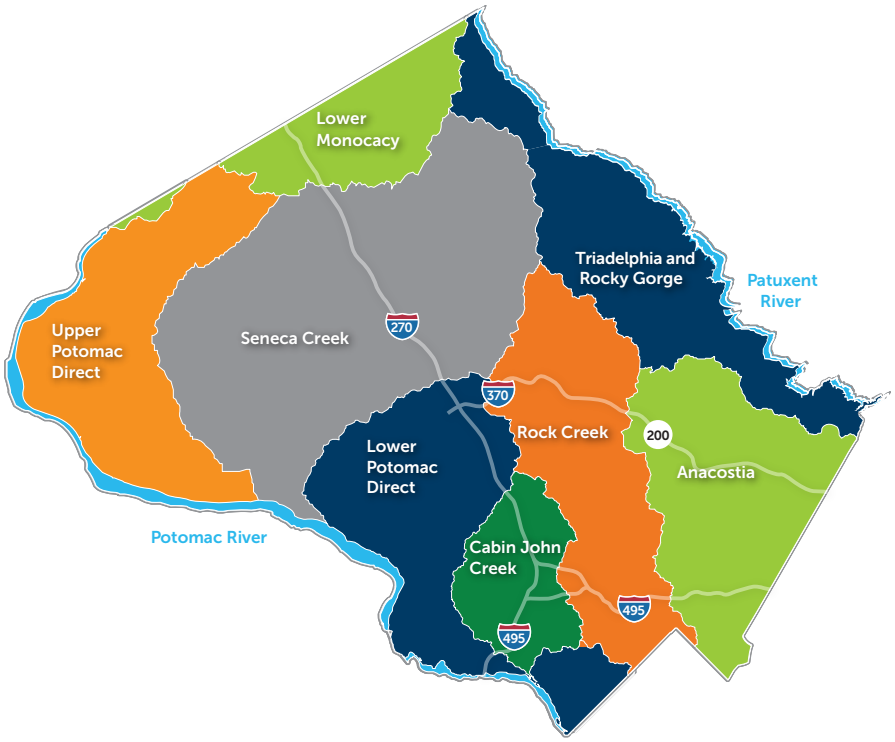
National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit

FY19 Annual Report

July 1, 2018 to June 30, 2019



Montgomery County, Maryland

DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

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List of Acronyms

≤	less than or equal to
≥	more than or equal to
§	Section
µS/cm	micro-Siemens per centimeter
ARP	Anacostia River Watershed Restoration Plan and Report
BIBI	benthic Index of Biological Integrity
BMP	best management practice
BOD	biochemical oxygen demand
CAST	Chesapeake Assessment Scenario Tool
CBLP	Chesapeake Bay Landscape Professional
CBP	Chesapeake Bay Program
CBT	Chesapeake Bay Trust
CCIS	County Coordinated Implementation Strategy
CD	consent decree
CFR	Code of Federal Regulation
CIP	Capital Improvement Program
CMAC	Continuous Monitoring and Adaptive Control
CMP	Clarksburg Monitoring Partnership
COMAR	Code of Maryland Regulations
COMCOR	Code of Montgomery County Regulations
County	Montgomery County
CPv	channel protection volume
CY	calendar year
DA	drainage area
DEP	Department of Environmental Protection
DEPC	Division of Environmental Policy and Compliance
DGS	Department of General Services
DHCA	Department of Housing and Community Affairs
DHS	Division of Highway Services
DOT	Department of Transportation
DPS	Department of Permitting Services
DSWS	Division of Solid Waste Services
DTS	Department of Technology Services
EMC	event mean concentration

EPA	U.S. Environmental Protection Agency
EPT	*Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), and *Trichoptera* (caddisflies) taxa
ESC	erosion and sediment control
ESD	environmental site design
FAP	Financial Assurance Plan
FFG	functional feeding groups
FIBI	fish index of biological integrity
FMD	Fleet Management Division
FOG	fats, oils, and grease
FY	Fiscal Year
GIS	geographic information system
HEC-RAS	Hydrologic Engineering Center River Analysis System
HOA	homeowners association
HSAF	Hotspot Assessment Form
I	Interstate
IA	impervious area/acreage
IBI	index of biological integrity
ICC	Intercounty Connector
ICPI PICP	Interlocking Concrete Pavement Institute - permeable interlocking concrete pavement
ID	identification
IDDE	illicit discharge detection and elimination
IPM	integrated pest management
ISR	impervious surface restoration
ISRP	Impervious Surface Restoration Plan
LID	low-impact development
LY	Levy Year
MC	mean concentration
MC311	Montgomery County Customer Service Center
MC-CBT	Montgomery County Chesapeake Bay Trust
MCPS	Montgomery County Public Schools
MD8DIG	Maryland's 8-Digit Watershed
MDA	Maryland Department of Agriculture
MDE	Maryland Department of the Environment
MEP	maximum extent practicable
mg/L	milligrams per liter
MNCPPC	Maryland National Capital Park and Planning Commission

MS4	Municipal Separate Storm Sewer System
MWCOG	Metropolitan Washington Council of Governments
N/A	not applicable
NGICP	National Green Infrastructure Certified Professional
NOI	notice of intent
NOV	notice of violations
NPDES	National Pollutant Discharge Elimination System
NR	not reported
NRDC	Natural Resources Defense Council
ºC	degrees Celsius
OCA	Office of the (Montgomery) County Attorney
PCB	polychlorinated biphenyl
Permit	Municipal Separate Storm Sewer System Permit Number 06-DP-3320 MD0068349
PM	preventive maintenance
POSWP	Public Outreach and Stewardship Work Plan
QA/QC	quality assurance/quality control
RCN	runoff curve number
RCP	Responsible Personnel Certification
RFP	request for proposal
ROW	right of way
SDE	spatial database engine
SEP	supplemental environmental project
SFR	single-family residence or residential
SHA	Maryland State Highway Authority
SM	standard method
SPA	Special Protection Area
SSO	sanitary sewer overflow
Strategy	Montgomery County Coordinated Implementation Strategy
SWFMP	Stormwater Facility Maintenance Program
SWM	stormwater management
SWPPP	stormwater pollution prevention plan
TKN	total Kjeldahl nitrogen
TMDL	total maximum daily load
TN	total nitrogen
TOC	time of concentration
TP	total phosphorous

TPH	total petroleum hydrocarbon
TSS	total suspended solids
µmho/cm	micromhos per centimeter
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WIP	watershed implementation plan
WLA	wasteload allocation
WMATA	Washington Metropolitan Area Transit Authority
WMOD	Watershed Management Operations Division
WQPC	Water Quality Protection Charge
WQv	water quality volume
WSSC	Washington Sanitary Sewer Commission
WTM	watershed treatment model
WVO	waste vegetable oil
WWTP	wastewater treatment plant

List of Appendixes

ATTACHMENT 1. COMPACT DISK WITH THE FOLLOWING ELECTRONIC FILES

Appendix A. Annual Report Databases MDENPDES19.accdb:
- Table A. GIS Storm Drain System Mapping Associated with GIS Shapefiles (Part III.C.1)
- Table B. Urban Best Management Practices Associated with GIS Shapefiles (Part III.C.2)
- Table C. Impervious Surfaces Associated with GIS Shapefiles (Part III.C.3)
- Table D. Watershed Restoration Project Locations Associated with GIS Shapefiles (Part III.C.5)
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- Table K. Quarterly Grading Permit Information Associated (Part III.E.2.c)
- Table L. Fiscal Analysis (Part III.I)

Appendix B. MDE Letter and Comments Approving the Strategy after review.
Appendix C. MCPS Report to the County on MS4 Activities in FY19. (Part III.B.5)
Appendix D. EPA MS4 inspection Findings and County Response
Appendix E. Implementing_ESD_Report_FINAL_110910.pdf
ESD - Zoning Code Analysis - Update March 28 2012.pdf
Appendix F. MDE STW Triennial Review and ESC Delegation Letters
Appendix G. FY19 Water Quality Cases
Documentation for Commercial and Industrial Surveys
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Appendix J. Detailed Watershed Restoration Project Tables
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Appendix L. NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek, 2009-2018
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DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System

Summary of Accomplishments July 1, 2018 to June 30, 2019

STORMWATER – WHAT'S THE PROBLEM?

As the County has become more developed, our natural landscapes have been replaced with asphalt, concrete, buildings, and roadways. Before development, water runoff from rain or snow melt was absorbed naturally into the soil or flowed over the ground to a nearby stream. Development has disrupted this natural water flow cycle.

Now, during rain and snow melt, this "stormwater runoff" flows across paved surfaces and picks up whatever is in its path: oil, litter, pesticides, fertilizer, leaves, animal waste, and more.

This polluted stormwater runoff then flows – often untreated – directly into streams and waterways, reducing water quality and damaging natural habitats.

Instead of filtering into the ground, stormwater runoff can also cause flash flooding and significant erosion, as well as damage to properties and infrastructure, as it flows over land or through storm drains to local streams.

WHAT'S THE SOLUTION?

Effective stormwater management:

- Improves the **quality** of stormwater runoff, by reducing the pollutants it carries to local waterways.
- Reduces the **quantity** of stormwater, by helping more of it soak into the ground.

Montgomery County manages multiple programs that assess and address impacts from stormwater and surface water pollution. By implementing a comprehensive stormwater management program, Montgomery County staff and agency partners work to protect and improve water quality in the County's streams and waterways.

A significant component of the County's stormwater program is its Municipal Separate Storm Sewer System (MS4) permit, a 5-year permit issued by the Maryland Department of the Environment (MDE).

This Summary of Accomplishments highlights progress the County has made between July 1, 2018 and June 30, 2019. It summarizes the fiscal year 2019 (FY19) Annual Report accomplishments toward meeting the requirements of the MS4 permit, as well as a summary of the impervious surface restoration achievements in FY19.

In FY19, the County completed restoration of 3,778 acres of impervious surfaces, fulfilling the terms of the April 2018 Consent Decree. On November 22, 2019, MDE notified the County that it had met all conditions of the Consent Decree, with the exception of this FY19 and FY20 Annual Reports. The County continued to implement restoration work following the completion of the 2010 permit restoration goal.

In FY19, the County completed restoration of 3,778 acres of impervious surfaces, fulfilling the terms of the April 2018 Consent Decree. The County continued to implement restoration work following the completion of the 2010 permit restoration goal.

A Best Management Practice is a device designed to temporarily store or treat runoff to mitigate flooding, reduce pollution, and provide other amenities. It is also known as a **stormwater management facility.**

RainScapes at the DEP Breewood Celebration

Other major accomplishments in protecting the County's streams between July 1, 2018 and June 30, 2019 include the following:

- After meeting the 2010 permit restoration goal, the County continued to implement the restoration program by completing 11 Capital Improvement Program (CIP) Projects; working with non-profits, watershed groups, and residents to implement 116 voluntary best management practice (BMP) grant and rebate-funded projects; and planting more than 2,400 trees.
- In FY19, Department of Environmental Protection (DEP) inspected 5,073 BMPs and ensured the preventive maintenance of 5,371 stormwater management BMPs.
- The Department of Permitting Services (DPS) continued to implement a highly effective erosion and sediment control (ESC) program by approving stormwater management plans, and ensuring environmental site design is implemented to the maximum extent practicable. In FY19, the County conducted more than 16,700 ESC inspections under this program, resulting in more than 500 enforcement actions.
- DEP continues to implement a highly effective illicit discharge detection program that includes public education and outreach, water quality investigations, and illegal dumping investigations. Water quality and illegal dumping complaints are reported through the County's call center for non-emergencies (MC311) or through DEP's website.
- DEP and the Montgomery County Department of Transportation (MCDOT) continue to coordinate with partners for trash removal programs. In FY19, 16,429 pounds of trash were removed from the Anacostia River Watershed.
- DEP's public education and outreach program continued to grow, reaching more than 34,000 attendees at 235 outreach events in FY19. DEP continued to expand the County's pet waste program, working with 21 communities and collecting 69% more pet waste (in pounds) than in FY18. The County's Stream Stewards program had 168 volunteers participate in 30 events and activities in FY19.
- DEP continued to focus on updating its data management procedures to add urban BMPs to the County BMP database, with 1,538 BMPs added in FY19, for a total of 14,575 facilities in the database.

Management Programs

Environmental Site Design (ESD) is a design strategy for maintaining pre-development runoff characteristics and protecting natural resources. ESD stormwater facilities integrate site design, natural hydrology, and smaller controls to capture and treat runoff. These practices include microbioretention, rain gardens, permeable pavement, and green roofs.

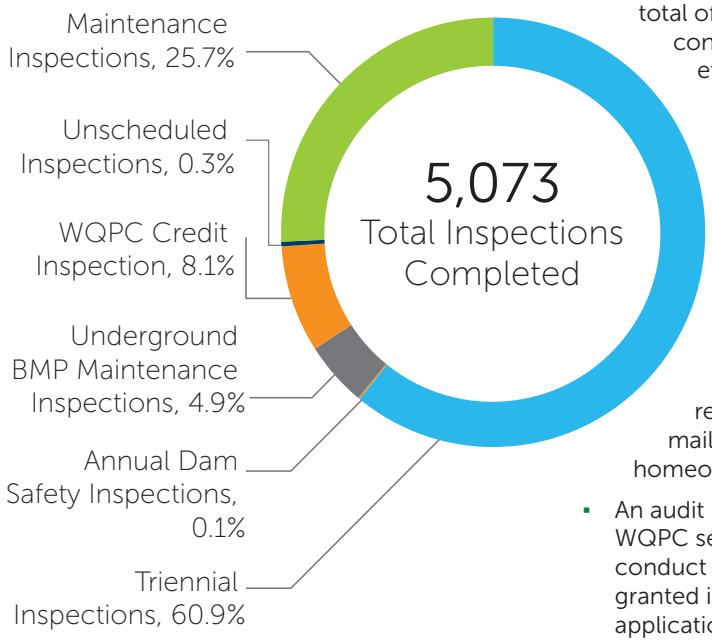
To control stormwater runoff and reduce pollution, the County implements a diverse set of management programs that target trash and litter reduction, stormwater facility maintenance and inspections, the detection and elimination of illicit discharges, and public outreach and education.

Stormwater Management Program – Inspection and Maintenance

DEP is responsible for the triennial inspection and ensuring preventive maintenance of 14,575 stormwater management facilities under the County's jurisdiction. DEP performs structural maintenance of 5,225 stormwater management facilities, of which more than 2,400 are privately owned and more than 2,800 are owned by the County, the public-school system, and the Maryland National Capital Park and Planning Commission. More than 9,300 facilities are privately owned and maintained. In FY19, DEP conducted 5,073 inspections.

Since 2010, DEP has added more than 8,000 facilities on public and private property, of which the majority are ESD (see definition in the box), more than doubling the County's BMP inventory in 9 years. DEP is also responsible for conducting triennial inspections of these facilities. Following are highlights of the inspection and maintenance program in FY19:

- In FY19, DEP inspected 639 ESD BMPs located primarily on non-residential and public property.
- In FY19, DEP hired the first of two new ESD program managers, responsible for maintenance of ESD on publicly owned properties. The second position will be advertised in FY20. The program will benefit from the leadership and focused

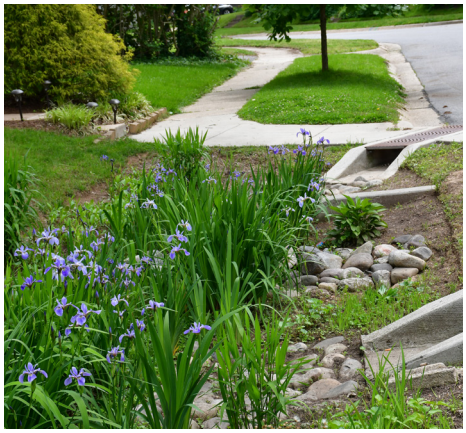


The Water Quality Protection Charge (WQPC) funds Montgomery County's stormwater management programs. The WQPC is assessed based on how much impervious area is on an owner's property, thereby contributing to stormwater runoff. WQPC credits are granted to property owners who install and maintain stormwater facilities on their properties to reduce and/or treat stormwater runoff.

attention of these full-time experienced ESD program managers.

- In Calendar Year (CY) 18, DEP modified its method of releasing inspection work to the inspection contractor. Previously, DEP released work monthly based on assigned preventive maintenance schedules. For CY19, DEP updated all asset preventive maintenance schedules so that all inspection work in each sub-region is released at one time, with a total of three work releases per year. This change gives the inspection contractor greater flexibility in scheduling work; thereby, increasing efficiency.
  - DEP previously developed and piloted a new online form for self-inspection of residential stormwater management facilities. The form is tied to the Water Quality Protection Charge (WQPC) credit. In FY19, 1,169 letters were sent to property owners with ESD BMPs. Of these, 171 completed the online inspection, resulting in 410 BMPs with approved WQPC credit inspections.
  - In FY19, DEP also developed a multi-faceted outreach and education program promoting the WQPC credit program to achieve more ESD facility inspections on single-family residence properties. The outreach program included postcard mailings, on-site credit application processing, and outreach to homeowners associations.
- An audit effort to verify the maintenance conditions of assets in the WQPC self-inspection program was initiated in FY19. The goal was to conduct annual audits of 20% of the approved applications for credits granted in the prior Levy Year (LY). Twenty percent of the approved applications from LY16, LY17, and LY18 were selected for audit (85 properties with 369 BMPs). Of these, 15 properties were not available for inspection, resulting in audits of 327 BMPs on 70 properties.
- DEP conducts other maintenance inspections to ensure that facilities are functioning properly and that preventive maintenance is being conducted as required by the permit. In FY19, DEP staff conducted 1,570 unscheduled maintenance inspections.
- In FY19, DEP and the inspection contractors developed a green roof inspection procedure that addresses access and notification issues that previously precluded inspection of private green roofs. As a result, green roofs will be scheduled for inspection in 2021.

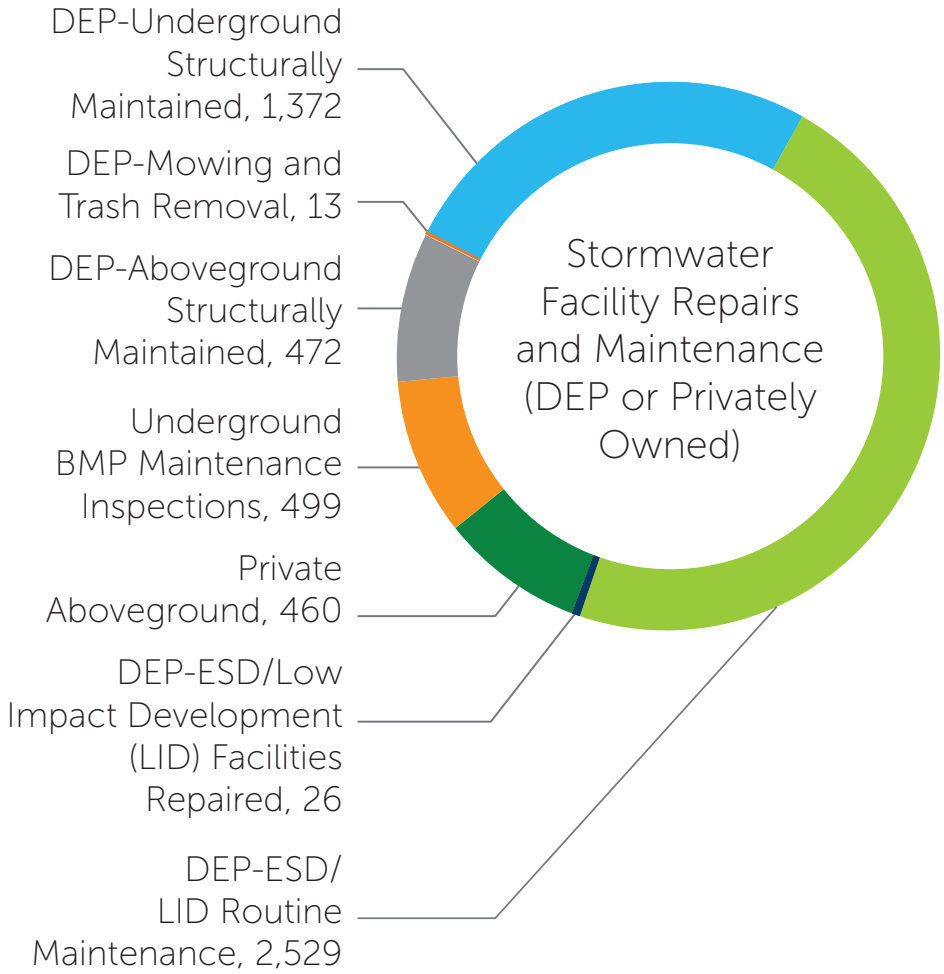
BMP in Franklin Knolls



BMP along Dennis Street

BMP at Rosa Parks Middle School

Stormwater Facility Repairs and Maintenance (DEP or Privately Owned)



In addition to inspections, the DEP stormwater facility maintenance program oversees structural and non-structural maintenance of all stormwater management facilities under the County's jurisdiction. In FY19, 5,371 facilities were maintained, either by DEP contractors or by the facility owner. All maintenance was performed under the guidance of DEP inspection staff.

In FY19, DEP renovated two ESD sites, Holiday Park Senior Center and Germantown Indoor Swim Center. Both have high public visibility and needed plant replacement to improve function and aesthetics. The extensive effort involved installing thousands of native plants to benefit local pollinators. The renovation was also done to positively affect County residents who encounter these gardens with visual beauty and psychologically connecting them to nature. Redesign included replanting native vegetation with more controlled growth habits, adding evergreen plants to achieve four seasons of interest, and reducing maintenance with a better ratio of shrubs, herbaceous perennials, grasses, and a ground cover layer.

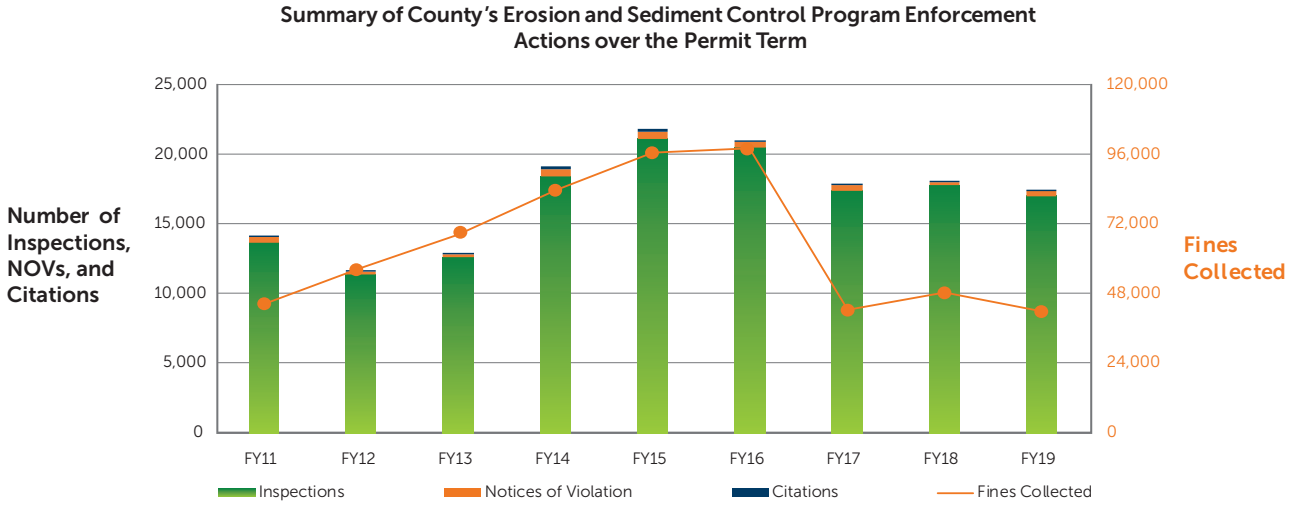
Holiday Park Senior Center before redesign

Holiday Park Senior Center after redesign with better plant ratio

Erosion and Sediment Control

The DPS implements an erosion and sediment control program designed to reduce pollutants during construction of new developments and redevelopment. County staff review permit applications, inspect erosion and sediment control practices, issue notices of violations, and collect fines.

MDE continues to evaluate the County's erosion and sediment control program and found it to comply with the permit. No additional improvements to the program are required.



Illicit Discharge Detection and Elimination

The County implements an inspection and enforcement program to ensure that anything other than stormwater that discharges to the MS4 is either permitted or eliminated.

Outfall Screening: DEP staff investigate all dry-weather discharges (non-stormwater) that are determined by field-testing to be polluted. These "illicit discharges" are then tracked to their sources and eliminated. In FY19, DEP screened 153 outfalls, of which 85 were new outfalls that were previously not mapped in the inventory, and 51 had dry-weather flows.

Of the 51 outfalls with dry-weather flows, 9 were found to have suspicious discharge that required follow-up investigation. Follow-up inspections conducted at 6 of the 9 observed no further suspicious discharge. One of the 9 sites was issued a notice of violation and fine, and 2 sites required further investigation. The remaining 42 outfalls that had dry-weather flows during the initial visit did not exhibit abnormal water chemistry parameters, visual characteristics, odor issues, or unusual vegetative growth and were, therefore, classified as groundwater discharge.

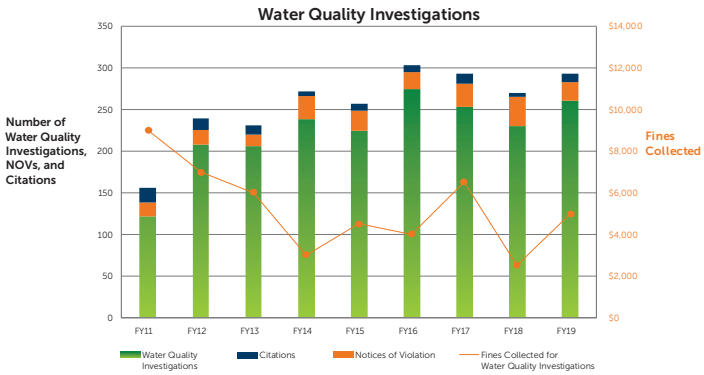
From FY11 to FY19, DEP staff assessed 1,498 outfalls by walking the entire reach of waterbodies in four sub-watersheds, capturing most of the existing outfalls in each drainage area. DEP is targeting smaller watersheds with the highest percentages of commercial and industrial areas to identify and eliminate pollutant sources in those areas.

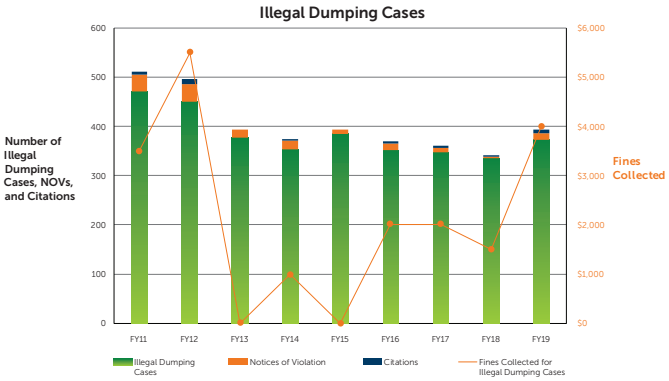
Commercial Industrial Surveys: DEP conducts annual hotspot surveys of properties in different commercial and industrial areas of the County. In FY19, DEP performed 48 hotspot surveys, resulting in the issuance of 2 citations, 2 notices of violation, 3 warning letters, and 5 verbal warnings.

Enforcement: DEP implements a highly effective enforcement program that has successfully eliminated discharges reported by the public. Water quality and illegal dumping complaints are reported through the County's call center for non-emergencies (MC311) or through DEP's website (https://www.montgomerycountymd.gov/DEP/contact/illegal-dumping.html).

In FY19, the County investigated 260 water quality issues, 194 complaints, 36 sanitary sewer overflows, and 30 hazardous materials-related cases. These investigations resulted in 39 warning letters and 33 formal enforcement actions (10 civil citations totally $5,000 and 23 notices of violation.)

During FY19, there were 373 complaints concerning illegal dumping of solid waste, resulting in 20 formal enforcement actions (7 civil citations with fines totaling $4,000 and 13 notices of violation) and numerous warning letters.





Holiday Campaign Gift Greener Ad

"Lift Up White Oak" community outreach campaign

Goshen Road and Odendhal Community Cleanup June 2019

Trash and Litter

The County actively participates in multiple programs and partnerships designed to meet the goals of the Potomac River Watershed Trash Treaty and the 2010 Anacostia Total Maximum Daily Load (TMDL). Initiatives directly related to regional campaigns include ongoing education and outreach for recycling and litter reduction, mass media outreach campaigns, and litter removal from streets, stormwater ponds, and transit stops.

In FY19, DEP continued to increase its outreach efforts for the County's Carryout Bag Tax by distributing approximately 50,000 reusable bags to community members. Bags were distributed at events, stocked at every County public library, and distributed through the County's partnership with Manna Foods. To combat the annual spike in the use of disposable bags during the holidays, DEP launched a holiday campaign in 2018 to promote reusable bag use when shopping for gifts. This holiday campaign is credited with the significant increase in the number of reusable bags distributed.

In FY19, the County continued to focus on trash removal in the Anacostia Watershed. DEP is actively installing and retrofitting BMPs that collect trash, which DEP then removes. DEP also sponsors volunteer cleanups. Together, these efforts removed 16,429 pounds of trash from the Anacostia River Watershed in FY19.

DEP continues to monitor trash in the Anacostia Watershed to measure trash reduction efforts. In FY18, DEP began developing a community-based social marketing outreach campaign in the White Oak neighborhood, selected from the Anacostia monitoring sites as the neighborhood with the highest recorded trash in the stream. Baseline monitoring was conducted, and the outreach and campaign messaging was pilot-tested with focus groups. After the campaign has been finalized and implemented in this community, DEP will repeat the same observation surveys in White Oak to assess the campaign's effectiveness in discouraging littering and encouraging proper trash disposal. The campaign launched in September 2019 and data from pre- and post- monitoring will be reported in the FY21 annual report.

In FY19, DEP continued to work with active community groups to support and expand local cleanup efforts particularly in the Anacostia watershed. The DEP supported 10 volunteer cleanups. Volunteers removed more than 4,513 pounds of trash, of which 3,235 pounds came from within the Anacostia Watershed and 1,278 pounds came from cleanups in other watersheds.

Property Management

All County agencies that operate maintenance facilities must comply with the general permit for stormwater. The County's 11 facilities and the Montgomery County Public Schools' 6 facilities maintain a stormwater pollution prevention plan and implement good housekeeping, such as routine sweeping. County facilities are inspected monthly and stormwater outfalls on the sites are inspected quarterly. Annual training is delivered to all facility operation employees, including ways to minimize the use of hazardous substances, pollutants, and contaminants and prevent their exposure to precipitation and stormwater runoff.

Road Maintenance

Each year, tons of pollutants are prevented from entering the County's streams by street sweeping and cleaning storm drain pipes and inlets. MCDOT and DEP jointly oversee the street sweeping program. MCDOT sweeps 56 residential routes at least once per year. Nineteen of these are "priority" residential routes based on the average tons of material collected per curb mile, lack of adequate stormwater management, and location in a watershed with a water quality impairment from sediment.

The remaining 37 MCDOT-swept routes are considered "non-priority" residential routes and are generally swept once per year. Some residential roads in rural areas (western and northern) of the County are not swept because the relatively low amount of vehicle traffic and the lack of curbs in these areas make street sweeping impractical. As in past years, more material was collected during FY19 from the priority areas (0.30 tons/curb mile) than the non-priority areas (0.20 tons/curb mile). The total amount of residential route material collected during FY19 (950.4 tons) was the most since FY15 (1,266 tons) and 39% more than the average for FY16 through FY18 (686 tons).

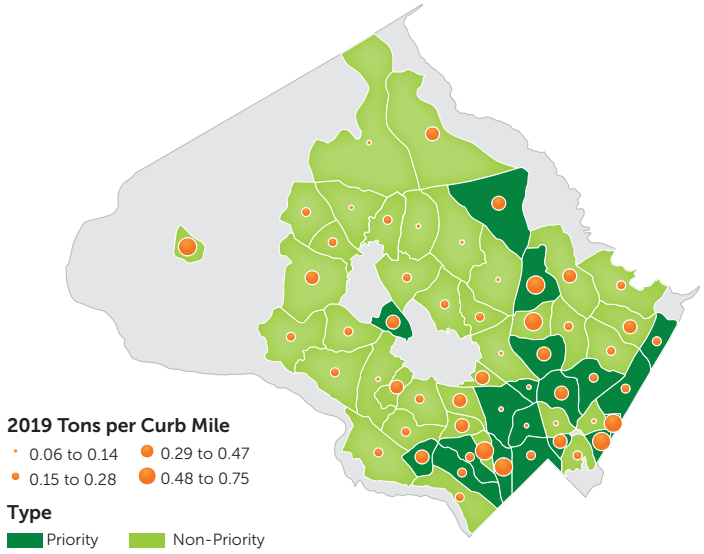
In FY19, DEP also swept arterial routes 21 times. Approximately 68% of the mileage swept helps maximize the environmental benefits in the Rock Creek and Anacostia River Watersheds, which have pollution limits for sediment and phosphorus. In FY19, DEP swept 6,202 curb miles of roadway and collected 836 tons of material, a 4% increase from the 803 tons of material collected in FY18.

In addition, MCDOT removes material from inlets and storm drains using a vacuum truck or manual labor. The amount of material collected is converted to equivalent impervious acres. In FY19, 173 tons of material were removed from inlets and storm drains.

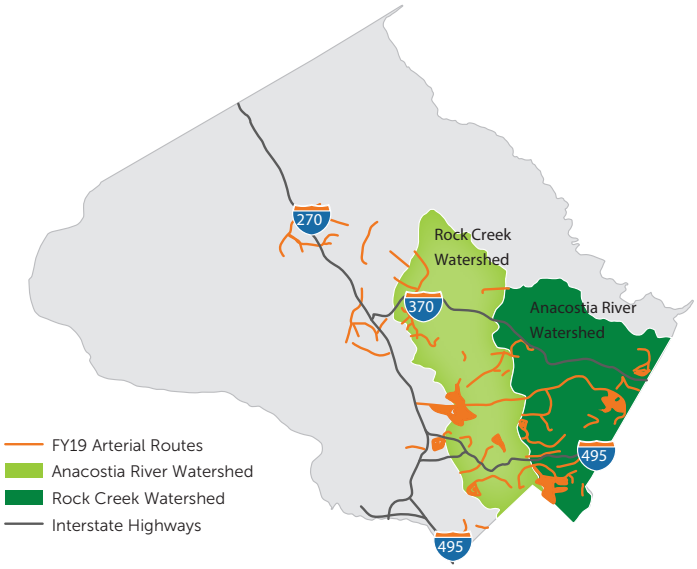
The road maintenance program also includes minimal use of herbicides and no fertilizers for roadside vegetation management.

In addition, de-icing materials (sand, salt, and salt brine) are carefully tracked to improve salt use management. In FY19, the snowfall total was 28 inches, which is higher than the snowfall totals of 16.1 inches in FY18 and 6.36 inches in FY17, but low compared with the snowfall total of 40.35 inches in FY16. A moderate amount of salt (57,692 tons) was used in FY19 due to the significantly increased use of salt brine (500,000 gallons) used to treat 8,000 lane miles.

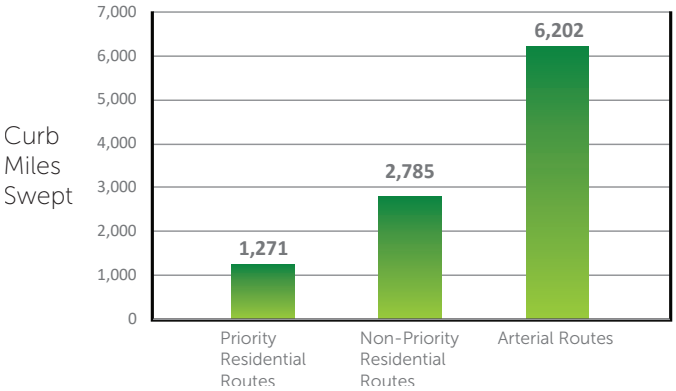
County-wide Street Sweeping – Tons of Material Collected per Curb Mile



Montgomery County Arterial Street Sweeping Routes



Summary of County's FY19 Street Sweeping Program



Areas of Significant Social Media Increases in FY19

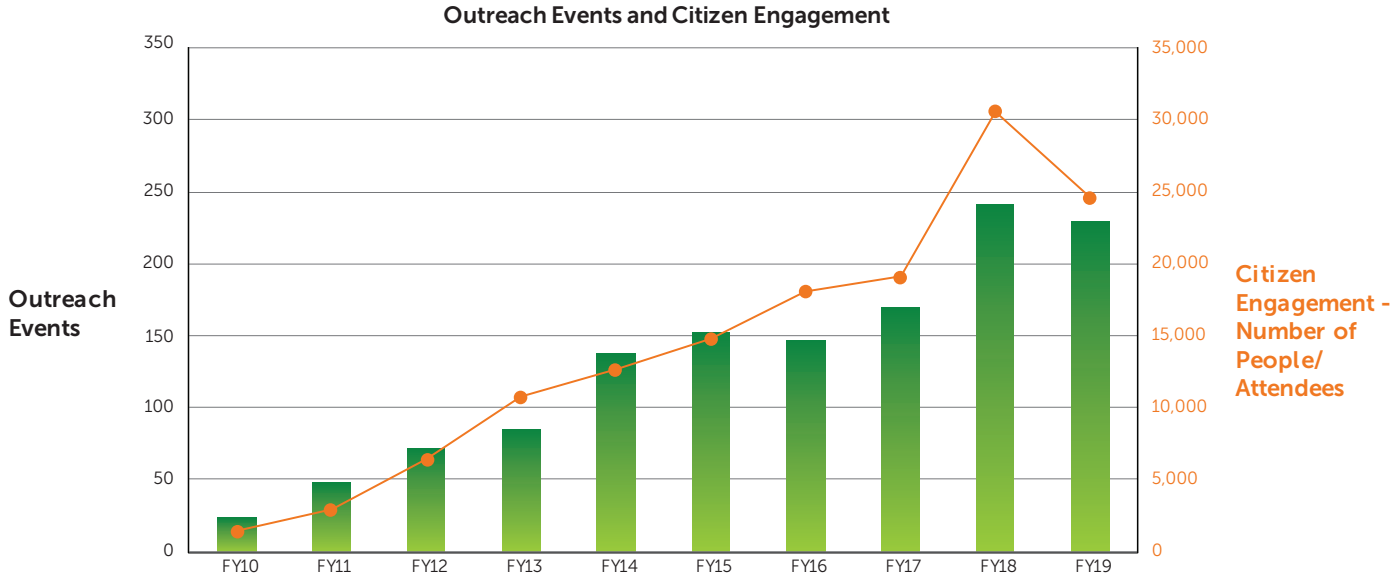
Activity/Communication Mechanisms	Percent Increase
Facebook followers	43
Twitter followers	23
Instagram followers	242
Twitter engagement	142
Facebook impressions	181
Twitter impressions	98
Instagram impressions	100
Blog submissions	3
My Green Montgomery e-newsletter subscribers	20
You Tube videos	63
You Tube subscribers	21

Public Education and Outreach

The County continues to implement a robust public education and outreach program designed not only to meet permit requirements, but also to increase local awareness of stormwater management benefits and to bring associated behavior changes. DEP is exploring ways to better quantify pollutant reductions associated with behavior changes related to public education and outreach.

Following are highlights of the FY19 public education and outreach program:

- **Outreach Events** – DEP hosted or participated in 235 outreach events with more than 34,500 attendees reached by stormwater outreach activities, representing a 13% increase in attendance over FY18. Most outreach activities continue to focus on the Anacostia River and Rock Creek Watersheds, following the intent of the outreach strategy.
- **Social Media** – In FY19, the My Green Montgomery online educational portal (http://www.mygreenmontgomery.org) continued to be used as the news and communication arm of the DEP. During the year, 116 blogs were posted on the website. The DEP now has 1,793 Facebook followers, 2,083 Twitter followers, and 595 Instagram followers. Water-focused content was featured on all platforms throughout FY19. Water-specific campaigns were launched for reducing plastic bag usage during the holidays and restoration programs. In celebration of Chesapeake Bay Awareness Week in June and National Water Quality Month in August, strategic emphasis was placed on water-related activities, including photos, facts, and live updates. RainScapes project photos were also shared on Pinterest.
- **Newsletters** – The My Green Montgomery monthly e-newsletter continued to use the govdelivery platform in FY19 and recorded a 20% increase in subscribers over FY18. The quarterly *RainScapes Gazette* and the *RainScapes Gazette for Landscape Professionals (Pro Gazette)* continued



	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Outreach Events	20	49	71	82	140	150	148	172	243	235
Citizens Engagement	1,453	2,935	6,400	10,800	12,639	14,798	18,019	19,159	30,554	24,590

to reach and update a broad range of County and regional subscribers. There are currently 4,797 *RainScapes Gazette* subscribers and 2,852 *Pro Gazette* subscribers. FY19 numbers represent an increase from FY18 by 8% for the *RainScapes Gazette* and 14% for the *Pro Gazette.*

- **Pet Waste Management** – Since DEP initiated a pet waste pilot program in FY14 to help reduce bacterial levels in watersheds, 32,371 pounds of dog waste have been collected in 120 pet waste stations. In FY19, DEP worked with 21 communities to remove pet waste from the watershed and assist in meeting bacteria TMDLs. More than 12,800 pounds of pet waste were removed through 78 pet waste stations, serving 11,606 county residents. The pet waste stations prevented 134.5 trillion fecal coliform bacteria, 741.3 pounds of nitrogen, and 96.6 pounds of phosphorous from potentially entering local streams. Of the 78 pet waste stations maintained, 22 stations were installed in FY19 and 56 stations were installed in FY18. Of the ones installed in FY18, 54 stations were adopted. Only one graduating community decided against keeping two stations. In addition, more than 700 pet waste yard signs (400 in English and 300 in Spanish) were distributed.
- **GreenFest** – DEP and 13 community partners collaborated to conduct the fifth annual GreenFest, held at Brookside Gardens in Silver Spring in conjunction with Brookside's Earth Day event. Combining these events proved to be quite successful, as approximately 4,000 residents attended to learn how to "green" their lives. This represents a 233% increase in attendance from FY18. Overall, 2019 was the most successful GreenFest to date.
- **CIP Elements Focused on Outreach and Training –** On June 8, 2019, nearly 10 years since the effort first began, a group of residents joined dignitaries from Montgomery County government, Metropolitan Washington Council of Governments, Friends of Sligo Creek, and Northwood Presbyterian Church to celebrate the completion of the Breewood Watershed Restoration Project that provides cleaner water for current and future resident of Montgomery County to enjoy.
- **Stream Stewards** – The Stream Stewards program promotes champions for neighborhood streams and increases community involvement in stormwater awareness and watershed protection. Activities include watershed ambassadors and keepers, volunteer cleanups, storm drain art, and participation in trainings and volunteers contributed a total of 983.5 hours of service in FY19.

Pet waste yard sign placed in a residential area

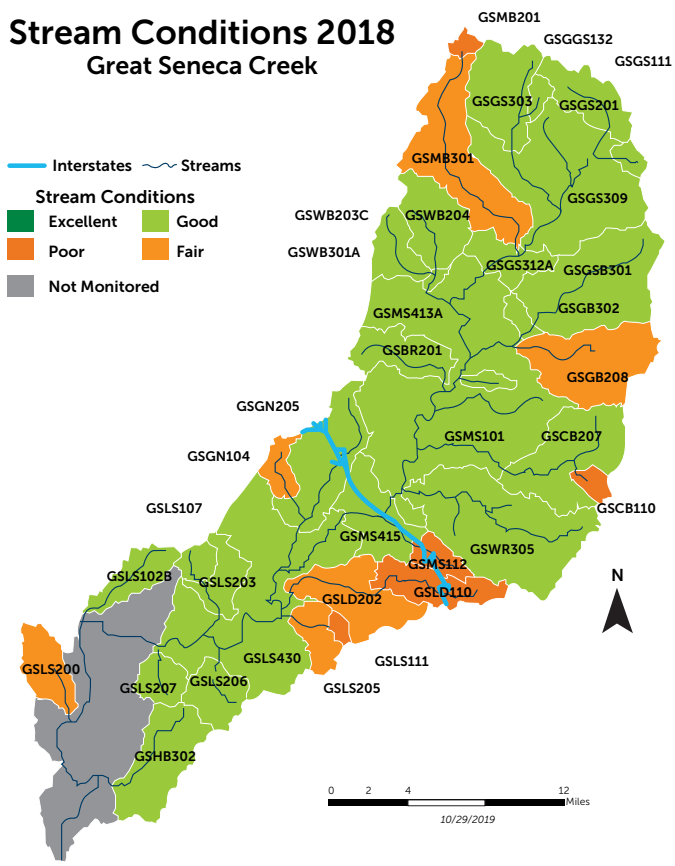
Residents participate in the Stream Maze at the 5th annual Greenfest

County Executive Marc Elrich addressed the crowd

Residents on a walking tour of the Breewood Watershed

Volunteers painted 9 new storm drains in FY19

Residents listen to speakers and learn about the Breewood watershed project



DEP stream monitoring interns and staff conducting fish sampling

Watershed Assessment

In accordance with the MS4 permit, the County has systematically assessed water quality within all of its watersheds, identified water quality improvement opportunities, and developed implementation plans to control stormwater discharges. DEP is currently implementing those plans as part of the County's MS4 program.

