DPW.



Chesapeake Bay Trust Grant Partnership Program

Charles County continued their partnership with the Chesapeake Bay Trust (CBT) in FY 2022 to administer grants funded by the Stormwater Remediation Fee. The Outreach and Restoration Grant program provides funds for outreach projects that raise public awareness and engage citizens about challenges and solutions to restoring natural resources, such as green spaces, parks, streams, rivers, and bays. The grant program also provides funds for on-the-ground community-based restoration projects that benefit Charles County's rivers, streams, native plants, trees, and the Chesapeake Bay, as well as a combination of outreach and restoration for the maximum award of up to $70,000.

Outreach & Restoration Grants Status

Grants Awarded in FY 2022

Interfaith Partners for the Chesapeake: $7,605 – Accelerating Watershed Restoration with Faith-Based Action in Charles County.

Interfaith Partners for the Chesapeake (IPC) was awarded a grant to train twelve people from three congregations located in Charles County to become Faithful Green Leaders by hosting four outreach events in the region for congregations who are willing to learn about IPC and how to develop action plans for the eventual installation of restoration projects.

In FY 2022, IPC formed the Southern Maryland Interfaith Task Force as a network of congregations in the Calvert/Charles/St. Mary's County region. The task force held their first workshop in September at the American Chestnut Land Trust in Calvert County on the topic of pollinator gardens.

IPC also held the following four virtual Learning Labs which allowed IPC to connect with Charles County residents.

- January 2022: Cross-Cultural Collaboration and Communication
- February 2022 Watch Party: Finding your Green Team Vision
- March 2022: Let's Network! Experienced Green Leaders Can Support You
- April 2022: Watch Party: Alternatives to an Ark: Reducing Flood Damage

IPC connected with the Charles County Interfaith Council and members of the Jesus Christ Church of Latterday Saints in Charles County. Members from both these organizations attended two training webinars: one on how to build successful green team action plans; and a second training on how to maintain stormwater restoration projects.

IPC plans to continue their work in Charles County by coordinating with the County Interfaith Council and the Southern Maryland Interfaith Task Force towards establishing Faithful Green Leaders.

University of Maryland Environmental Finance Center: $26,842 – Connecting Charles County Residents with Resources for Proper BMP Maintenance.

The University of Maryland (UMD) – Environmental Finance Center (EFC) was awarded an outreach and restoration grant to educate homeowners about proper care and maintenance of raingardens and porous pavement. EFC began this effort by first developing an outreach and education plan designed to reach homeowners and Homeowners Associations (HOAs) who are responsible for the maintenance of their rain gardens and/or porous pavement. The Plan calls for two summits to be held in the spring of 2023 and will be designed to educate homeowners about the purpose of their raingardens and porous pavement and to connect with service providers that can assist them with their BMP maintenance needs.

During August, members of UMD and County staff toured a series of communities in the County utilizing stormwater management raingardens and porous pavement. The tour was led by a County Storm Water Inspector and included touring residential areas ranging in age from one to seven years and ranging in size from a single resident to major subdivisions. A variety of raingardens were observed including those installed by large landscaping companies and raingardens installed by small business. If residents were available, they discussed their concerns about their raingarden(s). The team recorded concerns and documented maintenance issues. The group also toured the Scotland Heights subdivision and examined the condition of porous pavement driveways and access roads.

EFC met with the property management company to review the maintenance plans for the existing porous pavement and to discuss the installation of an outdoor educational sign to be a focal point in the Scotland Heights community.

The team of UMD and County staff met with Charles County management to brainstorm on 1) how to improve the process of informing homeowners about BMPs; 2) how to inform home buyers earlier in the purchasing process; 3) how to provide clarity about inspection expectations to new homeowners; and 3) how to ensure disclosure of and educational information about BMPs during future property transfers (i.e., resales).

Plans for the 2023 spring homeowner summits were also discussed including promotion of the events and identifying stakeholders such as service providers, homebuilders, landscaping companies, real estate agents, native plant suppliers, Master Gardeners, Chesapeake Bay Landscape Professionals, and others. UMD EFC and UMD Extension office will continue working

with the County into FY 2023 on the summits and homeowner outreach. An update of these efforts will be included in next year's Annual Report.

Community Engagement and Restoration Mini Grant Status

Cobb Island Citizens Association: $4,885 – Invasive Plant Removal Using Goats

Under Mini Grant #20667, the Cobb Island Citizens' Association (CICA) was awarded a mini grant to eradicate invasive plants on Association-owned property while teaching the residents of Cobb Island about the environmental harm caused by invasive plants, the benefits of using goats to remove invasive plants, and how to prevent regrowth of invasives.

Prior to the goats arriving to the island, an information booth was set up for Cobb Island Day (June 4th, 2022). Informational sessions were held at the booth about why goats are a good partner in removing invasive plants and keeping them away, how to recognize invasive plants, the detrimental effect of invasives to native trees, and how trees contribute to the health of the Wicomico River and Neale Sound watersheds. Approximately 150-200 people stopped by the project booth including people of various ethnicities (including Black, Asian, and American Indian). Informational flyers, and posters were handed out and five copies of the book *Nadia the Wonder Goat* by Mary Bowen were raffled off (winners included five children). Sixteen people signed up to help with root removal. The public was also invited to come see the property and witness the problem with invasives before the goats arrive, and to watch the goats in action on June 20, 21, and 22. Approximately thirty people showed up to witness the goats were on site during the three days.

During the three days, the goats successfully consumed invasive species, especially vines that were threatening the health of native trees and plants. *Before* and *After* photos were taken. Prior to the goat's arrival, a vegetation removal permit was obtained from the County. The herd of goats was provided by Browsing Green Goats from Sunderland, Maryland: https://browsinggreengoats.com.

Volunteers were recruited for a follow-up cleanup day held on July 2nd to remove illegally dumped trash, pull up exposed invasive roots that the goats left at the surface, and to cut English Ivy vines that were girdling the trees (goats do not like to eat English Ivy).

The project was shared on the CICA Facebook page, and the Charles County Government created and posted a video about the project on the County's YouTube channel at https://youtu.be/BVQeZ6AfJIA .

CBT Sponsorship Program

Neighborhood Creative Arts Center (NCAC) Nature Fest 2022: $700 – To help cover costs for materials.

NatureFest 2022 was a collaborative effort of several organizations to educate children on the importance of watersheds for protecting wildlife and horticulture in Charles County. Educational activities at the festival helped children to develop skills for growing produce, recognizing and protecting native plants and animal life, maintaining bees, to cut down on waste, to recycle/upcycle, and to make others aware of why we need to protect our watershed resources.

NatureFest 2022 took place on Saturday, April 30th, at Tilghman Lake Park in La Plata. The festival was free of charge, and served 250 children with a large and diverse set of activities at the event. Nature-based kits were handed out to the children to complete at home.

"Who Polluted the Potomac?" and *"The Misadventures of Mr. McGregor"* puppet shows were shared throughout the day, as well as a petting zoo of chicks, goats, and a variety of small animals. Partnering organizations included the Charles County Master Gardeners, Southern Maryland Audubon Society, Nanjemoy Creek Environmental Education Center (NCEEC), Melwood Horticultural Training Center, Charles County Public Works, Rotary Interact Club, Charles County 4-H, Charles County Master Naturalists, and Deez L'Town Beez, Inc.

For more information about Nature Fest and the Neighborhood Creative Arts Center, please visit: https://www.neighborhoodcreativeartscenter.org/nature-fest .

Student Outreach

Virtual Career Days for Middle School

The WPRP continued outreach and education for students during FY 2022. Charles County Public Schools maintain a Virtual Career Day website that contains approximately 68 presentations from the community covering seven major career fields. The *Virtual Career Day* link (provided below) was distributed to approximately 5,500 middle school students and includes a presentation by WPRP staff in the Science & Technology category. The presentation teaches students basic watershed concepts; stormwater pollution sources; provides ideas on how to help protect their watershed; suggests volunteer opportunities; lists clubs to join; and gives advice on how to prepare for a career in watershed protection and restoration.

2022 Virtual Career Day Charles County Public Middle Schools

Charles County Fair & Youth Day

WPRP staff also reached out to students who attended the 2022 Annual Charles County Fair. Staff presented the EnviroScape Watershed Model demonstration to more than forty students on ***Youth Day***, a Friday when public schools were closed for both students and teachers. The stormwater/watershed demonstration taught basic watershed concepts such as stormwater runoff, nonpoint source pollution, common sources of pollution, and how to help stop pollution to County waterways. Several educational materials and event notices were handed out to school age children, high schoolers, college students, and adult residents of Charles County.

Charles County 4-H Club

Nurture Natives: A Youth-Led Service Project

In late 2021, NCAC, Charles County 4-H, and Charles County Master Gardeners were awarded a grant to train teen pollinator ambassadors. As part of that project, 18 teen ambassadors learned about the importance of pollinators, challenges they face, and ways they can be supported. Teens used that knowledge to develop fun, interactive activities to teach younger children and adults about pollinators at schools, camps, and outreach events. Through their efforts a total of 665 people; 447 youth and 218 adults learned about pollination.

Three of those ambassadors, Esther Bonney, Samantha Rutherford, and Abigail Bonney continued on to attend the national 4-H Agri-Science Youth Summit in March, 2022. There they

were challenged to develop a project that would use their new knowledge to address an agricultural issue within their community. The girls decided to launch the Nurture Natives initiative. Their issue: invasive trees that displace local farmland and attract invasive species in the Chesapeake Bay watershed. Their solutions: 1) Inspire youth to take action through educational programs, 2) Increase the number of native trees and pollinators within our community by hosting a native tree giveaway, and 3) Encourage customers to make educated purchases by providing local nurseries with *Nurture Natives Guide: A Guide to Invasive Species and their Native Look-Alikes*. The guide discusses invasive and native plants found in Maryland but can be used as a reference for the whole MidAtlantic region, including Virginia, Delaware, New Jersey, New York, Pennsylvania, and the District of Columbia.

A copy of the Guide is available to the public:
https://extension.umd.edu/sites/extension.umd.edu/files/2022-10/Nurture%20Natives%20Guide-Final.pdf

Nurture Natives was selected by the National 4-H Council as one of twelve in the "lead to change" projects nationwide to receive $2,000. With a portion of their award, they purchased 150 native trees and shrubs through *Butterfly Alley*—a local native plant stand located in Hollywood, Maryland. Esther worked with *Butterfly Alley* to select and order the trees/shrubs in the spring, then drove to *Environmental Concerns* on the Eastern Shore to pick them up just days before the event.

On Saturday, October 15, with the assistance of the Charles County Master Gardeners, 150 trees and shrubs were unloaded and organized for distribution. Approximately 65 families came through to pick up their trees and get expert advice from Master Gardeners. Attendees also enjoyed other family-oriented activities. Children were able to play pollinator games organized by Charles County 4-H, create collages and mobiles from natural items collected around the park, visit Abigail at the honey-tasting station, and speak to Samantha about honeybees and beekeeping. Watch the award-winning students describe their projects at https://youtu.be/izqPgAZFseI

Septic System Maintenance Incentives, Outreach & Education

Septic Pump-Out/Riser Reimbursement Program

The Septic Pump-Out Reimbursement Program was initiated in 2015 as an incentive program to encourage homeowners to change their behavior by either getting their septic tank pumped for the first time and/or to pump their tank more frequently (once every three to five years). For over eight years the program has been reimbursing approved septic system owners between $100 to $182.50 for a pump-out. On average, the County has approved 850 pump-out reimbursements per year with a primary goal to have most septic tanks pumped regularly, at least once every five years. This frequency is the minimum standard for optimum performance to prevent leachate from seeping into surface water, breakage, or drain field failures.

Table 27: Septic Program Reimbursements

Fiscal Year	# of Pump-Outs	# of Risers
2015	832	-
2016	783	-
2017	606	-
2018	760	-
2019	779	36
2020	948	142
2021	1238	215
2022	857	207

Charles County has an estimated 25,500 homes that utilize a private septic system, indicating the five-year pumping goal is reached when 5,100 tanks are pumped per year. Using FY 2021 data, there were approximately 1,240 reimbursed and 500 non-reimbursed pump-outs, or 1,740 total. Even though the number is higher than previous years, the program goal (5,500 pump-outs per year) has been falling short by approximately 3,360 pump-outs each year. Data from the Mattawoman WWTP for FY 2022 shows that the number of pump-outs conducted in the County fell to FY 2015 levels, when the pump-out program was initiated.

Based on the findings of a recent cost effectiveness analysis, WPRP staff will be recommending that the Septic Tank Pump-Out Reimbursement Program be brought to a close. Staff recommends however that the Septic Tank Riser Installation Reimbursement Program continue since risers are a better investment (a one-time purchase that provides permanent access to septic tanks necessary for conducting inspections, pump-outs, cleanings, and repairs). Risers are a considerably better educational tool as well. They serve as a visual, above-ground reminder to homeowners to get routine maintenance. Since 2019, approximately 600 riser rebates have been issued, with potential for an additional 25,000.

WPRP staff, with help from the Charles County Extension Office, the Health Department, and the County's Media Services will continue to draw attention to the issue of septic system maintenance by promoting to homeowners to have their septic system inspected and cleaned regularly.

UMD Webinars

In 2022, the UMD Extension education staff conducted their live series, *Wednesday Water Webinar.* The series taught proper septic system care and maintenance and why it is important. Webinars were virtual, held on the third Wednesday of the month, and included questions and answers with the instructor. Lesson titles included:

- Warning Signs That a Septic System Is Not Working Effectively
- Top Things to Know about Septic Systems
- Prolonging the Life of Your Septic System

The workshops were well attended (107 residents attended septic related webinars). All webinars were taught by Dr. Andrew Lazur through Zoom and recorded. The recordings were uploaded to https://extension.umd.edu/resource/wednesday-water-webinars-recorded and https://www.youtube.com/playlist?list=PLlYVlIyavc0sIbpBtYtRy-IS_W4QDbFFs . Several septic system owners were referred to the webinars and recordings by WPRP staff.

Bay Restoration Fund (BRF) Grant Program:

The BRF is a State-supported fund that replaces conventional septic tanks with nitrogen-reducing units or connects existing dwellings to sewer treatment utility. For low-income

households, BRF funding can be used to replace a failing septic system. The program's purpose has been to reduce the amount of harmful nutrients entering the Chesapeake Bay and its tributaries from failing septic systems.

Public information on how to apply for a Bay Restoration Fund Grant continues to be available on the Charles County Health Department website at https://CharlesCountyhealth.org/percolation-sewage-bay-restoration/ and the Charles County Government website at https://www.CharlesCountyMD.gov/government/planning-and-growth-management/septic-system-reimbursement-programs.

MDE's Water and Wastewater Permitting Requirements and Guidance for the Regulated Community

The County provides the following information regarding NPDES permitting requirements, pollution prevention plan development, proper housekeeping and spill prevention and response, upon request and to violators or potential violators of the County's IDDE regulations:

Maryland Wastewater Permits Program
https://mde.state.md.us/programs/Water/wwp/Pages/index.aspx

https://mde.maryland.gov/programs/LAND/Documents/EPA%20Sector%20P%20Transportation%20Facilities%20Fact%20Sheet%2012.2006%2011%20pgs.pdf

Maryland Water Permit Applications
https://mde.maryland.gov/programs/Permits/WaterManagementPermits/Pages/waterpermits.aspx

Maryland NPDES Industrial & General Surface Water Discharge Permits
http://www.mde.state.md.us/programs/Water/wwp/Pages/IndustrialSurfaceDischargePermits.aspx

Maryland Guidance for Developing Your Storm Water Pollution Prevention Plan
http://mde.maryland.gov/programs/Permits/WaterManagementPermits/Documents/Marina%20GP/16MA/16MA%20MDE%20SWPPP%20Guidance%20for%20Marinas.pdf

Maryland Stormwater Pollution Prevention Guidance
https://mde.maryland.gov/programs/Permits/WaterManagementPermits/Documents/GDP%20Stormwater/MD%20Stormwater%20Hotspots.pdf

Maryland General Permit for the Discharge of Exterior Vehicle Washwater to Groundwater from Commercial Vehicle Washing Operations
https://mde.maryland.gov/programs/Water/wwp/Documents/GENERAL_VW_PERMIT_FINAL_sig.pdf

Maryland Spill Response - Toll Free Number (866) 633-4686
http://mde.maryland.gov/programs/Crossmedia/EmergencyResponse/Pages/ERHome.aspx

In FY 2022, the following contacts continued to be made available to government personnel and the public:

County & State Agency Contacts for Reporting Discharges
Unrelated to Stormwater/Storm Drain System*

Sewage
Department of Public Works Utilities – Operations Support
301-609-7400
(24 hours/day, 7 days /week)

Septic Systems
Charles County Health Department
301-609-6900

Salt Storage,
Sediment & Erosion Control Failure,
Charles County, PGM – Codes, Permits and Inspections Services (CPIS)
301-645-0622
301-645-0692

Industrial
Maryland Department of the Environment (MDE)
Water Management Administration, Compliance Program
410-537-3510 (regular business hours)
866-633-4686 (emergencies, after hours)

Hazardous Material
Charles County Hazardous Material Team
Emergency Management
301-609-3429
301-609-3430
Safety Emergency: 911

Town of La Plata
301-934-8421
301-932-3870

Town of Indian Head
301-743-5511
301-753-6633

State Highway Administration
1-800-543-2515 or locally at 410-582-5650

Maryland Department of Transportation
410-865-1000

*** Related to Stormwater/Storm Drain System**
Charles County, PGM – Codes, Permits and Inspections Services (CPIS)
301-645-0622
301-645-0692

MDE: 866-633-4686 (environmental emergencies, after hours)
mde.wsacompliance@maryland.gov

Public Outreach and Participation Summary

Outreach and participation totals for FY 2022 are summarized on the next page.

Table 28: Public Outreach and Participation Summaries in FY 2022

Workshops & Events		
Type	Events	Attendance
Workshops/Trainings	11	247
Watershed Events	4	182
Public Works Events	156	3,700
TOTAL	**171**	**4,129**

County Commissioners	
Public Meetings	5
Hearings	2

Illicit Discharges Reported By	
Inspectors	Public
61	**34**

Septic Tank Pump-Out/Risers Installation Reimbursement Participants	**1,064**

Student Outreach	
Virtual Career Day	Presentation available to 5,500 Middle School Students
County Fair Youth Day	Watershed Demonstration to 40 students
Nature Fest	Watersheds, Wildlife and Horticulture Festival for 250 children
Charles County 4-H	Nurture Natives Initiative taught 447 youth

Website Unique Views	
Watershed/Stormwater	6,579
Pollution Prevention	22,175

Social Media	
YouTube	4,830 subscribers
Facebook	18,000 subscribers
Twitter	5,714 followers

Public Service Announcements	
Media	**Impressions**
Television	267,862
Streaming	147,058
Internet/Digital	131,267
Movie Theater	10,979 plays
Radio	283 spots
TOTAL	557,449

IV.E. Restoration Plans and Total Maximum Daily Loads

Overview of Permit Conditions

1. Watershed Assessments

a. By the end of the permit term, Charles County shall complete detailed watershed assessments for the entire County. Watershed assessments conducted during previous permit cycles may be used to comply with the requirement provided the assessments include all of the items listed in Part IV.E.1.b. below. Assessments shall be performed at an appropriate watershed scale (e.g., Maryland's hierarchical eight- or twelve-digit sub-basins) and be based on MDE's TMDL analysis or equivalent and comparable County water quality analysis;

b. Watershed assessments by the County shall:

i. Determine current water quality conditions;
ii. Include the results of a visual watershed inspection;
iii. Identify and rank water quality problems;
iv. Prioritize all structural and nonstructural water quality improvement projects; and
v. Specify pollutant load reduction benchmarks and deadlines that demonstrate progress toward meeting all applicable stormwater WLAs.

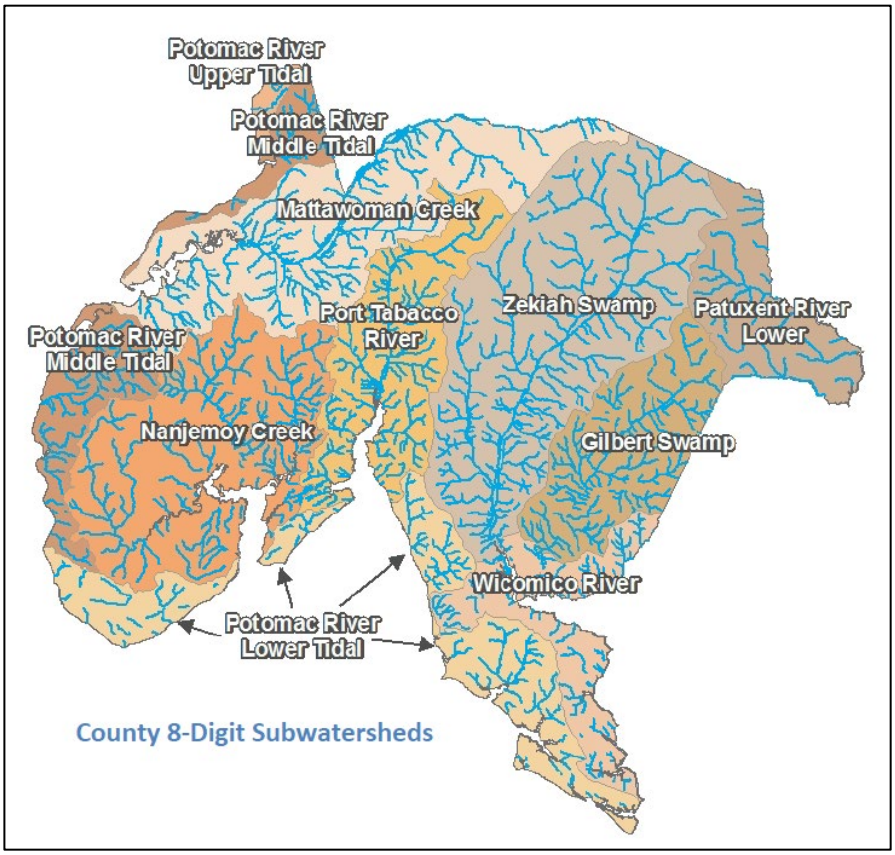
FY 2022 Status

Watershed Assessments Summary

Charles County contracted KCI Technologies, Inc. to complete watershed assessments for each of the County's watersheds. Watershed assessments were initiated in the summer of 2014, just prior to the County's new permit term which began in December 2014 and were completed and submitted to MDE by July 2018. A single watershed, or multiple watersheds were assessed each year as shown in the following table.

