Anne Arundel County
Department of Public Works
Bureau of Watershed Protection and Restoration

Fiscal Year 2021 NPDES MS4 Annual Report
Anne Arundel County
Permit Number: 11-DP-3316 MD0068306

February 2022

Fiscal Year 2021 Annual Report for
Anne Arundel County
National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer System Discharge Permit
Permit Number: 11-DP-3316 MD0068306

Submitted to:

Water Sciences Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

February 2022

Submitted by:

Anne Arundel County
Department of Public Works
Bureau of Watershed Protection and Restoration
2662 Riva Road
Annapolis, MD 21401

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I. INTRODUCTION

This Annual Report describes compliance activities for the County and State Fiscal Year (FY) 2021 (July 1, 2020 through June 30, 2021), in association with Anne Arundel County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit (Permit Number 11-DP-3316, MD0068306). The current permit was issued on February 12, 2014 and, in February 2019, was administratively continued until the next permit was issued (November 2021). This is the sixth MS4 Annual Report prepared under this permit.

The MS4 Annual Report describes the components of the stormwater management program and associated implementation status and summarizes the monitoring programs implemented by Anne Arundel County (County) including data collection and analysis. Digital data and specific reports for the major programs conducted during the reporting term can be found within the report's **Appendices**. Digital data found in **Appendix A** is submitted in the format consistent with the MS4 Geodatabase structure as described in the May 2017 document entitled *National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4), Geodatabase Design and User's Guide, Version 1.2* (MDE 2017).

II. STORMWATER MANAGEMENT PROGRAM

Components of Anne Arundel County's stormwater management program were established to address the requirements outlined in the County's NPDES MS4 permit. The major components also address stormwater Waste Load Allocations (SW-WLAs) associated with Total Maximum Daily Loads (TMDLs), and overall water quality improvement within the County's waterways. Program components include the following features:

- Storm Drain Infrastructure and Impervious Area Inventory;
- Erosion and Sediment Control Program;
- Stormwater Management Program;
- Illicit Discharge Detection and Elimination;
- Litter and Floatables;
- Management and Maintenance of County-owned Facilities (e.g., roads, parking lots);
- Public Education and Outreach;
- Watershed Assessment;
- Watershed Restoration Plans;
- TMDL Compliance;
- Watershed Restoration Assessment;
- Stormwater Management Assessment; and
- Program Funding.

The County believes the above programs address the major water quality interests within County watersheds. Monitoring efforts have shown that implementation of these programs results in the improvement of water quality, which motivates the County to continue its dedication to these

programs. Efforts in these program areas during the reporting period are described under the appropriate permit condition sections in **Part IV** of this report.

III. WATER QUALITY

The NPDES MS4 Permit issued to Anne Arundel County in February 2014 requires implementation of a stormwater management program to effectively prohibit pollutants in stormwater discharges, to attain applicable WLAs as set forth in approved TMDLs, and to comply with all provisions of the permit. Compliance with permit conditions shall constitute compliance with the Clean Water Act (§402(p)(3)(B)(iii)) and adequate progress toward compliance with Maryland's water quality standards and any U.S. Environmental Protection Agency (EPA) approved stormwater WLAs.

Anne Arundel County endeavors to manage, implement, and enforce a stormwater management program in accordance with the Clean Water Act and corresponding NPDES regulations. The activities undertaken in support of permit compliance, and documented herein, show progress toward reducing pollutants in stormwater discharges, prohibiting unauthorized discharges to the County's storm drain system, and attaining stormwater WLAs for established TMDLs.

IV. STANDARD PERMIT CONDITIONS

A. PERMIT ADMINISTRATION

Anne Arundel County shall designate an individual to act as a liaison with the Maryland Department of the Environment (MDE) for the implementation of this permit. The County shall provide the coordinator's name, title, address, phone number, and email address. Additionally, the County shall submit in its annual reports to MDE an organizational chart detailing personnel and groups responsible for major NPDES program tasks in this permit. MDE shall be notified of any changes in personnel or organization relative to NPDES program tasks.

Status:

Effective with the beginning of FY2021 (FY21), the County created the Bureau of Watershed Protection and Restoration (BWPR) within the Department of Public Works (DPW). This administrative change elevated the former Watershed Protection and Restoration Program from a division within the Bureau of Engineering (BOE), to a stand-alone Bureau within DPW. Concurrent with the creation of BWPR, the Stormwater Infrastructure Program (SIP) formerly housed within the Bureau of Highways (BOH) Infrastructure Management Division IMD), became a division of the BWPR.

For FY21 Anne Arundel County's NPDES MS4 Permit coordination was performed by the Department of Public Works (DPW) Bureau of Watershed Protection and Restoration (BWPR). The program coordinators during this reporting year are listed below:

Mr. Erik Michelsen
Deputy Director, BWPR
Anne Arundel County DPW
2662 Riva Road, MS 7409
Annapolis, MD 21401
410-222-7520
pwmich20@aacounty.org

Ms. Ginger Ellis
Environmental Planning Administrator, BWPR
Anne Arundel County DPW
2662 Riva Road, MS 7409
Annapolis, MD 21401
410-222-0549
pwelli16@aacounty.org

Ms. Janis Markusic
Program Manager/Senior Planner, BWPR
Anne Arundel County DPW
2662 Riva Road, MS 7409
Annapolis, MD 21401
(410) 222-0551
pwmark02@aacounty.org

Figure 1 shows the County's organizational chart for FY21. Information on specific positions and personnel responsible for permit compliance and stormwater program tasks follows.

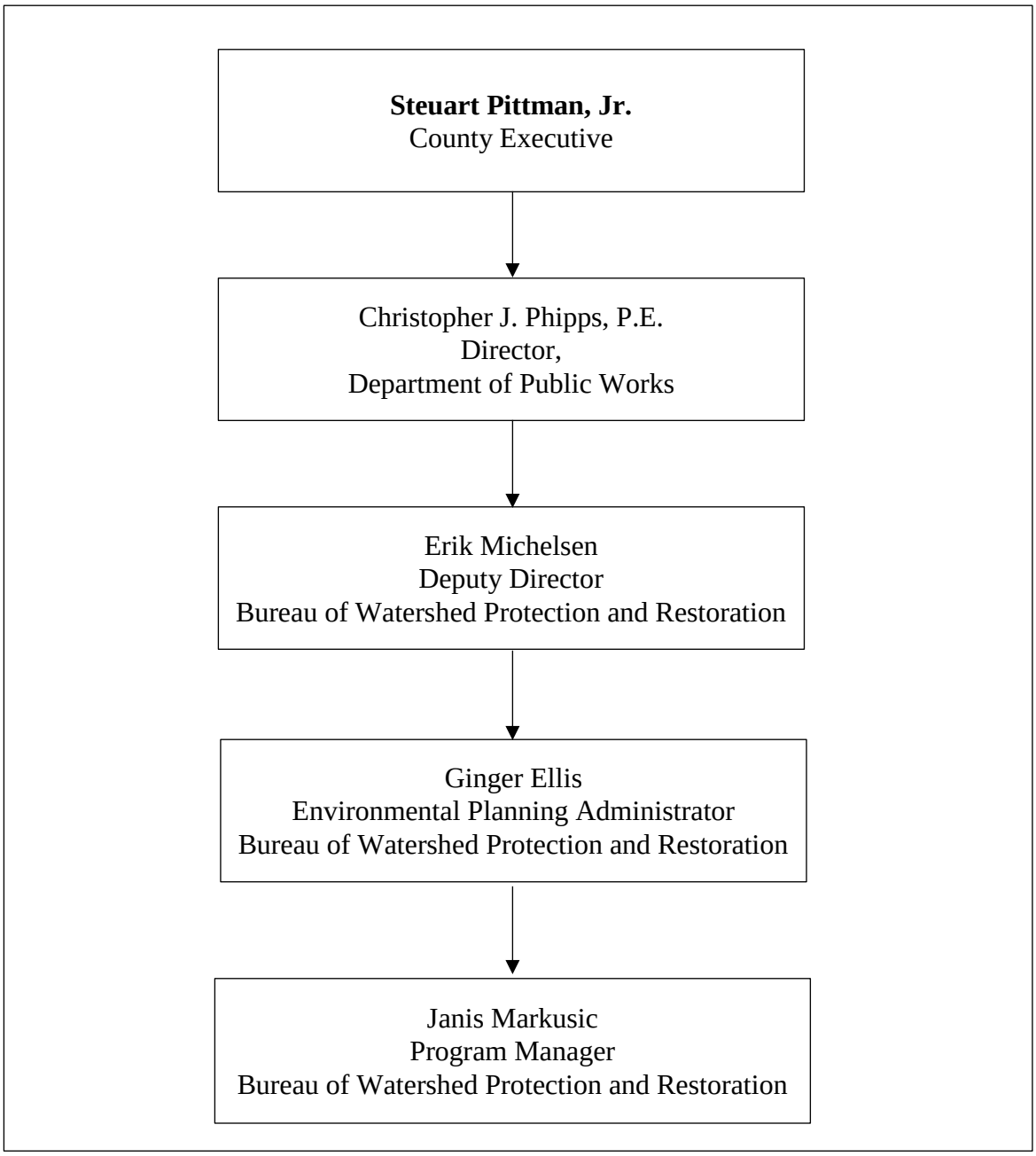

Figure 1. Organization chart for NPDES MS4 Permit administration (FY21)

Additional County staff responsible for components of the NPDES MS4 Permit requirements during FY21 include those listed below.

Department of Public Works (DPW)
Bureau of Watershed Protection and Restoration

- Jens Geratz, Engineer Manager, Restoration Implementation

Administers the CIP Restoration Project Implementation unit responsible for design and construction of BWPR stream restoration projects.

- Karen Jennings, Senior Engineer, Restoration Implementation

Manages design and construction of watershed restoration projects.

- James Woods, Senior Engineer, Restoration Implementation (7/2020 – 1/2021)
- Vacant (1/2021 -)

Manages design and construction of watershed restoration projects.

- Nasrin Dahlgren, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Gerry Inglesby, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Larry Mathena, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Joe Ports, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Jeff Ratteree, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Gregory LeBlanc, Project Manager, Restoration Implementation

Manages design and construction of watershed restoration projects.

- Brenda Morgan, Engineer Manager, Modeling and Analysis

Administers the Modeling and Analysis Unit responsible for providing water quality, pollutant loading, and impervious area data management, analysis, tracking and reporting for NPDES MS4 permit, TMDL and the County's Phase II Watershed Implementation Plan (WIP); and Stormwater Remediation Fee oversight and support.

- Joshua Thompson, Ph.D. Senior Engineer, TMDL Support

Administers the TMDL Support Program; manages watershed assessment contracts; manages the technical engineering and water quality models in support of NPDES MS4 Permit activities, individual TMDL compliance, and the Phase II WIP; coordinates data, tracking, and reporting of impervious surface reduction and pollutant load credit; manages the County's impervious surface

and land cover GIS layers; and documents the locations and descriptions of watershed restoration projects.

- Brennan Smith, Engineer III, TMDL Support

Maintains, updates, and provides quality control of GIS data layers (e.g., impervious surfaces, land cover) that support the engineering and water quality models utilized for supporting NPDES MS4 and TMDL Restoration Plan activities.

- Melissa Bragg, GIS Specialist, TMDL Support (through 10/2020)
- Vacant (10/2020-8/2021)
- Jennifer Tam (8/2021-present)

Provides GIS analysis to support the engineering and water quality models utilized for supporting NPDES MS4 and TMDL compliance activities. Maintains, updates and provides quality control of GIS data.

- Sally Szydlowski, Program Manager, Stormwater Fee

Administers the SW Remediation Fee Support Unit, oversees fee assessment, appeals and credit processing and tracking. Assists with Historic BMP record database update and input into MS4 Geodatabase.

- Melissa Bragg, Program Specialist II, Stormwater Fee (10/2020-present)

Provides program management support to the Modeling and Analysis Stormwater Remediation Fee Unit carrying out assignments related to fee assessment, appeals and credit processing and tracking, and stormwater Best Management Practice (BMP) performance review.

- Bertha Berrios, GIS Specialist, Stormwater Fee

Assists the Stormwater Remediation Fee Unit with researching and tracking fee assessment, appeals and credits.

- Chris Victoria, Water Quality Compliance Specialist, Ecological Assessment and Evaluation

Assists in documenting ecological condition of County watersheds and waterways and conducts applied research to ensure the credibility of BWPR monitoring and assessment. Assists with NPDES MS4 Permit compliance and TMDL and watershed support.

- Douglas Griffith, Planner II, Ecological Assessment and Evaluation

Provides consultant oversight for stormwater monitoring, biological monitoring, and geomorphic assessment of County stream reaches including those identified in Part IV. F of this permit. Assists Program Manager with implementation of the Illicit Discharge Detection and Elimination (IDDE) Program as identified in Part IV.D.3 of this permit, and assists in the development of TMDL Restoration Plans and plan implementation.

- Bryan Perry, Program Specialist II, Ecological Assessment and Evaluation

Provides program support for surface water and biological monitoring projects and coordinates projects with ecological restoration permit requirements.

- Rachel Antonio, Program Specialist I, Ecological Assessment and Evaluation

Provides technical support for surface water, stormwater, and ecological monitoring projects.

- Robb Fish, Public Education and Outreach Specialist (through 8/2021)

Fulfills the public education and outreach requirements of the County's NPDES MS4 permit ensuring that continual outreach regarding the development of watershed assessments and restoration plans, and TMDL compliance, is achieved and public input is solicited and incorporated. Administers the public outreach and support to all BWPR units.

- Sally Albright, Grants Administrator

Identifies and secures grant funding for watershed restoration projects and projects that further the mission of the Bureau of Watershed Protection and Restoration.

- Mike Hrubiak, Financial Services Management Assistant II

Provides management, oversight and accountability for all revenue and expenditures associated with the Watershed Protection and Restoration Fund (WPRF). Ensures that the integrity of the dedicated revenue fund and structure is maintained to support compliance with the MS4 permit.

- Maria Ramallosa, Financial Services Management Aide

Supports the Financial Management Assistant in tracking revenues and expenditures associated with the WPRF, processing procurements for restoration work, and maintaining established reports to ensure Fund integrity.

- Richard Davis, Engineer Administrator, Stormwater Infrastructure Program (SIP) (3/2021 – present)

Administers the Stormwater Infrastructure Program that is responsible for the inspection, repair and maintenance of closed storm drain and culvert systems and maintains (public) stormwater management practices.

- Ken Pensyl, Program Manager, SIP

Administers the Stormwater Management Maintenance Program that is responsible for the inspection, repair and maintenance of DPW maintained (public) stormwater management practices.

- Ryan Rich, Construction Inspection Supervisor, SIP (8/2020 – present)

Manages, inspects and maintains a subset of urban stormwater BMPs that are the responsibility of DPW. Investigates stormwater management practices complaints and provides construction inspection services for resulting projects.

- Chuck Henney, Program Specialist II, SIP (through 8/2021)

Manages, inspects and maintains a subset of urban stormwater best management practices that are the responsibility of DPW. Investigates BMP and SWM pond complaints and provides construction inspection services for resulting projects

- Vacant, Senior Engineer, SIP (3/2021 –)

Administers the Culvert & Storm Drain Section that is responsible for the inspection, repair and maintenance of publicly owned storm drain/culvert systems.

- Bob Murphy, Engineer III, SIP

Northern District storm drainage and culverts project manager.

- Robert Savidge, Engineer III, SIP

Central/Southern District storm drainage and culverts project manager

- Rick Larrimore, Construction Inspector Supervisor - Northern District, SIP

Investigates storm drainage complaints and provides construction inspection services for drainage projects in the northern district

- Daniel Verrette, Construction Inspector Supervisor - Central & Southern Districts, SIP

Investigates storm drainage complaints and provides construction inspection services for drainage projects in the central and southern districts.

- Clark Rosendale, Construction Inspector Supervisor, SIP

Video inspection of culverts and closed storm drain systems.

Department of Public Works (DPW)
Bureau of Engineering

- Engineer (GIS) Manager, Technical Engineering, Vacant (7/2020 – 4/2021)
- Jeff Cox, Engineer (GIS) Manager, (4/2021 - present)

Provides managerial support and oversight for geographic information systems (GIS) data collection and geodatabase development activities associated with urban best management practices (BMPs) and closed storm drain system records.

- GIS Specialist, Watershed Support, Technical Engineering, Vacant (7/2020 -7/2021)
- Ty Manning, (7/2021 – present)

Provides Quality Control services for GIS data collection for BMPs created through the grading permit process.

- Richard Beier, GIS Specialist, Watershed Support, Technical Engineering

Performs BMP GIS data capture for newly constructed BMPs created through the grading permit process. Assists with updates to GIS layers for Closed Storm Drain system piping and structures.

- Steve Britschge, Program Manager, Technical Engineering

Provides direct oversight of the Closed Storm Drain and BMP GIS layers maintenance and publishing processes.

Department of Public Works (DPW)
Bureau of Highways (BOH)

- Blake Lightcap, Engineer Administrator, Infrastructure Management Division (IMD)

Administers the Infrastructure Management Division and oversees the capital program associated with publicly owned roadways.

- Jeff Cox, Program Manager, IMD (through 4/2021)
- Vacant (4/2021 –)

Programs and maintains GIS databases for the closed storm drain system, associated infrastructure databases, and the County's roads inventory.

- Wayne McCready, GIS Specialist, IMD

Maintains associated infrastructure databases, develops GIS inspection tools, and creates CADD drawings of closed storm drain system and culverts.

- Richard Davis, Chief Road Operations Division, Bureau of Highways (through 3/2021)
- Vacant (3/2021 – present)

Administers the County's Road Operation Division; maintains the Bureau's permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity); develops and implements Stormwater Pollution Prevention Plans (SWPPPs) associated with seven Road Operations district yard facilities; documents the use of pesticides, herbicides, fertilizers, and de-icing materials associated with road maintenance activities; implements the County's street sweeping and inlet cleaning programs; directs the County's winter weather de-icing program, conducts roadside litter clean-up activities; and provides support for volunteer watershed and stream clean-up activities.

Department of Public Works (DPW)
Bureau of Utility Operations (BUO)

- Larry Parsons, Utility Administrator, Infrastructure (2/2020 – Present)

Responsible for SWPPP development/implementation and ensuring compliance with the MDE General Permit No 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity) for the Bureau of Utility Operations Central Utility Operations Center.

- Christian Tait, Regulatory Compliance Manager, Wastewater Operations

Responsible for SWPPP development/implementation and ensuring compliance with the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity) for Bureau of Utility Operations Water Reclamation Facilities. Oversees Utility Operations compliance with individual NPDES point source permits for County Water Reclamation Facilities.

Department of Public Works (DPW)
Bureau of Waste Management Services (WMS)

- Rhody Holthaus, Deputy Director

Responsible for ensuring implementation of the WMS facilities' permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity) for the County's three landfill facilities.

- Mark Morris, Environmental Monitoring Manager

Responsible for maintaining the Waste Management Services facilities' permit coverage under the MDE General Permit No. 12-SW (General Discharge Permit for Stormwater Associated with Industrial Activity), and for the development and implementation of SWPPPs associated with the County's three landfill facilities.

Department of Inspections & Permits (I&P)

- Eva Kerchner, Assistant Director (retired 5/2021))
- Raghu Badami, P.E., Acting Assistant Director (6/2021 - present)

Oversees implementation of the County's Erosion and Sediment Control Program and Stormwater Management Program that are the responsibility of the Department of Inspections and Permits

- Raghu Badami, P.E. Engineer Manager, Engineering Division (9/2018 – 6/2019; 12/2019 - present)

Oversees the review of stormwater management on development projects and ensures that the requirement for all proposed new stormwater management plans comply with the Environmental Site Design (ESD) standards in accordance with the County Code, State Code, and the current edition of Maryland Stormwater Management Design Manual.

- John Igbinovia, P.E., Code Enforcement Administrator

Administers the County's Stormwater Management Program and the County's Erosion and Sediment Control Program to ensure compliance with State regulations. Tracks, inspects, and enforces all permits for private and public stormwater management BMPs related to new development and redevelopment projects. Oversees triennial inspection of stormwater BMPs. Tracks development projects disturbing more than one acre and reports this information to MDE as required by the Program and the NPDES MS4 Permit. Oversees staff who respond to County Environmental Compliance Hotline and provides follow-up enforcement for IDDE Program.

- Jim Johnson, Code Enforcement Administrator – Critical Area Program

Supervise the County's Code Compliance Division, including investigation of non-permitted and environmental complaints, forestry program management, and building site review processes to ensure compliance with County construction code, and federal, State and local laws. Tracks standard grading plans required when disturbance is less than 5000 sq.

- Stephen Trumpler, Stormwater Inspection Supervisor, Watershed Program (retired 8/2021)

Manages stormwater inspection staff responsible for inspecting private stormwater BMPs, construction inspection of water quality restoration projects (County and private), and supervises illicit discharge enforcement.

- Stormwater Inspection Staff

Seven (7) inspectors are dedicated to the stormwater management program. The FY21 inspection staff is listed below.

Zach Bradley	Robert Branch	Michael McNeill
Mary Ford	Dennis Gills	
Andrew Fertig	Andrew Hein	

Anne Arundel Soil Conservation District (AASCD)

- John Czajkowski, District Manager

Oversees development plan review for erosion and sediment control compliance.

Anne Arundel Department of Health
Bureau of Environmental Health

- Don Curtian, Deputy Director

Oversees the Housing and Food Protection Services and Sanitary Engineering divisions of the Environmental Health Bureau, including Environmental Sanitarian response to hotspots associated with food service facilities that are identified through the IDDE program. Oversees programs associated with administering the Bay Restoration Fund within the County, and recreational water quality monitoring at designated bathing beaches.

- Sharon Pawlowski, Program Manager

Provides support and response for IDDE program compliance with respect to food service facilities within the County, ensuring good housekeeping for disposal of waste cooking oil/grease and trash dumpsters.

B. LEGAL AUTHORITY

Anne Arundel County shall maintain adequate legal authority in accordance with NPDES regulations 40 CFR Part 122.26 throughout the term of this permit. In the event that any provision of its legal authority is found to be invalid, the County shall notify MDE within 30 days and make the necessary changes to maintain adequate legal authority. All changes shall be included in the County's annual report.

Status:

Anne Arundel County maintains the authority to comply with the terms of this permit. As documented in prior MS4 Annual Reports, this includes implementation of the 2000 Maryland

Stormwater Design Manual (MDE 2009) as well as the 2007 Stormwater Management Act. Over the past decade, and as reported in previous MS4 Annual Reports, the County Code was revised to incorporate these stormwater management requirements and subsequently renumbered. The entire County Code can be found online through the County website at www.aacounty.org/our-county/county-code/, under the link for the County Code. There were no updates or revisions to County Code, affecting the County's legal authority pertaining to this permit, during the reporting year.

The County Stormwater Management Practices and Procedures Manual (Manual) was revised May 1, 2017. The revised Manual became effective October 30, 2017, and a copy of MDE's approval letter was submitted with the FY18 MS4 Annual Report. There were no updates to the Manual in FY21. Additional guidance regarding stormwater facility design and maintenance was provided electronically in the form of Blue Notices as further discussed in **Part IV.D.1**. (Stormwater Management).

As documented in the FY20 MS4 Annual Report, and due to COVID-19-related restrictions pertaining to in-person meetings, MDE conducted the triennial stormwater management program review as a Statewide review of jurisdictions' programs. This review was completed via surveys and interactive trainings. County participation in these activities occurred in both FY20 and FY21.

The provisions of County Bill 67-20, pertaining to stormwater management practices owned or maintained by HOAs, became effective on January 1, 2021. A copy of this legislation is found in **Appendix B** and discussed in **Part IV.D.1** (Stormwater Management).

In fall 2020, MDE reviewed the County's delegated erosion and sediment control enforcement authority. Based on the review findings and subsequent communications, MDE granted continued delegation of authority through June 30, 2023. A copy of that delegation letter, dated April 29, 2021, is found in **Appendix B**.

As reported in previous MS4 Annual Reports, Anne Arundel County established a Watershed Protection and Restoration Program (Program) in 2013, as mandated by Maryland Environmental Code Ann §4-202.1. Concurrent with the beginning of FY21, the Program became the stand-alone Bureau of Watershed Protection and Restoration (BWPR) within the Department of Public Works. The BWPR continues to maintain and administer the Watershed Protection and Restoration Special Revenue Fund established under Article 13 Title 7 §4-11-119 of the Anne Arundel County Code.

C. SOURCE IDENTIFICATION

Sources of pollutants in stormwater runoff countywide shall be identified and linked to specific water quality impacts on a watershed basis. The source identification process shall be used to develop watershed restoration plans. The following information shall be submitted annually for all County 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 Systems: all infrastructure, major outfalls, inlets, and associated drainage areas delineated***

Status:

In 2008, Anne Arundel County completed a Countywide inventory of storm drain inlets, manholes, outfalls, culverts, and pipes for all County watersheds. This inventory is continuously updated and the information is incorporated into County storm drain maps and the County GIS.

As of the end of June 2021 there were 39,205 storm drain inlets, 1,014 miles of storm drain pipes, and 6,590 storm drain outfalls based on the County's infrastructure inventory. The major storm drain outfalls, a subset of all storm drain outfalls (see definition below), were then identified in the GIS by querying for storm drain structures with no hydraulic connection to any other downstream storm drain structure and based on outfall diameter. Next, the upstream contributing areas of these major storm drain outfalls were delineated using GIS. According to 40 CFR 122.26, a major municipal separate storm drain outfall is defined as a single outfall pipe with an internal diameter of 36 inches or greater or its equivalent (discharge from other than circular pipe which is associated with a 50-acre or greater drainage area); or a single outfall pipe with an internal diameter of 12 inches or greater or its equivalent (discharge from other than a circular pipe associated with a 2-acre or greater drainage area) that discharges stormwater from industrially zoned lands. Of the 6,590 storm drain outfalls in the FY21 County inventory, 2,418 are categorized as major outfalls.

Updates to the MS4 Geodatabase *Outfall* feature class in FY21 include the removal of 15 previously submitted major outfall records (**Table 1**) and the addition of 89 new major outfalls. For reporting purposes, an additional 27 minor outfalls are included with the major outfalls in the MS4 Geodatabase *Outfall* feature class because these minor outfalls were screened as part of the Illicit Discharge Detection and Elimination (IDDE) Program (**Part IV.D.3**); thus, the total number of outfalls included in this feature class is 2,445 for the FY21 reporting year.

The major storm drain outfalls and corresponding drainage areas are included in the accompanying MS4 Geodatabase (feature classes *Outfall* and *OutfallDrainageArea,* **Appendix A**). An additional geodatabase, also included in **Appendix A** of this report, contains the County's complete storm drain system, including major and minor outfalls, inlets, pipes, and other storm drain infrastructure.

Table 1. Changes to existing outfall database records in FY21

MDE_OUTFALL_ID	LOCAL_OUTFALL_ID	COMMENT
AA16OUT000087*	I11O013	Deleted. Correction made to storm drain inventory.
AA16OUT000149*	W15O015	Deleted. Correction made to storm drain inventory.
AA16OUT000445	R14O032	Deleted. Correction made to storm drain inventory.
AA16OUT000697*	U15O017	Deleted. Correction made to storm drain inventory.
AA16OUT000840	I18O004	Deleted. Correction made to storm drain inventory.
AA16OUT001544*	M08O033	Deleted. Correction made to storm drain inventory.
AA16OUT001823*	B12O005	Deleted. Correction made to storm drain inventory.