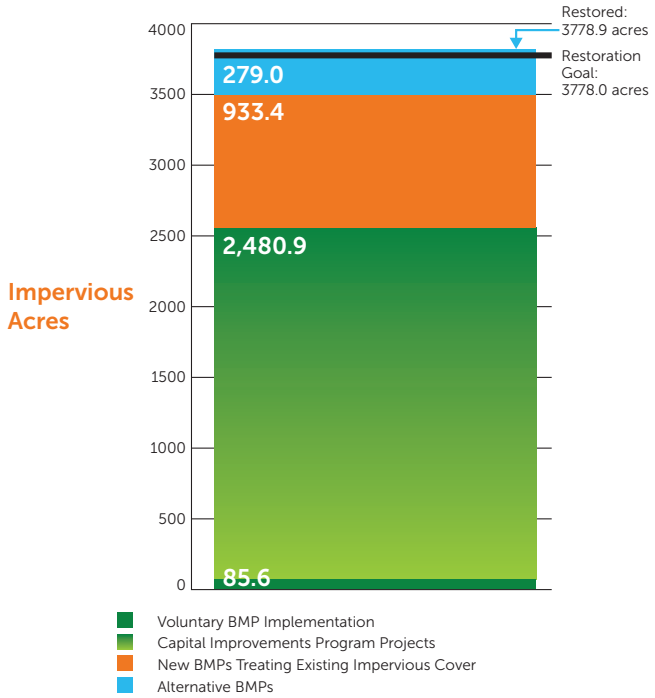
Watershed Screening

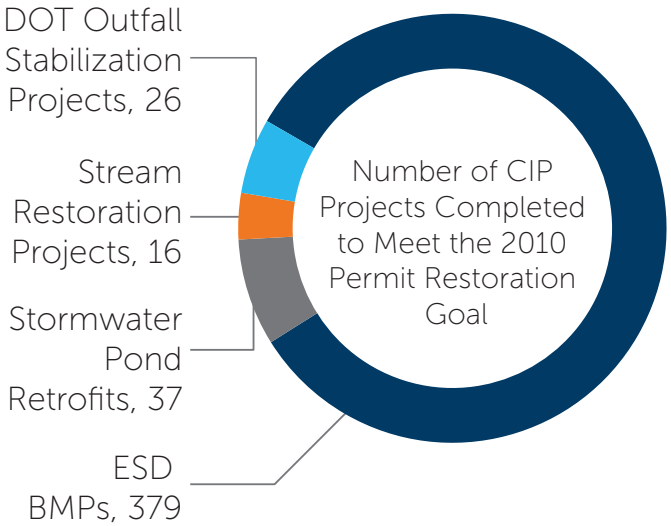
DEP's Stream Monitoring Team monitors the aquatic biological community (fish and benthic organisms) and stream habitat conditions at representative stations in all County watersheds on a rotating basis over a 5-year cycle. Monitoring results enable the County to assess watershed health and changes over time. DEP also adds randomly selected monitoring stations within each watershed to help assess watershed-wide stream conditions. DEP's full 5-year cycle of baseline watershed conditions from 2011 to 2015 is available as an interactive map at: https://www.montgomerycountymd.gov/water/streams/watershed-health.html. This map allows users to examine the health of more than 150 sub-watersheds in the County by zooming in or searching by address.

In 2018, DEP conducted stream monitoring in the Great Seneca Creek sub-watersheds, with the exception of two main tributaries (Dry Seneca and Little Seneca, which were monitored in 2019 and will be included in the FY20 Annual Report.) Overall conditions are Good at 70% of sites, Fair at 16%, and Poor at 14% of sites within the Great Seneca Watershed. No stations are rated Excellent. Benthic scores are rated Fair at all mainstem stations except for the most upstream one. These larger stream sections generally provide preferred fish habitat such as deeper pools and more woody debris, increasing fish scores and increasing overall conditions. Riffles, habitat preferred by benthic macroinvertebrates, may be limited by the deeper waters or not represented in the station due to the lower frequency of larger order streams.

Ratings of Great Seneca Creek's tributaries are more varied. Tributaries with Poor and Fair ratings tend to drain highly urbanized areas such as Magruder Branch, downstream of Damascus and Long Draught Branch, downstream of Gaithersburg. One exception is on an unnamed tributary in the Lower Great Seneca Watershed that is rated Fair. Aerial photos show a site with a limited riparian buffer in an agricultural area. Most tributaries surveyed are rated Good and, like the mainstem stations, are influenced by high fish scores. Only two stations had fish ratings below 64%. Conversely, 21 stations (57%) had benthic ratings below 64%. Lower benthic ratings may be a result of prolonged impacts from runoff and high flows. Benthics are not as mobile as fish, limiting their ability to recolonize an area after these events; this is supported by reviewing aerial photography of the watershed. The Middle Great Seneca area is the most urbanized, thus having greater runoff resulting in only 1 station having a benthic rating above 64% (75%).

County Projects and Alternative BMPs Implemented to Meet the 2010 Permit Restoration Goal





Watershed Restoration

The County's MS4 area comprises 25,119 impervious acres, with 6,230 controlled to the maximum extent practicable by the end of the previous permit (2009). The current permit requires the County to restore 20% of the remaining uncontrolled impervious acres, which translates to an additional 3,778 acres.

In FY19, the County completed the remaining restoration projects needed to meet the permit restoration goal of 3,778 impervious acres.

On October 1, 2019, the County submitted a Revised Final Consent Decree Completion Report to MDE, showing that, as of December 28, 2018, the County had completed restoration of 3,778.9 impervious acres. On November 22, 2019, MDE notified the County that, based on a review of information in the report and with the exception of this FY19 and the FY20 Annual Reports, **all conditions of the Consent Decree have been met**. The Office of the County Attorney then worked with the Assistant Attorney General to file a satisfaction of judgment with the court, and an order terminating the Consent Decree was signed on December 30, 2019, officially closing the enforcement action.

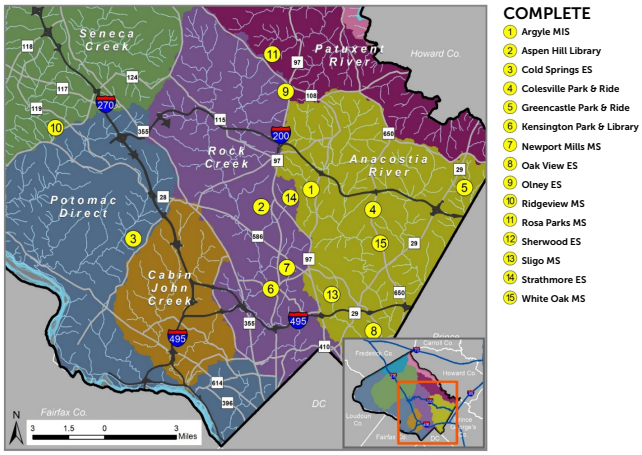
In the first half of FY19, the DEP's CIP, with help from Agency Partners, completed construction of six BMPs treating 60.3 acres of impervious area.

The County met the permit watershed restoration goals through implementation of the following types of projects:

- **Green Streets** - The County implemented one of the first Green street programs in the state, installing 328 green street BMPs in 9 neighborhoods and restoring 73.5 impervious acres. Green street BMPs not only capture stormwater, but also create aesthetically attractive streetscapes, provide natural habitats, and help visually connect neighborhoods, schools, parks, and business districts. (https://www.montgomerycountymd.gov/water/restoration/green-streets.html)

Left to right: Dennis Avenue, Green Castle Park and Ride

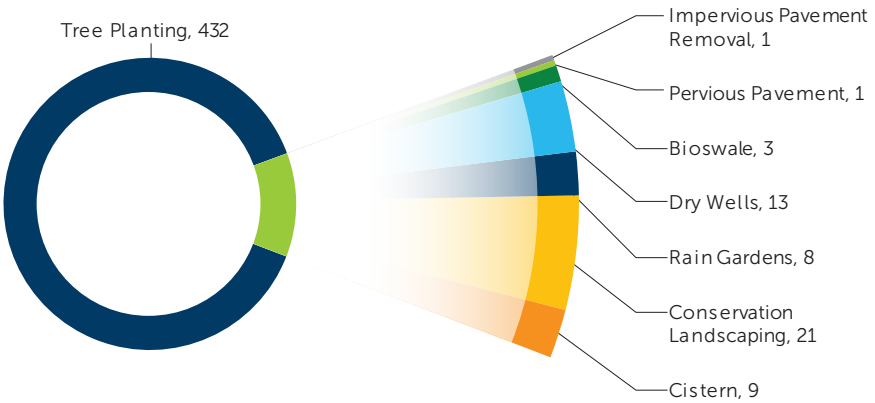
Montgomery County Government Facilities *(July 2019)*



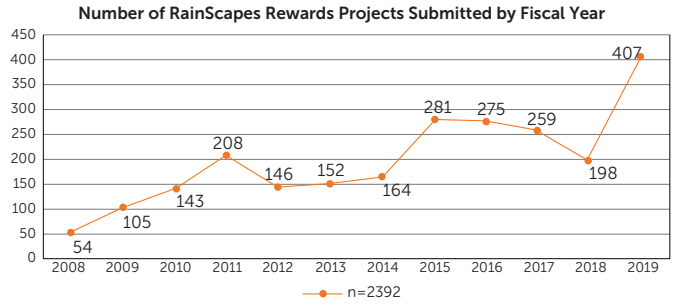
Participants of all ages participated in stormwater outreach activities during events targeted towards the Montgomery County LatinX Community under a Chesapeake Bay Trust grant

- **Public Property BMPs** – During FY19, DEP continued to design and implement stormwater management projects on public property including school grounds, libraries, parking lots, and community centers. These projects are used to help teach people about the benefits of stormwater management. In FY19, DEP completed three ESD projects at Olney Elementary School. The projects were used to satisfy the supplemental environmental projects requirement of the Consent Decree; no impervious area credit was taken. Sometimes during an ESD project, additional benefit is achieved by installing underground water quality treatment systems. These facilities are especially useful in highly urbanized areas where space for stormwater controls is extremely limited. The County installed 45 ESD practices and 4 underground water quality treatment systems on public property, treating more than 19.3 impervious acres to meet the 2010 permit restoration goal.
- **Stormwater Pond Retrofits** – In FY19, DEP retrofitted 3 stormwater ponds, providing treatment for an additional 60.3 impervious acres. The County has retrofitted 36 stormwater ponds and installed 1 new pond, treating a combined total of 1,213.2 impervious acres to meet the 2010 permit restoration goal. In addition, 5 pond retrofits treating 205.7 impervious acres are being carried forward to the next permit as a result of the increase in stream restoration credit. Stormwater pond retrofits have focused on the ponds located in the Anacostia River, Rock Creek, and Seneca Creek Watersheds. These retrofits include native planting, wetland planting, and native trees to provide ecological habitat benefits.
- **Stream Restoration Projects** – To date, the County has completed 16 stream restoration projects, restoring almost 30,000 linear feet of stream and 896.3 impervious acres to date. Stream restoration projects are focused in the Anacostia River, Rock Creek, and Seneca Creek watersheds.
- **Community-based Restoration Watershed Grants** – DEP administers a watershed grant program through the Chesapeake Bay Trust. More than $1.7 million in grant projects have been funded using the Chesapeake Bay Trust to administer the grants. FY19 marked the fourth time that grants were funded to non-profits through the water quality protection charge funds. Nine grants were funded this fiscal year,totaling 39 grants since inception.These grants have funded the installation of 59 BMPs,treating 7.1 impervious acres.

Community-Based Restoration Projects Implemented to Meet the 2010 Permit Restoration Goal

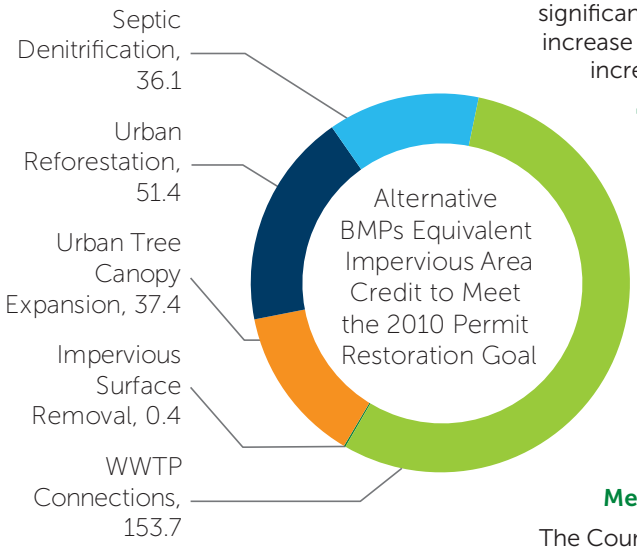


Twitter post on the increase in RainScape rebates



- **RainScapes Program** – DEP implements a RainScapes program to promote and implement environmentally-friendly landscaping and small-scale stormwater management projects on residential, institutional, and commercial properties and offers technical and financial assistance. RainScapes Rewards provides rebates to property owners who install qualified small-scale stormwater projects. The RainScapes program has treated 55.4 impervious acres in the County to meet the 2010 permit restoration goal from the implementation of rain gardens, rain barrels, cisterns, conservation landscaping, pavement removal, and permeable pavement. The 55.4 acres have been achieved by a combination of Rewards Rebates, demonstration projects installed by DEP RainScapes on neighborhood and publicly-accessible properties, and curricular projects at Montgomery County Public Schools. In total, 1,477 RainScapes projects have reduced runoff to meet the 2010 permit restoration goal.

  The program has grown in popularity over the years. Rebate amounts were significantly increased in November 2018, and both the program and the increase in rebates were publicized. In FY19, 407 projects were submitted, an increase of 205% in applications, and 92 projects were rebated.



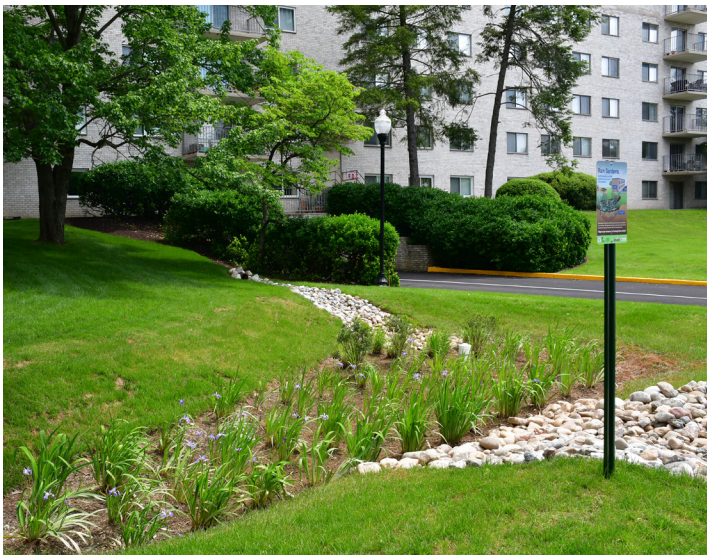
- **Alternative BMPs** – Alternative BMPs provide water quality benefits that give the County additional methods to meet restoration requirements. These types of BMPs include removing impervious surfaces, connecting septic systems to wastewater treatment plants, cleaning catch basins and storm drains, and sweeping streets. Two alternative BMPs that have been implemented extensively by the County are Urban Tree Canopy Expansion projects, which provide credit for every new individual tree planted in developed areas, and Urban Reforestation projects, which are implemented in urban or suburban areas with the intent of establishing forest ecosystem processes. A total of 279.0 acres were treated with alternative BMPs to meet the 2010 permit restoration goal.

Meeting the Consent Decree

The County submitted its Final Consent Decree Completion Report to MDE on February 15, 2019. The report showed that the County had completed the Impervious Surface Restoration Plan required by the 2010 permit ahead of the Consent Decree schedule, having inspected the completion of all projects needed to restore 3,778 acres of uncontrolled impervious surfaces to the maximum extent practicable. On April 30, 2019, MDE released updated guidance, tripling the equivalent impervious acre restoration credit for stream restoration practices outside of the Coastal Plain. The County applied this new guidance to the projects completed for the 2010 MS4 permit and submitted a Revised Consent Decree Completion Report on October 1, 2019. The new guidance allowed the County to replace annual practices with permanent BMPs and to carry 22 completed projects (8 ponds and 14 ESD) forward to meet the next permit restoration goal, thereby bringing the total impervious acres restored by the County to 3,778.9 acres. MDE approved the revised report on November 25, 2019. The Office of the County Attorney then worked with the Assistant Attorney General to file a satisfaction of judgment with the court, and an order terminating the Consent Decree was signed on December 30, 2019, officially closing the enforcement action.

Upstream View of Sligo Creek, Breewood Tributary, Study Area 1, Pre-Restoration (2013)

Upstream View of Sligo Creek, Breewood Tributary, Study Area 1, Post-Restoration (2013)



BMPs installed at University Towers

Assessment Of Controls

Watershed Restoration Assessment

The permit requires the County to assess the effectiveness of its stormwater management program and control measures using pre-restoration and post-restoration watershed monitoring, which includes chemical, physical, and biological monitoring. DEP targeted the Breewood Tributary in the Anacostia Watershed for comprehensive watershed restoration and assessment efforts.

As of FY19, DEP has completed the Breewood Tributary Water Restoration Project. This project installed and restored the following:

- 11 ESD practices along residential roads
- 3 RainScapes projects on individual residential properties
- 1,200 linear feet of stream restoration
- 12 ESD practices at University Towers Condominiums
- 1 ESD practice at the Northwood Presbyterian Church

The Breewood Tributary Restoration Project is designed to quantify the changes in both water quality and water quantity resulting from comprehensive watershed restoration efforts. The project will also provide valuable information regarding how long it takes after completion of restoration projects for benefits to be seen in stream. Benefits of watershed restoration include stabilized streambanks, reduced pollutant load, reduced flooding, and improved ecological health.

Monitoring the Breewood Tributary Watershed is intended to generate information on the effectiveness of an intensive watershed restoration in improving water quality and stream conditions. The study design focuses on comparing conditions before the project with conditions after the completion of restoration efforts. Monitoring of the watershed began in 2009. Various projects were installed from 2014 through 2018. During this period, data collected reflect transitional conditions and construction impacts. Beginning in 2018, the data provide information on the completed watershed restoration. These data can be compared with data collected between 2009 and 2014 to evaluate the effectiveness of the overall effort. Data will continue to be collected for multiple years to create a robust data set that will permit a conclusive evaluation of the impacts of this project.

Stormwater Management Assessment

The permit requires the County to assess the effectiveness of stormwater management practices found in the Maryland Stormwater Design Manual for stream channel protection. DEP monitors the developing Newcut Road neighborhood tributary to the Little Seneca Creek "test" area in the Clarksburg Special Protection Area and compares results with those from the undeveloped Soper's Branch, Little Bennett sub-watershed "control" area to evaluate the effectiveness of the design manual criteria in protecting the stream channel.

Results of biological, physical, and hydrologic monitoring indicate the stream channel in the test area may still be in a state of flux as the system responds to the new development. Preliminary results indicate that the change in land use from agricultural to residential has impacted the test area causing instability (erosion) in the stream channel. The streams will remain unstable as they

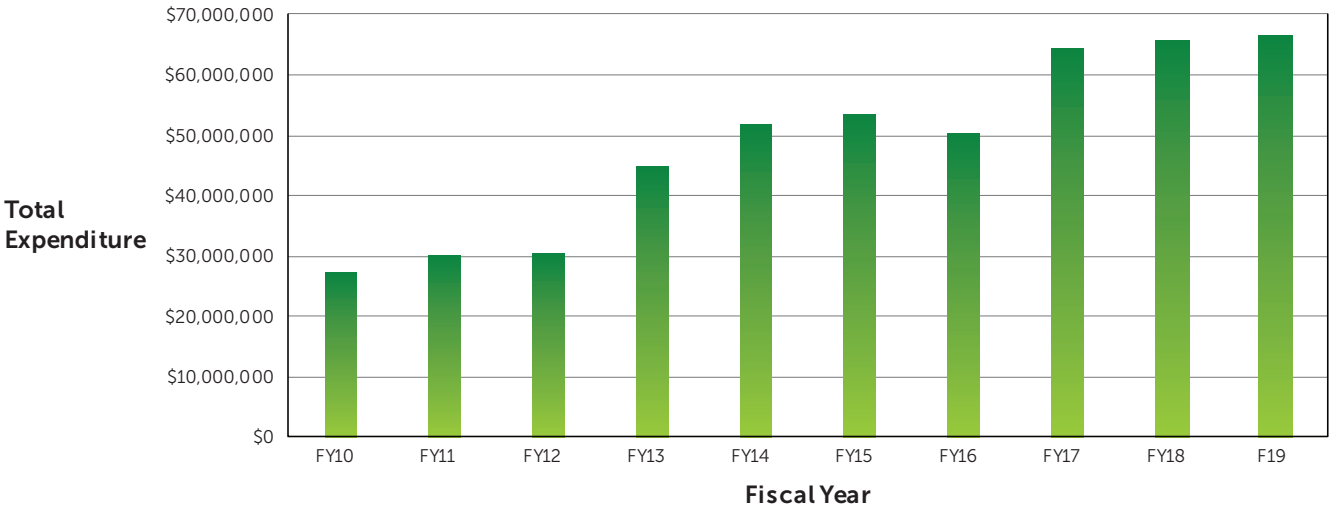
adjust to receiving more runoff at a faster rate from impervious surfaces in the newly developed area.

Program Funding

The County has demonstrated its commitment to meet stormwater initiatives by investing more than $129 million in CIPs and more than tripling its WQPC funding over the permit term.

Total expenditures for all programmatic measures, including personnel and CIP costs, have increased substantially through the permit term, except in FY16, when legal challenges against the WQPC limited expenditures. During FY19, the total expenditures associated with permit requirements were $66,648,765, an increase of 1.5% over the permit expenditures in FY18. Highlights of the stormwater management budget include continuing the planning and implementation of stormwater management projects, public outreach, stream monitoring, and other actions needed to comply with the County's MS4 permit. Expanding the use of public-private contracts

Total Expenditures for MS4 Related Programs by Fiscal Year



and partnerships through a new CIP will help the County meet permit goals in a more cost-effective manner.

In FY19, the County applied for low-cost financing through the Maryland Water Quality Revolving Loan Fund, which will be secured by the WQPC. Through this loan program, the County stands to save an estimated $22 million in financing costs, over the life of the loans, as compared with traditional bond funding. On December 20, 2019, the County closed on two loans to fund two restoration projects that will be used for MS4 restoration credit anticipated for the next MS4 permit. The second loan also funds repair and replacement of stormwater facilities and conveyance systems. The total loan amount awarded to the County is $50,667,320. The County also modified its approach of using separate contracts for impervious surface restoration design and construction of stormwater management facilities and is pursuing a design-build contracting vehicle to support restoration requirements anticipated in the next permit. This mechanism has provided significant cost efficiencies in other jurisdictions. As a result of these changes to the capital budget, the WQPC rate in FY19 remained the same as in FY18.

The County submitted its biennial Financial Assurance Plan (FAP) on February 15, 2019 to MDE as required. The law requires Phase I MS4 jurisdictions to project annual and 5-year costs to meet the requirements of their MS4 permit. On June 25, 2019, MDE determined the County demonstrated that it has sufficient funding in its FAP. Montgomery County is required to submit its next biennial FAP on February 15, 2021.

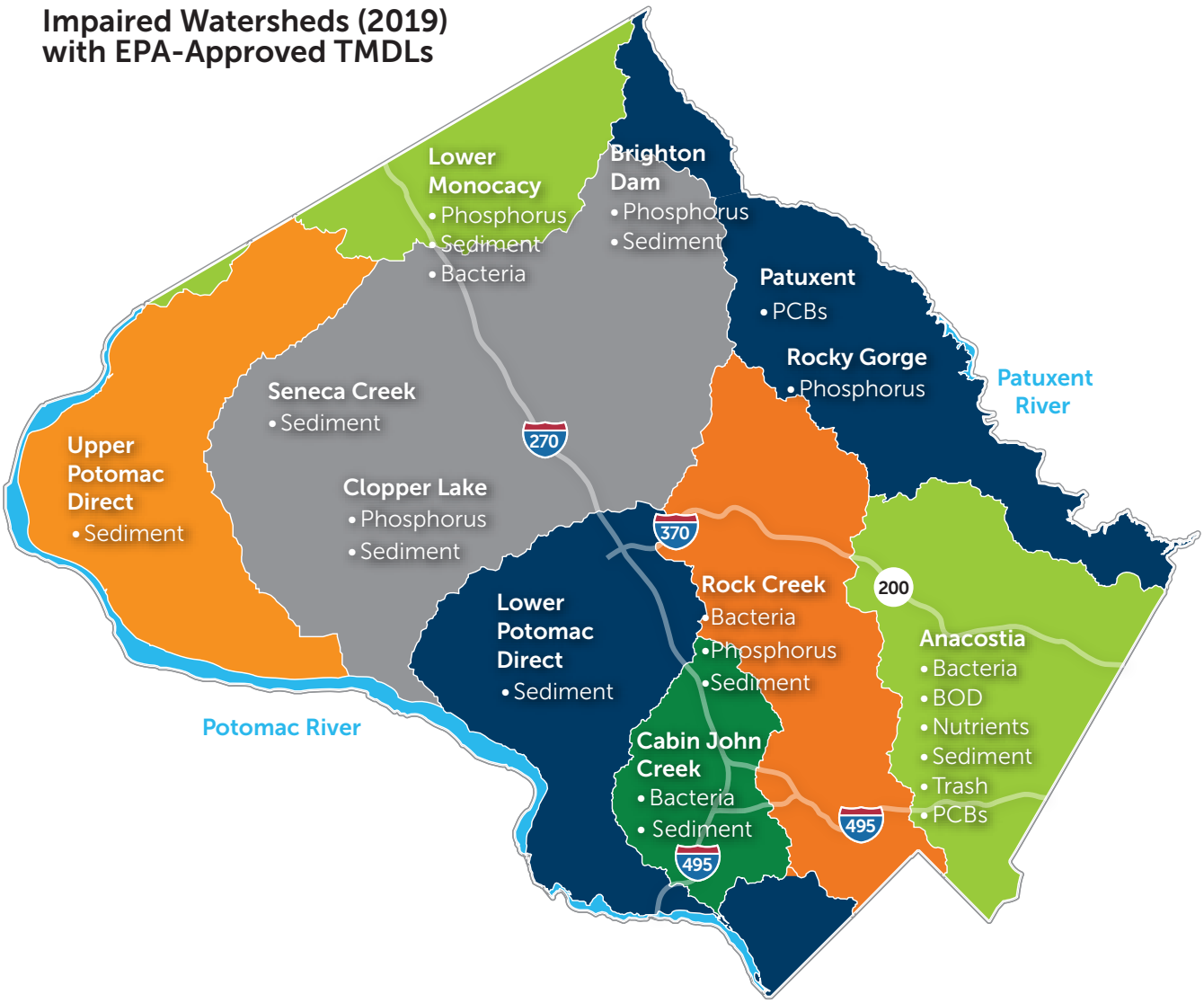
Total Maximum Daily Load

A **TMDL** is a regulatory term that describes the maximum amount of a pollutant that a water body can receive while still meeting water quality standards.

The permit required the County to develop implementation plans to achieve progress toward the County's waste load allocations associated with the TMDLs that existed when the permit was issued in 2010. These plans were developed and submitted within 1 year of the start of the permit, as required.

Additional TMDLs were added after the permit was issued, and TMDL implementation plans either have been completed or are included in a County-wide Coordinated Implementation Strategy.

County stormwater controls and watershed restoration initiatives have made progress toward meeting the TMDL goals.



II. Introduction

This submission by the Montgomery County (the County) Department of Environmental Protection (DEP) to the Maryland Department of the Environment (MDE) fulfills the annual progress report requirement as specified in Part IV of the Municipal Separate Storm Sewer System (MS4) Permit Number 06-DP-3320 MD0068349 (the Permit). The DEP is submitting its 10th report in this current permit cycle (February 16, 2010 through February 15, 2015).

The 5-year permit term began February 16, 2010, covering stormwater discharges from the MS4 in the County. The Permit term expired on February 15, 2015. The DEP submitted a reapplication for the MS4 permit in the fourth annual report submitted on March 31, 2014. As provided in Code of Maryland Regulations (COMAR) §26.08.04.06A(3), if a new permit is not issued by MDE after timely reapplication by the permittee, "the terms and conditions of the existing permit shall continue and remain fully effective and enforceable." The County continues to implement the requirements of the Permit, which is administratively continued and is now in its 10th year.

The County has made considerable progress in meeting all Permit requirements since 2010, including maintaining adequate legal authority, identifying pollutant sources, expanding the County stormwater facility maintenance and inspection program, enhancing property management programs to reduce stormwater pollution, expanding our stormwater pollution awareness outreach programs, making progress on meeting the County wasteload allocations for approved total maximum daily loads (TMDLs), and assuring adequate funding for the Permit-required programs.

The County has always been a leader in implementing innovative and aggressive stormwater programs, including the ambitious restoration goal in our current permit. Even with the support of the County Executive and the County Council, the restoration goal proved to be challenging. In April 2018, MDE and DEP signed a Consent Decree (CD) identifying corrective actions to bring the County into compliance with the 2010 MS4 permit. The 5-year permit required the County to restore 20 percent of the County's impervious surface area that is not already restored to the maximum extent practicable (MEP). MDE approved an impervious surface restoration plan of 3,778 acres. As of the execution of the CD, the County had restored 2,927 impervious acres (IAs), resulting in a deficit of 851 IAs that had not been restored to the MEP. The data presented in this report show that, in Fiscal Year 2019 (FY19), the County completed the restoration of the required 3,778 IAs.

The CD imposes a $300,000 penalty for failure to complete the restoration work required by the 2010 permit before it expired in 2015. The penalty can be satisfied through the construction of one or more MDE-approved Supplemental Environmental Projects (SEP) by December 31, 2020. In addition, the CD requires that the restoration work remaining under the terms of the 2010 MS4 permit be completed in the same timeframe.

The County submitted a Final CD Completion Report on February 15, 2019. The report showed that the County completed the Impervious Surface Restoration Plan (ISRP) required by the 2010 permit ahead of the CD schedule. The FY18 MS4 Annual Report and the final CD report together demonstrated that the County had inspected the completion of all projects needed to restore 3,778 IAs to the MEP. In addition to the restoration progress documented in the MS4 Annual Report for FY18, the County completed eight projects comprising 18 best management practices (BMPs), treating a combined total of 178.2 acres of restoration during the first half of FY19, bringing the total impervious surface restored to 3,781.8 acres.

On April 30, 2019, MDE released updated guidance tripling the equivalent impervious acre restoration credit for stream restoration practices outside of the Coastal Plain. The County applied this new guidance to the projects completed for the 2010 MS4 permit. This resulted in the County revising the final list of BMPs submitted to demonstrate completion of the restoration requirement in the 2010 MS4 Permit. On October 1, 2019, the County submitted a Revised Final CD Completion Report to MDE showing that, as of December 28, 2018, the County completed restoration of 3,778.9 IAs, thus meeting the restoration requirement in the 2010 MS4 permit. The revisions included replacing equivalent impervious acres treated by annual practices with permanent credit and carrying 22 stormwater practices treating 275.91 IAs forward to the next permit. MDE approved the revised report on November 25, 2019. The Office of the County Attorney then worked with the Assistant Attorney General to jointly file a satisfaction of judgement and notice to terminate the CD on December 16, 2019. An order terminating the CD was signed on December 30, 2019, officially closing the enforcement action.

The FY19 MS4 annual report has been organized based on the headings in the Permit's Part III, Standard Permit Conditions, to document implementation of required elements. Required elements of the Permit are presented in a box format at the beginning of each section/sub-section. Information required by the Permit's Attachment A, Annual Report Databases, Tables A through L can be found electronically on the compact disc submission in Appendix A.

III. Standard Permit Conditions

A. Permit Administration

A. **Permit Administration**

The County shall designate an individual to act as a liaison with the Maryland Department of 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 to MDE an organizational chart detailing personnel and groups responsible for major NPDES program tasks in this permit. MDE shall be notified within 14 days of any changes in personnel or organization relative to NPDES program tasks.

The designated individual to act as a liaison with the MDE is as follows:

Amy Stevens, Manager
Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville MD 20850
240-777-7766
Amy.Stevens@montgomerycountymd.gov

Table III.A.1 shows the County personnel responsible for major National Pollutant Discharge Elimination System (NPDES) program tasks; these are the County's contacts as of December 2019.

Table III.A.1 Organization Chart for Montgomery County Permit-Required Programs

Permit Section	Responsible Party			
	Department	**Name**	**Title**	**Telephone**
Part III. Standard Permit Elements				
A. Organization Chart- Liaison with MDE for Permit Implementation	DEP	Amy Stevens	Manager	240-777-7766
B. Legal Authority	OCA	Walter Wilson	Associate County Attorney	240-777-6759
C. Source Identification	DEP	Vicky Wan	Information Technology Manager	240-777-7722
D. Discharge Characterization (as described in Part III H. Assessment of Controls)				
E. Management Programs				
1. Stormwater Management				

Table III.A.1 Organization Chart for Montgomery County Permit-Required Programs

Permit Section	Responsible Party			
	Department	**Name**	**Title**	**Telephone**
1.a. Stormwater Facility Inspections and Maintenance	DEP	Pam Parker	Manager	240-777-7758
1.b. Stormwater Management Permitting and Plan Review	DPS	Linda Kobylski	Division Chief	240-777-6346
2. Erosion and Sediment Control	DPS	Linda Kobylski	Division Chief	240-777-6346
3. Illicit Connection Detection and Elimination Program	DEP	Steve Martin	Field Program Manager	240-777-7746
4. Trash and Litter	DEP	Amy Stevens	Manager	240-777-7766
5. Property Management	DGS	David E. Dise	Director	240-777-6191
6. Road and Roadside Maintenance	DOT	Richard Dorsey	Division Chief	240-777-7600
7. Public Education and Outreach	DEP	Amy Stevens	Manager	240-777-7766
F. Watershed Assessment Countywide Monitoring	DEP	Amy Stevens	Manager	240-777-7766
G. Watershed Restoration Assessments and Project Implementation	DEP	Frank Dawson	Division Chief	240-777-7732
H. Assessment of Controls	DEP	Amy Stevens	Manager	240-777-7766
I. Program Funding	DEP	Patty Bubar	Deputy Director	240-777-7786
J. Total Maximum Daily Load	DEP	Amy Stevens	Manager	240-777-7766
Part IV. Program Review and Annual Progress Reporting	DEP	Amy Stevens	Manager	240-777-7766
Part V. Special Programmatic Conditions	DEP	Amy Stevens	Manager	240-777-7766

DEP *Department of Environmental Protection, 255 Rockville Pike, Suite 120, Rockville MD 20850*
DGS *Department of General Services, 101 Monroe Street, 9th Floor, Rockville, MD 20850*
DPS *Department of Permitting Services, Division of Land Development Services, 255 Rockville Pike, 2nd Floor, Rockville MD 20850*
DOT *Department of Transportation, Division of Highway Services, 101 Orchard Ridge Drive, 2nd Floor, Gaithersburg MD 20878*
OCA *Office of the County Attorney, 101 Monroe Street, 3rd Floor, Rockville, MD 20850*

B. Legal Authority

B. **Legal Authority**

Montgomery County shall maintain adequate legal authority in accordance with NPDES regulations 40 CFR part 122 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 the Department within 14 days and specify a schedule for making the necessary changes to maintain adequate legal authority.

The laws of the County provide sufficient legal authority to enable the County to meet the requirements of the MS4 Permit. Those laws are as described in the following sections.

B.1 Chapter 19 of the Montgomery County Code – Erosion, Sediment Control, and Stormwater Management

Chapter 19 was enacted to protect, maintain, and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to control the adverse impacts associated with land disturbance and increased stormwater runoff from developed and developing properties. Chapter 19 includes the following guidelines:

- Article I establishes the County's legal authority to administer a sediment and erosion control program.
- Article II establishes the County's legal authority to administer a stormwater management program.
- Article IV establishes the County's authority to prohibit the discharge of pollutants to waterbodies within the County without a state-issued permit and control water quality by establishing an inspection and enforcement regime that includes penalties for noncompliance.

The following modifications to Chapter 19 have occurred during the current Permit cycle:

a. Stormwater Management

In July 2010, the County Council enacted Expedited Bill 40-10 (Stormwater Management – Revisions), which was later amended in July 2011 by Expedited Bill 7-11 (Stormwater Management – Revisions). Together these bills updated the County's stormwater management law to require management of stormwater runoff through the use of nonstructural BMPs to the MEP for new development and redevelopment projects approved by the County's DPS. They also brought the County's stormwater management law into compliance with the Maryland Stormwater Management Act of 2007 and associated state implementing regulations adopted in 2010.

The County's revised stormwater management law contains more stringent requirements than Maryland State law for redevelopment sites to protect water quality. Specifically, the Maryland Stormwater Management Act of 2007 requires management of the first inch of runoff from 50 percent of the redevelopment site using environmental site design (ESD) to the MEP. The County law requires both stormwater management of the water quality volume (WQv, the first inch of runoff) and channel

protection volume (CPv, the expected runoff from a 1-year 24-hour duration rainfall) from 100 percent of the redevelopment site and requires the use of ESD to the MEP to meet these standards.

b. Sediment and Erosion Control

In March 2013, the County Council enacted Expedited Bill 1-13 (Erosion and Sediment Control – Special Protection Areas – Amendments), which brings local erosion and sediment control requirements into compliance with the Maryland Stormwater Management Act of 2007 and the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The County legislation mirrors the requirements of State law and regulations by, among other things, including more stringent stabilization requirements and the establishment of maximum grading unit criteria. In addition, this law requires persons that engage in land disturbing activity in an area designated as a special protection area to pay a monitoring fee, established by regulation, to the DEP in lieu of developing and implementing their own best management practices monitoring plan. The monitoring regulation is codified at Code of Montgomery County Regulations (COMCOR) §19.67.03.01.

c. Water Quality Protection Charge

In April 2013, the County Council enacted Expedited Bill 34-12 (Stormwater Management – Water Quality Protection Charge) to bring County law into compliance with a state law enacted by the General Assembly as House Bill 987 mandating the levying of local charges to pay for stormwater remediation in Phase I jurisdictions.

In April 2015, the County Council enacted Bill 2-15 (Stormwater Management - Water Quality Protection Charge - Credit and Financial Hardship Exemption Deadlines), which extended the deadline for submittal of both requests for credit against the Water Quality Protection Charge (WQPC) and financial hardship exemptions to September 30 of each year, after annual property tax bills are posted in July.

In November 2015, the County Council enacted Expedited Bill 45-15 (Stormwater Management - Water Quality Protection Charge – Curative Legislation) to explicitly designate the WQPC as an excise tax under the County's general taxing authority in response to an adverse court ruling premised on the assumption that the WQPC was intended to function as a fee-for-service.

In June 2016, the County Council enacted Expedited Bill 11-16 (Stormwater Management – Water Quality Protection Charge – Grants – Credit) to authorize the establishment of a watershed restoration grant program for certain owners of improved aircraft landing areas to offset costs of the WQPC, to clarify the eligibility criteria for a property owner to receive a WQPC credit, and expand the timeframe for a property owner to appeal the denial of a request for a credit or adjustment of the amount of the WQPC billed to the property owner. These legislative changes and corresponding regulatory changes (Executive Regulation 12-16AM also adopted in June 2016) modify the credit award to being based on the proportion of the volume of water treated by the stormwater management system. With the credit awards being tied to volume of treatment, a credit of 60 percent will be provided for properties using traditional stormwater management, and up to 80 percent for properties with stormwater management systems that implement ESD to the maximum extent practicable. Additionally, these changes increase the maximum credit for a non-residential or multifamily residential property to 100 percent for treatment of adjacent properties.

In January 2018, the County Council enacted Bill 1-18 (Stormwater Management – Water Quality Protection Charge – Appeals) to require that a property owner who wants to appeal the County's imposition of the WQPC or the denial of a WQPC tax credit take that appeal to the Maryland Tax Court,

rather than the County Board of Appeals. This is consistent with Bill 45-15, which designated the WQPC as an excise tax imposed under the County's general taxing authority.

d. Coal Tar Sealants

In September 2012, the County Council enacted Bill 21-12 (Erosion, Sediment Control and Stormwater Management - Coal Tar Pavement Products), which banned the sale and use of coal tar products in the County. Under that law, use of a coal-tar based sealant can result in a fine of up to $1,000 for each violation. Depending on the circumstances, fines may be imposed on the applicator, the property owner, or both.

B.2 Additional Laws to Protect Local Water Quality

Beyond Chapter 19, other legislation enacted in support of the water quality protection programs required under the Permit include those described in the following sections.

a. Carryout Bag Tax (Chapter 52, Article XIV)

In January 2012, the County Council enacted Bill 8-11 (Taxation - Excise Tax - Disposable Carryout Bags) to help the County meet the Permit requirements for litter reduction. The goal of the law was to increase awareness of disposable bag litter pollution and to reduce the use of carryout bags. The carryout bag tax law imposes a tax of 5 cents, which is collected at the point of sale, for each paper and plastic bag that a customer takes from certain retail establishments to carry purchases. The Department of Finance is responsible for enforcing the bag tax law.

b. Expanded Polystyrene Food Service Ware (Chapter 48, Article VI)

In January 2015, the County Council enacted Bill 41-14 (Solid Waste [Trash] - Food Service Products - Packaging Materials – Requirements), which bans the use and sale of expanded polystyrene food service ware and loose fill packaging. The law requires that disposable food service ware purchased and used in the County be either recyclable or compostable. The law is applicable to County agencies, contractors and lessees as of January 1, 2016, and for all other food service businesses as of January 1, 2017. DEP's Division of Solid Waste Services (DSWS) developed an education campaign to inform food service businesses, certain retailers, and consumers about the requirements and the deadlines for compliance.

c. Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions (Chapter 33B)

County Bill 52-14 (Pesticides – Notice Requirements – Cosmetic Pesticide Use Restrictions) became law on October 20, 2015. This law accomplishes the following:

- Restricts the use of certain substances on lawns in the County and permits only those substances that: (a) contain active ingredients recommended by the National Organic Standards Board, or (b) that are designated as minimum risk pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act. These restrictions took effect on January 1, 2018.

- Places additional notification requirements on pesticide retailers and applicators.

- Requires the implementation of a public outreach and education campaign related to the law.

- Requires the Montgomery County Parks Department to implement a pesticide-free parks program.

d. Solid Waste – Illegal Dumping and Litter Control (Chapter 48)

In March 2016, the County passed Bill 1-16 to amend the existing County law to prohibit the disposal of garbage and other solid waste on certain public and private property and to provide additional penalties as authorized in a 2015 amendment to the State law. Bill 1-16 implements the new authority given to Montgomery County through the Maryland General Assembly's enactment of House Bill 106 to impose additional penalties up to those in the State law.

B.3 Executive Regulation

In April 2016, the County adopted Executive Regulation 16-15 (COMCOR §19.67.03) to implement the best management practices monitoring fees in the Special Protection Areas. This regulation establishes a fee that a private entity or County public agency must pay to the DPS to cover the cost of monitoring stormwater best management practices for any development project in a Special Protection Area.

B.4 Resolution

In June 2016, the County Council adopted Resolution Number 18-538 to approve the 2016 NPDES MS4 Permit Financial Assurance Plan (FAP). A hearing was held on the FAP on June 14, 2015. On June 30, 2016, the County provided to MDE the FY16 FAP. On October 17, 2016, MDE acknowledged receipt of the FAP. The submission fulfilled the requirements of the 2015 revisions of the Annotated Code of Maryland, Section 4-202.1 of the Maryland Environmental Article, Watershed Protection and Restoration Programs.

B.5 Co-Permittees

The MDE modified the County's Permit effective January 26, 2004 to add six small localities as co-permittees for coverage under the Phase II of the NPDES MS4 Permit Program. In FY19, the County continued its oversight, inspection, and enforcement authority over the Towns of Chevy Chase, Kensington, Poolesville, and Somerset, and Chevy Chase Village; and one special tax district, the Village of Friendship Heights. Municipality contacts are shown in Table III.B.1.

In January 2010, MDE added Montgomery County Public Schools (MCPS) to the County's Permit as a co-permittee. MCPS designated Brian Mullikin, Environmental Team Leader, Division of Maintenance, and Agustin Diaz, Environmental Specialist, as staff responsible for implementing stormwater management programs and coordinate on Permit issues. MCPS provided a detailed annual report on MS4 related activities. MCPS's Report to the County on MS4 Activities in FY19 can be found in Appendix C in the compact disc attachment to this report. This report includes information on MCPS MS4-related activities as appropriate.

Table III.B.1 List of Contacts for Municipalities Co-Permittees

Municipality	Contact Name and Title	Address	Telephone
Chevy Chase Village	Shana R. Davis-Cook, Village Manager Ellen Sands, Director of Municipal Operations	Chevy Chase Village Hall 5906 Connecticut Avenue Chevy Chase, MD 20815	301-654-7300
Village of Friendship Heights	Julian Mansfield, Village Manager	4433 South Park Avenue Chevy Chase, MD 20815	301-656-2797
Town of Chevy Chase	Todd Hoffman, Town Manager	4301 Willow Lane Chevy Chase, MD 20815	301-654-7144
Town of Kensington	Sanford Daily, Town Manager	3710 Mitchell Street Kensington, MD 20895	301-949-2424
Town of Poolesville	Town Manager [1]	P.O. Box 158 Poolesville, MD 20827	301-428-8927
Town of Somerset	Rich Charnovich, Town Manager	4510 Cumberland Avenue, Chevy Chase, MD 20815	301-657-3211

[1] *Town of Poolesville currently has an open job requisition for a new Town Manager.*

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C. Source Identification

C. **Source Identification**

Sources of pollutants in stormwater runoff 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 that effectively improve water quality. The following information shall be submitted for all County watersheds in geographic information system (GIS) format with associated tables as required in PART IV of this permit:

1. Storm drain system: major outfalls, inlets, and associated drainage areas delineated;
2. Urban best management practices (BMP): stormwater management facility data including outfall locations and delineated drainage areas;
3. Impervious surfaces: delineated controlled and uncontrolled impervious areas based on, at a minimum, Maryland's hierarchical eight-digit sub-basins;
4. Monitoring locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual*; and
5. Watershed restoration: restoration projects proposed, under construction, and completed with associated drainage areas delineated.

The County continues to improve geographic information system (GIS) data to accurately account for the IA controlled within the MS4 boundary. Data improvements include digitizing IAs, updating the urban BMP database and refining existing BMPs drainage areas. The information is submitted for all County watersheds in GIS format as required by the Permit in Part IV and Attachment A, Annual Report Databases, Tables A through L. The information can be found in this report's CD attachment in Appendix A, MDENPDES19.accdb, Tables A through L.