Watersheds	Watershed Assessment Status
Port Tobacco River	Completed September 2015; submitted to MDE June 2016
Mattawoman Creek, Patuxent River Lower	Completed June 2016; submitted to MDE June 2016
Gilbert Swamp, Zekiah Swamp, and Wicomico River	Completed May 2018; submitted to MDE July 2018
Potomac River Upper Tidal, Potomac River Middle Tidal, Potomac River Lower Tidal, and Nanjemoy Creek	Completed May 2018; submitted to MDE July 2018

All plans were completed, presented at public meetings, and made available for 30-day public review and comment periods. Any comments received were addressed in revisions to the assessment reports and documented in an appendix of each report. The full assessment reports can be viewed on the Charles County Government website: https://www.charlescountymd.gov/government/planning-and-growth-management/stormwater-management/watershed-assessments



Watershed Assessment Methods

The goals of each of the assessments are to meet the County's permit requirements under Section III.E.1.b. Assessments document the current conditions of the watershed, identify issues, and identify and prioritize water quality improvements. The assessments include anticipated implementation costs and calculations of pollutant loading reduction and impervious surface treatment that would be expected from implementation of the recommended projects and programs.

The assessments include the following field and desktop assessments.

- Neighborhood Source Assessment
- Hotspot Site Investigations
- Nutrient Synoptic Sampling
- Stream Corridor Assessment

Results of the desktop and field watershed assessments were compiled and the results analyzed to determine appropriate restoration measures. Structural and non-structural practices and programs

suggested include:

- Stream restoration
- Shoreline erosion control
- Stormwater BMPs (swales, step pool stormwater conveyance, bioretention, wet pond)
- Reforestation
- Environmental site design
- Street sweeping
- Inlet cleaning
- Trash clean-up
- Homeowner practices (rain barrels, rain gardens, downspout disconnect)

Lastly, projects are prioritized for implementation by scoring each project on a series of metrics including project benefits, project constraints, and project costs. Each project was ranked based on the total score and a final prioritization was determined to aid the County's planning process of project implementation.

Calculated and modeled estimates of impervious surface treatment and SW-WLA (Bay and local) reductions were developed for each of the watersheds for each pollutant.

Watershed Assessment Results

The following briefly describes the findings of the completed studies.

Port Tobacco River Watershed

The Port Tobacco Watershed Assessment was completed in September of 2015. A summary of the assessment was included in the County's FY 2015 NPDES MS4 Annual Report and was attached as Appendix J.

The Port Tobacco study resulted in 15 neighborhood assessments, 26 hotspot investigations, 47 synoptic water quality sampling sites, and eight miles of stream corridor assessments in 11 separate reaches. A number of potential projects were identified including eight stream restoration projects, one shoreline erosion control project, six tree planting projects, and 13 SWM projects including dry swales, SPSC, bioretention and wet pond retrofits. These projects were combined with 15 additional projects identified through Charles County's impervious surface treatment site selection efforts, and with homeowner practices and operational programs to determine the full scope of treatment potential identified for the watershed. Cost estimates and anticipated load reductions for each project were calculated.

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Port Tobacco River Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)		
				TN	TP	TSS
Stream Restoration	$12,106,005	$15,450,641	18,769 LF	1,407.7	1,483.2	327,180.0
Shoreline Erosion Control	$753,920	$753,920	2,432 LF	182.4	165.4	333,184.0
Stormwater Management BMPs	$6,820,541	$8,657,261	28 projects	6,373.2	688.3	192,436.6
Reforestation	$904,478	$1,567,954	6 sites	310.1	19.6	2,862.0
Street Sweeping	$564	$11,273	4.6 miles	12.3	4.9	1,478.4
Inlet Cleaning	$2,990	$59,800	115 inlets	53.3	21.3	6,394.8
Trash Cleanups	$7,000	$7,000	7 sites	N/A	N/A	N/A
Homeowner Practices	$2,129,216	$2,129,216	N/A	161.4	34.3	N/A
Septic Practices	$71,500	$689,000	133 sites	0.0	0.0	0.0
Total	**$22,796,214**	**$29,326,065**	**N/A**	8,500.40	2,417.00	863,535.80

Port Tobacco River Impervious Accounting

Impervious Accounting	Port Tobacco River
Baseline Impervious Treatment	
Port Tobacco Impervious Estimate*	1,030.8 acres
Impervious Treated	384.7 acres
Impervious Treated Percent	37%
Impervious Untreated	646.1 acres
Impervious Untreated Percent	63%
Potential Impervious Treatment	
Operational Practices	7.5 acres
Septic Pump Outs	3.9 acres
Septic Upgrades	0.5 acres
Homeowner Practices	81.4 acres
Structural Practices	374.4 acres
Vista Retrofit Projects	196.2 acres
Total Potential Impervious Treatment	**663.8 acres**
Summary of Projected Progress	
Impervious Untreated	646.1 acres
Total Potential Impervious Treatment	663.8 acres
Percent of Untreated Impervious Treated (Port Tobacco Only)	**103%**

*Impervious acres include County and private lands outside the Town of LaPlata, and is based on 2011 aerial photos.

Mattawoman Creek Watershed Assessment

The Mattawoman Creek Watershed Assessment was completed in June of 2016 and submitted to MDE for their review. The full report was included as Appendix H of the FY 2016 NPDES MS4 Annual Report.

The Mattawoman study included 10 neighborhood assessments, 21 hotspot investigations, and synoptic water quality sampling at 51 sites located throughout the watershed. During the stream corridor assessment, which covered 6.3 miles of stream, field teams collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions. Following data analysis and re-visits to several sites, potential projects were identified in several categories including, five stream restoration projects, 21 tree planting projects, and 18 SWM projects including SPSC, created wetlands, bioretention, wet ponds, and infiltration basins. These newly identified project opportunities were combined with projects identified through parallel County efforts to determine the full potential of treatment identified to date.

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Mattawoman Creek Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)		
				TN	TP	TSS
Stream Restoration	$6,730,142	$8,589,540	10,037 LF	662.9	564.8	124,585.7
Stormwater Management BMPs	$27,258,837	$32,572,910	79 projects	11,519.7	2,410.6	864,212.8
Reforestation	$340,310	$589,942	21 sites	116.7	7.6	1,344.8
Street Sweeping	$27,837	$556,749	100.7 miles	1,281.0	512.4	153,720.0
Inlet Cleaning	$69,199	$1,383,984	183 inlets	93.5	37.4	11,224
Trash Cleanups	$7,000		7 sites	N/A	N/A	N/A
Homeowner Practices	$1,675,674		N/A	123.6	26.6	N/A
Septic Practices	$222,279	$370,325	199 sites	0.0	0.0	0.0
Total	**$36,331,278**	**$44,063,450**	**N/A**	13,797.4	3,559.4	1,155,087.3

Mattawoman Creek Impervious Accounting

Impervious Accounting	Mattawoman Creek
Baseline Impervious Treatment	
Impervious Estimate*	3,326.4 acres
Impervious Treated	1,157.3 acres
Impervious Treated Percent	35%
Impervious Untreated	2,169.1 acres
Impervious Untreated Percent	65%
Potential Impervious Treatment	
Operational Practices	157.1 acres
Septic Connections	7.4 acres
Septic Pump Outs	4.9 acres
Septic Upgrades	4.4 acres
Homeowner Practices	39.2 acres
Structural Practices	135.0 acres
Vista Retrofit Practices	456.4 acres
GMB Structural Practices	56.5 acres
Total Potential Impervious Treatment	**860.9 acres**
Summary of Projected Progress	
Impervious Untreated	2,169.1 acres
Total Potential Impervious Treatment	**860.9 acres**
Percent of Untreated Impervious Treated	**40%**

*Impervious acres include County and private lands outside the Town of LaPlata and is based on 2011 aerial photos.

Lower Patuxent River Watershed

The Lower Patuxent River assessment was completed in June of 2016 and submitted to MDE for their review. The full report was included as Appendix I of the FY 2016 NPDES MS4 Annual Report.

The Lower Patuxent assessment included 4 neighborhood assessments, 1 hotspot investigation, and synoptic water quality sampling at 14 sites located throughout the watershed. During the stream corridor assessment, which covered 1.5 miles of stream, field teams collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions. Following data analysis and re-visits to several sites, potential projects were identified in several categories including, one stream restoration projects and three SWM projects including Filterra and bioretention projects. These newly identified project opportunities were combined with projects identified through parallel County efforts including a bioretention project, two shoreline stabilization projects, one tree planting project and homeowner/operation strategies to determine the full potential of treatment identified to date.

The following tables provide cost estimates and the impervious treatment achieved by planned strategies described above.

Cost Estimate and Load Reduction by Project Type in Lower Patuxent River Watershed

Project Type	Total Initial Cost	Total Cost Over 20 Years	Quantity	Load Reduction (lbs/year)			
				TN	TP	TSS	Bacteria
Stream Restoration	$2,220,433	$2,833,892	3,443 LF	258.2	234.1	51,638.0	
Shoreline Erosion Control	$2,108,438	$2,530,125	3,466 LF	260.0	235.7	474,842.0	
Stormwater Management BMPs	$138,945	$164,586	3 projects	13.70	1.50	256.90	
Reforestation	$175,000	$42,905	1 sites	6	2	0.5	
Homeowner Practices	$855,914		N/A	60.8	13	N/A	
Septic Practices	$312,000	$277,130	132 sites	0.0	0.0	0.0	
Pet Waste	$5,000	Variable					30 bn MPN/day
Total	**$5,640,676**	**$5,848,638**	**N/A**	598.7	486.3	526,737.4	30 bn MPN/day

Lower Patuxent River Impervious Accounting

Impervious Accounting	Lower Patuxent River
Baseline Impervious Treatment	
Impervious Estimate	536.0 acres
Impervious Treated	207.4 acres
Impervious Treated Percent	39%
Impervious Untreated	328.6 acres
Impervious Untreated Percent	61%
Potential Impervious Treatment	
Operational Practices	0.0 acres
Septic Connections	0.0 acres
Septic Pump Outs	3.6 acres
Septic Upgrades	6.2 acres
Homeowner Practices	19.9 acres
Structural Practices	36.70 acres
Vista Retrofit Practices	0.0 acres
BayLand Structural Practices	140.6 acres
GMB Structural Practices	0.0 acres
Total Potential Impervious Treatment	**207.0 acres**
Summary of Projected Progress	
Impervious Untreated	328.6 acres
Total Potential Impervious Treatment	207.0 acres
Percent of Untreated Impervious Treated	**63%**

*Impervious acres include County and private lands outside the Town of LaPlata and is based on 2011 aerial photos.

Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Assessments

The Gilbert Swamp, Zekiah Swamp, and Wicomico River watershed assessments were conducted Spring 2016 through Fall 2016 and the final reports were submitted to MDE in July 2018.

Field and desktop assessments were performed similarly to previous assessments. The neighborhood source assessments were conducted at 11 neighborhoods located throughout the three watersheds and a total of 20 hotspot investigations were conducted. Synoptic water quality sampling took place at 96 sites and stream corridor assessment was completed for approximately 8 miles of streams. During the stream corridor assessment, the field team collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions.

The desktop and field assessments resulted in the identification of potential restoration projects which were revisited in the field to determine feasibility. The following table presents the number and type of projects identified in each watershed.

Projects Identified During the Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Assessments

Project Type	Gilbert Swamp	Zekiah Swamp	Wicomico River
Stream restoration	5	1	1
Stormwater BMPs (includes bioretention, dry swale, SPSC)	5	7	3
Tree Plantings	3	8	1
Trash Cleanup Sites	2	6	2
Rain Barrels and Rain Gardens- # Neighborhoods	4	5	2

The following tables provide a cost estimate and the impervious treatment achieved by planned strategies described above.

Gilbert Swamp, Zekiah Swamp, and Wicomico River Watershed Impervious Accounting

Impervious Accounting	Gilbert	Zekiah	Wicomico
Baseline Impervious Treatment*			
Total Impervious Area	998.4 acres	3,783.7 acres	387.4 acres
Impervious Treated	113.4 acres	718.7 acres	32.5 acres
Impervious Treated Percent	21%	27%	20%
Impervious Untreated	439.5 acres	1,932.3 acres	132.6 acres
Impervious Untreated Percent	79%	73%	80%
Potential Impervious Treatment			
Total Potential Impervious Treatment	**157.0 acres**	**723.2 acres**	**66.4 acres**
Summary of Projected Progress			
Impervious Untreated	439.5 acres	1,932.3 acres	132.6 acres

FY17 Progress – Impervious Treatment	9.8 acres	116.2 acres	105.9 acres
Potential Impervious Treatment	157.0 acres	723.2 acres	66.4 acres
Total Progress and Potential Treatment	166.8 acres	839.4 acres	172.3 acres
Percent of Untreated Impervious Treated	**38%**	**43%**	**130%**

*Impervious acres based on 2011 aerials photos (Vista, 2017).

Cost Estimate by Project Type and Level - Gilbert Swamp, Zekiah Swamp, and Wicomico River Watersheds

	Total Initial Cost		
Project Type	**Gilbert**	**Zekiah**	**Wicomico**
Level 9- Projects from watershed assessments	$6,167,154	$1,825,290	$3,304,133
Stream Restoration	$5,967,540	$544,380	$2,974,740
Stormwater Management	$152,514	$1,042,480	$321,893
Reforestation	$45,100	$232,430	$5,500
Trash Cleanups	$2,000	$6,000	$2,000
Level 2- In Construction as of FY 2016	$0	$0	$0
Level 3- Full Design as of FY 2016	$0	$898,320	$0
Level 5-11- Concept as of FY 2016	$3,354,000	$7,633,030	$178,758
Street Sweeping	$0	$53,743	$1,730
Inlet Cleaning	$0	$15,504	$0
Homeowner Practices	$685,180	$1,353,260	$34,504
Septic Practices	$55,089	$139,689	$90,667
Total	**$10,261,423**	**$11,020,516**	**$3,609,792**

Nanjemoy Creek and Potomac River Upper, Middle and Lower Watershed Assessments

There are no local SW-WLA assigned to Charles County for the Nanjemoy Creek or Potomac River watersheds, however these watersheds are included in the SW-WLA assigned to Charles County for the Chesapeake Bay TMDL for nutrients and sediment. The Nanjemoy Creek and Potomac River Upper, Middle, and Lower watershed assessments were conducted Spring 2017 through Fall 2017 and the final reports were submitted to MDE in July 2018.

Field and desktop assessments were performed similarly to previous assessments. The neighborhood source assessments were conducted at 19 neighborhoods located throughout the four watersheds and a total of 23 hotspot investigations were conducted. Synoptic water quality sampling took place at 97 sites and stream corridor assessment was completed for approximately 9 miles of streams. During the stream corridor assessment, the field team collected information on channel alteration, erosion, exposed utility pipes, drainage pipe outfalls, fish barriers, inadequate buffers, construction in or near the stream, trash dumping, and recorded any unusual conditions.

The tables below show the impervious treatment achieved by planned strategies and present cost information associated with these planned practices.

Nanjemoy Creek and Potomac River Watershed Impervious Accounting

Impervious Accounting	Nanjemoy Creek	Potomac Lower	Potomac Middle	Potomac Upper
Baseline Impervious Treatment*				
Total Impervious Area	903.3 acres	945.2 acres	621.5 acres	48.1 acres
Impervious Treated	109.2 acres	78.5 acres	63.9 acres	5.6 acres
Impervious Treated Percent	21%	18%	22%	16%
Impervious Untreated	413.7 acres	365.3 acres	222.4 acres	29.2 acres
Impervious Untreated Percent	79%	82%	78%	84%
Potential Impervious Treatment				
Total Potential Impervious Treatment	**222.2 acres**	**82.0 acres**	**0.0 acres**	**0.0 acres**
Summary of Projected Progress				
Impervious Untreated	413.7 acres	365.3 acres	222.4 acres	29.2 acres
FY17 Progress-Impervious Treatment	95.5 acres	553.7 acres	28.2 acres	66.4 acres
Potential Impervious Treatment	222.2 acres	353.6 acres	86.0 acres	3.2 acres
Total Progress and Potential Treatment	317.7 acres	907.3 acres	114.2 acres	69.6 acres
Percent of Untreated Impervious Treated	**77%**	**100%**	**51%**	**100%**

*Impervious acres based on 2011 aerials photos (Vista, 2017).

Cost Estimate by Project Type and Level - Nanjemoy Creek and Potomac River Watersheds

	Total Initial Cost	
Project Type	**Nanjemoy**	**Potomac**
Level 9- Projects from watershed assessments	$574,270	$8,228,610
Stream Restoration	$64,500	$5,141,295
Stormwater Management	$410,770	$1,999,015
Reforestation	$99,000	$168,300
Shoreline Erosion Control	$0	$920,000
Level 2- In Construction	$0	$0
Level 3- Full Design	$0	$1,763,310
Level 5-8- Concept	$931,858	$4,807,156
Street Sweeping	$0	$5,750
Inlet Cleaning	$0	$0
Homeowner Practices	$689,848	$1,701,566
Septic Practices	$ 228,830	$691,054
Total	**$2,424,806**	**$17,197,446**

Overview of Permit Conditions

2. Restoration Plans

a. Within one year of permit issuance, Charles County shall submit an impervious surface area assessment consistent with the methods described in the MDE document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, June 2011 or subsequent versions). Upon approval by MDE, this impervious surface area assessment shall serve as the baseline for the restoration efforts required for this permit.

By the end of the permit term, Charles County shall commence and complete the implementation of restoration efforts for twenty percent of the County's impervious surface are consistent with the methodology described in the MDE document cited in Part IV.E.2.a. that has not already been restored to the MEP. Equivalent acres restored of impervious surfaces, through new retrofits or the retrofit of pre-2002 structural BMPs, shall be based upon the treatment of the WQv criteria and associated list of practices defined in the 2000 Maryland Stormwater Design Manual. For alternate BMPs, the basis for calculation of equivalent impervious acres restored is based upon the pollutant loads from forested cover.

FY 2022 Status

Restoration projects as required by this permit condition have been completed and are listed in the County's Final Impervious Surface Restoration Analysis, attached as Appendix A in the County's FY 2020 MS4 Annual Report. Restoration percentage goals are based on the impervious area baseline for restoration 7,887 acres as approved by MDE in 2018.

Progress accomplished as of FY 2020 to the meet the 20% restoration requirement needs to be maintained and if a project cannot be maintained, a substitution with other projects of equal credit must occur. This section of the report will track any substitutions. Additionally, ongoing restoration projects to achieve new goals are described in this section and quantified in Table 29.

The following changes occurred in FY 2021 affecting restoration project selection and prioritization:

1) MDE's 2021 *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* which includes new bmps, new bmp criteria, new incentives, and new credit calculations,
2) Chesapeake Bay Model Phase 6, which is the basis for MDE transitioning project load reduction tracking to spreadsheet models referred to as the TMDL Implementation Progress and Planning Tool (TIPP), and
3) Installation of Resilience Authority of Charles County, prioritizing urban nuisance flooding.

The Resilience Authority of Charles County is a non-profit, government instrumentality financing organization, that will undertake and support resilience infrastructure projects that mitigate and adapt to the effects of climate change by offering a range of financing structures that leverage public and private investment. It is expected that by the Resilience Authority's focus on urban nuisance flooding that many projects will be identified with co-benefits for the MS4 permit.

Following are descriptions of the County's impervious surface restoration projects that will count towards new restoration goals, which are anticipated to be established under the County's next MS4 permit. The restoration progress is summarized in Table 29.

Capital Projects Complete or Under Construction

Apple Creek Stream Restoration
(County Permit # VCI 160055)

Design completed May 2019.
Construction began July 2019.

Impervious Treatment: 18.02 acres

Approx. cost per acre treated: $45,325

Status: Construction Complete March 2020

LaPlata High School Stormwater Retrofit
(County Permit # N/A)

Design completed May 2018.
Construction began May 2019.

Impervious Treatment: 29 acres

Approx. cost per acre treated: $27,368

Status: Construction Complete May 2020

St. Charles Parkway Stream Restoration
(County Permit # VCI 170053)

Design completed August 2019.
Construction began December 2019.

Impervious Treatment: 7.1 acres

Approx. cost per acre treated: $115,521

Status: Construction Completed June 2020

Thomas Higdon ES Stream Restoration
(County Permit # VCI 170071)

Design completed August 2019.
Construction began December 2019.

Impervious Treatment: 50 acres

Approx. cost per acre treated: $21,768

Status: Construction Complete June 2020

Potomac Heights Shoreline Restoration
(County Permit # VCI 180003)

Design completed September 2019.
Construction began November 2019.