MDE_OUTFALL_ID	LOCAL_OUTFALL_ID	COMMENT
AA16OUT001859	O38O001	Deleted. Correction made to storm drain inventory.
AA17OUT000085	N11O018	Feature is an inlet. Feature moved to the correct dataset.
AA18OUT000046*	I16O008	Deleted. Correction made to storm drain inventory.
AA18OUT000047*	I19O024	Deleted. Correction made to storm drain inventory.
AA18OUT000048*	J04O041	Deleted. Correction made to storm drain inventory.
AA18OUT000053*	R06O047	Deleted. Correction made to storm drain inventory.
AA18OUT000056*	R06O048	Deleted. Correction made to storm drain inventory.
AA20OUT000011*	T16O033	Deleted. Correction made to storm drain inventory.
*Outfalls also removed from the Industrial & Commercial Sources Geodatabase in **Appendix A.**		

The County will continue to update the storm drain inventory and incorporate the information in the County storm drain maps and the County GIS.

2. ***Industrial and Commercial Sources***: ***industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants***

Status:

The NPDES MS4 Permit requires that sources of pollutants in stormwater runoff be identified and linked to specific water quality impacts on a watershed basis. Compliance with this permit requirement includes the annual submittal, in GIS format with associated tables, of the "…industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants." A methodology for determining these land uses and the associated outfalls is described below. These outfalls and land use data are included in the Industrial & Commercial Sources Geodatabase in **Appendix A**. The outfalls are a subset of the major outfalls found in the *Outfall* feature class of the MS4 Geodatabase of this report.

Attachment 2 to the Basis for Final Determination to Issue Anne Arundel County's NPDES MS4 Permit (11-DP-3316; MD0068306) is a memorandum from the U.S. EPA to MDE dated November 29, 2012. This memorandum lists specific objections to draft language proposed for the 4th generation NPDES MS4 Permits. A paragraph on Page 4 of this memorandum addresses Industrial/Commercial Monitoring as a component of the MS4 permit. In this paragraph, EPA objects to the permit on the basis that it does not require the permittee to maintain an inventory of industrial and commercial sites having the potential to contribute pollutants to the storm drain system. EPA proposes the language (above) be included in the permit as part of the Source Identification Section (**Part IV.C.2**), further indicating that these identified sites correlate to the required visual surveys of commercial and industrial areas that are conducted under the Illicit Discharge Detection and Elimination (IDDE) program as described in the NPDES MS4 Permit (**Part IV.D.3**).

Page 6 of the Anne Arundel County NPDES MS4 Permit Fact Sheet, developed by MDE as a companion document to the Permit, describes requirements for an effective IDDE program. Included in this program description, is the requirement that the County routinely survey

commercial and industrial areas, and monitor major storm drain outfalls to identify illicit discharges. Major storm drain outfalls are defined by the Clean Water Act (40 CFR 122.26) as follows:

> A municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive stormwater from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of two acres or more).

To meet the **Part IV.C.2** requirement of identifying commercial and industrial land uses and sites having the potential to contribute pollutants to the storm drain system, and to correlate this requirement with that found in **Part IV.D.3.b**, the County developed a GIS coverage and geodatabase predicated on intersecting the following GIS layers and data:

- Industrial and commercial polygons from Anne Arundel County 2020 Land Cover; and
- County closed storm drain system major outfall drainage areas.

Specifically, if a drainage area to an outfall contained commercial and/or industrial land uses, that outfall and its drainage area were included in the Industrial & Commercial Sources Geodatabase in **Appendix A**.

Twenty-one of the 89 new outfalls added to the County's MS4 Geodatabase Outfalls feature class in FY21 were identified for inclusion in the Industrial & Commercial Sources Geodatabase. Eleven outfalls that were removed from the Outfalls feature class were also removed from the Industrial & Commercial Sources Geodatabase (**Table 1)**. The final updated data set, with a total of 1,313 commercial and industrial outfalls, is included in the Industrial & Commercial Sources Geodatabase in **Appendix A**.

3. Urban Best Management Practices (BMPs): stormwater management facility data including outfall locations and delineated drainage areas

Status:

Information on the County's stormwater management facilities (e.g., urban BMPs, alternative BMPs, restoration BMPs) is incorporated into the MS4 Geodatabase and included as part of the County's FY21 NPDES MS4 Annual Report submittal (**Appendix A**).

This reporting year, the County is submitting 15,181 BMP POIs (*BMPPOI* feature class); as noted in the comments of this feature class, 139 of these POIs solely represent restoration BMPs and therefore have no associated record in the BMP table. The BMP table includes records for 26,490 BMPs, including 461 BMP records added in FY21 and 195 BMPs with a status of

"Removed." There are 14,888 drainage areas delineated for these BMPs (*BMPDrainageArea*), with multiple BMPs represented by a common drainage area to a single POI.

The County continued to collect BMP data in FY21 from newly completed grading permits. These data are entered from as-built plans into a database structure and geospatial framework developed to manage the County's BMP inventory. Quality assurance and quality control procedures (QA/QC) are performed, providing review and verification of BMP information, including but not limited to: BMP type, location, drainage area, water quality treatment, built date, and any modifications to a BMP resulting from subsequent land development or other changes in site condition. Additionally, these data are also reviewed in context with restoration BMPs to ensure that required adjustments to BMP POIs and drainage areas are made in cases where more than one BMP may provide stormwater management for a given area.

The County continues to work on the challenge of data formatting for loading into the MS4 Geodatabase. Particularly for older BMPs, there are mandatory data fields that will never be populated because either the data are missing from the plan drawings or the design of the BMP pre-dated the type of information required. For example, sometimes, certain practices are identified on a set of as-built drawings as contributing to the stormwater management required for a site, but these practices no longer fit into a current suite of BMP practices; or BMP practices are only vaguely indicated on the plans and lack clear drainage areas. The County understands that certain data are mandatory for crediting purposes, but the County is also required to perform triennial inspections and report on all BMPs regardless of their contribution to TMDL or managed impervious surface crediting. In our efforts to report on all BMPs and to account for these data formatting issues, this year the County continued its practice of incorporating error codes into the MS4 Geodatabase and the reader is referred to the ReadMe document associated with **Appendix A** for explanations of null and/or blank values and for explanation of error codes. For example, the "99999" error code represents a missing descriptive value (e.g., location, permit number). Dates coded as "1/1/1899" are used for missing or inapplicable values. For example, in the BMP table, projects that are proposed but not complete will not have the mandatory built-date and are coded "1/1/1899".

4. ***Impervious Surfaces: public and private land use delineated, controlled and uncontrolled impervious areas based on, at a minimum, Maryland's hierarchical eight-digit sub-basins***

Status:

The County continued its efforts to maintain an accurate impervious surface dataset in FY21. This year, the County began using it most current impervious surface dataset derived from imagery captured in early 2020 for the State of Maryland's High-Resolution Aerial Ortho-photography. This report includes an analysis of the County's 2020 data to identify controlled versus uncontrolled impervious areas, as well as the results of an analysis to accurately quantify changes in impervious surface acreage over time.

Controlled vs. Uncontrolled Impervious Surface Analysis

Jurisdictional and Non-Jurisdictional Land within the County

For NPDES MS4 reporting, the County is responsible for accounting for all impervious surface and BMP information pertaining to County-owned land and private lands directly under the jurisdiction of the Anne Arundel County government. Land areas that are outside the stormwater authority of Anne Arundel County include the City of Annapolis, Baltimore Washington International Thurgood Marshall Airport (BWI), Fort George G. Meade, the Patuxent Research Refuge, State Highway and Federal Highway roads, and State and Federal facilities. As the County does not maintain data regarding the stormwater management associated with federal, State, or municipal land not under its jurisdiction, these lands were excluded from the analysis of controlled versus uncontrolled impervious areas.

Controlled Impervious Areas

For the purposes of this analysis, the County considered a controlled impervious area to be any impervious surface within the drainage area of an existing structural or ESD BMP. This includes BMPs that were constructed for the purposes of stormwater management related to new development or re-development, or for restoration. Alternative BMPs, such as those that provide equivalent impervious management credit (e.g., inlet cleaning, stream restoration, shoreline stabilization, etc.), were not included. While those practices provide benefits that are equivalent to the direct management of impervious areas, alternative practices are not directly tied to and do not, strictly speaking, provide control of runoff from a specific area of impervious surface. A full discussion of such practices and the associated credit is already provided in **Part IV.E.2.a** of this report.

The County did not exclude structural or ESD BMPs from this analysis based on practice type or the level of stormwater management provided by a BMP when designating an impervious area as controlled. Guidance from MDE does not allow MS4 impervious surface baseline or restoration credit for practices such as dry ponds and does not consider less than 1-inch of water quality treatment as full management of an impervious surface. However, in other contexts, such as in the Phase 6 Chesapeake Bay Model, dry ponds are considered to provide some water quality treatment. The County has already made a full accounting according to MDE guidance of the baseline water quality management provided for all impervious surfaces (see **Appendix H** of the FY18 MS4 Annual Report) and provides updates in its annual reports regarding impervious restoration credit (see **Part IV.E.2.a**), so the County opted not to duplicate in this report section analyses already presented elsewhere.

Table 2 provides the results of the impervious area analysis using the 2020 dataset, showing that 10,634 impervious acres (30%), out of a total of 35,259 acres under County jurisdiction, are subject to some degree of stormwater control by a BMP. The percentage of controlled versus uncontrolled impervious surface is approximately the same for both County and private lands, with 27% vs. 73% and 31% vs. 69%, respectively.

Table 2. Controlled vs. uncontrolled impervious acreage for Anne Arundel County jurisdictional land based on the 2017 impervious surface dataset

MDE 8-Digit Watershed Name	MDE 8-Digit Watershed Code	Controlled Impervious Acres			Uncontrolled Impervious Acres			All Impervious Acres
		County	Private	County & Private	County	Private	County & Private	County & Private
Baltimore Harbor	02130903	446	1,925	2,371	1,654	3,802	5,456	7,827
Bodkin Creek	02130902	70	121	191	180	415	595	786
Little Patuxent River	02131105	325	1,186	1,511	530	1,502	2,032	3,543
Lower North Branch Patapsco River	02130906	228	1,253	1,481	421	1,462	1,883	3,364
Lower Patuxent River	02131101	0	3	3	24	105	129	132
Magothy River	02131001	450	797	1,247	983	2,332	3,315	4,562
Middle Patuxent River	02131102	14	55	69	183	820	1,003	1,072
Severn River	02131002	583	1,679	2,262	1,131	3,171	4,302	6,564
South River	02131003	288	837	1,125	829	2,228	3,057	4,182
Upper Patuxent River	02131104	52	181	233	237	885	1,122	1,355
West Chesapeake Bay	02131005	19	44	63	192	623	815	878
West River	02131004	13	65	78	197	719	916	994
Total		2,488	8,146	10,634	6,561	18,064	24,625	35,259

The County continues to track the control of stormwater runoff from impervious surfaces through the maintenance and update of its urban BMP inventory and its inventory of restoration projects, provided in **Appendix A**, within the following feature classes of the FY21 MS4 Geodatabase:

BMPPOI	*RestBMP*	*AltBMPPoint*
BMPDrainageArea	*AltBMPLine*	*AltBMPPoly*

Analysis of Impervious Acreage over Time

In the FY19 Annual Report, the County noted that the initial analysis of the impervious surface data showed an increase of 290 impervious acres between 2014 and 2017. The County recognized that this was likely not an accurate accounting of growth and development for that time period and was probably the result of corrections and minor adjustments to more accurately define the extent of an impervious area during the 2017 data update. These corrections may be the result of improvements made over time to the orthophotography resolution or due to issues impacting orthophoto interpretation in a particular year. Although the development of an impervious surface dataset is highly automated, it also involves a significant level of best professional judgement. Impervious surface data development involves defining the specific

edges of features through interpretation of a 2-dimensional image of a 3-dimensional surface and although issues that impact orthophotography such as shadows and camera tilt are corrected in post-processing, not all distortions are eliminated. In addition, shadows, tree cover, and temporary die-off of vegetation during a particular year are also liable to impact orthophoto interpretation and may lead to an underestimation or overestimation of impervious surface area that is then corrected in a future year.

The County updates the impervious surface dataset every two to three years. To more accurately determine the true increase in impervious acreage, the County developed a procedure to evaluate the changes between consecutive impervious datasets. For this FY21 Annual Report, an analysis was completed evaluating the changes between the 2014 and 2017 datasets Countywide, expanding on the pilot study that was conducted for the Lower Patuxent Watershed and detailed in the FY20 Annual Report. In addition, an analysis was completed evaluating the changes between the 2017 and 2020 datasets Countywide.

To create the datasets used in each of these analyses, impervious datasets from the two years being evaluated were merged, resulting in a single impervious dataset for each analysis, with the source of each feature being identified as present in the first dataset only, present in the second dataset only, or an area present in both datasets. Additional attribute information was then added to the merged dataset, which included the following:

- Spatial data representing the land cover types for each of the dataset years;
- The built date on file with the State Department of Assessments and Taxation for a property; and
- Whether a grading permit or building permit was completed in the area between the dataset years.

An analysis based on this information classified each impervious feature as one of the following: 1) No change (i.e. an area of agreement in both datasets), 2) True addition or removal of impervious acreage between years, or 3) Not a true change in impervious acreage between years (**Table 3** and **Table 4**). The third category includes corrections or adjustments to data between years (i.e. a slight shift or reshaping of an impervious feature that is not connected to any change on the ground), incorrect removal of a feature (i.e. a feature should have been carried over from the previous dataset but was instead deleted during the update), and misclassification of a surface as impervious (e.g., a barren area that was identified as a non-natural impervious area and should be classified as pervious). If the attributes of a feature were not sufficient to make this determination, a visual inspection of the aerial imagery was performed to allow for correct classification.

In the analysis between the 2014 and 2017 datasets (**Table 3**), 2,938 of the acres that differed did not represent a true change whereas in the analysis between the 2017 and 2020 datasets (**Table 4**), roughly half of that number of acres did not represent a true change (1,662 acres). This is likely the result of fewer modifications and corrections being made between the 2017 and 2020 datasets, indicating that these datasets are more consistent in terms of what was considered impervious and in how those impervious surfaces were captured compared to the 2014 and 2017 datasets.

Table 3. Impervious acreage in Anne Arundel County by year and category as determined by the 2014 vs 2017 evaluation

Category	Impervious Acres			
	2014 Only	2017 Only	2014 and 2017	Total
No change	0	0	40,193	40,193
True addition or removal	333	1,264	0	1,597
Not a true change (correction, adjustment, error, misclassification)	1,789	1,149	0	2,938

Table 4. Impervious acreage in Anne Arundel County by year and category as determined by the 2017 vs 2020 evaluation

Category	Impervious Acres			
	2017 Only	2020 Only	2017 and 2020	Total
No change	0	0	41,641	41,641
True addition or removal	189	1,279	0	1,469
Not a true change (correction, adjustment, error, misclassification)	775	887	0	1,662

Table 5 shows the increase in impervious acreage between 2014 and 2017, according to the original raw data and according to the analysis results. The raw data indicated an increase in impervious acreage of 0.7% between 2014 and 2017 with a difference of 290 acres, while the analysis of the revised data found a 2.2% increase with a difference of 930 acres. Analyzing the raw data resulted in a 640-acre under-calculation of new impervious area in 2017. In the FY19 Annual Report the County recognized that the increase in impervious acres was likely greater than the increase of 290 acres found in the raw data, and this analysis found that to be correct.

Table 5. Change in impervious area between 2014 and 2017 in Anne Arundel County

	Raw Data (Original)	Analysis of Revised Data (Categorized)
Impervious Acreage	+290	+930
Percentage Change	+0.7%	+2.2%

Table 6 shows the increase in impervious acreage between 2017 and 2020, according to the original raw data and according to the analysis results. The raw data indicated an increase in impervious acreage of 2.8% between 2017 and 2020 with a difference of 1,202 acres, while the analysis of the revised data found a 2.6% increase with a difference of 1,090 acres. Analyzing the raw data resulted in a 112-acre over-calculation of new impervious area in 2020.

Table 6. Change in impervious area between 2017 and 2020 in Anne Arundel County

	Raw Data (Original)	Analysis of Revised Data (Categorized)
Impervious Acreage	+1,202	+1,090
Percentage Change	+2.8%	+2.6%

Based on the results of these analyses, the increase in impervious acreage over the three-year period between 2014 and 2017 (+930 acres) was only slightly less than the increase in impervious acreage over the three-year period between 2017 and 2019 (+1,090 acres). This is consistent with the expected growth and development for those time periods. By accounting for the inconsistencies between datasets, these analyses provide a better understanding of the true increase in the County's impervious acreage. This will allow for a better accounting of growth and inform the planning required to maintain the progress towards achieving the County's MS4 and TMDL goals and improve water quality.

5. ***Monitoring Locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the 2000 Maryland Stormwater Design Manual***

Status:

Parole Plaza, Church Creek, and Picture Spring Branch
In compliance with the NPDES MS4 Permit, **Part IV.F**, the County maintained three monitoring sites, Parole Plaza, Church Creek, and Picture Spring Branch, where the required chemical, physical, and biological monitoring of watershed restoration efforts and stormwater management application is conducted. A summary of the FY21 monitoring efforts at these sites is found in **Part IV.F**, and the monitoring reports for the reporting year are included in **Appendix C** (*Chemical and Geomorphic Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2020-2021*) and **Appendix D** (*Geomorphological Condition in the Picture Spring Branch Subwatershed, Severn River Watershed, Anne Arundel County, Maryland: FY2021*).

The *MonitoringSite* and *MonitoringDrainageArea* feature classes contained in the MS4 Geodatabase represent the locations of the Parole Plaza, Church Creek, and Picture Spring Branch chemical and physical monitoring sites. Effective January 1, 2021 the County joined the Chesapeake Bay Trust's Pooled Monitoring Program (PMP) in lieu of the **Part IV.F**. Assessment of Controls monitoring. As such, spring 2021 biological monitoring within the Church Creek and Picture Spring Branch stream reaches was not conducted and those monitoring locations are not included in these MS4 Geodatabase feature classes. The *ChemicalMonitoring* table contains FY21 results for the abbreviated monitoring period (pursuant to PMP transition) and is included in the MS4 Geodatabase provided in **Appendix A**.

Countywide Biological Monitoring Program
Since 2004, the County has implemented a Countywide Biological Monitoring Program (Program) focusing on benthic macroinvertebrates and modeled after the Maryland Biological Stream Survey (MBSS). The program uses a probability-based stratified random sampling design so that overall watershed condition can be evaluated and comparisons between different watershed units can be made. A total of 24 Primary Sampling Units (PSUs) are sampled in a five-year rotation called a Round. Round 1 began in 2004 and ended in 2008. Round 2 began in 2009 and concluded in 2013. Round 3 began in 2017 and will conclude in 2021. The County will review and evaluate the Round 3 summary results before embarking on a Round 4 effort.

Following completion of Rounds 1 and 2, the County did an extensive program re-evaluation and update before launching Round 3. In summary, fish and water quality sampling were added to the benthic macroinvertebrate sampling already conducted. In addition, a second set of random sites was established using a finer scale stream coverage to supplement sample sites established on the coverage used in Rounds 1 and 2. This was done to better evaluate small streams in the County. Complete Program information, including Quality Assurance Documents and the Method Quality Objectives, can be found at www.aacounty.org/departments/public-works/wprp/ecological-assessment-and-evaluation/biological-monitoring/index.html.

The complete collection of biological monitoring reports for Rounds 1 and 2, and the Round 3 reports completed to date, are available for download at www.aacounty.org/departments/public-works/wprp/ecological-assessment-and-evaluation/biological-monitoring/biological-monitoring-reports/index.html.

Surface Water Quality Monitoring Program

In addition to the work performed in the Church Creek subwatershed, during FY21, the County assessed water quality in Cowhide Branch, a tributary to tidal Weems Creek and the Severn River. Continuous flow and rainfall data are collected at the monitoring station, and monthly stormwater and baseflow monitoring are performed. Parameters currently analyzed include the following:

Calcium	TKN	Hardness
Copper	NH3	Alkalinity
Lead	TP	Total Phenols
Zinc	TSS	Oil and Grease
Magnesium	PO4	*E. coli*
Iron	COD	VOC (EPA 624)
BOD_5	Turbidity	TPH
NO_3/NO_2	TOC	

Cowhide Branch receives runoff from the Parole Town Center drainage area. One continuous monitoring station is maintained by the County on Cowhide Branch. As part of the Parole Town Center, this site has been monitored since the late 1980s. The automated station was taken out of service in September 2016 prior to stream restoration work. The station remained out of service until March 2019 when post-restoration monitoring was initiated.

Post-restoration monitoring includes the above referenced water quality data collection during baseflow and storm events, habitat assessment, biological monitoring for benthic macroinvertebrates and fish community health, geomorphic assessment of the restored stream reach as well as several unrestored reaches upstream, and riparian vegetation community assessment. Post-restoration monitoring will continue through spring 2024 (FY24).

6. ***Water Quality Improvement Projects: projects proposed, under construction, and completed with associated drainage areas delineated***

Status:

The NPDES MS4 Permit requires the reporting of watershed restoration projects that are under design, under construction, and completed during the reporting year. The County continuously updates the inventory of watershed restoration projects as new projects are planned or completed. These projects are documented in the MS4 Geodatabase (**Appendix A**) across four feature classes: *RestBMP*, *AltBMPLine*, *AltBMPPoint*, and *AltBMPoly*.

This report section summarizes the inventory of the watershed restoration projects, while **Part IV.E.2** (Restoration Plans) details the corresponding water quality improvements. The County attained its restoration goal of treating the equivalent of 20% of the County's unmanaged impervious surfaces as of June 30, 2020. Credit for projects completed since then, which includes all FY21 projects, will be applied to the County's restoration goal in the fifth generation MS4 permit that was issued on November 5, 2021. **Table 7** provides a summary of the FY21 project inventory, including 246 new restoration projects completed and 119 projects currently under construction or design.

All new watershed restoration projects that have progressed to the schematic (30%) design phase as of the end of FY21 have been added to the appropriate feature classes in the MS4 Geodatabase. In FY21, the County identified five previously unreported septic connections to wastewater treatment plants that were completed under this administratively continued fourth generation MS4 permit. Minor corrections were also made to completed project lengths for outfall restorations and shoreline management, resulting in decreases in cumulative lengths of 33 feet and 452 feet, respectively.

Table 7. FY21 restoration BMP project inventory summary

	Projects Completed in FY21	**Projects Completed – Cumulative through FY21**	**Projects Under Design or Under Construction in FY21[1]**
Restoration BMPs			
- ESD	9	32	3
- Structural	8	165	43
Alternative Restoration BMPs			
- street sweeping *(annual practice)*[2]	338 tons/yr.	422 tons/yr.	-
- impervious surface elimination	0	6	2
reforestation	0	2	1
- catch basin and storm drain cleaning *(annual practice)*[2]	167 tons/yr.	175 tons/yr.	-
- stream restoration	7 (12,480 ft.)	34 (40,964 ft.)	52 (109,541 ft.)
- outfall stabilization	0 (0 ft.)	66 (4,046 ft.)	5 (2,092 ft.)
- shoreline management	6 (4,882 ft.)	78 (28,732 ft.)	13 (13,853 ft.)
- septic pumping *(annual practice)*[2]	19,323 units/yr.	9,566 units/yr.	-
- septic denitrification[3]	191	1,520	0
- septic connections to WWTP[3]	25	199	0

	Projects Completed in FY21	Projects Completed – Cumulative through FY21	Projects Under Design or Under Construction in FY21[1]
Total number of projects (excl. annual practices)	**246**	**2,102**	**119**

[1]Three ESD and 11 structural BMPs in the *RestBMP* feature class, as well as five stream restoration projects in the *AltBMPLine* feature class, with an implementation status of "Under Design" are on hold or cancelled (see comments in MS4 Geodatabase) and are not included in these tallies.

[2]For annual practices, "Projects Completed – Cumulative through FY21" is the average annual quantity of materials collected (street sweeping and catch basin cleaning) or number of units serviced (septic pumping), dating from the full implementation of the programs. Averages for street sweeping and septic pumping are based on FY16-FY18 implementation, and the average for catch basin cleaning is based on FY17-FY18 implementation.

[3] Septic denitrification systems and septic connections to WWTP are not included in the County's BMP inventory while under design and construction due to the unique funding mechanisms and planning processes these BMPs require. While the County expects additional BMPs of these two types to be completed in FY22, neither are included in the BMP inventory until project completion, when exact locations and other information required for the MS4 Annual Geodatabase become available.

D. MANAGEMENT PROGRAMS

The following management programs shall be implemented in areas served by Anne Arundel County's MS4. These management programs are designed to control stormwater discharges to the maximum extent practicable (MEP) and shall be maintained for the term of this permit. Additionally, these programs shall 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 management program shall continue to be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

- ***a. Implementing the stormwater management design policies, principles, methods, and practices found in the latest version of the 2000 Maryland Stormwater Design Manual. This includes:***
  - ***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 been 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.***
- ***b. Maintaining programmatic and implementation information including, but not limited to:***

i. ***Number of Concept, Site Development, and Final plans received. Plans that are re-submitted as a result of a 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 for qualitative and quantitative control shall be documented.***

Status:

The 2000 Maryland Stormwater Design Manual was fully implemented by the County. This condition was then superseded by the Maryland Stormwater Management Act of 2007. During FY21, the Department of Inspections & Permits (I&P) continued the requirement that all proposed new stormwater management plans to comply with the Environmental Site Design (ESD) standards in accordance with the County Code, State Code, and the current edition of Maryland Stormwater Management Design Manual.

A comprehensive review and update to the County's Stormwater Management Practices & Procedures Manual was completed in FY18 and approval was received from MDE on October 30, 2017. The approval letter was submitted with the FY18 MS4 Annual Report. There were no formal updates to the Practices & Procedures Manual in FY21. Stormwater facility design and maintenance guidance was provided to the development community, citizens, and other stakeholders in the form of "Blue Notices" posted to the I&P webpage here: www.aacounty.org/departments/inspections-and-permits/blue-notices/ .

As noted in the FY17 MS4 Annual Report, the County's development review engineers were relocated from the Office of Planning and Zoning (OPZ) to I&P, improving communication and interaction between the review engineers and the field inspectors. The County continues improving communication and interaction between engineers and field inspectors through collaborative field visits to various job sites.

The onset of the COVID-19 coronavirus resulted in certain changes to County government operations in FY20. Beginning March 18, 2020 and extending through FY21, County government buildings were closed to non-County employees to prevent the spread of COVID-19, social distancing and use of a facemask were advised. During FY21 and while County government buildings remained closed to non-County staff, stormwater program implementation continued through a combination of remote/teleworking activities, scheduled in-office staff rotations to ensure social distancing while inside, and the on-going field review/inspection of construction sites and stormwater facilities.