C.1 Storm Drain System

The County's storm drain outfall inventory is found in Appendix A, MDENPDES19.accdb, Table A. Storm Drain System Mapping Associated with GIS Coverage. Storm drain mapping is continuing to improve, thanks to strong leadership by Montgomery County DOT, and consistent interdepartmental collaboration. Significant progress has been made in compiling datasets from many entities in a centralized database and regularly transferring networks verified as built into an integrated "master" dataset, accessible in a universal location. This master dataset represents data vetted to be in the ground and is a reliable stand-alone source of storm drain information at the countywide level. DOT also hosts and updates a public web map containing up-to-date storm drain data for the County. Much work is still being devoted to quality assurance/quality control (QA/QC) of older data, and data quality improvements at all stages of the process. New data are also being regularly added from right of way and sediment control permits, field surveys, and other sources, building the overall comprehensiveness of the inventory. Additionally, developers now have the option of submitting digital storm drain data via the web map, in computer-aided design-format, or in GIS shapefiles. Looking ahead, discussions about ways to streamline the data input process and take advantage of technological improvements are ongoing.

C.2 Urban Best Management Practices

The County's urban BMP database as of June 30, 2019 with associated coverage is included electronically in Appendix A, MDENPDES19.mbd, Table B. The database uses the format required by the Permit's Attachment A, Annual Report Databases and Table B, Urban BMPs. The term BMP is also used synonymously with stormwater management (SWM) facility in this report. MDE distributed the new MS4 geodatabase format on March 15, 2015 (a more recent version was distributed in May 2017) and requests that the County continue to progress toward a full transition to the new geodatabase. MDE is requesting the County implement the geodatabase during this permit term, however the County believes that the accounting and transition to the new geodatabase would be smoother with the implementation on the next permit. Therefore, as reported in FY18 Annual Report, the County has not submitted the FY19 report using the new geodatabase and will begin progression and full implementation of the new geodatabase format with the reporting of the next permit.

The FY19 urban BMP database has 14,625 records. This is an increase of 1,538 records (12.2 percent) from the FY18 urban BMP database. Table III.C.1 summarizes the active BMPs by structure type in the urban BMP database.

In FY19, Montgomery County DEP continued to improve on the attribute data for BMP built dates, inspection dates, drainage areas, and IA for 14,625 records. Again, this year the County included both the active and removed BMPs to account for retrofitted BMPs. Records that are removed are the pre-retrofit BMP records; 50 records were removed. The submission of the removed BMP records is a result of a discussion with MDE's Chesapeake Bay Restoration Section. The County was informed that the data submitted as part of the MS4 report are used in the Bay model. Not accounting for an asset pre- and post-retrofit, the County would lose the pre-retrofit treatment. Therefore, the total number of active BMPs is 14,575, with 50 removed or inactive BMPs, totaling 14,625 records.

Each year, approximately 1,000 new BMPs are added to the County BMP inventory. To ensure data accuracy, DEP has developed a process to rigorously review the attributes of each data point for quality control and assurance. The urban BMP database is not populated until the attribute data are complete.

Table III.C.1 FY19 Total Number of Active SWM BMPs by Structure Type Designation

Practice Type	Code	Number
Green Roof—Extensive	AGRE	96
Green Roof—Intensive	AGRI	10
Permeable Pavement	APRP	218
Reinforced Turf	ARTF	6
Bioretention	FBIO	484
Organic Filter	FORG	1
Sand Filter	FSND	811
Underground Sand Filter	FUND	750
Infiltration Basin	IBAS	62

Table III.C.1 FY19 Total Number of Active SWM BMPs by Structure Type Designation		
Practice Type	**Code**	**Number**
Infiltration Trench	ITRN	1,199
Infiltration Berm	MIBR	5
Dry Well	MIDW	5,237
Landscape Infiltration	MILS	113
Microbioretention	MMBR	1231
Rain Garden	MRNG	174
Rain Water Harvesting	MRWH	46
Submerged Gravel Wetland	MSGW	4
Bioswale	MSWB	237
Grass Swale	MSWG	429
Dry Swale	ODSW	49
Other[1]	OTH	743
Extended Detention—Wet	PWED	167
Wet Pond	PWET	59
Extended Detention—Wetland	WEDW	106
Wet Pond—Wetland	WPWS	21
Shallow Marsh	WSHW	2
Extended Detention—Dry	XDED	90
Detention Structure	XDPD	739
Oil-Grit Separator	XOGS	1,484
Structural Control Component for Wet Ponds	XOTH	2
Total Number of Facilities:		**14,575**

[1] *Other includes Hydroguard Separator, underground detention, StormTrap, Snout, Stormchamber, Rainstore, underground with stone bottom*

The following subsections summarize the data being reported in Appendix A, Table B for the FY19 Annual Report.

a. Drainage Area

Drainage area data are provided for the 14,575 active BMPs and 50 removed BMPs. The drainage areas are submitted for the removed BMPs as a reference, in the event MDE would need to analyze the pre- and post- retrofit treatment in detail.

b. Built Date

Built dates are provided for the 14,575 active BMPs and 50 removed BMPs. This is an important field that is looked at for the Bay model.

c. Construction Purpose

DEP used this field in FY19 to provide information on the retrofitted SWM ponds completed for the impervious surface restoration requirement. Records marked with "CONV" are for the pre-retrofit BMPs, and records marked with "REST" are for the retrofitted BMPs; 101 records are marked with "CONV" and "REST."

d. Structure Type

For the FY19 urban BMP database, the County transitioned to the new geodatabase BMP types. The MDE structure type designated as "Other" is frequently used by DEP.

e. Permit Number

The DEP has included a "place-holder permit number" for facilities that were built before 1986 and do not have a permit number. Because many of these facilities were built before the County's authority to permit such facilities, DEP will not be able to recover a permit number from the paper files. This place holder number is "0000000000" and represents DEP's final attempt to recover the data from the paper files. All original permit numbers known for the facilities built before 1986 have been entered into the database (typically a 6-digit number).

In addition, a 10-digit place holder number beginning with 900118XXXX was also entered for those facilities built prior to 1986. This number was created by Montgomery County DPS for those facilities to be entered into their database system. The DEP has kept this permit number to allow interface with the DPS database. Data are also missing in the permit number field for facilities built after 1986. The remaining 247 are left blank in the case the permit number is discovered.

f. Runoff Curve Number

The DEP's new asset and maintenance management system requires a number for all number fields. Those records with a runoff curve number (RCN) of "0" are records where the RCN was not provided in the sediment and erosion control permit records.

g. Impervious Area

For BMPs that are not located on single-family residential (SFR) lots, where available, Table B provides the gross IA in each facility's drainage area, regardless of spatial context. These data should not be used to determine the net total IA treated by all BMPs, as reported towards the impervious surface restoration (ISR) goal. This dataset does not remove duplicative treatment areas nor consider how well or completely that facility is treating its IA or any nested or more downstream facilities. Summation of the gross data will result in an inflated and erroneous amount of impervious acreage treated.

For SFR properties, the MDE's Chesapeake Bay Restoration Section informed DEP that the group could not incorporate the treatment provided into the Bay model, because the County followed the "POI" direction and duplicated the property's IA for each BMP on the SFR property as the treatment area. In FY18, the Chesapeake Bay Restoration Section had suggested the data be modified so that the treatment

area of all BMPs within a single-family property equals the property's IA. In the FY19 submission, the County has again followed that guidance and have noted the records for easy identification (ID). BMPs located on SFR properties can be identified by "SFR […]" noted in the GEN_COMNT field and are each given the property polygon as its drainage area. The property's drainage area (DRAIN_AREA) and impervious acreage (IMP_ACRES) values have been split evenly amongst all the facilities located on that property.

h. Last Inspection Date

All 14,575 active BMP records have a last inspection date. Of these, approximately 3,950 SFR facilities do not have an inspection date within the past 3 years due to the County's lack of legal authority to access these properties for inspections. More information on the County's continued efforts and progress on the inspection data provided in the urban BMP database is provided in Section III.E.1.

i. General Comments

The General Comments (GEN_COMNT) field is populated with several comments about the BMP data. This field describes the structure type if listed as other (OTH), identifies the SFR BMPs as discussed in Subsection C.2.g above, and includes a comment about the impervious surface treatment credit when the inspection date is not within the past 3 years.

Appendix A, Tables C and D, provide detail on the amount of impervious surface restoration credit the County is claiming to meet the 20-percent restoration goal. However, the County has several SFR BMPs that have not been inspected in the last 3 years, and some of these BMPs are treating existing impervious surfaces. In the general comments field, the comment "[…] Restoration Credit Not Taken" indicates when the facility does not have an inspection date within the past 3 years and the impervious surface treatment credit was removed from MDENPDES19.mbd, Tables C and D for the MS4 permit ISR crediting purposes. More information about the inspection dates is provided in Section III.E.1, and more information about the impervious surface reduction taken due to these facilities is provided in Section III.G.1.d.

C.3 Impervious Surfaces

The County's 2009 IAs with associated coverage can be found in Appendix A, MDENPDES19.mbd, Table C, Impervious Surfaces Associated with GIS Coverage. This impervious information was used to develop the County's Coordinated Implementation Strategy. DEP continues to digitize and update IAs for the County's stormwater utility charge: WQPC. DEP continues to update and digitize the drainage areas of all BMPs.

C.4 Monitoring Locations

The GIS coverage and associated attribute information for locations established for chemical, biological, and physical monitoring of watershed restoration efforts required in Section III.H, Assessment of Controls can be found in Appendix A, MDENPDES19.accdb, Tables E., E.1., and E.2. Monitoring Site Locations Associated with GIS Coverage.

C.5 Watershed Restoration

Appendix A, MDENPDES19.accdb, Table D, Water Quality Improvement Project Locations Associated with GIS Coverage, provides information about the GIS coverage and associated attribute information for watershed restoration projects proposed, under construction, and completed with associated drainage areas.

D. Discharge Characterization

D. **Discharge Characterization**

Montgomery County and 10 other municipalities in Maryland have been conducting discharge characterization monitoring since the early 1990s. From this expansive monitoring, a statewide database has been developed that includes hundreds of storms across numerous land uses. Analyses of this dataset and other research performed nationally effectively characterize stormwater runoff in Maryland for NPDES municipal stormwater purposes. These analyses and additional monitoring data required under this permit shall be used by Montgomery County to assess the following: the effectiveness of stormwater management programs, County watershed restoration projects, and to document progress toward meeting waste load allocations (WLAs) included in total Maximum Daily Loads (TMDLs) approved by the U.S. Environmental Protection Agency (EPA) for watershed or stream segments located in the County. Details about this monitoring can be found in PART III.H.

The Permit requires that the County use discharge characterization monitoring gathered since the early 1990s and additional monitoring data required under the Permit to assess the effectiveness of its stormwater management programs and watershed restoration projects. The County must also document progress towards meeting the waste load allocations in U.S. Environmental Protection Agency (EPA)-approved TMDLs for watersheds or stream segments located in the County. Discharge characterization results and County progress towards meeting waste load allocations (WLAs) can be found in Appendix A, MDENPDES19.accdb, Tables F, G, G.1, G.2, and H. Details about this monitoring can be found in Part III.H. Assessment of Controls.

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E. Management Programs

E.1 Stormwater Management Programs

1. Stormwater Management

An acceptable stormwater management program shall be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. At a minimum, the County shall:

a. Conduct preventative maintenance inspections of all stormwater management facilities at least on a triennial basis. Documentation identifying the facilities inspected, the number of maintenance inspections, follow-up inspections, the enforcement action(s) used to ensure compliance, the maintenance inspection schedules, and any other relevant information shall be submitted in the County's annual reports.

b. Implement the stormwater management design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual* and the provisions of Maryland's *Stormwater Management Act of 2007* (Act). This includes, but is not limited to:

i. Within one year of State adoption of regulations required under the Act, modify the County stormwater management ordinance, regulations, and new development plans review and approval processes in order to implement environmental site design (ESD) to the MEP;

ii. Within one year of State adoption of regulations required under the Act, review existing planning and zoning and public works ordinances and other local codes to identify impediments to, and opportunities for, promoting the implementation of environmental site design (ESD) to the MEP;

iii. Within two years of State adoption of regulations required under the Act, modify those ordinances and codes identified in Part III.E.1.b.ii. above to eliminate impediments to, and promote implementation of, ESD to the MEP; and

iv. Report annually the modifications that have or need to be made to all ordinances, regulations, and new development plans review and approval processes to accommodate the requirements of the Act.

c. Maintain programmatic and implementation information according to the requirements established as part of MDE's triennial stormwater program review.

E.1.a Stormwater Management Facility Inspections and Maintenance

i. Inventory and Maintenance Responsibilities for Stormwater Management Facilities

The Permit requires the County to conduct preventive maintenance (PM) inspections of all SWM facilities on at least a triennial basis (once every 3 years). The DEP Stormwater Facility Maintenance Program (SWFMP) oversees inspection and maintenance of all SWM facilities (also referred to as BMPs) under County jurisdiction.

The DEP performs structural maintenance on facilities owned by the County, MCPS, Maryland National Capital Park and Planning Commission (MNCPPC), as well as structural and nonstructural maintenance on ESD practices located on County property and County right-of-way (ROW). DEP is also responsible for performing structural maintenance on private practices where maintenance responsibility has been transferred to the County (the private property owner remains responsible for nonstructural maintenance). All maintenance of ESD BMPs located on private property is the responsibility of the property owners.

The data reported for FY19 represent DEP's inspection and maintenance responsibilities as defined in County Code (Chapter 19) and Part III.E.1 of the Permit. In the urban BMP database there are 14,575 active SWM facilities and an additional 50 inactive facilities, which are not inspected (see Part III.C.2). The breakdown of facility maintenance responsibility and DEP oversight of the facilities is as follows:

- A total of 5,225 SWM facilities are structurally maintained by DEP, of which 2,404 are privately owned (that is, facilities that serve residential common properties) and 2,821 are publicly owned (that is, facilities that serve public schools, government, and park properties).

- A total of 9,350 SWM facilities are privately owned and structurally maintained by the private property owners; DEP's program ensures and enforces maintenance for these facilities, of which over 5,800 are privately owned ESD practices on single-family lots.

ii. Stormwater Management Facility Inspections

The DEP oversees inspection of all SWM facilities under County jurisdiction, both publicly and privately owned. Inspections that are tracked and reported in the MS4 Annual Report include triennial inspections; annual inspections for certain facilities; WQPC inspections by SFR property owners for WQPC credit; unscheduled inspections for compliance, enforcement, and in response to complaints; and maintenance inspections.

During FY19, 5,073 inspections were conducted by DEP staff and the triennial inspection contractor. Table III.E.1 summarizes the inspections conducted from July 1, 2018 to June 30, 2019.

Table III.E.1 Total Number of Inspections Completed (FY19)	
Triennial Inspections	3,087
Annual Dam Safety Inspections	6
WQPC Credit Inspection	410
Maintenance Inspections	1,304
Underground BMP Maintenance Inspections	249
Unscheduled Inspections	17
Total Inspections Completed:	**5,073**

(a) *Triennial Inspections*

Between July 1, 2018 and June 30, 2019, 3,087 triennial inspections were completed by DEP staff or by DEP's inspection contractor. The triennial inspections, which are conducted under DEP's triennial inspection contract, identify repair and maintenance needs. The County is divided into three geographical regions for triennial inspections, and each geographical region is divided into three sub-regions (see

Figure III.E.1). Fiscal reports will always include inspection and maintenance information for two regions since DEP schedules work on a calendar year. Table III.E.2 provides a breakdown of the total number of triennial inspections completed in inspection Regions 2 and 3 between July 2018 and June 2019.

In Calendar Year (CY) 18, and beginning in Region 3, DEP modified its method of releasing inspection work to the inspection contractor. Previously, DEP released work monthly based on assigned PM schedules, managed through the Infor Asset Management System. For CY19, DEP updated all asset PM schedules so that all inspection work in each sub-region is released at one time, with a total of three work releases per year. The inspection contractor now has the flexibility to schedule their work more closely related to geographic location, resulting in increased efficiency.

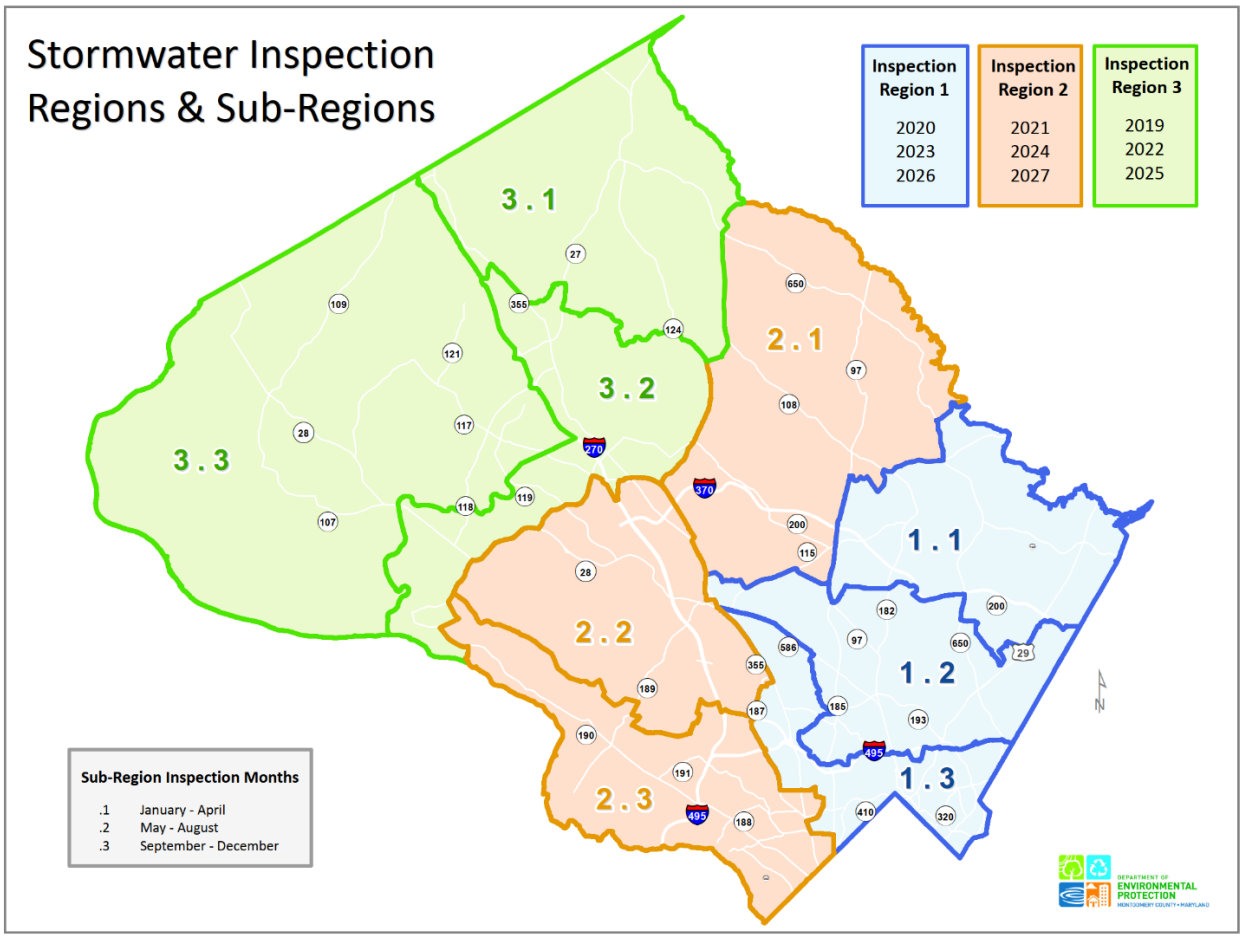

Figure III.E 1. Map of the Stormwater Facility Inspection Regions

Table III.E.2 Triennial Inspections Completed (FY19) for Regions 2 and 3	
Inspection Type	**Total**
ESD [1]	639
Filtering Systems [2]	790
Stormwater Infiltrations [3]	389
Oil/Grit Separators	182
Proprietary Hydrodynamic [4]	344
Stormwater Ponds [5]	409
Underground Storage	250
Stormwater Wetlands	41
Open Channel Systems [6]	30
Other [7]	13
Triennial Inspections Completed in FY19:	**3,087**

[1] *Includes bioretention and all ESD practices in Chapter 5 of the Maryland Stormwater Design Manual (MDE 2009)*
[2] *Includes all aboveground and underground sand filters and proprietary filters such as Stormfilters*
[3] *Includes trenches*
[4] *Includes BaySaver, Stormceptor, Vortechs systems, and other proprietary hydrodynamic devices*
[5] *Includes all dry and wet ponds and ponds with extended detention*
[6] *Includes dry swales and bioswales*
[7] *Includes all other types of devices*

(b) *Triennial Inspection of Environmental Site Design Best Management Practices*

In FY19, DEP inspected 639 ESD practices; these practices were located primarily on non-residential and public property.

In July 2010, when ESD was first required by Montgomery County Code, the County did not require easements on SFR properties that would allow the County access to perform inspections of permitted ESD BMPs. In 2016, DEP worked with the DPS to require right-of-entry and maintenance agreements for all SWM facilities constructed under all new sediment and erosion control permits. DPS began requiring the easements for ESD on SFR properties on January 1, 2017. However, permits were approved before January 1, 2017, a large number (more than 5,800) of existing ESD BMPs are on SFR lots where DEP has no legal access via an easement to conduct inspections. This number continues to increase as projects permitted prior to the easement requirement are still being completed through the permitting process and the associated BMPs brought into DEP's inventory.

The number of ESD BMPs added to DEP's urban BMP database also presents a challenge. Since 2010, DEP has added more than 8,000 ESD BMPs on public and private property to the Infor Asset Management System. DEP is responsible for conducting triennial inspections of these BMPs, however, DEP's inspection program must develop both contractual and staff capacity to accomplish the required inspections.

DEP has taken the following actions to address triennial inspections of ESD BMPs on commercial, SFR, other residential properties (for example, homeowner association [HOA] properties), and public properties:

- During FY16, DEP worked with the triennial inspection contractor to develop contract prices for inspections of the ESD practices found in Chapter 5 of the *Maryland Stormwater Design Manual* (MDE 2009). The prices were finalized in July 2016. During FY17 and FY18, 117 and 691 inspections were conducted, respectively, under these new contract prices. During FY19, 639 ESD BMPs received a triennial inspection. Future fiscal years will show increasing numbers of ESD inspections as DEP and the contractor expand capacity.

- DEP included an FY18 budget request for two new ESD program managers that will develop the programs needed to accommodate the rapid growth of ESD BMPs. Both program managers were approved in FY18. The first program manager was hired in FY19 and is responsible for maintaining ESD on publicly owned properties. The second program manager position will be advertised during FY20 and will develop a program to accomplish inspections of more than 6,000 ESD BMPs on private property, primarily SFR lots.

- DEP hired a program manager dedicated to managing the triennial inspection program. The program will greatly benefit from the leadership and focused attention of a full-time staff member.

- To document inspections for ESD BMPs on SFR for which there is no right-of-entry, during FY16, DEP developed and piloted an online self-inspection form allowing property owners to claim credit against their WQPC for any ESD BMPs on their property. DEP considers the self-certification to be a triennial inspection. The online inspection form also provides ESD BMP maintenance information.

  The self-inspection form is tied to the County's WQPC program, making it easy for the owner to apply for a credit at the time of inspection. DEP plans to continue to work with property owners to provide resources to help them perform yearly inspections and required maintenance on the ESD facilities on their property. DEP recommends owners inspect their ESD facilities on an annual basis and perform maintenance as necessary.

  To promote participation in the WQPC credit self-inspection program, during FY19, 1,169 letters with WQPC credit program information were sent to SFR property owners with ESD facilities; 171 owners completed the WQPC credit application and inspection report, which represented a 15-percent response rate to the letters. The responses resulted in 410 ESD BMPs having an approved WQPC credit inspection. In FY19, DEP also began a multifaceted outreach and education program promoting the WQPC credit program and SFR ESD inspections, including post-card mailings, on-site credit application processing, and outreach to HOAs.

- During FY19, DEP began an audit effort that consisted of site visits to verify the maintenance condition of assets in the WQPC self-inspection program. The goal of this effort was to conduct annual audits of 20 percent of the approved applications for the credits granted in the prior Levy Year (LY). For the FY19 audits, total approved credit applications for LY16 (123 credited applications), LY17 (17 credited applications), and LY18 (236 credited applications) were included (376 total applications). Applications were submitted on a property basis, and each property may have more than one BMP; 20 percent (85 properties) of the approved applications were selected for audit, which included 369 assets (BMPs). Of these applications, 15 properties were not accessible for site visits due to conditions such as gated fences or unavailable property owners; this resulted in an actual audit of 327 BMPs on 70 properties, an audit rate of 18.6 percent of total applications. Long term, DEP

intends to conduct audit inspections of all WQPC credit self-inspected facilities initially to ensure the practices are functioning properly.

(c) Other Types of Inspections

DEP conducts other inspections of SWM facilities outside of the triennial inspection program, including inspections in response to public complaints, of facilities being considered for transfer into DEP's SWFMP, and to assess conditions after large storm events. DEP inspection staff also perform unscheduled and compliance follow-up inspections for privately maintained facilities as needed.

DEP also conducts other maintenance inspections to ensure both that the facilities are functioning properly and that PM is being conducted as required by the permit. In FY19, DEP staff conducted 1,570 unscheduled and maintenance inspections. These inspections were conducted to evaluate DEP's maintenance contractor's performance for the following activities:

- Maintenance and/or repairs of structural facilities and ESD practices
- Inspections of monthly routine maintenance conducted on ESD practices
- Inspections of unscheduled repairs from complaints or other issues identified by residents of the County.

(d) Triennial Inspections and the Urban Best Management Practice Database

In FY19, DEP again increased the number (3,087) of completed SWM BMP triennial inspections from the previous year (2,739). DEP works to ensure that all BMPs have a valid inspection date. Inspections must increase annually because many (more than 1,500) BMPs are added to the Infor Asset Management System each year. The urban BMP database (Appendix A, Table B) was generated for submittal in January 2020 and includes inspection data through January 2020. The inspection date field within the urban BMP database includes triennial inspections, WQPC credit inspections, unscheduled inspections, maintenance inspections, and inspections conducted by DPS as of January 2020.

More than 10,600 BMPs have had inspections conducted within the last 3 years of this reporting period (2016 through 2018). However, the urban BMP database also shows that 3,950 BMPs (37 percent) have not had an inspection within the last 3 years (since 2016). All of these BMPs (3,950) are ESD practices on SFR properties. Access and notification issues had precluded triennial inspections of private green roofs prior to FY19. During FY19, DEP and the inspection contractor developed a green-roof inspection procedure that addressed the issues, and in subsequent inspection years, green roofs will be scheduled for inspection according to their PM inspection schedule. Thus, 19 green roof practices have an inspection date for 2021.

The 3,950 BMPs that do not have an inspection date within the last 3 years have a note in the general comment field indicating that "SFR; Restoration Credit Not Taken." After the facility is inspected, the restoration credit will be included in Appendix A, Tables C and D. Information about this comment is provided in Section III.C.2.i.

iii. Stormwater Management Facility Maintenance

In addition to inspections, the DEP SWFMP oversees structural and non-structural maintenance of all SWM facilities under the County's jurisdiction. In FY19, 5,371 maintenance and/or repair work orders

were completed, either by DEP contractors or by the facility owner (see Table III.E.3). All maintenance was performed under the guidance of DEP inspection staff who conduct follow-up inspections of both privately maintained and DEP maintained facilities to ensure that repair work is completed and that routine cleaning/maintenance has been conducted.

Table III.E.3 Stormwater Facility Repairs and Maintenance (FY19)

Type of Facility	Total Number of Work Orders
Privately Owned and Maintained	
Aboveground	460
Underground	499
Total Number of Privately Owned Facilities Maintained by Owner	**959**
DEP Maintained	
Aboveground Structurally Maintained	472
Mowing and Trash Removal	13
Underground Structurally Maintained	1,372
ESD / Low Impact Development (LID) Routine Maintenance	2,529
ESD / LID Facilities Repaired	26
Number of Facilities Maintained by DEP	**4,412**
Total Number of Facilities Maintained (Owner and DEP)	**5,371**

(a) *Privately Owned and Maintained Aboveground Facilities*

During FY19, 460 aboveground facilities were privately maintained; this number includes facilities issued a Notice of Violation (NOV) in FY18 or FY19. DEP conducted a final inspection for each of these facilities to assure that the facilities were complying and properly functioning. Furthermore, DEP issued 264 NOVs requiring correction of deficiencies noted during triennial inspections. Of the 264 NOVs, 200 facilities with a "high" or "emergency" maintenance need level were maintained by the private owner in FY19. DEP also transmitted 206 routine maintenance notification letters to property owners in FY19. Inspectors conducted approximately 920 follow-up inspections to ensure compliance on the NOVs and notices issued by DEP.

(b) *Privately Owned and Maintained Underground Facilities*

During FY19, 499 underground facilities were privately maintained. Any repairs identified in the triennial inspection are required to be completed at the same time. DEP issued 12 NOVs for maintenance and repair of privately owned underground facilities. Inspectors conducted approximately 36 follow-up inspections on the underground facilities to ensure compliance on the NOVs and notices issued by DEP.

During FY19, DEP modified their notification procedure to private underground BMP property owners. In order to conduct a triennial inspection of an underground SWM facility, the property owner/manager must first hire a cleaning contractor to pump out and clean the facility. Triennial inspections with confined space entry can only be completed when the facility is clean and clear of water. In previous

years, maintenance notices were released and mailed to responsible property owner/managers each month, with a 45 day timeframe for compliance. Private property owners/managers needed more time to coordinate cleaning and funding the maintenance, and as a result, several NOVs were issued to otherwise compliant property managers. In January of CY19, DEP notified all underground facility property owners/managers in the inspection region that a triennial inspection was due that year for their facility. The owners/managers then had time to coordinate and schedule the needed cleaning, and as a result, fewer compliance actions were necessary.

(c) *DEP Maintained Aboveground Facilities*

During FY19, DEP used a general contractor to perform structural maintenance on 472 aboveground SWM facilities. This number includes all conducting inspection repairs identified in triennial inspections, removing minor accumulations of sediment, unblocking clogged low flows, completing minor concrete repairs, making erosion repairs, restoring and/or replenishing media, and removing debris. Thirteen ponds had regular mowing and monthly trash removal performed by DEP contractors.

(d) *DEP Maintained Underground Facilities*

During FY19, DEP cleaned and repaired 1,372 underground facilities. Of these facilities, three Stormceptors located at the Shady Grove Transfer Station are maintained three times a year, and three BaySavers at a bus depot are maintained six times a year.

(e) *DEP Maintained ESD Facilities*

During FY19, DEP continued conducting monthly maintenance of ESD facilities on County property, including ESD facilities constructed through the Watershed Restoration Program. The facilities include those constructed in roadway ROWs within neighborhoods ("Green Streets") and those constructed on County-owned properties such as civic centers and libraries. DEP's contractor for routine maintenance of aboveground SWM facilities conducts the monthly maintenance. The contractor performed more than 2,500 maintenance visits in FY19, and 26 ESD facilities were repaired. In addition, ten green roofs at seven locations on County buildings were maintained quarterly by DEP green roof contractor, and all are in outstanding condition.

(f) *Pervious Pavement Maintenance*

During FY19, DEP worked with the Montgomery County DOT to issue a task order for a DOT maintenance contract to vacuum 302,826 square feet of pervious pavement (concrete and PaveDrain) at several County-owned buildings, sidewalks, and parking pads in the ROW. Inlets associated with the PaveDrain were cleaned and fabric on trash racks replaced on all 22 locations. These facilities are functioning properly and the partnership between DEP and DOT has resulted in ease of maintenance on an ongoing basis.

(g) *Environmental Site Design Renovation*

During FY19, DEP renovated two sites, Holiday Park Senior Center and Germantown Indoor Swim Center. Both have high public visibility and were in need of plant replacement to improve function and aesthetics. Plants were overgrown, facilities had invasive and noxious weed issues, and they were lacking vegetation. The effort was extensive, which involved installing thousands of native plants to benefit local pollinators. The renovation was also carried out to positively affect county residents who encounter these gardens with visual beauty and psychologically connecting them to nature. The costs to renovate Holiday

Park Senior Center was $6,200.00 and Germantown Indoor Swim Center was $40,300.00. This location had three assets with three facilities per asset approximately 700 square feet each.

The redesigning of the facilities included the following activities:

- Replanting native vegetation that have more controlled growth habits
- Adding evergreen plants to achieve four seasons of interest
- Reducing maintenance with a better ratio of shrubs, herbaceous perennials, grasses, and a ground cover layer (Figures III.E.2 and III.E.3 Holiday Park Senior Center).

Figure III.E.2. Holiday Park Senior Center before Redesign

Figure III.E.3. Holiday Park Senior Center after Redesign with Better Plant Ratio

iv. Co-Permittee Structural and Nonstructural Maintenance

MCPS Division of Maintenance upgraded and repaired existing underground and aboveground stormwater facilities in FY19. MCPS staff perform some of the nonstructural maintenance on aboveground stormwater facilities and contracts the rest of the work. The maintenance of 254 bioretention facilities and 1,043,429 square feet of green roof on MCPS facilities is contracted out.

E.1.b Stormwater Management Design, Plan Review, and Permitting

The Permit requires the County to maintain programmatic and implementation information according to the requirements established as part of the MDE triennial stormwater program review. The DPS is responsible for implementing the programmatic requirements for the SWM plan review and permitting. Table III.E.4 provides detail on the number of reviews and approvals in FY19.

Notably, local SWM requirements are stricter than State minimum standards in certain ways. For example, MDE standards include an SWM exemption for projects that disturb fewer than 5,000 square feet, while DPS requires sediment control and SWM to be addressed for any construction of a new home

or commercial building regardless of the disturbance area. This undoubtedly accounts for many of the waivers of SWM issued by DPS in FY19 and subsequent years, especially for SFR teardown projects that may not have otherwise been required to address SWM. Likewise, DPS did not follow the State standard for reducing SWM compliance for redevelopment projects when it incorporated ESD into the Montgomery County Code. DPS instead requires redevelopment projects to address ESD to the MEP; this approach, while generally successful in obtaining ESD compliance on most projects, can be expected to generate additional waivers due to limitations of existing site conditions, such as poor soils and shallow receiving storm drain systems.

Table III.E.4 Permits and Plan Review (FY19)	
Approved Concept Designs	104
Site Development	1
Final Plans [1]	691
Redevelopment	35
Waivers [2]	236

[1] Total sediment control plan approvals within the fiscal year. Based on unique grading permit number. Includes permits issued for SWM concept applications submitted in prior years, multiple permits under the same concept file number, and projects for which a separate stormwater conceptual submission is not required.

[2] Includes full and partial waivers for residential and non-residential projects. These include teardown/rebuild of existing SFR homes on existing recorded lots, for which a separate stormwater concept submission is not required. Many of these residential rebuilds require at least a partial waiver of stormwater requirements. Whether or not a waiver is granted, all must provide ESD to the maximum extent practicable on the lot. Teardown/rebuild on existing SFR lots accounted for all but 8 of the waivers issued in FY19.

E.2 Erosion and Sediment Control

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall be maintained in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. At a minimum, the County shall:

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

b. At least three times per year, conduct responsible personnel certification classes to educate construction site operators regarding erosion and sediment control compliance. Program activity shall be recorded on MDE's "green card" database and submitted as required in PART IV of this permit; and

c. Report 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.

Section III.E.2 of the Permit requires the County to maintain an acceptable erosion and sediment control (ESC) program, including implementing improvements identified in MDE's biennial evaluation of the County's ESC program. The Permit also requires the County to conduct responsible personnel certification classes to educate construction site operators regarding ESC compliance, and to report quarterly information regarding earth disturbances exceeding 1 acre.

E.2.a Evaluation of County Application for Delegation of ESC Enforcement Authority

i. No Improvements Required by MDE Evaluation of County Delegation

MDE performed a biennial evaluation of the County's ESC program as part of their review of the County's application for the delegation of ESC enforcement authority on November 8 and 9, 2017. A follow-up inspection was completed on November 22, 2017. Continued delegation was granted through June 30, 2020 by a letter from Jennifer M. Smith, Program Manager of MDE's Water and Science Administration. In the letter dated January 19, 2018 (see Appendix F), MDE "has also determined that the County's program is in compliance with the ESC program elements stipulated in Part III.E.2 of the Montgomery County MS4 Permit." MDE did not identify any improvements that the County was required to make in its ESC Program.

ii. Description of County ESC Program

The DPS is responsible for implementing the ESC program for Montgomery County. The goal of the ESC program is to reduce pollutant loads from new developments and redevelopment during construction. The County employs inspection and enforcement actions by issuing violation notices and stop work orders to enforce compliance with ESC plans. The elements of the program include the following:

- Reviewing the grading permit applications for earth disturbance
- Inspecting and enforcing grading and sediment control regulations

- Conducting compliance investigations
- Reporting earth disturbances exceeding 1 acre
- Providing training for certification of responsible personnel

iii. Inspection and Enforcement Actions

Table III.E.5 details the number of ESC inspections and enforcement actions taken by DPS in FY19.

Table III.E.5 ESC Program Enforcement Actions for FY19	
Number of ESC Inspections	16,789
Enforcement Actions	
Number of NOVs	396
Number of Stop Work Orders	60
Number of Civil Citations	75
Civil Citation Fines Collected	$41,225

Table III.E.6 summarizes the County's ESC Control Inspection and Enforcement Program over the Permit term.

Table III.E.6 Summary of County's ESC Program Enforcement Actions over the Permit Term (FY11 through FY19)

	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	Total
Inspections	13,472	11,191	12,439	18,151	20,793	20,152	17,120	17,488	16,789	147,595
NOVs	343	248	235	520	511	424	355	250	396	3,282
Citations	146	105	103	160	162	115	137	71	75	1,074
Fines collected	$43,926	$55,750	$67,000	$82,350	$94,955	$96,350	$41,855	$47,550	$41,225	$570,961

E.2.b Responsible Personnel Certification

In 2016, MDE developed an on-line Responsible Personnel Certification (RPC) training to make it more convenient for personnel to receive training on an as-needed basis without waiting for the regular scheduled training classes. Because the RPC training sessions are held online by MDE, and per correspondence with MDE, data related to training are no longer being reported in this document.

E.2.c Quarterly Grading Permits

Quarterly grading permit information for earth disturbances in the County of 1 acre or more can be found in Appendix A, MDENPDES19.mbd, Table K, Quarterly Grading Permit Information.

E.3 Illicit Discharge Detection and Elimination

3. Illicit Discharge Detection and Elimination

The County shall implement an inspection and enforcement program to ensure that all discharges to and from the municipal separate storm sewer system that are not composed entirely of stormwater are either permitted by MDE or eliminated. At a minimum, activities shall include:

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;

b. Conducting routine surveys of commercial and industrial areas for discovering and eliminating pollutant sources. Areas surveyed shall be reported annually;

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

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

e. Reporting illicit discharge detection and elimination activities as specified in PART IV of this permit.

The Permit requires the County to implement an inspection and enforcement program to ensure that all non-stormwater discharges to and from the municipal separate storm sewer system that are not composed entirely of stormwater are either permitted by MDE or eliminated.

E.3.a. Outfall Screening

The Permit requires field screening of at least 150 outfalls annually, with field water chemistry analysis of dry-weather discharges according to parameters specified in the Permit's Attachment A, Annual Report Databases, Part I: Illicit Discharge Detection and Elimination. The aim of the outfall screening process is to identify, investigate, and eliminate illegal connections to the County's storm drain system.

i. Approach to Outfall Screening

Beginning in FY11, Montgomery County DEP began using a comprehensive approach to outfall screening that includes walking all stream reaches within a targeted watershed. This approach has developed into screening outfalls each year in a different region of the county, with regions rotating every year and targeting outfalls near commercial and industrial properties. The areas screened in FY19 were located in the southeast region of Montgomery County, predominantly in and around Silver Spring. Watersheds screened included Northwest Branch, Little Paint Branch, Paint Branch, and Sligo Creek. All suspicious discharges are investigated and follow-ups should occur within 2 weeks of initially discovering the suspicious discharge (weather permitting).

All outfalls encountered are categorized, documented, and sampled when dry-weather flow is found. Outfalls with no flow are assessed for physical indicators such as pipe benthic growth, corrosion, algae, and structural issues. Outfalls found not currently listed in the County's inventory are assigned identification (ID) numbers in the field, photographed, and their location is marked with a global positioning system point. The ID numbers and pertinent data are forwarded to the DEP GIS team for inclusion in the ArcMap storm drain outfall layer. This method has allowed DEP to document and add over 894 new outfall points to its GIS storm drain layer over 8 years. In addition, numerous structures, such as road and driveway culverts, that were mistakenly identified in the system as outfalls were corrected.

ii. Outfall Screening Results in FY19

During April, May, and June 2019, the DEP's Division of Environmental Policy and Compliance (DEPC) performed outfall screening near commercial and industrial areas in Silver Spring, Takoma Park, and Wheaton in the southeast region of Montgomery County. These areas are located predominately within the Northwest Branch, Little Paint Branch, Paint Branch, and Sligo Creek watersheds (Figure III.E.4). The outfalls screened in FY19 are in Appendix A, MDENPDES19.mbd, Table I.

In FY19, DEPC screened a total of 153 of the 157 targeted outfalls, 85 of those being newly identified outfalls that were previously not mapped in the inventory. Of the 153 outfalls screened, 51 outfalls were found with dry-weather flows. Errors in outfall location or type as shown on the existing maps were reported and will be corrected in the GIS inventory. The 85 new outfalls identified will be added to the existing maps. Figure III.E.4 shows the locations of the priority outfalls that were screened during the 2019 Illicit Discharge Detection and Elimination (IDDE) screening program. A copy of the Storm Drain Outfall Screening and Monitoring online application form can be found in Appendix G.

Of the 51 outfalls with dry-weather flows, 9 were found to have suspicious discharge (Table III.E.7)) that required follow-up investigation. Follow-up inspections conducted at six of the nine sites observed no further suspicious discharge, one of the nine sites was issued a notice of violation and fine, and two sites required further investigation. The remaining 42 outfalls that had dry-weather flow during the initial visit did not exhibit abnormal water chemistry parameters, visual characteristics, odor issues, or unusual vegetative growth and were, therefore, classified as groundwater discharge.

Table III.E.8, summarizes DEP's IDDE program during the Permit term. From FY11 to FY19, DEP has conducted 1,498 outfall assessments by walking the entire reach of waterbodies in four separate subwatersheds and targeting outfalls in close proximity with commercial and industrial areas to identify and eliminate pollutant sources in those areas.

Table III.E.7 Investigation Results of Suspected Illicit Discharges During FY19

Outfall ID	Location	Problem Found	Resolution
HQ563P9510	2535 Glenallen Avenue	Elevated detergents	• Several follow-up investigations traced the elevated detergent flow to under the Glenmont Metro Station. • DEP, in conjunction with Washington Metropolitan Area Transit Authority (WMATA) staff, is developing a plan to further investigate the flow and enter the pipe if needed.
JQ122P0047	1806 Blueridge Avenue	Cloudy water with heavy sediments	• Heavy sediment laden flow was traced to the Wheaton Library construction site. • Staff alerted DPS, who then issued fines and forced the builder to improve sediment control measures. • The library has since been completed, and no further suspicious discharge has been observed.
KQ343P9502	12500 Prosperity Drive	Elevated detergents and conductivity	• Elevated detergents were tracked under Route 29. • Flow was not found on the opposite side of Route 29, and the minimal flow was found to be coming from under Route 29. • The source of elevated detergents and conductivity was not located.
KQ343P9499	2331 Broadbirch Drive	Elevated detergents	• Investigations of elevated detergents have eliminated a nearby office park and nearby businesses as the source. • The investigation continues because the source of elevated detergents has not been located.
KQ343P9494	12210 Cherry Hill Rd - DARCARS Toyota	Elevated detergents	• Elevated detergents were traced to outdoor vehicle washing occurring at DARCARS Toyota. • A NOV and $500 fine was issued to DARCARS, and the outdoor vehicle washing has stopped. • No further suspicious discharge was observed.
JP121P0600	9509 Columbia Boulevard	Heavy sediments	• Heavy gray sediments was discovered during initial screening. • Flow was traced to the intersection of Georgia and Dale Avenues, but no road work was observed. • During several follow-up visits, no issues were observed, and road work was believed to be the likely cause of gray sediments observed during initial screening.

Table III.E.7 Investigation Results of Suspected Illicit Discharges During FY19

Outfall ID	Location	Problem Found	Resolution
KP122P6634	10110 New Hampshire Avenue	Elevated detergents	• Several investigations into nearby businesses and structures have not shown source of elevated detergents and the source has not been found. • Washington Suburban Sanitary Commission (WSSC) has investigated the nearby sewer line and confirmed the storm drain has no breakage or leak.
KP122P6632	10110 New Hampshire Avenue – Holly Hall Apartments	Elevated detergents	• Investigation into elevated detergents found the source was likely residential car washing at an adjacent apartment complex. • Several follow-ups did not show dry-weather flow or any further detergents or issues. • The apartment complex is slated to be torn down, and no further suspicious discharge was observed.
JQ121P0363	10914 Georgia Avenue - Rampart Way	Elevated detergents	• The source of detergents during initial screening was not able to be located. • Prior year investigations have not determined the source of elevated detergents. • The outfall drains from a large area of downtown, Wheaton and an extensive further investigation is required.