Impervious Treatment: 70.2 acres

Approx. cost per acre treated: $21,621

Status: Construction Complete June 2020

Cliffton Shoreline Stabilization Phase 1&2
(County Permit # VCI 160056 Phase1)
(County Permit # VCI 170096 Phase2)

Design completed August 2017 Phase 1.
Design completed May 2019 Phase 2.
Construction began July 2019.

Impervious Treatment: 82 .16 acres Phase 1
Impervious Treatment : 92.72 acres Phase 2

Approx. cost per acre treated: $17,437

Status: Construction Complete July 2020

General Smallwood Middle School
(County Permit # VCI 170032)

Design completed February 2019.
Construction began May 2019.

Impervious Treatment: 4.64 acres

Approx. cost per acre treated: $108,814

Status: Construction Complete September 2020

Bensville Park Stormwater Retrofits and Tree Planting
(County Permit # VCI 170079)

Design completed September 2018
Construction began May 2019.

Impervious Treatment: 7.93 acres

Approx. cost per acre treated: $54,105

Status: Construction Complete November 2020

Best Buy Stormwater Pond Retrofit
(County Permit # DSP 190036)

Design completed April 2019.
Construction began June 2020

Impervious Treatment: 4.62 acres

Approx. cost per acre treated: $70,671

Status: Construction Complete May 2021

Cedar Tree Stormwater Pond Retrofit
(County Permit # DSP 190047)

Design completed April 2019.
Construction began June 2020

Impervious Treatment: 3.61 acres

Approx. cost per acre treated: $51,271

Status: Construction Complete June 2021

Ruth B. Swann Main Channel Stream Restoration
(County Permit # DSP 190020)

Design completed September 2019
Construction began December 2020

Impervious Treatment: 106.07 acres

Approx. cost per acre treated: $12,750

Status: Construction Ongoing

Hunt Club/Bridle Path Stream Restoration

(County Permit # DSP 190022)

Design completed July 2019
Construction began November 2021

Impervious Treatment: 73.28 acres

Approx. cost per acre treated: $14,260

Status: Construction Ongoing

Marbella Subdivision Stream Restoration and Outfall Stabilizations
(County Permit # DSP 190107)

Design completed July 2021
Construction start date TBD

Impervious Treatment: 63.5 acres

Approx. cost per acre treated: $40,760

Status: Prepararing Bid Documents

CSM Tributary Stream Restoration
(County Permit # DSP 190030)

Design completed May 2020
Construction began March 2022

Impervious Treatment: 53.5 acres

Approx. cost per acre treated: $23,750

Status: Construction Ongoing

Acton Village/Westdale Drive Stream Restoration
(County Permit # DSP # 200027)

Design completed October 2022
Construction began October 2022

Impervious Treatment: 10.91 acres

Approx. cost per acre treated: $84,150

Status: Construction Ongoing

Ruth B. Swann Tributary Restoration
(County Permit # DSP 190051)

Design Completed July 2021
Construction began June 2022

Impervious Treatment: 19.38 acres

Approx. cost per acre treated: $54,330

Status: Construction Ongoing

Ruth B. Swann Upper Stream Restoration
(County Permit # DSP 190080)

Design Completed August 2022
Construction began October 2022

Impervious Treatment: 78.1 acres

Approx. cost per acre treated: $21,738

Status: Construction Ongoing

Capital Projects under Design & Estimated Impervious Acres to be Treated

The following impervious acres are taken from the most recent engineered drawings or concepts and are subject to change based on final approved engineered drawings.

Board of Education Projects (Subtotal: 71.6 Acres)
Milton Somers Middle School Steam Restoration and Stormwater Pond Retrofit (Town of LaPlata Permit) – 39.4 Impervious Acres
Mitchell Elementary School Outfall Stabilization, Stream Restoration and Bioretention (County Permit # DSP 200029) – 32.2 Impervious Acres

Stream Restoration Projects (Subtotal: 259.15 Acres)
Port Tobacco Stream Upper/Lower (County Permit # DSP 200035) – 84.6 Impervious Acres
Locust Grove Farm Stream (County Permit # CSD Concept) – 16.45 Impervious Acres
Oak Ridge Park Western Stream (County Permit # DSP 200025) – 120.72 Impervious Acres
Oak Ridge Park Eastern Stream – 18 Impervious Acres

Stormwater Management Facilities/ Step Pool Conveyance Projects (Subtotal: 85.31 Acres)
South Hampton Pond Retrofits & Step Pool Conveyance (County Permits # DSP 190073-76) – 37.4 Impervious Acres
White Plains Golf Course Pond Retrofit (County Permit # DSP 190097) – 16.66 Impervious Acres
White Oak Drive SWM Pond Retrofit (County Permit # DSP 200058) – 21.01 Impervious Acres
Wilton Court SWM Pond Retrofit (County Permit # DSP 190034)– 10.24 Impervious Acres

Miscellaneous Projects (Subtotal: 10.5 Acres)
Waldorf Urban Redevelopment Corridor Infrastructure Improvements Study – Impervious Acres TBD
White Plains Failing Septic Connection to Sewer (Gateway Blvd. and Park Ave.) (County Permit # VCI 080048) – 10.5 Impervious Acres
Southerland Failing Septic Connection to Sewer – Impervious Acres TBD

Completed Grant, Private and Operational Projects

	FY 2021	FY 2021 Acres	FY 2022	FY 2022 Acres
Inlet Cleaning	319.2 tons	40.23	60.65 tons	24.26
Septic Pump-outs	1,627	32.54	1,499	29.98
Septic Nitrogen Removal Upgrades	14	2.24	35	5.6
Septic Connection to Sanitary Sewer	3	0.69	6	1.38

(1) Inlet Cleaning: 40.23 acres accounts for maintenance of 2019 level of effort using pre-2021 Guidance. To exceed maintenance level requires a Standard Operating Procedure per 2021 Guidance.
(2) Septic Pump-outs: 22.4 acres (747 units) accounts for maintenance of 2019 level of effort using pre-2021 Guidance (0.03 acre/unit). Units exceeding 747 use 2021 Guidance (0.02 acre/unit).
(3) Septic Nitrogen Removal Upgrades: Pre-2021 Guidance allowed for 0.26 acre/unit; 2021 Guidance allows for 0.16 acre/unit.
(4) Septic Connection: Pre-2021 Guidance allowed for 0.39 acre/unit; 2021 Guidance allows for 0.23 acre/unit.

Impervious Surface Restoration Summary

The following table summarizes the County's progress towards impervious restoration requirement for the next permit term which is anticipated to begin in 2023. The data is also included in the enclosed MS4 Geodatabase, in the *Impervious Surface Table*.

Table 29: Impervious Surface Restoration Summary (Acres)

	Half of FY 2020 (Jan 1 - Jun 30)	FY 2021	FY 2022
Impervious Surface Area Total (Countywide)	10,637	10,637	10,637
Uncontrolled Acres (w/o SWM)	7,887	7,887	7,887
Controlled Acres (w/SWM)	2,750	2,750	2,750
Planned Acres for Restoration	789	295.9	231.27
Capital Restoration Projects Under Design	342.47	531.53	383
Capital Restoration Projects Under Construction	327.77	337.1	243.36
Completed Capital Restoration Projects	164	203.72	0
Completed Operational Annual Restoration Projects	89	72.77	54.24
Completed Grant and Private Permanent Restoration Projects	21	2.93	6.98
Completed in Reporting Year	274	279.42	61.22

Notes:
(1) The Impervious Surface Area Total is based on impervious surface from 2011 aerial photos.
(2) The Impervious Acres Total does not include impervious surface on federal, state, town, or industrial stormwater permit properties. It does include County Government and Board of Education owned properties in towns.
(3) Annual operational restoration projects are based on averages over the permit period.

Street sweeping is no longer proposed to be tracked towards impervious restoration and is to be replaced by the projects shown on the following table. Additionally, any other projects counted towards the 2019 impervious surface restoration, that are not continually verifiable and maintained will be replaced and tracked on the following table.

Table 30: Maintenance of 20% Impervious Restoration Completed through 2019

2019 Restoration Project	Year Removed	EIA Removed	Replacement Restoration	Year Replaced	EIA Replacement
Street Sweeping 5-year Avg.	2020	75.69	St. Charles Stream Restoration	2020	7.1
			Potomac Heights Shoreline Stabilization	2020	70.20
Various Shoreline and Outfall Stabilizations not maintained	2021	20	TBD	TBD	TBD
Total		**75.69**			**77.3**

2. Restoration Plans

b. Within one year of permit issuance, Charles County shall submit to MDE for approval a restoration plan for each stormwater WLA approved by EPA prior to the effective date of the permit. The County shall submit restoration plans for subsequent TMDL WLAs within one year of EPA approval. Upon approval by MDE, these restoration plans will be enforceable under this permit. As part of the restoration plans, Charles County shall:

i. Include the final date for meeting applicable WLAs and a detailed schedule for implementing all structural and nonstructural water quality projects, enhanced stormwater management programs, and alternative stormwater control initiatives necessary for meeting applicable WLAs;

ii. Provide detailed cost estimates for individual projects, programs, controls, and plan implementation;

iii. Evaluate and track the implementation of restoration plans through monitoring or modeling to document progress toward meeting established benchmarks, deadlines, and stormwater WLAs; and

iv. Develop an ongoing, iterative process that continuously implements structural and nonstructural restoration projects, program enhancements, new and additional programs, and alternative BMPs where EPA approved TMDL stormwater WLAs are not being met according to the benchmarks and deadlines established as part of the County's watershed assessments.

FY 2022 Status

To address this requirement, Charles County developed the *Charles County Municipal Stormwater Restoration Plan,* which was submitted to MDE in June 2016 and includes the following:

- Demonstrates ways to meet the Total Maximum Daily Load (TMDL) Stormwater Wasteload Allocations (SW-WLAs) approved by U.S. Environmental Protection Agency
- Illustrates a strategy to provide additional stormwater runoff management on impervious acres equal to 20% of the impervious area for which runoff is not currently managed to the Maximum Extent Practicable (MEP)
- Educates and involves residents, businesses, and stakeholders in achieving measurable water quality improvements
- Establishes a reporting framework for annual reporting under the County's MS4 permit
- Provides an evaluation and adaptive management process for developing actions to be taken if permit requirements are not met
- Identifies the funding needed to implement the Restoration Plan

MDE provided comments on the Restoration Plan on June 21, 2017. These comments, along with updates based on public review and comment were addressed and the Plan was resubmitted with the Annual Report in December 2017. MDE provided comments on the Stormwater Wasteload Allocation (SW-WLA) Revised Implementation Plan on November 28, 2018. These comments were addressed in the FY 2018 Annual Report.

Charles County's final approved local TMDLs with SW-WLAs include the following:

- Mattawoman Creek – Nutrients: Nitrogen and Phosphorus
  - 0214011 – Mattawoman Creek
- Mattawoman Creek – PCBs – No County responsibility
  - 0214011 – Mattawoman Creek
- Lower Patuxent River (shellfish harvesting areas) – Fecal Coliform Bacteria
  - 021311010887 – Indian Creek
- Tidal Potomac River – PCBs (Polychlorinated Biphenyls) – No County responsibility
  - 02140201 – Upper Potomac River
  - 02140102 – Middle Potomac River
  - 02140101 – Lower Potomac River
- Patuxent River Lower – Sediment
  - 02131101 – Patuxent River Lower
- Port Tobacco River – Sediment
  - 02140109 – Port Tobacco River

The Restoration Plan presents the projects and programs to be implemented by Charles County to meet the NPDES MS4 requirements for local TMDL SW-WLAs in the Mattawoman Creek and Lower Patuxent River watersheds, and restoration goals for the Chesapeake Bay TMDL and associated impervious surface treatment. The Patuxent River sediment, and Port Tobacco sediment TMDLs were not addressed in the restoration plan due to the timing of the approval dates for each, which were after the Restoration Plan was completed.

Target reductions for the Chesapeake Bay, Mattawoman Creek, and Lower Patuxent TMDLs are summarized in the following table.

Table 31: Target Percent Load Reductions from the Stormwater Sector at Edge of Stream (EOS)

	Total Nitrogen EOS (lbs/yr)	Total Phosphorus EOS (lbs/yr)	Total Susp. Solids EOS (lbs/yr)	Bacteria (bn MPN/day)
Mattawoman Reductions from 2000 Baseline	54%	47%		
Lower Patuxent Reductions from 2001 Baseline				43.94%
Port Tobacco Reductions from 2009 Baseline			34%	
Chesapeake Bay Reductions from 2010 Baseline	20.24%	38.26%		

Mattawoman Creek PCB TMDL

A final TMDL for PCBs in the Mattawoman Creek watershed was approved by EPA on February 19, 2019. Upon review of the TMDL, it was confirmed with MDE that Charles County does not have a responsibility for the TMDL attainment and is not required to develop a TMDL implementation plan. The 5% reduction assigned to the Piscataway and Mattawoman tidal segments for NPDES regulated stormwater were done to provide a margin of safety. Further, the 5% reduction is expected to be achieved from a 93% reduction in atmospheric deposition.

Tidal Potomac River PCB TMDL

Charles County is included in the TMDL for polychlorinated biphenyls (PCBs) in the Potomac River Lower Tidal, Middle Tidal, and Upper Tidal. The percent reduction for these TMDLs in Charles County is 5% and is due to the margin of safety (MOS) built into the TMDL calculation. According to the TMDLs, 5% MOS reduction is expected to be achieved through the proposed 93% reduction in atmospheric deposition; therefore, reduction strategies from the stormwater sector of Charles County are not necessary to meet the overall TMDLs. These TMDLs are not addressed further in the County's *Restoration Plan*.

Lower Patuxent River Sediment TMDL

The Lower Patuxent River Sediment TMDL was not addressed in the *Charles County Municipal Stormwater Restoration Plan* because the TMDL was approved on July 2, 2018, after the completion of the *Restoration Plan*. Charles County began working on the *Lower Patuxent River Sediment TMDL Restoration Plan* in early 2019 and it was discovered that historic Maryland Biological Stream Survey (MBSS) biological data indicated that streams within the Lower Patuxent River watershed were in good biological condition and a Restoration Plan may be unnecessary. Communication with MDE was initiated, and a sampling plan was developed for the County to re-sample the six previously sampled MBSS sites. In spring and summer of 2019, the County completed MBSS sampling of benthic macroinvertebrate and fish communities and found that the sites remained in good biological condition. A report detailing the findings was submitted to MDE in October 2019.

Additional communication with MDE resulted in the option for the County to delist its portion of the watershed from the Integrated Report (IR) impairment listing. Following MDE's *Delisting Methodology for Biological Assessments in Maryland's Integrated Report*, an "Initial Request for Delisting" was submitted to MDE in June 2022, which presented past biomonitoring data as well as the future sampling plan to confirm conditions required for delisting. MDE requested two additional sampling sites, one on Indian Creek and one on an Unnamed Tributary to the Patuxent River, which will provide data on catchments not previously sampled. These sites were sampled for the first time in the spring and summer of 2022 and will be sampled again in 2023. PAXL-115-R, which was sampled in 2004 by MBSS and in 2019 by KCI, was re-sampled in 2022 to satisfy the delisting requirements that non-Tier II sites be sampled twice within the most recent 10-year period.

Assuming biological conditions meet the requirements, it is anticipated that the "Final Justification for Delisting" document will be completed in January 2024.

Port Tobacco River Sediment TMDL

A TMDL for sediment was approved by EPA on October 11, 2019 for the Port Tobacco River watershed. Charles County submitted a Restoration Plan for this TMDL to MDE on October 9, 2020 after a public meeting and 30-day public comment period was advertised and the public meeting was held on October 5, 2020. Submittal of the restoration plan to MDE occurred within one year of the TMDL's approval.

Future Restoration Planning

The County plans to complete a Countywide TMDL Stormwater Implementation Plan in 2023, which will update the previously developed Restoration Plan and include all local and Bay TMDL responsibilities. Pollutant load reduction estimates will be updated using MDE's recently released spreadsheet model, the TMDL Implementation Progress and Planning Tool (TIPP). The Plan will include lists of projects and programs to meet the load reductions, describe analysis and modeling methods, and include final dates and benchmarks. The Plan will be updated annually to document progress for each TMDL SW-WLA with net pollutants reduced and provide updates to projects, programs, costs, and schedules.

Baseline, permit loads, and FY 2022 progress loads for each of the County's TMDL responsibilities are presented in *Part IV.E.5 TMDL Compliance* of this annual report.

3. Nutrient Trading

Charles County may acquire total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) credits, in accordance with the requirements of the Maryland Water Quality Trading and Offset Program, COMAR 26.08.11, to meet its 20 percent impervious surface area restoration requirement in this permit. The basis for an equivalent impervious acre restored through trading is the difference in pollutant loads between urban and forest stormwater runoff according to MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, 2014, or the most recent version). On an annual basis, until reissuance of this permit, the permittee shall report to MDE:

a. The cumulative impervious acres restored achieved through the installation of BMPs during the permit compliance period;
b. The equivalent impervious acres restored achieved through credit acquisition during the permit compliance period; and

c. *Documentation required to verify credits acquired and to be used for impervious surface restoration during the permit compliance period.*

FY 2022 Status

The County has not acquired nutrient or sediment credits to meet the impervious surface area restoration requirement of this permit.

4. Public Participation

Charles County shall provide continual outreach to the public regarding the development of its watershed assessments and restoration plans. Additionally, the County shall allow for public participation in the TMDL process, solicit input, and incorporate any relevant ideas and program improvements that can aid in achieving TMDLs and water quality standards. Charles County shall provide:

a. Notice in a local newspaper and the County's website outlining how the public may obtain information on the development of watershed assessments and stormwater watershed restoration plans and opportunities for comment;
b. Procedures for providing copies of watershed assessments and stormwater watershed restoration plans to interested parties upon request;
c. A minimum 30-day comment period before finalizing watershed assessments and stormwater watershed restoration plans; and
d. A summary in each annual report of how the County addressed or will address any material comment received from the public.

FY 2022 Status

During the permit period Charles County incorporated public review and comment into all ten of its watershed assessments and its stormwater restoration plans. This was done by officially publishing Public Notices in the Maryland Independent Newspaper to establish public meeting dates and thirty-day comment periods for each. Additional advertisement included News Releases, Facebook, Twitter and web ads on the Charles County Homepage with links to the draft documents.

The public meetings and presentations were held at the Charles County Government Building in La Plata, Maryland followed by question and answer sessions and 30-day public review periods. The comments received are listed along with the County's response in the Appendix of each document.

The watershed assessments are posted on the County's website at:

https://www.charlescountymd.gov/government/planning-and-growth-management/stormwater-management/watershed-assessments

The TMDL stormwater restoration plans are posted on the County's website at: https://www.charlescountymd.gov/government/planning-and-growth-management/stormwater-management/tmdl-total-maximum-daily-load-stormwater-restoration-plan

5. TMDL Compliance

Charles County shall evaluate and document its progress toward meeting all applicable stormwater WLAs included in EPA approved TMDLs. An annual TMDL assessment report with tables shall be submitted to MDE. This assessment shall include complete descriptions of the analytical methodology used to evaluate the effectiveness of the County's restoration plans and how these plans are working toward achieving compliance with EPA approved TMDLs. Charles County shall further provide:

a. *Estimated net change in pollutant load reductions from all completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives;*
b. *A comparison of the net change in pollutant load reductions detailed above with the established benchmarks, deadlines, and applicable stormwater WLA's; and*
c. *Itemized costs for completed projects, programs, and initiatives to meet established pollutant reduction benchmarks and deadlines;*
d. *Cost estimates for completing all projects, programs, and alternatives necessary for meeting applicable stormwater WLAs; and*
e. *A description of a plan for implementing additional watershed restoration actions that can be enforced when benchmarks, deadlines, and applicable stormwater WLAs are not being met or when projected funding is inadequate.*

FY 2022 Status

Baseline loads, permit loads, and FY 2022 progress loads, are presented below for the Chesapeake Bay TMDL and local TMDLs. The information is also included in the MS4 Geodatabase *Local Stormwater Watershed Assessment* and *Countywide Stormwater Watershed Assessment Tables* in the County's submitted geodatabase.

Chesapeake Bay TMDL

Chesapeake Bay TMDL loads are presented here for informational purposes only, as Charles County's stormwater sector is required by its MS4 NPDES permit to meet the Bay TMDL requirements by completion of a set amount of impervious surface restoration. The impervious

surface restoration was required to be met by the end of the County's permit term in December of 2019, and the Bay TMDL is required to be met by 2025. Refer to *Part IV.E.2.a. Restoration Plans* of this annual report (previous section) for more information on impervious surface restoration.

Countywide Bay TMDL loads have previously been calculated using MAST/ CBP WM Phase 5.3.2. In FY 2022, CAST CBP WM Phase 6 was used to calculate baseline, target, permit and current loads for the Bay TMDL. CAST was developed specifically for Bay scale modeling for the Bay TMDL pollutants. Countywide 2010 baseline loads were modeled in CAST with "2010 Progress" BMPs. Target loads were calculated by multiplying the Bay TMDL target reduction percent with the Countywide modeled baseline pollutant load for each pollutant to first calculate a calibrated reduction target. This reduction target was then subtracted from the baseline load to calculate the target load (i.e., SW-WLA).

Bay TMDL loads representing conditions coinciding with the issuance of the County's current permit, or 'permit loads' were modeled in CAST using 2010 land use conditions and includes BMPs with a built date prior to, and including, 12/30/2014 (Charles County's permit issuance date). The FY 2022 Current Loads were modeled in CAST using 2010 land use conditions and includes BMPs with a built date prior to, and including, 6/30/2022.