Due to the COVID-19 coronavirus, the routine triennial inspection specific to the County's stormwater program did not occur. Instead, MDE implemented a Statewide review for all jurisdictions comprised of information gathering via survey and participation in three interactive

online training sessions. The online sessions were designed to refresh the local jurisdictions' understanding of program legal and regulatory authorities and ensure that program requirements continue to be interpreted correctly and consistently when reviewing stormwater management design plans and when interpreting stormwater management policy. The County participated in each of the online interactive workshops held in the fall of 2020 (FY21).

As previously reported, from 2018 through 2021 the County's Stormwater Workgroup (Workgroup), a group comprised of developers, engineers, homeowners' association and Non-governmental Organization (NGO) representatives, realtors, County agencies, and representatives of the building trades, routinely communicated with program approval authorities to discuss issues of concern, identify recommendations, and develop an action plan for each of those recommendations. The results of this effort are summarized in **Table 8** and **Table** 9 below. The Workgroup proposed that the lead agency provide primary guidance and direction, working with stakeholders (County agencies, Homeowner Associations (HOAs), development community, and other stakeholders) to discuss recommendations in detail and develop a road map for the action plan implementation. The work group recommendations were finalized in March 2019. During this reporting period, the County continued to meet with workgroup members to discuss implementation of action plan items from **Table 9**.

Table 8. Anne Arundel County stormwater workgroup action plan (March 2019)

#	Action Item	Action Plan	Lead Agency
1.	HOA Documents	Code Changes and Policy Changes	OPZ
2.	Turnover	Hand-off; Code changes	I&P
3.	Education	One-stop BMP portal	DPW BWPR
4.	Warranty	Code change	I&P
5.	Budget	Roll into #1	OPZ and I&P
6.	Inspections	Work flow changes	I&P
7.	Notices	Work flow changes	I&P
8.	BMP Database	Public mapping interface	DPW BWPR
9.	Inspection checklists	Roll into #3	DPW BWPR
10.	Flooding Concerns	Meet with I&P Staff	I&P
11.	New Infill Lots	Coordination	I&P
12.	Public Ponds	Roll into #3	DPW
13.	BMP Designs	Stormwater manual changes	I&P

OPZ – Office of Planning and Zoning
I&P – Inspections and Permits
DPW BWPR – Department of Public Works Bureau of Watershed Protection and Restoration

Table 9. Stormwater workgroup actions and lead agency

Work Group	Lead Agency	Discussion Items
#1 HOA Documents	OPZ	HOA docs, disclosures, covenants, conditions, reserve study, plat, transparency, clarity, education, budget, private/HOA infrastructure
#2 Transition	I&P	Warranty (bond similar to street tree maintenance, reforestation), surety, third party inspections, facility maps/inventory, turnover/transition, inspections, work flow, process, timing, SWMA agreement
#3 Education	DPW	One stop website, checklists, education, contractors, maintenance guidance, training, other municipality examples, education, Database
#4 Design and Construction	I&P	Maintenance costs (routine and non-routine), design issues, inspection, construction issues, details on plan, design manual updates

During FY19, DPW/BWPR created a one-stop BMP portal for the public and added the locations of public and private stormwater BMPs to its public mapping interface. Throughout FY21, I&P worked with the County Office of Law (OOL) to develop legislation addressing responsibility requirements with respect to stormwater management practices that will be owned or maintained by HOAs by requiring the grading permit applicant to post a warranty and security to correct any deficiencies that occur within a 2-year warranty period. Via this legislation, the applicant would be responsible for repair or restoration of stormwater BMPs to be owned or maintained by HOAs for at least two years after approval of the as-built plan. The resulting legislation (County Bill 67-20, **Appendix B**) was introduced to Council on September 8, 2020 (FY21), approved on October 5, 2020, and took effect on January 1, 2021. This legislation resulted in amendments to Article 16 Title 4 of the County Code. The County will address BMP hand-off between the Developer and HOA during FY22.

I&P, OPZ and OOL continue efforts to revise HOA document requirements including requiring HOA review checklists to help with the review of HOA covenants, reserve study, budgets, stormwater facility inventory map, and costs associated with stormwater facilities. This work is anticipated to be finalized in FY22.

The County continues collection of programmatic and implementation information related to stormwater management associated with development activities. During FY21, County records indicate the following activities (**Table 10**).

Table 10. Concept, Site Development, Final Development, and Redevelopment Plans received in FY21

Type	Number of Projects Received
Concept Plan[(a)]	72
Site Development Plan[(a)]	145
Final Development Plan[(b)]	78
Final Redevelopment Plan[(c)]	10

Type	Number of Projects Received
Stormwater Exemptions	0
Waiver Requests Received	0
Waiver Requests Approved	0

Notes:
[(a)]Concept Plan and Site Development Plan based on submittal date for each unique Project Number (e.g., P2015-0050-00-NF)
[(b)]Final Plan based on unique Grading Permit No.
[(c)]Redevelopment data only available for Final Redevelopment Plan

c. Maintaining construction inspection information 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 Anne Arundel County.

Status:

Stormwater construction inspections are conducted by the County's erosion control inspectors in conjunction with the required erosion and sediment control plan inspections. All stormwater construction violations must be resolved and abated prior to the completion of the associated grading permit. For the reporting period, the following inspections were performed:

- 1277 Stormwater Construction Inspections
- 191 Stormwater Correction Notices

d. Conducting preventative maintenance inspections, 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.

Status:

The State and County Stormwater Management Codes require preventive maintenance inspections once during the first year of operation and every three years thereafter for all stormwater management facilities. For the reporting period, the following maintenance inspections were performed:

- 5,313 Three-Year Maintenance Inspections;
- 6 Three-Year Maintenance Correction Notices; and
- 5 Three-Year Maintenance Violation Notices.

There were 5,313 three-year inspections of stormwater BMPs conducted in FY21 and included in the *BMPInspections* table of the MS4 Geodatabase (**Appendix A**). In addition to these

inspections, the County's stormwater management inspection staff performed numerous site visits in response to property owners requesting guidance, to obtain permission for site access in some situations, and to follow up on required maintenance activities.

The inspection staff also review previously issued and current correction notices to confirm and ensure compliance. When additional action was required to bring a facility into compliance, additional Phase I enforcement notices were issued as appropriate. In prior reports the County documented the inspection process, including issuance of correction notices and Phase 1, 2, and 3 violation notices. During the FY21 reporting period, all correction notices were successfully enforced at the Phase 1 and Phase 2 levels; there were no Phase 3 violation notices required. Additional information relating to inspection and enforcement activities in FY21 is provided in the *SWM* table of the MS4 Geodatabase (**Appendix A**).

Alternative BMP inspections are also documented in the MS4 Geodatabase and, for FY21, the following alternative BMP inspection data are provided:

- The FY21 *AltBMPPointInspections* table contains 382 records associated with inspections of alternative BMPs such as septic system upgrades, connections to Water Reclamation Facilities (WRF), and septic pumpouts. Septic system upgrade (SEPD) inspections are conducted via a service provider visit from MDE's Best Available Technology Management Network (BATMN); inspection results are housed in MDEs BATMN database. It should be noted that 19 of the SEPD inspection records are annotated with an error code in the inspection date field to indicate SEPD BMPs that were due for inspection this year, but for which the MDE inspection record is incomplete and should be revisited by MDE.
- The FY21 *AltBMPPolyInspections* table contains 681 inspection records associated with vacuum street sweeping, inlet and catch basin cleaning and other associated alternative BMPs.
- The FY21 *AltBMPLineInspections* table contains 14 inspection records associated with stream restoration and shoreline stabilization projects.

Lastly, restoration stormwater BMPs are also subject to maintenance inspection to ensure their efficacy within the landscape. The FY21 *RestBMPInspections* table contains 52 restoration BMP inspection records.

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall continue to be maintained and implemented in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

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

Status:

During the reporting period the County continued to maintain MDE delegation of erosion and sediment control enforcement authority. In August 2020, the County submitted an application to

continue delegation of authority beyond June 30, 2021 and, during FY21, MDE completed the application review.

As a part of that review, on October 21, 2020 MDE staff accompanied County personnel and the Anne Arundel Soil Conservation District (SCD) to inspect six active construction sites totaling 72 acres of earth disturbance. MDE found the majority of sites to be in good condition and routine enforcement by the County inspection staff generally effective in gaining compliance. However, major modifications of plans without SCD approval, and locations of stormwater management facilities not effectively protected during construction, were also identified by MDE. On January 14, 2021, MDE staff met with the County and SCD and the County resolved to take necessary steps including working with SCD to improve its program. Subsequently, on April 29, 2021, MDE issued written correspondence that the County's request for continued delegation of program enforcement authority was extended through June 30, 2023. Please see **Appendix B** for a copy of the delegated authority correspondence.

The County also took action to recognize and address requirements of Maryland HB 703 (approved by the State legislature in FY19). This state legislation requires certain new reporting from delegated jurisdictions with respect to environmental violations within the critical area and designated sensitive areas. In July 2020, the County notified developers and their engineers that information related to the total acreage of disturbed area and the acreage of disturbance within the critical area and/or designated sensitive areas (e.g., habitat protection area, wetlands, buffers) is required on grading permit plan cover sheets (new and revised grading permit submittals) effective September 1, 2020. This information is used to satisfy Maryland HB 703 reporting requirements.

Communication to effect program improvements included issuing Blue Notices to the development community and stakeholders. Blue Notices provide information and guidance on topics such as "Enforcement Efforts to Improve Stabilization of Construction Sites Prior to Wet Weather Events" and "Site Inspection and Enforcement Actions for Offsite Erosion and Sediment Deposition Resulting from Rainfall Events" and can be found www.aacounty.org/departments/inspections-and-permits/blue-notices/.

b. At least three times per year, conducting responsible personnel certification classes to educate construction site operators regarding erosion and sediment control compliance;

Status:

Anne Arundel County continues to require a valid Responsible Personnel Certification be held by construction site operators and includes a place on the approved construction plans for the cardholders' name and certification number. Moreover, the County checks for a designated cardholder at the project pre-construction meeting.

Responsible Personnel Certification classes are no longer conducted by County staff. Beginning in FY15, MDE assumed responsibility for this training, which is offered on-line via the MDE

website. The optional MS4 Geodatabase table *RespPersonnelCertInfo* is not submitted with the FY21 MS4 Annual Report.

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

Status:

As noted above, Anne Arundel County is no longer responsible for providing Responsible Personnel Certification training as it is available on-line via the MDE. Therefore, no certification information is submitted in this narrative or with the MS4 Geodatabase. Other relevant program information is found in the *ErosionSedimentControl* table within the MS4 Geodatabase (**Appendix A**).

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.

Status:

Based on previous guidance from MDE, submission of quarterly reports is not required provided that the Construction General Permit Activity Database continues to be submitted with the annual report. Information regarding grading permits from the County's Construction General Permit Activity Database is provided in the *QuarterlyGradingPermits* feature class and *QuarterlyGradingPmtInfo* table of the MS4 Geodatabase submittal (**Appendix A**).

3. Illicit Discharge Detection and Elimination (IDDE)

Anne Arundel County shall continue to implement an inspection and enforcement program 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 shall include, but not be limited to:

a. Field screening at least 150 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.

Status:

Anne Arundel County has developed, and continues to maintain, an extensive program designed to detect and eliminate illicit discharges into the municipal storm drain system and upland pollutant sources resulting from dumping, poor housekeeping, and other non-permitted activities. The program includes the dry-weather inspection of a minimum of 150 storm drain outfalls annually. This outfall inspection records the presence of dry-weather flow, the structural integrity of the outfall, and relevant maintenance issues.

Each year, the Anne Arundel County NPDES MS4 Program Manager, or a delegated staff member, coordinates with the support consultant to identify priority assessment areas in the County that should be investigated for possible illicit discharges to the stormwater system. GIS desktop analysis is used to identify target outfalls primarily draining commercial, industrial, and residential land uses. As deemed appropriate, the County also revisits outfalls that had exhibited illicit discharge during previous assessments to confirm illicit discharge elimination. By assessing a different area of the County each year and incorporating the option of returning to sites that exhibited possible illicit discharge conditions in previous survey periods, the County achieves an area-wide review of likely sources of dry-weather discharge throughout the permit period.

The geographic area targeted for the FY21 field effort is loosely defined by I-97/Glen Burnie Bypass to the west, Route 100 and Mountain Rd to the north, and US- 50 to the south. In addition, the County revisited outfalls (not necessarily within the priority assessment area) where illicit discharge was confirmed in prior years but follow-up investigations were inconclusive regarding source. Outfalls located on 31 County-owned properties Countywide – primarily police and fire facilities – were also inspected. Field crews successfully inspected 210 major and minor outfalls draining commercial, industrial, and residential land uses. For the FY22 effort, the County's outfall screening efforts will be focused within a target area defined by Route 100 to the south, I-97 to the east, and the County boundary to the west and north. The County will conduct outfall and upland screenings on four County-owned properties within the target area.

Anne Arundel County’s GIS coverage of storm drains and closed storm drain utility grids provided the base data for maps to guide field activities. These maps assisted field crews in identifying the extent of the storm drain systems, locations of outfalls, and any contributing businesses or facilities. The maps included parcels for commercial and industrial facilities and their storm drain systems for screening efforts, as per the guidance provided by MDE (MDE 1997).

Field crews recorded the physical condition of each outfall structure and conditions surrounding the outfall on field datasheets for each site visit. When crews found a dry-weather discharge, they tested the discharge using Hach color comparator test kits (for detergents, phenols, copper, chlorine, and ammonia), an ExTech ExStik II fluoride meter (for fluoride), and an ExTech PH220 sonde (for water temperature and pH). Physical parameters noted at each outfall included structural condition, vegetative condition, erosion, floatables, algae growth, discharge odor, and discharge clarity.

If field tests determined that an outfall’s discharge had a concentration above the action criteria for any of the analytes during the first visit, the protocol stipulated that crews revisit the outfall within 24 hours, but at least four hours after the first test. The second visit helps determine if the initial result was an anomaly or, if the outfall continues to exhibit flowing discharge, confirm the results of the chemical tests conducted on the first visit.

If both inspections revealed dry-weather flows and concentrations above the action criteria, the outfall is qualified as having a possible illicit connection. Another site condition that implied possible illicit connections included any situation where an observable pollutant had been

discharged through a storm drain system, but, at the time of inspection, the system was not flowing, or the discharge test did not reveal detectable levels of the pollutant.

To identify the source of any possible illicit discharge, the field crews systematically investigated access points in the storm drain system upstream of the outfall, testing flows through manholes and inlets as necessary and practical, until either the source was identified or the discharge could not reasonably be tracked further. Field crews photo-documented evidence of illicit discharges, including the probable cause(s). Staff prepared site-specific reports for each identified potential illicit discharge and structural issue found in the field; staff submitted the reports to the Anne Arundel County MS4 Program Manager and delegated staff. The potential illicit discharge reports were then forwarded to the County's Department of Inspections and Permits (I&P), the County's Stormwater Infrastructure Program (SIP) (formerly the Infrastructure Management Division (IMD)), or the Anne Arundel County Department of Health (Health Department), as appropriate, for further investigation and enforcement. On March 18, 2020, due to the COVID-19 pandemic, the County's Department of Health (Health Department) began responding only to emergency and COVID-19 related complaints. From this date through September 2020, I&P investigated complaints typically handled by the Health Department. In September 2020 the County's Department of Health resumed investigating food waste-related concerns.

A full report of the procedures and data collected from the illicit detection and elimination field investigations is found in the Illicit Discharge Detection and Elimination – FY 2021 Annual Report (**Appendix E**); relevant digital data are included in the *IDDE* table of the MS4 Geodatabase provided in **Appendix A**. The complete report (**Appendix E**) contains details of the findings from the FY21 reporting period, and the corrective actions associated with these sites. The full report also includes details regarding the resolution of previously unresolved cases described in prior reporting years. Closed investigations where the discharge source was not able to be identified (e.g., inconclusive) will be prioritized for future re-screening, and open cases will continue to be investigated with results reported in FY22.

Of the screened outfalls containing dry-weather flow during the initial screenings in the FY21 reporting period, two yielded a result above the action-criteria limit for one or more of the tested contaminants. Dry weather flow at one of the outfalls exceeded the action criteria for chlorine on the first visit and second visits. The contributing storm drain system was investigated, but no specific source was identified by LimnoTech field crews. County inspectors performed a follow-up investigation and successfully identified the source of the discharge and resolved the issue. Complete investigation details, including a site-specific report, agency responses, and detailed corrective actions, are found in the Illicit Discharge Detection and Elimination – 2021 Annual Report (**Appendix E**). At the second outfall, dry weather flow exceeded the action criteria for detergents during the first visit, and active vehicle washing was observed. At the time of the second visit, vehicle washing had ceased and no flow was present at the outfall. This outfall was located on County-owned property (a fire station). No site-specific report was generated because there was no flow observed upon the second visit, however the fire company staff have been advised to prevent runoff from vehicle washing from entering the storm drain system. Dry weather flow was also observed at a third outfall but could not be sampled due to accessibility constraints (could not gain access to locked fence gate); flow was not observed upstream in the storm drain system.

The County consultant's field teams identified 11 locations where physical issues significantly affected stormwater infrastructure within the targeted areas of Anne Arundel County during the FY21 reporting period. The site-specific reports were then forwarded to SIP for appropriate corrective action. Complete investigation details, including site-specific reports, agency responses, and corrective actions, are found in **Appendix E**.

b. Conducting annual visual surveys of commercial and industrial facilities, as identified in PART IV.C.2 above for discovering, documenting, and eliminating pollutant sources. Areas surveyed shall be reported annually.

Status:

During the permitting period, field personnel perform a visual inspection of accessible commercial and industrial sites within the target screening areas that have the potential to contribute significant pollutants (a.k.a. potential upland pollutant sources). The inspections are designed to identify poor housekeeping, dumping, and other non-permitted discharges (e.g., vehicle wash water) that may be intercepted by the County's storm drain system.

For the FY21 reporting period, field crews evaluated approximately 50 commercial areas and industrial sites for evidence of upland pollutant sources. As a result, field crews identified 10 upland pollutant sources within the target areas while conducting these routine visual inspections; these sources demonstrated the potential to discharge pollutants into County storm drains or Waters of the United States. Staff reported upland pollutant sources to the County MS4 Program Manager; the Program Manager or designee sent copies of the reports to I&P or the Health Department, as appropriate, to initiate corrective action. Complete investigation details, including site-specific reports, agency responses, corrective actions, and the report of the special investigation are found in **Appendix E**.

A total of 31 County-owned and improved properties, mostly police and fire facilities, were visually screened for potential upland pollution source identification in FY21. Stormwater maintenance needs and/or possible upland pollution source were identified at 19 of the County-owned properties visited by field crews. Site-specific reports are included in the IDDE Annual Report found in **Appendix E**. Observations from screenings conducted at County-owned improved properties will be used to inform the development and implementation of Good Housekeeping Plans under the next generation MS4 permit. Good Housekeeping Plans will include actions that recognize vehicle washdown activities and material storage, two potential pollution sources observed during inspections of County-owned properties. Inspection reports from these screenings were also shared with the County's Facilities Construction and Planner Coordinator.

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

Status:

There are two departments within the County government that address reports of illegal dumping and spills. I&P is the County agency primarily responsible for enforcing regulations regarding spills and illegal dumping into both publicly and privately owned storm drain systems. The Health Department addresses complaints specifically relating to food service facilities (e.g., overflowing dumpsters or waste grease containers) and documents violations during regular facility inspections.

Thirty-six (36) illicit discharge, dumping, or storm drainage complaints were reported to I&P during the FY21 reporting period; these cases were supplemental to the IDDE survey results for outfalls and the commercial and industrial facilities as described above. The complaints included referrals from the Department of Public Works as part of the department's IDDE Program and referrals from other sources. Illicit discharge complaints and referrals are logged into the I&P Compliance Case Database; this is used to track cases from the receipt of a complaint or referral to closure. Case numbers facilitate tracking the progress of any individual Illicit Discharge complaint or referral received by I&P.

Compliance case data pertinent to the complaints received during the 2020 reporting year are documented in **Appendix E**. All complaints and referrals were investigated and enforced as appropriate.

I&P utilizes a phased approach to eliminating and enforcing illicit storm drain discharges. Phase I Enforcement consists of a Violation Notice sent by first class and certified mail to the property owner. The Phase I Violation Notice includes an explanation of the violation and requests a written commitment to immediately cease the illicit discharging activity. Upon written receipt of the commitment to comply, the Department monitors the site for up to 60 days. If compliance is maintained, the violation is considered abated. Should the Department fail to receive the written commitment to comply, or if further violations are observed, the Department proceeds to Phase II Enforcement.

At the Phase II level of enforcement, I&P posts a Stop Work Order on the property and issues a $1,000 civil citation to the property owners. The civil citation must be paid, and the violation abated, or the civil citations are litigated in court. If a violation were to remain unabated by the court date, the Department requests the full payment of the fines and an abatement order from the District Court judge. The failure to comply with any Court-issued abatement order results in Contempt of Court charges being filed by the County Office of Law.

Significant violations are screened with the County Office of Law for possible criminal enforcement as authorized in the County Code, or for referral to MDE for enforcement under the State Code. During the FY21 reporting period, it was not necessary to issue any civil citations for failure to eliminate illicit storm drain discharges.

As part of its general activities associated with food service facilities, the Health Department has protocols for abatement of leaking or overflowing dumpsters. Enforcement is conducted under State of Maryland Regulations dealing with Food Service Facilities (COMAR 10.15.03.19) which requires that each facility retain a sufficient number of durable refuse containers capable of holding the facility's garbage between periods of removal; the containers must be adequately covered and not leaking. Violation of this regulation would be marked on the food facility inspection report and would require correction typically within 30 days of the investigation. Failure to comply by the second re-inspection would result in $175 re-inspection fees until compliance is achieved.

The Health Department also routinely inspects food service facilities to monitor the sanitary and physical conditions of each establishment. If the County receives a complaint about a specific issue relevant to a food service facility, the Health Department conducts an investigation applicable to the issue; these inspections augment those conducted under the routine schedule for facility assessments. The Health Department also conducts re-inspections, as necessary, to supplement routine inspections or complaints; these ensure corrective actions and facility compliance. The Anne Arundel County Department of Health may choose to issue civil citations for violations relating to "poor housekeeping" for those facilities under their jurisdiction. After a citation is issued, it is attempted to be served by a third-party server. Upon service, the property owner has 20 days to pay the fine and correct the violation, or 15 days to elect - via written response - to stand trial. After 20 days have passed since the initial inspection, the property is re-inspected for compliance. If the citation was unable to be served, the property is re-inspected immediately after receiving notice it was unable to be served. If violations remain at that point, the Department of Health may file for injunction. Once a citation or injunction is referred to the Office of Law, the property is re-inspected every 30 days until the trial date or until the violation is corrected. In FY21, the Department of Health issued 3 civil citations for violations stemming from IDDE-related visual watershed surveys. At the end of the FY21, two civil citations had been responded to and those violations corrected without further enforcement action; there had been no response to one citation.

On March 18, 2020, due to the COVID-19 pandemic, the Health Department began responding only to emergency and COVID-19 related complaints. From this date through September 2020, I&P investigated complaints typically handled by the Health Department. In September 2020 the County's Department of Health resumed investigating poor housekeeping and food waste-related concerns. For the FY21 reporting period, the Health Department addressed 10 issues reported to the Department by County consultants during the reporting period. Details regarding the reported conditions, agency responses, and corrective actions are in **Appendix E**.

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**

Status:

During the FY21 reporting period, no illicit discharge complaints were referred to MDE. One illicit discharge complaint received during the period was successfully enforced by I&P. I&P

also resolved two cases that were initiated in previous reporting periods. Details regarding these cases are in **Appendix E**.

e. **Reporting illicit discharge detection and elimination activities as specified in PART V of the MS4 permit.**

Status:

The report in **Appendix E** provides descriptions of all procedures undertaken and activities completed, findings from follow-up investigations, and data collected as part of the County's FY2021 IDDE program. Additionally, the County follows the requirements in the Permit for reporting IDDE data. The *IDDE* table in the FY21 MS4 Geodatabase included in **Appendix A** contains the required information related to screenings of 210 outfalls conducted during the FY21 reporting period.

Also submitted in **Appendix E** is the County IDDE Outfall Screening Prioritization Process (draft) for FY22 through FY26. This document includes both the prioritization process description as well as the field screening schedule for FY22 through FY26 and is submitted pursuant to the requirements of NPDES MS4 Permit # 20-DP-3316, issued November 5, 2021. The County will address MDE comments or required changes to this draft and submit the final prioritization process document with the FY22 MS4 Annual Report.

4. Litter and Floatables

This section of the permit requires Anne Arundel County to address problems associated with litter and floatables in waterways that adversely affect water quality. Increases in litter discharges to receiving waters have become a growing concern both nationally and within Maryland and cannot be ignored. Anne Arundel 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 Anne Arundel County's watershed assessments under PART IV.E.1 of this permit, Anne Arundel County shall document all litter control programs and identify potential sources, ways of elimination, and opportunities for overall improvement.

Status:

All comprehensive watershed assessments for the County, as required under **Part IV.E.1**, were completed in FY18. Watershed studies completed during the term of this administratively continued permit included a summary of potential litter sources, and the observed locations of riparian area dumpsites and upland areas where trash and litter were seen. As reported in the FY18 MS4 Annual Report, please see Section 5 of the final Herring Bay, Middle Patuxent, and Lower Patuxent Watershed Assessment Report (www.aacounty.org/departments/public-works/wprp/herring-bay-middle-patuxent/index.html) for detailed information related to this permit requirement and a map of the dumpsite locations within the study areas. The County's programs for addressing trash and litter are also documented in the County's FY21 Litter and Floatables Comprehensive Plan Annual Update (**Appendix F**).

The County continues to identify and eliminate sources of litter through screening for upland pollutant sources as part of the County's Illicit Discharge Detection and Elimination program (**Part IV.D.3**). Under this program, observed sources of litter such as inadequately covered or overflowing dumpsters, improper trash disposal, and illicit dumping are reported to the appropriate County agencies, which can compel the tenant and/or landowner to properly dispose of trash and make the necessary corrections.

The County's Bureau of Waste Management Services (WMS) continued to employ an effective education and outreach program targeting both homeowners and businesses with an emphasis on recycling and waste reduction. Together with the County's Bureau of Highways (BOH), WMS supported community cleanup and watershed cleanup events in FY21. The County's full efforts in reducing and eliminating sources of litter are detailed in the County's FY21 Litter and Floatables Comprehensive Plan Annual Update (**Appendix F**).

During the reporting period, the County continued to explore additional methods of eliminating or reducing certain types of trash and litter on a Countywide basis, such as catch basin inserts and trash traps. The County has coordinated with NGOs that are actively managing trash trap programs (e.g., South River Federation, Anacostia Watershed Society) to gain insight into locating, building, and maintaining these facilities. The County has yet to identify a suitable location for trash trap installation. Due to cost and maintenance concerns, the County decided not to pursue the use of catch basin inserts as a litter reduction strategy at this time.

- ***b. Within one year of permit issuance, as part of the public education program described in PART IV.D.6., Anne Arundel County shall develop and implement a public education and outreach program to reduce littering and increase recycling. This shall include:***
  - ***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.***
- ***c. Evaluating annually the effectiveness of the education program.***
- ***d. 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.***

Status:

Anne Arundel County has implemented public education and outreach programs addressing litter, recycling, and overall waste management. These programs are integral to the services provided by the WMS and BOH. In FY21, the County reviewed and updated the Litter and Floatables Comprehensive Plan. This Plan details existing conditions in the County, highlights all County and County-supported programs pertaining to reduction of litter and floatables, and describes future actions the County may take towards preventing litter from entering waterways. A copy of this plan is found in **Appendix F**.