Table III.E.8 Summary of Illicit Discharge Detection and Elimination during the Permit Term (FY11 through FY19)

	Number of Outfalls	Percent of Total
Outfall Assessments	1,498	--
Unmapped Outfalls Discovered	894	59.7
Outfalls with Dry-Weather Flow	201	13.4
Illicit Discharge Investigations	96	6.4
Illicit Discharges Eliminated	23	1.5

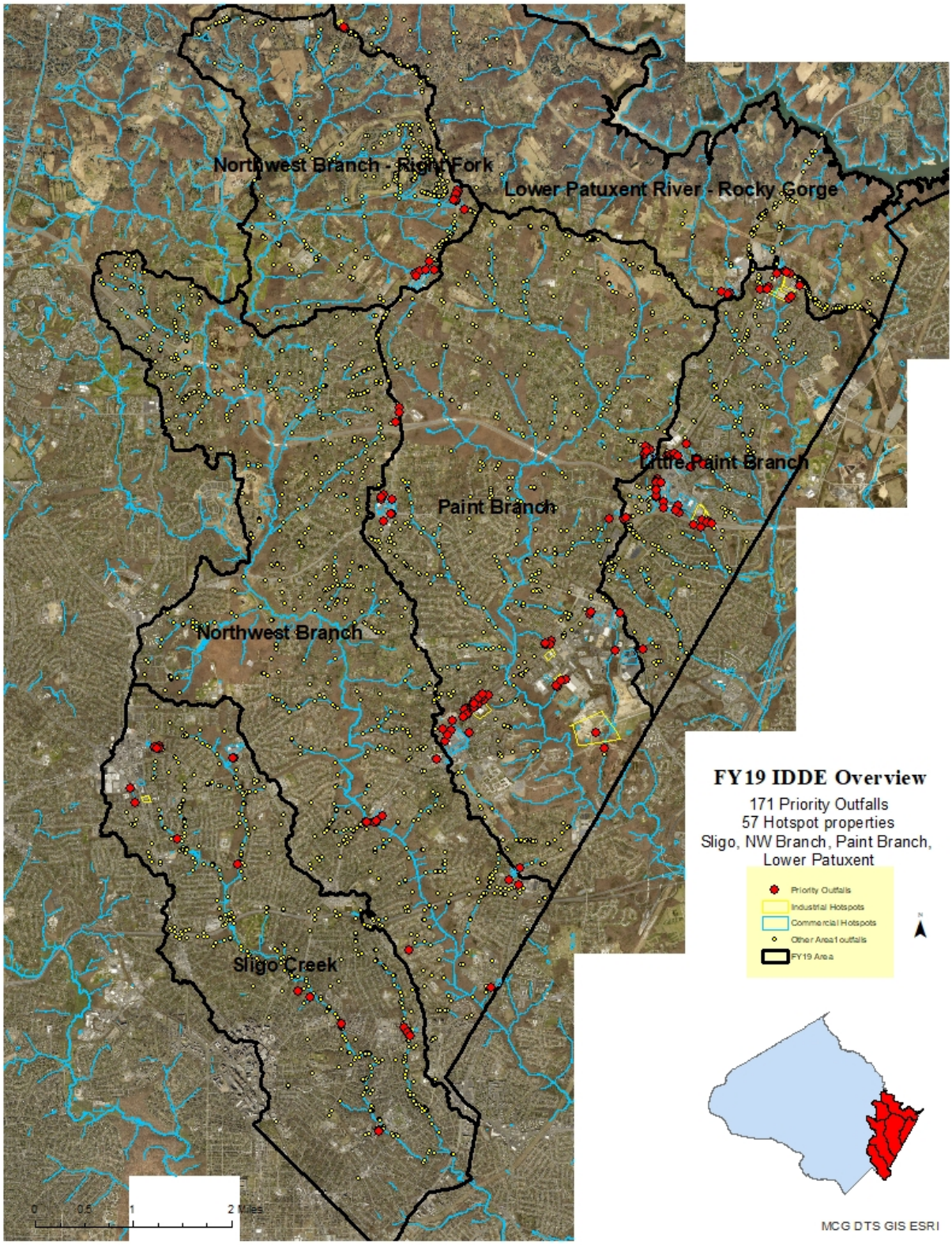

Figure III.E.4 Locations of the FY19 IDDE Screening Targeted Outfalls and Targeted Hotspots

iii. WSSC Sanitary Sewer Overflow Follow-Up Investigations

DEP is continuing to work with WSSC by performing follow-up site visits for reported sanitary sewer overflows (SSOs) in the County and performed 37 site visits in FY19. These follow-up site visits verify that the SSO has been corrected, ensure adequate cleanup and treatment of all affected areas, and ensure adequate public notice signage has been posted in affected areas. Also, the DEP is continuing to work with WSSC's Fats, Oils and Grease (FOG) Program regarding restaurant grease issues, which directly affect stormwater quality in the County.

E.3.b Routine Pollutant Surveys of Commercial and Industrial Areas

i. Procedures for Conducting Pollutant Surveys of Commercial and Industrial Areas

The permit requires the County to conduct routine surveys of commercial and industrial areas to assess the potential for, and if discovered eliminate, pollutant sources. DEP conducted 48 hotspot surveys (of the 57 targeted hotspots) of commercial and industrial sites as part of the comprehensive IDDE program in FY19. In addition, DEP selected areas for outfall screening based on results of the pollutant surveys of commercial and industrial areas, which are detailed in the following subsections. The documentation for these procedures is provided in Appendix G.

(a) Commercial and Industrial Survey Area Selection Process

A GIS spatial database engine (SDE) Property layer is maintained and managed by the Montgomery County Department of Technology Services (DTS). DEP uses GIS to research the "Land Use Codes" field in "SDE.Property" layer related to commercial and industrial properties. A table showing the land use codes including a description and pollutant potential is included in Appendix G.
Properties containing restaurants, vehicle repair/fueling businesses, and industrial are classified as high-priority sites. In addition, sites located within 100 feet of a storm drain inlet are given additional priority ranking. The search of the current GIS SDE property layer showed a total of 2,103 sites (566 industrial and 1,537 commercial sites). Of the 2,103 total industrial and commercial sites, 1,193 are located within 100 feet of a storm drain inlet.

(b) Equipment Needed for Commercial and Industrial Surveys

- Site information packet (see Section (c) Commercial and Industrial Survey Process below for details)
- Paper or iPhone/iPad with Hotspot Assessment Form (HSAF)
- Storm drain test kit
- Manhole hook(s)
- Flashlight
- Long handle dipper
- Spill absorbent, spill pads and spill boom
- Hard hat, safety boots, gloves (leather and chemical resistant), safety glasses and safety vest

(c) Commercial and Industrial Survey Process

Routine surveys of commercial and industrial areas for assessing and eliminating potential pollutant sources involve the following steps:

- Prepare site information packet to include aerial map showing the local storm drain system and surface water features, research nearby outfalls to determine whether they are appropriately identified and mapped (if not identified in the system, then the staff member will need to complete the applicable outfall screening process), complete HSAF form (paper or iPad PDF), research results of complaint database and any previous local outfall screening activities, document research if the facility has a general or specific NPDES permit issued by MDE, NOV form and Civil Citation booklet, and a copy of Montgomery County Code, Chapter 19, Water Quality Control Ordinance.

- With the permission of the senior facility representative on site (if necessary), walking the site and checking all areas noted on the HSAF, paying particular attention to observing, photographing, and documenting any issues that could result in illicit discharge of pollutants to the storm drain system

- Immediately reporting issues to the facility representative on site stressing that corrective actions are required as soon as possible or enforcement action can be taken

- Upon completion of the survey, opening a case in CaseBase (DEP database system) linking the HSAF in the documents tab, entering all actions, documents, and photographs

For issues that require correction, Staff members should then follow up within a few days to ensure corrective actions have been taken. If unresolved actions remain, the staff member will issue the appropriate enforcement action requiring compliance within a reasonable period of time.

ii. Results of the Commercial and Industrial Surveys

The Permit requires the County to routinely survey commercial and industrial areas to discover and eliminate pollutant sources and report those surveys annually. In FY19, DEP performed 48 hotspot surveys of properties located in commercial and industrial areas of Silver Spring, Takoma Park, and Wheaton. The surveys resulted in enforcement actions, as presented in Table III.E.9.

Based on the hotspot surveys, DEP investigated water quality issues and related cases, which resulted in the issuance of two citations, two NOVs, three warning letters, and five verbal warnings. The formal enforcement actions (NOV issued) are summarized in Table III.E.9, and the entire list of investigated issues is provided in Appendix G.

Table III.E.9 Summary of Stormwater Discharge Enforcement Cases based on Commercial and Industrial Survey Results for FY19

Case No.	Location Description	Issue	Enforcement Action	Resolved
20191279	Cloverly Auto Care	Prior Oil Spill	Warning Letter	Yes
20191416	White Oak Shopping Center	Grease	Warning Letter	Yes
20191504	Hickory Bar and Grill	Grease	Verbal Warning	Yes
20191507	Burtonsville Auto Body	Outdoor vehicle washing	Verbal Warning	Yes
20191551	Percontee	Outdoor vehicle washing	Verbal Warning	Yes
20191658	Shell Gas Station	Oil Spill	Citation	Yes
20191700	BP Gas Station	Solid Waste and Water Quality	NOV	Yes

Table III.E.9 Summary of Stormwater Discharge Enforcement Cases based on Commercial and Industrial Survey Results for FY19

Case No.	Location Description	Issue	Enforcement Action	Resolved
20191708	Shoppes of Burnt Mills	Grease Container	Verbal Warning	Yes
20191713	Colesville Center	Grease Container	Warning Letter	Yes
20191741	Wheaton Mall	Leaking Dumpsters	Verbal Warning	Yes
20191906	DARCARS Toyota	Outdoor vehicle washing	NOV, Citation	Yes

E.3.c Program to Address Illegal Discharges, Dumping, and Spills

In FY19, the County met permit requirements to maintain a program to address and respond to illegal discharges, dumping, and spills. Information on illegal dumping can be found at https://www.montgomerycountymd.gov/DEP/contact/illegal-dumping.html

The County maintains a 311 call service center that citizens can use to report environmental concerns. DEP is responsible for investigating and enforcing clean-up of non-emergency small quantity fuel, oil, or chemical spills that do not pose an immediate risk to public health or safety. The County's Fire and Rescue Service responds to emergency and large quantity spills. The description of the 311 spill response hotline can be found at http://www3.montgomerycountymd.gov/311/Solutions.aspx?SolutionId=1-3G15WH

During FY19, 373 complaints were made concerning the illegal dumping of solid waste. DEPC's investigation of illegal dumping complaints resulted in the issuance of 20 formal enforcement actions (7 civil citation with fines totaling $4,000 and 13 NOVs) and numerous warning letters. The vast majority of complaints concerned bags of trash, vegetation (leaves and brush), or other unwanted materials either dumped or being stored on private or public property. Only a small percentage of these cases represented a potential for direct runoff of contaminated material into a storm drain or receiving system. Complaint resolution invariably involved removing and properly disposing of trash and debris and properly storing (for example, under cover) other materials.

E.3.d Water Quality Investigations in FY 2019

In FY19, overall the DEPC investigated 260 water quality issues, 194 complaints, 36 SSOs, and 30 hazardous materials-related cases. This resulted in 39 warning letters and the issuance of 33 formal enforcement actions of which 10 were civil citation fines totaling $5,000, 23 were NOVs. The formal enforcement actions are summarized in Table III.E.10, and the entire list of investigated water quality issues is provided Appendix G.

Table III.E.10 FY19 Stormwater Discharge Enforcement Cases

No.	Case Number	Date Issued	Fine	Case Type	Case Sub-Type	Citation Number
1	20181727	8/1/2018	$500	Stormwater	Pollutant Discharge	1Z39889452
2	20181728	8/1/2018	$500	Stormwater	Pollutant Discharge	4Z39889875
3	20181748	8/2/2018	$500	Stormwater	Pollutant Discharge	6Z39889457
4	20181748	8/3/2018	$500	Stormwater	Pollutant Discharge	5Z39889456
5	20182506	11/23/2018	$500	Stormwater	Pollutant Discharge	0Z39889458
6	20191409	4/4/2019	$500	Stormwater	Pollutant Discharge	5Z39889463
7	20191418	4/8/2019	$500	Stormwater	Pollutant Discharge	0Z39889899
8	20191466	4/9/2019	$500	Stormwater	Pollutant Discharge	6Z39889464
9	20191473	4/9/2019	$500	Stormwater	Pollutant Discharge	4Z39889826
10	20191658	5/7/2019	$500	Water Quality	Surface Water – Hotspot Survey	2Z39889467
11	20181830	7/3/2018	NOV	Water Quality	Surface Water – Hotspot Survey	N/A
12	20182094	7/31/2018	NOV	Stormwater	Pollutant Discharge	N/A
13	20181748	9/18/2018	NOV	Stormwater	Pollutant Discharge	N/A
14	20182283	9/19/2018	NOV	Stormwater	Pollutant Discharge	N/A
15	20182221	9/19/2018	NOV	Stormwater	Pollutant Discharge	N/A
16	20182272	9/19/2018	NOV	Stormwater	Pollutant Discharge	N/A
17	20182278	9/19/2018	NOV	Stormwater	Pollutant Discharge	N/A
18	20182580	12/7/2018	NOV	Stormwater	Pollutant Discharge	N/A
19	20181965	1/17/2019	NOV	Water Quality	Surface Water – Hotspot Survey	N/A
20	20191020	2/4/2019	NOV	Stormwater	Pollutant Discharge	N/A
21	20191020	2/4/2019	NOV	Stormwater	Pollutant Discharge	N/A
22	20191123	2/12/2019	NOV	Stormwater	Pollutant Discharge	N/A
23	20191118	2/12/2019	NOV	Stormwater	Pollutant Discharge	N/A
24	20191353	3/21/2019	NOV	Stormwater	Pollutant Discharge	N/A
25	20191353	3/21/2019	NOV	Stormwater	Pollutant Discharge	N/A
26	20191356	3/21/2019	NOV	Stormwater	Pollutant Discharge	N/A
27	20191406	4/4/2019	NOV	Stormwater	Pollutant Discharge	N/A
28	20191534	4/29/2019	NOV	Water Quality	Surface Water - NPDES Inspection	N/A

Table III.E.10 FY19 Stormwater Discharge Enforcement Cases						
No.	**Case Number**	**Date Issued**	**Fine**	**Case Type**	**Case Sub-Type**	**Citation Number**
29	20191700	5/13/2019	NOV	Water Quality	Surface Water – Hotspot Survey	N/A
30	20191818	5/28/2019	NOV	Stormwater	Pollutant Discharge	N/A
31	20191469	5/28/2019	NOV	Stormwater	Pollutant Discharge	N/A
32	20191906	6/21/2019	NOV	Water Quality	Surface Water – Hotspot Survey	N/A
33	20191903	6/27/2019	NOV	Stormwater	Pollutant Discharge	N/A

E.4 Trash and Litter

4. Trash and Litter

In 2006, Montgomery County committed to the goal of a trash free Potomac River by 2013 and signed the *Potomac River Watershed Trash Treaty* with other Washington, D.C. metropolitan area jurisdictions. Activities to meet obligations under the Treaty are specified in the *Trash Free Potomac Watershed Initiative 2006 Action Agreement* and include trash abatement program implementation, education, and evaluation to improve the quality of the Potomac River and its tributaries. The Potomac River Watershed Trash Treaty is incorporated by reference into this permit.

Consistent with the Potomac River Watershed Trash Treaty, Montgomery County shall:

a. Support and implement regional strategies to reduce trash and increase recycling;

b. As part of its public education program described in Part III.E.7 below, within one year of permit issuance, develop a work plan to implement a public outreach and education campaign with specific performance goals and corresponding deadlines to increase residential and commercial recycling rates, improve trash management, and reduce littering;

c. Within one year of permit issuance, establish baseline conditions of trash being discharged to and from the storm drain system and develop a trash reduction strategy and work plan for the Montgomery County portion of the Anacostia Watershed detailing control measures and deadlines by which those measures will be implemented to meet the 2013 goal of a trash free Potomac River. MDE shall review the work plan and approve it, if it meets the requirements of this permit;

d. In conformance with the County's trash reduction strategy, implement approved control measures according to the schedule specified in the Anacostia trash reduction work plan to eliminate the discharge of trash and debris from the County storm drain system;

e. Evaluate and modify local trash reduction strategies with an emphasis on source reduction and proper disposal;

f. Conduct a public participation process in the development of the trash reduction strategy that includes:

   i. Notice in a local newspaper and the County's web site outlining how the public may obtain information and provide comments to the County regarding the trash reduction strategy;

   ii. Procedures for providing the strategy to interested parties upon request;

   iii. A minimum 30-day public comment period; and

   iv. A summary of how the County addressed or will address any material public comments received.

g. Submit annually, a report which details progress toward implementing the requirements of the Trash Free Potomac Watershed Initiative 2006 Action Agreement. The report shall describe the status of trash and litter elimination efforts including resources (e.g., personnel and financial) expended and the effectiveness of the program components described above toward meeting the goals of the Anacostia Watershed trash reduction strategy developed according to PART III.E.4.d. above

E.4.a Regional Strategies and Work Plan to Reduce Trash and Increase Recycling

The Permit requires the County to implement multifaceted trash abatement and antilittering programs to meet goals of the Potomac River Watershed Trash Treaty and achieve trash reductions to meet the County's WLA in the Anacostia River Trash TMDL. Specific Permit requirements include County participation in regional strategies to reduce trash and increase recycling, public outreach, and education work plans. Requirements are meant to increase residential and commercial recycling rates, improve trash management, reduce littering, and develop trash reduction strategies for the Anacostia Watershed.

i. Trash Reduction Strategy and Work Plans

The Anacostia Trash Reduction Strategy and work plans were developed as part of the County's overall Coordinated Implementation Strategy. The County is also working with the Anacostia Watershed Restoration Partnership, the Alice Ferguson Foundation, and other partners to meet regional trash reduction goals. Initiatives directly related to the regional campaigns include ongoing education and outreach for recycling and litter reduction, mass media outreach campaigns, and litter removal from streets, stormwater ponds, and transit stops.

ii. Carryout Bag Tax

In FY16, outreach planners launched an enhanced outreach campaign working with the County's Public Information Office to make improvements to the Carryout Bag tax website (located at http://www.montgomerycountymd.gov/bag), create new focused advertising, and provide updated outreach materials (for example, flyers, point of sale cards, posters) to retailers, restaurants and the public. In FY17, the County worked on distributing these materials to businesses who requested them. The County has also worked to identify businesses that should potentially be reporting bag sales through the law to the County who were not enrolled in the online system. In FY18, the County continued to focus on conducting more outreach to businesses about the bag law. The County has worked to ensure businesses are educated about the bag law and offer resources.

In FY19, the Montgomery County DEP distributed approximately 50,000 reusable bags to the community. This was achieved through various events, stocking them at every County public library, and through the County's partnership with Manna Foods. Consistently each year, the largest spike in disposable bag purchases happens during the holiday season. To help combat this, the DEP launched an annual holiday campaign during the 2018 season to promote reusable bag use when shopping for gifts. This holiday campaign is credited with the significant increase in the number of distributed reusable bags from the previous fiscal year.

From the implementation of the Carryout Bag Tax (January 2012) to June 2019, almost 465 million non-reusable bags have been sold in the County. Approximately 65 million were sold in FY19, with about 5.4 million sold per month. According to the U.S. Census Bureau, the County population estimate for

2015 is 1,040,116 people. This averages out to about five disposable bags bought per County resident each month. In FY19, registered retailers paying the bag fee increased from 1,511 to 1,583. DEP does not have enough data to definitively report a change in bag usage for the County.

iii. Ban on Use and Sale of Expanded Polystyrene Materials

The Division of Solid Waste Services (DSWS) of DEP continued efforts to educate businesses; affected retailers; County agencies, contractors, and lessees; and the public about the County's ban on the use and sale of expanded polystyrene (Styrofoam®) food serviceware and loose-fill packaging peanuts. DSWS provided notification to food service businesses that all food serviceware used and distributed in the County must be either recyclable or compostable. DSWS also posted an annual update on information pertaining to alternative recyclable and compostable food serviceware on the DSWS website and investigated complaints received regarding non-compliance.

iv. Recycling and Waste Diversion Initiatives

According to the MDE's Calendar Year 2017 Maryland Waste Diversion Rates and Tonnages Report, Montgomery County's overall recycling and waste diversion rate, was 60.91 percent. The County has a goal to reduce waste and recycle 70 percent of all waste by 2020, aiming ultimately for zero waste.

The County has a robust waste reduction, reuse, and recycling outreach and education program, with a strong volunteer component. During FY19, staff and DSWS recycling program volunteers participated in 247 educational events and activities, providing 34,389 people with assistance and information on waste reduction, reuse, recycling, buying recycled products, composting, grass-cycling, and other related topics. Recycling volunteers contributed 1,454 hours of direct service with an estimated value of $38,400. More detailed information on DSWS waste reduction, reuse, and recycling activities and other trash and litter reduction measures can be found in the Division's Quarterly Reports, posted at https://www.montgomerycountymd.gov/sws/about/quarterly-reports.html

DSWS consistently monitors reuse opportunities and recycling markets, including the following, to identify potential opportunities to remove additional materials from the waste stream, redirect them for reuse by others, and/or divert them for recycling:

- DSWS has operated a model food-scrap recycling collection program at the Montgomery County Executive Office Building in Rockville since November 2011. This project, in which pre-consumer food scraps generated in the building's cafeteria are separated for recycling collection, has diverted a total of 162.8 tons of food scraps for commercial composting through the end of FY19.

- DSWS also manages food-scrap recycling collection programs for pre-consumer food scraps generated from the cafeterias at the Montgomery County Council Office Building in Rockville and the Montgomery County Public Safety Headquarters Building in Gaithersburg.

- DSWS accepts unused paint and either offers it to residents or donates it to charities. In FY19, the County distributed 912 gallons of free latex paint to residents through the County's "Paint Store" and approximately 280 tons of latex paint were donated to nonprofit organizations and charities servicing Maryland and elsewhere.

- DSWS collects bicycles for restoration and distribution to countries around the world. In FY19, 27 tons of restorable bikes were removed from the waste stream and shipped to countries worldwide as well as distributed locally.

- The Montgomery County Shady Grove Processing Facility and Transfer Station has a vendor that accepts waste vegetable oil (WVO`) for the sole purpose of bio-diesel production. In FY19, a total of 28 tons of straight vegetable oil was shipped out for processing into biodiesel.

- The County distributed 4 tons of usable, donated construction materials and gave away 12 tons of books that were dropped off for reuse donation at the Montgomery County Shady Grove Processing Facility and Transfer Station in FY19.

v. Trash Removal from County Right-of-Way

The County's 311 Customer Service Center (MC311) tracks all calls related to litter on County roads. Clean-up is handled by the Montgomery County DOT. This information is conveyed to the County's police force to increase surveillance of these roadside hotspots. The DOT's Adopt-A-Road Program supplies community groups who have adopted a total of 515 road segments (generally each segment is about 1 mile in length) and 11 adopted spots, with equipment in exchange for their voluntary services of picking up trash and litter along roadways. 253 groups reported 642 clean-ups, picking up a total of 3,079 (40 to 55 gallons) bags of trash in FY19. More than 2,805 volunteers assisted with the cleanings.

vi. Increased Litter Removal from County Owned Public Areas

Transit stops (bus stops) are prime litter hotspots. DOT maintains litter containers at all 710 sheltered bus stop locations, 5 transit centers, and other high-activity areas around the County. Placing containers is prioritized based on stop activity, and many of the locations are shared by both the County Ride On Transit System and the WMATA buses. In FY19, the DOT program spent $532,047 to empty transit stop trash cans around the County, which netted a total of 306.26 tons of trash.

vii. Illegal Dumping Enforcement

The County MC311 call service center for non-emergency services allows citizens to report incidents involving environmental problems, including illegal dumping. Outside normal business hours, citizens can report issues through the MC311 and DEP websites. During FY19, 373 complaints were made concerning the illegal dumping of solid waste, which resulted in the issuance of 20 formal enforcement actions (7 civil citations with fines totaling $4,000 and 13 notice of violations) and numerous warning letters. The vast majority of complaints concerned bags of trash, vegetation (leaves and brush), or other unwanted materials either dumped or being stored on private or public property. Only a small percentage of these cases represented a potential for direct runoff of contaminated material into a storm drain or receiving system. Complaint resolution invariably involved removal and proper disposal of trash and debris and proper storage (for example, under cover) of other materials.

viii. Anti-Litter Enforcement

The County's police force participated in the annual Litter Enforcement Month, conducting additional vigilance and community engagement on litter, especially with teens in urban areas. The Department of Housing and Community Affairs (DHCA) Code Enforcement Division investigates and enforces violations of litter code on private property. In FY19, they handled 4,025 trash/rubbish-related complaints, and issued 592 civil citations to property owners. DCHA estimates that 72.71 tons of trash were removed as a result of their "clean or lien" program. The DSWS also investigates and enforces compliance with the County's solid waste and recycling regulations.

E.4.b Trash Baseline in the Anacostia Watershed

The TMDL baseline load for trash is 228,683 pounds per year (see Table III.J.2 in Section III.J).

E.4.c Trash Removal in the Anacostia Watershed

The DEP's Watershed Restoration Program, described in Section III.G, is actively installing SWM practices to meet the Permit's impervious area stormwater control requirement. Many of these practices are structural and do not allow trash to pass. Debris tends to build up around forebays, around plants and internal elements, and around the outlets. The DEP ensures that the trash is removed from the facilities through the SWFMP. In the Anacostia, BMPs installed or retrofitted after the baseline year of the Trash TMDL removed 13,194 pounds of trash from the watershed in FY19.

Through volunteer clean-ups sponsored by DEP, 2,946 pounds of trash were removed from the Anacostia Watershed in FY19. DEP is working with several groups, agencies, and departments to improve our reporting on the trash removal in the Anacostia Watershed. Combining the information from the BMPs installed or retrofitted after the baseline year of the Ancostia Trash TMDL with the volunteer clean-ups in the Anacostia Watershed, the County has removed 16,429 pounds of trash from the Anacostia Watershed, a 7.4 percent reduction from the TMDL baseline (Table III.E.11).

Table III.E.11 Summary of Anacostia Watershed Trash Removal in FY19

	Pounds of Trash Removed
Volunteer clean-ups	3,235
SWM BMPs installed after 2010	13,194
Totals:	**16,429**

In 2016, the three jurisdictions in the Anacostia Watershed began meeting regularly as part of the Anacostia Trash Reduction Workgroup organized through Metropolitan Washington Council of Governments (MWCOG). The intent of this group is to standardize the Anacostia Watershed trash TMDL and MS4 reporting metrics amongst the jurisdictions. The first reporting metric the group worked on together was to determine the correct reduction factor of trash bags collected from volunteer clean-ups done in all jurisdictions. Considering the MS4 allocation and wet-weight reduction, the County determined that 16.05 pounds of trash for each trash bag collected at a volunteer clean-up within the Anacostia Watershed should be counted towards meeting trash TMDL requirements. Starting in FY18, DEP started using this metric for the reporting of volunteer clean-up trash removal towards meeting the County's trash TMDL requirements. The Anacostia Trash Reduction Workgroup is continuing to work on standardizing reporting metrics for street sweeping, trash traps, and education and outreach.

DEP has been working on the possibility of installing a trash trap within the Anacostia Watershed area of the County. A MWCOG feasibility study within the watershed determined the most suitable locations for installation of a Bandalong Litter Trap™. The County's grant program will issue an Request for Proposal (RFP) under a new track for trash trap installation and maintenance in FY20. On March 30, 2018, the U.S. District Court for the District of Columbia ruled in favor of the Natural Resources Defense Council (NRDC) and directed EPA to develop or approve a replacement TMDL for the Anacostia River Trash

TMDL. NRDC's contention was that the TMDL should contain a maximum load of trash, rather than the required trash removal from the waterway. DEP plans to continue current efforts to prevent and reduce trash until a replacement TMDL is established at which point the efforts will be revisited and modified as necessary.

E.4.d Evaluate and Modify Local Trash Reduction Strategies

i. Anacostia Watershed Trash Monitoring - Post TMDL

The DEP continues to monitor and assess trash in the Anacostia Watershed through a contract with the MWCOG. Monitoring to date includes the following:

- DEP completed nine cycles of post-TMDL trash monitoring in the Anacostia Watershed. The Anacostia Tributary monitoring follows the same protocols for stream-level and land-based surveys as those used for trash TMDL development. Five items (that is, carryout plastic bags; plastic bag others; plastic bottles; cloth, carpeting, and clothing; and miscellaneous items) compose 71 percent of the total weight of the trash collected in FY19. As in prior years, the weight of expanded polystyrene is the lowest among these selected items, and the weight of all plastic bags (for example, carryout and other bags) is the highest among all trash items.

- In FY19, DEP continued work on piloting a community based social marketing campaign in the White Oak neighborhood to discourage littering and encourage proper trash disposal. This area was chosen from Anacostia trash-monitoring sites; this site has the highest recorded trash in the stream. Baseline monitoring was conducted within this specific neighborhood before the campaign began for comparison. The pilot study is being used as a test of the top recommended anti-litter programs. After the campaign is finalized and implemented in this community, DEP will repeat the observation surveys in White Oak to see if any change in litter is found and determine the campaign's effectiveness. If results show a significant reduction in litter due to the pilot effort, then DEP plans to bring the model to other smaller neighborhoods in the Anacostia to reduce overall trash and meet our TMDL requirements. The campaign will launch in September 2019, and data from pre- and post-monitoring will be reported in the FY21 annual report.

ii. Trash Removal at Stormwater Facilities

The County contracts the removal of organic debris and trash from County-maintained SWM facilities. These trash collections are augmented by citizen volunteer clean-ups. In FY19, there were nine trash collections at seven different facilities that were sorted into categories and weighed. Unreported other cleanings took place that were not sorted and weighed. Cleanings are scheduled as needed, and the frequency is related to the number of storms that wash in large amounts of material. Information on the trash and organic debris removed from these facilities is summarized and analyzed by DEP to better understand what is captured in SWM ponds. This information is not used to calculate the TMDL reductions for the Anacostia trash TMDL.

A total of 837 pounds of trash (including aluminum, plastic and glass containers, plastic bags, tires, styrofoam, paper, and miscellaneous items), and an estimated 12,017 pounds of organic debris (converted from cubic yards using a conversion factor based on County records) were removed in FY19 (Table III.E.12.).

Table III.E.12 Trash Collected from Ponds in FY19 (pounds)

Date	Ponds Cleaned	Trash (pounds)								Organic Debris	Total
		Aluminum	Glass Bottles	Oil Quart Containers	Plastic Bags	Plastic Bottles	Styrofoam and Paper	Tires	Miscellaneous		
7/26/2018	3	9	18	0	6	9	4	18	12	4,415	**4,488**
7/27/2018	3	15	12	2	28	57	8	0	35	2	**158**
7/30/2018	1	14	5	3	36	82	24	0	28	0	**189**
4/3/2019	2	24	27	0	187	136	9	21	14	7,600	**8,019**
Total:	9	61	61	5	256	283	44	39	88	12,017	**12,854**
Percent:		0.47	0.47	0.04	1.99	2.20	0.34	0.30	0.69	93.49	100.00

Recyclable materials (aluminum, glass and plastic bottles) made up about 48.3 percent of all trash (non-organic debris) collected. Over the past 9 years, there has been a shift away from glass bottles and a corresponding increase in plastic bottles. In FY19, plastic bottles made up 33.8 percent by weight of the trash items collected at the ponds (Figure III.E.5). More pounds of plastic bottles were collected (283) than any of the other categories of trash.

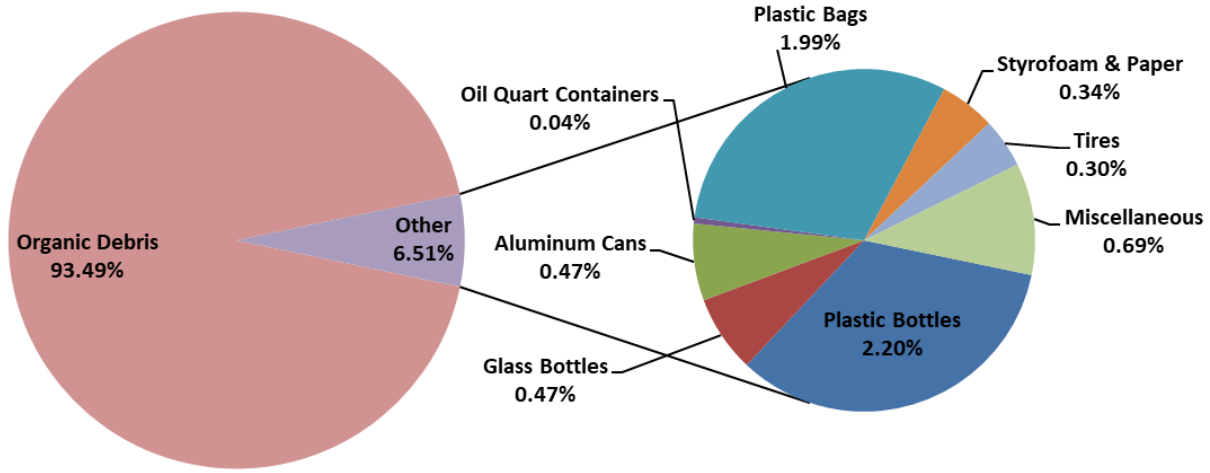

Figure III.E.5 Trash and Organic Debris Collected from Stormwater Ponds by Weight in FY19

E.4.e Anti-Litter Education and Public Outreach

In FY19, DEP continued to work with active community groups to support and expand local clean-up efforts particularly in the Anacostia Watershed. IMPACT Silver Spring, a local nonprofit that has partnered with DEP, continued to conduct annual community clean-ups near the East County Community Center, completing two clean-ups of Edgewood Park in FY19.

The DEP supported eight other volunteer clean-ups, either organized by communities in the Anacostia Watershed or directly by DEP in FY19. From these 10 events, volunteers removed a total of just over 4,513 pounds of trash. 3,235 pounds from within the Anacostia Watershed and 1,278 pounds more countywide (Table III.E.13).

Table III.E.13 Summary of the Volunteer Trash Clean-Ups Conducted in FY19

Location	Date	Collected (pounds)
Oakview at East Light Drive	10/13/2018	842
Oakview at Avenal Road	3/23/2019	658
East County Edgewood Park	3/30/2019	199
Wheaton Pond	4/13/2019	401
Great Seneca Elementary School	4/13/2019	803
Manor Lake Homeowners Association	4/14/2019	161

Table III.E.13 Summary of the Volunteer Trash Clean-Ups Conducted in FY19		
Location	**Date**	**Collected (pounds)**
White Oak Earth Day Clean-Up	4/19/2019	362
Townes of Glouchester	4/22/2019	289
Goshen Road	6/8/2019	315
East County Edgewood Park	6/22/2019	483
Total:		**4,513**

E.4.f Annual Progress Report

i. Cost of Trash Reduction Efforts

For FY19, the County invested an estimated $6,995,426 in trash reduction strategies and programs; this is an increase of about 0.27 percent from FY18. A breakdown of cost per program type can be seen in Table III.E.14 and Figure III.E.6.

Table III.E.14 Estimated Trash Reduction Costs for Various Programs in FY19	
Program	**Costs**
Solid Waste Program Management	$4,569,495
Enforcement Programs	$1,497,881
Street Litter Removal	$532,047
Trash Removal from SWM Ponds	$30,964
Anti-Litter Outreach	$365,039
Total:	**$6,995,426**

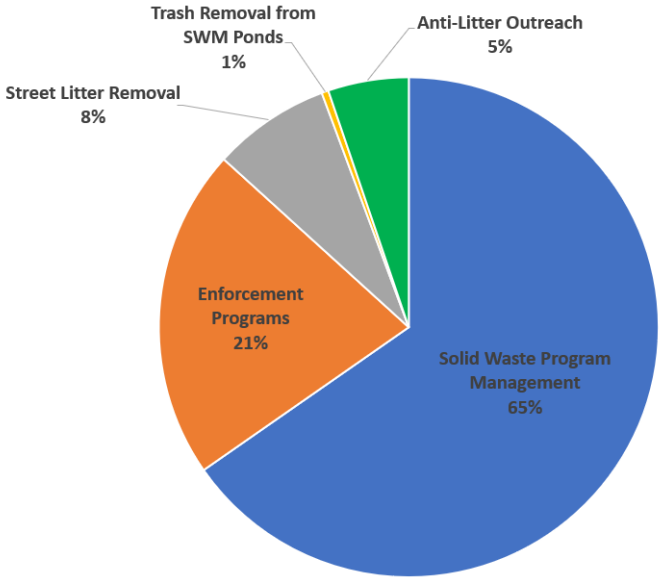

Figure III.E.6 Estimated FY19 Percentage of Trash Reduction Cost

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E.5 Property Management

5. Property Management

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

The County has 11 facilities covered under the MDE General Discharge Permit for Stormwater Associated with Industrial Activities (General Permit 12-SW) and MCPS has six facilities. These facilities are listed in Tables III.E.15 (County) and III.E.17 (MCPS). The MDE accepted Notices of Intent (NOIs) for these facilities in August 2014 for coverage until December 31, 2018. MDE issued a final determination for a modification to the General Permit for Discharges of Stormwater Associated with Industrial Activity, identified as General Permit 12-SW-A. The effective date of Modification A is December 7, 2018. General Permit 12-SW-A has the same expiration date as 12-SW, December 31, 2018. MDE is developing a renewal permit, and until such time that the permit is reissued, the existing permit will be administratively extended (per the terms of the permit).

All facilities covered under the General Permit For Discharges of Stormwater Associated With Industrial Activity (12-SW) had maintained up-to-date coverage and a stormwater pollution prevention plan (SWPPP), including at MCPS facilities. During the implementation of the SWPPPs, the County and MCPS identified good housekeeping needs and implemented those at facilities, including routine sweeping, annual training, and capital improvements. The MDE's acceptance letters are included in Appendix H.

For most of the County facilities, the DGS has the overall responsibility for meeting the requirements of the NPDES General Permit, including updates to the facilities' SWPPP. Agencies housed at the facilities are responsible for implementing portions of the SWPPP that relate to their operations and include DOT Division of Highway Services (DHS) and Division of Transit Services; DEP DSWS and Watershed Management Operations Division; and DGS Fleet Management Division (FMD). Both the FMD and DHS have program managers responsible for environmental compliance for their respective operations at these facilities.

E.5.a Pollution Prevention at Department of Transportation and Department of General Services Facilities

All County facilities covered under the MDE General Discharge Stormwater Permit 12-SW have annual comprehensive SWPPP inspections. They are also inspected monthly and receive quarterly water quality monitoring of stormwater outfall locations. At some locations, County staff have not been able to maintain the required quarterly stormwater quality monitoring, therefore, supplemental services from an outside third-party environmental consultant were employed for FY17, FY18 and FY19. In addition, annual training and site inspections are performed by DOT representatives.

Table III.E.15 Inventory and Status of County Facilities Covered under the Maryland General Discharge Permit for Stormwater Associated with Industrial Activities

Name of Facility (Responsible Agency)	Application/ NPDES Number	Watershed/ Facility Acreage	Status	SWPPP Status
Colesville Highway Maintenance Depot (DOT)	12SW0267/ MDR00267	Anacostia River 02140205/11.73 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Damascus Highway Maintenance Depot (DOT)	12SW0269/ MDR000269	Seneca Creek 02140208/ 1.4 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2017
Equipment Maintenance and Transit Operations Center (DGS)	12SW0277/ MDR000277	Rock Creek 02140206/15.1 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Gaithersburg Highway Maintenance Depot (DOT)	12SW2487/ MDR002487	Rock Creek 02140206/ 0 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Poolesville Highway Maintenance Depot (DOT)	12SW0268/ MDR000268	Seneca Creek 02140208/ 4 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Seven Locks Maintenance Center (DGS) [Including Bethesda Highway Maintenance Depot (DOT)]	12SW0265/ MDR000265	Cabin John Creek 02140207/18.86 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Kensington Small Transit Service Maintenance Facility at Nicholson Court (DGS)	12SW2311/ MDR002311	Rock Creek 02140206/3.31 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019
Silver Spring Highway Maintenance Depot (DOT)/Bus Maintenance Facility (DGS)	12SW0278/ MDR000278	Rock Creek 02140206/ 17.47 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2019

Table III.E.15 Inventory and Status of County Facilities Covered under the Maryland General Discharge Permit for Stormwater Associated with Industrial Activities

Name of Facility (Responsible Agency)	Application/ NPDES Number	Watershed/ Facility Acreage	Status	SWPPP Status
Shady Grove Processing Facility (DEP)	02SW0262/ MDR000262	Rock Creek 02140206/ 52.5 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2018
Gude Landfill (DEP)	02SW0263	Rock Creek 02140206/ 120 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2015
Oaks Landfill (DEP)	02SW0264	Patuxent River - 02121107, Rock Creek- 0240206/190 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in 2015

During FY19, DOT and DGS continued to deliver yearly training on the General Permit requirements to all facility operation employees. Operation-specific training, incorporating annual SWPPP inspection findings, was delivered at each facility location. Assessments, needs, and improvements were covered in this training, as well as ways to minimize the use of hazardous substances, pollutants, or contaminants and prevent their exposure to precipitation and stormwater runoff. DGS has transitioned to a computer-based training system and has developed a Pollution Prevention Training Module that employees must complete annually.

E.5.b Pollution Prevention at Division of Solid Waste Services Facilities

The DEP's DSWS is responsible for meeting the General Permit requirements at the Shady Grove Processing Facility and the Gude and Oaks Landfills. The DSWS Environmental Compliance Manager, Senior Engineer, and Engineer I are responsible for ensuring environmental compliance at solid waste operational facilities.

The DSWS quarterly stormwater inspection reports indicate the Oaks and Gude Landfills and Shady Grove Processing Facility are in good shape. Litter is picked up on the sites and along the perimeter fence lines regularly, and the landfills are well vegetated. The Gude Landfill is routinely inspected and stormwater depressions and leachate seeps are identified and repaired as required. The Shady Grove Processing Facility storm drain inlet screens and "capture bags" that screen trash are routinely inspected and cleaned.

E.5.c Annual Staff Training

Annual site-specific training continued to be conducted for facility staff at several depots, landfills, and the transfer station. As requested by MDE, training dates and the number of staff in attendance are provided in Table III.E.16.

E.5.d County Co-Permittees Property Management

i. Town of Poolesville

The Town of Poolesville is the only one of the six small municipal co-permittees that is required to have a MDE General Discharge Stormwater Permit 12-SW. The Town of Poolesville has a maintenance yard associated with the Poolesville Wastewater Treatment Plant, with outside truck and materials storage, and maintains a current SWPPP for the site. The Town's Public Works Director is responsible for the SWPPP on this site and conducts weekly inspections to assure compliance. The Town reported no changes for FY19.

ii. Montgomery County Public Schools

MCPS operates six industrial sites (Shady Grove, Randolph, Facilities Maintenance, Clarksburg, West Farm, and Bethesda Depots) that are categorized under MDE General Discharge Stormwater Permit 12-SW (Table III.E.17). MCPS treats 100 percent of the impervious surfaces at the six industrial sites and is responsible for ongoing monthly and annual site evaluation. In addition, quarterly visual monitoring is conducted at outfalls described in the SWPPP. Improvements have been implemented at these sites as recommended by the annual inspections.

Table III.E.16 Summary of the Pollution Prevention Training		
Depot	**Training Date [1]**	**Number of Staff in Attendance**
Shady Grove Processing Facility Gude, Landfill, Oaks Landfill (DEP)	12/6/2018	10
Shady Grove Processing Facility Gude, Landfill, Oaks Landfill (DEP)	12/7/2018	10
Silver Spring Highway Maintenance Depot (DOT)/Bus Maintenance Facility (DGS)	7/26/2019 to 12/21/2019	25
Damascus Highway Maintenance Depot (DOT)	8/8/2019	1
Gaithersburg Highway Maintenance Depot (DOT)	7/26/2019 to 12/17/2019	59
Poolesville Highway Maintenance Depot (DOT)	8/7/2019	1
Seven Locks Maintenance Center (DGS) [Including Bethesda Highway Maintenance Depot (DOT)]	7/29/2019 to 8/9/2019	4
Colesville Highway Maintenance Depot (DOT)	8/12/2019	1
Kensington Small Transit Service Maintenance Facility at Nicholson Court (DGS)	7/26/2019 to 12/20/2019	22
	Total:	**133**

[1] Date ranges represent the time over which training was completed by individual employees through computer based online training which has been implemented at the DGS and DOT facilities.

MCPS is responsible for training employees in positions that particularly have potential for stormwater pollution; primarily maintenance and transportation staff. During FY19, 120 DOT maintenance staff completed a SWPPP refresher training, and 217 MCPS staff completed an online SWM overview course. MCPS maintains 21 underground storage tanks at 13 facilities per MDE regulations. In addition, MCPS operates a wastewater treatment plant at Darnestown Elementary School.

iii. Integrated Pest Management at Montgomery County Public Schools

MCPS implements an Integrated Pest Management (IPM) Program at all schools, centers, and facilities. Emphasis is placed on physical over chemical measures for pest control, in accordance with MCPS Regulation ECF-RB, Pesticides Use in Schools. MCPS IPM staff work with facility occupants to stress the need for proper sanitation measures and structural exclusion for pest control. Pesticides are used only when all other measures have failed. Under Maryland law, only licensed and registered pest control workers may apply any sort of pesticides or herbicides in a school building or on school grounds (COMAR §15.05.02.10). In addition, only certain products are approved for use in and around MCPS facilities by certified pest applicators. All chemicals used undergo a thorough safety review by professional staff. State law also enumerates very specific requirements about the storage, use, signage, and notification required for pesticide applications. MCPS has a process to pre-qualify contractors who perform athletic field maintenance at high school athletic fields to have more centralized controls in place over fertilizer and herbicide applications.

Table III.E.17 Inventory and Status of MCPS Facilities Covered under the Maryland General Discharge Permit for Stormwater Associated with Industrial Activities

Name of Facility/ Responsible Agency	Application/ NPDES Number	Watershed/ Facility Acreage	Status	SWPPP Status
Bethesda Fleet Maintenance/Bethesda Facilities Maintenance Depot	12SW0524/ MDR000524	Cabin John Creek 02140207/ 6.2 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in FY14
MCPS Facilities Maintenance Depot	12SW3325 MDR003325	Seneca Creek 02140208/ 34.4 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in FY18
Randolph Fleet Maintenance/Randolph Facilities Maintenance	12SW0522/ MDR000522	Anacostia River 02140205/ 9.3 acres	NOI accepted for registration under the NPDES General Permit. Coverage until Dec. 31, 2018	Last updated in FY14
Shady Grove Fleet Maintenance/ Shady Grove Facilities Maintenance	12SW0523/ MDR000522	Rock Creek- 02140206/ 15.0 acres	NOI accepted for registration under the NPDES General Permit. Coverage until December 31, 2018	Last updated in FY14
West Farm Transportation Depot	12SW1258/ MDR001258	Anacostia River 02140205/ 5.06 acres	NOI accepted for registration under the NPDES General Permit. Coverage until December 31, 2018	Last updated in FY14
Clarksburg Fleet Maintenance/ Clarksburg Facilities	12SW0525/ MDR000525	Seneca Creek 02140208/ 15.11 acres	NOI accepted for registration under the NPDES General Permit. Coverage until December 31, 2018	Last updated in FY14

iv. Coordination with other County Agencies

As co-permittee on the countywide MS4 Permit, MCPS worked with the County environmental agency to improve project communication and coordination, as follows:

- In 2010, MCPS signed a new Memorandum of Understanding with Montgomery County DEP outlining the various responsibilities of both agencies under the new MS4 Permit.
- Since 2012, MCPS has participated in the County task forces on low-impact development and MS4 coordination.
- As a co-permittee, MCPS was a participant in the EPA inspection of the County's MS4 program in 2014.
- MCPS cooperates with the County in promoting the RainScapes for Schools program, managed by the County.