Countywide Bay TMDL loads are reported in EOT (edge-of-tide) lbs/yr to align with the Bay TMDL. Table 32 presents the baseline loads and target loads, as well as current loads, which include BMPs implemented between the baseline year and FY 2022. Table 33 and Table 34 present the Countywide restoration BMP implementation through FY 2022.

Table 32: Countywide Chesapeake Bay TMDL Loads & Reductions, Baseline through FY 2022

	Nitrogen (EOT lbs/yr)	Phosphorus (EOT lbs/yr)	Sediment (EOT lbs/yr)
Baseline Load (2010 Baseline Year)	258,985.69	35,298.79	42,078,480.26
Target Percent Reduction	20.24%	38.26%	-
Target Load	206,566.99	21,793.47	-
Permit Load	258,868.38	35,287.78	42,042,807.00
FY 2022 Current Load	255,585.75	34,342.00	40,483,088.77
FY 2022 Current Load Reduction	3,399.94	956.78	1,595,391.50
FY 2022 Percent Reduction	1.3%	2.7%	3.8%
Reduction Remaining for Treatment	49,018.76	12,548.53	-

Table 33: Countywide BMP Implementation, Baseline through FY 2022

BMP Type	# Practices	Length (feet)	Drainage Area (Acres)	Impervious Area (Acres)	Acres Planted
Mattawoman Creek					
Bay-Wise Certified	5	n/a	0.06	-	n/a
Bioretention	2	n/a	5.77	3.43	n/a

Disconnection of Rooftop Runoff	5	n/a	0.09	0.05	n/a
Dry Swale	4	n/a	15.51	4.14	n/a
ESD - Micro-Scale Practices	1	n/a	12.56	12.56	n/a
Extended Detention Structure, Wet	1	n/a	24.40	1.20	n/a
Grass Swale	12	n/a	85.92	17.91	n/a
Rain Gardens	1	n/a	0.01	0.01	n/a
Rainwater Harvesting	15	n/a	0.34	0.15	n/a
Retention Pond (Wet Pond)	2	n/a	27.42	8.23	n/a
Sand Filter	1	n/a	12.58	3.33	n/a
Shallow Marsh	1	n/a	393.00	92.12	n/a
Step Pool Storm Conveyance	3	n/a	186.28	42.73	n/a
Submerged Gravel Wetlands	3	n/a	463.88	128.71	n/a
Wet Pond - Wetland	2	n/a	92.51	26.19	n/a
Forest Planting	1	n/a	n/a	n/a	1.47
Stream Restoration	1	748	n/a	n/a	n/a
Zekiah Swamp					
Bay-Wise Certified	4	n/a	0.05	-	n/a
Disconnection of Rooftop Runoff	2	n/a	0.03	0.02	n/a
Extended Detention - Wetland	1	n/a	82.23	27.60	n/a
Grass Swale	2	n/a	4.66	1.38	n/a
Rain Gardens	1	n/a	0.01	0.01	n/a
Rainwater Harvesting	12	n/a	0.28	0.12	n/a
Shallow Marsh	1	n/a	192.50	0.80	n/a
Sheetflow to Conservation Areas	2	n/a	0.02	0.02	n/a
Step Pool Storm Conveyance	1	n/a	34.13	20.18	n/a
Submerged Gravel Wetlands	1	n/a	192.50	4.42	n/a
Stream Restoration	1	552	n/a	n/a	n/a
Nanjemoy Creek					
Bay-Wise Certified	1	n/a	0.01	-	n/a
Disconnection of Rooftop Runoff	2	n/a	0.03	0.02	n/a
Rainwater Harvesting	4	n/a	0.09	0.04	n/a
Sheetflow to Conservation Areas	2	n/a	0.02	0.02	n/a
Wet Pond - Wetland	1	n/a	5.43	2.60	n/a
Shoreline Stabilization	9	8,240	n/a	n/a	n/a
Lower Patuxent River					
Bay-Wise Certified	1	n/a	0.01	-	n/a
Disconnection of Rooftop Runoff	3	n/a	0.03	0.03	n/a
Rain Gardens	1	n/a	0.18	0.14	n/a
Shoreline Stabilization	2	682	n/a	n/a	n/a
Port Tobacco					
Bay-Wise Certified	5	n/a	0.06	-	n/a
Disconnection of Rooftop Runoff	1	n/a	0.01	0.01	n/a
Rainwater Harvesting	8	n/a	0.18	0.08	n/a

Sheetflow to Conservation Areas	1	n/a	0.01	0.01	n/a
Shoreline Stabilization	2	569	n/a	n/a	n/a
Wicomico River					
Bay-Wise Certified	3	n/a	0.03	-	n/a
Disconnection of Rooftop Runoff	2	n/a	0.03	0.02	n/a
Rainwater Harvesting	1	n/a	0.02	0.01	n/a
Sheetflow to Conservation Areas	1	n/a	0.01	0.01	n/a
Shoreline Stabilization	10	2,879	n/a	n/a	n/a
Potomac River Lower Tidal					
Bay-Wise Certified	5	n/a	0.06	-	n/a
Disconnection of Rooftop Runoff	2	n/a	0.02	0.02	n/a
Rain Gardens	1	n/a	0.01	0.01	n/a
Rainwater Harvesting	3	n/a	0.07	0.03	n/a
Shoreline Stabilization	76	20,521	n/a	n/a	n/a
Stream Restoration	1	1,480	n/a	n/a	n/a
Potomac River Middle Tidal					
Bay-Wise Certified	1	n/a	0.01	-	n/a
Grass Swale	5	n/a	20.75	5.91	n/a
Rainwater Harvesting	1	n/a	0.02	0.01	n/a
Shoreline Stabilization	1	1,755	n/a	n/a	n/a
Potomac River Upper Tidal					
Sheetflow to Conservation Areas	1	n/a	0.01	0.01	n/a
Shoreline Stabilization	1	490	n/a	n/a	n/a
Gilbert Swamp					
Disconnection of Rooftop Runoff	1	n/a	0.01	0.01	n/a
Sheetflow to Conservation Areas	3	n/a	0.03	0.03	n/a

*Includes homeowner Fee Credit practices, including Rain Barrels, Bay-Wise Certified, and Disconnection of Runoff

Table 34: Countywide Street Sweeping & Inlet Cleaning Pounds Removed, FY 2022

Practice	Pounds Removed
Street Sweeping	0*
Inlet Cleaning	121,300

*Per current accounting guidance, street sweeping did not occur frequently enough to receive credit.

Local TMDLs

Mattawoman Creek Nutrients TMDL

The Mattawoman Creek TMDLs for nitrogen and phosphorus were approved by the EPA on January 5, 2005. Initial baseline and progress modeling was reported in the *Charles County Municipal Stormwater Restoration Plan,* along with planned implementation to meet the TMDL goals.

Mattawoman Creek local TMDL nitrogen and phosphorus loads were modeled in the TIPP spreadsheet. This spreadsheet model was used for the first time for FY 2022 reporting to model baseline, permit, and FY 2022 progress scenarios. In addition, the local TMDL baseline scenario used impervious and turf acres that were translated to baseline conditions following a backcasting land cover methodology developed by Baltimore County and reviewed and approved by MDE. Using the TIPP spreadsheet, the loads are translated from the values derived by the Bay model version that was used in the development of the TMDLs and translated to the TIPP model, making them compatible with current methods following MDE recommendations. All County completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives through 12/30/2014 were modeled in the TIPP to calculate 2014 permit loads. Progress through the end of FY 2022 was modeled in the TIPP to calculate current progress loads for TN and TP local TMDLs.

Charles County has set a Mattawoman Creek local TMDL completion date of 2035. Local TMDL loads and load reductions are reported in edge of stream (EOR) lbs/yr and are presented in Table 35. FY 2022 Progress includes BMPs installed between the baseline year (2000) and the end of FY 2022. Mattawoman Creek BMP implementation through FY 2022 is presented in Table 36.

Charles County completed two wet pond retrofits projects in the Mattawoman Creek watershed in FY 2022, as well as ongoing inlet cleaning and septic system practices. The County also has several projects constructed in the beginning of FY 2023, as well as currently under construction, in design, and planned for the Mattawoman Creek watershed, including two bioretention facilities, one sheetflow to conservation, one sand filter, fourteen tree plantings, six stream restorations, three outfall stabilizations, one submerged gravel wetland, and one wet pond/wetland. In addition, septic system practices and inlet cleaning are slated to continue in the watershed. Table 35 presents the loads and load reductions associated with these projects through FY 2027. Additional projects will be needed to meet the total nitrogen target load by 2035. Projects identified in the Restoration Plan, in addition to projects identified since the completion of the plan, will be prioritized in the coming years to continue progress towards meeting the goal.

Table 35: Mattawoman Creek Watershed TMDL Loads and Reductions

	Nitrogen (EOR lbs/yr)	Phosphorus (EOR lbs/yr)
Baseline and Targets		
Baseline Load (2000 Baseline Year)	90,561.7	10,688.2
Target Percent Reduction	54%	47%
Target Load	41,658.4	5,664.7
Total Reduction Required	48,903.3	5,023.4
Permit Load	90,359.3	10,665.7
FY 2022 Progress		
FY 2022 Current Load	87,033.6	9,886.7
FY 2022 Current Load Reduction	3,528.0	801.5
FY 2022 Percent Reduction	3.90%	7.50%

Reduction Remaining for Treatment	45,375.3	4,221.9
Planned FY 2023-FY 2027		
FY 2023-FY 2027 Planned Reduction	2,627.2	550.4
Total Reductions		
Reduction (Progress + Planned)	6,155.2	1,351.9
Total Percent Reduction	6.80%	12.65%
Reduction Remaining for Treatment	42,748.1	3,671.5

Table 36: Mattawoman Creek BMP Implementation, Baseline through FY 2022

BMP Type	# Practices	Drainage Area (Acres)	Impervious Area (Acres)	Pounds Removed	Length	Acres Planted
Mattawoman Creek						
Bay-Wise Certified	5	0.06	-	n/a	n/a	n/a
Bioretention	2	5.77	3.43	n/a	n/a	n/a
Disconnection of Rooftop Runoff	5	0.09	0.05	n/a	n/a	n/a
Dry Swale	4	15.51	4.14	n/a	n/a	n/a
ESD - Micro-Scale Practices	1	12.56	12.56	n/a	n/a	n/a
Extended Detention Structure, Wet	1	24.40	1.20	n/a	n/a	n/a
Grass Swale	12	85.92	17.91	n/a	n/a	n/a
Rain Gardens	1	0.01	0.01	n/a	n/a	n/a
Rainwater Harvesting	15	0.34	0.15	n/a	n/a	n/a
Retention Pond (Wet Pond)	2	27.42	8.23	n/a	n/a	n/a
Sand Filter	1	12.58	3.33	n/a	n/a	n/a
Shallow Marsh	1	393.00	92.12	n/a	n/a	n/a
Step Pool Storm Conveyance	3	186.28	42.73	n/a	n/a	n/a
Submerged Gravel Wetlands	3	463.88	128.71	n/a	n/a	n/a
Wet Pond - Wetland	2	92.51	26.19	n/a	n/a	n/a
Forest Planting	1	n/a	n/a	n/a	n/a	1.47
Inlet Cleaning*	n/a	n/a	n/a	51,105.24	n/a	n/a
Stream Restoration	1	n/a	n/a	n/a	748.00	n/a

*Includes homeowner Fee Credit practices, including Rain Barrels, Bay-Wise Certified, and Disconnection of Runoff

**Inlet cleaning are annual practices; pounds presented is material removed FY 2022 only.

Mattawoman Creek PCB TMDL

A final TMDL for PCBs in the Mattawoman Creek watershed was approved by EPA on February 19, 2019. Upon review of the TMDL, it was confirmed with MDE that Charles County does not have a responsibility for the TMDL attainment and is not required to develop a TMDL implementation plan. The 5% reduction given to the Piscataway and Mattawoman tidal segments for NPDES regulated stormwater were done to provide a margin of safety. Further, the 5% reduction is expected to be achieved from a 93% reduction in atmospheric deposition.

Lower Patuxent River – Indian Creek Bacteria TMDL

The bacteria TMDL for the Indian Creek portion of the Lower Patuxent River was approved on May 25, 2005. MDE published their bacteria guidance document, *Guidance for Developing Bacteria TMDL (Total Maximum Daily Load) Stormwater Wasteload Allocation (SW-WLA) Watershed Implementation Plans (WIPs)*, in February 2022. The focus for bacteria is on source tracking and bacteria baseline and progress modeling is not required. The County has not re-modeled bacteria loads for the FY 2022 progress runs and has not included modeling results and loads in the submitted geodatabase. The County will be revising the plan for the Lower Patuxent Bacteria TMDL according to the February 2022 guidance, which will be more focused on desktop source identification and monitoring.

Tidal Potomac River PCB TMDL

Charles County is included in the TMDL for polychlorinated biphenyl (PCBs) in the Potomac River Lower Tidal, Middle Tidal, and Upper Tidal, which was approved on October 31, 2007. The percent reduction for these TMDLs in Charles County is 5% and is due to the margin of safety (MOS) built into the TMDL calculation. According to the TMDLs, 5% MOS reduction is expected to be achieved through the proposed 93% reduction in atmospheric deposition; therefore, reduction strategies from the stormwater sector of Charles County are not necessary to meet the overall TMDLs. These TMDLs are not addressed further in the County's Restoration Plan.

Lower Patuxent River Sediment TMDL

The Lower Patuxent River Sediment TMDL was approved by EPA on July 2, 2018, and it was discovered early in 2019 that historic biological data indicated streams within the Patuxent River Lower watershed were in good condition and a Restoration Plan was possibly unnecessary. The monitoring results were provided to MDE in October 2019 confirming this. See Part IV.E.2.a. for further information on this TMDL. Because a restoration plan is likely not necessary, loads and load reductions for this TMDL have not been developed.

Port Tobacco River Sediment TMDL

A TMDL for sediment was approved by EPA on October 11, 2019 for the Port Tobacco River watershed. Charles County submitted a Restoration Plan for this TMDL to MDE on October 9, 2020. Port Tobacco River local TMDL sediment loads were modeled using a combination of CAST and a spreadsheet approach. MDE's TIPP spreadsheet model was used for the first time for FY 2022 reporting to model baseline, permit, and FY 2022 progress scenarios. In addition, the local TMDL baseline scenario used impervious and turf acres that were translated to baseline conditions following a backcasting land cover methodology developed by Baltimore County and reviewed and approved by MDE. Using the TIPP spreadsheet, the loads are translated from the values derived by the Bay model version that was used in the development of the TMDLs and translated to the TIPP model, making them compatible with current methods following MDE recommendations. All County completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives through 12/30/2014 were modeled in the TIPP to calculate 2014 permit loads. Progress through the end of FY 2022 was modeled in the TIPP to calculate current progress loads for the Port Tobacco River TSS local TMDL.

Charles County has set a Port Tobacco River local TMDL completion date of 2035. Local TMDL loads and load reductions are reported in edge of stream (EOS) lbs/yr and are presented in Table 37. FY 2022 Progress includes BMPs installed between the baseline year (2009) and the end of FY 2022. Port Tobacco River BMP implementation through FY 2022 is presented in Table 38.

Charles County continued their annual inlet cleaning practice in the Port Tobacco River watershed in FY 2022. The County has many projects currently under construction, in design, and planned for the Port Tobacco River watershed, including two stream restorations, one shoreline restoration (however, shoreline restoration does not achieve credit towards this EOS TMDL), one extended detention pond, two sheetflow to conservation, and two submerged gravel wetlands. Table 37 presents the planned loads and load reductions associated with these projects through FY 2027. Additional projects will be needed to meet the total nitrogen target load by 2035. Projects identified in the Restoration Plan, in addition to projects identified since the completion of the plan, will be prioritized in the coming years to continue progress towards meeting the goal.

Table 37: Port Tobacco River Watershed TMDL Loads and Reductions

	Sediment (EOS lbs/yr)
Baseline and Targets	
Baseline Load (2009 Baseline Year)	13,075,627.9
Target Percent Reduction	34.0%
Target Load	8,629,914.4
Calibrated Reduction	4,445,713.5
Permit Load	13,075,627.9
FY 2022 Progress	
FY 2022 Current Load	13,072,182.1

FY 2022 Current Load Reduction	3,445.8
FY 2022 Percent Reduction	0.03%
Reduction Remaining for Treatment	4,442,267.7
Planned FY 2023-FY 2027	
FY 2023-FY 2027 Planned Reduction	807,581.5
Total Reductions	
Reduction (Progress + Planned)	811,027.3
Total Percent Reduction	6.20%
Reduction Remaining for Treatment	3,634,686.2

Table 38: Port Tobacco River BMP Implementation, Baseline through FY 2022

BMP Type	# Practices	Drainage Area (Acres)	Impervious Area (Acres)	Pounds Removed	Length	Acres Planted
Port Tobacco River						
Bay-Wise Certified	5	0.06	-	n/a	n/a	n/a
Disconnection of Rooftop Runoff	1	0.01	0.01	n/a	n/a	n/a
Rainwater Harvesting	8	0.18	0.08	n/a	n/a	n/a
Sheetflow to Conservation Areas	1	0.01	0.01	n/a	n/a	n/a
Inlet Cleaning*	n/a	n/a	n/a	5,600	n/a	n/a
Shoreline Stabilization**	2	n/a	n/a	n/a	569	n/a

*Includes homeowner Fee Credit practices, including Rain Barrels, Bay-Wise Certified, and Disconnection of Runoff
**Inlet cleaning is an annual practice; pounds presented is material removed in FY 2022 only.
***Shoreline stabilization does not receive credit towards this edge of stream (EOS) TMDL.

IV.F. Assessment of Controls

Overview of Permit Conditions

1. Watershed Restoration Assessment

The County shall continue monitoring in the Mattawoman Creek watershed, or select and submit for MDE's approval a new watershed restoration project for monitoring. Monitoring activities shall occur where the cumulative effects of watershed restoration activities can be assessed. One outfall and an associated in-stream station, or other locations based on study design approved by MDE, shall be monitored. The minimum criteria for chemical, biological, and physical monitoring are as follows:

a. Chemical Monitoring:

i. *Eight (8) storm events shall be monitored per year at each monitoring location with at least two occurring per quarter. Quarters shall be based on calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month at the monitoring stations if flow is observed;*

ii. *Discrete samples of stormwater flow shall be collected at the monitoring stations using automated or manual sampling methods. Measurements of pH and water temperatures shall be taken;*

iii. *At least three (3) samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to methods listed under 40 CFR Part 136 and event mean concentrations (EMC) shall be calculated for:*

Biochemical Oxygen Demand (BOD_5)	*Total Lead*	*Hardness*
Total Kjeldahl Nitrogen (TKN)	*Total Copper*	
Nitrate plus Nitrite	*Total Zinc*	
Total Suspended Solids	*Total Phosphorus*	
Total Petroleum Hydrocarbons (TPH)	*E. coli or enterococcus*	

iv. *Continuous flow measurements shall be recorded at the in-stream monitoring station or other practical locations based on the approved study design. Data collected shall be used to estimate annual and seasonal pollutant loads and reductions, and for the calibration of watershed assessment models. Pollutant load estimates shall be reported according to any EPA approved TMDL with a stormwater WLA.*

FY 2022 Status

For the 2022 reporting year, Charles County continued the long-term chemical monitoring program in the Acton-Hamilton watershed. The monitoring period for this reporting year extended from July 2021 through June 2022.

Background on Site Selection

In the fall and winter of 2013, Charles County began the process of selecting a new chemical monitoring site. The location selected is in the Acton-Hamilton watershed, within the County's Development District. The proposed site is located downstream of several proposed water quality retrofits to be built over the next several years. In March 2014, MDE met with the County at the proposed chemical monitoring station. MDE proposed that the County wait on moving the Arthur Middleton Elementary School site to the Acton-Hamilton site until further study could be performed to ensure the magnitude of proposed water quality projects would be large enough to show a water quality difference. Based on guidance from MDE to delay the relocation of the sampling stations, sampling resumed at Arthur Middleton Elementary School in July 2014.

In response to MDE's request for further study, Vista Design, Inc. produced a report titled *Acton-Hamilton Watershed NPDES Watershed Restoration Concept Study* in August 2014, which includes an analysis of the treated and untreated impervious area within the Acton-Hamilton watershed and all of the proposed stormwater retrofit improvements. Based on this report, the Acton-Hamilton study area is approximately 730 acres of which 243.23 acres are impervious surfaces. A determination in the report was made that 98.72 acres of the 243.23 acres are considered to be "treated". Of the remaining 144.6 acres of "untreated" or "undertreated" impervious surfaces, several proposed stormwater facilities and retrofits to existing stormwater facilities are planned. These include a large offline submerged gravel wetland and wetland along the main stem channel, thirteen pond retrofits, and the addition of four submerged gravel wetlands and Filterra treatment systems. After implementation is complete, the total proposed "treated" impervious surfaces area will be 187.03 acres which represents 77% of all the impervious surfaces in the study area.

In February and March 2015, site selection for the proposed upstream and downstream in-stream stations began in the Acton-Hamilton Watershed. Station locations were field visited and selected based on stream channel characteristics, access to stream channel, and proximity to all of the proposed water quality retrofits and enhancement projects. In April 2015, two instream stations were established within the unnamed tributary to Piney Run. The upstream site (AH001) is located just downstream of a large culvert near the intersection of US 301 and Business Park Road. The downstream site (AH002) is located just upstream of the culvert under Hamilton Road and just below the existing in-stream Acton-Hamilton Geomorphic Study Reach along Timberbrook Drive.