Documented below is a summary of the County's litter and recycling education and outreach programs for FY21.

Litter Cleanup, Waste Management, & Recycling

The County's WMS developed and operates a robust public education and outreach program targeted to waste reduction and recycling, as well as household hazardous waste disposal.

WMS Recycling Division's successful recycling program is achieved through effective, consistent communication and education. Maintaining adequate program promotion and education are key to keeping customers informed and motivating them to continue and improve recycling as programs change and evolve. Lack of a comprehensive communication strategy can result in higher contamination levels in collected recyclables; less recycling by new residents; and existing customers may lose interest or become frustrated with changing program guidelines. Therefore, the Recycling Division has made communication and education its primary focus and the mechanism by which to cause a steady incremental growth in the residential recycling rate.

WMS recognizes the importance of keeping citizens educated about its programs, particularly with regards to its changes and advancements, and to encourage residents to "Recycle More Often" and to "Recycle More, Recycle Right." Recycling Program Specialists provide public outreach at attend schools, fairs, festivals, HOA meetings, community outreach events, and more. WMS also provides technical assistance with recycling at larger-scale events such as the Anne Arundel County Fair, Annapolis Greek Festival, and more. During FY21, events were severely limited due to the COVID-19 pandemic. Eight virtual community presentations were delivered and one in-person event was attended in FY21, with recycling assistance provided to one event. Anne Arundel County promotes its recycling program to the public through several methods including those outlined below.

- Providing technical assistances, and services when possible, to small businesses and multifamily units.
- Improving communication with customers by maximizing the use of various media including direct mail, broadcast media, social media, newspaper advertisements, and its websites (http://www.recyclemoreoften.com/ and http://www.aacounty.org/departments/public-works/waste-management/). In addition, the County has partnered with Recycle Coach, the largest recycling education network, to launch an app that will further enhance the County's ability to effectively and quickly communicate information to residents regarding the recycling program, curbside collection services, Recycling Centers and the Millersville Landfill. The Recycle Coach app, which launched in April 2020, is available to County residents on mobile devices and desktop computers.
- Attending civic and community meetings and events, workshops, displays, and special promotions.
- Specially designed programs and contests for school aged children.
- Educating customers on new programs, changes to existing programs, source reduction, schedule updates, and holiday collections.

Education programs are offered to students, faculty, parents, and more throughout Anne Arundel County's public and private schools, as well as day care and home-schooling groups. Technical assistance with recycling is also provided upon request, as well as assistance with obtaining Green School Certification through the Maryland Association for Environmental and Outdoor Education (MAEOE) program. Due to the COVID-19 pandemic, during FY21 Recycling Program Specialists were unable to provide school outreach at the same level as years past, but were able to provide outreach virtually. There were 11 virtual school programs in total. While there were no tours of the County Landfill, staff did record a virtual tour highlighting programs and opportunities available at the County Recycling Centers. The Recycling Division also hosted the annual elementary (poster) and middle school (sculpture) contests online, open to all County students. These contests help generate even more excitement about the importance of recycling. The County utilizes a multi-media outreach approach. In addition to planned attendance and participation in the multiple community events, recycling-themed mailers and brochures are distributed and advertisements supporting recycling can now be heard on music streaming services. In-line with the switch to virtual outreach, and as noted above, the Recycling Division introduced a new smartphone app called Recycle Coach, free to download for County Residents. Recycle Coach provides collection reminders, recycling tips and education, a database of searchable items with disposal information, and more. Additional information on the County's recycling and household hazardous waste programs may be found at the following websites:

- www.recyclemoreoften.com/
- www.aacounty.org/services-and-programs/household-hazardous-waste-drop-off-days
- www.facebook.com/annearundelrecycling/
- https://recyclecoach.com/anne-arundel-county-recycle-coach/

This ongoing and extensive outreach effort has proven to be very successful. Since the inception of the education and outreach program in 2008, the Countywide recycling rate has increased from 31% to 36%. This overall increase in recycling indicate less material being contributed to the landfill stream and, thus, less material (e.g., potential litter) that could be distributed by wind at pick-up locations or blown out of private vehicles traveling to a landfill for disposal.

The WMS Recycling Division offers a Small Business Recycling Program for offices looking to recycle. This operation is an extension of the residential program with contractors servicing the businesses on the roster with weekly pick-up of containers up to 96 gallons. In FY21, 179 small businesses were signed up for Small Business Recycling and more than 1,200 tons of single-stream recycling was collected. WMS Recycling Division staff is available for presentations, technical support, and Maryland Recycling Act (MRA) assistance regardless of whether a business elects to use the County for collection of recyclables. Currently there are 241 County-based businesses that report to the County for MRA purposes and thus are known to be actively participating in a recycling program.

With recycling being so heavily promoted in the County, it is only fitting that the County employees lead by example and practice recycling as well. The County Office Recycling Program (CORP) was developed to assist in providing County offices and facilities with the necessary tools behind an effective recycling program (e.g., containers, signage, and pick-up service); all offices/facilities have a Recycling Coordinator that directly communicates with the

recycling program office. Approximately 1,050 tons of single-stream recycling was collected at 117 County sites (offices, parks, pools, etc.) in FY21.

In FY21, there were seven household hazardous waste events. Two events were hosted at each of the three Recycling Centers, plus one additional event was held in September of 2020 at the Severn location, due to earlier cancellations caused by the COVID-19 pandemic. These events accounted for the proper disposal of 248 tons of household hazardous waste, successfully keeping these materials out of the County's landfills, roadside ditches, and waterways – an increase of 141 tons from the previous reporting period. These events are vital in helping to keep harmful toxins out of the County landfill, as well as discouraging illegal dumping of hazardous materials. The County does not accept hazardous waste for disposal at its landfill. All household hazardous waste collected at the facilities during these events is packaged, transported, and disposed of by a licensed hazardous waste contractor.

The County also provides 40 cubic-yard roll-off bins throughout the year for citizen groups, communities, and the County's BWPR to aid in community cleanup activities. WMS assists in hauling the trash and recyclable material collected from these activities. In FY21, WMS was scheduled to assist with 126 community cleanups by providing dumpsters and/or hauling services.

In support of activities designed to capture and eliminate litter before it enters County waterways, in 2018, the County purchased custom designed storm drain stencils that can be loaned to NGOs, schools, and other organizations for use, as well as custom medallions that can be installed on storm drains. In FY21, approximately 150 medallions were installed on storm drains by Boy Scouts in the Piney Orchard (Odenton) area.

The County BOH is responsible for all maintenance activities associated with County-maintained roads. Litter is collected from County roadways during weekdays on a largely per-request basis. In addition, BOH typically conducts weekend roadside litter and trash removal throughout the year, using supervised inmate labor in partnership with the County Department of Detention Facilities. The program was first started in 2007 with a focus on high-litter-count road segments, dumpsites, and illegal roadside signs that were proliferating across the County. Since the inception of the program, BOH has constructed a list of high-litter areas based on staff and citizen observations. The goal of the weekend pickup program is to realize an improvement in the condition of roadsides in Anne Arundel County without a reduction to other Highways services.

Since the inception of the program BOH has constructed a list of high litter areas based on staff and citizen observations. Weekend litter removal activities follow a programmed frequency throughout the year. Litter removal crews bag recyclables and other trash items separately and crews are asked to empty the recyclable items out of their collection bags into containers provided by the WMS Recycling Division. The overall effectiveness of the program ultimately depends on the number of inmates eligible for the program. For the entirety of FY21, weekend roadside trash removal was suspended due to the COVID-19 pandemic, with roadside cleanup being conducted on weekdays only.

A total of 3,538 forty-gallon bags of litter were removed from roadsides from July 1, 2020 to June 30, 2021. Since FY10, the County's roadside litter cleanup program has removed an average of 9,974 bags of litter from roadsides per fiscal year. Litter collection may vary from year to year largely as a result of the number of work release inmates made available to the BOH. BOH also performs debris collection from roadsides, which involves pickup of larger items such as discarded tires, appliances, and furniture as well as tree limbs. In FY21, BOH collected over 1,024 tons of roadside debris, an increase of nine tons from the previous reporting period.

Stream and Watershed Cleanups

BOH and WMS both supported stream/watershed cleanup initiatives during the reporting period. In partnership with these efforts, these agencies supported two events and hauled away over one ton of material for proper disposal. Specific examples of these clean-up events supported by the County are listed in **Table 11**.

Table 11. Community cleanup activities supported by County agencies in FY21

Date	Organization/Location	Location	Amount of Trash Removed
April 24, 2021	Alliance for the Chesapeake Bay	1343 Cape St. Claire Rd – Annapolis, MD	0.35 tons
June 29, 2021	Shoreline Clean-Up (Northern Recycling Center)	100 Dover Rd – Glen Burnie, MD	0.79 tons

The Anne Arundel Watershed Stewards Academy (WSA) was created in 2009 to build capacity within communities to reduce pollutants entering our waterways via stormwater runoff. The WSA employs hands-on training courses for Stewards via an intensive classroom instruction and field-experiences, and assists the Stewards in working within their communities to develop good intentions into positive action. In FY21, WSA successes included the removal of 280 pounds of trash from County streams and watersheds.

5. Property Management and Maintenance

a. Anne Arundel 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.

Status:

Anne Arundel County's Water Reclamation Facilities (WRFs) NPDES discharge permits are current or continue in force pending MDE issuance of a revised permit. The County-owned WRFs with NPDES discharge permits are listed in **Table 12** below.

Table 12. County Water Reclamation Facility discharge permits

Facility	Permit	Permit Coverage Period
Annapolis WRF	12DP0838A	Oct. 1, 2015 – Sept. 30, 2020
Broadneck WRF	14DP0677A	Nov. 1, 2017 – Oct. 31, 2022
Broadwater WRF	14DP0813A	Nov. 1,2017 – Oct. 31, 2022
Cox Creek WRF	14DP0698	Jan. 1, 2020 – Dec. 31, 2024
Maryland City WRF	11DP2393A	April 1, 2015 – Mar. 31, 2020
Patuxent WRF	11DP0132A	April 1, 2015 – Mar. 31, 2020
Piney Orchard WRF	15DP1936A	July 1, 2019 – Feb. 28, 2022

NPDES wastewater discharge permit reapplications for the above-listed County-owned WRFs, except Cox Creek WRF, were submitted to MDE as required and are pending issuance. Until the new permits are issued, the current permit conditions remain in force.

The State's General Discharge Permit for Stormwater Associated with Industrial Activities, Permit 12SW or 12SR, became effective January 2014. County-owned facilities requiring general discharge permit coverage submitted NOIs to MDE. These facilities, their General Permit Number, the date MDE received the NOIs and Stormwater Pollution Prevention Plans (SWPPPs), and the permit coverage period are listed in **Table 13.** The General Permit coverage expired at the end of 2018 and MDE administratively extended the permit term until a new general permit (20SW) is issued. A tentative determination to issue the new 20SW permit was advertised by MDE and the public comment period ended on April 19, 2021. The Tentative Determination Draft General Permit and supporting documents are found on the MDE webpage here: mde.maryland.gov/programs/permits/watermanagementpermits/pages/stormwater.aspx. Until the Final Determination is issued, all covered facilities are required to maintain compliance with the existing 12SW/12SR permit conditions.

Table 13. County 12-SW and 12-SR permitted facilities

Facility	Permit	NOI & SWPPP Received by MDE	Permit Coverage Period
Bureau of Highways (BOH) – Northern District Road Yards			
200 Dover Rd	12-SW-1176	July 8, 2014	Sept. 12, 2014 – Dec. 31, 2018
318 Mountain Rd	12-SW-1181	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018
BOH – Central District Road Yards			
1427 Duckens St	12-SW-1177	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018
1847 Crownsville Rd	12-SW-1179	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018
415 Broadneck Rd	12-SW-1182	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018
BOH – Southern District Road Yards			
350 West Central Ave	12-SW-2298	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018
6657 Old Solomons Island Rd	12-SW-1180	July 8, 2014	Aug. 21, 2014 – Dec. 31, 2018

Facility	Permit	NOI & SWPPP Received by MDE	Permit Coverage Period
Bureau of Waste Management Services (WMS)			
Millersville Landfill & Resource Recovery Facility (MLFRRF)	12-SW-1304A	July 16, 2019	Aug. 15, 2014 – Dec. 31,2018
Northern Recycling Center (NRC)	12-SW-0298A	December 7, 2018	Aug. 15, 2014 – Dec. 31, 2018
Southern Recycling Center (SRC)	12-SW-0297A	December 7, 2014	Aug. 18, 2014 – Dec. 31, 2018
Bureau of Utility Operations (BUO)			
Annapolis WRF	12-SW-0756	May 20, 2014	June 16, 2014 – Dec. 31, 2018
Broadneck WRF	12-SW-0758	June 27, 2014	July 30, 2014 – Dec. 31, 2018
Broadwater WRF	12-SW-0757	June 18, 2014	June 26, 2014 – Dec. 31, 2018
Cox Creek WRF	12-SW-0760	June 30, 2014	Aug. 11, 2014 – Dec. 31, 2018
Patuxent WRF	12-SW-2459	June 27, 2014	Aug. 6, 2014 – Dec. 31, 2018
Maryland City WRF	12-SW-0761	June 11, 2014	July 14, 2014 – Dec. 31, 2018
Piney Orchard WRF	12-SR-0727	Nov 18, 2014	Jan. 16, 2015 – Dec. 31, 2018
Anne Arundel County Utility Operations Center	12-SW-2345	July 16, 2014	Sept. 8, 2014 – Dec. 31, 2018

At a minimum, each facility performs quarterly and annual inspections as well as staff training on stormwater pollution prevention plans. Compliance documentation, as required by General Permit 12-SW, is maintained at each facility and is available for inspection upon request. Information specific to these facilities and their permit compliance activities is presented in the *MunicipalFacilities* table of the MS4 Geodatabase. Copies of the most recent quarterly inspection and the most recent annual comprehensive site inspection, as well as training records for the above-listed facilities are found in **Appendix G**.

Bureau of Highways (BOH) Stormwater Pollution Prevention Plan Development and Implementation

During the FY21 reporting period the following items related to General Permit 12-SW at the County's Road Operations Yards were completed:

- Implemented each SWPPP, including
  - Performed routine facility inspections of each facility, at least quarterly;
  - Completed quarterly outfall visual assessments of each facility;
  - Completed comprehensive annual inspections of each facility;
  - Provided training to Road District personnel during the reporting period to support SWPPP implementation;
  - Completed an internal document review during comprehensive annual inspections of each facility;
  - Continued maintenance improvements to further prevent stormwater impacts, including

    - Use of coir log wattles and/or straw bales to protect inlets,
    - Use of asphalt curbing to contain bulk road maintenance materials, and
    - Added wooden bulkheads to entryway of salt barns, in addition to straw bales;
- Completed underground storage tank testing and inspection of Bureau of Highways facilities using Maryland Department of the Environment Certified UST Inspectors for the following conditions:
    - Annual testing of spill buckets (catchment basins) at two facilities in March 2021;
    - Third Party Inspections at two facilities in calendar year 2021 based upon MDE notification; and
    - Five-year tank tightness testing and five-year containment sump testing were completed at all applicable facilities.

Additionally, in April 2021 the MDE Water and Science Administration Compliance Program conducted an inspection of the Northern District Road Operations Yard (Mountain Road Yard -- Permit 12-SW-1181). This compliance inspection revealed that the facility should be conducting quarterly benchmark monitoring for the inlet cleaning and street sweeping dewatering facilities, and the County should submit an updated NOI. The County will address this identified deficiency and will coordinate with MDE regarding submission of a new NOI and necessary SWPPP updates. Moreover, the County is reviewing SWPPP requirements and good housekeeping activity for all the road operations facilities, and taking appropriate action to ensure continued compliance with the 12SW Permit in anticipation of the 20SW Permit issuance. In response to the compliance inspection, actions taken in FY22 to resolve identified deficiencies will be reported in that MS4 Annual Report as appropriate.

Bureau of Waste Management Services Stormwater Pollution Prevention Plan Development and Implementation

The State's General Discharge Permit 12-SW also applies to the three County-owned facilities managed by WMS identified in **Table 13**. During the reporting period, annual comprehensive SWPPP compliance inspections were performed at these facilities in October 2020 and will be performed again in October 2021; visual inspections occur on a quarterly basis. In addition, the stormwater management facilities at these sites are routinely inspected and all identified repairs are immediately reported and scheduled for maintenance. WMS employs two environmental technicians who inspect and manage the stormwater facilities to ensure proper function.

As reported in FY20, MDE conducted a Permit 12-SW compliance inspection at the Millersville Landfill & Resource Recovery Facility (MLFRRF) in June 2019. This inspection resulted in MDE requesting an NOI and SWPPP modification to add Sector A (Timber Products), SIC Code 2499 (Wood Products, Not Elsewhere Classified) for the composting operation at this facility. The updated NOI and SWPPP for MLFRRF were submitted to MDE on July 16, 2019, and included in the FY19 MS4 Annual Report (Appendix G). In FY20, MDE subsequently conducted two unannounced compliance inspections at the MLFRRF and two announced compliance inspections at the Northern Recycling Center (NRC) and Southern Recycling Center (SRC) facilities. Because of COVID-19 restrictions, MDE did not conduct stormwater compliance inspections at MLFRRF, NRC or SRC in FY21.

Bureau of Utility Operations Stormwater Pollution Prevention Plan Development and Implementation

During this reporting period, Anne Arundel County's Bureau of Utility Operations (BUO) continued SWPPP implementation specific to the seven WRF facilities and the Utilities Operations Center site listed in **Table 13** (above). In support of the NOI and in compliance with the SWPPP, staff perform monthly inspections, quarterly dry weather inspections, quarterly wet weather inspections, annual comprehensive site inspections, annual record review, and annual training to ensure compliance. Records are maintained at each facility.

b. The County shall continue to 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 alternative activities:

i. Street sweeping;

Status:

Anne Arundel County's street sweeping program is intended to provide a continuous level of street cleanliness while keeping debris (including litter and floatables) and pollutants out of storm drains, creeks, rivers and ultimately the Chesapeake Bay.

The County's neighborhood streets are relatively clean because of the work of conscientious residents who assist us by keeping the areas in front of their homes free of litter and debris. Residential streets were not included in the County's program for routine street sweeping during the reporting period. Roads with higher traffic volumes are prioritized to maximize collection. The primary focus of the County's street sweeping program is on main thoroughfares (arterial roads, local and collector streets, roads with high traffic volume), business parks and industrial areas, County park-and-ride lots, NPDES priority areas, and facility parking lots subject to SWPPP implementation. These areas were scheduled for twice-monthly street sweeping.

During Fiscal Year 2021, the County swept 6,654 curb miles, which equates to 554.5 curb miles per month – the same as the last reporting period. Accomplishments may vary 5% annually depending on disposal costs and other factors. The current funding level supports sustainable accomplishment of approximately 6,800 curb miles annually, a 40% increase over FY16 levels. This contracted street sweeping program collected 337.83 tons of material from County-maintained streets in FY21.

ii. Inlet inspection and cleaning;

Status:

Anne Arundel County BOH conducts manual and mechanical storm drain inlet cleaning throughout the County. For FY21, the County manually cleaned and removed debris from catch basins, inlets, and outlets of pipes to maintain proper drainage for 4,084 structures. This is a -38% decrease from the previous reporting period in which 6,637 structures were cleaned by hand.

In addition, the County inspects catch basins, manholes, and associated pipes to identify structures for cleaning with a sewer vacuum or power rodder. A total of 4,274 structures required cleaning with a sewer vacuum, an increase of 91% from the last reporting period in which 2,237 were cleaned with a sewer vacuum. A total of 90,979 linear feet of pipe were cleaned, an increase of 3% from the last reporting period in which 88,756 linear feet were cleaned.

Ditch & Curb-line Cleaning
During the reporting period, the County cleaned and removed debris from roadside inlet and outlet ditches and concrete swales, removed leaves from ditch lines and curbs using a leaf vacuum, and cleaned and reshaped roadside ditches by machine for a total of 68,528 feet during the reporting period. This is a decrease of 47% from the last reporting period in which the County cleaned 129,747 feet. Year-to-year variability in linear feet of ditch and curb-line cleaning is routinely around 30%.

iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;

Status:

Pesticides & Herbicides
The quantities of pesticides, herbicides and fertilizers used on County-owned properties for vegetation management and pest control are listed in the *ChemicalApplication* table of the FY21 MS4 Geodatabase. New for the FY21 data submission, County-owned golf courses (Eisenhower Golf Course, both Compass Pointe Golf Courses) provided detailed information on the pesticides and herbicides applied in FY21. These data, presented in the *ChemicalApplication* table, were not provided in prior year reports.

Anne Arundel County makes a financial contribution annually to support Maryland Department of Agriculture (MDA) programs for gypsy moth control (mda.maryland.gov/plants-pests/Pages/gypsy_moth_program.aspx) and mosquito control (mda.maryland.gov/plants-pests/Pages/mosquito_control.aspx). The County does not maintain information regarding the quantity of materials used by these State programs.

Herbicide use associated with road maintenance performed by the BOH is limited to the application of glyphosate (e.g., Roundup ™) on County rights-of-way to control vegetative growth around guardrails, concrete structures, and prior to crack sealing operations in the traveled portion of the roadway. A total of 45 gallons of glyphosate was used during the reporting period. This is a 3% decrease over the previous reporting period in which a total of 46.5 gallons was applied. The change can be largely attributed to the total number of application cycles scheduled during the reporting period. The BOH recorded no other herbicide, pesticide, or fertilizer application.

The BOH employs a contractor who holds a Pest Control Applicator Certificate. The applicator categories are 3A - Ornamental, 3C - Turf, and 6 - Right-of-Way. The contractor is required to

attend re-certification training per MDA guidelines to include Integrated Pest Management and pesticide safety. Each time there is chemical use, a pesticide report is completed and filed, which is available to be reviewed during MDA's biennial inspection.

Anne Arundel County Facilities Maintenance Division (FMD), Horticulture Unit, maintains landscaping on County properties including all Administrative Buildings, Libraries, Police and Fire Stations, Senior Centers, and Health Centers throughout the County. The liquid fertilizer and the herbicides applied to these properties in FY21 are listed in **Table 14**. The quantities of each are included in the FY21 MS4 Geodatabase *ChemicalApplication*. No granular fertilizers were applied in FY21.

Table 14. Herbicides and fertilizers used by the FMD Horticulture Unit in FY21

Trade Name	Active Compounds
Ortho GroundClear	Glyphosate (2.97%), Imazapyr (0.47%)
Monsanto RoundUp Pro liquid	Glyphosate (50.2%)
Monsanto RoundUp QuickPro –granular	Glyphosate (73.3%), Diquat dibromide (2.9%)
Bonide Grass Beater	Sethoxydim
Lesco Prosecutor – granular	Glyphosate (41%)
SedgeHammer granular	Halosulfuron-methyl, methyl 3-chloro-5-(4,6-dimethoxypyrimidin-2-ylcarbamoylsulfamoyl)-1-methylpyrazole-4-carboxylate (75%)
Lesco sprayable fertilizer 20-20-20	Total Nitrogen (N; 20.00%) Nitrate Nitrogen (5.98%), Ammoniacal Nitrogen (6.00%), Urea Nitrogen (8.02%), Available Phosphate (P_2O_5; 20.00%), Soluble Potash (K_2O; 20.00%)
Terro Ant Killer – granular	Lamda-cyhalothrin (0.04%)

Landfills and recycling centers managed by WMS do not use herbicides to control unwanted woody and herbaceous vegetation. Weeds and other problematic vegetation at these facilities are removed almost entirely by physical and mechanical means. Occasionally, however, limited application of herbicide (RoundUp, active ingredient Glyphosate) is used around the WMS Administrative Building and parking lot. During FY21, however, the WMS did not use any herbicide application. In addition, fertilizer use on WMS properties such as the side slopes to Cell 9 or the Cell 567 capping project are limited to only when grass needs nutrients to encourage proper growth that helps with the prevention of soil erosion and limits runoff.

WMS employs a contractor who holds a Pest Control Applicator Certificate. Pesticides are applied indoors at WMS facilities and outside around buildings. In FY21, outside pesticide use included the active ingredients Bifenthrin, Bromadiolone, Orthoboric Acid, and Brodifacoum. Quantities of each chemical used are found in the FY21 MS4 Geodatabase *ChemicalApplication* table. Each time there is a chemical application, a pesticide report is completed and filed.

Anne Arundel County Recreation and Parks (AACRP) is committed to providing parks with pest-free environments through the implementation of preventive methods, integrated pest management (IPM), and chemical strategies when necessary. Because AACRP properties,

facilities, and programs are often contiguous physically, programmatically, geographically, and operationally to Anne Arundel County Public School properties, it was deemed imperative that there be a high degree of standardization, commonality, and uniformity in pest management philosophy. The AACRP Turf Division has reported using the herbicides Ranger Pro (Glyphosate liquid) and Oxadiazon (granular) as well as a 46-0-0 urea fertilizer on multipurpose fields and footballs fields during FY21. Quantities of these chemicals are included in the FY21 MS4 Geodatabase *ChemicalApplication* table.

The County-owned Compass Pointe and Eisenhower Golf Courses are operated by AACRP via contract with Indigo Golf Partners. These golf course properties (Compass Pointe is comprised of two golf courses) are subject to an intensive pesticide, herbicide, and fertilizer turf management program. The grass types on each of the golf courses' fairways and tees are not the same so there are differences in the turf maintenance programs between the three courses. The turf management programs at these facilities are carried out by MDA licensed applicators (certified pesticide and certified fertilizer applicators) and all turf management applications are reported to MDA in a timely manner, as required. Additionally, in March 2021 the MDA conducted an inspection of the turf management program at Compass Pointe and identified no violations or record-keeping deficiencies. For FY21, the quantities of pesticides, herbicides, and fertilizers applied to these managed turf areas are reported in the MS4 Geodatabase *ChemicalApplication* table. As noted earlier, this is the initial year that these data are reported via the MS4 Geodatabase and MS4 Annual Report.

The County BWPR conducts post-restoration vegetation monitoring at the Cowhide Branch stream restoration site. During FY20 and FY21, observed mortalities amongst the planted trees was attributed to collapsed tree cages and competition from invasive vines and rank grasses. The County contracted with a professional landscape company to perform vegetation maintenance including mechanical and minimal herbicidal control of invasive vegetation and to remove tree cages to discourage trellising vines and overcrowding from grasses. Glyphosate, the only herbicide used for this work, is included in the *ChemicalApplication* table.

Integrated Pest Management (IPM)

The maintenance plan for all FMD properties and rights-of-way includes IPM. Key elements include the following:

- Use of herbicides only when pulling or cutting weeds have not proven effective;
- Use of insecticides only when natural methods have not proven effective;
- Elimination of fertilizer use, proper use of hand weeding and mulching, and sparing use of herbicides on roadway medians;
- Limiting fertilizer use on FMD properties, and using only when grass needs nutrients to encourage proper growth that helps with the prevention of soil erosion and limits runoff;
- Selecting disease- and insect-resistant plants for new plantings; and
- Selecting the least toxic product available, using appropriate storage facilities and techniques, and compliance with all applicable laws and regulations.