- MCPS provides annual reports to County agencies on mandatory and non-mandatory recycling activities.

MCPS has been working very closely with the WSSC on their Fats, Oils, and Grease (FOG) Program to reduce and eliminate SSOs that could potentially originate from MCPS sites and negatively impact stream water quality. As part of this process, MCPS has scheduled the installation and clean out of grease interceptors, provided training, and implemented BMPs in all school cafeterias.

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E.6 Road Maintenance

6. Road Maintenance

The County shall continue to implement a program to reduce pollutants associated with road maintenance activities. The road maintenance program shall include:

a. Street sweeping;
b. Inlet cleaning;
c. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with roadside vegetation management through increased use of integrated pest management (IPM); and
d. Controlling the overuse, and to the MEP, reducing use of winter weather deicing materials through continual testing and improvement of materials, equipment calibration, employee training, and effective decision-making.

The County shall report annually on the changes in practices and the pollutant reductions resulting from the road maintenance program.

The Permit requires the County to reduce pollutants associated with roadways by implementing a road maintenance program that includes street sweeping; inlet cleaning; reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with roadway vegetation management; and controlling the overuse of winter weather deicing materials. This section describes pollutant-reduction methodologies related to ongoing road maintenance programs in the County. The overall goal of these activities is to reduce the amount of trash and sediment from entering streams and waterways, improve street aesthetics, and aid in meeting the State environmental goals.

E.6.a Montgomery County Street Sweeping Program

i. Description of Street Sweeping Program – Miles Swept

The County's street sweeping program continues to help reduce pollutants associated with road maintenance activities (Table III.E.18). The County uses both mechanical and vacuum street sweepers to remove debris and litter from streets. The Montgomery County DOT and DEP jointly oversee the street sweeping program that is funded entirely by DEP. In FY19, DOT administered street sweeping on residential routes, and DEP administered arterial route sweeping (arterial routes are larger roads with more commercial activity, traffic, and more observed trash).

Table III.E.18. Summary of County's FY19 Street Sweeping Program

Category	Materials Removed (tons)	Curb Miles Swept	Tons Material per Curb Mile	Cost per Ton	Cost per Curb Mile	Total Cost
Priority Residential Routes	381	1,271	0.30	$129.61	$38.80*	$49,325
Non-Priority Residential Routes	570	2,785	0.20	$189.61	$38.80*	$108,042

Table III.E.18. Summary of County's FY19 Street Sweeping Program						
Category	**Materials Removed (tons)**	**Curb Miles Swept**	**Tons Material per Curb Mile**	**Cost per Ton**	**Cost per Curb Mile**	**Total Cost**
Arterial Routes—21 cycles	836	6,202	0.13	$287.95	$38.80*	$240,649
Average:			0.17	$222.84	$38.80*	
Total:	1,786	10,258				$398,016

** Includes 12/17 1.7-percent consumer price index increase*

The DOT sweeps 56 residential routes shown on Figure III.E.7 at least once per year; 19 of these routes have been designated as "priority" residential routes based on the average tons of material collected per curb mile, lack of adequate stormwater management, and being located in a watershed with a water quality impairment from sediment. These routes also tend to coincide with areas in the County of the highest annual average daily traffic as shown on Figure III.E.8. Sweeping is scheduled so that the priority residential routes are swept first early in the spring to more effectively recover material applied during winter storms.

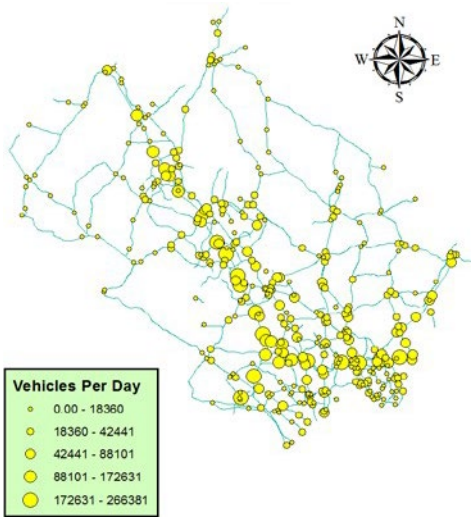


Figure III.E.7. Countywide Street Sweeping 2019 – Tons of Materials Collected per Curb Mile

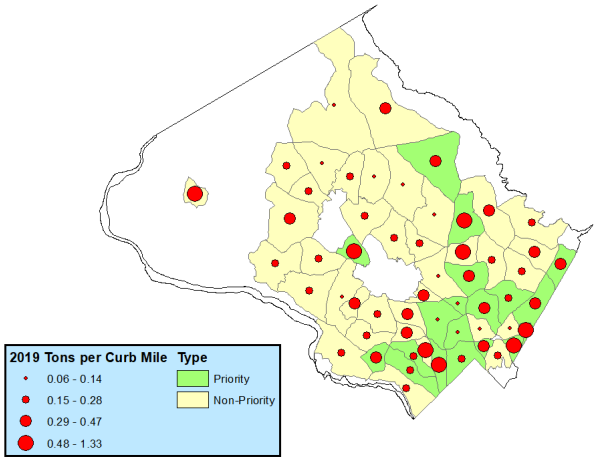


Figure III.E.8. Annual Average Daily Traffic (2010) State Highways (Source: Maryland State Highway Administration)

The remaining 37 DOT swept routes are considered "non-priority" residential routes and are generally swept once per year following priority residential route sweeping. Some residential roads in rural (western and northern) areas of the County are not swept. The relatively low amount of vehicle traffic and the lack of curbs in these areas make street sweeping impractical. As in past years, more material was collected during FY19 from the priority areas (0.30 ton per curb mile) than non-priority areas (0.20 ton

per curb mile). The total amount of residential route material collected in FY19 (950.4 tons) was the most since FY15 (1,266 tons) and 39 percent more than the average for FY16 through FY18 (686 tons).

The DEP oversees sweeping of the arterial routes, which are swept at night when traffic volumes are low. In FY19, DEP swept the arterial routes 21 times. Figure III.E.9 shows the arterial routes swept in FY19. Approximately 68 percent of the mileage is located to maximize environmental benefits in the Rock Creek and Anacostia River Watersheds that both have TMDLs for sediment and phosphorus. The program swept 6,202 curb miles of roadway and collected 836 tons of material, which was a 4-percent increase from the 803 tons of material collected in FY18.

Figure III.E.10 shows tons of materials removed annually by street sweeping from FY99 to FY19 in the priority and non-priority residential areas and arterials. This figure also includes tons of salt, tons of sand/salt, and tons of sand applied during the winter period. From FY98 through FY10, data on salt and sand applied during the winter period are presented, however, data for FY09 were not reported. Starting in FY11, separate data for the application of salt and sand were available and are presented on this figure. Use of salt was relatively high between FY14 and FY16 but has been lower since. Sand has not been widely used since FY14. (See Table III.E.22).

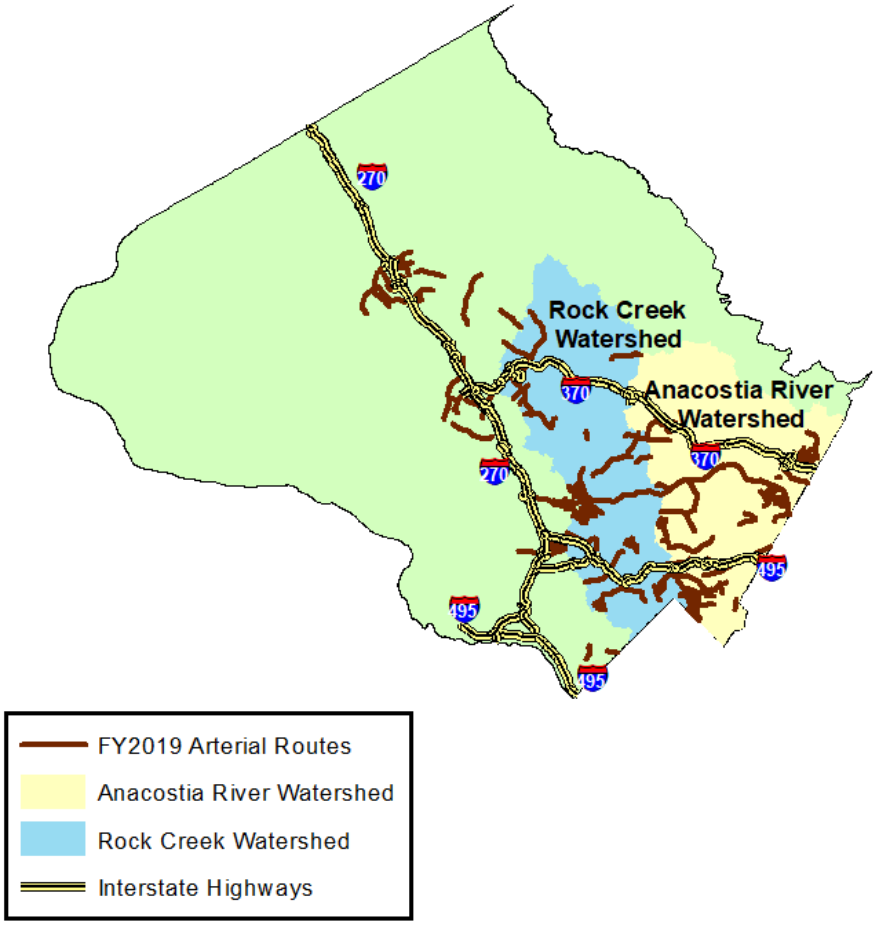


Figure III.E.9. Montgomery County Arterial Street Sweeping Routes FY19

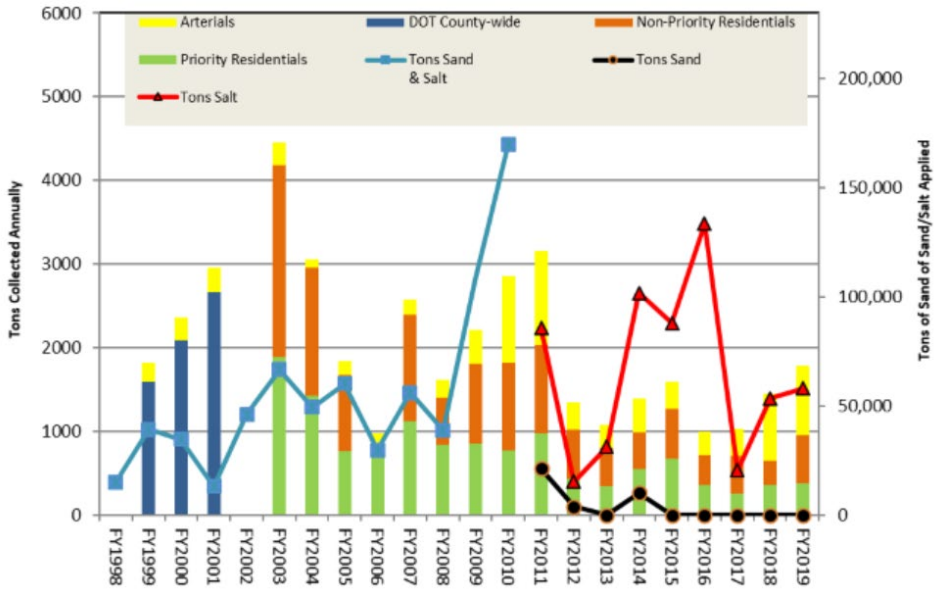


Figure III.E.10. Tons of Material Applied During Winter Activities and Collected by Street Sweeping (1998 through 2019)

ii. Description of Street Sweeping Program – Materials Removed

Figure III.E.11 shows the annual street sweeping mileage from FY99 to FY19. From FY96 through FY01 data were represented as arterials and DOT county-wide area. Starting in FY03, mileage of street sweeping on residential routes, both priority and non-priority, along with arterials are presented.

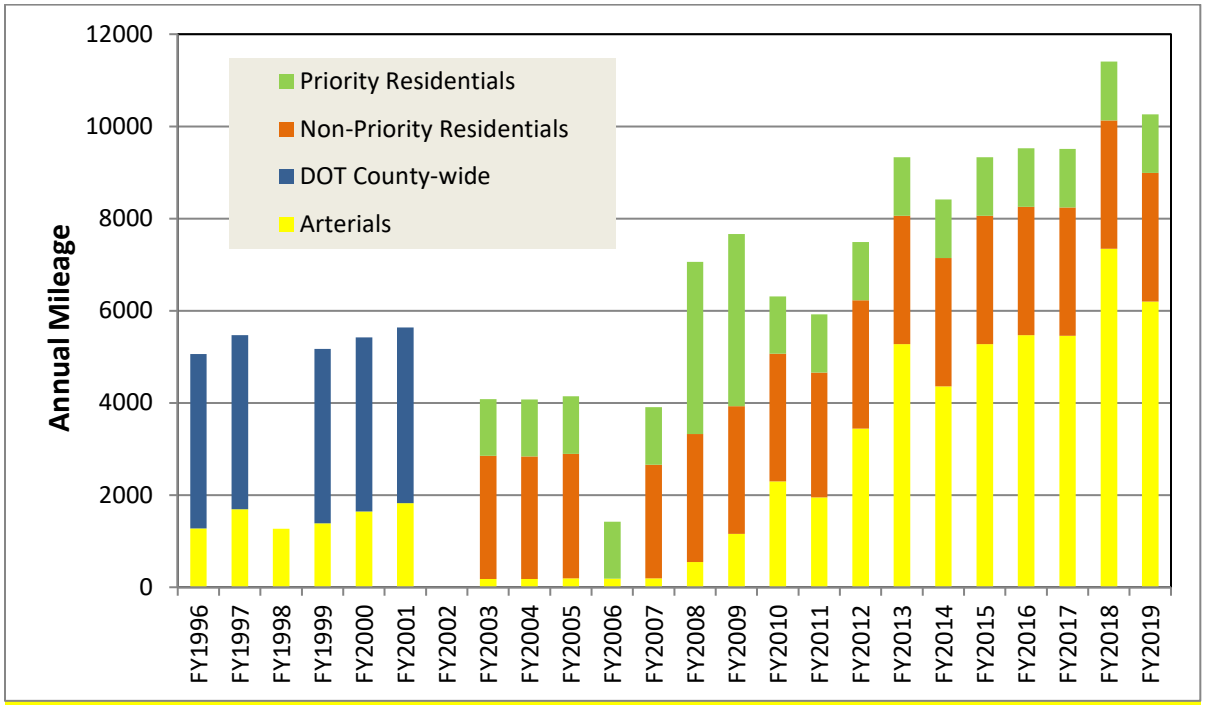


Figure III.E.11. Annual Montgomery County Street Sweeping Mileage, 1996 through 2019

Figure III.E.12 shows the annual street sweeping mileage and average cost per mile for the program from FY05 through FY19. The cost of the program decreased over time with a notable decline in FY17 mainly due to change in the contractor.

iii. Calculating Equivalent Impervious Acreage and Pollutant Reductions for TMDL Watersheds and Countywide

In FY12, the County began sweeping 229 miles of roadway identified as arterial routes twice monthly. The routes were realigned in FY15, and mileage was added in FY18. Table III.E.19 shows the miles of arterial routes, along with the percent of the total arterial routes, currently swept in five watersheds in FY19. The arterial routes were swept 21 times. This sweeping frequency allows the County to take credit for stormwater control for impervious acreage equivalent and stormwater pollutant load reductions in the swept watersheds, all of which have approved TMDLs. The credits were calculated according to MDE's August 2014 guidance *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*, Table 3.E: Alternative Urban BMPs. MDE is in the process of updating the guidance, so these credits are subject to change.

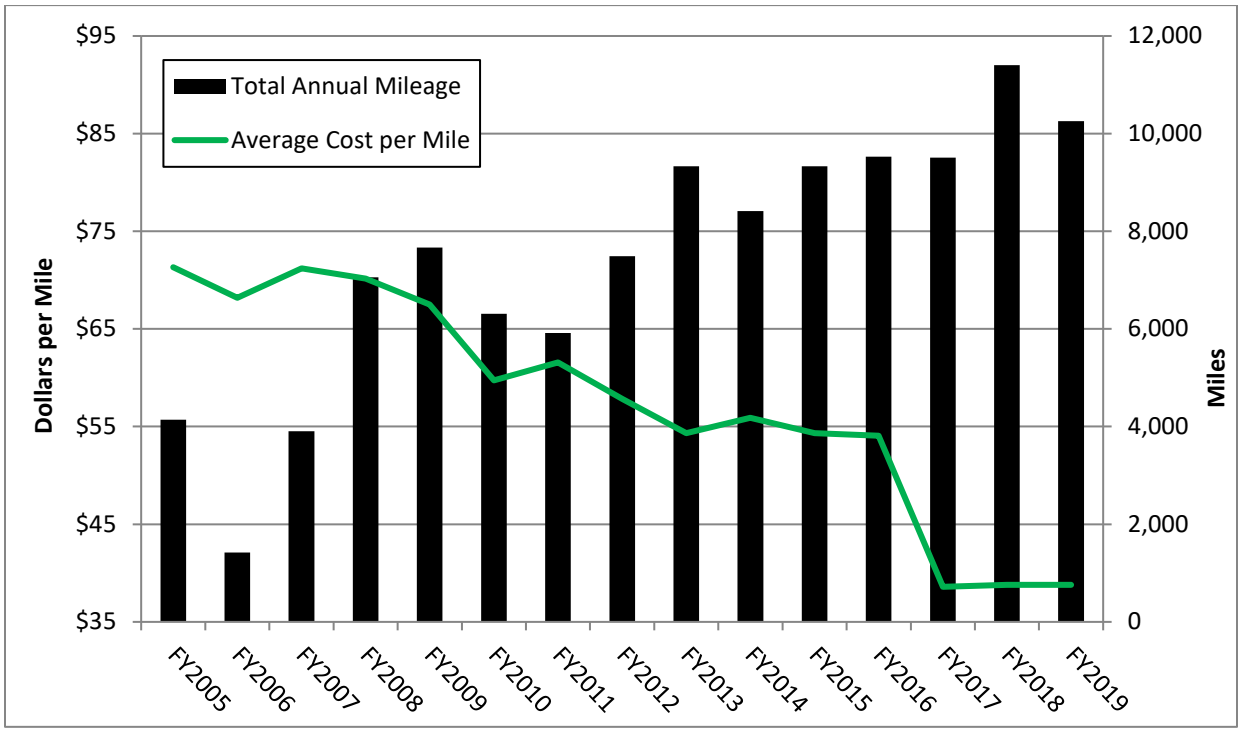


Figure III.E.12. Montgomery County Street Sweeping Mileage and Average Cost, 2005 through 2019

Table III.E.19. Summary of the Arterial Street Sweeping Program by Watershed in FY19

MD8DIG	Watershed	Miles Swept	Percent	IA Credit (acres)	TN Removal (pounds)	TP Removal (pounds)	TSS removal (tons)
02140205	Anacostia River	2,153	34.7	116	1,016	406	60.9
02140207	Cabin John Creek	547	8.8	29	258	103	15.5
02140202	Potomac Direct	485	7.8	26	229	92	13.7
02140206	Rock Creek	2,053	33.1	111	968	387	58.1
02140208	Seneca Creek	964	15.5	52	454	182	27.3
	Total:	**6,202**	**100.0**	**334**	**2,925**	**1,170**	**175.5**

Note: Total amount of material collected from Arterial Routes in FY19 = 836 tons

IA = impervious acre(s)
MD8DIG =State of Maryland 8-digit watershed code
TN = total nitrogen
TP = total phosphorus
TSS = total suspended solids

E.6.b Inlet Cleaning

Table III.E.20 compares the DOT inlet cleaning program for this Permit cycle from 2010 and FY11 to FY19. The FY19 IA equivalence treated is 69.2 acres, as calculated using guidance from *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated*, Table 3.E: Alternative Urban BMPs. MDE is currently updating the guidance, so these credits are subject to change. Material is removed from inlets and storm drains using a vacuum truck or manual labor. Material removed via a vacuum truck is disposed of at the Oaks Leachate Treatment Facility, all other litter and debris are taken to the Shady Grove Transfer Station.

Table III.E.20. DOT Inlet Cleaning, by FY10 through FY19

Year	No. Inlets Cleaned	Linear Feet Cleaned	Debris Collected (tons)	IA Equivalence Treated	Cost
FY19	145	42,366	173	69.2	$460,458
FY18	550	16,699	158	63.2	$466,000
FY17	594	40,679	145	58.0	$512,524
FY16	603	35,792	153	61.2	$315,165
FY15	2,218	31,180	346	138.4	$353,226
FY14	648	20,710	217	86.8	$418,353
FY13	803	15,769	494	197.6	$246,200
FY12	811	14,382	367	146.8	$275,392
FY11	1,191	17,604	107	42.8	$269,593
2010	2,011	24,128	181	72.4	Not Reported

E.6.c Roadside Vegetation Management

Montgomery Weed Control, Inc. conducts the County's State-required roadside weed spraying program for noxious weeds. Specialized spray equipment achieves cost efficient control with minimal use of herbicides. Operational BMPs are always followed. All personnel employed by Montgomery Weed Control, Inc. are pesticide applicators registered and trained in compliance with the State Pesticide Applicator's Law. Other than for noxious weed control, the County uses no other pesticides and no fertilizers for roadside vegetation management. Table III.E.21 shows the amount of herbicides applied along County roadways from FY11 through FY19.

Table III.E.21 Herbicide Usage by Montgomery Weed Control Inc. on Montgomery County ROWs from FY11 to FY19

Purpose	Herbicide	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
State - mandated treatment for noxious weeds	Clopyralid (gallons)	5.20	4.78	4.84	7.35	8.29	5.74	7.89	9.96	5.24
	Glyphosate (gallons)	4.55	4.55	4.10	2.58	1.10	2.5	0.14	1.37	2.17
Program Cost (thousands)		$22.0	$22.0	$22.8	$22.0	$22.0	$22.0	$22.0	$22.0	$22.0

Note: Herbicide use is directly correlated to growing conditions for each season

E.6.d Winter Weather Deicing Materials Application

The DOT uses plowing and salting to achieve a desired level of winter weather roadway treatment. The DOT follows the October 2011 Maryland State Highway Administration Salt Management Plan. All application equipment is calibrated once a year. In FY11, DOT launched a new online system to track the status and progress of roadway treatment and plowing during winter weather events. In FY12, the snow tracking application was revised to include salt used per route to identify trends in salt usage and improve salt use management.

DOT began a salt brine pilot program in 2009 to reduce the use of salt as a winter weather deicing material on 240 lane miles of primary roads. Salt brine is a 23 percent salt solution created in a brine maker and stored in tanks until used. Brine has a freezing point of -6 degrees F (°F) and continues to work when salt, which loses effectiveness at 20° F, does not. A contractor sprays the salt brine on highways 2 hours to 2 days prior to the onset of frozen precipitation to prevent snow and ice from bonding to pavements. During FY19, Montgomery County DOT increased the lane miles for each application of salt brine from 1,100 miles of primary roadways, to 1,600 lane miles, which includes all the emergency salt routes. This resulted in increased salt brine usage and a relatively low amount of overall salt usage. In FY19, DOT sprayed a total of 500,000 gallons of salt brine to treat 8,000 lane miles.

Table III.E.22 compares DOT's winter weather deicing materials use from FY10 through FY19. The amount of salt applied is related to the number of winter events, temperatures, amount of ice, refreezing, etc. Relatively large amounts of salt were applied during FY14, FY15, and FY16. These years also had

relatively large snowfall totals. In FY19, relatively high snowfall totals resulted in a moderate amount of salt being used due to the increased use of salt brine.

Table III.E.22 DOT Winter Weather Deicing Material Usage from FY10 to FY19

Year	Winter Storms	Snow (inches)	Salt (tons)	Sand (tons)	Salt Brine (gallons)
FY10	NR*	73.2**	169,633 sand and salt		NR*
FY11	NR*	12.6**	85,600	21,400	NR*
FY12	NR*	3.7**	15,200	3,800	122,031
FY13	NR*	12.7**	31,309	0	93,005
FY14	NR*	52.8**	111,787	10,000	121,787
FY15	28	36.9**	87,900	0	36,400
FY16	5**	40.35	133,517	0	43,000
FY17	9	6.36	20,408	0	147,122
FY18	15	16.1	53,479	0	168,000
FY19	13	28	57,692	0	500,000

** NR = not reported*

*** National Oceanic and Atmospheric Association Local Climatological Data, Washington, DC (Washington Dulles International Airport)*

E.7 Public Education Outreach

7. Public Education
The 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 within one year of permit issuance, develop a work plan to implement a public outreach and education campaign with specific performance goals and deadlines to:

a. Establish and publicize a compliance hotline for the public reporting of suspected illicit discharges, illegal dumping, and spills.

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

i. Increasing water conservation;

ii. The importance of community stormwater management 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. Car care;

vii. Improving private well and septic system management; and

viii. Proper pet waste management.

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

i. NPDES permitting requirements;

ii. Pollution prevention plan development;

iii. Proper housekeeping; and

iv. Spill prevention and response.

d. Provide information regarding trash and littering as prescribed in Part III.E.4 above.

The County maintains a robust public outreach and education program to reduce stormwater pollution. The County continues to conduct and expand those activities. The public outreach and education campaigns for FY19 are featured in this section as well as throughout the report.

E.7.a Compliance Hotline and Communication Mechanisms

The County continues to use environmental education, outreach, and stewardship through various communication mechanisms to work with and support local citizens to address stormwater quality issues and the MS4 permit requirements. For this effort, the County utilizes multimedia approaches and various community platforms to involve a majority of audiences, such as citizens, culturally diverse communities, schools, faith communities, businesses, and organizations to create a campaign to educate them on

environmental issues and implement various practices. The following subsections summarize the communication mechanisms for public reporting of suspected illicit discharges, illegal dumping, and spills.

i. Montgomery County Community Service Center MC311

The Permit requires the County to establish and publicize a compliance hotline for public reporting of spills, illegal dumping, and suspected illicit discharges. The County maintains a call center that allows citizens to call one number (311) for all concerns in the County, including surface water quality concerns. More information can be found on the 311 home page at:
http://www3.montgomerycountymd.gov/311/Home.aspx

ii. My Green Montgomery

In FY19, the My Green Montgomery online education portal (http://www.mygreenmontgomery.org) continued its long-term Montgomery County Coordinated Implementation Strategy (Strategy) as the news and communication arm of the DEP. During the year, 116 blogs were posted on the website. The My Green Montgomery website had 26,536 users and 55,226 page views in FY19, which is a slight decline from users and views in FY18.

iii. Newsletters

The My Green Montgomery monthly e-newsletter continued to use the govdelivery platform in FY19 and recorded a 20 percent increase in subscribers compared with FY18 (5,097 in FY18 to 6,109 in FY19). The RainScapes section, which provides outreach and voluntary rebates for green infrastructure installations, continues to issue e-newsletters.

The RainScapes Gazette and the RainScapes Gazette for Landscape Professionals continued to be a communication tool that the RainScapes program could reliably use to share information on the program activities and other DEP programs. These quarterly newsletters reach and update a broad range of both County and regional subscribers. There are currently 4,797 RainScapes Gazette subscribers and 2,852 Pro Gazette subscribers. FY19 numbers represent an increase from FY18 by 8 percent for the RainScapes Gazette and 14 percent for the RainScapes Gazette for Landscape Professional.

iv. DEP Website

The DEP general websites (www.montgomerycountymd.gov/dep, /green, /water, /lawns, and /bag) received 144,396 users with 350,519 pageviews. This reflects a slight increase in users and a slight decrease in page views compared to FY18. Overall, these categories remained fairly consistent. The top water pages remained the same as the previous year: public water supply, well and septic, RainScapes, and stormwater maintenance. At the end of FY19, there are more than 8,279 pictures on the DEP Flickr website and 119 videos on DEP's YouTube channel.

v. Social Media

The My Green Montgomery social media platform was officially changed to the Department of Environmental Protection in the spring of 2019. The DEP now has 1,793 Facebook followers, 2,083 Twitter followers, and 595 Instagram followers. Increases in each can be found in Table III.E.23. Water-focused content was featured on all platforms throughout FY19. Water-specific campaigns were launched for reducing plastic bag usage during the holidays and restoration programs. In celebration of Chesapeake Bay Awareness Week in June and National Water Quality Month in August, strategic

emphasis was placed on water-related activities, including photographs, facts, and live updates. The RainScapes section also began sharing RainScapes project photographs and plants on Pinterest. More information about the Breewood Restoration Celebration can be found at https://mygreenmontgomery.org/2019/working-together-to-protect-our-streams/ and more information can be found about Chesapeake Awareness Week at https://mygreenmontgomery.org/2019/chesapeake-bay-awareness-week-2019/.

vi. Montgomery County GreenFest Website

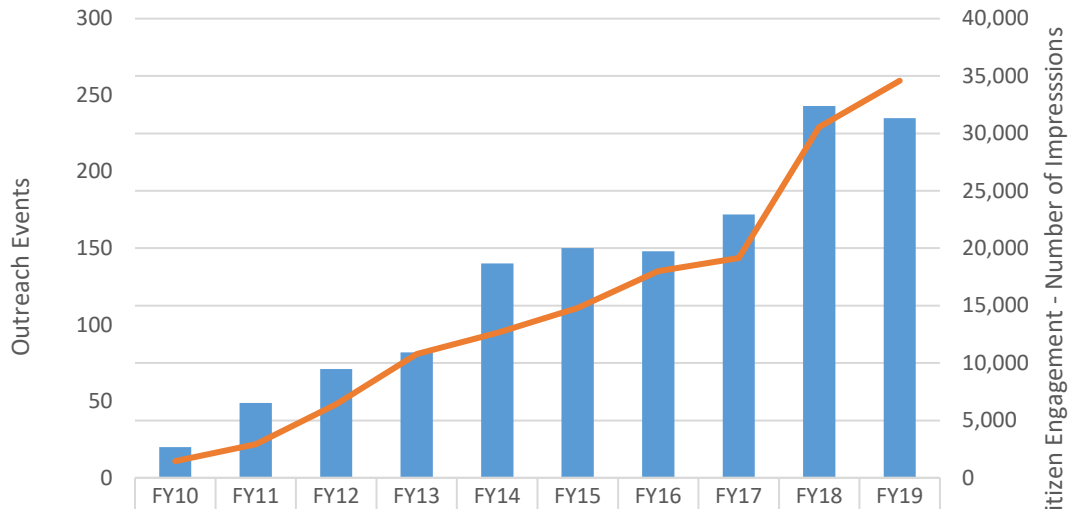
Montgomery County GreenFest is committed to helping everyone in the County explore their path to a greener life. The Montgomery County GreenFest website (www.montgomerycountygreenfest.org) provided highlights for the successfully completed April 28, 2019 event and provides information for the upcoming April 19, 2020 event.

E.7.b Summary of FY19 Public Education and Outreach

During FY19, DEP events continued to focus on targeting specific audiences, increasing stormwater awareness, encouraging directionally corrective measures, and establishing baseline information through surveys. The baseline information will help guide follow-up measures. DEP will continue to search for ways to estimate pollutant reductions from behavior change, beyond those documented in the Strategy, or will default to criteria when established by MDE.

The DEP hosted or participated in 235 outreach events in FY19; 34,590 attendees directly educated because of outreach efforts, and this represents a 13-percent increase in attendance from FY18. During the past 9 years, staff was able to host or participate in over 1,300 events, workshops, trainings, or engagement activities resulting in educating more than 150,000 citizens. Figure III.E.13 presents the steady increase in outreach activities by DEP over the course of the most recent Permit cycle. Figures III.E.14 and III.E.15 presents a breakdown of stormwater outreach impressions and events, respectively, in various watersheds in FY19. Most outreach activities continue to be conducted in the Anacostia River and Rock Creek Watersheds, which follows the intent of the Strategy.

i. Summary of FY19 Activities



	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Outreach Events	20	49	71	82	140	150	148	172	243	235
Citizen Engagement	1,453	2,935	6,400	10,800	12,639	14,798	18,019	19,159	30,554	34,590

Figure III.E.13. Increase in Outreach Events and Citizen Engagement Over Time

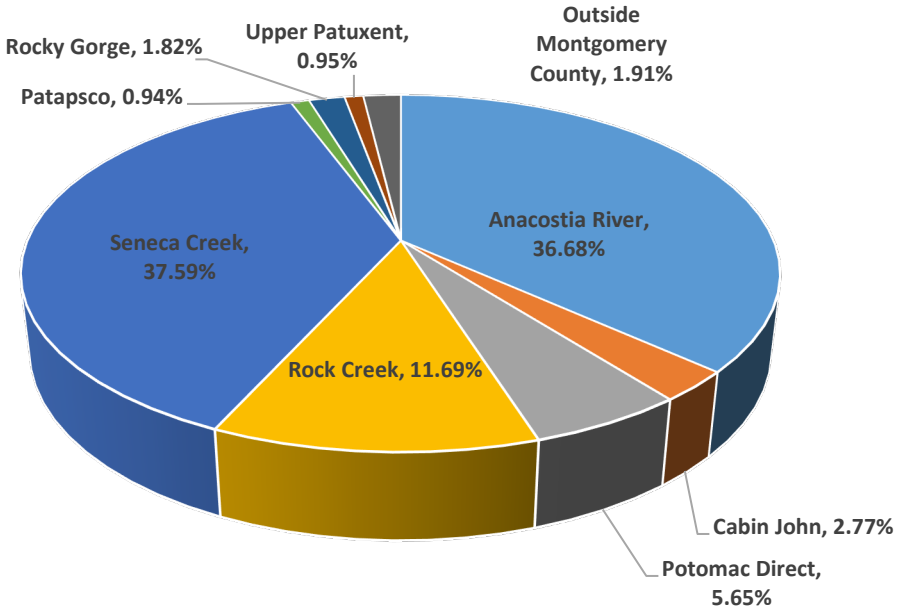


Figure III.E.14 Outreach Impressions by Watershed in FY19

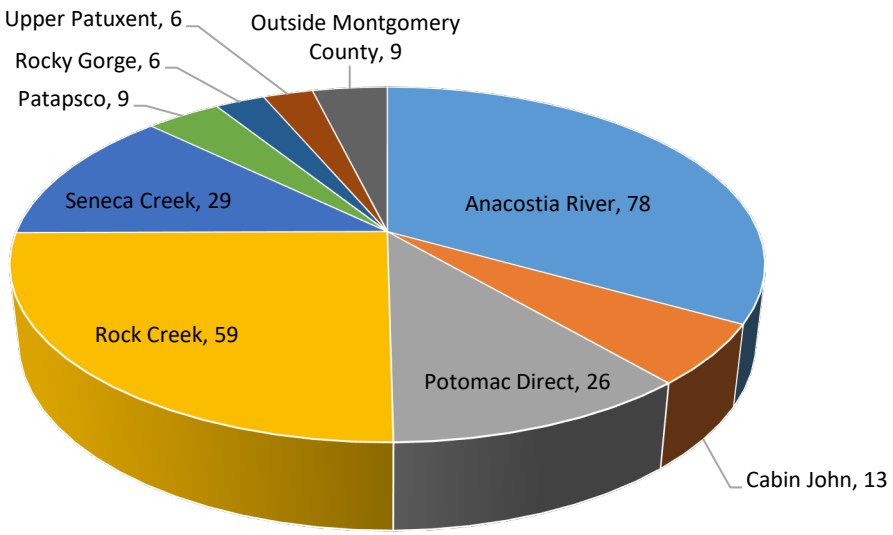


Figure III.E.15 Outreach Events by Watershed in FY19

Table III.E.23 summarizes FY19 areas of significant documented outreach increases from FY18. More details on each of these programs can be found in the following subsections.

Table III.E.23 Areas of Significant Social Media Increases in FY19

Activity/Communication Mechanisms	Percent Increase
Facebook followers	43
Twitter followers	23
Instagram followers	242
Twitter engagement	142
Facebook impressions	181
Twitter impressions	98
Instagram Impressions	100
Blog submissions	3
My Green Montgomery e-newsletter subscribers	20
Youtube videos	63
YouTube subscribers	21

ii. Outreach Database

DEP continued using an outreach database to track outreach activities across multiple DEP programs, including watershed restoration. The new database increases reporting efficiency by standardizing data required for each outreach effort. DEP planners use the database to coordinate events that occur in close proximity or time frames, allowing for enhanced outreach. Metrics tracked include: type of event and location including watershed, event date, number of impressions, volunteer participation, topics covered, and media coverage.

iii. Focused Efforts to Provide Outreach to Culturally Diverse Communities

As of FY19, the population in Montgomery County has increased 8.3 percent since 2010. According to the U.S. Census Bureau, 43.4 percent of the population identified themselves as White, non-Hispanic. Hispanic, and African American populations were both listed as 19.9 percent, and the Asian population remained the same at 15.6 percent (http://www.census.gov/quickfacts/table/PST045215/24031,00). Approximately 40.6 percent of households speak a language other than English in the home. DEP recognizes the need to develop outreach targeted to the County's increasingly diverse demographics and provides translation services for many of its public outreach materials. DEP also provides on-site translations at DEP restoration projects and during enforcement.

E.7.c Public Outreach and Stewardship Work Plan Implementation

The Permit requires the County to develop and implement a public outreach and education program focused on stormwater pollution reduction. To meet this requirement, the County developed a Public Outreach and Stewardship Work Plan (POSWP) as part of the County's overall Strategy. The POSWP includes practice sheets for eight specific outreach campaigns such as pet waste management, lawn stewardship, anti-littering, stormwater awareness, establishing a volunteer program, riparian reforestation, roof runoff reduction and parking lot recharge. Each practice sheet identifies performance goals, key messages, intended outcomes, targeted audiences, partnerships to develop, delivery techniques, startup costs, measurement objectives, timelines and milestones from start up through 2025. The practice sheets along with outreach recommendations developed for each County Watershed Implementation Plan make up the POSWP, which can be found online at https://www.montgomerycountymd.gov/DEP/Resources/Files/ReportsandPublications/Water/Countywide%20Implementation%20Strategy/Watershed-Outreach-Plan-2012.pdf.

i. Pet Waste Management Program (POSWP Priority Practice #1)

Since DEP initiated a pet waste pilot program in FY14 to help reduce bacterial levels in watersheds a total of 32,371 pounds of pet waste have been collected through 120 stations. In FY19, DEP worked with 21 communities (15 communities completed their 1-year maintenance of stations via the program and added 6 new communities to the program) to remove pet waste from Montgomery County watersheds and assist in meeting bacteria and nutrient TMDLs in Montgomery County watersheds. There was a 69-percent increase in pounds of pet waste collected in FY19 compared with FY18. Since the program expanded in FY17, the program has continued to be popular. The program covers the entire County, outside of municipalities, and a waiting list now exists.

In FY19, 12,893.36 pounds of pet waste were removed through 78 pet waste stations, serving 11,606 households in Montgomery County. The stations prevented 134.5 trillion fecal coliform bacteria, 741.3 pounds of nitrogen, and 96.6 pounds of phosphorous from potentially entering local streams. The pet waste collected and pollutants reduced by watershed are shown in Table III.E.24.

Table III.E.24 Pet Waste Collected and Fecal Coliform, Nitrogen, and Phosphorus Reduced by Watershed in FY19

Watershed	Number of Stations	Pet Waste Collected (pounds)	Fecal Coliform Reduced (trillions)	Nitrogen Reduced (pounds)	Phosphorus Reduced (pounds)
Anacostia River	6	2,144.80	22.4	123.3	16.1
Cabin John Creek	7	867.60	9.1	49.9	6.5
Patuxent	3	671.40	7	38.6	5.0
Potomac Direct	6	148.15	1.5	8.5	1.1
Rock Creek	4	233.14	2.4	13.4	1.7
Seneca Creek	52	8828.27	92.1	507.6	66.2
Total:	**78**	**12,893.36**	**134.5**	**741.3**	**96.6**

FY19 was the first year DEP pet waste stations were added in the Patuxent Watershed due to one newly recruited community.

In FY19 overall, 6 new communities were added to the program and 15 communities "graduated" from the program. Graduated communities have completed the 1-year program provided by the County. The communities decide whether or not to "adopt" the stations after the first year. Adoption entails keeping the station and taking over the maintenance. Of the 78 stations maintained through the program in FY19, 22 stations were installed in FY19, and 56 stations were installed in FY18. Of the ones installed in FY18, 54 stations were adopted. Only one graduating community decided against keeping 2 stations. Following are the 14 communities that adopted 54 stations:

- Woodrock HOA: three stations
- Bethesda Place HOA: three stations
- Rosewood Condominiums: three stations
- Park Overlook HOA: three stations
- Courtyard at Rio HOA: three stations
- Germantown Estates HOA: five stations
- Orchard Hills HOA: two stations
- Fox Chapel North: three stations
- Stedwick HOA: seven stations
- Clarksburg Village HOA: seven stations
- South Village HOA: six stations
- Norbeck Crossing HOA: two stations
- Sierra Landing Condominiums: two stations
- Patton Ridge Homes Corporations: five stations

Table III.E.25 shows the communities participating in the program and the pounds of pet waste collected at stations in each community.

Table III.E.25 Community Associations Participating in the Pet Waste Program in FY19

Community Name	No. of Homes	Watershed	City	Number of Stations	Pounds Collected
Norbeck Crossing	243	Anacostia	Silver Spring	2	1,414.4
Sierra Landing	200	Anacostia	Silver Spring	2	609.4
Glenfield North	60	Anacostia	Silver Spring	2	121
Bethesda Place	217	Cabin John	Bethesda	3	49.6
Inverness	255	Cabin John	Potomac	4	818
Champlain	142	Patuxent	Olney	3	671.4
Woodrock	246	Potomac Direct	Potomac	3	110.35
Courtyard at Rio	87	Potomac Direct	Gaithersburg	3	37.8
Park Overlook	446	Rock Creek	Derwood	3	131.83
Edson Condos	48	Rock Creek	Rockville	1	101.31
Rosewood	202	Seneca Creek	Gaithersburg	3	80.8
Germantown Estates	287	Seneca Creek	Germantown	5	70.32
Orchard Hills	155	Seneca Creek	Gaithersburg	2	140.8
Fox Chapel North	132	Seneca Creek	Germantown	3	78.5
Greenhill condos	57	Seneca Creek	Damascus	2	151.08
Stedwick	1,200	Seneca Creek	Montgomery Village	7	1,168.43
Clarksburg	4,000	Seneca Creek	Clarksburg	7	1,563.5
South Village	1,010	Seneca Creek	Montgomery Village	6	2,269.44
Patton Ridge	1,070	Seneca Creek	Montgomery Village	6*	1,204.4
Northgate Homes	1,149	Seneca Creek	Montgomery Village	6	1,702.5
Herons Cove	400	Seneca Creek	Montgomery Village	5	398.5
Total:	**11,606**	**-**	**-**	**78**	**12,893.36**

[1] *Five stations were adopted by Patton Ridge Homes Corporations in FY19 and anticipate that they will be adopting one more in FY20*

At the end of the 12-month program, each community received a report with pre- and post-surveys, along with pet waste collection weights for each station located in their community for the entire year. Based on the data and surveys, the communities can then decide whether or not to adopt the stations. Contact is maintained with the graduated communities to provide outreach materials as needed, and the communities that decided to keep the stations continued to maintain their pet waste program after participating in the DEP's pet waste management program.

DEP continued to educate County residents about the importance of picking up after their dog by distributing information at festivals and events specifically targeting dog owners (for example, pool pooch parties). In FY19, DEP partnered with Friends of Cabin John Creek Watershed to share outreach information to veterinary offices, groomers, and pet stores located in Cabin John Watershed.

The lawn signs created in FY16 and translated to Spanish in FY18 were distributed to homeowners, HOAs, and schools interested in placing the sign on green areas. Overall, 700 lawn signs were distributed in FY19; 400 in English and 300 in Spanish. Figure III.E.16 shows a sign in a residential yard.

Figure III.E.16 Pet Waste Lawn Sign ("There's no such thing as the Poop Fairy") in a Residential Yard

Table III.E.26 summarizes the number of pet waste stations and waste collected by watershed since the program began in FY14.

Table III.E.26 Summary of Pet Waste Program FY14 to FY19

FY	Watersheds						
	Anacostia	Cabin John	Patuxent	Potomac Direct	Rock Creek	Seneca Creek	Total
Number of Stations (Stations typically overlap multiple FYs)							
FY14	N/A	N/A	N/A	N/A	7	N/A	7
FY15	11	N/A	N/A	N/A	10	N/A	21
FY16	16	N/A	N/A	N/A	16	N/A	32
FY17	5	N/A	N/A	N/A	4	N/A	9
FY18	4	3	N/A	6	6	40	59
FY19	6	7	3	6	4	52	78

Table III.E.26 Summary of Pet Waste Program FY14 to FY19							
FY	**Watersheds**						
	Anacostia	**Cabin John**	**Patuxent**	**Potomac Direct**	**Rock Creek**	**Seneca Creek**	**Total**
Pounds of Pet Waste Collected							
FY14	N/A	N/A	N/A	N/A	1,669	N/A	1,669
FY15	932	N/A	N/A	N/A	705	N/A	1,637
FY16	2,180	N/A	N/A	N/A	5,631	N/A	7,811
FY17	279	N/A	N/A	N/A	446	N/A	725
FY18	419	737	N/A	1,103	1,332	4,046	7,637
FY19	2,145	868	671	148	233	8,828	12,893
Total Pounds Collected	**5,955**	**1,605**	**671**	**1,251**	**10,016**	**12,874**	**32,372**

N/A = not applicable

ii. Innovative Stormwater Management Outreach and Stewardship (POSWP Practice #4)

This priority practice focuses on promoting public understanding and support of SWM practices, particularly environmental site design and watershed restoration. This includes creating new programming and initiatives intent on encouraging and evaluating social behavior change.

(a) Fifth Annual Montgomery County GreenFest

The DEP, along with 13 community partners, collaborated to conduct the fifth annual GreenFest that took place at Brookside Gardens in Silver Spring, MD. This combined the Brookside Earth Day event with GreenFest. This change proved to be quite successful; approximately 4,000 residents were in attendance to learn how to "green" their lives, which represents a 233-percent increase in attendance from FY18. Overall, 2019 was the most successful GreenFest to date.