Chemical wet-weather monitoring began at AH001 and AH002 on April 25, 2015 and has continued twice per quarter. Final MDE approval for moving the Arthur Middleton Elementary School site to the Acton-Hamilton site was received by the County in July 2015.

The goal of sampling storms during the 2015-2019 reporting years was to determine a baseline in water quality before construction occurs within the watershed. The construction on the large offline submerged gravel wetland and wetland along the main stem channel between Timberbrook Drive and Shearwater Drive began in early 2018 and was completed September 2019. The construction activities for the installation of these facilities may have impacted sampling results for the 2019 reporting year. Beginning in the 2020 reporting year, the goal of sampling storms will be to determine the impact constructed water quality treatment facilities within the watershed have on the water quality in the stream. An assessment of the functionality of the newly constructed facilities is summarized in this report; however, more monitoring data will be required to determine the effect of the facilities on the stream.

Acton-Hamilton Chemical Monitoring

For the 2022 reporting year, chemical monitoring was performed at two instream stations on a tributary to Piney Run within the Acton Hamilton watershed that were established in April 2015. Site AH001 is located just downstream of a large culvert near the intersection of US 301 and Business Park Road. Site AH002 is located just upstream of the culvert under Hamilton Road and just below the existing in-stream Acton-Hamilton Geomorphic Study Reach along Timberbrook Drive.

The location of each station was selected based on its proximity to future water quality improvements within the Acton-Hamilton watershed. The sites were established prior to construction of the water quality projects to develop a pre-retrofit baseline for pollutant inflow to the receiving channel.

An In-Situ level logger and staff plate were installed at each station on June 18, 2015. Prior to installation, flow depth was measured at a surveyed cross-section at each station to determine the discharge from a rating table. This method was used for the 2015 through the 2021 reporting years. A new cross-section and rating table were established for the 2022 reporting year due to damage to the previous monitoring station. This is discussed in more detail in a subsequent section.

Eight storms were sampled at the Acton-Hamilton sites during FY 2022. Storm event samples were collected on 9/01/2021, 9/22/2021, 10/25/2021, 12/29/2021, 3/09/2022, 4/05/2022, 6/02/2022 and 6/22/2022.

The monitoring protocols included three discrete samples, representative of the rising limb, peak, and falling limb of the storm hydrograph for each storm event, collected at each monitoring station. All samples were collected manually so that *Escherichia coli (E. coli)* and

TPH (Total Petroleum Hydrocarbons) could also be analyzed. Martel Laboratories in Towson, Maryland performed the laboratory analysis for each event. Due to the duration of some storm events and the proximity of the sites to the laboratory, most of the discrete E. coli samples were delivered to laboratory after the method holding time for both sites.

Table 39: Number of Samples for Chemical Monitoring at the Acton-Hamilton Stations

		Wet Weather Sample		Baseflow Sample	
Year	**Month**	**AH001**	**AH002**	**AH001**	**AH002**
2015	April	1	1	1	1
	June	2	2	-	-
	September	1	1	-	-
	October	1	1	-	-
	November	2	2	-	-
2016	January	1	1	-	-
	April	1	1	-	-
	May	1	1	-	-
	June	1	1	-	-
2017	March	1	1	-	-
	April	1	1	-	-
	May	2	2	-	-
	August	1	1	-	-
	September	1	1	-	-
	October	2	2	-	-
2018	March	2	2	-	-
	April	1	1	-	-
	July	-	-	1	1
	August	1	1	-	-
	October	2	2	-	-
	November	1	1	-	-
2019	January	1	1	-	-
	March	1	1	-	-
	June	2	2	-	-
2020	April	1	1	1	1
	May	1	1	-	-
	June	1	1	-	-

	September	2	2	-	-
	October	1	1	-	-
	November	1	1	-	-
2021	March	2	2	-	-
	June	2	2	-	-
	September	2	2	-	-
	October	1	1	-	-
	December	1	1	-	-
2022	March	1	1	-	-
	April	1	1	-	-
	June	2	2	-	-

The combined Acton-Hamilton results from the chemical monitoring for this reporting year are contained in the *Chemical Monitoring Table* of the enclosed MS4 geodatabase and Appendix E.

Acton-Hamilton Continuous Flow Data

Continuous flow data was collected at the AH001 and AH002 sites during the FY2021 sampling period. At the AH002 site, the water level logger was lost due to a large storm event in June 2020, then reset and lost again during another large storm event in January 2021. Maintenance was conducted at the station, and a new cross section established for the discharge calculations. A new level logger and staff plate were installed at the sampling station.

The level depth to flow rate rating curve was replaced for AH002 as a result of these modifications. Field measurements at the cross section were taken to establish channel geometry, and tied in elevation to the level logger located in a pool downstream. Bentley FlowMaster was used to develop a Manning's equation rating table based on depth measurements at the level logger to the flow through the surveyed cross section. These flow rates were used to establish the flow-weighted event mean concentrations for monitored storm events.

Acton-Hamilton Event Mean Concentrations

Using the modeled stage-discharge relationship for each station and the laboratory results for each discrete sample collected at the sites, event mean concentrations (EMCs) were computed. EMCs were weighted based on the volume of flow for each limb of the storm. Volume was calculated using each station's level logger data and a modeled stage-discharge rating curve. The chemical concentrations were multiplied by the flow volume, summed, and divided by the total flow volume to compute a weighted average for each storm event.

If a parameter was not detected in the laboratory analysis, a value of zero was used for the low end of the possible range, and the detection limit was used for the high end of the range. The flow-weighted EMCs for each storm were then averaged over each season. Seasonal averages were weighted per seasonal flow volume and averaged to determine the average EMC for each parameter at each site. Average flow-weighted EMCs by calendar year for the Acton-Hamilton sites (AH001 and AH002) are provided in Tables 40 and 41.

Table 40: Annual Average Flow-Weighted EMC and Number of Events Sampled, AH001

FY	TKN	NO_x	TP	TSS	BOD	Pb	Cu	Zn	TPH	E-coli	Hardness
	mg/L Event					ug/L Event			mg/L Event	MPN Event	ug/L Event
2014/15[1,2]	0.783	0.203	0.163	683	7.083	5.123	10.343	82.443	1.13	21,7303	26,4343
2015/16[2]	0.928	0.258	0.158	558	4.798	1.838	9.618	71.048	0.98	10,0928	30,7878
2016/17[2]	1.528	0.348	0.158	748	4.868	4.288	11.038	71.198	3.268	7,5078	33,8828
2017/18[3]	0.357	0.227	0.117	417	2.747	1.637	8.627	58.97	1.27	3,3107	32,9627
2018/19[3]	0.368	0.308	0.148	368	2.378	2.248	7.868	63.158	2.88	78,8468	24,5878
2019/20[3]	0.377	0.267	0.117	317	3.057	2.437	8.167	64.267	2.27	5,9417	38,2777
2020/21[3]	0.208	0.228	0.098	308	3.258	2.768	8.368	53.008	1.48	3,3358	40,3258
2021/22[3]	0.518	0.248	0.158	428	3.158	2.278	8.628	56.738	1.58	18,0378	32,0928
NURP	2.35	0.96	0.47	140	11.00	180.0	50.00	180.00			

[1]*Values were revised after initial submission to calculate annual EMCs weighted per season.*

[2]*Annual average EMCs were calculated by averaging the seasonal EMCs with non-detected samples set to zero.*

[3]*Annual average EMCs were calculated by averaging the seasonal average of EMCs with non-detected samples set to zero and EMCs with non-detected samples set to the detection limit.*

Table 41: Annual Average Flow-Weighted EMC and Number of Events Sampled, AH002

FY	TKN	NO_x	TP	TSS	BOD	Pb	Cu	Zn	TPH	E-coli	Hardness
	mg/L Event					ug/L Event			mg/L Event	MPN Event	ug/L Event
2014/15[1,2]	1.143	0.833	0.353	2093	7.523	7.113	8.163	78.613	4.13	15,1173	28,9373
2015/16[2]	0.848	0.318	0.208	598	4.928	1.688	5.188	58.318	0.38	9,5118	33,4298
2016/17[2]	1.528	0.348	0.158	748	4.868	4.288	11.038	71.198	3.268	7,5078	33,8828
2017/18[3]	0.357	0.297	0.167	737	1.957	2.797	4.817	39.597	1.17	3,9157	26,8037
2018/19[3]	0.48	0.42	0.21	182	2.25	5.23	4.00	44.89	3.4	42,074	22,358

	8	8	8	8	8	8	8	8	8	8	8
2019/20[3]	0.417	0.287	0.217	787	3.667	3.917	5.267	47.527	1.77	7,8817	32,4047
2020/21[3]	0.208	0.218	0.108	488	2.498	2.238	3.568	30.718	1.48	4,7788	35,0058
2021/22[3]	0.718	0.248	0.188	798	3.728	2.748	4.528	37.878	1.48	9,6558	28,6018
NURP	2.35	0.96	0.47	140	11.00	180.0	50.00	180.00			

[1]*Values were revised after initial submission to calculate annual EMCs weighted per season.*
[2]*Annual average EMCs were calculated by averaging the seasonal EMCs with non-detected samples set to zero.*
[3]*Annual average EMCs were calculated by averaging the seasonal average of EMCs with non-detected samples set to zero and EMCs with non-detected samples set to the detection limit.*

Chemical Monitoring Assessment

The results of the laboratory analysis (both individual samples and EMCs) were reviewed for the storm events during the permit period. Findings are summarized below:

AH001 – Upstream Site

- A first flush effect was observed for several constituents at this sampling station. Concentrations were typically higher for NOx (nitrate and nitrite), phosphorus, BOD, lead, copper, zinc, and hardness in rising limb samples than for peak and falling samples. TKN (total Kjeldahl nitrogen), TSS (total suspended solids), and *E. coli* concentrations did not show a prominent trend between the rising, peak, and falling samples. This is consistent with observations from previous years.
- There did not appear to be a strong correlation between flow volume and TSS concentrations. Higher volumes are often able to mobilize a higher concentration of suspended solids, and this was not observed.
- The 6/22/2022 storm event had comparatively high concentrations of nearly all constituents, particularly for the first flush sample.
- TPH was detected in only one sample this year (9/22/2021 first flush). This is consistent with past years monitoring results.
- The eight-hour holding time for *E. coli* was exceeded for the 9/1/2021, 10/25/2021, 12/29/2021, 3/9/2022, 4/5/2022, and 6/22/2022 rising samples. *E. coli* holding times for the peak samples were exceed on 9/1/2021, 10/25/2021, 3/9/2022, 4/5/2022, and 6/22/2022. Falling limb *E. coli* sample holding times were exceeded 9/1/2022 and 4/5/2022.

AH002 – Downstream Site

- A first flush effect was not present at this sampling station this year as in the FY2020 and FY2021 sampling years. This may be an effect of the newly installed wetland system upstream of the monitoring site.
- TSS concentrations for the first flush of 9/22/2021 were very high.
- The 9/22/2021 first flush sample was the only sample taken with a measurable TPH concentration. This correlates to AH001.
- The eight-hour holding time for *E. coli* was exceeded for the 9/1/2021, 10/25/2021, 3/9/2022, 4/5/2022, and 6/22/2022 rising and peak samples. Falling limb holding times for *E. coli* were exceeded for 9/1/0221 and 3/9/2022. The 4/6/2022 peak sample for BOD exceeded the hold time.

Federal and State acute and chronic criteria are presented in Table 42 below. The laboratory data are compared, where possible, to these criteria to assess the extent of possible pollution within this watershed. Criteria are used to protect against both short-term and long-term effects. Numeric criteria are important where the cause of toxicity is known or for protection against pollutants with potential human health impacts or bioaccumulation potential. Narrative criteria can be the basis for limiting toxicity in discharges where a specific pollutant can be identified as contributing to the toxicity.

Criteria do not exist for all parameters measured at the monitoring stations. In addition, a clear cause and effect relationship between water quality and ecological condition is difficult to determine. However, these comparisons can be used as general indicators of water quality impairment. Both State and Federal criteria are based on ambient stream conditions. Chronic criteria consider the maximum levels at which aquatic life can survive if continuously subjected to a pollutant concentration. Acute criteria reflect the maximum level at which an aquatic organism can survive if periodically subjected to a pollutant concentration. Since storm events represent a periodic condition, wet-weather samples are compared only to acute criterion.

Table 42: State and Federal Water Quality Criteria Available for Parameters Sampled

Pollutant	Water Quality Criteria		Reference
	Chronic	Acute	
Metals ((µg/L):			
Lead	2.5	65	COMAR 26.08.02.03-2
Copper	9	13	COMAR 26.08.02.03-2
Zinc	120	120	COMAR 26.08.02.03-2
Other Pollutants (mg/L):			
Total Phosphorus	0.10		1972 305(a) Report to Congress (EPA 440/9-74-001)
BOD_5	7		Quality Criteria for Water, EPA 1986

Nitrate	10	Quality Criteria for Water, EPA 1986
TSS	500	1972 305(a) Report to Congress (EPA 440/9-74-001)
TKN	None	---
TPH	None	---
Hardness	None	---
E. Coli[(1)] (MPN/100ml)	235	COMAR 26.08.02.03-3

(1): Used most restrictive standard as a conservative approach: frequent full body contact recreation criterion.

The results of the laboratory analysis (both individual samples and EMCs) for the 2022 reporting year were compared to the values reported in Table 42 as well as the Nationwide Urban Runoff Project (NURP) values reported in Tables 40 and 41. Findings are summarized below:

AH001 – Upstream Site

- Individual samples were above State and Federal water quality values for BOD in the 10/25/2021 peak and 6/22/2022 rising samples. All EMCs were below the State and Federal water quality criterion value.
- All individual samples and EMC's for NOx were below State and Federal water quality criteria values.
- Individual samples were above State and Federal water quality criteria values for total phosphorus in the 9/1/2021 rising sample, the 9/22/2021 rising sample, the 10/25/2021 rising and peak samples, the 3/9/2022 rising and peak samples, the 4/5/2022 rising sample, the 6/2/2022 rising and peak samples, and the 6/22/2022 rising and peak samples. EMCs for total phosphorus were above State and Federal water quality criteria values for the 9/1/2021, 9/22/2021 10/25/2021, 3/9/2022, 6/1/2022, and 6/22/2022 storm events.
- All individual samples and EMC's for TSS were below State and Federal water quality criteria values.
- Individual samples were above State and Federal water quality chronic criteria values for lead in the 9/1/2021 rising and peak samples, the 9/22/2021 rising sample, the 10/25/2022 rising sample, the 3/9/2022 peak sample, the 6/1/2022 rising and peak samples, and the 6/22/2022 rising and peak samples. EMCs for lead were above chronic State and Federal water quality criteria values for the 9/1/2021, 6/1/2022, and 6/22/2022 storm events.
- Individual samples were above State and Federal water quality chronic criteria values for copper in the 9/1/2021 rising sample, 9/22/2022 rising and peak samples, 3/9/2022 rising and peak samples, the 4/5/2022 rising sample, the 6/1/2022 rising and peak samples, and the 6/22/2022 rising and peak samples. EMCs for copper were above chronic State and Federal water quality criteria values for the 9/22/2021, 3/9/2022, 6/1/2022, and

6/22/2022 storm events. However, the average annual EMC value for copper was below the chronic State and Federal water quality criteria value.

- Individual samples were above State and Federal water quality chronic criteria values for zinc in the 9/1/2021 rising sample, the 10/25/2021 rising sample, the 6/2/2022 rising sample, and the 6/22/2022 rising and peak samples. EMC's for zinc were within chronic State and Federal water quality criteria values for all storm events.
- All individual samples and EMCs for *E. coli* were above State and Federal water quality criteria.

AH002 – Downstream Site

- Individual samples were above State and Federal water quality values for BOD in the 4/5/2022 rising sample. All EMC's were below chronic criteria.
- All individual samples and EMC's for NOx were below State and Federal water quality criteria values.
- Individual samples were above State and Federal water quality criteria values for total phosphorus in the 9/1/2021 rising and peak samples, the 9/22/2021 rising and peak samples, the 10/25/2021 samples for all limbs of the storm, the 12/29/2021 rising and peak samples, the 3/9/2022 rising and peak samples, the 4/5/2022 rising and peak samples, the 6/1/2022 rising and peak samples, and the 6/22/2022 rising and peak samples. EMCs for total phosphorus were above State and Federal water quality criteria values for all storm events.
- All individual samples and EMC's for TSS were below State and Federal water quality criteria values.
- Individual samples were above State and Federal water quality chronic criteria values for lead in the 9/1/2021 peak sample, the 9/22/2021 samples for all limbs of the storm, the 10/25/2021 peak sample, the 4/6/2022 peak sample, and the 6/22/2022 peak sample. EMCs for lead were above chronic State and Federal water quality criteria values for the 9/1/2021, 9/22/2021, and 6/22/2022 storm events. The average annual EMC value for lead exceeded the chronic State and Federal water quality criteria value.
- Individual samples were above State and Federal water quality chronic criteria values for copper in the 9/22/2021 rising sample, the 10/25/2021 peak sample, and the 6/22/2022 peak sample. EMCs for copper were below chronic State and Federal water quality criteria values for all events.
- Individual samples were above State and Federal water quality chronic criteria values for zinc in the 9/22/2021 rising sample and the 6/22/2022 peak sample. EMCs for zinc were below chronic State and Federal water quality criteria values for all events.
- All individual samples and EMCs for *E. coli* were above State and Federal water quality criteria values except in the 12/29/2021, where all samples were below the criterion.

Acton-Hamilton Comparison between AH001 and AH002

Overall, when comparing 2016 reporting year through 2022 reporting year data in Tables 40 and 41, the following trends were observed. TKN was much lower and consistent at the two sites between reporting years 2018 and 2022 than in the previous reporting years, though this increased some in 2022. Nitrate and phosphorus have been trending downward for several years, with a small increase in 2022. This trend may be attributed to the constructed BMPs upstream of the monitoring stations. TSS had also been trending downward, with an increase during 2022. BOD has remained fairly consistent over the years. Likewise, lead, copper, zinc, and TPH levels appear consistent. 2022 witnessed an increase in *E. coli* values.

For the 2022 reporting year, both sites have flow-weighted values that are fairly consistent, with the exception of copper and zinc. Site AH001 continues to have higher annual concentrations for these parameters. The upstream monitoring site (AH001) is located just below a large area of commercialization along US 301 that would typically produce heavy metals and hydrocarbons associated with vehicles. The downstream monitoring site (AH002) is surrounded by residential neighborhoods which may be contributing more nutrients from lawn care. The AH002 site also has a much larger drainage area than the upstream site (AH001), which may be producing a dilution effect for the heavy metals.

The goal of the annual chemical monitoring is to assess the conditions present within the Acton-Hamilton watershed before water quality projects are implemented. Once the water quality projects have been implemented, analysis of storm results will determine if these projects are significantly reducing sampled pollutants within the watershed. The constructed offline submerged gravel wetland and wetland along the main stem channel may be contributing to the reducing concentrations of TKN, nitrate, and phosphorus at both monitoring sites. As each facility matures and as more facilities are constructed over the next few years, pollutant EMCs may see a more significant reduction.

b. *Biological Monitoring:*

i. *Benthic macroinvertebrate samples shall be gathered each Spring between the outfall and in-stream stations or other practical locations based on an approved study design; and*

ii. *The County shall use the EPA Rapid Bioassessment Protocols (RBP), Maryland Biological Stream Survey (MBSS), or other similar method approved by MDE.*

c. *Physical Monitoring:*

i. *A geomorphologic stream assessment shall be conducted between the outfall and in-stream monitoring locations or in a reasonable area based*

on the approved study design. This assessment shall include an annual comparison of permanently monumented stream channel cross-sections and the stream profile;

ii. *A stream habitat assessment shall be conducted using techniques defined by the EPA's RBP, MBSS, or other similar method approved by MDE; and*

iii. *A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.*

d. *Annual Data Submittal: The County shall describe in detail its monitoring activities for the previous year and include the following:*

i. *EMCs submitted on MDE's long-term monitoring database as specified in Part V below;*

ii. *Chemical, biological, and physical monitoring results and a combined analysis for the approved monitoring locations; and*

iii. *Any requests and accompanying justifications for proposed modifications to the monitoring program.*

FY 2022 Status

Biological and Physical Stream Assessments

Beginning in Fall 2005, a study site has been monitored for biological and physical condition on a tributary to Mattawoman Creek. This section summarizes data collected by KCI and Coastal Resources in the spring of 2022. The study site is located in northern Charles County between Berry Road and Acton Lane just off Timberbrook Lane. This site was previously identified as part of Charles County's Watershed Restoration Plan and was termed Acton-Hamilton based on the two major roads in the area. The Acton-Hamilton site was ranked as the fifth highest priority for restoration and was therefore selected for further investigation. The Acton-Hamilton long-term site was monitored to establish baseline values in the fall of 2005 (geomorphic assessment) and the spring of 2006 (bioassessment). The following table lists the field assessment dates including the baseline assessments.