During the reporting period, the AACRP continued implementation of an IPM program for County parks and athletic facilities. The IPM plan is required pursuant to County legislation that

became effective July 1, 2013, and that modified Article 14 of the County Code by adding §14-1-105 (Integrated Pest Management Plan). Article 14 of the County Code can be found online at www.aacounty.org/our-county/county-code/index.html. Pursuant to this legislative requirement, the public is provided prior notification of pesticide application at Recreation and Parks public facilities. Key elements of the IPM program at AACRP facilities include the following actions:

- Minimize the amount and toxicity of pesticides used in the park facilities;
- Eliminate unnecessary pesticide applications;
- Provide IPM education to the public, park users and park staff;
- Improve landscape and grounds cleanliness;
- Utilize only Licensed, Certified and Registered Technician pesticide applicators;
- Reduce or eliminate exposure of children, vulnerable adults, nursing mothers with infants and pets to pesticide applications; and
- Provide universal public and staff notification.

iv. Reducing the use of winter weather de-icing materials through research, continual testing and improvement of materials, equipment calibration, employee training, and effective decision-making; and

Status:

The amounts of de-icing chemicals used by the County BOH during FY21 are found in **Table 15**. De-icing chemical data for the four previous reporting periods are provided as a comparison. The quantity of de-icing chemicals used each year is highly variable because it is based on actual winter weather conditions including precipitation type, precipitation frequency, and factors such as road surface temperature.

Table 15. De-Icing material applied by the Bureau of Highways, FY 2017–2021

Material	2016-2017	2017–2018	2018–2019	2019-2020	2020-2021
Road Salt (tons)	5,361	17,420	12,760	982	7,785.50
Liquid Salt Brine (gal.)	139,000[a]	142,850[a]	133,500[a]	40,400[a]	21,900[a]
Total Salt (tons)	5,500	17,563	12,894	1,022	7,807.4
Liquid Calcium Chloride (gal.)	1,046[b]	2,900[b]	432[b]	0[b]	0[b]
NWS Snow Totals – BWI (in.)	3.0[c]	15.4[c]	18.3[c]	1.8[c]	8.9[c]
NWS Avg. Winter Temp (°F)	40.5	36.4	37.5	43.0	40.3

[a] One ton of rock salt produces 1000 gallons.

[b] Average winter temperature at BWI Thurgood Marshall Airport is 35.1 degrees per the National Weather Service (NWS). Calcium Chloride depresses the freezing point and is used more extensively during colder periods to prevent ice formation and to deice road surfaces. Increased use is likely when average temperature is near or below freezing, or in cases of ice and heavy snowfall.

[c] Average long-term annual snowfall total at BWI Thurgood Marshall Airport is 20.1 inches per the National Weather Service (NWS). Winter 2019-2020 snowfall total at BWI was 1.8 inches. Below-normal snowfall, moderate temperatures, anti-icing, and sensible salting practices partially offset two additional salting events and an ice event in 2019-2020; this resulted in a decrease in salt use from that recorded in the 2018-2019 winter season.

In 2014, after the promulgation of a Statewide Salt Management Plan, the County's BOH developed the Department of Public Works Salt Management Plan to outline the practices intended to effectively manage road salt for winter maintenance activities within the County. The Salt Management Plan is organized into the following areas:

- Winter maintenance policies;
- Trends and data analysis;
- Materials ordering, delivery, storage, handling and record keeping;
- Equipment upgrading, calibration and washing;
- Snow and ice control training;
- Weather forecasting, storm response, environmentally sensitive areas;
- Technology review; and
- Public outreach and education.

Near-Term Goals incorporated in the Salt Management Plan include:

- *Winter Maintenance Policies:* The Department has established level of service and maintenance standards which have been generally accepted by the community at large. These policies form the foundation for program delivery and can have a significant effect on the environment. The goal is to review the various departmental standards relating to the winter maintenance program and seek endorsement for the level of service and maintenance policies.
- *Record Keeping:* One of the keys to an effective winter maintenance program is to place the right amount of material in the right place at the right time. At the present time, the record of material usage is tracked manually and reconciled with the residual inventory but should be enhanced to document salt usage by route, by vehicle, and by storm.
- *Winter Maintenance Training:* A thorough understanding of good housekeeping practices, the measures of snow and ice control and the expectations of program delivery will result in a greater probability of success with the salt management plan. For this reason, it is essential that all staff involved with winter operations be provided with Winter Maintenance and Operations Training.
- *Communications:* The goal in this area is to communicate the Department's winter maintenance program and salt management initiatives to staff and to the public. The prime focus in this area will be to increase public awareness in the role of de-icing materials in snow and ice control through the development of appropriate information on the Department's webpage.
- *GPS Upgrade:* It is recommended that the Snow Operations fleet be upgraded by installing an Automated Vehicle Location system (AVL). Strategic and tactical decision making during a storm response, informed by an AVL system, improves effectiveness, resource allocation, and potentially reduces storm response duration. The GPS data provided by an AVL can assist with the analysis of complaints, trouble spots, and claims against the County. This is possible because the location of a truck can be pinpointed in time throughout the storm with a high level of accuracy.

Longer Term Goals identified in the Salt Management Plan include:

- *Equipment Upgrading:* It is intended that the winter maintenance fleet be capable of delivering appropriate levels of de-icing materials within a full range of climatic conditions. The most cost-effective way of fleet upgrading is to consider changes as vehicles within the fleet come up for replacement. In this regard, as the salt spreader fleet comes up for replacement within the County's heavy equipment replacement program, the vehicles are to be equipped with electronic controllers, infrared thermometers, and pre-wet capabilities. The equipment upgrades will improve the capability of placing the right amount of de-icing material in the right place, at the right time and allow for an increased level of data collection which, in turn leads to more effective use of salt.
- *Environmentally Sensitive Areas:* Concentrations of chloride in the environment can have negative environmental impacts and the Statewide Salt Management Plan suggests a program to assess the levels of impact due to winter maintenance. Initially, the environmentally sensitive areas can be identified and ranked starting with the most vulnerable areas (highest ranked); a monitoring program can be developed, where appropriate, to explore the level of impact resulting from the County's winter maintenance practices. Over time, where appropriate, action plans are to be developed to reduce the chloride impacts on the environment.

In 2020–2021, the BOH continued its efforts to reduce the use of winter weather de-icing materials through application of best practices and improvement of materials, equipment calibration, employee training, and effective decision making. The County issued contracts to continue a Countywide anti-icing program during the 2020–2021 season, procured additional heavy-duty dump trucks equipped with the latest spreader controller technology and on-board liquid application capability, and continued to equip its plow fleet with AVL tracking hardware to monitor and optimize snow removal operations.

The BOH continued its use of a maintenance decision support system (MDSS), which uses real-time data from our Road Weather Information System (RWIS). The RWIS system is a series of pavement and bridge deck sensors and other instruments installed along certain County-owned bridges and roadways. The integration of RWIS data into an MDSS allows the management team to select the most appropriate winter treatment for actual weather conditions in each area of the County during a winter storm event. Studies have shown use of an MDSS can help reduce the use of de-icing chemicals.

Annual training on proper snow plowing techniques and safety is also offered to both County and contractor personnel responsible for maintaining the County's roadways during inclement winter weather. The training includes information on the application of de-icing products and proper application rates. Training sessions are held in October and November each year. Approximately 150 County personnel and 115 contractors attended the training sessions in FY21.

These training sessions present the concept of "Sensible Salting" to all winter operations personnel (County and contractors). "Sensible Salting" training creates an awareness of the need to protect the environment and is another way of saying "Enough and no more." Sufficient salt is

required to produce the desired safety and mobility to achieve the level-of-service goal. "Excess" applications add cost but no further benefit, and harm the environment.

The Sensible Salting Practices include:

- Limited Salting During the Late Evening/Early Morning Hours (11:00 p.m. – 4:00 a.m.): During these hours, salting is not as effective due to low traffic volumes. In the late evening/early morning hours, the goal is to ensure passable roads which means only intersections, hills, curves, and bridges will be salted. Beginning at 4:00 a.m., the BOH prepares the roads for rush hour.
- Limited Salting on Secondary Roads: Secondary Roads (local streets) will be plowed as often as possible, but will only be salted at intersections, hills, curves, bridges, and school zones. "Spot Salting" will also be used when necessary.
- Proper Calibration of Equipment: All equipment will be calibrated to ensure that desired application rates are applied correctly and over-salting is avoided.

Activities at WMS facilities also require the use of de-icing materials, however, in FY20 and FY21, no bulk salt was used. The amount of bagged deicer (mixture of sodium chloride, magnesium chloride, calcium chloride, and potassium chloride) used at each facility in FY21 was as follows:

- Millersville Landfill and Resource Recovery Facility & Central Recycling Center – 16,950 pounds;
- Northern Recycling Center – 8,250 pounds; and
- Southern Recycling Center – 1,600 pounds.

The County's BUO and the Utility Operations Center relies on BOH to ensure access roads to treatment facilities are plowed and remain open during the winter months. As such, no winter weather de-icing material usage is actively tracked by this Bureau.

v. Ensuring that all County staff receive adequate training in pollution prevention and good housekeeping practices.

Status:

The BOH held quarterly staff training sessions with Road District personnel during the reporting period to support SWPPP implementation, as summarized in **Table 16.**

Table 16. SWPPP training summary for Bureau of Highways Facilities in FY21

Training Number	Training Location	Training Date	# Attendees	Training Session Topic
20491596	1310ND	09/30/2020	18	Topic: What is a SWPPP
19435859	1310NM	08/30/2020	18	Topic: Keep the Rain out of the Drain
20489057	1312SD	08/28/2020	21	Topic: Source of Storm Water Pollutants
21531511	1311CO	08/28/2020	12	Topic: SWPPP

Training Number	Training Location	Training Date	# Attendees	Training Session Topic
20499218	1311CC	09/02/2020	8	Topic: SWPPP Training
20500768	1311CS	09/11/2020	5	Topic: SWPPP Training Tailgate
20491600	1310ND	12/22/2020	16	Topic: Keep the Rain out of the Drain
20489062	1312SD	11/18/2020	21	Topic: Salt Management & Proper Cleaning
21531519	1311CO	11/30/2020	9	Topic: SWPPP/ When and What to Look For
21528098	1311CC	11/16/2020	4	Topic: SWPPP Training
20512691	1311CS	11/23/2021	6	Topic: SWPPP Training/ Cal Chloride Cont
20491455	1310NM	11/02/2020	18	Topic: Walk Safe & What SWPPP is
21529314	1310NM	02/26/2020	18	Topic: When it Rains it Drains
21531522	1311CO	02/26/2021	10	Topic: SWPPP & Confined Areas
21528728	1311CC	03/24/2021	4	Topic: SWPPP Training
20489072	1312SD	02/17/2021	22	Topic: Equip Maintenance During post snow events
21535755	1310NM	05/19/2021	7	Topic: Accident Procedures/ SWPPP /
21523443	1310ND	02/05/2021	14	Topic: SWPPP When it Rains it Drains
21529367	1311CO	06/10/2021	11	Topic: SWPPP/Containment Well
21540592	1311CC	06/30/2021	9	Topic: SWPPP Training
20489069	1312SD	05/31/2021	22	Topic: Salt Management & Proper Cleaning
21530839	1311CS	02/21/2021	4	Topic: SWPPP/ Structure Poll Prevent
21535212	1310ND	05/18/2021	14	Topic: Accident Procedures and SWPPP
21529369	1311CS	04/20/221	5	Topic: SWPPP Training

The County's WMS staff continued their training on stormwater pollution prevention with formal SWPPP training sessions held in March and April 2021, as summarized in **Table 17** below.

Table 17. SWPPP training summary for Bureau of Waste Management Services in FY21

Training Date	# Attendees	Course Title
4/20/2021	12	Municipal Storm Water Pollution Prevention SWPPP Annual Training (NRC)
3/23/2021	21	Spill Response Non-Emergency HAZMAT SWPPP Annual Training (MLFRRF)
4/28/2021	8	Municipal Storm Water Pollution Prevention SWPPP Annual Training (SRC)
4/14/2021	13	Municipal Storm Water Pollution Prevention SWPPP Annual Training (CRC & Special Collections)

The BUO conducted SWPPP staff training sessions at the WRFs and Utility Operations Center facilities as summarized in **Table 18** below.

Table 18. SWPPP training for Bureau of Utility Operations in FY21

Training Date	# Attendees	Course Title
10/6/2020	9	SWPPP Annapolis WRF
10/28/2020	9	SWPPP Broadneck WRF
6/16/2021	8	SWPPP Broadwater WRF
10/1/2020	14	SWPPP Cox Creek WRF
7/2021	5	SWPPP Maryland City WRF
8/23/21	19	SWPPP Training: Utility Operations Center
8/26/21	30	SWPPP Training: Utility Operations Center
8/26/21	16	SWPPP Training: Utility Operations Center
9/13/21	19	SWPPP Training: Utility Operations Center

6. Public Education

Anne Arundel County shall continue to implement a public education and outreach program to reduce stormwater pollutants. Outreach efforts may be integrated with other aspects of the County's activities. These efforts are to be documented and summarized in each annual report. The County shall continue to implement a public outreach and education campaign with specific performance goals and deadlines to:

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

Status:

The Department of Inspections & Permits maintains a 24-Hour Environmental Hotline for citizens to report environmentally related complaints including critical area violations, spills, and illegal dumping into the County storm drain system. The Hotline has been in existence since 1988 and has been advertised in numerous ways including the County Inspections and Permits webpage: www.aacounty.org/departments/inspections-and-permits/index.html. The Environmental Hotline number is 410-222-7171.

In addition to the 24-hour environmental hotline, the County webpage provides a link for citizens to submit on-line requests for investigation of environmental concerns or any other observation or issue of concern: www.aacounty.org/services-and-programs/report-a-concern. This on-line reporting interface is in addition to the options for reporting concerns and issues through the mobile app SeeClickFix.com© (SeeClickFix, Inc., 2008-2017) or by dialing 311 (Mon–Fri from 8:00 to 4:30) to reach a County customer service representative. The County is committed to customer service and promptly responds to reported concerns.

In August of 2018, the County implemented a new complaint management system whereby complaints received via the above reporting mechanisms are entered into a database based on one of three major categories (Building, Environment, or Zoning) and assigned to one of numerous subcategories within each major category (e.g., Illegal Discharges is an Environmental subcategory). The complaint is then assigned to an inspector for follow-up and enforcement

action, all of which is documented within the database. Information on complaints received and the subsequent actions taken can be viewed via the County's Inspections and Permits webpage by clicking on the hot link "Code Compliance Database" found on the right side of the webpage. This link: www.aacounty.org/departments/inspections-and-permits/code-compliance/review-system/index.html takes you to where case information can be searched by address, Tax ID, or Case ID number. Of note, the Case ID for all environmental complaints begins with "E" followed by the calendar year opened (e.g., 2020).

During this reporting period, 646 building and 785 environmental complaints were documented via the compliance database. The environmental concerns included illegal discharges (37 complaints), stormwater management issues (33 complaints), grading without a permit (194 complaints), and general drainage concerns 137 complaints) among other subcategories.

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***

Status:

The County continues to provide residents with relevant information to make informed decisions regarding water quality issues and environmental stewardship. Several County departments have public education and outreach programs tailored to their specific discipline. In some cases, education and outreach occurs through organizations in partnership with the County. Examples of some of the outreach activities are described in this section of the report

Bureau of Watershed Protection & Restoration
To increase stormwater pollution awareness throughout Anne Arundel County, the Bureau of Watershed Protection & Restoration (BWPR) has developed a comprehensive education and outreach program.

BWPR Internet Resources
A major component of this initiative was the development of the BWPR's webpage (www.aarivers.org) to provide residents with an overview of the BWPR program and stormwater fee, environmental restoration plans, watershed assessments and information about stormwater pollution in general. The webpage also provides links to other County departments such as Utilities for water conservation tips and Inspections and Permits for stormwater management and Chesapeake Bay Critical Area information. Below is a listing of BWPR's public facing resources:

- **BWPR Annual Reports** – BWPR's FY annual report summarizes the watershed protection and restoration actions initiated by the BWPR and our partners and the fiscal resources used to implement those actions.
    - www.aacounty.org/departments/public-works/wprp/annual-reports/index.html
- **Financial Assurance Plan -** This report constitutes Anne Arundel County's financial assurance plan, required by MDE per State regulations, identifying actions that will be required of the County to meet the requirements of its NPDES MS4 permit along with projected annual and 5-year revenues or other funds that will be used to meet the impervious surface restoration plan requirements of its NPDES MS4 permit.
    - www.aacounty.org/departments/public-works/wprp/financial-assurance-plan/index.html
- **Frequently Asked Questions** – Addresses common questions residents may have about the BWRP and the Watershed Protection and Restoration Fee (WPRF).
    - www.aacounty.org/departments/public-works/wprp/frequently-asked-questions/index.html
- **WPRF Credit Program** – Explains how eligible property owners in Anne Arundel County may reduce their WPRF assessments by up to 50% for proactive and sustainable uses of stormwater runoff controls.
    - www.aacounty.org/departments/public-works/wprp/wprf-credit-program/index.html
- **Stormwater Property Tax Credit Program -** Residential and commercial property owners can receive a credit on their property taxes by installing and maintaining stormwater treatment practices. It provides for a reduction in County property taxes for qualified stormwater improvements.
    - www.aacounty.org/departments/public-works/wprp/stormwater-property-tax/index.html
- **WPRF Appeal Program** – The WPRF Appeal Program is intended for property owners who feel that they have been billed in error.
    - www.aacounty.org/departments/public-works/wprp/wprf-appeal-program/index.html
- **BWPR Highlighted Projects** – Shows in-depth details about some of the restoration projects that are currently underway in the County. This is not an exhaustive list of projects.
    - www.aacounty.org/departments/public-works/wprp/restoration/WPRP_Projects
- **BWPR Restoration Project Interactive Map** – Shows the location and status of all BWPR programmed restoration projects. The link is embedded in the BWPR webpage (aarivers.org) under Watershed Restoration Projects. The map also includes status of non-County projects which includes NGO, private, and Maryland State Highway Administration restoration projects.
    - annearundelmd.maps.arcgis.com/apps/webappviewer/index.html?id=e7e7fb6733e448a8809938140bed9e18
- **WPRF Mapping Application** – Interactive map shows the specific WPRF for each parcel in the County. Residents can also identify impervious surfaces on their property.
    - gis.aacounty.org/portal/apps/webappviewer/index.html?id=ee7d5336874541df8e65b082f2dc4c33
- **BWPR Watershed Application** – Interactive map identifying environmental information regarding watershed studies, stream assessment survey, as well as subwatershed and stream priorities for restoration and preservation.

    - gis.aacounty.org/portal/apps/webappviewer/index.html?id=dac2fecf1fc14077bf0faee596f8cf43
- **BWPR Goals Dashboard** – Shows the number of completed and anticipated projects by type. Also shows progress of impervious surface attainment goal.
    - www.aacounty.org/departments/public-works/wprp/WPRP_Goals
- **Targeted Biomonitoring** – The Anne Arundel County Bureau of Watershed Protection and Restoration's Ecological Assessment & Evaluation Program routinely collects biological, habitat, and geomorphological data from local streams as part of a long term targeted biological monitoring program. The sample sites are located on reaches of interest where certain stream restoration activities have occurred or are planned.
    - www.aacounty.org/departments/public-works/wprp/targeted%20biomonitoring/index.html
- **TMDL Restoration Plans** - BWPR has developed several restoration plans to address certain local water quality impairments for watersheds with an approved Total Maximum Daily Loads (TMDL) issued by the Maryland Department of the Environment (MDE) and approved by the U.S. Environmental Protection Agency (EPA). This also includes progress reports as required by the MDE.
    - www.aacounty.org/departments/public-works/wprp/watershed-assessment-and-planning/chesapeake-bay-tmdl/index.html
- **NPDES MS-4 Permit** – Includes a link to the current Anne Arundel County NPDES-MS4 permit and all annual reports as required by MDE.
    - www.aacounty.org/departments/public-works/wprp/npdes-ms4-permit/index.html
- **Education and Outreach** – This section is for educating and motivating students, homeowners, and other stakeholders to take positive personal actions and work together for greater impact. Topics range from watershed identification, understanding impacts of stormwater, responsible boating, and actions residents can take to help minimize stormwater pollution.
    - www.aacounty.org/departments/public-works/wprp/education-outreach/index.html
- **Waterfront Homeowners Guide** - Anne Arundel County is lucky to have over 533 miles of shoreline. This resource outlines opportunities for waterfront homeowners to protect and enhance their waterfront properties and outlines their responsibilities in regard to the Critical Area Law.
    - www.aacounty.org/departments/public-works/wprp/waterfront-homeowners/index.html
- **BMP Maintenance** – Highlights a selection of typical stormwater BMPs found in the region and suggested maintenance actions to keep BMPs functional to ensure water quality is protected.
    - www.aacounty.org/departments/public-works/wprp/bmp_maintenance/index.html
- **Watershed Studies** - Since 2002, the County has conducted systematic and comprehensive assessments of the County's watersheds. These assessments were conducted to assess current water quality conditions and prioritize the County's streams and subwatersheds for restoration and preservation to improve the conditions of the County's watersheds.
    - www.aacounty.org/departments/public-works/wprp/watershed-assessment-and-planning/watershed-studies/index.html
- **Biological Monitoring** - In 2004, Anne Arundel County initiated a Countywide Aquatic Biological Monitoring Program. The County program is based upon the Maryland DNR

MBSS program, scaled down to a County level. The program is structured such that all major watersheds of the County are sampled in a 5-year period.
    - www.aacounty.org/departments/public-works/wprp/ecological-assessment-and-evaluation/biological-monitoring/index.html
- **Illicit Discharge Detection & Elimination** – Examines the County's Illicit Discharge Detection & Elimination Program and provides resources for residents to identify and report potential illicit discharges.
    - www.aacounty.org/departments/public-works/wprp/illicit-discharge/index.html
- **Storm Drain Marking Program** – The storm drain marking program allows the community to work together to protect our waterways. Volunteers apply educational messages on storm drains to remind residents that whatever goes into storm drains travels untreated to our creeks, streams, and rivers.
    - www.aacounty.org/departments/public-works/wprp/storm-drain-markers/index.html
- **Explore Your Watershed -** Anne Arundel County consists of 12 primary watersheds and hundreds of sub-watersheds and all of them discharge directly into the Chesapeake Bay. Residents can learn about the specific watershed they live in.
    - www.aacounty.org/departments/public-works/wprp/watersheds/index.html
- **Science of Stormwater** - Many people believe that stormwater is "clean" and that it does not harm water quality. This perception is understandable since the amount of pollution from any one spot is not usually significant by itself. This resource explains how stormwater pollution occurs, where it goes, and how to minimize sources of pollution.
    - www.aacounty.org/departments/public-works/wprp/science-of-stormwater/index.html
- **Reduce Stormwater Pollution at Your Home** – Explains simple things property owners can do around their home and yard to help reduce the flow of stormwater pollution to the Bay. Strategies include: pet waste collection and disposal, proper lawn fertilization techniques and alternatives, rainwater collection methods, septic tank maintenance, proper household waste disposal options and alternatives, bay-friendly car maintenance tips, and responsible boating tips.
    - www.aacounty.org/departments/public-works/wprp/think-bay/index.html
- **Responsible Boating -** While most boaters appreciate the natural resources that abound in the watersheds in which they recreate, many are unaware of the impacts boating can have upon those resources.
    - www.aacounty.org/departments/public-works/wprp/clean-boating/index.html
- **Rhode River Bacteria Brochure** – A brochure was distributed to marinas on the Rhode River relating to bacteria pollution. The brochure was targeted to boaters to explain how boating can contribute to bacteria issues in the river.
    - www.aacounty.org/departments/public-works/wprp/education-outreach/Bacteria_Handout_FINAL_2.pdf

In addition to the BWPR webpage, several social media outlets including Facebook (https://www.facebook.com/aawprp) and Twitter (https://twitter.com/AAWPRP), are used to help educate residents about water quality issues and to provide an avenue for timely updates of restoration projects, educational materials, links to local watershed groups, and relevant articles. These social media sites are updated daily and provide residents with an outlet to discuss local stormwater issues and allow the BWPR to continually educate residents about the program.

BWPR in the Community
The BWPR strives to keep residents apprised of current accomplishments of the program. One of the most effective ways to communicate those milestones is through the local media. Below are some select articles about the BWPR that were published during the reporting period:

- Nutrient Credit Trading: Challenges & Opportunities
  www.youtube.com/watch?v=wBPS0I-coyU

- Chesapeake Bay Trust, Annapolis City and Watershed Protection Program Grant $1.3 M
  www.eyeonannapolis.net/2021/06/chesapeake-bay-trust-annapolis-city-and-watershed-protection-program-grant-1-3-m/?utm_source=WPRP+Staff&utm_campaign=eadc6ae093-EMAIL_CAMPAIGN_11_15_2019_9_21_COPY_01&utm_medium=email&utm_term=0_68d37766f1-eadc6ae093-5116005

The following (**Table 19**) is a list of informational presentations and events in which the BWPR participated during the reporting period:

Table 19. BWPR outreach events in FY21

Date	Organization/Event	Topic
7/30/20	Virtual Community Meeting	Dairy Farm Road Outfall Restoration
8/5/20	Virtual Community Meeting	Lower Mill Creek Stream Restoration
8/11/20	Virtual Community Meeting	Forked Creek Outfall Restoration
8/12/20	Virtual Community Meeting	Susans Branch Stream Restoration
8/13/20	Virtual Community Meeting	Broad and Beards Creek Stream Restoration
9/3/20	Glenwood Civic Association	Marley Creek Stream Restoration
9/2020	Stormwater Success	BWPR
9/2020	Stormwater Success	Stormwater Fee
10/28/20	Virtual Community Meeting	Tolstoy Lane Stream Restoration
11/5/20	Key School- Virtual School Presentation	BWPR Overview
11/10/20	CBF Aquaculture Conference	Nutrient Trading
11/12/20	PaxCon	Stream Restoration
12/18/20	South River High School Green Club	Glebe Creek Restoration
1/6/21	Anne Arundel County Youth Corp Summit	BWPR Overview
3/5/21	WSA Conference	BWPR Annual Update
3/16/21	WSA Local Government Discussion	BWPR
3/16/21	WSA Local Government Discussion	BWPR/SIP
4/22/21	Action Fair	BWPR Overview
5/12/21	Monarch Global Academy 4th Grade	BWPR Overview

Date	Organization/Event	Topic
5/13/21	ACEC Conference	TMDL Progress
5/20/21	ACEC MD Discussion	MS4 Next Steps
5/26/21	CBT BMP Maintenance Panel	BMP Maintenance
6/3/21	St. Martin's Episcopal School	Berrywood Restoration Tour
6/16/21	CBT Monitoring Forum	Research Translation

In addition to the above public outreach events and meetings, BWPR Project Managers provide continuous updates to members in the communities where our restoration projects occur. In many cases, feedback from the local community is taken into account from the design process through construction.