Water education and stormwater focuses at the 2019 GreenFest included a reusable bag give away, a downspout planter box do-it-yourself demonstration, and the third running of the Stream Maze, which focused on the Anacostia River (see Figure III.E.17). The University of Maryland continued surveying participants on what they learned and actions they can follow through with at home.

Figure III.E.17 Residents Participating in the Stream Maze at the Fifth Annual Greenfest Residents roleplay as fish and try to avoid "pollution" to find the healthiest stream.

(b) Caching the Rain Stormwater Awareness Program

The Caching the Rain geotrail is a scavenger hunt geocaching activity with a stormwater pollution outreach focus. DEP established geocaches at six locations, primarily in the lower (more urban) part of the county near stormwater facilities. Participants answer stormwater-related trivia questions at each station and verify their answers in a survey once they complete the trail. The six locations have been visited collectively over 1,400 times. Table III.E.27 represents the cumulative surveyed changes since the program began in FY14 in awareness of participants after completing the Caching the Rain geotrail for specific topic areas.

Table III.E.27 Caching the Rain Stormwater Awareness Program Statistics

Topic (awareness)	Increased Awareness After Geotrail Completion
Awareness of Local Watersheds	90%
Knowledge of local Stormwater Facilities	55%
Behaviors/Action Steps to improve the Environment	49%
Knowledge of Stormwater Pollution	43%

Following are other facts about the geocaching program:

- A total of 176 citizens have completed the geotrail and received a souvenir coin since the launch in FY14.
- The Caching the Rain geotrail has been "favorited" and shared by participants a total of 65 times and has a completion rate of 82 percent.
- Of the behaviors/action steps the participants learned about during the geotrail, 62.2 percent said they would be highly interested/likely to add a RainScape practice to their property, and 15 percent indicated they currently participate in the program.
- Forty-two percent of participants currently pick up after their pets, which is in line with other studies; 13 percent indicated they would be more willing to do so after participating in the geotrail.
- Forty-eight percent were willing to reduce the amount of fertilizer and pesticides they use on their property, and 31 percent indicate they have reduced their use of fertilizers and pesticides already.
- Forty-eight percent were willing to plant a native tree on their property, and 32 percent of participants stated they have personally planted trees.
- Forty-five percent stated they would be likely to volunteer for an environmental cause.
- A total of 81.5 percent stated they recycle on a regular basis, and 16 percent indicated they would be more willing to properly recycle after participating in the geotrail.

A quote from a participant this year: "I think it's such an important and educational topic and very cool to know how proactive this county is at reducing pollution in a specific way."

(c) Watershed Group Capacity Building

DEP did not conduct capacity building efforts in FY19. However, the DEP continued to provide limited support. Watershed groups remained focused on continuing their efforts to assist in meeting requirements of the MS4 permit in FY19.

(d) Watershed Group Accomplishments

During FY19, ten watershed groups actively recruited members and conducted special activities including educational events, roadway and watershed clean-ups, and invasive plant work days. These groups include the Eyes of Paint Branch, Friends of Sligo Creek, Friends of Ten Mile Creek, the Neighbors of Northwest Branch, the Rock Creek Conservancy, the Little Falls Watershed Alliance, the Friends of Cabin John Creek, the Muddy Branch Alliance, the Seneca Creek Watershed Partners, and the Watts Branch Alliance.

DEP staff continued collaborating with the local watershed groups and the Stormwater Partners Network to further watershed restoration and green infrastructure education. Watershed groups have continued to have an increased presence in the County. Individual outreach activities and reporting data can be found on the watershed groups' individual websites and Facebook accounts.

(e) Capital Improvement Program Elements Focused on Outreach and Education

On June 8, 2019, nearly 10 years since the effort first began, a group of residents joined dignitaries from Montgomery County government, MWCOG, Friends of Sligo Creek, and Northwood Presbyterian Church to celebrate the completion of the Breewood Watershed Restoration Project that provides cleaner water for current and future resident of Montgomery County to enjoy. More information can be found at https://mygreenmontgomery.org/2019/working-together-to-protect-our-streams/ and Figures III.E.18 and III.E.19 depict photographs from the event.

Figure III.E.18. Residents Listening to Speakers and Learn About Breewood Restoration Project

Figure III.E.19. County Executive Marc Elrich Addressing the Crowd

"The bioretention garden constructed at the church as part of the Breewood project has not only contributed to the beauty of our church property but has also made our congregation excited to become more actively involved in the improvement of God's creation close and within our worship home."

-Rev. Maggie Haywood, of the Northwood Presbyterian Church

In addition to being inspired by the speakers, those in attendance were provided with the opportunity to do a walking tour of the Breewood Watershed to see and learn how the new SWM facilities work to manage and clean stormwater runoff (see Figure III.E.20). At approximately 1.3 miles in length, the Breewood Watershed walking tour offers a great way to see all the project areas. The guide and map of the walking tour is available at https://www.montgomerycountymd.gov/water/restoration/breewood.html. A video clip of the celebration event can be found at https://youtu.be/CKh7Kv0byy0.

Figure III.E.20. Residents on a Walking Tour of the Breewood Watershed

iii. Stream Stewards Outreach and Stewardship Campaign (POSWP Priority Practice #5)

This priority practice includes programs that promote champions for neighborhood streams and increased community involvement in stormwater issue awareness and watershed protection. Table III.E.28 summarizes the Stream Steward volunteer activities for FY19.

Table III.E.28 FY19 Stream Stewards Volunteer Activities

Volunteer Opportunity	Number of Hours	Number of Volunteers[1]	Service Value2
Office Assistance/Intern	49	6	$1,403.85
Orientations, including FrogWatch	220	118	$6,303.00
Watershed Ambassador	363.5	87	$10,414.28
Watershed Keeper			
DEP Cleanups	114	57	$3,266.10
Storm Drain Art	237	64	$6,790.05
Opportunity Total:	**983.50**	**168**	**$28,177.28**

[1] Total number of volunteers = the total number of individuals that volunteered with DEP throughout the year and not the total number of times they volunteered. Some volunteer participated in multiple events.

[2] Service value per independent sector (http://www.independentsector.org/volunteer_time) rate of $28.65 per volunteer hour in Maryland.

(a) Volunteer Involvement

To maintain communications with the volunteers; quarterly announcements were emailed to more than 900 active and potential volunteers; 168 volunteers helped by participating in 30 activities. This level of involvement from volunteers is similar to prior years which allowed the County to continue to have plenty of volunteers at each activity. The following were the FY19 volunteer activities:

- The Montgomery County Agricultural Fair occurred in 2019.
- The following seven DEP cleanups were held:
  - Oakview community cleanup, October 13, 2019
  - Great Seneca Elementary School cleanup, April 13, 2019
  - Wheaton Branch stormwater pond cleanup, April 13, 2019
  - White Oak community cleanup, April 18, 2019
  - Townes of Gloucester community cleanup, April 22, 2019
  - White Oak community cleanup, May 4, 2019
  - Community cleanups in Goshen and Odendhall, June 8, 2019
- Eighty-two volunteers participated in two training orientations on July 31, 2018 and August 3, 2018 to educate volunteers on DEP programs. Increased number of volunteers trained because this year we combined orientations for Recycling Volunteers and Stream Stewards—two volunteer programs housed at DEP (see Figures III.E.21 and III.E.22).
- Twenty volunteers participated in a FrogWatch classroom and/or field trainings.
- Volunteers helped paint a total of nine new storm drains
  - Three new storm drains in the Wheaton Urban District (October 21 and November 4, 2019)
  - Two storm drains in the Germantown Bus Bay on Century Boulevard (April 20, 2019)
  - Four storm drains at Viers Mill Elementary School (June 5, 2019)
- Twenty-two volunteers helped during the annual GreenFest in April 28, 2019.

Figure III.E.21 Stream Stewards Painting a Storm Drain in Honor of Earth Day in April 2019

Figure III.E.22. Stream Stewards Helping during the 2019 GreenFest at Brooksides Garden, April 28, 2019

- Twenty volunteers helped in FY19 to help educate people about not using plastic bags at 10 events. They distributed more than 5,000 reusable bags to County residents during the holiday season from November 10, 2018 through December 22, 2019.

- This year, DEP partnered with Friends of Cabin John Creek to carry out outreach related to pet waste. Two volunteers helped distribute pet waste information to veterinary offices, pet stores, and groomers in the Cabin John watershed area. In addition, two volunteers participated in outreach education events at Cabin John Dog Park.

(b) Stream Monitoring Interns

The DEP Biological Monitoring Section conducts detailed biological, chemical, and physical assessments of County watersheds on a 5-year rotating basis (see Section III.F Watershed Assessment). DEP recruits and trains interns each year to assist with the monitoring and laboratory analysis. During FY19, seven interns were paid instead of volunteering for the program, which is a change from previous years.

iv. Watershed Restoration and Outreach Grants (POSWP Priority Practices #4 and #5)

The DEP administered the fourth round of the Montgomery County Watershed Restoration and Outreach Grant Program in FY19 for eligible non-profit organizations. More than $1.7 million in grant projects have been funded using the Chesapeake Bay Trust as a conduit. FY19 marked the fourth time grants were funded to non-profits through the WQPC funds. Nine grants were funded this fiscal year, totaling 39 grants since inception.

The grant program funds projects that reduce pollutants through community-based restoration practices as well as projects focused on public engagement through education, outreach, and stewardship. A priority focus area is on non-profit-owned properties with larger areas of impervious surfaces. Restoration and outreach projects were largely focused on congregations and projects in the Anacostia and Rock Creek Watersheds. FY19 grantee accomplishments included the following:

- Round 2 Grants:
  - Arts on the Block
    - The stormwater planter boxes installation and Lightscape project, which included a dry stream bed conservation landscape and raingarden, were completed. They also installed educational signage that the students helped design.
  - Rock Creek Conservancy
    - A video was developed about their project and can be viewed at . http://www.derwoodstation2.com/Derwood%20Station%202%20Video_FINAL_Grant%2015559.mp4 (see Figure III.E.23).

Figure III.E.23 Video Cover for the Completed Derwood Project

- Round Three grants:
  - Anacostia RiverKeepers
    - Five outreach events geared towards the Latino community were conducted (see Figure III.E.24).
    - Two videos in Spanish were made highlighting the effects of stormwater on Sligo Creek. The videos can be viewed at https://www.youtube.com/watch?v=VsyKJAnW94U&t=3s and https://drive.google.com/file/d/1oKhE2gQVoPp5B85hp79O4SWu709dhK5D/view
    - A rain garden was installed at the Sandy Spring Friends Meeting House. (see Figure III.E.25)

Figure III.E.24 Participants at Outreach Activities Targeting Montgomery County LatinX Community

Figure III.E.25. Recently Installed Rain Garden at the Sandy Springs Friends Meeting House The garden captures and treats stormwater from the roof and sidewalk of the building before it enters the creek nearby.

- Audubon Naturalist Society
  - An 527-square-foot rain garden and signage installation was completed. The society is now one step closer to treating 100 percent of the stormwater on the sanctuary property and can educated visitors on various ways to treat stormwater from impervious surfaces (Figures III.E.26 and III.E.27).
- Butler Montessori
  - A 3,000-square-foot installation of porous pavement project was completed along the circle driveway of the school and educational signage that the students helped design. The sign explains how the new permeable paver project treats stormwater runoff from their school and improves the water quality to the Chesapeake Bay and also helps explain the various layers beneath the surface of the permeable pavers (see Figures III.E.28 and III.E.29).

Figure III.E.26. Recently Constructed Rain Garden at the Audubon Naturalist Society

Figure III.E.27. Interpretive Signage at the Audubon Naturalist Society

Figure III.E.28. Butler Montessori Permeable Paver Project Signage

Figure III.E.29. Butler Montessori Students Admire the Permeable Paver Sign

- Friends of Sligo Creek:
  - A conservation landscaping project and educational signage were completed at the Three Oaks neighborhood in the Sligo Creek Watershed (Figure III.E.30).
- University of Maryland - Environmental Finance Center
  - Three stormwater reductions plans were completed for the communities of Wheaton Hills Civic Association, Glenmont Forest Neighbors Civic Association, and the McKenney Hills – Carroll Knolls Neighborhood Association.
- Wildlife Habitat Council
  - An additional workshop was held to encourage businesses to install conservation landscaping, rain gardens, and other green alternative practices. One corporate attendee agreed to host a green infrastructure webinar; as a result, one Montgomery County based real estate company is further pursuing involvement.

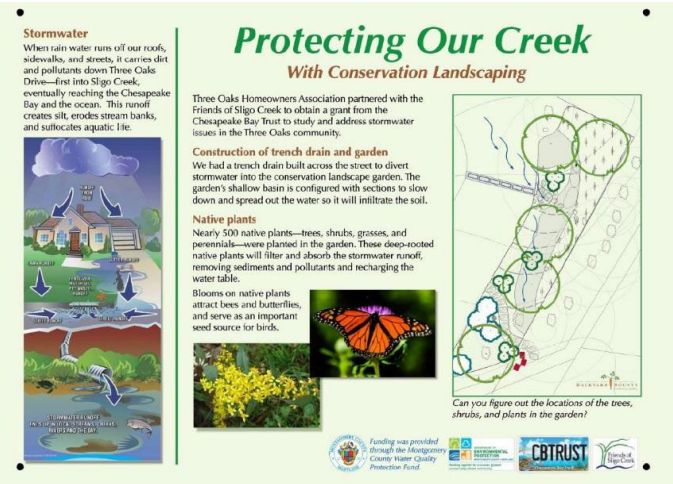


Figure III.E.30 Sign Installed in the Conservation Landscaping Project at the Three Oaks Community

- Round Four grants
  - Carolyn Condos
    - A stormwater assessment and designs were initiated for a demonstration project.
  - Little Falls Alliance – Sumner Village Conservation Landscaping
    - The conservation landscaping project was designed and construction began. The project was not yet complete as of the FY19 Annual Report submission.
  - Anacostia RiverKeepers – Adventist Community Services and Tartan Ridge Community
    - The design for both projects were completed, but construction has not yet begun.
  - Bethesda Green – Glenwaye Gardens
    - A pre-construction meeting was held and final design is completed for the conservation landscaping. Project construction has not yet begun.
  - Friends of Cabin John Creek
    - Work with communities continued on the Stormwater Solutions Program to support stormwater assessments and educational efforts.
  - Our House, Inc.
    - Staffing turnaround has delayed this project, but the invasive Bradford pears on the property have been removed.
  - Audubon Naturalist Society
    - A total of 75 percent of the design work for a permeable paver retrofit on the property has been completed.
  - University of Maryland Environmental Finance Center
    - A community stormwater summit was held and work with the Rosemary Hills Civic Association and the Parkside Condominium Association on stormwater reduction plans was finalized.

v. RainScapes Program Outreach

The DEP's RainScapes program promotes and implements small scale stormwater control and infiltration projects on residential, institutional, and commercial properties. The multi-faceted program is designed to provide information and training to residents and landscape professionals, as well as incentives and project delivery to County sites. For more information on the incentive programs, RainScapes Rewards and RainScapes Neighborhoods (see Section III.G). The following subsection provides an update on RainScapes program outreach efforts for programs in County schools, landscape professionals, and County residents.

(a) RainScapes Programs in Montgomery County Public Schools

Since FY10, two RainScapes programs are offered through MCPS: the RainScapes for Schools and the RainScapes for Schools Growing program. The RainScapes for Schools program implements curricular ESD projects on MCPS property. Projects installed include rain gardens and conservation landscapes. These projects provide runoff reduction while also providing a hands-on location for curriculum lessons. The program has supported 17 school-based projects accessible to students from kindergarten through 12th grade. Locations of participating schools are shown on Figure III.E.31, and photographs of established RainScapes Gardens in visible locations providing educational value are shown in Figures III.E.32 and III.E.33.

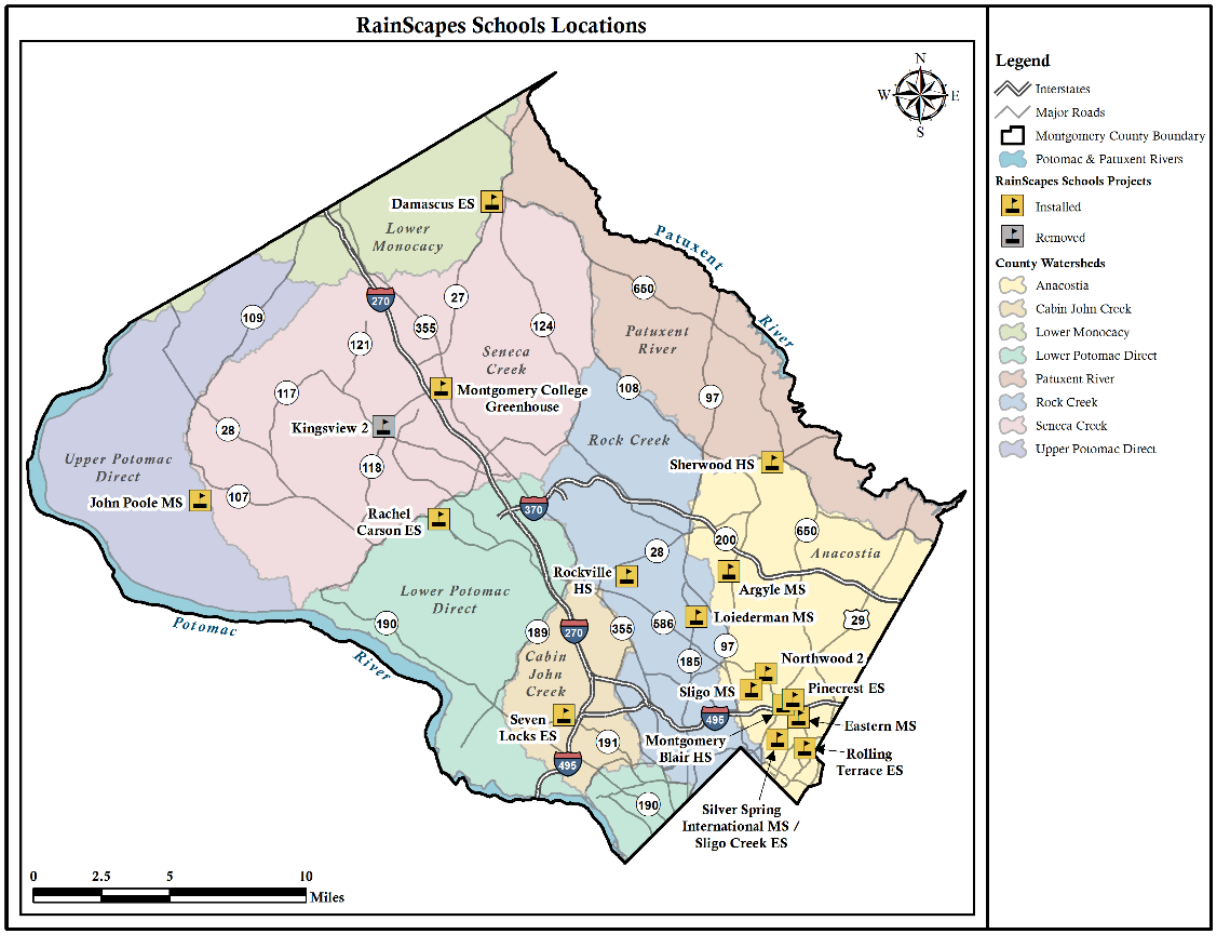


Figure III.E.31 RainScapes for Schools Demonstration Projects

Figure III.E.32 RainScapes Conservation Landscape at Montgomery Blair High School Provide Environmental Information near the Front Door

Figure III.E.33 Native Plants Thriving in the Established Rain Garden at Pine Crest Elementary School

The RainScapes for Schools Growing program provides native plants like those shown in Figure III.E.34 and educational materials to several of the County's high schools and Montgomery College horticulture classes to support instruction on growing and using plants in SWM. Plants from the program have been used in community-based projects and in RainScapes workshops as take-home materials. During spring FY19, nearly 1,000 plants were used as replacement plantings in DEP and MCPS ESD and RainScapes for Schools projects, watershed group community projects, and RainScapes workshops. This program supports the MCPS High School Environmental Horticulture Program, which now includes SWM as part of their curriculum; it is designed to introduce high school students to the job market and range of opportunities available in horticulture and green infrastructure.

RainScapes has led the workdays of the Poolesville Global Ecology Program freshmen at the Lathrop E. Smith Center for Environmental Education in the Spring since 2009 (see Figure III.E.35). This is a partnership project with DEP, MCPS and Montgomery County Parks. After a decade of effort, projects include stilt grass removal, pond invasive plant removal and wildlife discovery, garden planting using RainScapes Growing Program Plants and Local Ecotype natives provided by Parks. 80 students each year spend 2 days working with RainScapes program staff to improve the landcover conditions at the Smith Center, and positive progress is visible.

In FY19, RainScapes continued to train local designers and contractors focusing on site assessment, rain garden design, and project requirements for RainScapes Rewards projects. RainScapes provides training in cooperation with the Landscape Technology Program of Montgomery College for the National Green Infrastructure Certified Professional (NGICP) Program and the Chesapeake Bay Landscape Professional Program (CBLP). During FY19, the RainScapes program offered the Interlocking Concrete Pavement Institute (ICPI) Permeable Interlocking Concrete Paver (PICP) certification course to local contractors who wish to install PICP projects but who lacked the training. (Figure III.E.36) Staff also provided technical support to local tours featuring local green street and other green infrastructure examples.

Figure III.E.34 Plants from the RainScapes Growing Program at Sherwood High School as part of its Horticulture Education Program

Figure III.E.35 RainScapes Poolesville Global Ecology Workday at Smith Center

(b) RainScapes Workshops and Professional Training

Figure III.E.36 ICPI PICP Students Learning How to Design a PICP project at RainScapes sponsored workshop

(c) RainScapes Training for Communities and Watershed Groups and Grants

For FY19, DEP RainScapes refined customized outreach approaches to specifically focus on communities such as faith based organizations, civic associations, home owner associations, private pools, and the commercial sector. Congregations and residential communities are expressing more interest in participating using a neighbor to neighbor outreach approach. RainScapes materials were widely shared with a variety of community-based audiences, from watershed groups, civic associations, HOA property managers and faith based organizations. RainScapes was also acting in cooperation with other County agencies to provide information on the program at the County sponsored Interfaith Working Group workshop in FY19, as shown in Figure III.E.37.

Figure III.E.37 RainScapes Participated in the Countywide Interfaith Workshop with other County Agencies

(d) Highlights of RainScapes Program Outreach in FY19

The RainScapes program continues to participate in department-wide outreach efforts, such as at Greenfest and at the Montgomery County Agricultural Fair. At the Breewood Restoration Celebration, outreach efforts have made more use of social media and television advertising to spread the program information to a broader audience.

Figure III.E.38 RainScapes at the DEP Breewood Celebration

Congregational outreach continued both under the auspices of Montgomery County Chesapeake Bay Trust (MC-CBT) grants and the additional time directly provided by RainScapes staff. Projects were used by the congregations to share the message that their faith practice supported watershed stewardship as demonstrated with their RainScapes project. The majority of congregational work through the RainScapes program for congregations has been in the Rock Creek Anacostia and Cabin John Creek Watersheds. The numbers shown include congregations expressing interest; three of which have installed a range of projects. Overall, 44 RainScapes projects have been installed on congregational properties using the RainScapes Rewards program; some congregations have both grant and Rewards Rebate projects on their properties, solving different runoff issues with different programmatic approaches. Additional grant sponsored outreach to congregations about RainScapes is planned for FY20 through watershed group efforts.

Application numbers for RainScapes Rewards continued to be strong as more people attending are motivated to do their part at home. Rebate amounts were significantly increased in November of 2018, and demand for projects jumped significantly. To publicize the program, a combination of social media posts and ads (Figure III.E.39) as well as publication of an ad in the Bethesda Magazine Newcomers Guide and 15 sec ad spots on our local public television were deployed. We also publicized the increase in rebates through our two e-Gazettes for both consumers (RainScapes Gazette) and pros (RainScapes Gazette for Landscape Professionals). Projects which capture larger amounts of stormwater in FY19 continue the pattern of growth in understanding that the problems of watersheds have solutions that start at home. With an increase in the match provided by the county, larger projects have been installed. This suggests that sustained and effective outreach efforts, educational materials, and training of professionals as well as are having a positive impact.

Figure III.E.39 Twitter post on the increase in RainScape rebates

Figure III.E.40 shows the number of RainScapes Reward projects submitted since 2008. By the end of FY19, 2,392 projects had been submitted. FY19 shows a large increase in submissions over the previous years. While the program was short staffed for 18 months, the increase in maximum rebate amounts may explain the uptick. Rebate maximums increased from $2,500 to $7,500 per residential property and from $10,000 to $20,000 for institutional or HOA and commercially owned properties. Effective advertising of the program via a variety of outlets may also have led to such an increase.

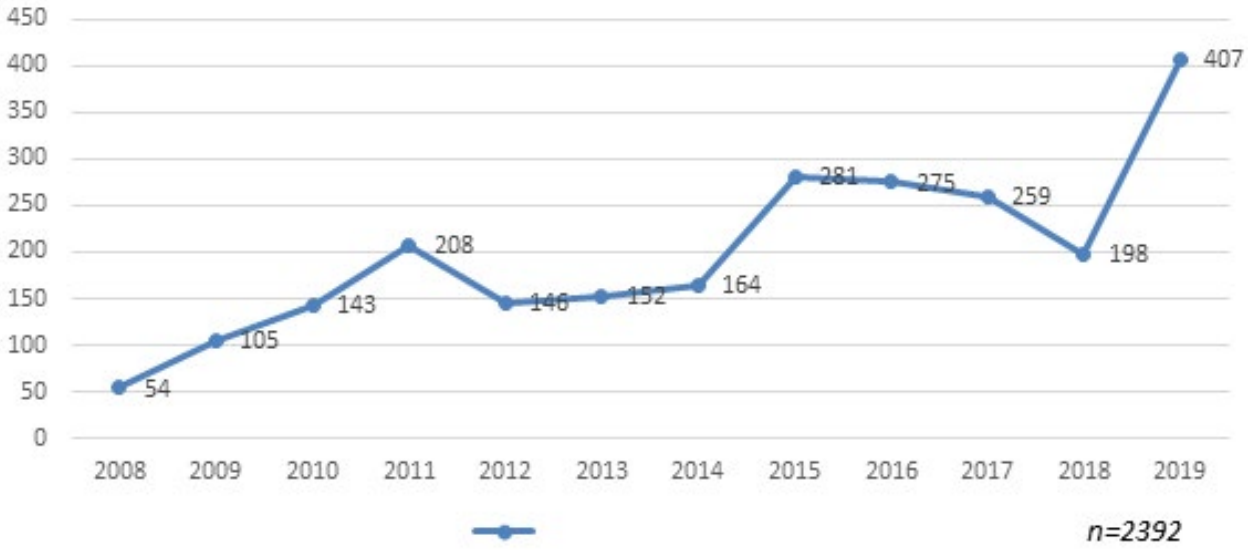


Figure III.E.40 Application Numbers of RainScapes Rewards Projects by Fiscal Year

In addition to the increase in overall numbers, over the past 4 years, the nature of projects being installed has changed. Applications for conservation landscapes, rain gardens, permeable pavement, and pavement removal doubled. After rebates were increased, the number of permeable pavement projects applied for and completed has risen noticeably as the cost share came closer to 40 percent for those projects. On average, once a project is submitted, about 65 percent of the projects are completed. The dominant projects being installed are reportedly being inspired through altruistic motives in conjunction with their runoff reduction benefits based on the information that participants share with us. Also, after several years

of effort in targeted communities, neighbors have been inspiring neighbors to solve runoff problems after talking to each other about their projects.

RainScapes staff provided technical assistance to most grants awarded under the Montgomery County Chesapeake Bay Trust Grants. Site assessments conducted by RainScapes staff provided the technical guidance and outreach support to allow grant projects to move from discussion to reality. The range of projects spanned rain gardens, drywells, conservation landscapes, and water harvesting. Staff input included design review, oversight of installations, and support for workshop planning and delivery. Many of these were congregational projects that started as possible rebate projects but were developed as grant proposals after the scale was enlarged to be more suitable as a grant.

Conference presentations at local, regional, national, and international conferences, as well as staffing tables continued. In FY19, the program added sponsoring the local GreenMatters event, which reached 350 people, as well as participating in a national webcast on incentive programs that reached 354 people. In total, separate from the Montgomery County Agricultural Fair, 30 events were provided to about 1,366 people, including hands-on and grant-related workshops. Events educated both the public and professionals on the topic of SWM and specific actions one can do at home, work, and places of worship to reduce runoff and improve the environment. Events ranged in attendance from 7 to 354 people per event. Media ads were placed on social media and local PBS stations during the spring. RainScapes expertise on plants and site-specific solutions continues as a program strength that is sought by local and national audiences.

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F. Watershed Assessment

1. The County shall conduct a systematic assessment of water quality within all of its watersheds. These watershed assessments shall include detailed water quality analyses, the identification of water quality improvement opportunities, and the development and implementation of plans to control stormwater discharges to the MEP. The overall goal is to ensure that each County watershed has been thoroughly evaluated and has an implementation plan to maximize water quality improvements. At a minimum, the County shall:
   a. Within one year of permit issuance, provide a long-term schedule for the completion of detailed assessments of each watershed in Montgomery County. These assessments shall be performed at an appropriate scale (e.g., Maryland's hierarchical twelve-digit sub-basins). At a minimum, watershed assessments shall:
      i. Determine current water quality conditions;
      ii. Identify and rank water quality problems;
      iii. Identify and prioritize all structural and nonstructural water quality improvement opportunities;
      iv. Include the results of a visual watershed inspection;
      v. Specify how restoration efforts will increase progress toward meeting any applicable WLAs included in EPA approved TMDLs. The County shall modify restoration efforts based on program implementation effectiveness, implementation plans developed according to PART III.J. below, and any TMDLs that are changed during this permit term;
      vi. Specify how the restoration efforts will be monitored and how those data collected will be used to document progress toward meeting applicable WLAs;
      vii. Provide an estimated cost, a detailed implementation schedule, and benchmarks for anticipated pollutant load reductions to show progress toward meeting applicable WLAs for those improvement opportunities identified above; and
      viii. Include a public information component.
   b. Perform watershed assessments based on the established long-term schedule until all land area in Montgomery County is covered by a specific action plan to address the water quality problems identified.
   c. The County shall complete a detailed watershed assessment for the Great Seneca Creek and Muddy Branch watersheds within one year of permit issuance.
   d. Report annually on the status of compliance with the watershed assessment schedule.

F.1 Watershed Assessment Plan and Schedule

As required by the Permit, DEP continues to develop and update watershed assessments by evaluating current water quality conditions and then identifying and ranking structural, non-structural, and programmatic watershed restoration opportunities for each County watershed. Watershed assessments include field investigations, prioritized project inventories, and cost estimates. Watershed implementation plans (WIPs) include results from the watershed assessments and more detailed implementation planning and schedules to meet regulatory and programmatic targets.

The Permit required DEP to develop and submit a County-wide implementation plan within 1-year of Permit issuance to identify how the County would achieve Permit requirements within the 5-year Permit cycle. A final version of the Montgomery County Coordinated Implementation Strategy (Strategy), and WIPs are accessible on DEP's website at https://www.montgomerycountymd.gov/water/stormwater/county-implementation-strategy.html

Implementation plans were developed for those watersheds with existing EPA-approved TMDLs in 2009 and for watersheds where existing assessments and project inventories had been previously compiled (Muddy and Watts Branch). These plans identified BMPs, quantified treatment by those practices, determined the watershed restoration potential, evaluated the ability of the watersheds to meet applicable TMDLs, and provided schedules and cost estimates. More information on implementation plan development for EPA-approved TMDLs is provided in Part III.J, Total Maximum Daily Loads.

F.2 Watershed Assessment Status

The status and schedule of watershed restoration planning is shown in Table III.F.1.

Table III.F.1 Status of Montgomery County Watersheds' Assessments

8-Digit Watershed	Watershed Assessment Status	TMDLs (Issue Date)
Anacostia 02140205	Anacostia Watershed Restoration Plan (2010) Strategy WIP (2011) PCB[1] WIP (2012)	Bacteria (2006) Sediment (2007) Biological Oxygen Demand (2008) Nitrogen (2008) Phosphorous (2008) Trash (2010) PCB (2011)
Rock Creek 02140206	Strategy WIP (2011) Watershed Assessment (2018)	Bacteria (2007) Sediment (2011) Phosphorous (2012)
Cabin John Creek 02140207	Watershed Assessment (2004) Strategy WIP (2011) Watershed Assessment (2018)	Bacteria (2006) Sediment (2011)
Seneca Creek 02140208	Great Seneca and Muddy Branch Watershed Assessment (2007) Strategy WIP (2011) - Completed for Great Seneca Subwatershed, including Clopper Lake Little and Dry Seneca Watershed Assessment (2014)	Clopper Lake: Phosphorus and Sediment (2002)
	WIP Completed FY14	Sediment (2011)
Lower Monocacy 02140302	Watershed Assessment (2014) Updated WIP Completed FY14	Sediment (2008) Bacteria (2009) Phosphorus (2012)

Table III.F.1 Status of Montgomery County Watersheds' Assessments		
8-Digit Watershed	**Watershed Assessment Status**	**TMDLs (Issue Date)**
Potomac Direct 02140202	Great Seneca and Muddy Branch Watershed Assessment (2007 and 2014) WIP Completed FY14	Sediment (2011)
Patuxent-Rocky Gorge and Triadelphia Reservoirs 02131107	Watershed Assessment (2014) WIP Complete FY14	Rocky Gorge-Phosphorous (2008) Triadelphia -Phosphorous (2008) Triadelphia - Sediment (2008) Patuxent-PCBs (2017)

[1] *PCB = polychlorinated biphenyl*

F.3 Great Seneca and Muddy Branch Watersheds Study

During 2004, DEP began watershed inventories in the Great Seneca and Muddy Branch Watersheds as cooperative efforts with the U.S. Army Corps of Engineers (USACE), the City of Gaithersburg, and MNCPPC. These areas represent roughly one-third of the total County land area and include drainage from the densely developed areas of Gaithersburg and Germantown. The study was to be completed by FY13 but is delayed indefinitely due to limited federal funding. DEP completed an interim assessment of stream restoration opportunities in the Great Seneca Creek and Muddy Branch Watersheds in 2007. Projects identified in the assessment are included in the County's 2012 Strategy, as well as in the DEP's project planning.

F.4 Summary of Ongoing Watershed Assessment and Restoration Planning

The interjurisdictional Anacostia River Watershed Restoration Plan and Report (ARP) was completed in February 2010 (http://www.anacostia.net/plan.html). DEP is developing a Continuing Authorities Program - Section 206 Feasibility Cost Sharing Agreement to conduct an ecosystem restoration feasibility study with the USACE; this is to develop stream restoration design concepts for 7.4 miles of streams identified in the ARP. After the feasibility study is complete in FY21, the study recommendations will be submitted for future USACE funding authorization of final design and construction. The constructed projects will contribute towards the County's impervious surface restoration goals and WLAs.

F.5 Watershed Screening

The DEP's Monitoring Team monitors the biological community and stream habitat conditions at representative stations in all County watersheds on a rotating basis over a 5-year cycle, as displayed in Figure III.F.1. DEP then uses a multi-metric Index of Biological Integrity (IBI) to develop narrative ratings of biological conditions in water bodies. A benthic IBI (BIBI) is calculated using benthic macroinvertebrates sampling results while a fish IBI (FIBI) is calculated using fish sampling results. For the purposes of this report, a combined IBI for benthics and fish is used for stations having a drainage area greater than 350 acres. The combined IBI score is converted to a percentage with 100 percent the

highest possible score. Biological conditions in the water body are then described as *Excellent* (88 to 100 percent), *Good* (64 to 87 percent), *Fair* (42 to 63 percent) and *Poor* (0 to 41 percent).

For stations with drainage areas less than 350 acres, unless otherwise noted, only the BIBI is converted to a percentage, with 100 being the highest possible score. Only BIBIs are used in these smaller drainage areas because these small streams typically only support pioneering fish species due to limited habitat. In addition, pioneering species adapt well to changing habitat and flow conditions, making them unreliable indicators for rating impairments. DEP's full round of baseline watershed conditions in the County from 2011 to 2015 is available as an interactive map at: https://www.montgomerycountymd.gov/water/streams/ This map allows the user to examine the health of over 150 subwatersheds in the County by zooming in or searching by address. The information provided for this report is for the 2018 calendar year stream monitoring season. The monitoring completed in calendar year 2019 will be provided in the FY20 Annual Report.

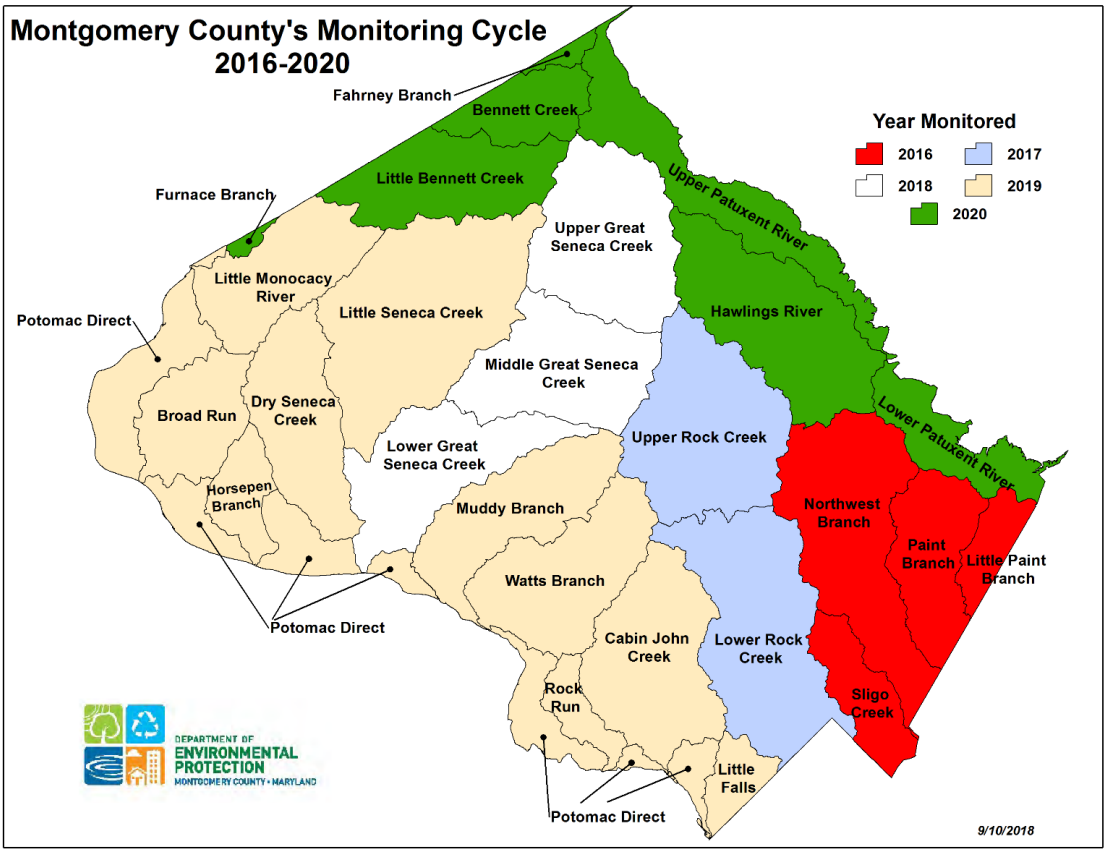

Figure III.F.1 Montgomery County DEP Provisional Baseline Stream Monitoring Cycle
The monitoring cycle will repeat starting in 2021 to 2025.

F.6 2018 Watershed Screening Results

The headwaters of Great Seneca Creek begin near Damascus, in the northwestern portion of Montgomery County, and it flows south through Germantown and Gaithersburg before joining the Potomac River near the town of Seneca. The watersheds of two main tributaries to Great Seneca (Dry Seneca and Little Seneca) will be monitored in 2019 and are not included here. The remaining major tributaries surveyed in 2018 include Magruder Branch, Wildcat Branch, Goshen Branch, Whetstone Run, Gunners Branch, and

Long Draught Branch. Instream impoundments include Lake Whetstone, Gunners Lake, and Clopper Lake. The Great Seneca Watershed is separated into Lower, Middle, and Upper Sections, over which 27 long-term and 10 random monitoring stations are distributed. Station locations are shown on Figure III.F.2 with a list of monitoring station details presented in Appendix N.

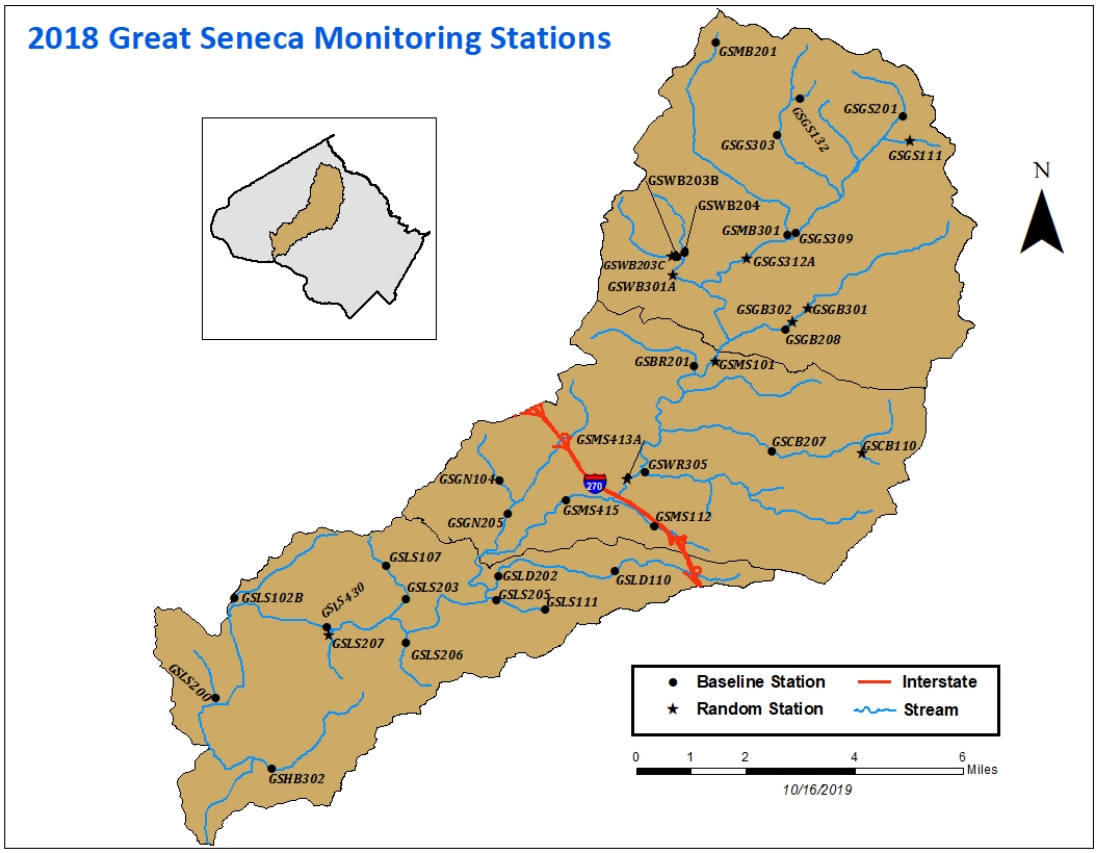

Figure III.F.2 Locations of Baseline & Random Stations Monitored in the Great Seneca Watershed, 2018

Overall conditions are *Poor* at 14 percent of sites, *Fair* at 16 percent, and *Good* at 70 percent within the Great Seneca Watershed. Ratings range from a low of *Poor* (25 percent) at GSLS111 to a high of *Good* (85.5 percent) at GSWB204. No stations are rated *Excellent*. Stations located on the mainstem of Great Seneca Creek include GSGS309, GSGS312A, GSMS413A, GSMS415, and GSLS430, and all are rated *Good;* this is due largely because of resulting fish scores. Benthic scores are rated *Fair* at all mainstem stations except for the most upstream, GSGS309. These larger stream sections generally provide preferred fish habitat such as deeper pools and more woody debris, increasing fish scores and increasing overall conditions. Riffles, habitat preferred by benthic macroinvertebrates, may be limited by the deeper waters or not represented in the station due to the lower frequency of larger order streams.

Ratings of Great Seneca Creek's tributaries are more varied. Tributaries with *Poor* and *Fair* ratings tend to drain highly urbanized areas such as Magruder Branch, downstream of Damascus and Long Draught Branch, downstream of Gaithersburg. One exception is GSLS200 on an unnamed tributary in the Lower Great Seneca Watershed that is rated *Fair*. Aerial photographs show a site with a limited riparian buffer, in an agricultural area. Most tributaries surveyed are rated *Good* and, like the mainstem stations,

are influenced by high fish scores. Only GSLS200 and the two Long Draught Branch stations at GSLD110 and GSLD202 had fish ratings below 64 percent. Conversely, 21 stations (57 percent) had benthic ratings below 64 percent. Lower benthic ratings may be a result of prolonged impacts from runoff and high flows. Benthics are not as mobile as fish limiting their ability to recolonize an area after these events; this is supported by reviewing aerial photography of the watershed. The Middle Great Seneca area is the most urbanized thus having greater runoff resulting in only one station, GSMS101, having a benthic rating above 64 percent (at 75 percent). Stream conditions for 2018 surveys of Great Seneca are displayed on Figure III.F.3.