Table 43: Field Assessment Dates

Year	Geomorphic Assessment	Biological
2005-2006	December 14, 2005	April 17, 2006
2006-2007	January 11, 2007	May 4, 2007
2007-2008	December 12, 2007	April 17, 2008
2008-2009	December 15, 2008	April 29, 2009

2009-2010	December 1, 2009	March 08, 2010
2011	April 26, 2011	April 26, 2011
2012	-	April 27, 2012
2013	March 8, 2013	March 8, 2013
2014	April 16, 2014	April 16, 2014
2015	March 16, 2015	March 16, 2015
2016	March 16, 2016	March 16, 2016
2017	March 24, 2017	March 24, 2017
2018	March 13, 2018	March 13, 2018
2019	March 29, 2019	March 29, 2019
2020	April 23, 2020	April 23, 2020
2021	April 28, 2021	April 28, 2021
2022	April 25, 2022	April 25, 2022

The geomorphic assessment includes cross-sections, longitudinal profiles, and particle size analysis. Spring bioassessment monitoring involves the collection of water quality data, sampling, and analysis of the benthic macroinvertebrate community, assessment of physical and habitat features and photo-documentation of site conditions at monitoring stations on the study reach.

Geomorphic Assessment

The channel substrate along the assessment reach is dominated by coarse gravel. There are two cross-sections located within the approximately 400-foot profile. At Cross Section 1, a combination of deepening of the channel due to headward migration of the pool and erosion of the left bank have caused the cross-sectional area to increase over the monitoring period, until 2020 when deposition occurred in the right side of the channel. Cross sectional area once again increased in 2021 as erosion occurred on the left bank and downcutting occurred along the right bank, however decreased slightly in 2022 due to deposition filling in the right bank some. In 2022, the thalweg continued to downcut. The low bench on the right bank has remained nearly the same throughout the monitoring period.

At Cross Section 2, erosion and about a half-foot of downcutting occurred between 2011 and 2013. Additional downcutting occurred most years since then. In 2019, the cross-sectional area at Cross Section 2 had decreased due to aggradation across the stream bed. In 2020, cross sectional area increased slightly due to degradation on the right side of the stream bed. In 2021, cross sectional area increased again due to downcutting in the channel and remained similar in 2022. There has been minor erosion present on the bottom of both banks in most years, but the upper banks remain stable. Tables 44 and 45 below summarize the cross section, profile, and pebble count data for baseline and subsequent monitoring efforts. Changes in bankfull area for the two cross sections is primarily due to erosion and aggradation associated with typical stream

processes. Full results, including graphical depictions of the profile, cross sections, and pebble count data, are included in the Annual Monitoring Report found in Appendix F.

In general, the substrate is highly mobile with point bar formations, areas of channel aggradation, and some finer sedimentation in the pools. The channel geometry remains consistent with previous years, with the exception of a lowered grade downstream of station 1+77 that was first evident in 2013. The stream appears to experience overbank flow in the floodprone zone regularly.

Table 44: Bankfull Channel Dimensions – Cross Section 1

Parameter	2013 0+46	2014 0+47	2015 0+46.5	2016 0+46.5	2017 0+46.5	2018 0+47	2019 0+46.7	2020 0+46.7	2021 0+46.7	2022 0+46.7
Top of Bank Cross sectional Area (ft^2)	52.3	52.2	55.4	57.9	57.0	58.2	61.5	57.7	73.6	62.5
Bankfull Cross sectional Area (ft^2)	28.4	28.4	31.2	33.8	32.8	33.8	33.5	29.6	39.1	36.0
Top of Bank Width (ft)	30.5	28.3	29.3	30.6	29.8	29.5	31.0	29.0	34.0	27.2
Bankfull Width (ft)	22.1	22.2	22.3	22.5	22.6	23.1	22.8	20.8	20.9	18.3
Mean Depth (ft)	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.4	1.9	2.0
Width-depth Ratio	17.1	17.4	15.9	14.9	15.5	15.8	15.5	14.6	11.1	9.3
Velocity (ft/s) at Bankfull	3.8	3.8	3.9	4.0	4.2	4.0	4.0	3.6	3.9	4.6
Discharge Rate (cfs) at Bankfull	106.9	107.4	121.5	133.6	137.7	134.0	133.4	106.5	153.4	164.7
Entrenchment Ratio	2.3	2.2	2.2	2.2	2.2	2.2	2.2	1.0	2.4	2.7
D50 Particle Size (mm)	17	19	18	21	25	21	12	17	18	19
D84 Particle Size (mm)	25	40	41	37	42	46	28	40	34	33
Threshold Grain Size at Bankfull (mm)	17	19	19	20	20	19	15	15	17	19

Parameter	2013 0+46	2014 0+47	2015 0+46.5	2016 0+46.5	2017 0+46.5	2018 0+47	2019 0+46.7	2020 0+46.7	2021 0+46.7	2022 0+46.7
Channel Slope (%)	0.48	0.54	0.49	0.52	0.53	0.49	0.38	0.39	0.39	0.39

Table 45: Bankfull Channel Dimensions – Cross Section 2

Parameter	2013 3+09	2014 3+05	2015 3+05	2016 3+05	2017 3+11	2018 3+15	2019 3+13	2020 3+13	2021 3+13	2022 3+14
Top of Bank Cross section Area (ft^2)	32.6	35.5	35.4	33.8	34.4	41.0	38.9	39.9	49.9	45.2
Bankfull Cross section Area (ft^2)	23.1	23.9	26.6	25.3	25.6	32.0	30.1	30.9	36.5	36.2
Top of Bank Width (ft)	19.4	19.2	19.6	18.9	19.3	19.4	19.4	19.4	20.1	19.0
Bankfull Width (ft)	14.3	14.5	14.5	14.7	14.9	15.6	15.4	16.1	15.9	16.5
Mean Depth (ft)	1.6	1.7	1.8	1.7	1.7	2.0	1.9	1.9	2.3	2.2
Width-depth Ratio	8.9	8.8	7.9	8.5	8.6	7.6	7.9	8.3	6.9	7.5
Velocity (ft/s) at Bankfull	4.2	4.0	4.5	4.0	4.6	4.8	4.6	4.2	4.7	4.9
Discharge Rate (cfs) at Bankfull	97.0	96.8	119.1	102.3	117.9	153.2	137.4	130.1	172.7	177.5
Entrench -ment Ratio	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.2
D50 Particle Size (mm)	17	19	18	21	25	21	12	17	18	19
D84 Particle Size (mm)	25	40	41	37	42	46	28	40	34	33
Threshold Grain Size at Bankfull (mm)	20	21	24	22	24	26	19	19	22	22
Channel Slope (%)	0.47	0.47	0.49	0.52	0.53	0.49	0.38	0.39	0.39	0.39

Instream Water Quality and Bioassessment

Table 46 summarizes the water quality, habitat, and bioassessment data. Instream water quality was measured during the bioassessment conducted in the spring of 2022. All regulated parameters fell within acceptable *COMAR* ranges. Excessive algae presence was noted during the 2007-2010 monitoring events and again from 2015 through 2017. While filamentous algae were present from 2018 to 2022, it was not in excessive amounts.

The physical habitat assessment rated the habitat for fish and benthic macroinvertebrates at the low to mid-range of suboptimal. The banks were unstable (poor) with marginal vegetative protection. Both banks had marginal riparian vegetative zone widths, and were greatly impacted by human activities (i.e., mowing). The PHI rating was "Partially Degraded" from 2006 to 2019 and dropped to "Degraded" in 2020, remaining in that category in 2021 and 2022. The decrease in PHI rating was generally due to decreased bank stability on both banks.

The BIBI score at this site was rated as "Fair" in 2022, with a score of 3.86. This is a slight increase from the first year it was monitored in 2006 and is the same as the 2021 BIBI score. It is the second highest score in all years of monitoring, which ranged from 1.86 (Very Poor) to 4.43 (Good).

Table 46: Acton-Hamilton Instream Water Quality and Habitat Assessment Data

Instream Water Quality							Habitat and Biological Assessment	
Year/Time	**pH**	**DO (mg/L)**	**Temp (°C)**	**Conductivity µS/cm**	**TDS (mg/L)**	**Turbidity (NTUs)**	**PHI**	**BIBI**
Spring 2006 11:00 AM	7.04	9.09	13.19	214.2	137.0	14.9	74 (Partially Degraded)	3.6 (Fair)
Spring 2007 8:30 AM	7.13	3.62	13.20	214.0	139.0	4.3	74 (Partially Degraded)	2.7 (Poor)
Spring 2008 7:00 PM	6.85	11.17	15.79	186.0	121.3	2.6	71 (Partially Degraded)	3.0 (Fair)
Spring 2009 11:00 AM	6.73	6.97	16.33	236.9	n/a	3.49	78 (Partially Degraded)	2.7 (Poor)
Spring 2010 8:30 AM	7.76	13.52	4.50	395.7	n/a	4.16	72 (Partially Degraded)	2.7 (Poor)
Spring 2011 8:30 AM	6.19	8.82	18.27	174.3	n/a	8.62	73 (Partially Degraded)	2.4 (Poor)

Instream Water Quality							Habitat and Biological Assessment	
Year/Time	pH	DO (mg/L)	Temp (°C)	Conductivity µS/cm	TDS (mg/L)	Turbidity (NTUs)	PHI	BIBI
Spring 2012 8:30 AM	6.23	8.75	12.17	171.5	n/a	6.62	74 (Partially Degraded)	2.1 (Poor)
Spring 2013 8:00 AM	6.57	13.13	4.17	185.3	n/a	12.70	77 (Partially Degraded)	1.9 (Very Poor)
Spring 2014 7:00 AM	7.19	10.52	8.50	304.5	n/a	22.40	77 (partially degraded)	2.7 (Poor)
Spring 2015 8:30 AM	6.60	11.90	5.33	587.0	n/a	10.13	76 (Partially Degraded)	3.0 (Fair)
Spring 2016 8:30 AM	7.38	11.99	9.78	368.7	n/a	6.90	77 (Partially Degraded)	3.29 (Fair)
Spring 2017 8:30 AM	6.70	12.67	5.13	293.3	n/a	1.60	82 (Minimally Degraded)	2.71 (Poor)
Spring 2018 9:00 AM	6.65	12.70	3.27	296.7	n/a	1.60	80.3 (Partially Degraded)	4.14 (Good)
Spring 2019 9:00 AM	6.80	10.73	9.40	214.7	n/a	3.43	66.4 (Partially Degraded)	2.43 (Poor)
Spring 2020 8:30 AM	6.84	9.72	10.83	189.3	n/a	3.17	60.9 (Degraded)	3.29 (Fair)
Spring 2021 8:30 AM	6.42	8.57	15.27	203.3	n/a	4.18	65.7 (Degraded)	3.86 (Fair)
Spring 2022 9:25 AM	7.46	9.15	14.33	219.7	n/a	2.80	65.8 (Degraded)	3.86 (Fair)
COMAR Limits	6.5 - 8.5	> 5.0	< 32.0	n/a	n/a	< 150	n/a	n/a

2. Stormwater Management Assessment

The County shall continue monitoring Piney branch watershed, or select and submit for MDE's approval a new watershed restoration project for determining the effectiveness of stormwater management practices for stream channel protection. Physical stream monitoring protocols shall include:

a. *An annual stream profile and survey of permanently monumented cross-sections in the unnamed tributary to Piney Branch to evaluate channel stability;*

b. *A comparison of the annual stream profile and survey of the permanently monumented cross-sections with baseline conditions for assessing areas of aggradation and degradation; and*

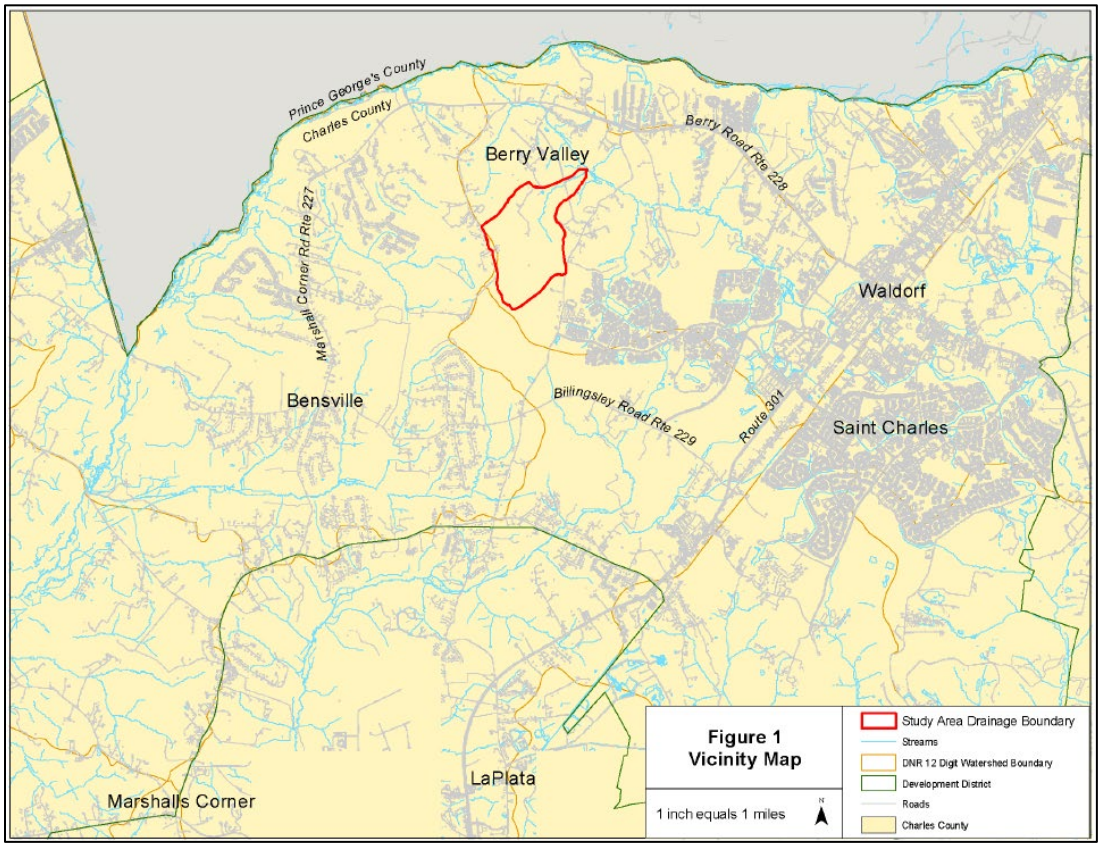
c. *A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.*

FY 2022 Status

Since 2003, the County has been conducting stream monitoring on the tributary to Piney Branch to evaluate the effectiveness of stormwater management, designed under the stormwater design regulations in the *2000 Maryland Stormwater Design Manual*, to adequately provide channel protection. The most recent assessment was conducted in June 2022.

The tributary to Piney Branch study area lies between Berry Road and Middletown Road and is a part of watershed 021401110785. The drainage area was historically in agricultural and forest use. The study area is located within the County's Development District and has been under development since the start of monitoring in 2003 with the addition of North Point High School, William A. Diggs Elementary School and the residential developments of Windsor Mill, Avalon, and Middletown Woods.

A map of the location follows.



In the fall of 2003, at the time of the first site visits and survey, the North Point site construction was well underway with full clearing and installation of temporary storm water management (SWM) facilities. By the spring of 2004 clearing and grading were complete at the Windsor Mill site and all four temporary SWM facilities were in place, three of which were in the study area. In the fall of 2004, the Windsor Mill site had roadways in place and the ponds had risers installed. Temporary SWM ponds were in place and functioning properly at the Avalon site. By the spring of 2005, little had changed at the Windsor Mill site, while homes were beginning to be built at the Avalon site. Construction of North Point High School was complete in 2005. By 2006, the William A. Diggs Elementary School was also complete. Site visits in late 2006 and early 2007 did not show major changes in the study area from the previous year. In 2008 and 2009 houses continued to be added to the western portion of the Avalon development. By 2013, more homes were added to Phase II of the Avalon community and many homes had been constructed south of Avalon Phase I. Just outside of the study area, construction continued at the Avalon West community with many new homes built since 2009. Additional homes were under construction on existing lots in the Avalon community in 2014. In early 2015, several new streets were under construction as part of Middletown Woods, located on the southern side of Frankfurt Drive within the drainage area. New home construction along those streets was nearing completion in 2017 and no new construction was observed between 2017 and 2018. The Maryland Department of Transportation's State Highway Administration (SHA) is proposing to plant approximately 22 acres

of trees in the summer of 2018 within the drainage boundary. In 2019, trees were planted in subwatersheds 1 and 2 within Avalon development between Devonfield Ave. and Downshire Ct. The exact area of planting is not mapped but based on field observations approximately 10 acres of trees were planted. In 2020 new construction is ongoing at the end of Daves Rd., an access road off of Davis Rd., south of North Point High School in an area that has been cleared for some time. There was no other significant development or land use changes noted in the watershed. In 2021, the Avalon community was expanding to the north into the clearing that was identified in 2020 at the end of Daves Road. Multiple new homes have been constructed on Devonfield Ave. north of the intersection with Brooksfield St., and new homes are being built on newly constructed Poppyseed Ct. and Peppermill Ct. In 2022, home construction has been completed within the expanded section of the Avalon community along Poppyseed Ct. and Peppermill Ct. Three permanent stormwater facilities were added to this area. Grading activity was observed off of Lexington Dr. It is unclear what construction activity was occurring on the site, but sediment controls were in place. This property is owned by the Maryland Highway Administration. There were no other significant development areas or landuse changes within the watershed.

Profiles 1 & 2

The assessment includes surveys of a longitudinal profiles (Profiles 1 and 2) of the stream thalweg and cross sections along each profile. The profile surveys are conducted to locate and quantify the length and sequence of various instream features such as riffles, pools and glides. The profiles surveyed in the fall of 2003 represent the pre-construction baseline conditions, as was conducted before stormwater runoff from upstream sites was generated. The surveys are repeated yearly and compared to previous assessments for changes in stream morphology such as thalweg degradation or aggradation. Visual inspection and site photographs are also compared for changes in stability, planform, dominant substrate particle sizes and signs of excessive sedimentation. Cross Sections 1, 2, 4, 5, and the Stream Gage Cross Section are located on Profile 1, and Cross Section 3 is located on Profile 2.

Profile 1 - Station 0+00 to 26+35

Profile 1 between station 0+00 and the confluence with Profile 2 is in a confined stream valley with relatively steep valley walls. The valley has a well-developed floodplain that varies from approximately 100 to 150 feet wide, with the channel meandering within the valley. Several beaver dams (both active and inactive) and their associated ponds have been present throughout the years of monitoring. In 2022, no significant changes were observed to this section of Profile 1. The large beaver dam at approximately station 6+60 remains as the stream continues to cut around the beaver dam through the newly formed channel in the floodplain in the area of cross section 1. This portion of Profile 1 receives stormwater runoff from both Windsor Mill and Avalon. The majority of Avalon runoff flows into the segment with Profile 2 and then into Profile 1 at the confluence near station 25+25.

Cross Section 1

Cross Section 1 is located at station 5+13 with the channel adjacent to the valley wall. In the early years of monitoring, the thalweg was generally shifting toward the right side of the channel (the outside of the meander) with aggradation along the left bank. The increase in aggradation may have been due to the increased beaver activity in the vicinity of Cross Section 1. At the 2014 survey, a beaver dam had been built through the cross section, significantly decreasing the cross-sectional area and diverting some of the stream flow around the cross section. A second beaver dam had been built approximately 10 feet downstream of Cross Section 1 in 2015. Both of these dams remained in place through 2018. In 2019 the second beaver dam had washed out, but the beaver dam built through the cross section remained unchanged. There were no significant changes to the cross section in 2020. In 2021, the beaver dam built through the cross section had washed out, and the channel had been abandoned due to the stream cutting around the large beaver dam upstream of this cross section and forming a new channel in the floodplain. In 2022, little change has been observed between 2021 and 2022. The channel remains abandoned in this location with evidence that it receives flow only during large storm events.

Cross Section 2

Cross Section 2 is located at station 15+66 on a generally stable reach with good floodplain connectivity. In general, the cross-sectional area has been increasing slowly since the baseline survey due to downcutting of the channel and undercutting of the banks. By the fall of 2009, the cross-sectional area increased by 40% since the baseline condition. Minor changes in the bed and banks occurred between 2014 and 2017. In 2018, the thalweg moved to the left side of the channel, though the cross section area remained nearly the same. In 2019, the channel continued to degrade on the left side and degraded slightly on the right side as well. In 2020, both banks became slightly more undercut, and the right side of the channel degraded slightly. This trend continued in 2021. In 2022, a slight reduction in cross sectional area was observed. Banks remain undercut, but the stream still maintains good floodplain connection. The water depth at Cross Section 2 was 1.2 ft and a section of Profile 1 was backwatered between approximately stations 14+64 to 16+00 due to a riffle crest at approximately station 14+64 that is set at a higher elevation of 56.44 ft. It is possible that the back watering effect from the downstream riffle grade control has reduced the channel velocity enough for sediment to drop out and accumulate in the bottom of the channel, leading to the decrease in channel area between 2021 and 2022. As of 2022, the cross sectional area has increased by 37% over the baseline monitoring in 2003.

Stream Gage Cross Section

Cross Section, was found vandalized in 2013 and no gauge data had been recorded since March 2010. The cross section is located at station 16+19 on Profile 1, just upstream of Cross Section 2. Similarly, to Cross Section 2, the cross-sectional area has been following an increasing trend since the baseline survey due to downcutting of the channel and undercutting of the banks. This trend continued until 2019, when the cross-sectional area decreased due to bed aggradation. There was no significant change to the cross section in 2020. In 2021, the left bank had become

undercut and the left side of the channel had downcut slightly. In 2022, the left bank did not appear as undercut as it is likely the left bank slumped into the stream. The right bank did remain slightly undercut that has been consistent with previous monitoring years. The thalweg remains in the same location, however aggradation was observed in 2022 that is likely material from the slumped bank. The cross-sectional area was 53% larger in 2022 than at the baseline monitoring survey in 2003.