Watershed Restoration Grant Program
Successful conservation and preservation of the County's watersheds takes teamwork. To that end, in 2014 the Anne Arundel County Department of Public Works, in partnership with the Chesapeake Bay Trust, created the Anne Arundel County Watershed Restoration Grant Program, a community grant program to support watershed restoration activities throughout the County to improve water quality in local streams and rivers.

The grant program engages local nonprofit organizations, landowners, and communities in efforts to restore the County's waterways; provides resources to these groups to enable them to implement greening and water quality projects; and assists Anne Arundel County's efforts to meet the requirements of its State and federal stormwater permit and local waterway cleanup plans. This program encourages on-the-ground restoration activities that reduce stormwater flow and pollutants and engage Anne Arundel County residents in these activities.

Below (**Table 20**) is a list of organizations that were awarded funding from Anne Arundel County for water quality restoration projects in 2021. Implementation of these projects will result in approximately 100 acres of treated impervious area.

Table 20. Projects awarded BWPR grant funding in FY21

Organization	Project Description	Watershed	Funding Amount	Match Amount
Arundel Rivers Federation	St. Mark UMC Stormwater Restoration	South River	$298,665	$142,260
Arundel Rivers Federation	Quiet Waters-Caffrey Run Stream Restoration	South River	$221,960	$531,770
Arundel Rivers Federation	Broad Creek Valley West Stream Restoration	South River	$302,569	$838,373
Severn Riverkeeper	Belvoir Farm Pond SPSC Retrofit	Severn River	$274,880	$328,787
		TOTAL	$1,098,074	$1,841,190

More information about the grant program can be found at www.cbtrust.org.

Bureau of Utility Operations
The County BUO is tasked with providing safe, clean drinking water and to manage the collection and processing of wastewater in public service areas throughout the County. As such, a major aspect of the BUO outreach program focuses on water conservation.

Resources have been developed to promote water saving actions, including the distribution of toilet tank leak detection kits. In addition to leak detection, other water conservation tips include the use of commercial car washes, limiting or eliminating lawn watering, use of low-flow showerheads, and the use of rain barrels to harvest rainwater for use in gardens.

During the reporting period, the BUO did not participate in in-person outreach meetings due to COVID. Information in the form of videos was provided including tours for the Center for Applied Technology (CAT-N) instructors. The Bureau continued to use social media to provide outreach including the DPW website and twitter.

The BUO produces an "Annual Water Quality Report" as required by the Safe Drinking Water Act which summarizes the state of the County's drinking water sources and production methods. The reports are found on the BUO webpage and are mailed to all direct bill customers. More details can be found here: www.aacounty.org/departments/public-works/utilities/forms-and-publications/water-quality-reports/index.html

Sanitary Sewer Overflows caused by sewer system obstructions, damage, or flows in excess of sewer capacity can have a significant impact on local water quality. Sanitary Sewer Overflows that have occurred in the County during FY2021 can be found here: gis.aacounty.org/portal/apps/webappviewer/index.html?id=5df56f6b83cf4314b32edd13c62ba6fd The BUO works in partnership with the Anne Arundel County Department of Health to notify the community when a Sanitary Sewer Overflow causes a closure to a local waterway.

With nearly 1,800 miles of sewer lines throughout its service area, BUO appreciates notification from the public if a sewer backup is suspected. Citizens are directed to call the 24-hour Emergency Services at 410-222-8400 at any time to report water or sewer emergencies in Anne Arundel County.

Bureau of Highways (BOH)
The County BOH performs maintenance activities to keep the County's roads safe and in good condition. The BOH is also responsible for roadside maintenance, drainage maintenance, and snow removal.

Roadside maintenance is mainly performed by three Road Districts. Some examples of the additional services performed in County-maintained roadways include:

- **Litter/Debris Removal** - Litter and debris are picked up along all County-maintained roadways. Residents may request litter/debris removal within the County-maintained road right-of-way by contacting their local Roads District. www.aacounty.org/departments/public-works/highways/road-maintenance/Roadside_Maintenance/litterdebris-removal

- **Leaf Removal/Recycling** - Residents may request removal of leaves that have accumulated on County-owned roadways or ditches and are causing a hazard or blocking the flow of water by contacting their local Roads District. The following link explains relevant County services, and suggests opportunities for homeowners to manage leaves responsibly. www.aacounty.org/departments/public-works/highways/road-maintenance/Roadside_Maintenance/leaf-removalrecycling

Drainage maintenance is performed by various divisions within BOH including Road Operations and Infrastructure Management. Some examples of the services performed in County-maintained roadways include:

- **Culvert & Closed Storm Drain Program** - The Bureau of Highways is responsible for the inventory, inspection, and maintenance of the County's culverts and closed storm drain systems. The Road Operations Division performs routine maintenance on these systems. The Infrastructure Management Division, inventories and inspects these systems via a programmed approach. There are approximately 85,000 components in the inventory at this time. These components include inlets, manholes, pipes, culverts and outfalls. Residents may request Storm Drain System Maintenance by contacting their local Roads District. www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/culvert--closed-storm-drain-program
- **Ditch/Curb and Gutter Cleaning** - BOH completes necessary ditch or curb and gutter cleaning work on County-maintained property, reducing sediment and debris traveling to the bay during periods of inclement weather. Keeping ditches and curb lines free of debris also protects the citizen's investment in County infrastructure by ensuring that these structures do not overflow and cause stormwater to pond on roadways causing safety issues and pavement damage. Residents may request Ditch/Curb and Gutter Cleaning by contacting their local Roads District. www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/ditchcurb-and-gutter-cleaning
- **Drainage Construction** – BOH constructs new drainage systems including inlets, pipes, headwalls, and/or placement of outfall protection on County-maintained property. By completing necessary drainage construction work on County-maintained property, we help control the flow of water and sediment into the bay. Residents may request Drainage Construction by contacting their local Roads District. www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/drainage-construction
- **Drain Pipe Cleaning** - Drainage pipes are critical to carry the flow of water under the road so that it may continue its natural drainage course. Pipe obstructions may result in flooding and/or damage to the roadway surface. Work under this activity includes cleaning and removing debris from pipes and flushing pipes using a power rodder to remove any obstructions. Residents may request Drain Pipe Cleaning by contacting their local Roads District. www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/drain-pipe-cleaning
- **Drain Pipe Repair/Replacement** - Work in this activity includes the repair or replacement of pipes, depending on the degree of deterioration. This activity is scheduled throughout the year, however, in the presence of a safety hazard, work is scheduled when detected.

Residents may request Drain Pipe Repair/Replacement by contacting their local Roads District.
www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/drain-pipe-repair-and-replacement

- **Emergency Storm Drain Program** - The BOH is responsible for resolving flooding or water ponding problems that are caused by storm runoff from County-maintained roadways. Residents may request flooding and/or ponding assistance by contacting their local Roads District.
  www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/emergency-storm-drain-program
- **Erosion Control** – The County repairs eroded areas caused by water coming from a County-owned or County-maintained road. To reduce water pollution and prevent erosion, material such as topsoil, jute mats, grass seed, rip rap, etc. is placed on County-maintained property. Residents may request Erosion Control by contacting their local Roads District.
  www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/erosion-control
- **Rain Gardens** – The BOH provides information on relevant County requirements for rain gardens and outlines opportunities for homeowners to use rain gardens to provide flood control, groundwater recharge, and water-cooling benefits, while removing many types of pollutants and other contaminants from stormwater runoff.
  www.aacounty.org/services-and-programs/rain-gardens
- **Storm Drain Cleaning** - Cleaning of storm drain inlets on County-owned property reduces sediment traveling to the Bay. Work is completed on a rotating basis using a vactor (vacuum) truck on approximately 25,850 inlets. Inlets are cleaned every 3 years with special attention given during and after rainfall events to insure proper drainage. Residents may request Storm Drain Cleaning by contacting their local Roads District.
  www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/storm-drain-cleaning
- **Storm Drain Repair** - Repair to storm drain inlets and manholes on County-maintained property reduces sediment and protects investment in our infrastructure by preventing deterioration of the road network due to consistent ponding on streets. In addition, road shoulders and side slopes are protected from erosion caused by the flow of uncontrolled water. Residents may request Storm Drain Repair by contacting their local Roads District.
  www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/storm-drain-repair
- **Stormwater Management Facilities** - The BOH currently manages the maintenance of approximately 700 County-owned stormwater facilities. These facilities generally serve single-family residential developments. Other BMP's found in apartment and townhome complexes, industrial and business centers, or in developments under construction are privately maintained. Services provided on County-maintained BMP's include mowing, inspection, and general maintenance of these devices. Residents may report a problem with a County-maintained BMP by contacting the Infrastructure Management Division (IMD). Inquiries regarding privately maintained BMPs are directed to the Department of Inspections and Permits.
  www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/stormwater-management-facilities

- **Street Sweeping** - Anne Arundel County's street sweeping program is designed to keep debris out of storm drains, our creeks, rivers and ultimately the Chesapeake Bay. The list of roads included in the street sweeping program is available for viewing. Street sweeping data is shared on social media and in the BWPR Annual Report. www.aacounty.org/departments/public-works/highways/road-maintenance/Drainage_Maintenance/street-sweeping

Snow removal on County-maintained roads is performed by the BOH. The BOH is dedicated to ensuring the safety of the traveling public while providing timely service to our citizen and business communities during inclement weather by planning and executing its winter operation activities on more than 6,700 County-maintained roads and streets, and doing it in an environmentally friendly way.

De-icing materials are an effective tool for maintaining safe winter road conditions. The BOH strives to only apply as much salt as necessary to achieve safe driving conditions. Use of salt management data is shared on social media and in the BWPR Annual Report.

The County's winter de-icing strategy and resources are discussed in **Part IV.D.5.b** of this MS4 Annual Report, and are explained on the County webpage at www.aacounty.org/departments/public-works/highways /snow-information/index.html. This webpage succinctly explains the County's efforts toward winter preparations, what citizens and business should expect during snow storms, what County citizens can do to help during inclement weather events, and general winter weather tips.

Bureau of Waste Management Services (WMS)
The County's WMS is responsible for collecting recycling, yard waste and trash from over 167,000 curbside customers. This Bureau also is responsible for the operation of the Millersville Landfill and Resource Recovery Center and the County's three Recycling Centers.

The Recycling and Waste Reduction Division of WMS administers an extensive outreach program geared toward residential and commercial recycling and other source reduction strategies and promotes the proper disposal of household hazardous waste (HHW) materials. During FY21 efforts continued to promote the exclusion of plastic bags, wrap, and film from the recycling stream.

Outreach pertinent to HHW disposal has been reported in previous MS4 Annual Reports and is also documented in the County's Litter and Floatables Comprehensive Plan **(Appendix F)**; a summary of events related to HHW is found in **Part IV.D.4**. of the MS4 Annual Report. Additional information on HHW disposal is available on the County's website at: www.aacounty.org/services-and-programs/household-hazardous-waste-drop-off-days.

The County's WMS typically holds six resident-only HHW collection events each year. In FY2021 seven HHW events were held. Two events were hosted at each of the Recycling Centers plus one additional event was held in September 2020 at the Severn location, due to earlier cancellations caused by COVID. These events accounted for the proper disposal of 248 tons of HHW, successfully keeping these materials out of our landfills, roadside ditches, storm drains,

and waterways. These collection events are vital to keeping harmful toxins out of our landfill, and discourage the improper disposal of hazardous materials. All HHW materials collected at the events are packaged, transported, and disposed of by a licensed hazardous waste contractor.

WMS also provides information such as what can be recycled; ways to get recycling and composting bins; dealing with yard waste and grass cycling; source reduction; amounts recycled in different areas of the County; local events that promote recycling; and question-and-answer forums at outreach events, in County offices, through the County website (www.recyclemoreoften.com), and on the Anne Arundel County Recycling Division Facebook page (www.facebook.com/annearundelrecycling/). Since the program's inception in 2008, the Countywide recycling rate has increased to 36%.

Department of Health

The Anne Arundel County Department of Health has published a fact sheet series entitled "Health Matters" (see examples in 2014 Annual Report). These fact sheets are distributed at events run by the Department of Health. Environmental health information can also be found on their website (www.aahealth.org/environmental-health). Some of the topics addressed include

- Recreational Water Quality: Water quality and swimming or fishing in Anne Arundel County rivers and creeks;
- Bay Restoration Fund (BRF) Program: for nitrogen-reducing pretreatment units for septic systems to be installed within the Chesapeake Bay Critical Area;
- Wells & Septic Systems: On-site sewage disposal systems and private water wells; collapsed septic tanks, overflowing septic systems and failing septic systems interim health and safety requirements; and
- Application procedures for property improvements where well or on-site septic systems are utilized.

Recreational Water Quality

The Anne Arundel County Department of Health continues to publicize a seasonal water quality information line (410-222-7999) on the Department of Health's website (www.aahealth.org/recreational-water-quality).The water quality information line alerts the public to current advisories and closures of recreational water as the result of sewage spills and bacterial exceedances from over 80 bathing beaches that the Department monitors from Memorial Day through Labor Day. The Department also promotes an e-alert system so an individual can be notified by e-mail when the Department has an advisory or closure of recreational waters. Individuals can sign up for the e-alert system on the Department of Health's website. In addition, water quality advisories are communicated via the Department's Facebook and Twitter pages. The Department continued to recommend no direct water contact for 48 hours after a significant rain event due to predicted elevated bacteria levels.

The Department of Health, in conjunction with MDE and the Maryland Department of Health and Mental Hygiene, promotes the Maryland Healthy Beaches campaign (www.marylandhealthybeaches.com). The campaign makes people aware of everyone's impact to the waterways in the State of Maryland. One of the campaign's major focus areas is the importance of picking up pet waste.

The Anne Arundel County Department of Health also issues a closure when a sewage spill, leak, or other problem indicates human waste has impacted the water. Subscribers to the Department's Recreational Water Quality E-mail Alerts receive an e-mail notifying them when County waterways are closed and reopened. Alerts can also be received via text messages by following the Department of Health on Twitter or Facebook.

Bay Restoration Fund (BRF)
The Department of Health promotes the BRF Program. This program provides grant funding to qualified applications for assistance to install nitrogen reducing pretreatment units in conjunction with an onsite sewage disposal system that is in the Chesapeake Bay Critical Area. The grant funds the entire cost of the treatment unit and a five-year service and maintenance program for repairs of failing systems in the Critical Area. Additionally, the grant funds can be used to help qualified applicants connect to existing public sewer system. These connections can be funded if the existing dwelling, currently served by a septic system, is located where public sewer is available and immediately abuts the property. The Department of Health administers this grant, awarded by MDE.

The FY21 BRF-funded projects are included in the County's *AltBMPPoint* feature class of the MS4 Geodatabase (**Appendix A**). Implementation of these projects provide a direct reduction to the nitrogen load that is reaching the Chesapeake Bay.

The Department of Health publicizes information about on-site sewage disposal systems and private water wells. The Department also provides a DVD on the maintenance and care of an on-site sewage disposal system to each individual homeowner at the time of installation for each newly installed system. The videos are also available to view on the department's website (www.aahealth.org/guidelines-for-maintaining-your-septic-system).

Department of Inspections & Permits (I&P)
The Department of Inspections and Permits (I&P) strives to provide the citizens of Anne Arundel County with the highest inspection standards consistent with the adopted codes and regulations. This is accomplished through the consistent and equitable application of regulations in the built and natural environment through plan reviews, inspections, enforcement, and the issuance of permits and licenses.

The I&P website contains general information available to the public regarding erosion and sediment control, buffer management, grading and permits, the Chesapeake Bay Critical Area, invasive species, and sensitive areas. This information can be found at www.aacounty.org/departments/inspections-and-permits/about-us/

The Emergent Grasses Program is a County supported effort between the Department of Inspections and Permits and the Department of Recreation and Parks to facilitate shoreline stabilization. Through this program, County residents with qualifying living shoreline or other tidal projects can apply for emergent marsh grasses for planting on appropriate sites at no cost.

I&P maintains the Anne Arundel County Environmental Hotline at 410-222-7171 as previously described.

The Anne Arundel Soil Conservation District also plays a role in the prevention of erosion and sediment during construction activity.

Anne Arundel Soil Conservation District

For more than 70 years, farmers have turned to the Anne Arundel Soil Conservation District (AASCD, the District) as a trusted source of knowledge and technical expertise in managing and protecting soil and water resources on their farms. Today, farmers, developers, businesses, environmental groups, and government agencies rely on the District to help them meet nutrient and sediment reduction goals outlined in the County's Watershed Implementation Plan to protect and restore the Chesapeake Bay by 2025.

Agricultural Programs

The Phase III Watershed Implementation Plan was published on August 23, 2019, and agriculture is well on its way to reducing the nutrients and sediment reaching the Bay, reducing nitrogen levels by 20%, phosphorus by 26% and sediment by 28% since 2017. This success is largely due to the on-the-ground efforts of AASCDs soil conservation professionals, who work with farmers to develop Soil Conservation and Water Quality Plans (SCWQPs) that address natural resource and environmental concerns for their farms. These plans usually include a menu of best management practices (BMPs) that can be installed to protect soil and water resources. Cover crops and streamside buffers are often recommended to prevent nutrients from crop fields and nurseries from entering waterways. Livestock fencing, watering facilities, and improved pasture management practices help farmers protect streams from livestock impacts.

In FY21, the AASCD developed/updated 59 SCWQPs totaling 3,977 acres for County farms. These plans included more than 222 (153 WIP) BMPs. The design, installation and construction supervision of these practices are the responsibility of the District's technical staff. See **Table 21** for FY21 accomplishments.

Table 21. Anne Arundel Soil Conservation District agricultural BMPs FY21

Best Management Practice	Achieved (acres)	Percent of WIP Goal Achieved	2025 WIP III Goal (acres)
Cover Crops – Traditional (acres)	922	105%	4,667
Soil Conservation & Water Quality Plans (cumulative acres)	11,345	81%	14,000
Prescribed Grazing (acres)	32.2	2%	1,500
Horse Pasture Management (acres)	165.2	41%	400
Land Retirement to Open (acres)	138	26%	538

Urban Programs

Construction and road building projects can have a significant impact on water quality. The District is authorized to review and approve erosion and sediment control plans for projects in the County. This ensures that environmental safeguards are in place to minimize soil erosion,

nutrient runoff and sediment buildup in local waterways. In FY21, the District reviewed 1,106 erosion and sediment control plans for construction projects on 9,856 acres. Approximately 364 of these plans were new submittals totaling 615 acres and 750 were revised plans totaling 7,240 acres. To further protect the County's valuable natural resources, the District provides recommendations to homeowners with drainage, erosion, and shoreline erosion concerns.

Conservation Partners
The AASCD works with local, State, and federal agencies to carry out its mission, including the Maryland Department of Agriculture, Natural Resources Conservation Service, Farm Service Agency, University of Maryland Extension, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Southern Maryland Resource Conservation and Development, and U.S Navy. Working with a $954,000 grant from the Department of Natural Resources, Chesapeake and Coastal Service, AASCD is currently installing a 1,000+ linear foot SPCS on an agricultural property.

Anne Arundel County Watershed Stewards Academy
The Anne Arundel County Watershed Stewards Academy (WSA) was created in 2009 as a partnership between Arlington Echo Outdoor Education Center and the Anne Arundel County Department of Public Works to build capacity within communities to reduce pollutants entering our waterways via stormwater runoff. The BWPR continues to provide critical support in connecting Stewards and communities with watershed studies, planning, and restoration efforts.

Throughout this reporting period WSA responded to the COVID pandemic by making strategic adjustments and adaptations to continue support of Steward candidates and certified Stewards. Technology was utilized to create virtual opportunities to train stewards and to facilitate outreach. WSA also developed protocols and guidance for hosting safe, socially distant outdoor project opportunities so that Stewards could continue to install and maintain restoration projects.

As noted in previous MS4 Annual Reports, the WSA developed and refined training and resources for Stewards to employ community-based social marketing to affect pollutant reducing behavior changes such as pet waste disposal, removal of leaves from impervious surfaces, and reduction in fertilizer use. Using face-to-face surveys, Stewards are taught to measure a baseline of behavior and measure a behavior change. They are also supported with template tools and sample behavior change campaigns for use in their own community. Further details can be found on the WSA website at aawsa.org.

2021 WSA Successes
- Managed more than 330 restoration projects
- Reached 9,775 County residents, providing technical assistance or environmental education
- Planted 17,457 native plants and shrubs and 4,375 trees for a total of 21,832 plants in the ground
- Stewards donated 10,265 volunteer hours towards restoration, education, and outreach in their communities
- Removed 50,005+ square feet of invasive species
- Removed 280 pounds of trash.

WSA 13th Certification Course

- WSA recruited 37 Stewards as part of the 13th Certification Course

Outreach Events

During this reporting period, WSA hosted several events to keep Stewards and Consortium Members engaged including those listed below.

- WSA's Annual Conference (March 2021): This year's conference was entirely virtual with 248 attendees including 131 Stewards and 23 Consortium members. Session topics included how to connect with your local government, ensuring equity in designing projects, conquering invasive plants, and more. One highlight of the conference was a panel discussion called "Around the Watershed" with representatives from each of the watershed organizations in Anne Arundel County.
- Networking and Continuing Events: Networking was severely limited by COVID. Two events were held in fall 2020, a tour of a newly completed restoration project and a Steward hike. During the tour of the "Gravely Grand Canyon", Stewards learned about the funding, and the process and technique used to complete this major stream restoration project.

Restoration Project Monitoring

WSA staff and Steward Volunteers monitored 37 projects due for triennial inspection. WSA continues to track and inspect projects.

Partnership with Anne Arundel Public Libraries

During this reporting period WSA launched a new "Ask a Master Watershed Steward" initiative at several County libraries, hosting educational programs for children and adults, working with library staff to address erosion and drainage issues, and offering scholarships to librarians who want to take the Watershed Stewards Certification Course.

RiverWise Congregations

Over the past year, WSA has

- Engaged 12 new congregations to take environmental action;
- Supported projects at 11 congregations
- Trained 9 Master Watershed Stewards from 7 congregations
- Continued to build relationships with 15 congregations who participated in the 2020 Faithful Green Leaders Training.

Engaging Faith Communities

Over the past year, WSA continued to strengthen relationships with faith partners.

- Conducted a stormwater tour with faith communities
- Supported 3 new Green Teams
- Convened several meetings between the Chesapeake Bay Trust and the faith community to address concerns and assist with grant applications for restoration projects
- Assisted faith communities with maintenance of restoration projects on their sites
- Led 2 new restoration projects, St. Mark United Methodist Church and Congregations Kol Shalom

Clean Water Communities
WSA continued to work with the communities of Glen Isle, Columbia Beach, Millstone Village, and Pines on the Severn to achieve their Clean Water Communities benchmarks. To learn more about Pines on the Severn progress or the Glen Isle community success story, please visit the webpage aawsa.org/cwc-about

Stormwater Success Program
The following Stormwater Success activities were conducted during this reporting period.

- The Stormwater Success Short Course for HOAs and Property Managers was held virtually and the course content developed into webinars. The short course provides property managers and HOA leaders with information and resources to help them reduce pollution coming from their properties while addressing key concerns including flooding, maintenance of stormwater management devices, reducing management costs, and engaging residents to reduce pollution from pet waste, litter and other sources. To read about the program and to review course materials, visit aawsa.org/stormwater-success .
- WSA conducted a Stormwater Best Management Practices Tour on 9/12/2021. Fifteen County residents attended.
- A new advanced seminar, "Stormwater Success 201", was created (aawsa.org/blog-posts/2020/10/28/a-stormwater-success). This course builds off "Stormwater Success 101" and focuses on community HOAs that have responsibility for maintaining private stormwater management systems in their communities using Environment Site Design criteria. The 3-hour course is available via YouTube.

Replant Anne Arundel
A summary of Replant Anne Arundel can be found here: aawsa.org/replant-2, and a presentation about Replant Anne Arundel County may be found at:
drive.google.com/file/d/1un4QU6qOwH5JvAlJ3og53s4kVYXM3cjD/view?usp=sharing

Accomplishments during the reporting period are listed below.

- Tree Troopers: 31 Tree Troopers were trained in 2021. In fall 2020, 750 bare root seedlings were planted as a restoration project. And, during fall and winter 2020, 900 larger trees were planted in communities.
- Groves of Gratitude: As part of Replant Anne Arundel, WSA facilitated a fall tree sale called "Groves of Gratitude". This sale provided County residents access to trees in the form of single trees or pre-designed "grove" packages. Groves of Gratitude distributed 424 trees during fall 2020.

From My Backyard to Our Bay
This booklet, originally created in partnership with Anne Arundel Soil Conservation District, and the Bureau of Watershed Protection and Restoration explains water quality issues and outlines steps residents can take to reduce pollution and improve water quality. An update was initiated in 2020 to add new and more relevant information. The final proof of From My Backyard to Our Bay can be found here: drive.google.com/file/d/1dVTCtDA3p271R6N6nvDKCZ-tcbP15YxF/view?usp=sharing

Arlington Echo Outdoor Education Center - Chesapeake Connections
Chesapeake Connections is the Outdoor Education outreach program of Arlington Echo which connects Anne Arundel County classroom instruction with a series of relevant hands-on experiences that lead to environmental stewardship. The staff at Arlington Echo Outdoor Education Center provide support and expertise to complete yearlong environmental service-learning projects. The service-learning projects are incorporated into each school's curricula and involve using community areas or school grounds for environmental restoration activities. The program works to restore and/or create bogs, raingardens, and manage runoff areas on school grounds or in the community to treat stormwater pollution.

The County partners with the Chesapeake Connections program to provide hands-on experiences for Anne Arundel County students through the planting of native trees and other vegetation at BWPR restoration projects. No projects were planted with Chesapeake Connections in FY21 due to COVID restrictions. Plantings will resume in the future as the COVID situation allows.

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.***

Status:

Managers at each of the County-owned facilities subject to the stormwater general discharge permit (Permit 12-SW) updated their SWPPPs following the issuance of the new General Permit by MDE in January 2014 and strive to perform pollution prevention training as set forth in their SWPPP. The facility staff follow their SWPPP requirements including quarterly and annual compliance inspections to ensure proper good housekeeping and stormwater pollution prevention practices are maintained and functioning accordingly. When deficiencies are identified, via compliance inspection, corrective actions are taken. All current permittees are awaiting issuance of the next stormwater general discharge permit (20-SW).

SWPPP training is performed yearly, at a minimum, which is critical to ensure staff are fully knowledgeable of the potential pollutant sources at each facility, how to properly store and handle these sources, and the procedures for responding to a spill or emergency. The County provides training for staff working at those County facilities with stormwater discharge permits as discussed in **Part IV.D.5.b.v**.

E. RESTORATION PLANS AND TOTAL MAXIMUM DAILY LOADS

In compliance with §402(p)(3)(B)(iii) of the CWA, MS4 Permits must require stormwater controls to reduce the discharge of pollutants to the MEP. By regulation at 40CFR §122.24. BMPs and programs implemented pursuant to this permit must be consistent with applicable

WLAs developed under EPA-approved TMDLs (see list of EPA-approved TMDLs attached and incorporated as Attachment B).

Anne Arundel County shall annually provide watershed assessments, restoration plans, opportunities for public participation, and TMDL compliance status to MDE. A systematic assessment shall be conducted and a detailed restoration plan developed for all watersheds within Anne Arundel County. As required below, watershed assessments and restoration plans shall include a thorough water quality analysis, identification of water quality improvement opportunities, and a schedule for BMP and programmatic implementation to meet stormwater WLAs included in EPA-approved TMDLs.