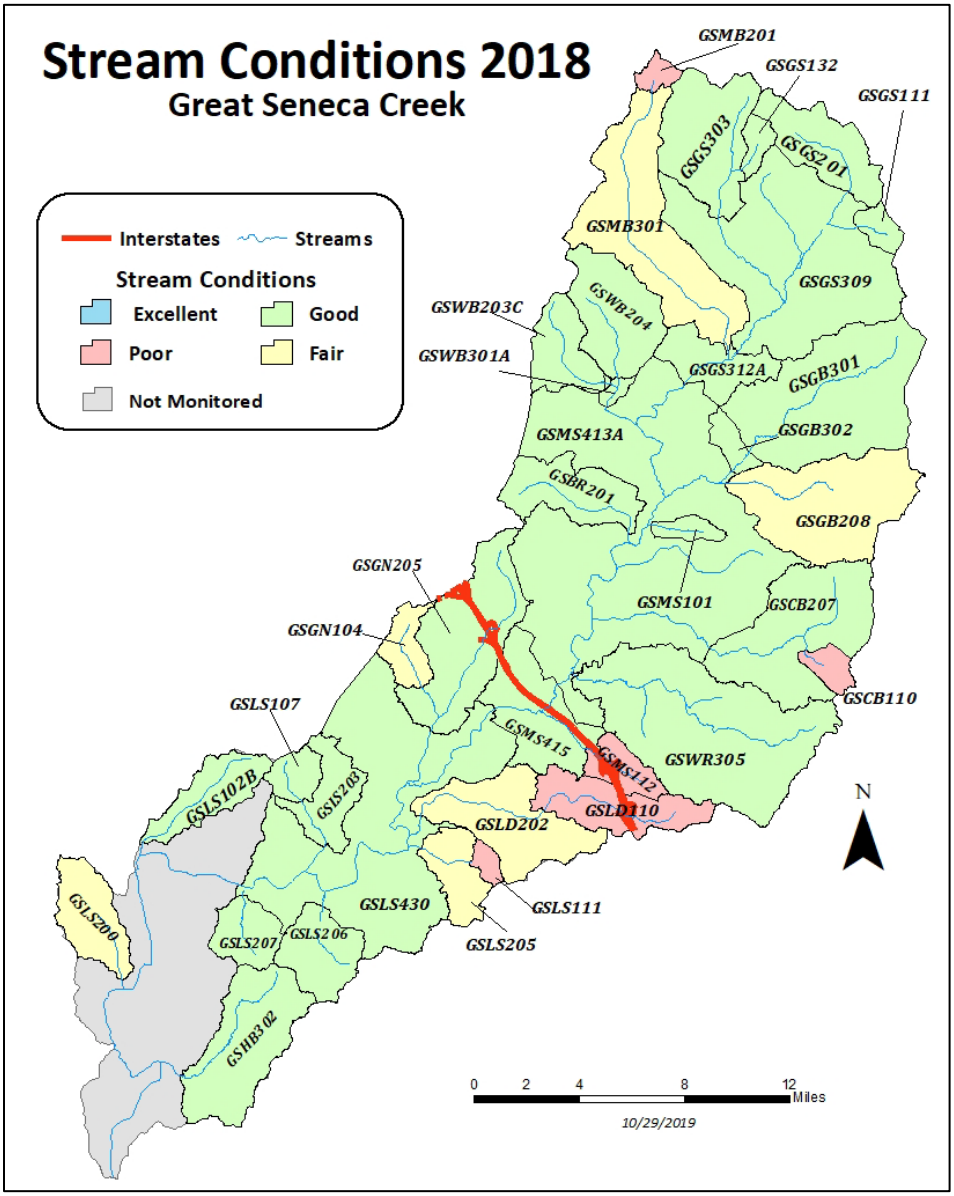

Figure III.F.3 Great Seneca Creek Stream Conditions, 2018

Since 1997, conditions in the Great Seneca Watershed have been predominately rated *Good*. A low of 20 percent (*Poor*) has been recorded at GSLS111 in 1998 and twice at GSMS112 during 1998 and 2006. A high of 90.5 percent (*Excellent*) was recorded at GSLS203 in 2013. Stream conditions have been most

consistent in Middle Great Seneca generally remaining *Fair* or low *Good* since 1998. Overall conditions are highest in Upper Great Seneca. Yearly averages remain above 63 percent (*Fair*) with only the upper Magruder Branch site, GSMB201, rated *Poor* since 1997. Of the stations surveyed in 2013 and 2018, nine have changed ratings. In Upper Great Seneca, GSGB208 and GSMB301 decreased from *Good* to *Fair,* while GSGS132 decreased from *Excellent* to *Good*. Decreases also occurred at three stations located in Lower Seneca: GSLD202 (*Good* to *Fair*) and GSLS203 and GSLS102B (*Excellent* to *Good*). GSBC207, GSMS415, and GSWR305 increased from *Fair* to *Good* in Middle Seneca. For temporal trends in Great Seneca Creek stream conditions see Appendix N.

Table III.F.2 summarizes the physical chemistry results taken at the time of benthic and fish surveys; physical chemistry is not continuously monitored at these sites. The maximum pH of 9.07, which is above the upper limit for water quality criteria for Class I waters, occurred at GSLD110. Since 2006, pH readings have been above the water quality criteria for Class I waters: 8.79 in 2006 and 9.38 in 2013. A review of orthophotograph show no apparent change in the watershed, which is a mix of residential, industrial, and commercial land uses. In addition, conductivity appears to be elevated in Great Seneca Creek, however, 2018 results are consistent with prior monitoring. Graphs of biological conditions versus habitat conditions displaying possible stations impaired for causes other than habitat are located in Appendix N.

Table III.F.2 Summary of Physical Chemistry Results for Great Seneca Creek Watershed, 2018

Parameter	2018 Maximum	2018 Average	2018 Minimum	Average (1997, 2001, 2006, 2013, 2018)	Water Quality Criteria for Class I Waters
Benthic Sampling					
Dissolved Oxygen (mg/L)	17.60	12.00	9.57	11.44	≥5 mg/L
pH	9.07	7.43	6.76	7.37	6.5 ≤ pH ≤ 8.5
Conductivity (µS/cm)	2370	654	155	340	N/A
Water Temperature (ºC)	18.4	10.3	6.7	12.3	≤ 32° C
Percent Saturation	176	108	89	105	N/A
Fish Sampling					
Dissolved Oxygen	10.42	7.92	5.23	8.03	≥ 5 mg/L
pH	8.15	7.08	6.65	7.28	6.5 ≤ pH ≤ 8.5
Conductivity (µS/cm)	1174	403	173	290	N/A
Water Temperature (°C)	26.0	20.0	16.2	19.6	≤ 32° C
Percent Saturation	109	88	57	88	N/A

≥ = more than or equal to
≤ = less than or equal to
ºC = degrees Celsius
mg/L = milligrams per liter
N/A = not applicable
µS/cm= micro-Siemens per centimeter

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G. Watershed Restoration

G. Watershed Restoration

The County shall implement those practices identified in PART III.F, to control stormwater discharges to the MEP. The overall goals are to maximize the water quality in a single watershed, or combination of watersheds; use efforts that are definable and the effects of which are measurable; and show progress toward meeting any applicable WLAs developed under EPA approved TMDLs. At a minimum, the County shall:

1. By the end of this permit term, complete the implementation of those restoration efforts that were identified and initiated during the previous permit term to restore ten percent of the County's impervious surface area. The watershed, or combination of watersheds where the restoration efforts are implemented shall be monitored according to PART III.H, to determine effectiveness toward improving water quality.
2. By the end of this permit term, complete the implementation of restoration in a watershed, or combination of watersheds, to restore an additional twenty percent of the County's impervious surface area that is not restored to the MEP. Restoration shall include but not be limited to the use of ESD and other nonstructural techniques, structural stormwater practice retrofitting, and stream channel restoration. These efforts shall be separate from those specified in PART III.G.1 and shall be monitored according to PART III.H, to determine effectiveness toward improving water quality.
3. Report annually:
   a. The monitoring data and surrogate parameter analyses used to determine water quality improvements;
   b. The estimated cost and the actual expenditures for program implementation; and
   c. The progress toward meeting any applicable WLAs developed under EPA-approved TMDLs in the watersheds established in PART III.G.1 and 2, where restoration has occurred.

The following describes setting the 2010 MS4 Permit Watershed Restoration Goal:

The Permit requires the County to implement restoration practices identified through watershed assessments to control twenty percent of the County's IA not already controlled to the MEP. The *Montgomery County Coordinated Implementation Strategy* (Strategy) (DEP 2012) provides the planning basis to meet the Permit's restoration requirement. DEP developed the Strategy using 2009 data, including IA and BMP drainage areas. The Strategy was submitted in draft form to MDE in February 2011, approved on July 19, 2011, and finalized in January 2012. DEP notes that the Strategy was developed prior to the release of MDE's guidance for *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* in August 2014 (MDE 2014). Figure III.G.1 shows the County area in 2009, subject to the Permit.

The County MS4 area comprises 25,119 IAs, 6,230 acres of which were determined to be controlled to the MEP in 2009. The Permit requires the County to restore 20 percent of the remaining 18,889 uncontrolled and inadequately controlled IAs, which totals 3,778 acres. Table III.G.1 summarizes the County-controlled and -uncontrolled IA.

In a letter dated October 11, 2016, MDE approved an increase to the County's permit restoration goal by 1 acre (from 3,777 to 3,778). This increase was a result of a number of non-structural BMPs located on single-family lots that were not inspected and, therefore, cannot be credited toward the County's IA controlled to the MEP in 2009. MDE approved removing these BMPs from the County's inventory, which removes 40 acres of control and increased the overall permit restoration goal by 1 acre. The County is developing a program to address the inspection of these practices to allow for credit in the future.

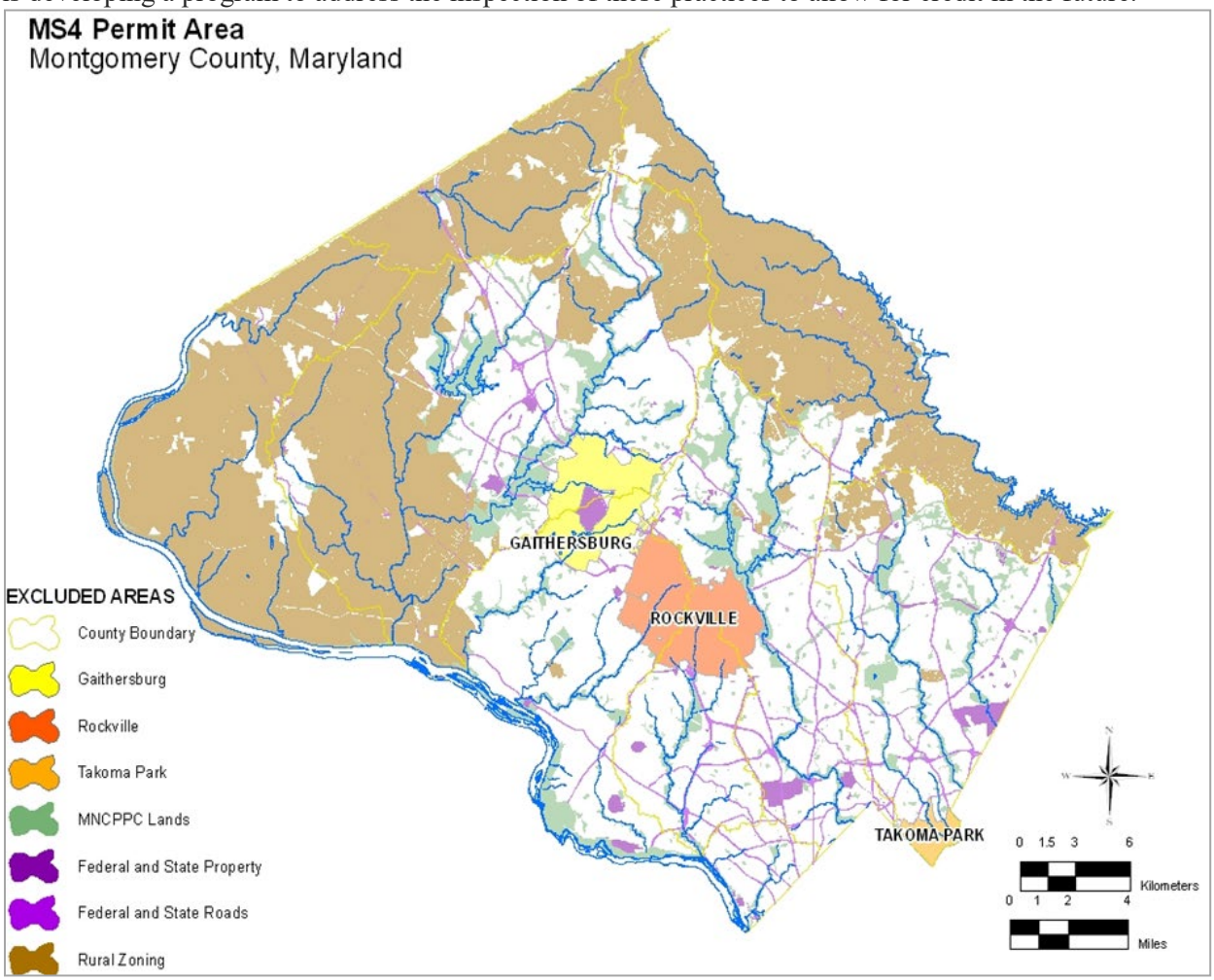


Figure III.G.1 County Area Subject to the MS4 Permit

Table III.G.1 Area for the MS4 Permit Restoration Requirement		
	Description	**Area in Acres**
A	County MS4 IA for the 2010-2015 MS4 Permit	25,119
B	County IA Controlled to the MEP in 2009 (2016 Revision)	6,230
C	County MS4 IA Inadequate/Uncontrolled (2016 Revision) (A-B)	18,889
	IA Restoration Requirement (2016 Revision) (20 perecnt of C)	3,778

G.1 Completion of the Permit Impervious Area Restoration Goal

When the Permit was issued in 2010, it was the first of its kind in Maryland and included an aggressive requirement to restore 20 percent of the County's uncontrolled impervious surface. Despite protracted litigation initiated by third parties that remanded the Permit to MDE, the County immediately began restoration efforts to achieve the requirements. Ultimately, the Permit was found to be valid in March 2016. The County also continued to work towards the restoration goal even after the Permit expired in February 2015. In April 2018, the County signed a CD with MDE committing to fulfill the restoration requirement by December 2020.

By the end of FY18, the County had restored 3,603.6 IAs, an increase of 681.2 acres from FY17. This restored area accounted for 95 percent of the IA permit restoration goal of 3,778 acres. The County continued its restoration work in FY19 and met the restoration goal on December 28, 2018. The County submitted a Final CD Completion Report to MDE on February 15, 2019, documenting the completion of both the SEPs required by the CD and of the ISR requirement in the 2010 MS4 Permit. The report included a table listing 18 projects completed between July and December 2018 that treated a combined total of 178.2 IAs, bringing the total IAs restored to 3,781.8 acres.

On March 11, 2019, MDE requested clarification of several restoration projects and of the acreage for "New BMPs Treating Existing Impervious Cover." The County provided MDE with the requested information and on April 4, 2019. MDE sent the County their review of the FY18 Annual Report, the CD completion report, and the clarifications provided in response to the March 11, 2019 request. MDE approved "the credit of 3,604 acres of restoration through 6/30/18." MDE requested that the County submit "a detailed list of BMPs, in a format similar to Appendix J of the FY18 Annual Report, prior to the submittal of its FY19 Annual Report" in order to close out the CD at an earlier date.

Subsequent to the request for additional data and before the detailed list of BMPs had been submitted, on April 30, 2019, MDE released updated guidance tripling the equivalent IA restoration credit for stream restoration practices outside of the Coastal Plain. The County applied this new guidance to the projects completed for the 2010 MS4 Permit, which resulted in the County revising the final list of BMPs submitted to demonstrate completion of the ISR requirement in the 2010 MS4 Permit. The County used the additional ISR credit to do the following:

- Replace the equivalent IA credit associated with six WSSC stream stabilization projects with a combined length of 2,325 linear feet. The credit that was originally claimed was 23.2 IA (0.01 multiplied by the length restored), however, the credit was increased and replaced using the updated equivalent IA of 69.7 (0.03 multiplied by the length restored). The County and WSSC are working towards, but have not yet reached, an agreement assigning responsibility for monitoring, inspection, and maintenance requirements associated with WSSC stream stabilization projects. Shared credit and responsibility for WSSC stream stabilization projects can be revisited under the next permit once an agreement has been reached.

- Replace annual practices with permanent ones. The County had taken IA credit for street sweeping, catch basin cleaning, and septic system pump-outs totaling 301.20 IAs. Replacing annual credits with permanent ones gives the County the flexibility to modify annual programs in the future without having to worry about maintaining compliance with the restoration requirement.

- Carry the restoration credit for 22 stormwater practices that are no longer needed for compliance with the 2010 ISR requirement forward to the next permit.

The County met with MDE on August 14, 2019 to discuss the proposed revisions. On August 15, 2019, MDE emailed the County to approve the analysis and the County submitted a Revised Final CD Report, including an updated version of Appendix I showing detailed project information, on October 1, 2019. MDE approved the revised report on November 25, 2019. The Office of the County Attorney (OCA) then worked with the Assistant Attorney General to file a satisfaction of judgement with the court, and an order terminating the CD was signed on December 30, 2019, officially closing the enforcement action. Appendix I includes a copy of the Revised Final CD Report and of the court order terminating the CD.

Table III.G.2 summarizes the restoration achievements that contributed to meeting the 2010 permit restoration goal. In this table, the restoration efforts are presented in four categories: Capital Improvement Program (CIP) Projects, Voluntary BMP Implementation, Alternative BMPs, and New BMPs Treating Existing IA. The IA credit for the alternative BMPs is based on the MDE guidance *Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated* (MDE 2014), with the exception of credit for stream restoration, which is based on the MDE April 30, 2019 memorandum, and for tree planting and reforestation, which are based on the Chesapeake Bay Program's (CBP's) Urban Tree Canopy BMP Expert Panel Recommendations.

Background data for the alternative BMPs, database accounting for new BMPs treating existing IA, and detailed tables showing project-specific information for completed projects are provided in Appendix J. The County has continued restoration work since completing the 2010 permit restoration goal in December 2018. Restoration work that is above and beyond the 2010 permit restoration goal and that was completed in FY19 is presented in Section G.2.

Table III.G.2 County Projects and Alternative BMPs Implemented to Meet the 2010 Permit Restoration Goal

Category	IA Restoration Completed through FY18	IA Restoration Completed to Meet Goal [1] (02-15-2019 Final CD Report)	IA Restoration Completed to Meet Goal [1] (10-01-2019 Revised Final CD Report)
a. CIP Projects	2,004.3	2,182.6	2,480.9
i. ESD/LID Projects	96.1	100.3	95.4
DEP Green Streets	42.1	46.4	42.1
DOT CIP Green Street Projects	31.4	31.4	31.4
DEP Public Property ESD	20.0	20.0	19.3
DGS CIP ESD Project	1.0	1.0	1.0
MCPS ESD Project	0.7	0.7	0.7
Underground Water Quality Treatment	0.9	0.9	0.9
ii. Stormwater Pond Retrofits	1,244.9	1,418.9	1,213.2
iii. Stream Restoration	298.8	298.8	896.3
DEP Stream Restoration	162.6	162.6	487.9

Table III.G.2 County Projects and Alternative BMPs Implemented to Meet the 2010 Permit Restoration Goal

Category	IA Restoration Completed through FY18	IA Restoration Completed to Meet Goal [1] (02-15-2019 Final CD Report)	IA Restoration Completed to Meet Goal [1] (10-01-2019 Revised Final CD Report)
USACE – DEP Stream Restoration Projects	136.1	136.1	408.4
iv. DOT Outfall Stabilization	14.7	14.7	14.7
v. Agency Partnerships Restoration Projects	349.8	349.8	261.3
Intercounty Connector (ICC) Projects [2]	326.6	326.6	261.3
WSSC Stream Restoration Projects	23.2	23.2	-
b. Voluntary BMP Implementation	85.6	85.6	85.6
i. Watershed Management Grants	7.1	7.1	7.1
ii. RainScapes	55.4	55.4	55.4
iii. Voluntary BMP Earned WQPC Credits	23.0	23.0	23.0
c. Alternative BMPs [3]	580.3	580.3	279.0
i. Impervious Surface Removal	0.4	0.4	0.4
ii. Urban Tree Canopy Expansion	37.4	37.4	37.4
iii. Urban Forest Planting	51.4	51.4	51.4
iv. Septic Pumping [4]	60.0	60.0	-
v. Septic Denitrification	36.1	36.1	36.1
vi. Waste water Treatment Plant (WWTP) Connections	153.7	153.7	153.7
vii. Street Sweeping [4]	183.2	183.2	-
viii. Catch Basin Cleaning and Storm Drain Vacuuming [4]	58.0	58.0	-
d. New BMPs Treating Existing Impervious Cover [5]	933.4	933.4	933.4
Progress Total:	3,603.6	3,781.8	3,778.9
Percentage Progress Toward Restoration Goal:	95	100	100

[1] This column shows the IA restoration work completed through December 28, 2018 to meet the 2010 permit restoration goal

[2] ICC stewardship projects included the installation of bioswales, pond retrofits, new ponds, and impervious surface removal

[3] Includes a combination of permanent (for example, impervious surface removal, urban tree canopy expansion, urban forest planting, septic denitrification and WWTP connections) and annual (for example, septic pumping, street sweeping and catch basin cleaning) practices

[4] IA restoration credit for annual practices was replaced with permanent credit from stream restoration projects in FY19.

[5] IA from new BMPs treating existing impervious cover (for example, redevelopment)

G.1.a Capital Improvement Progam Projects

During the first half of FY19, the DEP's CIP, with help from agency partners, completed construction of six BMPs treating 60.3 acres of IA. This includes installing new ESD BMPs and retrofitting existing ponds as described in Section ii below. Table III.G.3 breaks down the number and type of CIP BMPs that were constructed or retrofitted during the first half of FY19, as well as summarizes the total number of BMPs and retrofit projects completed to meet the 2010 permit restoration goal.

i. Environmental Site Design/Low-Impact Development Practices

The County has installed 379 ESD/LID practices to meet the ISR goal, restoring a total of 95.38 IAs. This reflects a decrease of one BMP from the FY18 Annual Report. This BMP and other creditable ESD/LID practices completed during FY19 are being carried forward to the next permit as a result of the increase in stream restoration credit and are presented in Section III.G.2. These kinds of practices are either installed as part of the County's Green Streets program or on public property. The focus of this work has primarily been in the Anacostia River and Rock Creek Watersheds, two of the most impaired watersheds in the County.

a. Green Streets

Green Streets are roadways where ESD practices are constructed within the street ROW to capture and treat stormwater runoff. DEP implements Green Streets projects in neighborhoods where stormwater management is not adequate. In addition, DEP collaborates with DOT to implement Green Streets projects in areas where DOT is scheduled to do roadway maintenance or renovation. Green Streets are often the most practical stormwater management option in neighborhoods with little open space to install large stormwater practices. The County's Green Streets initiative creates aesthetically attractive streetscapes, provides natural habitat, and helps to visually connect neighborhoods, schools, parks, and business districts. Figure III.G.2 illustrates nine neighborhoods where multiple small-scale stormwater practices were completed to create greener communities. The County has installed 328 Green Streets ESD practices to meet the 2010 permit restoration goal, restoring a total of 73.54 IAs.

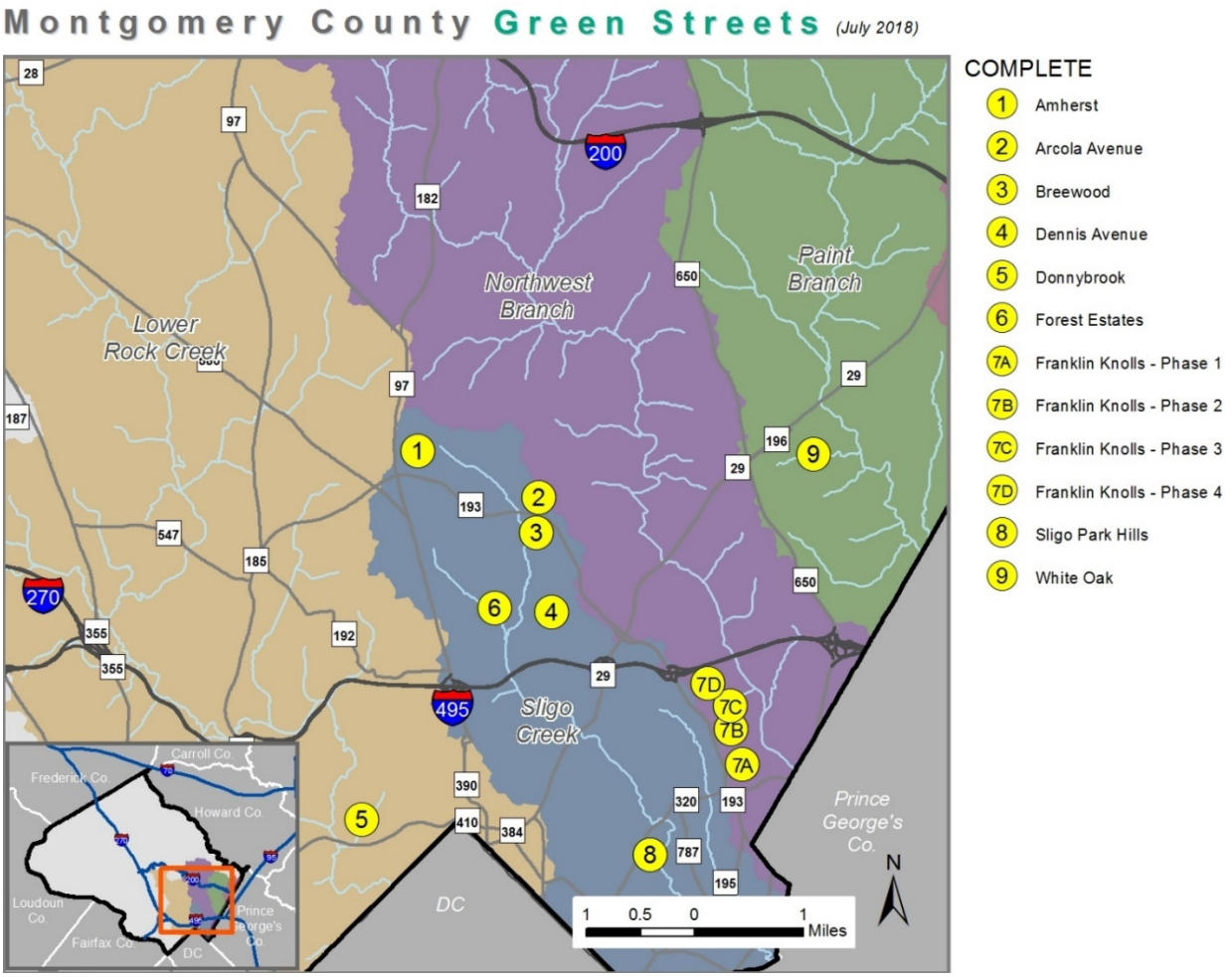


Figure III.G.2 Locations of the Green Street Neighborhoods, Each with Multiple Small-Scale Stormwater Practices

b. *Public Property ESD*

During FY19, the DEP continued to design and implement ESD projects on public property, including school grounds, libraries, parking lots, and community centers. Figure III.G.3 shows project locations of ESD practices installed on public property to meet the 2010 permit restoration goal; these projects are used to educate residents and children about the benefits of stormwater management. DEP completed three ESD projects at the Olney Elementary School in FY19. The projects were used to satisfy the SEPs requirement of the CD and, as such, no credit was taken for the IA treated by these BMPs. The County has installed 45 ESD practices on public property treating a total of 19.28 IAs to meet the 2010 permit restoration goal.

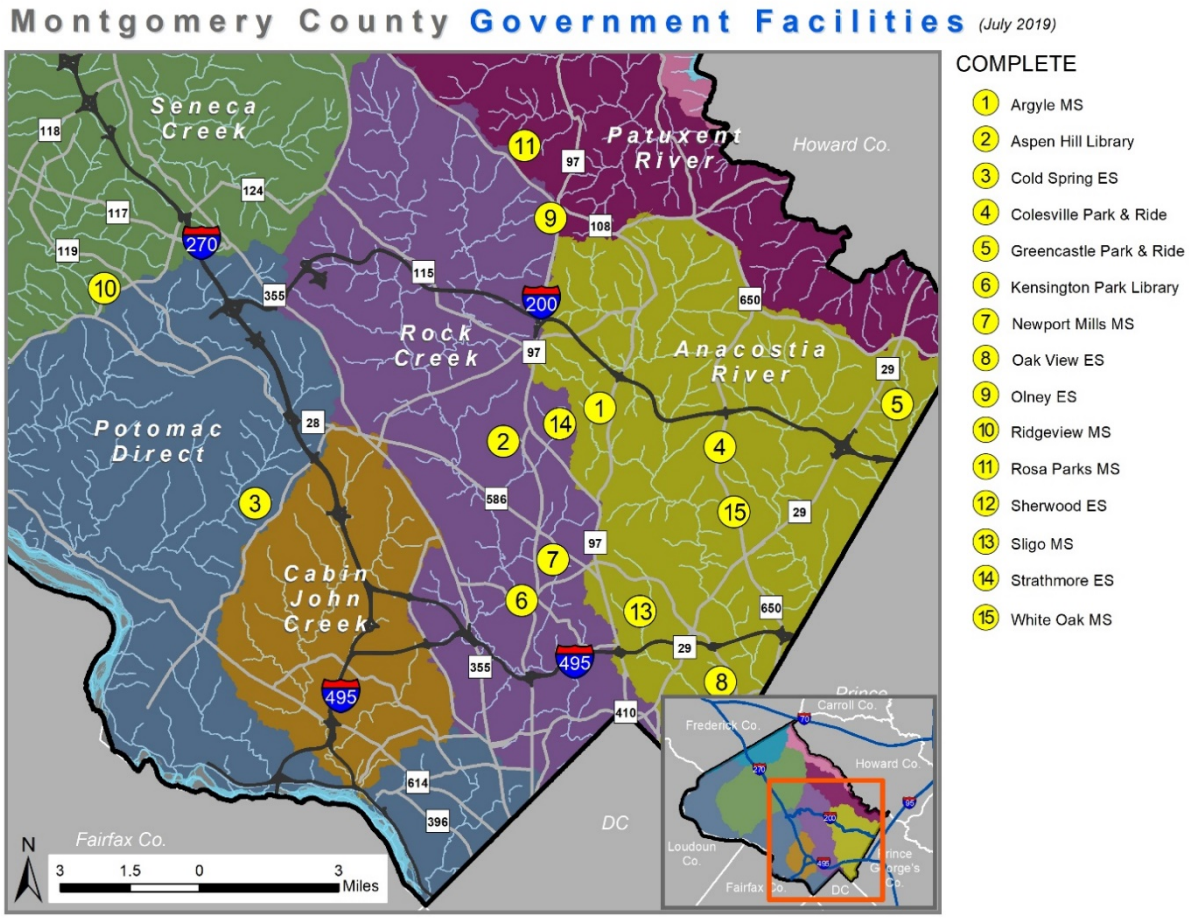


Figure III.G.3 Location of ESD projects on Public Property

c. *<u>Underground Water Quality Treatment</u>*

Sometimes during an ESD project, additional benefit is achieved by installing underground water quality treatment system. These facilities are especially useful in highly urbanized areas where space for stormwater controls is extremely limited. During the Permit term, the County has completed four underground water quality treatment facilities, treating a total of 0.85 IA.

ii. Stormwater Pond Retrofits

During the first half of FY19, DEP completed three pond retrofit projects providing treatment for an additional 60.30 IAs. The County has retrofitted a total of 36 stormwater ponds and installed 1 new pond, treating a combined total of 1,213.23 IAs to meet the 2010 permit restoration goal. In addition, five pond retrofits treating a total of 205.66 IAs are being carried forward to the next permit as a result of the increase in stream restoration credit, and are presented in Section III.G.2.

The focus of this work has been in the Anacostia River, Rock Creek, and Seneca Creek Watersheds. Existing stormwater ponds are upgraded by increasing their capacity to trap and reduce stormwater pollution during storms, as well as their ability to store water to reduce the flow volume (to provide water quality volume, and channel protection volume). In addition to meeting the treatment goal and creating

channel protection, DEP includes native planting, wetland planting, and native trees with each retrofit to ensure that ecological habitat benefits are also a part of the restoration.

Two of the 36 retrofitted stormwater ponds included the installation of Continuous Monitoring and Adaptive Control (CMAC) systems on two wet ponds. The CMAC system automatically controls the timing and rate of stormwater flow through BMP facilities. This is done by integrating information directly from field-deployed sensors with real-time weather forecast data to make intelligent and predictive control decisions. The result is dynamic control of the outlet structure, which provides more cost-effective water quality results. The systems were installed on the University Boulevard wet pond in the Sligo Creek Watershed and the Randolph Road Bus Depot wet pond in the Northwest Branch Watershed. Both are located in the Anacostia River Watershed. The two systems provide treatment for 130.35 acres above what the ponds were originally designed to treat.

iii. Stream Restoration Projects

The County has completed 16 stream restoration projects restoring 29,876 linear feet of stream and 896.27 IAs to date. The focus of this work is within the Anacostia River, Rock Creek, and Seneca Creek Watersheds. Many projects in the Anacostia Watershed were completed in partnership with the USACE.

In 2009, DEP launched a multi-year restoration initiative to implement a series of projects, including a stream restoration, Green Streets, and RainScapes, to reverse the damage to the Breewood Tributary and improve water quality. This tributary drains to Sligo Creek, a tributary to the Anacostia River, and has been monitored since 2009. This monitoring provides a valuable dataset for understanding the effectiveness of the restoration projects that have been implemented. More information about this flagship project and the multi-year watershed study is provided in Section III.H Assessment of Controls.

iv. DOT Outfall Stabilization

The DEP partners closely with DOT on several fronts. In addition to the Green Streets projects described above, DEP and DOT collaborate to increase the effectiveness of the DOT's outfall stabilization efforts. The DOT's rehabilitation program provides maintenance on County storm drain structures. DOT prioritizes outfall stabilization projects based on several factors, including information from DEP on outfalls identified in the watershed assessments as needing repair. DEP collaborates with DOT on selected stabilization projects. DOT has stabilized 26 outfalls, restoring 1,473 linear feet of stream and contributing 14.73 acres of impervious credit to meet the 2010 permit restoration goal.

v. Agency Partnerships Restoration Projects

Another important aspect of the County's approach to restoration is to seek out opportunities to partner with other agencies responsible for completing construction projects throughout the County. The DEP does not directly oversee the construction of these projects but is involved at the planning level to optimize possible stormwater runoff treatment and restoration from the already planned projects.

The ICC is a newly constructed highway connecting Interstate (I) 95 and I-370 through Montgomery County. The ICC was constructed during the third-generation permit cycle and completed in 2014. As part of the ICC construction, the Maryland State Highway Administration (SHA) was required to complete Environmental Stewardship projects. The DEP partnered with SHA by recommending projects from DEP's project inventory. The SHA constructed 268 restoration BMPs as part of the ICC Environmental Stewardship efforts. Impervious surface restoration credits were available to the County for these stewardship projects, including 14 retrofits of existing stormwater ponds, 243 new ESD BMPs

along the County ROW, and removal of impervious surface of 0.06 acre. Three stormwater pond retrofits were completed in FY18 and are being carried forward to the next permit as a result of the increase in stream restoration credit. These three ponds are presented in Section III.G.2. Most of the ICC partnership projects are located within Rock Creek and the Anacostia watersheds. Overall, 265 ICC Environmental Stewardship projects contributed 261.31 acres of IA credit to meet the 2010 permit restoration goal.

The WSSC is currently under consent decree with the EPA to address sanitary sewer overflows. As part of the consent decree, WSSC has designed and constructed stream stabilization projects throughout the County to protect the sanitary sewer infrastructure. These projects vary in length from 23 linear feet to over 2,000 linear feet. The DEP partnered with WSSC to track IA credits associated with these stream stabilization efforts and had previously taken credit for six projects totaling 2,325 linear feet and contributing 69.74 acres under MDE's April 30, 2019 updated guidance (23.25 acres of impervious credit under the old guidance). The County used some of the additional credit for stream restoration to remove the six WSSC stream stabilization projects for which it had previously taken credit from its compliance accounting, reducing the County's credit for IAs restored by WSSC stream stabilization projects to zero. The County and WSSC are working towards, but have not yet reached, an agreement assigning responsibility for monitoring, inspection and maintenance requirements associated with WSSC stream stabilization projects. Shared credit and responsibility for WSSC stream stabilization projects can be revisited under the next permit once an agreement has been reached.

Table III.G.3 CIP Projects by BMP Type Completed during FY19 and Implemented to Meet the 2010 Permit Restoration Goal

CATEGORY	Number of BMPs Completed in FY19	IA Treated in FY19	Number of BMPs Completed to Meet Goal	IA Treated to Meet Goal
i. Montgomery County's ESD/LID Projects	3	0.0	379	95.38
DEP Green Streets	0	0.0	202	42.09
DOT CIP Green Street Projects	0	0.0	126	31.45
DEP Public Property ESD	3	0.0	45	19.28
DGS Public Property CIP ESD Project	0	0.0	1	1.04
MCPS ESD Project	0	0.0	1	0.68
Underground Water Quality Treatment	0	0.0	4	0.85
ii. Montgomery County's Stormwater Pond Retrofits [1]	3	60.30	37	1,213.23
iii. Montgomery County's Stream Restoration [2]	0	0.0	16	896.27
DEP Stream Restoration	0	0.0	9	487.92
USACE - DEP Stream Restoration Projects	0	0.0	7	408.36

Table III.G.3 CIP Projects by BMP Type Completed during FY19 and Implemented to Meet the 2010 Permit Restoration Goal				
CATEGORY	**Number of BMPs Completed in FY19**	**IA Treated in FY19**	**Number of BMPs Completed to Meet Goal**	**IA Treated to Meet Goal**
iv. DOT Outfall Stabilization Projects	0	0.0	26	14.73
v. Agency Partnerships Restoration Projects	0	0.0	265	261.31
Intercounty Connector Projects	0	0.0	265	261.31
ESD/LID	0	0.0	243	31.71
Stormwater Pond Retrofits	0	0.0	14	229.54
Impervious Surface Pavement Removal	0	0.0	8	0.06
Total Number:	**6**	**60.30**	**723**	**2,480.92**

[1] *DEP installed a new pond on National Institute of Health's campus as a retrofit project.*

[2] *IAs restored by stream restoration are determined by dividing the linear feet of stream restored by 100 and multiplying by 3 to calculate the equivalent IAs (29,876 linear feet/100 x 3 = 896.27 acres)*

G.1.b Voluntary BMP Implementation

i. Community-Based Restoration Watershed Grants

Since 2015, DEP has administered a watershed grant program through the Chesapeake Bay Trust (CBT). The grant program funds projects that reduce pollutants through community-based restoration practices as well as projects focused on public engagement through education, outreach, and stewardship. As of FY18, DEP had awarded 30 grants and more than $1.2 million dollars in funding to nonprofit organizations. At the close of FY18, all Round 1 grants were completed and four Round 2 grants and one Round 3 grant were also completed. Table III.G.4 summarizes Watershed Grant projects and the restoration credit achieved to meet the 2010 permit restoration goal. The program continued in FY19 to help meet future permit goals. Section III.G.2 summarizes those projects. More details on the Watershed Grant projects are also provided in Section III.E.7.

Table III.G.4 Watershed Grant Projects Implemented by BMP Type to Meet the 2010 Permit Restoration Goal		
Grant Project Types	**Number of Practices Completed**	**IA Treated**
Bioswale	3	0.00
Cistern	9	0.13
Conservation Landscaping	21	4.67
Dry Wells	13	0.31

Table III.G.4 Watershed Grant Projects Implemented by BMP Type to Meet the 2010 Permit Restoration Goal

Grant Project Types	Number of Practices Completed	IA Treated
Impervious Pavement Removal	1	0.03
Pervious Pavement	1	0.00
Rain Gardens	8	0.55
Tree Planting	432	1.44
Total Watershed Grant Projects:	**488**	**7.13**

[*] *Individual BMPs may be included in a larger treatment train; when that is the case, the IA will equal zero because the treatment is counted in the terminal BMP.*

ii. RainScapes Program

The DEP's RainScapes program promotes and implements environmentally friendly landscaping and small-scale ESD projects on residential, institutional, and commercial properties. The program offers technical and financial assistance to encourage property owners to implement eligible RainScapes techniques, such as rain gardens, rain barrels or cisterns, conservation landscaping, pavement removal and/or replacement with permeable pavements.

RainScapes projects are designed to provide water quantity benefits by controlling, at a minimum, the first inch of rainfall from a specified IA using runoff reduction techniques. The RainScapes program has treated 55.44 IAs in the County to meet the 2010 permit restoration goal, adding impervious runoff reduction for at least the first inch of rain from the implementation of rain gardens, rain barrels, cisterns, conservation landscaping, pavement removal, and permeable pavement (see Table III.G.5); 426 trees were also planted as part of the RainScapes program (see Table III.G.6). The 55.44 acres have been achieved by a combination of Rewards Rebates, demonstration projects installed by DEP RainScapes on neighborhood and publicly accessible properties, and curricular projects at MCPS schools. Many projects are providing treatment for more than an inch and designed to treat the 1-year storm event. RainScapes Community program elements focused on outreach and training are described in Part III.E.7 Public Education and Outreach.

a. RainScapes Rewards

RainScapes Rewards provides rebates to private residential and institutional property owners who install qualified small-scale stormwater projects. RainScapes Rewards Rebate projects (Figure III.G.4 and Table III.G.5) provide a visible presence for stormwater management on private lots across the County. Due to their distribution County-wide, they are serving to both raise public awareness and demonstrate how small measures and individual actions can have a cumulative impact across the County.

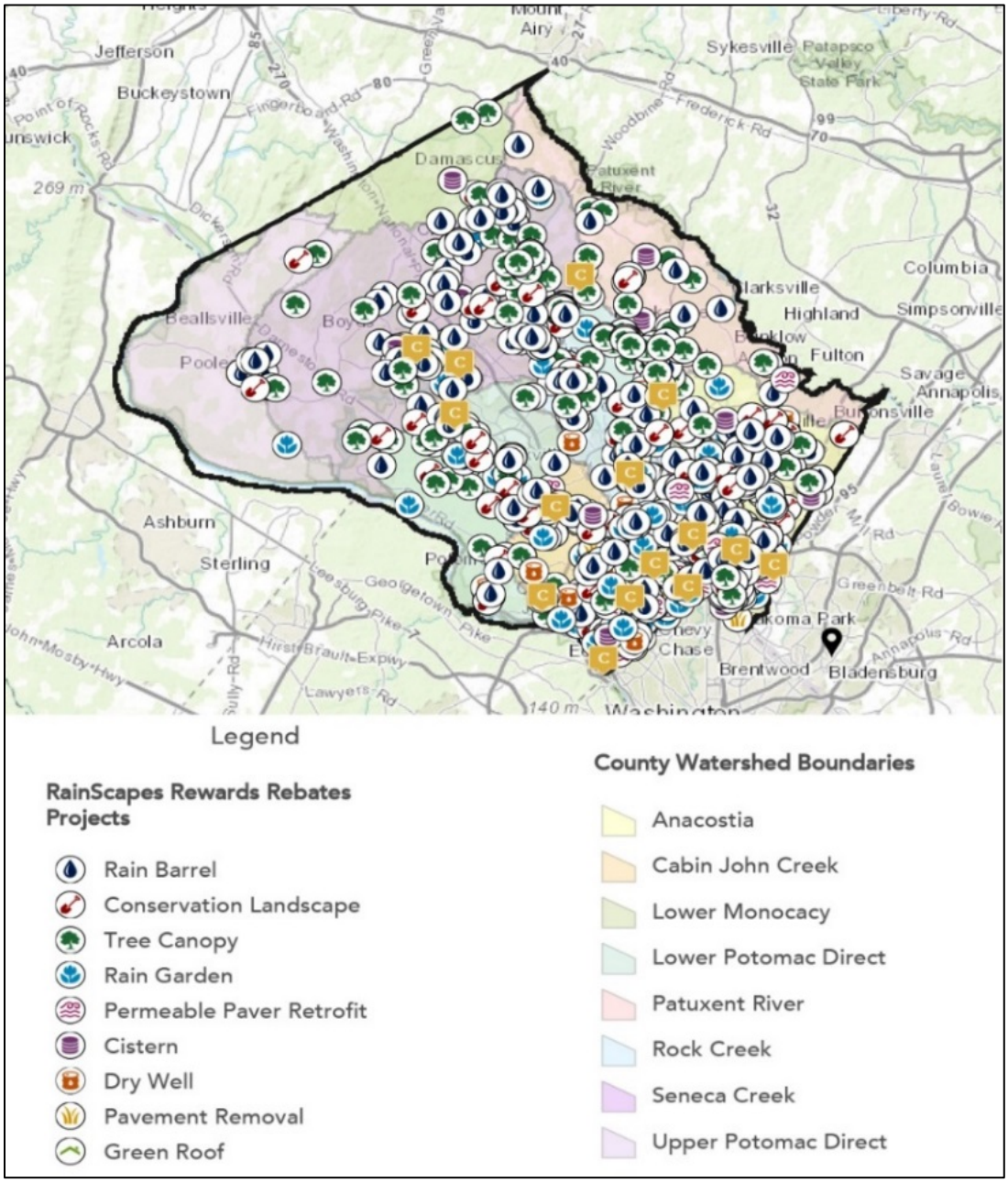


Figure III.G.4 RainScapes Rewards Projects

b. *<u>RainScapes Communities: Congregations</u>*

RainScapes Congregations efforts continued to implement the 2015 strategic plan for Congregational Property runoff reduction. This plan looked for ways to find retrofit opportunities on congregational properties, and in support of this plan, the County launched the RainScapes Congregations program. To date, 47 RainScapes Rewards projects have been completed at 24 Congregational sites, adding treatment for 3.94 acres of IA at an average of 3,600 square feet per site.