Profile 1 - Station 26+35 to 45+00

Profile 1 extends between station 26+35 (near the confluence with Profile 2) and approximately station 37+00 and is characterized by steep valley slopes to the southwest and little relief on the northeast terrace. The stream valley from station 37+00 to the upstream end of Profile 1 (approximately at station 45+00) is not confined and the topography levels out even further upstream of the profile where a forested wetland currently exists. This reach includes an MSHA ROW and areas cleared for the sewer line. In general, the water surface slope has decreased slightly since the initial survey in 2003, though it has remained nearly the same for the past several years. In 2018, no active beaver dams were observed in this reach, but several relic dams remained. In 2019, a large new beaver dam was built in the MSHA ROW that prevented survey upstream of the ROW due to depth of backwater. The dam remained in place and prevented survey from 2020 on. In 2022, an increase in small beaver dams between approximately stations 36+50 – 40+00 were observed. These smaller beaver dams backed water up to approximately the stream top of bank. This portion of Profile 1 receives flow from Windsor Mill and flow from the eastern half of Avalon.

Cross Section 4

Cross Section 4 is located at station 38+40, within the MSHA ROW but downstream of the utility ROW. This reach has been stable and surrounded by dense riparian vegetation through 2019. The banks have remained relatively stable since the baseline monitoring, while there have been minor changes in the bed over the years. In 2020, there was noticeable erosion to the tops of the banks, while in 2021 deposition occurred on the tops of the banks. In 2022, Cross Section 4 was located through a backwatered pool from a beaver dam located downstream, however less sediment deposition was noted along the left floodplain compared to 2021. The cross sectional area increased slightly from 2021. Left bank erosion was noted and the thalweg has shifted closer to the left bank when compared to the 2021 survey. It is likely that the downstream beaver dam is responsible for the left bank scour and slight increase in area. Overall, the cross-sectional area has increased by 18% from 2003 to 2022. Cross Section 4 receives flow from two of the three Windsor Mill ponds.

Cross Section 5

Cross Section 5 is located at station 44+09, upstream of the ROW crossing. Aggradation in the thalweg and slight scour of the left bank has occurred since the baseline monitoring, but in

general the cross-sectional area has remained stable. The cross-sectional area in 2018 was nearly the same as at the baseline monitoring. In 2019, a large new beaver dam located downstream of Cross Section 5 near station 41+60 caused significant backwatering extending upstream past the cross section. The left end pin of the cross section was buried in the remnants of another beaver dam that had been built at the cross section and washed out between the 2018 and 2019 surveys. The cross section was surveyed using an estimation of the location of the left end pin. The cross-sectional area only decreased by 4% from 2018 to 2019 due to aggradation from the beaver dam, but the wetted width increased from 10.4 ft in 2018 to 26.9 ft in 2019, and the water depth increased from 0.79 ft to 3.49 ft. In 2020, the left side of the channel appeared to downcut significantly. Cross-sectional area remained similar in 2021, though there was some deposition on the channel bottom and washout of the left bank. The channel remained backwatered in 2021, with increasingly soft, mobile material and less of a defined channel throughout the backwatered area. In 2022, Cross Section 5 was unable to be surveyed based on water elevations and the significant amount of debris hidden below the water surface that appeared to be remnants of an older dam. The Cross Section 5 right survey pin was recorded, and a channel shot was collected to complete Profile 1. This cross section will continue to be monitored in the future. Cross Section 5 receives flow from the one most upstream pond in Windsor Mill.

Profile 2 - Station 0+00 to 4+50

The Profile 2 channel is in a valley with 100-foot wide floodplain. The area upstream of Profile 2 is a very densely vegetated forested wetland. No beaver dams were located on this reach, however debris blockages have typically been present. Profile 2 receives the majority of flow from the Avalon development, although it did not appear that any had been received prior to the 2005 survey. The new development in the Avalon neighborhood is occurring at the upstream end of the study reach and clearing is occurring approximately 100 feet from the channel. The reach also receives flow from William A. Diggs Elementary School.

Cross Section 3

Cross Section 3 is located at station 2+29 on Profile 2, approximately halfway up the surveyed reach. This section had a large tree uproot on the right bank between 2009 and 2013, causing the cross-sectional area to increase substantially. The cross section remained nearly the same from 2013 to 2017. In 2018, the point bar along the left bank had increased in size, decreasing the cross-sectional area. In 2019, the point bar continued to increase in size, but the thalweg shifted further right under exposed tree roots, so the cross-sectional area increased slightly. In 2020 there was sediment accumulation under the rootwad, and the cross-sectional area decreased slightly. In 2021, the thalweg shifted further under the tree again and the cross-sectional area increased slightly. In 2022, the trend continues as the area underneath the rootwad has slightly increased, forming a shallow pool and shifting the thalweg closer to the right bank. The cross-sectional area has increased by 95% since the baseline monitoring in 2003.

Subwatershed Analysis

Subwatersheds (subsheds) were delineated within the study area watershed to analyze the changes in impervious area and land use that are potentially affecting the receiving channels and mainstem of the tributary. Impervious area in all of the subsheds has increased since 2004 due to development throughout the headwaters of the watershed. The largest increase was observed in subsheds 1 and 2. Subshed 1 had 0.7% impervious in 2004 and approximately 23.7% in 2017 (no change from 2017 to 2022). Subshed 2 had no impervious surface in 2004, but had 20.9% impervious in 2014, and remained the same since then. Impervious area increased slightly in 2022 by 0.97 acres with new development on Pepper Mill Ct. increasing the Subshed 2 impervious area percentage to 21.7%. Subshed 3 had 0.5% impervious in 2004 and 15.9% in 2017. There was no change in imperviousness from 2017 to 2020. In 2021, imperviousness increased an estimated 0.6% due to the new development in the Avalon neighborhood. In 2022, impervious area increased 0.81 acres from continued development in the Avalon neighborhood that is now complete. This increased the imperviousness to 16.7%. Overall, the entire watershed drainage area, which is represented by subshed 4, saw a marked increase in imperviousness since 2004 jumping from 1.1% to 13.9% in 2017, to 14.4% in 2021 and 2022. Land use within the subsheds consists of forest, residential, and institutional. In 2016, residential land use continued to replace forest in subshed 1 with the addition of several streets in Middletown Woods, a development at the southwestern side of the Avalon community. Planned residential developments in the watershed was supposed to be fully built with the completion of Middletown Woods in 2017. It is assumed that development in the Avalon community is now complete as of summer 2022.

North Point High School Pond Outfall

In 2011, KCI was directed to conduct a survey of an eroded outfall channel draining a stormwater management pond at the North Point High School within the tributary to Piney Branch watershed. Monuments were established and the initial survey was completed on April 26, 2011. Additional surveys were completed from 2013 to 2022.

Profile

The geomorphic survey begins at the pond outfall invert and extends just over 415 linear feet downstream. Riprap covers the channel and banks from the pond outlet to station 0+34. The trapezoidal engineered channel extends to approximately station 2+80 where the stream enters the forest and transitions to a natural channel. The channel profile from 0+00 to the end of the engineered channel has remained relatively unchanged from 2011 to 2021. The slope steepens significantly after the engineered channel ends, where a series of headcuts have formed and extend for approximately 40 feet. The initial headcut has continued to migrate upstream since monitoring began. Severe erosion before the 2018 monitoring caused the bed elevation to drop more than five feet over the initial headcut. In 2019 the headcuts began in approximately the same location (station 2+67), however the five-foot headcut had become undercut which

caused the loss of about five feet of material in the upstream direction (station 2+92 to 2+87). In 2020 the headcut did not move significantly further upstream and the total drop remained similar, but additional erosion of bed material created a step in the formerly undercut headcut. The headcut remained mostly unchanged in 2021. In 2022, the previously created step in the headcut had eroded away, leaving one large drop of approximately 7 feet in the channel.

Downstream of the headcuts at station 3+20, the stream becomes more stable and less incised, and meets the main channel approximately 75 feet downstream from the end of the survey at station 4+15. A second headcut started to form in 2018 at station 4+05, and in 2019 the bed elevation dropped approximately 2 feet over this headcut. In 2020 this headcut had filled in and seemed to be stabilizing. In 2021 this headcut was stabilized. From the upstream end of the headcuts to the end of the survey, the channel bed slope was 7.8 percent in 2011, 6.7 percent in 2019, 6.8 percent in 2020, 6.48 percent in 2021, and 6.68% in 2022. Four cross sections were surveyed at representative locations along the profile and rebar monuments were installed on both banks of each cross section.

Cross Section 1

Cross Section 1, station 0+11, characterizes the reach from the outfall to approximately station 0+40. This section has steep (45 percent side slopes), 12-foot high banks with riprap on the banks and channel bottom. Willows (*Salix* sp.) were dense in the channel each year until 2016, when it was observed that all vegetation was removed from the outfall to approximately station 0+80. This segment of the channel is very stable. Backwatered conditions due to root masses downstream have existed at this cross section in most years, including 2021. Excessive fine deposition (silt) was observed in this portion of the reach in 2017 to 2022. In 2022, the baseflow water surface elevation has increased due to the downstream beaver dam at approximately station 1+10, but the channel remains stable in this location.

Cross Section 2

Cross Section 2, station 1+18, characterizes the reach from station 0+40 to approximately 2+00. This section has dense willows in the channel, but the banks are slightly less steep (35% side slopes) than at Cross Section 1, with shallower 9-foot banks. This segment of the channel is also very stable and typically backwatered by root masses. In 2022, this cross section area increased as the stream downcut slightly by approximately 0.43 ft which is likely due to the effects of the beaver dam directly upstream of the cross section. Overall, conditions remain stable, and the baseflow width has increased.

Cross Section 3

Cross Section 3, station 2+36, characterizes the reach from station 2+00 to the end of the engineered channel where headcuts begin approximately at station 2+67. The headcuts have migrated upstream since 2014 when they were at station 2+80. Willows are much less dense in this section, allowing cattails to be the dominant vegetation. Both banks are much lower (3.5 feet) and had a more gradual slope (22 percent side slope) than the two upstream cross

sections. This cross section is also very stable. Deposition of fine sediment has formed an inset floodplain for the narrow (approximately one foot wide) low-flow channel that was observed starting in 2014. As no erosion of the bed or banks was noted upstream of Cross Section 3, the sediment being deposited here may be from the pond, which could indicate the pond is not functioning (not retaining sediment). No major changes were noted in 2020 or 2021. In 2022, the previous inset channel has expanded and the floodplain benches consisting of deposition have been removed. This cross section is now located through a backwatered pool created from a downstream beaver dam. The channel remains stable in this location.

Cross Section 4

Cross Section 4, located at station 3+73, characterizes the reach from station 2+80 to the end of the survey at 4+15. This section begins at the edge of a canopied forest below the engineered channel and then transitions into a low gradient wetland. In 2011, a 1.5 foot headcut with moderately severe bank erosion was located just upstream of Cross Section 4. The headcut had migrated upstream approximately 50 feet by 2013. Due to the changes created by the headcut upstream, this cross section was initially much less stable than the others but has had stable bed and banks through 2017. In 2018, the cross section was deeper due to the formation of a pool at a debris jam just downstream. The left bank had also experienced some erosion. In 2019, the bed elevation at Cross Section 4 had aggraded significantly and the left bank had continued to erode. In 2020, the left bank continued to erode and the channel bed degraded slightly. In 2021, there was additional erosion on both banks. In 2022, the cross sectional area increased, however the additional area does not take into account the woody material located through this section of stream. The left and right banks appeared to be stable with roots and vegetation providing surface protection. Overall, the cross-sectional area had increased by 163% since the baseline monitoring, but no cross sectional area increase has occurred between 2021 and 2022.

Summary

The tributary to Piney Branch channel cross sections and profiles indicate a relatively stable channel, with minor changes at most cross sections between 2021 and 2022. Until 2020, the greatest change in cross sectional area since the baseline survey in 2003 was noted at Cross Section 1, where a beaver dam built was directly through the cross section between the 2013 and 2014 surveys, resulting in a 95 percent decrease in area. This dam remained through 2020 but washed out in 2021 and has maintained grade in 2022. In 2022 the greatest change in cross

sectional area since the baseline survey occurred at cross sections 2 and 3. Cross Section 2 saw a decrease in cross sectional area by 22% due to bank slumping that occurred. Cross Section 3 showed a 24% increase in cross sectional area. This is associated with the tree on the right bank that became uprooted between 2009 and 2013, increasing the cross-sectional area. Despite these changes, the reaches associated with these cross sections do not show evidence of larger scale incision or widening.

Downstream of Cross Section 1, however, all beaver dams and remnant dams had been washed out in 2018, likely as a result of the significant storm on February 10-11th, 2018. While evidence of flows having accessed the floodplain were noted throughout the study area in 2018 to 2020, major changes were noted downstream of Cross Section 1 in 2018. A large headcut was present near station 4+00 and the channel had downcut through areas that were previously backwatered by beaver dams, leaving an incised single-threaded channel with bank erosion present in places. In 2019 the headcut seemed to have stabilized and no other major changes were noted, but the channel will likely continue to change in response to the new stream flow regime unless the beaver dams are rebuilt. In 2020 the channel appeared to degrade downstream of Cross Section 1. It is likely that fine sediment deposited while the beaver dams were backwatering this part of the reach are continuing to wash out. In 2022, the abandoned beaver dam that had blown out in 2021, remains stable with only a slight increase in cross sectional area from 2021 to 2022. The channel remains abandoned through Cross Section 1 due to the channel cutting around the large beaver dam upstream of Cross Section 1 and forming a new main channel through the floodplain.

Although the cross-sectional area of Cross Section 2 remained nearly the same from 2017 to 2018, the thalweg deepened along the left bank while a point bar formed along the right bank. The thalweg continued to deepen along the left bank in 2019, while the point bar on the left bank degraded slightly. In 2020, the thalweg remained approximately the same but the banks became more undercut. This trend continued in 2021 with increased undercutting of both banks and slight downcutting of the channel bed on the right side leading to a 17% increase in cross-sectional area from 2020 to 2021. In 2022, the left bank that was undercut previously, has slumped down, reducing the cross sectional area by 22% since 2021.Since the baseline monitoring, the area of the cross section has increased by 37% (though little change occurred from 2015 to 2020). The Stream Gauge Cross Section, located approximately 50 feet upstream of Cross Section 2, also

showed downcutting of the thalweg and slight widening from 2017 to 2018, then slight aggradation and narrowing from 2018 to 2019. There was very little change to this cross section in 2020. In 2021, there was undercutting of the left bank and minor downcutting of the channel bed at this cross section. In 2022, the cross section saw a slight decrease in channel area, but still maintained undercut banks consistent with previous monitoring years. The area of this cross section decreased by 7% since 2021 and increased 53% since 2003. Cross Section 2 and the Stream Gauge Cross Section are located on Profile 1 downstream from the confluence with Profile 2, receiving drainage from William A. Diggs Elementary School and Avalon and Windsor Mill developments. These cross sections are located in a relatively confined section of channel, the most likely position in the watershed for incision to occur. The off and on increase in cross-sectional area over time indicates that this area is responding to hydrologic changes by increasing the size of the channel. However, the stream in this reach still has access to its floodplain, as evidenced by sand deposition on the floodplain and debris racks on trees.

Cross Section 4 is located upstream of the confluence with Profile 2 and receives flow from two Windsor Mill stormwater ponds (Ponds 5 and 6). The cross-sectional area of Cross Section 4 has increased from 2003 with most of the change coming between 2019 and 2020. The cross-sectional area increased slightly by 3% from 2021 to 2022 as the left bank scoured slightly and the thalweg shifted to the left for an area increase of 18% since 2003. Overall, this cross section remains stable, but is showing a downcutting trend throughout the monitoring cycle.

Cross Section 5 is the most upstream cross section that receives flow from one Windsor Mill stormwater pond. Cross Section 5 was influenced by beaver activity early in the monitoring; however, the cross-sectional area remained consistent from 2003 to 2018. In 2019, a large beaver dam downstream of Cross Section 5 caused backwatering upstream far past Cross Section 5. A second beaver dam was built within the cross section after the 2018 survey and may have also caused downcutting of the thalweg as it constricted flows before failing prior to the 2019 survey. The remnants of this dam buried the left end pin of the cross section. The cross-sectional area has changed minimally despite this beaver activity and has increased by 1% since 2003. Though the cross-sectional area did not change significantly due to the beaver activity, backwatering caused the water depth to rise from 0.79 ft to 3.49 ft in 2019. There was minimal change to this cross section in 2021, though there was some deposition on the channel bottom and washout of the left bank. In 2022, cross section 5 was not surveyed. Beaver activity has continued in this area, causing the section of stream to be difficult to navigate across from exposed and submerged woody material. The downstream large beaver dam remains in 2022 which has provided a grade control. The edge of water and channel shot were recorded to complete Profile 1. This cross section will continue to be monitored in the future.

The upper portion of the North Point High School pond outfall channel remains very stable, but the middle of the profile continues to degrade with severe headcutting. In 2011, a 1.5 foot headcut had formed at station 3+68. Just two years later, the headcut had migrated 51 feet upstream. In 2018, the headcuts began at station 2+67 with a 5 foot drop. In 2019, the start of the headcut remained at station 2+67, but the main drop had become undercut by about 5 feet (station 2+92 to 2+87) and the drop increased to 5.5 feet. In 2020 and 2021 the headcut did not move significantly further upstream and the total drop remained similar, but additional erosion of bed material created a step in the formerly undercut headcut. In 2022, the previously eroded step in the headcut was gone, creating one large drop, but the headcut remained in the same location from 2021 to 2022. Beaver dams were noted throughout the North Point Tributary which is new for 2022. Cross Sections 1 and 2 remain stable and no significant changes were noted other than increased water surface levels from the backwatering effects of the beaver dams. Cross Section 3 saw a change in shape as it has lost the inset channel in the floodplain that was made up of fine sediment deposition, which was first noted in 2013. This feature is likely gone due to a beaver dam constructed downstream that has backed water up.

Cross Section 4 is located below the series of headcuts and experienced severe bank erosion and some downcutting between the initial survey in 2011 and the second survey in 2013. The cross section has changed little between 2014 and 2017. In 2018, the cross section was deeper due to the formation of a pool at a debris jam just downstream, and the left bank had experienced some erosion. In 2019, the cross section was much shallower due to aggradation, and the left bank continued to erode. In 2020 the left bank continued to erode and the channel downcut slightly. In 2021 both banks eroded further laterally but minimal downcutting occurred. In 2022, the channel appeared to be stable but maintained the woody material that took up cross sectional area. Vegetation and roots continue to provide surface protection to both banks.

As stated in 2014, it is still recommended that remedial action is taken to stabilize the headcuts in the outfall channel. A considerable amount of sediment is being eroded from the channel and transferred into downstream waters. Due to the sudden slope change at the end of the engineered channel and start of the natural channel, the headcut will likely continue to migrate upstream, further degrading the channel and causing sedimentation downstream.

A riprap stabilized outfall channel, from what appears to be a stormwater management facility in the SHA ROW is degrading and releasing a considerable amount of sediment to the Tributary to Piney Branch. The channel conveys flows down the valley wall and ends on the right floodplain (facing downstream) of the tributary near the largest beaver dam, at station 6+50. Sand and gravel eroded from the channel and deposited on the floodplain can be seen in photos in Appendix G.

A large new beaver dam was constructed between the 2018 and 2019 surveys within the upstream portion of the reach (station 41+61). This beaver dam has resulted in a backwater pool which has flooded the sewer crossing and extends from the dam across the sewer line ROW upstream past the extent of the surveyed reach. It is recommended that the safety of backwatering the sewer line be evaluated and the dam possibly be removed.

Imperviousness in the drainage area has increased from 1.1 percent in 2004 to 13.9 percent in 2017 (no change from 2018 to 2020) to 14.4 percent (estimated, construction ongoing) in 2021 and 17% in 2022. Development in the drainage area appears to have slowed with the completion of the Middletown Woods development. New development in the Avalon neighborhood began in 2020 and continued in 2021. Any impacts resulting from the increasing imperviousness and land use change from forest to residential may be seen years after the development is finished.

The beaver dams in the downstream end of Profile 1 are retaining sediment and preventing degradation of the channel. Beaver dam activity has increased overall in 2022 with the addition of multiple beaver dams at the upstream extent of Profile 1, downstream of the large beaver dam and upstream of Profile 2. Beaver dams have also appeared in the upstream portion of the North Point Tributary. In some cases, the beaver dams provide the stream with floodplain access as well as extensive floodplain wetlands upstream of these cross sections. Cross Section 5 became backwatered by the beaver dam in 2019 and changed significantly, however the change is attributed to the dam and not to changes in the watershed. The remaining forested wetlands in the headwaters of Profiles 1 and 2 may also be contributing to channel protection. The SHA tree planting completed in 2019 may also have a positive effect on the area in the future.

The full 2022 report, *Maryland Stormwater Manual Channel Protection Criteria Effectiveness Study, Stream Monitoring at the Tributary to Piney Branch*, is included in Appendix G.

III.G. Program Funding

Overview of Permit Conditions

1. *Annually, Charles County shall submit a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit.*
2. *Charles County shall maintain adequate program funding to comply with all conditions of this permit.*

FY 2022 Status

Funding Sources

Since the County's first generation NPDES MS4 permit was issued in 1997, the County has had dedicated enterprise funding to ensure permit compliance. The two original enterprise funds included the Environmental Service Fund and the Inspection and Review Fund. In 2013, the Watershed Protection and Restoration Fund was adopted. Revenues to support the enterprise funds are from the Environmental Service Fee, Lot Recordation Fee, Inspection and Review Fees, Stormwater Remediation Fee, and most recently a subsidy from the General Fund's Transfer Tax revenues. The adopted FY 2022 Enterprise Funds are in Appendix H.