1. ***Watershed Assessments***

a. ***By the end of the permit term, Anne Arundel County shall complete detailed watershed assessments for the entire County. Watershed assessments conducted during previous permit cycles may be used to comply with this 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 an 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.***

Status:

Anne Arundel County developed a TMDL Support program within the BWPR to facilitate NPDES MS4 permit compliance. One component of the program was oversight of watershed assessments for each of the County's 12 watersheds as stipulated by permit requirements (**Part IV. E.1.a and b**). These watershed studies involved a partnership between the County, various consultants, and citizen stakeholders. The field data collection was performed primarily by consultants for each watershed study effort. Modeling, analysis, subsequent action prioritization and reporting were performed by County staff working with the consultants. The work effort also included coordination of professional management team meetings between the County, the consultants, and citizen stakeholders to reach consensus pertaining to assumptions and data interpretations, and desired restoration/preservation implementation strategies. Following consensus, the watershed study was advertised for a 30-day public comment period after which a summary of comments received and the County's response was incorporated into the final watershed study document. Recommendations developed during watershed studies have been used to inform and prioritize land use decisions and Capital Improvement Program (CIP) expenditures relating to environmental restoration and preservation in support of TMDL compliance.

As reported in the FY18 MS4 Annual Report, the County completed the assessment of all 12 County watersheds and satisfied this permit requirement. The watershed assessment documents, for each of the 12 watersheds are found on the County's BWPR webpage here: www.aacounty.org/departments/public-works/wprp/watershed-assessment-and-planning/watershed-studies/. County watersheds and their associated MDE 8-digit Watershed Code are found in **Table 22** below.

Table 22. Anne Arundel County watersheds

County Watershed	MDE 8-Digit Watershed Code
Severn River	02131002
South River	02131003
Upper Patuxent River	02131104
Magothy River	02131001
Patapsco Non-Tidal	02130906
Patapsco Tidal	02130903
Bodkin Creek	02130902
Little Patuxent River	02131105
Rhode River	02131004
West River	02131004
Herring Bay	02131005
Middle Patuxent River	02131102

2. Restoration Plans

a. Within one year of permit issuance, Anne Arundel 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 in this permit.

By the end of this permit term, Anne Arundel County shall commence and complete the implementation of restoration efforts for twenty percent of the County's impervious surface area 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.

Status:

Anne Arundel County's NPDES MS4 Permit (Permit), issued in February 2014, requires the County to complete restoration equivalent to twenty percent (20%) of the County's impervious surface area that has not already been managed to the maximum extent practicable (MEP).

In 2015, the County submitted to MDE an impervious surface area assessment and the associated baseline for impervious area restoration (*Establishing Baseline – Impervious Area Assessment; Anne Arundel County, May 2015*). As part of the County's FY18 MS4 Annual Report, the County proposed revisions to this assessment and the restoration baseline (*Revision of Anne Arundel County's 2014 Baseline & Impervious Surfaces Treated to the MEP, February 2019*). MDE indicated its acceptance of the County's proposed revisions in "Attachment 1: MDE's Review of Anne Arundel County's 2018 MS4 Annual Report," received by the County on May 15, 2019. The updated impervious area assessment identified 5,970 acres of managed impervious area and 24,981 acres as the baseline of unmanaged impervious area, which set the 20% impervious surface restoration (ISR) goal at 4,996 acres. Please refer to Part IV.E.2.a and Appendix H in the County's FY18 MS4 Annual Report for the complete details of the adjustments made to the County's impervious surface assessment, associated analyses, and supporting data.

Impervious Area Restoration Plan Progress

The County's *Impervious Area Restoration Plan* (Appendix I of the FY15 MS4 Annual Report) provided a narrative description of the County's impervious area restoration completed to that date, and projection of progress through the end of the permit term. Included in the County's *Impervious Area Restoration Plan* are County CIP restoration projects, alternative urban BMPs (e.g., street sweeping, septic system connections to WRF, and septic systems upgraded to enhanced denitrification systems), County-funded restoration grant projects, and other NGO restoration projects.

This report section summarizes the County's continued progress in restoring impervious surface in FY21. **Part IV.C.6** (Water Quality Improvements Projects) describes the inventory of watershed restoration projects completed in FY21, while **Table 23** provides a summary of the associated impervious restoration credits, as well as cumulative restoration credit totals (FY14-FY21). Credits for annual BMPs (e.g., street sweeping, inlet cleaning, and septic pumping) are updated yearly and are not cumulative; averaged values representing full programmatic implementation are used for the cumulative restoration total (FY16-FY18 for street sweeping and septic pumping; FY17-FY18 for inlet cleaning).

Table 23. FY21 impervious surface restoration — credited acres

Restoration Project	Impervious Acres Credited	
	Completed in FY21[2]	Completed – Cumulative through FY21
Restoration BMPs		
- ESD	2.6	20.7
- structural	120.5	1,288.1
Alternative Restoration BMPs		
- street sweeping[1]	84.2	168.9
- impervious surface elimination	0	0.6
- reforestation	0	1.5
- catch basin and storm drain cleaning[1]	35.1	69.8
- stream restoration	297.7	1,673.9
- outfall stabilization	0.0	38.5
- shoreline management	208.3	1,686.9
- septic pumping[1]	579.7	287.0
- septic denitrification	30.7	376.3
- septic connections to WWTP	8.3	99.9
TOTAL ACRES	**668.1**	**5,712.1**

[1] For annual practices, cumulative attainment values are based on the average equivalent impervious treatment achieved after full implementation of the programs. Averages for street sweeping and septic pumping are based on FY16-FY18 implementation, and catch basin cleaning is based on FY17-FY18 implementation.
[2] Completed total acreage for FY21 does not include acreage tallied for annual practices, which serves as maintenance of the annual practice credits claimed in the cumulative total acreage restored.

Continued Restoration beyond the 20% ISR Goal

As of the end of FY20, the County met its 20% ISR goal of 4,996 acres. Please refer to the County's FY20 MS4 Annual Report, Part IV.E.2.a, for the full details. Projects completed in FY21 restored and managed 668.1 equivalent impervious acres, bringing the County's cumulative total to 5,712.1 acres. It is expected that credit for restoration that exceeds the County's fourth generation permit ISR goal will be applied to its fifth-generation permit goal of 2,998 acres. In anticipation of that, all credits for projects completed in FY21 were calculated in accordance with the *Accounting for Stormwater Wasteload Allocation and Impervious Acres Treated; Guidance for National Pollutant Discharge Elimination System Stormwater Permits; November 2021* (MDE 2021).

The County currently anticipates 769 acres of restoration credit for projects currently under construction, and estimates an additional 4,007 acres of credit from projects currently under design. Restoration projects that are proposed for design and construction, but for which design contracts are not yet in place, will also provide additional impervious surface management toward the County's future goals. In addition to maintaining a robust pipeline of planned County-managed stormwater CIP projects, the County utilizes other mechanisms to support its restoration goals, including the use of grants to non-governmental organizations (NGOs), public-

private partnerships, and most significantly through design-build contracts. The County accepted proposals and awarded contracts for full delivery design-build water quality improvement projects in FY17, FY19, FY20 and FY21. Completed full delivery projects include several living shorelines, a stream restoration, and the retrofit of three ponds with continuous monitoring and adaptive control (CMAC) technology. In FY18, the County awarded a contract for a large-scale, commercial septic to sewer conversion project that is anticipated to be completed in FY22. In FY19, the County awarded three contracts, which included living shoreline and stream restoration work, with all projects currently completed. In FY20, the County awarded one contract for two living shoreline projects, with the expectation that that work would be completed in early FY22. In FY21, the County awarded one contract for stream restoration work that is currently in the design and permitting phase. The County is currently reviewing project proposals received in response to its FY22 solicitation and will continue to look for new and innovative ways to support projects and activities with proven water quality benefits.

Strategy to Maintain Attainment of the 20% ISR Goal

As noted above, the County met its goal of restoring or providing equivalent stormwater management for 20% of unmanaged impervious surfaces in the County per the requirements of the administratively continued permit. To maintain attainment of its goal, the County understands it must continue current programmatic implementation levels of annual practices (street sweeping, inlet cleaning, and septic pumping). If for some reason continued programmatic implementation is not possible, the County will replace credit claimed for annual practices with credit derived from other structural or alternative practices according to the prevailing credit guidance at that time.

COVID-19 had a minor impact on the implementation levels of street sweeping and catch basin cleaning in FY21. However, the running credit averages for these practices remained close to or just above the amounts required to maintain the County's 20% ISR attainment (**Table 24**). The County expects implementation to rebound to previous levels as the effects of the pandemic wane in the next year or two. The County also recognized a significant increase in septic pumping this year that increased the running credit average to well above the required implementation level. The County is confident in its ability to maintain its annual programmatic credits and remain in compliance with its permit goals into the foreseeable future.

Table 24. Annual practices — average impervious acre credit

Annual Practice	Impervious Acres Credited	
	Required Implementation Average for 20% ISR Goal	Actual Implementation Average through FY21
Alternative Restoration BMPs		
- street sweeping	168.9	165.0
- catch basin and storm drain cleaning	69.8	75.0
- septic pumping	287.0	382.7
TOTAL ACRES	**525.7**	**622.7**

The County also has budgeted for and is committed to the continued maintenance and repair of its entire inventory of stormwater management and restoration practices, which include a robust inspection regime. The County is continuously enhancing its BMP maintenance inspection program, ramping up field inspection efforts, and increasing inspection and maintenance of existing and new BMPs to meet triennial inspection requirements. In the future this effort will be further enhanced as the County is in the process of automating and fully integrating our asset and work order management system (AWOM); stormwater BMP maintenance inspection is slated to be a part of this system. In addition, the County will continue to work, in the coming year, to inspect the backlog of BMPs identified through the historic BMP cleanup project.

b. Within one year of permit issuance, Anne Arundel 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, Anne Arundel 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.

Status:

During FY21 Anne Arundel County began developing a Countywide TMDL Stormwater Implementation Plan (Countywide Plan) in anticipation of the issuance of its next generation MS4 Permit. This initial Countywide Plan is submitted as **Appendix H** and addresses the permit requirements identified in **Part IV.E.2.b** above for all TMDLs with SW-WLAs listed in Appendix A of the County's NPDES MS4 Permit.

As required by the County's new NPDES MS4 Permit (issued 5 Nov 2021), the Countywide Plan includes the following items.

- A summary of all completed BMPs, programmatic initiatives, alternative control practices, and other actions implemented for each TMDL SW-WLA;
- An analysis and table summary of the net pollutant reductions achieved annually and cumulatively for each TMDL SW-WLA;

- An updated list of proposed BMPs, programmatic initiatives, and alternative control practices, as necessary, to demonstrate adequate progress toward meeting the Department's approved benchmarks and final stormwater WLA implementation dates.

The Countywide Plan submitted this year includes progress achieved through FY21.

The County previously submitted and received MDE approval for all TMDL restoration plans with the exception of the West River Non-Tidal Sediment TMDL Restoration Plan and the Patuxent River PCB Restoration Plan. All other TMDL Restoration Plans are approved by MDE with no outstanding questions to be addressed.

With this MS4 Annual Report, and as a component of the Countywide Plan, the County is resubmitting the West River Non-Tidal Sediment TMDL Restoration Plan for MDE approval. This version of the West River Plan includes updated modeling per the TMDL Implementation Progress and Planning Tool (TIPP). Concurrent with this submission, the West River Plan will be advertised for a 30-day public comment period.

The Patuxent River PCB Restoration Plan was submitted to MDE for review in 2020 (FY20) and subsequent comment/responses occurred from November 2020 through July 2021 (FY21). Currently, the County is working with MDE to finalize this plan and, per MDE guidance, will await publication of the MDE PCB Monitoring Guidance document (early 2022) prior to completing the plan.

3. Nutrient Trading

Anne Arundel 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 twenty 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 the Department:

a. The cumulative impervious acres restored achieved through 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.

Status:

Effective December 31, 2018, MDE modified the discharge permits for the six County WRFs to allow nutrient trading. In early 2019, the County submitted Discharge Monitoring Reports (DMRs) for the calendar year 2018 to MDE to confirm the nutrient credits generated and

available for trading via the registry. MDE verified the County's documentation and then entered the credits in MDE's Water Quality Trading (WQT Register) on October 4, 2019. The letter from MDE to the County providing verification of available credits for trading and a copy of the State's Water Quality Trading (WQT) Register are found in the FY19 MS4 Annual Report (Appendix I).

The FY19 MS4 Geodatabase documented completed restoration and alternative BMP projects that restored the equivalent of 3,170 acres of impervious surface. This required the County to acquire 1,827 acres of restoration credit through nutrient trading at the end of FY19 to comply with the 20% impervious surface restoration in its MS4 permit. This credit acquired through nutrient trading was replaced by credit achieved through BMP implementation in FY20; the complete summary and details of the credit replacement may be found in the FY20 MS4 Annual Report.

The County met the current, administratively continued permit's 20% impervious surface restoration goal as of June 18, 2020. As a result, the County did not participate in any credit trading in FY21.

4. Public Participation

Anne Arundel 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. Anne Arundel County shall provide:

a. Notice in a local newspaper and the County's web site 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.

Status:

The County provides information on watershed assessments, TMDL restoration plans and environmental restoration projects via the County BWPR website (www.aarivers.org) as well as through its interactive online mapping application. As the comprehensive watershed assessments and TMDL restoration plans were completed, the documents were publicized for a 30-day comment period after which a summary of comments and County responses were incorporated into the final documents. The final associated study reports were published on the BWPR webpage as noted in **Part IV.E.1**.

As originally reported in the 2010 MS4 Annual Report, the County developed an interactive online mapping application to track restoration projects undertaken by non-County organizations

such as the Watershed Stewards Academy, grassroots environmental preservation groups, and local Riverkeepers. The mapping application allows these organizations, and anyone with internet access and interest, to open and view the many data layers that have resulted from the County's watershed assessments. In 2021, this application was migrated from Geocortex to an ESRI web application, with updated functionality and a detailed guide to enhance the user experience. This mapping application can be accessed at: gis.aacounty.org/portal/apps/webappviewer/index.html?id=dac2fecf1fc14077bf0faee596f8cf43.

No new TMDLs were approved by EPA during this reporting period. The draft Non-Tidal West River Watershed Sediment TMDL Restoration Plan, submitted to MDE on April 17, 2020, did not include load reduction modeling because the MDE sediment load calculator (TIPP) was not finalized and available for use at that time. Subsequently, MDE released its TIPP spreadsheet model for use by local jurisdictions and the County incorporated baseline and progress modeling into the draft. The completed draft is provided for MDE review as an appendix to the Countywide Plan (**Appendix H**) and will be advertised for public comment in early 2022.

The County recognizes the importance of public input into both watershed assessments and restoration plans and provides a minimum of 30 days for public comment on draft plans and reports. Draft documents are made available for review and/or download through the County webpage. A minimum number of hard copy reports may also be made available on request. Prior to final acceptance, a summary of the comments received and County responses are incorporated into each document.

5. TMDL Compliance

Anne Arundel 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. Anne Arundel 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 WLAs;

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.

Status:

During FY21, the County continued implementing the individual TMDL restoration plans previously submitted to and approved by MDE. Progress made during FY21 is discussed in the Countywide TMDL Stormwater Implementation Plan (Countywide Plan) submitted as **Appendix H**.

A summary of progress is presented in **Part IV.E.2.b.** FY21 progress is also reported in the *LocalStormwaterWatershedAssessment* table of the MS4 Geodatabase **(Appendix A).** It should be noted that PCB and Bacteria modeling results are not included in this table as modeling was not required nor accomplished for FY21.

As noted in **Part IV.E.4** a draft of the Non-Tidal West River Sediment TDML Restoration Plan was submitted to MDE on April 17, 2020. During FY21 MDE finalized the TIPP sediment model and made it available to jurisdictions. The County incorporated TIPP modeling into this draft plan and the final draft Non-Tidal West River Sediment TDML Restoration Plan is submitted as an appendix to the Countywide Plan in **Appendix H**.

The Patuxent River Watershed PCB TMDL Restoration Plan was revised to address MDE's comments and to include a revised monitoring strategy. The revised plan was submitted to MDE on August 31, 2020. MDE provided additional comments on November 17, 2020 and again on May 14, 2021 to which the County responded on April 28, 2021 and July 15, 2021 respectively. Per MDE guidance, the County will await publication of the MDE PCB Monitoring Guidance document (early 2022) prior to completing the plan.

As noted earlier, Anne Arundel County continues working collaboratively with MDE and various stakeholders within the County to implement the County's Phase II WIP, in support of the Chesapeake Bay TMDL WIP, to reduce the nutrient and sediment load within Anne Arundel County's portion of three major tributary basins (Lower Western Shore, Patuxent River, and Patapsco River). The County's progress (i.e., net change in load) for achieving the Bay TMDL SW-WLA is presented in **Part IV.E.2.b** of this report and documented in the *CountywideStormwaterWatershedAssessment* table of the FY21MS4 Geodatabase (**Appendix A**). The *LocalStormwaterWatershedAssessment* table of the FY21 MS4 Geodatabase (**Appendix A**), as well as **Part IV.E.2.b** of this report, documents the load reduction summary for completed water quality improvement projects applicable to the County's local TMDLs. Specific itemized costs for the projects completed in FY21 are found in the FY21 MS4 Geodatabase in the *RestBMP*, *AltBMPPoint*, *AltBMPLine*, and *AltBMPPoly* feature classes. Costs associated with the restoration projects implemented by NGOs or other private entities are not provided.

The net pollutant load reductions associated with the County's cumulative stormwater management and restoration efforts, and the County's Chesapeake Bay TMDL SW-WLA are presented in **Part IV.E.2**. Any remaining reductions required to meet the SW-WLAs will be achieved through a blending of sector WLAs under the purview of Anne Arundel County. The cumulative cost of restoration, as of FY21, was $106,255,904. This number is derived from the cumulative cost reported in the FY20 MS4 Annual Report ($81,436,134) plus the FY21 project specific costs as reported in the "ISRP BMPs Implemented in FY21" tab of the FY21 WPRP Financial Report ($24,819,770). The County's FY21 WPRP Financial Report is found in **Appendix I** to this report and documented in the *NarrativeFiles* table of the MS4 Geodatabase

(**Appendix A**). Additional information on FY21 expenditures associated with restoration efforts is found in the *FiscalAnalysis* table of the FY21 MS4 Geodatabase (**Appendix A**).

The County continues to work toward meeting the targeted SW-WLA goals. Currently there are 119 projects planned (design contract issued) or under construction that are expected to be completed in upcoming reporting cycles (e.g., FY22, FY23) as previously mentioned in **Part IV.C.6** of this report. Any additional projects proposed for restoration will be included in the planned projects once a design contract is initiated.

Part IV.E.5.e. of this Permit requires the development of a plan for implementing additional watershed restoration actions when benchmarks, deadlines, and applicable SW-WLAs are not being met or when projected funding is inadequate. During the 2012 development of Maryland's Phase II WIP for the Chesapeake Bay, Anne Arundel County with the concurrence of the State of Maryland and EPA recognized the need for adaptive management in the WIP development and implementation process. As discussed in Maryland's Phase II WIP for The Chesapeake Bay, March 20, 2012, as implementation moves forward the achievement of SW-WLA goals needs to be evaluated and restoration plans modified in response to the rate of progress, additional modeling results, and resource availability. The 2018 adoption of nutrient trading regulations by the State, and the subsequent modification of the County's permit on December 7, 2018 allowing cross sector trading as an adaptive management tool for achieving load reductions, is an integral component of adaptive management to ensure future progress. The County recognizes that nutrient trading provides temporary credit which must ultimately be replaced by restoration actions. As such, the 1,827 acres of restoration credit acquired through nutrient trading at the end of FY19 was replaced by credit achieved through the County's BMP implementation in FY20 and documented in the FY20 MS4 Annual Report.

Anne Arundel County took a conservative approach when developing the urban stormwater component of its Phase II WIP. The County's strategy was structured to achieve the Edge of Stream (EOS) final target load derived from the County's Watershed Management Tool (WMT) baseline estimate which was higher than the MAST baseline estimates. In addition, the strategy included only restoration and preservation recommendations for the seven watersheds that were assessed when the County's Phase II WIP was developed in July 2012. Restoration opportunities for load reduction from the Little Patuxent, West and Rhode Rivers, Herring Bay and Middle Patuxent River Watersheds were not identified nor taken into account at that time. With these watershed assessments now complete opportunities for load reduction are being formulated into restoration projects and incorporated into the County's Capital Improvement Program (CIP) budget.

Further, Anne Arundel County adopted legislation in June 2013 to create a Watershed Protection and Restoration Program (WPRP) including a Stormwater Remediation Fee (Fee). The Fee is structured to provide sufficient funding for projects to meet the requirements of the County's MS4 Permit which also assists in meeting pollutant load reduction required by the Chesapeake Bay TMDL, EPA approved individual TMDLs with a SW-WLA, and to meet the impervious surface management requirements and other stormwater obligations set forth in the County's NPDES MS4 Permit.

Following the adoption of its Stormwater Remediation Fee, the County developed a 6-year Capital Improvement Program (CIP) in FY14 that created a Watershed Protection and Restoration Program (WPRP) Class of projects to implement those restoration projects identified in the County's Phase II WIP for achieving SW-WLAs. Projects in the WPRP Class were identified and prioritized through a planning level assessment and consist of restoration of ephemeral and perennial streams with a MBSS Maryland Physical Habitat Index (PHI) rating of severely degraded or degraded; implementation of stormwater/water quality treatment at currently untreated stormwater pipe outfalls (greater than 24 inches), and retrofit of stormwater management ponds built prior to 2002 (with drainage areas in excess of 10 acres) to optimize pollutant reduction and ecosystem functions for the facilities. As WPRP class projects are funded, a determination is made whether more detailed constructability assessments are needed. These assessments may result in identifying projects previously thought to be implementable but are not due to a variety of reasons, or identifying additional and new opportunities for load reduction. As these assessments are completed the County will incorporate these findings into its modeling, reassess anticipated load reductions, and adapt its implementation program to delete or add projects.

Adaptive management is a critical component of achieving the SW-WLAs required by the County's NPDES MS4 Permit. The Chesapeake Bay TMDL and individual approved TMDLs clearly established load reduction targets. Two-Year Implementation Milestones were established by the County to provide interim planning targets and to serve as a vehicle for assessing progress toward the Bay TMDL reduction targets. Likewise, the progress toward meeting local TMDLs is evaluated annually. Progress is measured through three approaches: tracking implementation of management measures, estimating load reductions through modeling, and tracking overall program success through long term monitoring. Planning targets are re-evaluated against progress and revised to ensure that Anne Arundel County is on track to meet its goals. In FY21 the County initiated a critical review of progress toward achieving individual TMDL SW-WLA attainment. Where individual TMDL progress through FY20 and planned load reduction through programmed restoration activities and BMPs fail to achieve SW-WLAs, the County began developing an adaptive management plan that speaks specifically to individual SW-WLAs not being achieved.

At this time multiple lines of evidence, including results of several model runs, monitoring data, and the most recent science on BMP effectiveness and water quality response, are evaluated as part of TMDL compliance assessment. The milestones and progress assessments contribute to continual reassessment of management plans, and adapting responses accordingly as technologies and efficiencies change, programs mature, credit trading is implemented, and regulations are put in place.

F. ASSESSMENT OF CONTROLS

Assessment of controls is critical for determining the effectiveness of the NPDES stormwater management program and progress toward improving water quality. The County shall use chemical, biological, and physical monitoring to assess watershed restoration efforts, document BMP effectiveness, or calibrate water quality models for showing progress toward

meeting any applicable WLAs developed under EPA approved TMDLs identified above. Additionally, the County shall conduct physical stream monitoring to assess the implementation of the latest version of the 2000 Maryland Stormwater Design Manual. Specific monitoring requirements are described below.

1. Watershed Restoration Assessment

The County shall continue monitoring the Parole Plaza outfall and Church Creek in-stream station in the South River 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 a study design approved by MDE, shall be monitored. The minimum criteria for chemical, biological, and physical monitoring are as follows:

a. Chemical Monitoring

- ***i. Twelve storm events shall be monitored per year at each monitoring location with at least two occurring per quarter. Quarters shall be based on the 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 temperature shall be taken;***
- ***iii. At least three samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to methods listed in 40 CFR Part 136 and EMC shall be calculated for:***

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

- ***iv. Continuous flow measurements shall be recorded at the in-stream monitoring station or other practical locations based on an 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.***

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 MDE 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.***

Status:

In 1998, Anne Arundel County began implementing a long-term monitoring program that satisfied the NPDES MS4 Permit monitoring requirements for "Assessment of Controls". Monitoring continued to be required as part of the terms of each renewed NPDES MS4 Permit. Effective January 1, 2021, the County formally began participation in the Pooled Monitoring Program coordinated through the Chesapeake Bay Trust (Trust) to meet the Best Management Practices (BMP) Effectiveness monitoring and the Watershed Assessment monitoring requirements set forth in the Permit's Assessment of Controls section. Signed Memoranda of Understanding between the County and the Trust, documenting the County's participation in lieu of Assessment of Controls monitoring, was provided to MDE and copies are found in **Appendix B**. The effective date by which chemical water quality monitoring ceased at the Church Creek and Parole Plaza stations was March 18, 2021, providing overlap between the initiation of Pooled Monitoring Program participation and the cessation of Assessment of Controls monitoring.

Prior to March 18, 2021, the County conducted monitoring as required to satisfy the above permit conditions. The monitoring program included chemical, biological, and physical monitoring in the Church Creek watershed located within the larger South River watershed. The monitoring effort undertaken during the abbreviated FY21 reporting period (July 2020 through March 18, 2021) is summarized below. The full Church Creek monitoring report can be found in **Appendix C** (*Chemical and Geomorphic Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2020-2021)* and the data required to support this section are also provided in the *MonitoringSite* and *MonitoringDrainageArea* feature classes, and the *ChemicalMonitoring* table of the MS4 Geodatabase included in **Appendix A**.

Figure 2 shows the locations of chemical, biological, and physical monitoring sites/reaches. Biological and physical monitoring take place at monumented locations along the study reach. In FY21, no biological monitoring or habitat assessment was conducted because the County opted into the Pooled Monitoring Program effective January 1, 2021, prior to the spring biological monitoring index period. Annual physical/geomorphic monitoring was conducted in October 2020 (FY21).