1. Environmental Service Fund: The ESF is no longer the primary source of funding for MS4 permit compliance since replacement by the Watershed Protection and Restoration Fund. However, ESF litter control outreach and septic programs still support permit compliance.

2. Inspection and Review Fund: The MS4 permit requires the County to maintain acceptable stormwater management and erosion and sediment control programs for new development in accordance with the Annotated Code of Maryland. Operating revenues for these activities are generated primarily by service charges for engineering plan reviews, site plan reviews, grading inspection, erosion and sediment control inspections, storm drain and stormwater inspections, which are deposited in the Inspection and Review Fund. This fund is for salary and fringe of full time and contractual positions.

3. Watershed Protection and Restoration Fund (WPRF): In June 2013, Charles County adopted Chapter 275 of the Charles County Code, establishing the Watershed Protection and Restoration Program and associated Stormwater Remediation Fee. The WPRF may be used for: capital improvements for stormwater management, including stream and wetland restoration projects; operation and maintenance of stormwater management systems and facilities; public education and outreach related stormwater management or stream and wetland restoration; stormwater management planning, including mapping and assessment of impervious surfaces, as well as related monitoring, inspection, and enforcement activities; reasonable costs necessary to administer the fund; and grants to nonprofit organizations for watershed restoration projects.

The Stormwater Remediation Fee is a flat rate charged to all improved properties countywide, except in the Towns of La Plata and Indian Head where the MS4 programs are funded and administered separately. Property owners in the County may obtain a 50% fee credit by demonstrating the use of onsite stormwater practices such as rain gardens, pervious paving, and other options. The following table shows the rate since adoption. Credits and exemptions are reported annually.

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Stormwater Remediation Fee	$43	$43	$35	$39	$54	$61	$78	$92	$115	$127

In 2014 NPDES MS4 permit coverage was expanded countywide, however the lot recordation fee continues to apply only to new lots recorded in the Development District (revised boundary in 2016) because this continues to be the County's urban area. This fee was discontinued in FY 2021.

Fiscal Year	2014	2015	2016	2017	2018	2019	2020	2021
Lot Recordation Fee	$121	$127	$131	$138	$142	$146	$154	-

Since FY 2016, subsidies from the General Fund have been approved in order to maintain a stable fee. The subsidy is only applied as needed.

Fiscal Year	2016	2017	2018	2019	2020	2021	2022	2023
General Fund Transfer	$550,000	$550,000	$550,000	$550,000	$550,000	$300,000	$0	$0

WPRF Budget and Staff Positions

The WPRF supports applicable expenditures from County Departments including: Planning and Growth Management, Public Works, County Attorney's Office, and Fiscal and Administrative Services. The following tables summarizes the WPRF budget and staff positions.

Table 47: WPRF Budget - Fiscal Years 2018 through 2023

Fiscal Year	2018 Audited	2019 Audited	2020 Audited	2021 Audited	2022 Unaudited	2023 Budget
Budget:	3,610,900	4,448,470	4,699,320	5,579,100	6,186,420	6,787,500
Revenue:						
Stormwater Remediation Fee	2,831,120	3,080,369	3,970,537	4,714,488	5,915,720	6,607,400
Recordation Fee per Lot	72,700	39,566	66,836	0	0	0
Miscellaneous	8,557	8,941	9,466	15,550	14,343	5,000
General Fund Subsidy	0	550,000	550,000	300,000	0	0
Total Operating Revenues	2,912,377	3,678,876	4,596,839	5,030,038	5,930,062	6,612,400
Expenditures:						
Salary & Fringe	368,520	563,614	705,838	1,065,151	1,189,668	1,426,600
Operating	1,454,608	1,607,530	1,810,778	1,891,509	2,121,178	2,802,200
Capital Project Transfer	120,000	708,380	67,000	343,200	249,000	77,000
Debt Service	1,105,281	1,365,884	1,702,492	2,146,031	1,971,004	2,481,700
Total Expenditures	3,048,409	4,245,408	4,286,108	5,445,891	5,530,850	6,787,500
Operating Gain/(Loss)	(136,032)	(566,532)	310,731	(415,853)	399,212	(175,100)
Fund Balance:						
Beginning	1,029,268	893,236	326,704	637,435	221,582	620,794
Ending	893,236	326,704	637,435	221,582	620,794	445,694

Table 48: WPRF Staff Positions - Fiscal Years 2018 through 2023

Dept.-Division	Position	2018	2019	2020	2021	2022	2023
PGM-Admin	Director	0.1	0.1	0.1	0.1	0.1	0.1
PGM-Admin	Deputy Director	0.1	0.1	0.1	0.1	0.1	0.1
PGM-Admin	Assist to the Director	0.1	0.1	0.1	0.1	0.1	0.1
PGM-CPIS	Chief	0.1	0.1	0.1	0.1	0.1	0.5
PGM-CPIS	Dev Services Manager	-	-	-	-		
PGM-CPIS-Permits	Engineer I-IV	0.4	0.8	1.8	1.8	1.8	3.0
PGM-CPIS-Permits	Floodplain Mgmt. Eng.	0.1	0.0	0.0	0.0	0.0	0.0
PGM-CPIS-Insp	Engineer Supervisor	0.1	0.1	0.1	0.1	0.1	0.7
PGM-CPIS-Insp	Permit Technician	0.3	0.3	0.3	0.0	0.0	0.0
PGM-CPIS-Insp	Admin Associate	-	-	-	0.1	0.1	0.1
PGM-CPIS-Insp	PGM Support Specialist	-	-	1.0	1.0	1.0	1.0
PGM-CPIS-Insp	Inspection Supervisor	-	-	-	1.0	1.0	1.0
PGM-CPIS-Insp	Inspector	-	-	2.0	2.0	2.0	2.0
PGM-Planning	Chief	0.3	0.3	0.3	0.3	0.3	0.3

PGM-Planning	Climate Resilience & Sustainability Officer	-	-	-	-	0.5	0.5
PGM-Planning	Assistant Chief	0.1	0.1	0.1	0.1	0.1	0.2
PGM-Planning	Assist to the Chief	0.1	0.1	0.1	-	-	0.3
PGM-Planning	Engineer I-IV	-	-	1.0	1.0	2.0	0.0
PGM-Planning	Planner IV	0.3	0.3	0.3	-	-	0.0
PGM-Planning	Planning Supervisor	-	-	-	0.3	0.3	0.0
PGM-Planning	Planner I-III	2.0	2.0	2.0	2.0	1.8	1.8
PGM-Planning	PGM Support Specialist	-	-	-	-	-	0.3
PGM-Planning	Admin Associate	-	-	-	0.3	0.3	0.0
PGM-Planning	Resource Analyst - GIS	0.1	0.1	0.1	0.3	0.3	0.3
DPW-Env Res	Env Compl. Officer	1.0	1.0	1.0	1.0	1.0	1.0
DPW-Roads	Bridge Mgmt/Proj Mgr	0.1	0.2	0.2	0.2	0.2	0.5
DPW-Roads	Roads Construction Inspector	0.1	0.2	0.2	0.2	0.2	0.3
TOTAL Full Time Equivalent (FTE)		5.4	5.7	10.7	12.1	13.2	13.3

ESF Budget and Staff Positions

A small percentage of the Environmental Service Fund is allocated to support the County's Septic Pump-Out Reimbursement Program implemented by the Department of Planning and Growth Management. This is because, a septic pumping is considered an alternative urban best management practice in MDE's 2014, *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for NPDES Permits* and awarded 0.03 acres/septic pumped towards the impervious surface restoration goal.

On October 16, 2018, the Charles County Commissioners adopted Bill No. 2018-08, which requires new home construction to install visible septic tank risers on each compartment of the septic tank for single-family dwellings that utilize on-site sewage disposal systems. Additionally, the Bill provides a reimbursement up to $100 per single-family dwelling for homeowners voluntarily choosing to have a septic tank riser installed, while sufficient funding is available. The County began implementation of the reimbursement program on December 1, 2018. The Septic Tank Risers program is in Chapter 122, Article I of the Charles County Code.

Table 49: ESF Budget for Septic Pump-Out Reimbursement Program – Fiscal Years 2018 through 2023

Fiscal Year	2018 Audited	2019 Audited	2020 Audited	2021 Audited	2022 Unaudited	2023 Budget
Budget	100,000	$108,000	$120,000	$254,500	$150,000	$150,000
Expenditures	$91,822	$107,980	$123,289	$254,648	$116,317	$150,000

A portion of the Environmental Service Fund is allocated to support the County's Education and Outreach Program to reduce litter entering the environment, which became a condition of the current MS4 permit, under Part IV.D.4. The litter control and recycling outreach efforts increase recycling and educate the public on the importance of reducing, reusing, and recycling.

Table 50: ESF Budget for DPW's Education & Outreach – Fiscal Years 2018 through 2023

Fiscal Year	2018 Audited	2019 Audited	2020 Actual	2021 Actual	2022 Actual	2023 Budget
Budget	214,200	229,740	227,000	210,400	239,000	233,600
Expenditures	209,510	233,338	208,426	211,499	204,100	233,600

Table 51: ESF Positions Dedicated towards Education and Outreach - Fiscal Years 2018 thru 2023

Department-Division	Position	2018	2019	2020	2021	2022	2023
DPW- Env Resources	Recyc./Litter Control Superintendent	1.0	1.0	1.0	1.0	1.0	1.0
DPW- Env Resources	Recycling Manager	0.25	0.25	0.25	0.25	0.25	0.25
DPW- Env Resources	Recycling Supervisor	0.25	0.25	0.25	0.25	0.25	0.25
DPW- Env Resources	Recycling Supervisor	0.25	0.25	0.25	0.25	0.25	0.25

Capital Improvement Projects Budgets

Capital projects are the primary compliance tool in meeting Part IV.E.2 Watershed Restoration of the NPDES MS4 permit. The County's Capital Improvements Program (CIP) budget is funded by 30-year bonds. Payments on the bonds come from the WPRF and is noted as 'Debt Service' on the table above.

In February 2004 the County began issuing bonds for the NPDES Retrofits Projects CIP budget. In March 2007 construction was initiated on the County's first watershed restoration projects. Individual project budgets and expenditures are listed in Table 52 below.

Table 52: NPDES MS4 Capital Improvements Bond Expenditures through Fiscal Year 2023

Bonds Issued to Date	Issued	Spent	Balance
2004 Public Improvement Bond	40,000	40,000	0
2006 Public Improvement Bond	100,000	100,000	0
2007 Public Improvement Bond	1,000,000	1,000,000	0
2008 Public Improvement Bond	400,000	400,000	0
2009 Public Improvement Bond	471,800	471,800	0
2010 Public Improvement Bond	500,000	500,000	0
2011 Public Improvement Bond	1,400,000	1,400,000	0

2012 Public Improvement Bond	700,000	700,000	0
2013 Public Improvement Bond	1,700,000	1,700,000	0
2014 Public Improvement Bond	3,000,000	3,000,000	0
2015 Public Improvement Bond	2,000,000	2,000,000	0
2016 Public Improvement Bond	4,880,000	4,880,000	0
2017 Public Improvement Bond	4,800,000	4,800,000	0
2018 Public Improvement Bond	5,000,000	5,000,000	0
2019 Public Improvement Bond	6,000,000	6,000,000	0
2020 Public Improvement Bond	3,800,000	3,800,000	0
2021 Public Improvement Bond	3,500,000	1,745,368	1,754,632
2022 Public Improvement Bond	6,000,000	0	6,000,000
TOTAL	45,291,800	37,537,168	7,754,632

Table 53: Capital Improvement Expenditures through Fiscal Year 2023 for NPDES MS4 Projects

CIP for NPDES Retrofits	Budget	Spent	Balance
Carrington (8014)	$1,867,230	$1,867,219	complete
Pinefield (8023)	1,096,090	1,096,057	complete
Acton/Hamilton (8024)	1,788,240	1,762,545	complete
Bryan's Road (8025)	1,915,880	1,912,855	complete
NPDES Study (8028)	24,740	24,738	complete
Fox Run (8030)	930,670	930,632	complete
Lancaster (8031)	73,010	72,997	complete
Northwood (8032)	28,830	28,830	complete
Ryon Woods (8033)	121,750	121,716	complete
White Plains Retrofits (8034)	564,630	564,629	complete
NPDES Mapping (8035)	716,110	716,103	complete
GIS Mapping (8036)	455,530	455,521	complete
Pinefield Temi Drive (8037)	1,126,320	1,126,283	complete
Holly Tree Farm Stream Restoration (8038)	1,632,490	1,632,468	complete
Stavors Road (8039)	0	0	complete
Acton Lane (8040)	282,700	282,676	complete
Cobb Island Drainage Study (8043)	20,710	20,704	complete
Potomac Heights (8046)	732,400	732,393	complete
Master Drainage Plan (8047)	186,390	183,332	complete
Feasibility & Concept Design (8048)	1,947,432	1,950,355	complete
Port Tobacco (8049)	11,750	11,744	complete
Tanglewood (8050)	1,341,570	1,341,571	complete
Charles County Plaza (8051)	870,160	870,160	complete
Tenth District (8052)	97,250	97,239	complete

Swan Point WWTP Shoreline Stabilization (8053)	1,498,470	1,498,470	complete
Public Works Campus Stormwater Management Improvements (8055)	1,016,126	1,017,035	complete
General Smallwood Middle School (8056)	509,000	508,998	complete
Lackey High School (8057)	115,220	115,220	complete
Poplar Court - Laurel Branch (8058)	112,750	112,881	complete
TC Martin Elementary School (8059)	51,360	51,360	complete
JP Ryon Elementary School (8060)	41,360	41,354	complete
Piccowaxen Middle School / Higdon Elementary School (8061)	67,810	67,798	complete
McDonough High School (8062)	49,410	49,393	complete
JC Parks Elementary School / Matthew Henson Middle School (8063)	87,340	87,337	complete
Mattawoman Middle School / Berry Elementary School (8065)	22,180	22,165	complete
Apple Creek Court (8066)	818,860	679,692	139,168
Floodplain Analysis Studies (8069)	473,610	211,402	262,208
Gilbert Run Watershed Dam Repairs (8070)	123,770	122,271	complete
Roof Top Disconnects Inspections (8071)	38,150	38,141	complete
Cliffton Shoreline Restoration (8072)	1,425,990	1,325,103	100,887
Benedict Shoreline Restoration (8073)	864,190	864,156	complete
Friendship Farm Park (8074)	97,940	97,932	complete
GIS Mapping (8075)	42,250	42,244	complete
La Plata High School (8076)	795,980	690,845	105,135
Hale Court (8077)	65,880	65,864	complete
Adams Farm Lake (Lambeth Lake) (8078)	4,530	4,520	complete
Huntington Lake (8079)	4,530	4,520	complete
Wakefield Lake (8080)	4,530	4,520	complete
Post Office Road Lake (8081)	4,530	4,520	complete
Upper Zekiah Ponds (8082)	11,930	11,923	complete
Pinefield Drainage (8083)	1,164,980	1,164,977	complete
St. Charles Parkway Stream Restoration (8084)	728,560	728,556	complete
Bridle Path Stream Restoration (8085)	1,367,260	960,915	406,345
Ruth Swann Stream Restoration (8086)	1,611,710	1,304,460	307,250
Thomas Higdon Stream Restoration (8087)	1,065,780	1,065,777	complete
Marbella Subdivision (8088)	2,097,360	222,073	1,875,287
Longmeade Outfall Protection (8089)	96,830	96,803	complete
Bensville Park (8090)	1,120,740	1,073,000	47,740
Cliffton Shoreline Rest Phase II (8091)	1,665,130	1,494,373	170,757
County-wide Shoreline Assessment (8095)	189,630	189,631	complete

Bryan's Road Storm Filter Maintenance (8096)	18,760	18,753	complete
Ruth B. Swann Tributary Channel Stream Restoration (8097)	1,184,400	166,915	1,017,485
Warren J. Willett Subdivision (8098)	6,000	2,644	3,356
Potomac Heights Shoreline Stabilization (8099)	1,520,820	1,392,075	128,745
South Hampton Stormwater Management Pond Retrofits (8100)	360,670	346,070	14,600
Oak Ridge Park - Upper Western Branch Stream Restoration (8101)	234,680	218,011	16,669
Oak Ridge Park - Lower Western Branch Stream Restoration (8102)	146,060	127,393	18,667
Cedar Tree Pond Retrofit (8103)	180,030	180,030	complete
Wilton Court Pond Retrofit (8104)	117,390	112,947	4,443
Milton Somers Middle School- Pond Retrofit and Stream Restoration (8105)	1,682,220	262,812	1,419,408
CSM North Tributaries Stream Restoration (8106)	1,367,830	862,718	505,112
Oak Ridge Park - Upper Eastern Branch Stream Restoration (8108)	191,840	130,435	61,405
Oak Ridge Park - Lower Eastern Branch Stream Restoration (8109)	178,160	112,734	65,426
Best Buy Pond Retrofit (8110)	282,470	282,541	complete
CSM Lot 5 Outfall Stream Restoration (8111)	73,750	73,750	complete
White Plains Golf Course Pond Retrofit and Stream Restoration (8112)	110,730	108,298	2,432
Walter Mitchell Outfall Repair and Stream Restoration (8113)	1,886,790	242,941	1,643,849
Locust Grove Farm (8115)	309,500	136,761	172,739
Port Tobacco (Upper) Stream Restoration (8116)	211,400	209,986	1,414
Port Tobacco (Lower) Stream Rest. (8117)	2,495,080	211,242	2,283,838
Ruth B. Swann North Tributary Stream Rest. (8118)	210,000	198,464	11,536
White Oak Pond Retrofit (8119)	867,870	307,528	560,342
Westdale Drive Stream Improvements (8122)	2,048,810	230,905	1,817,905
Gilbert Run Watershed Dam Repairs PH 2(8124)	2,269,000	85,431	2,183,569
Full Delivery of Water Quality Improvement (8125)	1,638,000	4,045	1,633,955
Benedict Water Quality Study (8126)	146,000	26,950	119,050
NPDES Swan Point Drainage (8128)	131,300	58,882	72,418
TBD (8019)	49,383,500	18,883	49,364,617
TOTAL	**$106,540,618**	**$39,973,140**	**$66,537,758**

The Capital Improvement Program appropriation for the NPDES Retrofit budget is the annual amount approved by the County Commissioners. The appropriations are cumulative towards the project total.

Table 54: Capital Improvement Program Appropriation per Fiscal Year

CIP Appropriation per Year	
FY03	214,000
FY04	220,000
FY05	224,000
FY06	72,000
FY07	778,000
FY08	1,452,000
FY09	2,127,000
FY10	2,409,000

CIP Appropriation per Year	
FY11	2,409,000
FY12	1,505,000
FY13	5,657,000
FY14	5,290,000
FY15	3,135,000
FY16	11,514,000
FY17	11,672,000
FY18	11,070,000

CIP Appropriation per Year	
FY19	11,346,000
FY20	11,017,000
FY21	7,958,000
FY22	8,922,000
FY23	8,956,000
FY24	8,853,000
FY25	TBD
FY26	TBD

Fiscal Analysis of Permit Conditions

Permit task implementation is supported by the enterprise funds listed above and includes staff salary, contractual costs, and other expenses. In summary, the cost for permit implementation:

Table 55: NPDES MS4 Permit Expenses per Permit Condition

Permit Condition	FY 2018 Audited	FY 2019 Audited	FY 2020 Audited	FY 2021 Audited	FY 2022 Unaudited
Source Identification	243,961	269,354	255,848	294,577	311,767
Stormwater Management	485,383	404,197	593,443	803,450	801,269
Erosion and Sediment Control	259,988	161,792	259,223	265,732	248,092
Illicit Detection and	47,336	60,916	46,268	74,543	102,726
Trash Elimination Education	216,621	217,165	216,280	219,407	212,672
Property Management	125,253	196,884	178,597	248,886	265,017
Inlet Cleaning	90,359	98,714	121,785	121,888	123,323
Street Sweeping	100,632	84,585	103,113	101,397	102,069
Road Maintenance - Other	510,789	620,575	737,553	805,445	859,725
Public Education	218,253	257,292	220,782	264,123	280,999
Watershed Assessment	45,508	45,611	10,421	13,832	37,778
Watershed Restoration	1,141,599	1,422,163	1,844,236	2,280,872	2,237,024
Chemical Monitoring	79,847	101,366	79,181	123,483	137,987
Biological Monitoring and	25,040	39,549	23,381	50,371	62,969
Physical Stream Assessment	11,499	21,411	15,973	24,954	35,110
Design Manual Monitoring	11,499	21,411	15,973	24,954	35,110
TMDL Assessments	49,169	54,084	31,856	44,767	57,999
Total Cost	$3,662,736	$4,082,879	$4,753,915	$5,906,796	$5,911,636

Financial Assurance Plan (FAP) and Watershed Protection and Restoration Program (WPRP) Annual Report

The FY 2022 WPRP Annual Report includes information on the number of subject properties, approved credits, hardships and appeals, and does not require Charles County Commissioner approval. The WPRP Annual Report is included in Appendix I.

On October 26, 2022, Charles County's FY 2023 FAP Resolution Number 2022-19 was approved by the Charles County Commissioners to fulfill requirements specified in the Annotated Code of Maryland, Environment Article, §4-202.1. This FAP is included in Appendix J of this MS4 Annual Report.