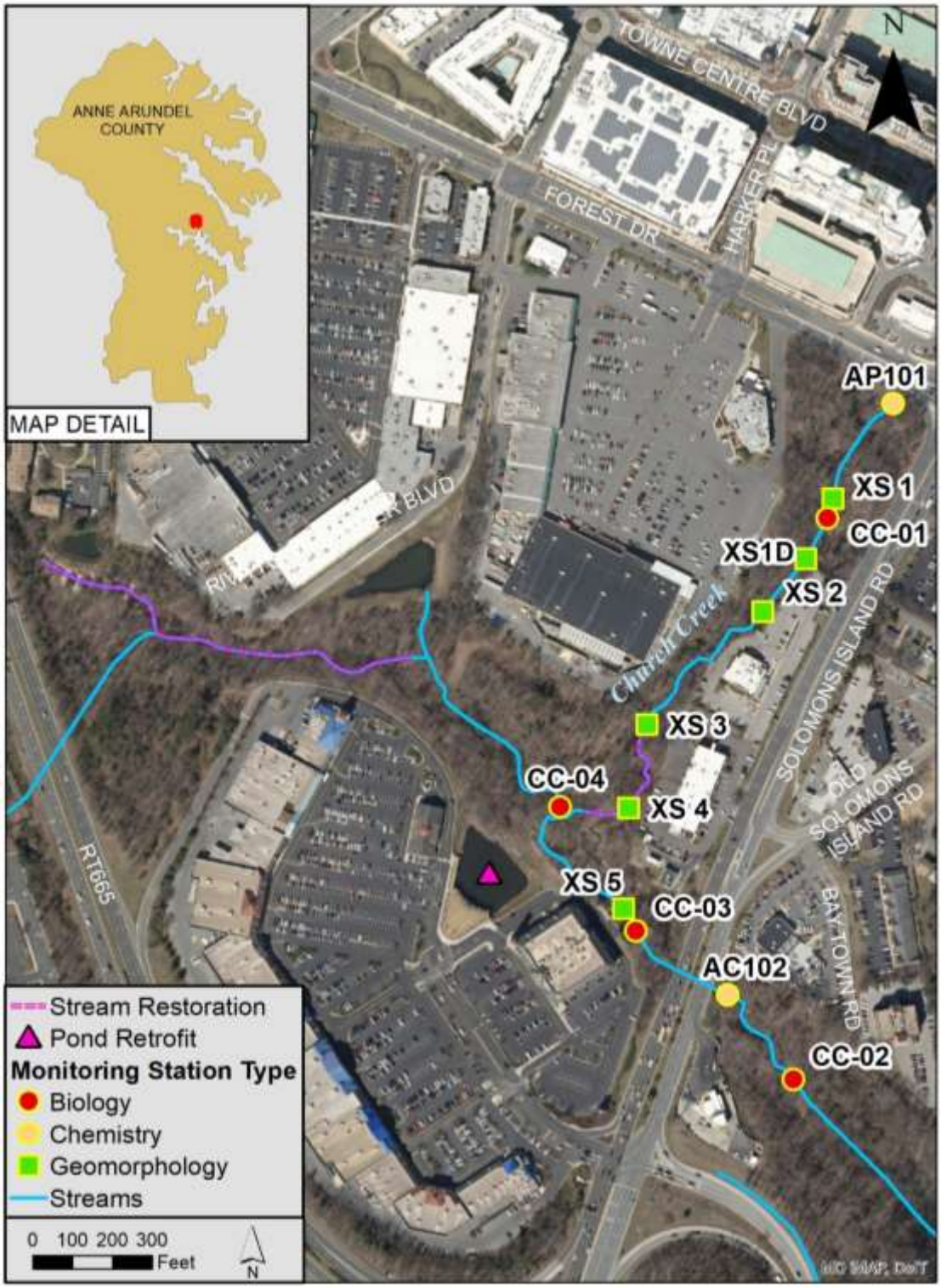

Figure 2. Church Creek and Parole Plaza study area, stream monitoring stations, and approximate stream restoration locations

The chemical monitoring activities continued through March 18, 2021, occurring at two stations in the Church Creek watershed (**Figure 2**):

- Parole Plaza Station: Outfall representing highly impervious (78.5%) commercial land use which was redeveloped in 2007 as the Annapolis Towne Centre; the construction incorporated stormwater management into the redevelopment (i.e., a restoration station); and
- Church Creek Station: An instream station on the mainstem of Church Creek, approximately 500 feet downstream of the Parole Plaza Tributary confluence (69.2% impervious).

As reported in the FY20 MS4 Annual Report, the restoration of the Annapolis Harbor Center pond located upstream of the Church Creek Station and the Parole Plaza Tributary confluence, occurred between July and September 2017. This restoration involved draining the pond and excavating the bottom to provide additional storage; and construction of two forebays, a wetland berm, and aquatic benches all within the existing pond footprint. Prior to the retrofit completion, the South River Federation (SRF), now Arundel Rivers Federation (ARF), completed 1,500 linear feet of stream restoration in the Church Creek reach upstream of the Harbor Center pond and the Church Creek sampling station. ARF and the Smithsonian Environmental Research Center (SERC) collaboratively monitored the restored stream reach to document changes in habitat as well as post-restoration in-stream nutrient processing. The County shared the continuous flow data and storm event water quality data from both MS4 monitoring stations with the researchers. This collaborative assessment was completed prior to the FY21 reporting period and the results are found on the Chesapeake Bay Trust webpage here: cbtrust.org/wp-content/uploads/Final-Rept-on-Restoration-Research-Grant-to-Arundel-Rivers-Federation_020921_final-14840.pdf

During the abbreviated FY21 reporting period, four storm events were sampled and four baseflow samples were collected and analyzed. Storm event samples were collected from both stations for the rising, peak, and falling limbs of the hydrograph. Samples were analyzed for the required parameters. For specific information related to each monitored storm event as well as the water quality analytical results, please see the monitoring report in **Appendix C** and the *ChemicalMonitoring* table in the MS4 Geodatabase (**Appendix A**). Dates for successful storm event and baseflow sampling are found in **Table 25**.

Table 25. Church Creek and Parole Plaza stations — sample dates (FY21)

Quarter	Sample Date	Sample Type
Summer 2020 (July – Sept)	7/30/20	Storm
	9/3/20	Storm
	9/28/20	Baseflow
Fall 2020 (Oct – Dec)	10/28/20	Baseflow
	12/4/20	Storm
	12/30/20	Baseflow
Winter 2021 (Jan – Mar)	2/25/21	Baseflow
	3/18/21	Storm

Four baseflow sample events were collected in place of storm event samples due to a low number of opportunities to sample qualifying storm events. Baseflow event information and water quality monitoring data can be found in the monitoring report in **Appendix C**, and in the *ChemicalMonitoring* table in **Appendix A**.

- Summer Quarter 2020:
  - Due to the impending end of the quarter and a lack of forecasted storm events, consultant support field teams collected a baseflow sample from both Church Creek and Parole Plaza stations on September 28, 2020. Field teams had not monitored a storm in August due to lack of opportunity for forecasted events.
- Fall Quarter 2020:
  - Baseflow samples were collected on October 28, 2020, from both stations, because opportunity for monitoring a qualified storm event earlier that month did not arise.
  - Due to the impending end of the quarter and lack of a prior forecasted storm event that met antecedent moisture conditions, minimum precipitation accumulation, and/or storm duration requirements, baseflow samples were collected from both Church Creek and Parole Plaza on December 30, 2020.
- Winter Quarter 2021:
  - After several unsuccessful storm attempts resulting in no storm events captured prior to February 25, 2021 the consultant support field teams collected baseflow samples from Church Creek and Parole Plaza stations.

Continuous water level measurements were taken at the Church Creek instream station and within both the 60-inch corrugated metal pipe (CMP) and the 54-inch RCP at the Parole Monitoring Station. Discharge was then determined using the rating curves developed for each monitoring location. Event Mean Concentrations (EMCs) for each measured water quality parameter were calculated for each event and applied to total stormflow discharges to calculate stormflow pollutant loads for each site. An EMC is a statistical parameter used to represent the flow-weighted average concentration of a given parameter during a storm event (U.S. EPA 2002). Total seasonal loads were calculated by multiplying the average seasonal EMC by the total volume for the season. Annual loads were calculated by summing all seasonal loads.

During the FY21 monitoring period, the rating curve for the 96” culvert at the Church Creek station was revised to more accurately reflect the water budget for this subwatershed. The revised rating curve was developed from directly measured discharges within the pipe at various times and stages during the 2006 - 2020 period. The revised rating curve was subsequently applied to continuous stage data collected from FY13 until the conclusion of monitoring in March 2021. This time period coincided with the NPDES MS4 Permit term. Loading and EMC data previously reported from FY13 through FY20 were recalculated using the revised continuous flow rate data and are found in the monitoring report (**Appendix C)**, as is the revised rating curve. The stand-alone geodatabase with the corrected loads and EMC data for FY13 through FY20 data is found in **Appendix A** (*AACountyChemicalMonitoring_CorrectedData_FY13thruFY20.mdb*).

Water chemistry data collected in FY21 continued to show general, gradually decreasing pollutant levels at the Parole Plaza outfall and in Church Creek, but at concentrations that continued to exceed surface water criteria for certain parameters.

During the abbreviated FY21 monitoring year, annual average EMCs for all parameters were generally higher at Church Creek than at Parole Plaza. Annual average EMCs for total phosphorus, nitrate-nitrite, and *E. coli* exceeded their corresponding criteria at both stations (see Table 4-5, **Appendix C**).

Concentrations of *E. coli* exceeded the water quality criterion in 81% of sample at Church Creek and in 75% of samples at Parole Plaza. Total phosphorus and combined nitrate and nitrite results exceeded the corresponding criteria 100% of the time at Church Creek, but only in 75% and 94% of samples, respectively, at Parole Plaza. Percentage exceedances for copper and zinc were higher at Parole Plaza than at Church Creek (see Table 4-4, **Appendix C**).

At Church Creek, the seasons in which the highest pollutant loads occurred were summer and winter. Only combined nitrate-nitrite was higher in winter and the remaining parameters were higher in the summer. At Parole Plaza, most parameters were at their highest during winter except for TSS and *E. coli* which were highest in summer (see Table 4-8, **Appendix C**).

For most parameters, annual loads at Church Creek exceeded those at Parole Plaza during FY21 except for *E. coli* (reported as annual average EMC). The mean annual loading rates for all parameters at the Parole Plaza station were lower during post-redevelopment (2009-2021) than pre-redevelopment (2002-2006) (see Tables 4-6 and 4-7, **Appendix C**). A comparison of post-redevelopment to pre-redevelopment loadings at the Church Creek station are no longer appropriate because of the revision to the 2013 to 2020 annual loadings due to application of the revised rating curve.

At Parole Plaza, annual pollutant EMCs in FY21 decreased for most parameters (except for TPH, total phosphorus, BOD_5, and *E. coli*) continuing a trend of gradually declining values first recognized in 2006 (see Figures 4-1 to 4-5, **Appendix C**). Most average annual pollutant EMCs (except for lead, BOD_5, and *E. coli*) decreased at Church Creek in 2021, also continuing the general 2006 to present pattern (see Figures 4-6 to 4-10, **Appendix C**). The period after the most recent stream restoration (2016) and stormwater pond retrofit (2017) projects in the Church Creek watershed coincided with a temporary decline in pollutant EMCs of most parameters in the 2017-2019 monitoring periods. Trends during the post-redevelopment period only (2009-2021) at Parole Plaza show gradual declines in annual average EMCs for nutrients, metals, TSS, and BOD_5, but not for *E. coli* or TPH, the latter of which was affected by a detection limit change. At Church Creek during the same period, negative slopes tended to be shallower or, in the case of lead, copper, and TSS, showed increasing trends. The reason for the increasing slopes may be due to increased traffic, continued development, or other unknown factors elsewhere in the Church creek watershed. Water chemistry benefits of the stream restoration and stormwater retrofit could not be distinguished in the short-term (2009-2021) data.

The redevelopment of Parole Plaza had an overall beneficial water chemistry impact to the receiving tributary. In terms of average annual EMCs, the reduction in average pollutant levels

between the pre-redevelopment (includes construction; 2004-2008) and post-redevelopment (2009-2021) phases ranged between 32% and 85% at Parole Plaza and 32% and 67% at Church Creek (note hardness and *E. coli* were not compared). A Student's t-test shows that the only significant (ά=0.05) reductions were at Parole Plaza for BOD_5, TSS, copper, and lead. The results indicate that the redevelopment had a significant beneficial effect on concentrations of selected pollutants discharged from the developed area. The improvements carried downstream to Church Creek; however, reductions in pollutant levels were less significant within the context of the larger overall watershed.

Again, further discussion of monitoring activities at these stations and the resulting data can be found in **Appendix C** (*Chemical and Geomorphic characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2020-2021*) and the *ChemicalMonitoring* table of the MS4 Geodatabase (**Appendix A**).

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.

Status:

Geomorphic stream assessment data were collected in October 2020. Habitat metrics, collected concurrent with the spring index biological monitoring period, were not collected in FY21 because the County opted into the Pooled Monitoring Program prior to the spring index period.

Due to the highly altered conditions of the drainage area and stream channel in the Church Creek study area, reliable bankfull indicators can be difficult to locate in the field; thus, best professional judgment is often used to augment data interpretation and categorize the stream segments. **Table 26** presents a summary of each reach and its classification since 2006 (for site locations refer to Figure 2-1 in **Appendix C**).

Table 26. Physical characterization assessment summary for cross sections in the Church Creek Subwatershed

Cross-section	XS-1	XS-1D	XS-2	XS-3	XS-4	XS-5
2006	E5	No Data	E5	G5c	E5	E5b
2007	C5	No Data	E5	G5c	E5	C5
2008	E4	No Data	E5	G5c	E5	C5

Cross-section	XS-1	XS-1D	XS-2	XS-3	XS-4	XS-5
2009	E5→C5	No Data	E5	G5c	E5	C5
2010	E5→C4/5	No Data	E5	G5c	E5	C3/5
2011	C4/5→F4/5	No Data	G5c	No Data	E5	C3/5
2012	F5	No Data	G5c	No Data	E5	C3/5
2013	F4	No Data	G5c	G4c	C5	F4/3
2014	F5/4	No Data	G4c	G4c	C5	F3
2015	F4	No Data	G4	G4/3c	C5	F3/4
2016	F4	No Data	G4c	G4c	E5/4	F4
2017	F4	No Data	G4c	G4c	E4/5	F4
2018	F4	No Data	G4c	G4c	E4/5	F4
2019	F5	No Data	G4c	G4c	E5	F4
Spring 2020	F5	C4	G4c	G4c	E4	F4
Fall 2020 (FY21)	F5	F5	G4c	G5c	E5	F4

The Church Creek study area has a very high percentage of impervious surface (approximately 64 percent). Five reaches were classified as either F or G channels, which are more entrenched and less stable. The most downstream reach of the Parole Plaza Tributary was classified as an E channel and maintains some limited connectivity to its floodplain even though there are significant stormwater inputs feeding into the stream, which typically result in accelerated channel erosion and degradation.

There were no changes in the overall classifications of each stream reach from 2017 to 2018, and stream types remained the same in 2019 apart from XS-1 which changed from an F4 to an F5 as its substrate became less coarse. In FY21 (October 2020), stream types remained stable with minor changes seen in XS-3 (G4c to G5c) and XS-4 (E4 to E5) due to decreased substrate size. Only one site, the newly established XS-1D, required reclassification, shifting from a C4 to an F5 due to a reduction in entrenchment ratio between surveys. Though the XS-1D segment does not exhibit the classic "U" channel shape associated with an F stream, the low slope, meandering channel, and presence of depositional bars in the immediate area, in conjunction with the lower entrenchment ratio, indicate that this site is transitioning between Rosgen classifications.

Bankfull channel dimensions (cross-sectional area, width, and depth) in the Church Creek study area showed departure from expected values, as derived from Maryland Coastal Plain regional relationships of bankfull channel geometry (McCandless 2003). Almost all dimensions were generally larger in the Church Creek study area (see Figures 4-11, 4-12, and 4-13 in **Appendix C**) and were often more similar to relationships of bankfull channel geometry derived from gaged urban watersheds located in the Coastal Plain (AADPW 2002). Values measured in FY20 (March 2020) and FY21 (October 2020) were slightly higher than prior assessment results. This reflects the higher level of imperviousness in the study area, as compared to the lower

impervious levels in the drainage areas used to develop the regional relationship data, suggesting the stream has enlarged as a result of high imperviousness and is both wider and deeper than the more stable channel forms (C and E-type channels) found in rural/suburban watersheds of the Coastal Plain.

It is likely the current stormwater management and wetland storage on the Church Creek mainstem, as well as the presence of an intact riparian vegetative buffer along much of the stream corridor contribute to minimizing some of the adverse effects of the high imperviousness in the watershed. Additionally, grade controls such as the culvert at Solomon's Island Road and cobble rip-rap armoring at XS-5 likely prevent some degradation from occurring in the channel upstream. Nonetheless, there are indications of channel instability (i.e., degradation, aggradation, widening) in the upper reaches of the Parole Plaza Tributary and, thus, a need for additional stormwater management to prevent further channel erosion.

Additional information and data pertinent to the water quality and geomorphic assessments of Church Creek are found in the full report in **Appendix C** (*Chemical and Geomorphic Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2020-2021*).

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 accompany justifications for proposed modifications to the monitoring program.***

Status:

The required chemical monitoring results are found in the *ChemicalMonitoring* table of the MS4 Geodatabase in the prescribed format (**Appendix A**). There are no FY21 biological or habitat assessment data for inclusion this year. As there is no geodatabase table for the physical monitoring results, these data are presented in **Appendix C** (*Chemical and Geomorphic Characterization of the Church Creek and Parole Plaza NPDES Monitoring Stations: 2020-2021*) which also provides greater detail on the work performed in this watershed.

The County's long-term monitoring (chemical, biological, and physical) of the Church Creek and Parole Plaza watershed was ended in mid-FY21 when the County opted into the Pooled Monitoring Program. As noted earlier in this section, the Pooled Monitoring Program funded a restoration research project undertaken by a team of scientists from SERC and ARF. That project, "Assessing Watershed-scale Restoration Effectiveness: Treatment Impacts and Monitoring Requirements", documented post-restoration habitat and water quality in the Church Creek watershed. The final report is found here: cbtrust.org/wp-content/uploads/Final-Rept-on-Restoration-Research-Grant-to-Arundel-Rivers-Federation_020921_final-14840.pdf. The County

desires to continue supporting this and similar restoration research and made the decision to re-allocate funding away from permit-required monitoring and into the Pooled Monitoring Program. Documentation of County correspondence regarding this program modification is found in **Appendix B**.

2. Stormwater Management Assessment

The County shall continue monitoring the Picture Spring Branch in the Severn River 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 Picture Spring 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-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.

Status:

Conducted annually since 2003, in October 2020 (FY21) geomorphic condition monitoring for Picture Spring Branch located adjacent to the Odenton Regional Library (formerly called West County Library), was performed. Typically, biological assessments and instream habitat evaluation work are also conducted, but due the County joining the Pooled Monitoring Program initiative before the benthic macroinvertebrate spring index period began, these facets of the assessment work were not executed during this reporting year. It should also be noted that the conditions described below do not represent change over the full year since the last assessment was conducted because the work for this report took place in October 2020.

For this work, five permanent cross-sections were established throughout the study area to evaluate channel stability over time (see *Geomorphological Condition in the Picture Spring Branch Subwatershed, Severn River Watershed, Anne Arundel County, Maryland: FY2021* in **Appendix D** for a location map, Fig 2-1). Three of the five cross-sections are located on the North Tributary, one is downstream of Maryland State Highway 170, and one is on the South Tributary. These cross-sections were re-measured and longitudinal profile surveys were conducted along both the North Tributary (totaling 1,968 linear feet) and South Tributary (totaling 356 linear feet). It should be noted that the South Tributary does not receive significant stormwater runoff from the Odenton Regional Library site. Most of the runoff from this site drains to the North Tributary, downstream of XS-1.

To compare changes over time, the cross-sectional area from 2011 through 2020 was calculated using the top of bank elevation from the baseline survey to standardize comparisons and reduce variability among more subjective bankfull elevation reference points, or even changes that can occur to top of bank elevations from year to year. As documented in prior years' reports,

calculations prior to 2011 did not use this baseline reference elevation; instead, the corresponding year's top of bank elevation was used to calculate cross-sectional area. Consequently, these values are not directly comparable to the cross-sectional areas reported in 2011 through 2020. Comparison of baseline cross-section area is, however, comparable from 2011 through 2020 as all calculations are made using the same top of bank elevation.

Channel dimensions along the North Tributary have not changed substantially from baseline conditions, although some aggradation has occurred in the past six years (2014-2020). Channel dimensions appear relatively constant for three (XS-2, XS-3, and XS-5) out of the five cross-sections in 2020 compared to baseline conditions; the cross-sectional areas decreased by 7.3%, 8.4%, and 0.6%, respectively, since the beginning of the study in 2003. Changes of greater magnitude have occurred at XS-1 and XS-4 where increases in overall cross-sectional area at XS-1 (79.7%) and XS-3 (40.8%) have been observed over the same interval. Unlike the other stations, XS-1 and XS-4 are not located in an engineered or partially armored channel. Additionally, XS-1 is located upstream of the library site; as such, it does not receive stormwater runoff from this site. In examining changes in cross-sectional area since 2011, when calculations were standardized as discussed above, the changes in cross-sectional area decrease at each cross-section to much lower percentages. Cross-sections 1 and 4 still exhibit the greatest overall percent change using these standardized calculations; 18.6% and 14.1%, respectively (see Table 4-1, **Appendix D**).

Overall, it appears that the BMPs installed as part of the development of the Odenton Regional Library site may have contributed to reducing the geophysical impacts of stormwater runoff. As noted previously, XS-1 on the North Tributary and the South Tributary (XS-4) do not receive significant amounts of drainage from the Odenton Regional Library site.

G. PROGRAM FUNDING

1. ***Annually, a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit shall be submitted as required in Part IV.***
2. ***Adequate program funding to comply with all conditions of this permit shall be maintained.***

Status:

This FY21 MS4 Annual Report covers the reporting period of July 2020 through June 2021, and corresponds to the County's 2021 Fiscal Year. The summary of funding and expenditures for FY21 is found in the *FiscalAnalyses* table of the MS4 Geodatabase (**Appendix A**). **Table 27** provides the FY21 break down of expenditures by permit condition.

Table 27. FY21 fiscal analysis (operating and capital appropriations)

Permit Condition	FY 21
Legal Authority	$0
Source ID	$1,562,761
SW Management	$1,177,804
Erosion and Sediment Control	$63,107
Illicit Discharge Detection and Elimination	$86,415
Trash and Litter Control	$515,244
Property Management	$8,688,633
Inlet Cleaning	$321,682
Street Sweeping	$338,087
Other Road Maintenance	$0
Public Education	$856,102
Watershed Assessment	$182,076
Watershed Restoration	$910,540
Chemical Monitoring Assessment	$634.302
Biological Monitoring Assessment	$603,431
Physical Stream Assessment	$97,318
Stormwater Design Manual Monitoring	$0
TMDL Assessment	$489,059
Annual Report Preparation	$91,370
Total Annual Cost for NPDES MS4 Program	$16,617,932

The WPRF was implemented July 1, 2013 in response to State legislated requirements found in Maryland Environmental Code Ann §4-202.1 (2013). This Fund provides the primary fiscal support for all eligible components of the NPDES MS4 Permit program. Those MS4 permit-requirements not eligible for WPRF funding continue to be supported by the County's annual budget process (general revenue funds).

With the implementation of the WPRF, a dedicated revenue source was created. These revenues for FY21 totaled $23,656,081. A total of 229,859 properties in Anne Arundel County were assessed the fee in FY20, which was the fifth year of the full fee implementation after the phase-in periods. In addition to the stormwater fee revenues, the Watershed Protection and Restoration Fund realized revenues from investment income as well as interfund recovery. Please refer to the FY21 WPRP Financial Report (**Appendix I**) for additional information. Estimated projections of revenue for FY22 are $23,988,445. These revenues fund the operating budget directly, and the Capital Improvement Program (CIP) budget indirectly through debt repayment.

During the reporting period, funding for NPDES MS4 Permit compliance was addressed through the County CIP and operating budgets. CIP funding for the current County fiscal year and the next five fiscal years is allocated to the "Stormwater Runoff Controls," "Water Quality Improvements" and "Watershed Protection and Restoration" CIP project classes. Specific line items funded through the CIP include storm drain rehabilitation, closed storm drain repairs and replacement, stormwater infrastructure inspection and maintenance, stormwater facility retrofits, outfall repairs, and stream and ecological restoration projects. The budgets for the "Stormwater Runoff Controls" and "Water Quality Improvements" project classes have been, for the most part, incorporated into the Watershed Protection and Restoration CIP and operating budget items as appropriate. It should be noted that "Watershed Restoration" in FY21, represented in **Table 27** and in the *FiscalAnalysis* table of the MS4 Geodatabase, is significantly less than prior years due to internal auditing that cut funding from many prior approved projects. Moving forward in FY22 and beyond this funding has been either restored or added to new projects and will continue to support our Capital Improvement Program. The Watershed Protection and Restoration CIP budgets for FY21 through FY26 total $110,594,000. The projected CIP budget for FY21 through FY26 increased significantly due to the implementation of a Permit Cycle 3 placeholder being added to the out years. These costs were detailed in the County's FY20 Financial Assurance Plan (FAP) that was submitted to MDE in February 2021 (FY20 MS4 Annual Report, Appendix J). Comments subsequently received from MDE indicate the County's FY20 FAP demonstrated sufficient funding to satisfy the projected two-year ISRP costs.

The Anne Arundel County operating budget for FY21 also provides permit compliance support through funding of personnel associated with permit compliance actions. Such support is derived primarily from the County's I&P, SCD, and DPW. Each of these agencies has responsibility or provides support for certain permit requirements and all must work collaboratively to achieve County compliance with permit terms. Additional funding for permit compliance has been included in the operating budgets for the WPRF. Specific line items funded through the operating budget include chemical, biological, and physical stream assessments, public education, grants, and contracted street sweeping.

The complete FY21 and FY22 approved County budgets (operating and capital) are available for review and download at www.aacounty.org/departments/budget-office/index.html.

Lastly, with the funding provided by the WPRF, increased staffing began in FY14. Delays due to proposed legislation changes slowed the implementation of the program initially. At the end of FY21 staffing levels were at 90% and additional hiring will be accomplished in FY22. The increase in staffing continues to assist the County to achieve MS4 permit compliance.

H. REFERENCES

Anne Arundel County Department of Public Works (AADPW). 2002. Cypress Creek Tributary Assessment and Findings Report. Prepared by Bayland Consultants and Designers, Inc., and Clear Creek Consulting. 32 pp., plus Appendices.

Maryland Department of the Environment (MDE). 1997. Dry Weather Flow and Illicit Discharges in Maryland Storm Drain Systems.

Maryland Department of the Environment (MDE). 2009. 2000 Maryland Stormwater Design Manual, Volumes I & II. Revised May 2009. Prepared by the Center for Watershed Protection, Ellicott City, MD, for the Maryland Department of the Environment, Baltimore, MD.

Maryland Department of the Environment (MDE). 2017. National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4), Geodatabase Design and User's Guide. Version 1.2. Revised May 2017. Prepared by MDE and Maryland Environmental Service (MES) for Environmental Protection Agency (EPA) Chesapeake Bay Regulatory and Accountability Program (CBRAP). Baltimore, MD.

Maryland Department of the Environment (MDE). 2021. Accounting for Stormwater Wasteload Allocation and Impervious Acres Treated; Guidance for National Pollutant Discharge Elimination System Stormwater Permits; November 2021. Baltimore, MD.

McCandless, T.L. 2003. Maryland stream survey: Bankfull discharge and channel characteristics of streams in the Coastal Plain hydrologic region. U.S. Fish and Wildlife Service, Annapolis, MD. CBFO-S03-02.

U.S. EPA. United States Environmental Protection Agency. 2002. Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements. EPA-821-B-02-001.