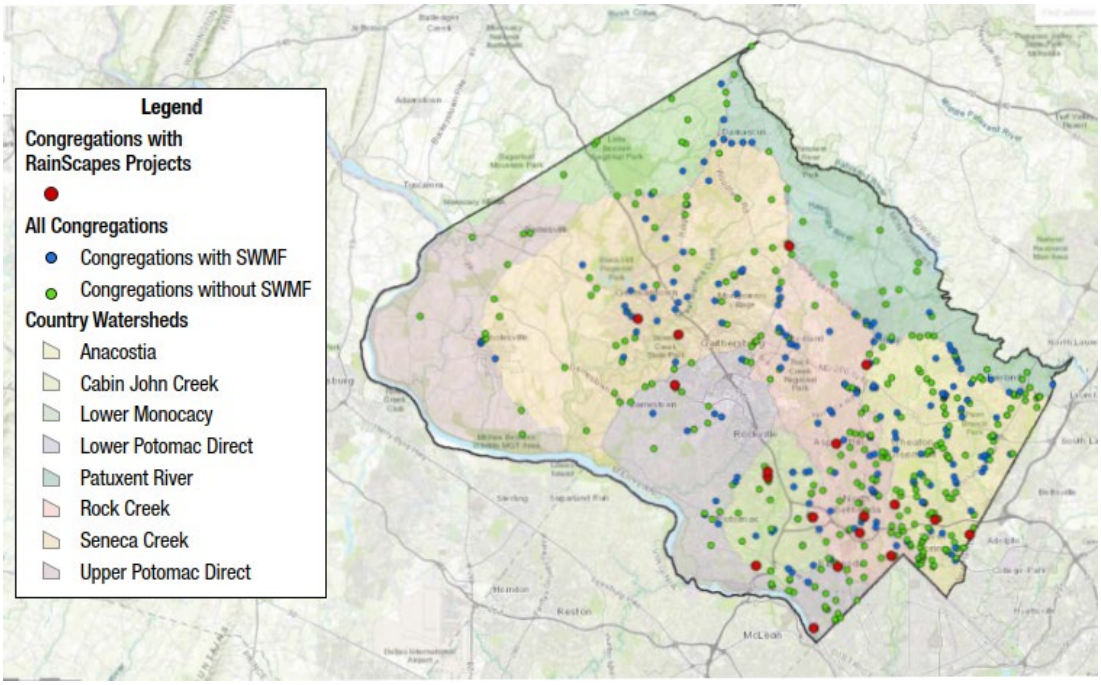


Figure III.G.5 Locations of RainScapes Community Congregation Properties

c. *RainScapes for Schools and other Demonstration Projects*

RainScapes demonstration projects have been installed with watershed groups and through the RainScapes for Schools program. Some projects are on private property home owner associations parcels, others are on individual lots, institutional properties, and on MCPS school sites. These projects were placed to provide locally accessible examples to the public and to support MCPS curricular lesson planning with "hands on" opportunities for students. These demonstration sites were also used to train both professionals and local watershed group members on site assessment and installation for RainScapes practices.

iii. Voluntary BMP Earned WQPC Credits

The County provides WQPC credits to property owners who voluntarily install BMPs on their property. A total of 63 BMPs treating 22.99 IA were installed and credited towards meeting the 2010 permit restoration goal.

G.1.c Alternative BMP Credits

The credits calculated for alternative BMPs are based on MDE 2014. The following section summarizes alternative BMP credits and methods of calculations.

Table III.G.5 RainScapes Projects Implemented by Watershed to Meet the 2010 Permit Restoration Goal

HUC-8 Watershed	Number of RainScapes Projects Completed	IA Treated
Anacostia River	472	14.29
Cabin John Creek	138	5.72
Lower Monocacy River	16	0.48
Potomac Direct	231	8.83
Rock Creek	429	14.76
Rocky Gorge Dam	34	2.42
Seneca Creek	152	8.76
Upper Patuxent River	5	0.19
Total RainScapes Projects:	1,477	55.44

i. Impervious Surface Removal

Some DEP and DOT CIP restoration projects result in a net removal of impervious surface. This net removal is credited on a per acre basis. The County removed 0.44 IA of cover to meet the 2010 permit restoration goal.

ii. Urban Tree Canopy Expansion

In 2016, the CBP Water Quality Goal Implementation Team approved the *Recommendations of the Expert Panel to Define BMP Effectiveness for Urban Tree Canopy Expansion* (CBP 2016). These recommendations included best management practices for both urban tree canopy expansion and urban forest planting which, in turn, provided for pollution reduction credit and equivalent IA credit. As such, the County's FY17 report included credits for Urban Tree Canopy Expansion for every new individual tree planted in developed areas, as well as for Urban Forest Planting for each acre where trees were planted to establish forested conditions.

Many of the urban trees planted in the County are coordinated through DOT's Street Tree and DEP's Tree Montgomery and RainScapes programs. Tree Montgomery continues to be developed and implemented by DEP by planting and establishing large shade trees on private property throughout the County. The program's goals include increasing canopy cover and raising the awareness of tree benefits. Trees planted under this program are funded by the Tree Canopy Law. This law took effect in July 2014 and has since resulted in the planting of more than 2,000 shade trees.

Under the Urban Tree Canopy Expansion credit, each tree planted in developed areas is eligible for a creditable area of 144 square feet, or the equivalent of 300 trees per acre. Therefore, each tree planted converts to 1/300 equivalent IAs. This creditable area is based on the estimated annual growth for a 10-year old tree after planting (assuming an initial diameter at breast height of 1-inch at planting). The trees are not required to be planted in a contiguous area. Further, they cannot be part of a buffer planting or

stormwater BMP (for example, bioretention, tree planter). The County has planted at least 11,220 individual trees along ROWs and on residential property. This has resulted in 37.42 acres of equivalent IA credit. Table III.G.6 provides the claimed credit for Urban Tree Canopy Expansion funded by the County. Tree plantings funded by Watershed Grants are included in Table III.G.4. Tree planting continued in in FY19 and is included in Table III.G.9.

Table III.G.6 Urban Tree Canopy Expansion Implemented to Meet the 2010 Permit Restoration Goal

Type of Planting	Year Tree was Planted	Land Use	Number of Trees Planted	Equivalent IA
Street trees planted in FY11	2010-2011	ROW Turf	422	1.42
Street trees planted in FY12	2011-2012	ROW Turf	437	1.46
Street trees planted in FY13	2012-2013	ROW Turf	863	2.88
Street trees planted in FY14	2013-2014	ROW Turf	848	2.83
Street trees planted in FY15	2014-2015	ROW Turf	1,029	3.43
Street trees planted in FY16	2015-2016	ROW Turf	1,652	5.51
Street trees planted in FY17	2016-2017	ROW Turf	1,761	5.87
Street trees planted in FY18	2017-2018	ROW Turf	1,719	5.73
RainScapes trees planted on residential property	2010-2016	Residential Turf	426	1.42
Tree Montgomery trees planted in FY15	2014-2015	Residential Turf	47	0.16
Tree Montgomery trees planted in FY16	2015-2016	Residential Turf	456	1.52
Tree Montgomery trees planted in FY17	2016-2017	Residential Turf	746	2.49
Tree Montgomery trees planted in FY18	2017-2018	Residential Turf	814	2.71
Total Individual Trees Planted:			**11,220**	**37.42**

iii. Urban Forest Planting

Montgomery County's reforestation project at the Oaks Landfill began in 2011 with the goal of converting mowed fields to a forest of native trees. As originally designed, this reforestation project met the criteria outlined in MDE 2014. However, the County is claiming credit for this project using the recommendations for Urban Forest Planting found in CBP 2016, which defines Urban Forest Planting projects as "tree planting projects in urban or suburban areas that are not part of a riparian buffer planting, structural BMP (bioretention, tree planter) or Urban Tree Canopy Expansion BMP." The intent of this BMP is to establish forest ecosystem processes which requires that urban forest plantings be documented in a planting and maintenance plan that meets state planting density and associated standards for establishing forest conditions. This is a land use change BMP converting developed turfgrass to forest and the trees are planted in a contiguous area.

The County planted 45.40 acres of land with a mix of native tree species and installed a fence to prevent damage from deer grazing. From 2011 through 2016, the County intensively managed the non-native invasive species and grasses with several treatments each year. Long-term maintenance is being implemented, including at least one treatment per year and supplemental planting when needed, and documentation is included in Appendix J. The DEP also completed 9 stream restoration projects to meet the 2010 permit restoration goal that included urban forest planting. These projects were calculated using the "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" method for Reforestation to Pervious Urban and totaling 5.98 IA equivalents. The Urban Forest Planting BMP used for the Oaks reforestation project is a 1-to-1 acre of land use change from managed turf to forest. Table III.G.7 provides the equivalent IA credit for DEP's Urban Forest Planting projects to meet the 2010 permit restoration goal.

Table III.G.7 Urban Reforestation to Meet the 2010 Permit Restoration Goal

Land Use Change	Year Planting Began	Land Use	Acres Planted	Equivalent IA
Oaks Urban Forest Planting[1]	2011	Urban turf	45.40	45.40
Reforestation to Pervious Urban Associated with CIP Stream Restoration[2]	2010 through 2013	Pervious Urban	15.74	5.98
Total Urban Reforestation:			**61.14**	**51.38**

[1] *IA treated calculated using CBP 2016 IA credit for Urban Forest Planting*
[2] *IA treated calculated using MDE 2014 IA equivalent for reforestation to impervious pervious urban*

iv. Septic Pumping

As stated at the beginning of this section, on April 30, 2019, MDE released updated guidance tripling the equivalent IA restoration credit for stream restoration practices outside of the Coastal Plain. The County used some of the increased credit to replace annual practices, like septic pumping, with permanent ones. The County has replaced 60.00 acres of IA credit previously claimed for septic system pump outs. Replacing annual credits with permanent ones gives the County the flexibility to modify annual programs in the future without having to worry about maintaining compliance with the 2010 permit restoration requirement.

v. Septic Denitrification

One hundred thirty-nine septic system denitrification systems have been installed in the County, treating the equivalent of 36.14 IAs. Septic denitrification data were obtained from the DPS well and septic unit and represents all the septic systems installed with a denitrification system as of June 30, 2016.

vi. Septic Connections to a Wastewater Treatment Plant

Montgomery County has claimed IA credit for the connection of 394 septic systems to WWTP from 2009 to 2017. Table III.G.8 lists all septic system BMP practices and their associated IA credit.

Table III.G.8 Septic System Practices Implemented to Meet the 2010 Permit Restoration Goal			
Alternative BMP	**Number of Septic Systems**	**IA Equivalent**	**IA Treated [1]**
Septic Denitrification	139	0.26	36.14
Septic Connections to WWTP	394	0.39	153.66

[1] *IA treated is obtained by multiplying the number of septic systems by the IA equivalent (MDE 2014).*

vii. Street Sweeping

The County used some of the increased credit for stream restoration to replace annual practices with permanent ones. The County has replaced 183.20 acres of IA credit previous claimed for street sweeping. Replacing annual credits with permanent ones gives the County the flexibility to modify annual programs in the future without having to worry about maintaining compliance with the 2010 permit restoration requirement.

viii. Catch Basin Cleaning and Storm Drain Vacuuming

The County used some of the increased credit for stream restoration to replace annual practices with permanent ones. The County has replaced 58.00 acres of IA credit previously claimed for catch basin cleaning and storm drain vacuuming. Replacing annual credits with permanent ones gives the County the flexibility to modify annual programs in the future without having to worry about maintaining compliance with the 2010 permit restoration requirement.

G.1.d New BMPs Treating Existing Impervious Area

Redevelopment continues to increase the County's BMP inventory and resulted in 933.45 acres of existing IA treated by new BMPs during the permit term (FY10 to FY18). In accordance with MDE's 2014 guidance, the IA s were determined by looking at new BMPs from development or redevelopment that are treating formerly unmanaged, existing IA. New BMPs treating existing impervious cover in FY19 are included in Table III.G.9.

G.2 Continued Restoration Work Completed in FY19 Beyond the 2010 Permit Restoration Goal

The County continued to implement restoration work in FY19 after the 2010 permit restoration requirement was completed in December 2018. Table III.G.9 summarizes projects being carried forward to the next permit and new restoration work completed, in design, or in construction in FY19. MDE is developing updated restoration guidance for use in the next permit term. As a result, project credit is subject to change, and only the numbers of projects completed by BMP type are presented in Table III.G.9.

Table III.G.9 County Projects and Alternative BMPs Implemented in FY19 Following Completion of the 2010 Permit Restoration Requirement

Category	Completed Projects Carried Forward Beyond Permit Goal	Continued Restoration in FY19 Beyond Permit Goal	Total Completed Restoration Projects Beyond Goal	Continued Restoration in Design or Construction in FY19
a. CIP Projects	22	11	33	12
i. ESD/LID Projects	14	2	16	
DEP Green Streets	13		13	
DOT CIP Green Street Projects				
DEP Public Property ESD	1	2	3	
DGS CIP ESD Project				
MCPS ESD Project				
Underground Water Quality Treatment				
ii. Stormwater Pond Retrofits	5	4	9	6
iii. Stream Restoration		4	4	6
DEP Stream Restoration		4	4	6
USACE - DEP Stream Restoration Projects				
iv. DOT Outfall Stabilization				
v. Agency Partnerships Restoration Projects	3	1	4	
b. Voluntary BMP Implementation		116	116	
i. Watershed Management Grants		4	4	
ii. RainScapes		112	112	
iii. Voluntary BMP Earned WQPC Credits				
c. Alternative BMPs [1]		2,481	2,481	5
i. Impervious Surface Removal				
ii. Urban Tree Canopy Expansion		2,479	2,479	
iii. Urban Forest Planting				5
iv. Septic Pumping				
v. Septic Denitrification				
vi. WWTP Connections				

Table III.G.9 County Projects and Alternative BMPs Implemented in FY19 Following Completion of the 2010 Permit Restoration Requirement				
Category	**Completed Projects Carried Forward Beyond Permit Goal**	**Continued Restoration in FY19 Beyond Permit Goal**	**Total Completed Restoration Projects Beyond Goal**	**Continued Restoration in Design or Construction in FY19**
vii. Street Sweeping		1	1	
viii. Catch Basin Cleaning and Storm Drain Vacuuming		1	1	
d. New BMPs Treating Existing Impervious Cover [2]		498	498	
Progress Total:	**22**	**3,106**	**3,128**	**17**

[1] *Includes a combination of permanent (for example, impervious surface removal, urban tree canopy expansion, urban forest planting, septic denitrification, and WWTP connections) and annual (for example, septic pumping, street sweeping and catch basin cleaning) practices*

[2] *New BMPs treating existing impervious cover (for example, redevelopment)*

H. Assessment of Controls

H. Assessment of Controls

Assessment of controls is critical for determining the effectiveness of the NPDES stormwater management program and progress toward improving water quality. Therefore, the County shall use chemical, biological, and physical monitoring to document progress toward meeting the watershed restoration goals identified in PART III.G and any applicable WLAs developed under EPA approved TMDLs. Additionally, the County shall continue physical stream monitoring in the Clarksburg Special Protection Area to assess the implementation of the 2000 Maryland Stormwater Design Manual. Specific monitoring requirements are described below.

1. Watershed Restoration Assessment

   The County shall continue monitoring in the Lower Paint Branch 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 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:

The Permit requires the County to assess the effectiveness of its stormwater management program and control measures using pre-restoration and post-restoration watershed monitoring, which includes chemical, physical and biological monitoring. The County must also document progress towards meeting the watershed restoration goals identified in Part III.G and any applicable WLAs developed under the EPA approved TMDLs.

H.1 Breewood Tributary Restoration Project

The DEP targeted the Breewood tributary for comprehensive watershed restoration efforts. In 2009, MDE approved DEP's proposal to conduct pre- and post-restoration monitoring required in Part III.H.1, Watershed Restoration Assessment, to assess effectiveness of the Breewood tributary restoration efforts.

The tributary is located within the Sligo Creek subwatershed of the Anacostia River watershed as shown on Figure III.H.1. Figure III.H.2 shows the Breewood tributary drainage area and locations of chemical, physical and biological monitoring stations. The Breewood tributary is a 1,200-foot first order stream in a small catchment (63 acres) containing 42 percent IA.

The catchment is predominantly medium density (0.25 acre) residential, and contains a condominium complex, a townhouse development, senior living center, high school and church. There are two primary roads in the upper portion of the catchment, University Boulevard and Arcola Avenue. Curb and gutter designed streets support residential development located in the middle and lower sections of the catchment. In 2009, the majority of the stormwater runoff from the IAs was not controlled. This led to a severely unstable stream channel that would transport sediment and other associated pollutants downstream.

During FY15, the DEP completed construction of 10 ROW ESD green street practices along residential roads within Breewood Manor community and 3 RainScapes projects on individual residential properties.

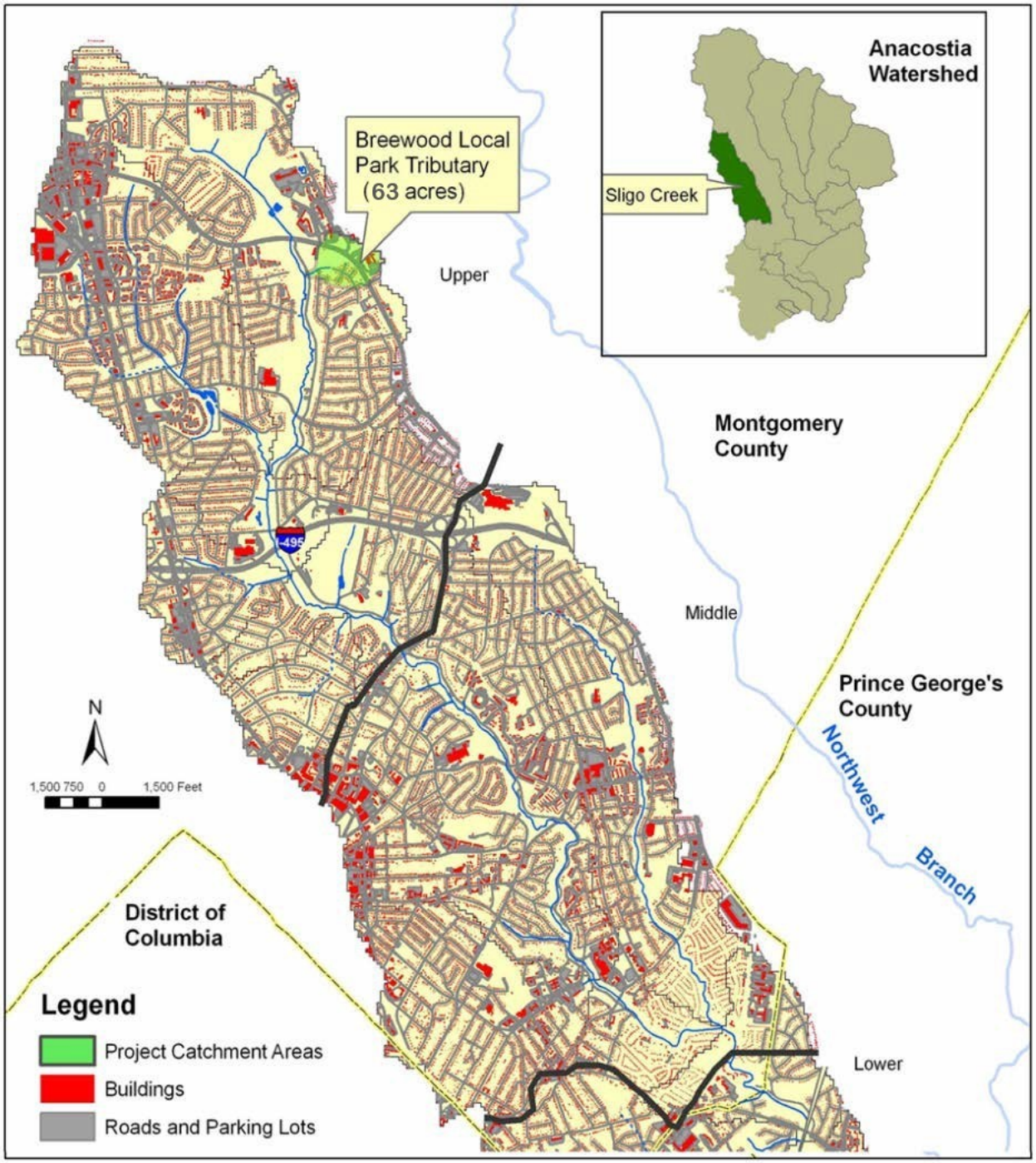


Figure III.H.1 Location of the Breewood Tributary within the Sligo Creek Subwatershed of the Anacostia River Watershed

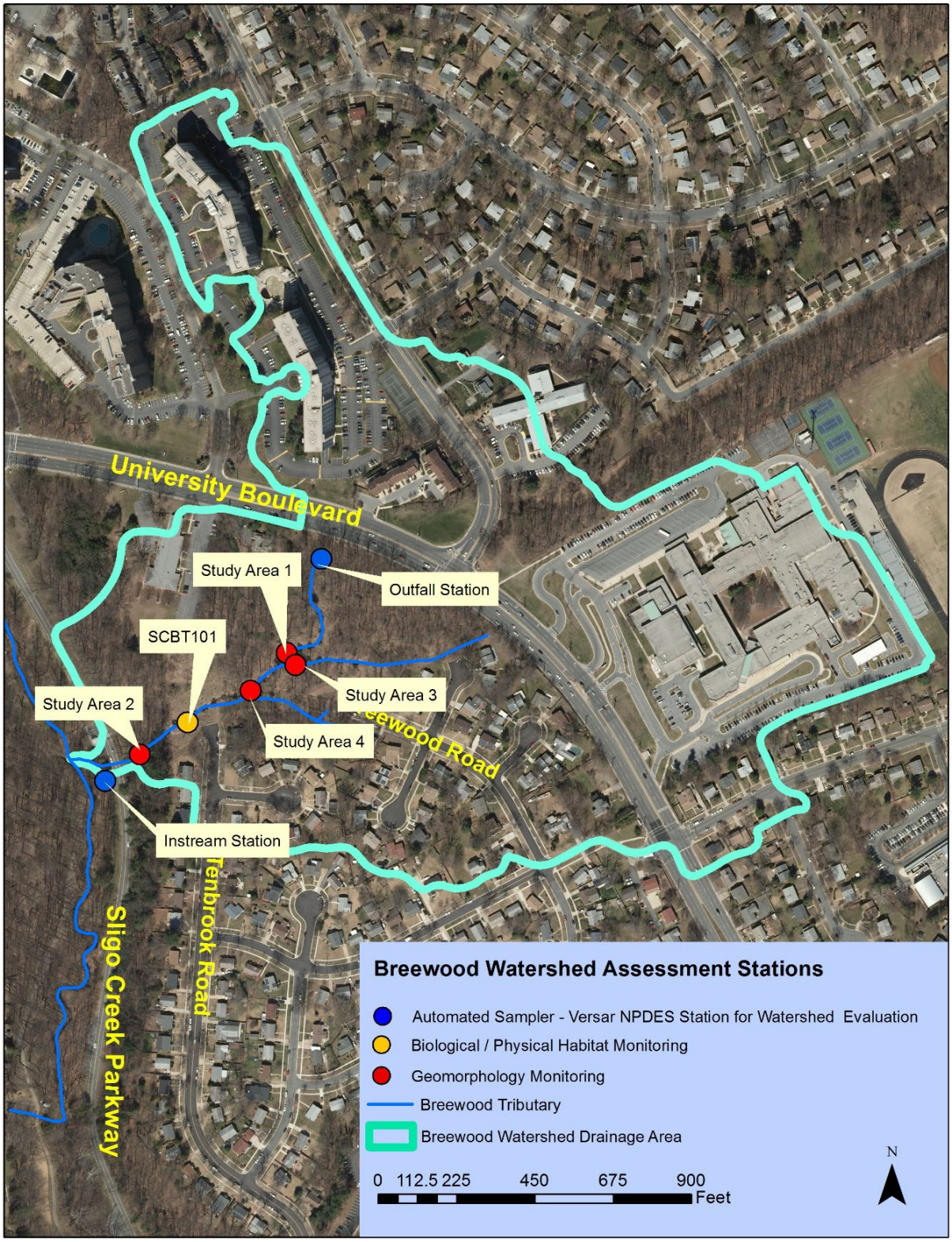


Figure III.H.2 Locations of Stream Chemistry, Biological, Physical Habitat, and Geomorphology Monitoring Stations

Overall these projects address runoff from 54 residential properties. Additionally, 1,200 linear feet of stream restoration was completed in FY15. In May 2017, the DEP completed construction of a bioretention project at the end of Breewood Road. Construction of 12 ESD practices to treat runoff from the University Towers and 1 ESD practice at the Northwood Presbyterian Church was finished in July 2018. Benefits of these restoration projects include:

- Stabilized banks to prevent erosion,
- New trees and plants along stream banks,
- Reduced sediment entering Sligo Creek,
- Reduced storm flow in the Breewood Tributary
- Improved water quality in both the Breewood Tributary and Sligo Creek,
- Reconnected the stream to its floodplain,
- Improved ecological health of the Breewood Tributary and adjacent floodplain areas,
- Improved citizen awareness of stormwater impacts and methods to address them.

In FY14, DEP launched a website dedicated to the entire project. The website includes project details, information, and status updates for the public. The site link is:
https://www.montgomerycountymd.gov/water/restoration/breewood.html

Figure III.H.3 shows the locations of the restoration projects. Table III.H.3 lists the construction dates for the various project components.

H.2 Watershed Restoration Assessment

H.2.a Breewood Tributary Chemical Monitoring

During 2018, DEP continued water chemistry monitoring in the Breewood tributary at 1 storm drain outfall draining University Boulevard and University Towers (the outfall station) and one instream station downstream of a culvert underneath Sligo Creek Parkway (the instream station), as shown on Figure III.H.2. A continuously recording rain gauge is located at the Wheaton Branch stormwater ponds in Silver Spring, approximately 1 mile southwest of the monitoring stations. Twelve BMPs at University Towers and one at Northwood Church were completed in the summer of 2018, but a relatively limited amount of data has been collected reflecting final conditions. Therefore, data in this report still generally reflect interim results. Initial results on the completed project are being captured during 2019 monitoring and will be provided in the FY20 Annual Report.

The Permit requires reporting of chemical monitoring data which is included electronically in Appendix A, MDENPDES19.accdb, Table F. The summary report NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek 2009-2018 is also included in the electronic attachment in Appendix L. The information provided for this report is the calendar year 2018 monitoring season. The monitoring completed in calendar year 2019 will be provided in the FY20 Annual Report.

Table III.H.1 shows the drainage area to each water chemistry station. Table III.H.2 shows the contribution of impervious land uses to total IA in the drainage area in 2012.

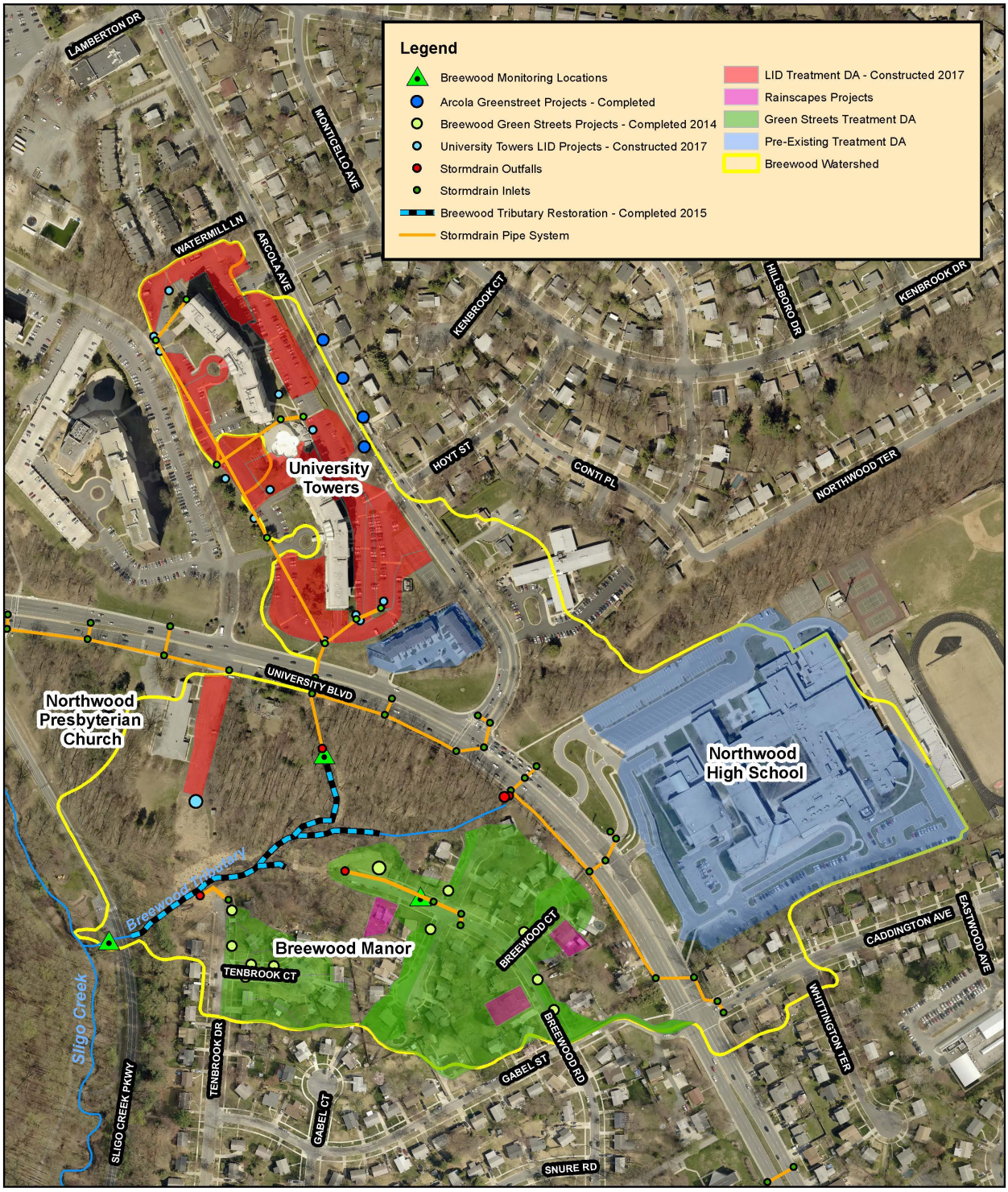


Figure III.H.3. Locations of the Breewood Tributary Restoration Projects

Table III.H.1 Drainage Area to Breewood Water Chemistry Monitoring Stations	
Location	**Acres**
Total drainage area to the outfall water chemistry station	16.9
Total drainage area to the instream water chemistry station	62.9
Total drainage area	63

Table III.H.2 Breewood Tributary Impervious Area 2012				
Impervious	**Property Type**	**Acres**	**Percent of Impervious Area**	**Percent of Watershed**
Buildings (includes accessory structures)		**8.12**	**31**	**13**
	Multi-family Residence	1.02	4	2
	Non-Residential	0.53	2	1
	SFR Attached	0.25	1	0
	SFR Detached	1.96	7	3
	School	4.36	16	7
Parking/Driveway		**11.69**	**44**	**19**
	Multi-family Residence	4.01	15	6
	Parks and Planning	0.02	0	0
	Non-Residential	1.23	5	2
	Right of Way	0.24	1	0
	SFR Attached	0.09	0	0
	SFR Detached	0.57	2	1
	School	5.54	2	9
Road		**6.09**	**23**	**10**
	Road	6.09	23	10
All Other IA		**0.72**	**3**	**1**
	Multi-family Residence	0.54	2	1
	Right of Way	0.10	0	0
	SFR Detached	0.08	0	0
Grand Total		**26.63**	**100**	**42**

i. Hydrology Modeling

The Permit requires that rainfall to runoff characteristics of the contributing watershed be evaluated using a standard, accepted hydrology model. The County produced a Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the Breewood Tributary watershed as part of the stream restoration design process. The model development was completed in FY14.

ii. Summary of Water Chemistry Monitoring Results

The DEP's contractor installed the monitoring stations, performed water chemistry monitoring (for example, metals, nutrients), water quality monitoring (for example, pH, specific conductivity, temperature, dissolved oxygen), continuous flow monitoring, and continuous rainfall monitoring according to methods described in the Quality Assurance and Quality Control Document for Water Chemistry Monitoring at Breewood Road Tributary (Hage and Jones 2010).

Field teams collected baseflow samples monthly and conducted automated storm runoff monitoring, targeting three events per quarter. A total of 85 storms and 8 baseflow events were monitored at the outfall station, and 86 storms and 110 baseflow events were monitored at the instream station from 2009 through 2018. For each storm event, samples were collected along the rising, peak, and falling limbs of the hydrograph. After laboratory analysis, storm event mean concentrations (EMC) were calculated from the results of these three samples.

Montgomery County is committed to capturing the required 12 storm events per year as required in the Permit. To achieve this, in 2017 the County revised the eligible rainfall depth criterion to any event greater than 0.3 inches. This helped balance the need to meet Permit terms and capture robust events that would provide data to discern changes in pollutant concentrations. During 2018, field staff successfully monitored eight storms. Six additional storms were attempted to capture the four remaining storms, without success due to various reasons. Staff attempted, without success due to various equipment problems., to capture one storm in June and October. Two additional attempted storms in June were not successful due to an inaccurately predicted storm event for one and insufficient rainfall for the other. The number of total attempts in 2018 was low partly because staff had a 100 percent success rate (that is, successful in first attempt) in capturing storms in January, February, April, and May. Additionally, during mid-July to the end of September, staff were not able to attempt storms because of delays in issuing work renewal purchase orders to Versar and the WSSC Laboratory. Due to low sample volume for the April 15, 2018 storm, metals were not analyzed in any of the samples.

Section 2.3.2 of the summary report, NPDES Water Chemistry Monitoring in the Breewood Tributary of Upper Sligo Creek 2009-2018 (see Appendix L), contains additional information on attempts to meet the sampling requirement. That section also contains information on detection limits for hardness and missing values for TPH and Enterococcus. The WSSC laboratory has informed DEP that a method detection limit cannot be provided for hardness standard method (SM) 2340. To address this issue, the laboratory switched to method SM 2340B in March 2018. Hardness samples collected after the change have a method detection limit of 0.2 mg/L and a practical quantitation limit of 0.5 mg/L. Samples collected prior to March 2018 were analyzed with method SM 2340 and have no detection limits. Samples for total petroleum hydrocarbons and Enterococcus were not collected for storms on January 12, April 16, and May 17, 2018 due to storm timing. The study protocol precludes collection of samples during late night hours for safety reasons.

Analysis of the flow and water chemistry data collected for this project will be used to evaluate the effectiveness of watershed restoration efforts at improving hydrology and water chemistry. Data collected to date document baseline conditions (that is, prior to retrofit construction) and conditions during construction. Stream restoration construction took place between October 2014 to May 2015. The culvert

and the channel immediately upstream and downstream of the Sligo Creek Parkway road crossing at the instream station were retrofitted by MNCPPC to install step pools during early September 2015. In 2016, a large bioretention structure was under construction at the end of Breewood Road, however construction was suspended due to high groundwater levels that necessitated a reevaluation of the design and some modifications. The bioretention was completed in May 2017. Installation of structures at the Northwood Church and University Towers projects were completed in July of 2018. Due to the continued construction in 2018, the first full year of post-construction data will be in 2019 and an evaluation of the overall project will be provided in the FY20 annual report.

The last project components were completed in summer of 2018 and DEP has begun collecting data on the entire project. Table III.H.3 outlines each project component's completion date. The County will have enough data on cumulative project impacts and the impacts of the various larger components of the project to begin drawing conclusions on effectiveness as of early 2020. An interim evaluation that looks at the cumulative impacts on peak flows is included in this report.

Table III.H.3 Breewood Watershed Restoration Progress

Project Component	Start Date	Completion Date
Arcola Green Streets	August 2011	October 2011
Breewood Manor Green Streets	October 2014	May 2015
RainScapes Projects	May 2014	November 2014
Breewood Tributary Restoration	October 2014	May 2015
Breewood Road Bioretention	December 2015	May 2017
University Towers Stormwater Management	November 2017	July 2018
Northwood Presbyterian Church Project	November 2017	July 2018

iii. Monitoring Results

Drainage area size and land use to both the outfall and instream stations affected flow rate, total stormflow volume, and response of flow from rainfall. As expected for rain events, rise in stream stage at the instream station occurred later than rise in stage at the outfall station. Stormflow appears at the outfall faster because its drainage area contains higher percentages of IA and connectivity. Flow rate values and total stormflow volumes were generally greater at the instream station as expected given its greater drainage area. The instream station also is somewhat less responsive to small events because of the relatively lower amount of IA and greater travel time through the system.

For each station, baseflow mean concentrations (MCs) were calculated for all Permit-required parameters over the ten-year monitoring period.

Storm EMCs represent the weighted average pollutant concentrations based on samples collected at discrete intervals during a storm. EMCs were calculated and averaged over the ten-year monitoring period for each parameter except total petroleum hydrocarbons (TPH) and Enterococcus. Stormflow samples for these parameters were collected only during first flush so MCs were calculated rather than EMCs. The average EMCs and MCs (Table III.H.4) of each parameter at each station were compared, with the following summary of results:

- Storm samples generally had higher concentrations of pollutants at the outfall than at the instream station.
  - Mean storm EMCs for 5-day biochemical oxygen demand (BOD), total Kjeldahl nitrogen (TKN), copper, zinc, and storm MCs for TPH and *Enterococcus* were all higher at the outfall than at the instream station. (TPH and *Enterococcus* weren't calculated using EMCs, but first flush grab results)
- At the instream station, there was not a consistent relationship between flow type and results.
  - Mean storm EMCs were higher than baseflow MCs for BOD, TKN, TP, TSS, and metals.
  - First flush storm MCs were higher than baseflow MCs for Enterococcus.
  - Mean storm EMCs were lower than baseflow MCs for nitrate plus nitrite, and hardness.
- At the outfall station, it was not possible to relate results to flow type.
  - The outfall station was generally dry, except following rainfall or other activities in the catchments. Baseflow samples were obtained on only eight occasions. In these samples, the baseflow MCs for Enterococcus and TPH were lower than stormflow MCs.

iv. Annual Pollutant Loadings

Annual pollutant loadings for each station during 2018 were computed from separate baseflow annual loadings and stormflow annual loadings as follows:

- The total annual baseflow discharge was obtained by separating baseflow values from the flow rate data record.
- The total annual stormflow discharge was determined by subtracting total annual baseflow discharge from the total annual discharge (determined by plotting the annual hydrograph in Flowlink).
- Stormflow annual load for each parameter at each station was determined by multiplying the average annual storm EMC by the total annual stormflow discharge.
- Baseflow annual load was determined by multiplying the annual baseflow MC by the total annual baseflow discharge.

Loading values were calculated from baseflow MCs, stormflow MCs, and stormflow EMCs. They are presented in Table III.H.5 and reported in the electronic attachment to this report, Appendix A., MDENPDES19.accdb, Table G.2. Pollutant Loads Associated with GIS Coverage.

Table III.H.4 Mean storm EMCs and baseflow MCs (± 1-sigma standard deviation) in Breewood Tributary, 2009-2018. All results in mg/L, except for Enterococcus (MPN/100 mL)

Analyte	Mean Storm EMC		Baseflow MC	
	Outfall	Instream	Outfall	Instream
Number of Samples Taken	**85**	**86**	**8**	**110**
Biochemical Oxygen Demand (5-day)	4.7 ± 4.0	3.7 ± 3.6	16.5 ± 7.7	0.4 ± 1.3
Total Kjeldahl Nitrogen	0.893 ± 0.607	0.748 ± 0.507	4.052 ± 2.672	0.136 ± 0.393
Total Phosphorus	0.032 ± 0.064	0.05 ± 0.11	0.071 ± 0.131	0.000 ± 0.000[b]
Nitrate + Nitrite	0.312 ± 0.205	0.48 ± 0.29	1.054 ± 1.538	2.124 ± 0.780
Total Suspended Solids	52.1 ± 56.8	98.401 ± 115.5	23.2 ± 16.7	4.2 ± 6.0
Total Cadmium	0.00000 ± 0.00002[c]	0.00000 ± 0.00002[c]	0.00000 ± 0.00000[b]	0.00000 ± 0.00000[b]
Total Copper	0.026 ± 0.017	0.018± 0.011	0.13 ± 0.127	0.005 ± 0.01
Total Lead	0.006 ± 0.007	0.008 ± 0.012	0.002 ± 0.004	0.0002 ± 0.0015
Total Zinc	0.082 ± 0.063	0.047 ± 0.033	0.289 ± 0.363	0.019 ± 0.012
Total Petroleum Hydrocarbons[c]	3 ± 4	1 ± 2	2 ± 3	1 ± 3
Enterococcus[c]	12,278 ± 39,002	2,579 ± 8,269	609 ±866	183 ± 382
Hardness	43 ± 26	60 ± 38	106 ± 110	146 ± 50
Number Copper Exceedances[d]	66	48	7	9
Number Lead Exceedances[d]	0	1	0	0
Number Zinc Exceedances[d]	17	4	5	0

[a] *Analytical results below detection limits and therefore means set to zero.*
[b] *Additional digits added to storm EMC and baseflow MC results to illustrate difference in results.*
[c] *EMCs are not calculated for TPH or Enterococcus. These values are arithmetic averages of first flush grab results. Number of storm samples taken at each station for TPH = 47; number of storm samples taken for Enterococcus are 44 and 43 at the instream and outfall stations, respectively.*
[d] *Storm EMCs and baseflow individual concentrations for metals (total form) are compared to Maryland's acute numerical criteria for protection of aquatic life in surface waters, which are dissolved or biologically available equivalence form: copper = 0.013 mg/L, lead = 0.065 mg/L, zinc = 0.120 mg/L.*

MPN/100 mL = most probable number per 100 milliliters

Table III.H.5 Baseflow, Stormflow, and Total Annual Loadings (Lbs.) in Breewood Tributary, 2018

Analyte	Stormflow Loading		Baseflow Loading		Total Loading (Stormflow plus Baseflow)	
	Outfall	Instream	Outfall	Instream	Outfall	Instream
Biochemical Oxygen Demand (5-day)	1,019	1,414	1,506	106	2,525	1,520
Total Kjeldahl Nitrogen	159	277	519	46	678	322
Total Phosphorus*	5	10	0	0	5	10
Nitrate+Nitrite	41	263	31	796	71	1,059
Total Suspended Solids	16,086	14,836	1,098	411	17,183	15,247
Total Cadmium*	0	0	0	0	0	0
Total Copper	4	4	8	0	12	4
Total Lead*	1	1	0	0	1	1
Total Zinc	16	17	18	11	34	27
Total Petroleum Hydrocarbons*	102	0	0	0	102	0
Enterococcus	47,181	4,924	0	7,624	47,181	12,547
Hardness	10,524	36,834	2,898	69,390	13,422	106,224

** Zero load indicates all concentration data below detection limits.*

v. Continuous Water Quality Monitoring

In June 2014, DEP began continuous monitoring of dissolved oxygen, specific conductivity, temperature, and turbidity at the instream and outfall stations. Through this additional monitoring, DEP hopes to produce more effective information on water quality impairments in this watershed. Information on dissolved oxygen levels could be especially helpful in determining the causes of poor biological communities.

Beginning in November of 2014, some low dissolved oxygen readings were observed, however, instrumentation problems associated with fouling of the dissolved oxygen sensors were also identified. The equipment manufacturer believes that bacteria and algae growing on the sensors may have obstructed water flow and produced readings of dissolved oxygen levels within the biological organisms growing on the sensor rather than the dissolved oxygen level of the water column. The results reflect the ambient dissolved oxygen level, but interpretation is difficult. The equipment was fitted with wipers in 2016 that regularly clean the sensors to improve accuracy. Wipers were not available for these units prior to 2016.

In 2016, continuous dissolved oxygen data were collected simultaneously by sensors with and without wipers to evaluate the reliability of the baseline data collected without wipers. The data has been found to be generally reliable, although the two instruments showed some differential performance, especially at higher dissolved oxygen readings. The data will permit evaluation of the impact of the project on stream water quality once all the structures have been completed.

H.2.b Breewood Tributary Biological Monitoring

i. Overview

As shown on Figure III.H.2, the biological monitoring station is located in the Breewood tributary upstream of the Sligo Creek Parkway and the instream water chemistry monitoring station. Prior to channel restoration, DEP scientists monitored benthic macroinvertebrates (aquatic insects) at SCBT101 from 2010 to 2014. Fish monitoring is not conducted in the Breewood tributary due its extremely small drainage area and its lack of adequate flow and habitat conditions for healthy fish populations. The Breewood tributary was restored in 2015. During that time no benthic macroinvertebrate sampling occurred due to the active site construction. Post-restoration biological sampling began in 2016.

The DEP uses a BIBI to assess stream conditions at SCBT101. Pre-restoration (2010 through 2014) benthic community results data was collected to be compared with post-restoration (2016 and later) data to help evaluate watershed restoration success. There are eight metrics of benthic macroinvertebrate community composition and function that comprise the BIBI. The DEP examines several of these more detailed metrics, including the percentage of functional feeding groups (FFGs) present, taxa richness, taxa composition, and pollution tolerance. Each measurement responds in a predictable way to increasing levels of stressors. Adjustments in the metrics may be observed as the biological community shifts and these smaller scale changes might be seen before the overall BIBI score changes.

FFG classifications organize benthic macroinvertebrates by their feeding strategies (Camann 2003 and Cummins in Loeb and Spacie, 1994). The five FFGs usually examined in a bio-assessment are: collector gatherers, filtering collectors, shredders, scrapers, and predators. Collector gatherers are the most generalized in feeding and habitat needs and are usually the most abundant FFG because their food source of fine particulate organic matter is abundant. Shredders reduce coarse material (like leaves) into fine material which can then be transported downstream for use by collectors. Shredders are considered specialized feeders and sensitive organisms and are typically well-represented in healthy streams (EPA 2008). Scrapers scrape and graze on diatoms and other algae. Many taxa in this group are sensitive to environmental degradation and are associated with high quality streams. Predators attack and consume other insects and macroinvertebrates.

ii. Benthic Macroinvertebrate Results

During the pre-restoration phase, the Breewood Tributary stream condition ranged from *Poor* (20 percent) to *Fair* (45 percent) (Figure III.H.4). The single occurrence of *Fair* occurred in 2011. The number of taxa present in the Breewood Tributary samples was low to moderate (ranging from five taxa in the year 2010 sample to 14 taxa in years 2011 and 2013 samples). Shredders only accounted for 5 percent of the FFGs present and no scrapers were found. Collectors accounted for 66 percent of the individuals in the pre-restoration samples and the dominant taxa were members of the Chironomidae (midge) family, which tend to be tolerant of pollution and other environmental stressors (Pedersen and Perkins 1986; Jones and Clark 1987). The percent of *Chironomidae* decreased from 91 percent in 2010 to 55 percent in 2014. No obvious cause for this shift was apparent.

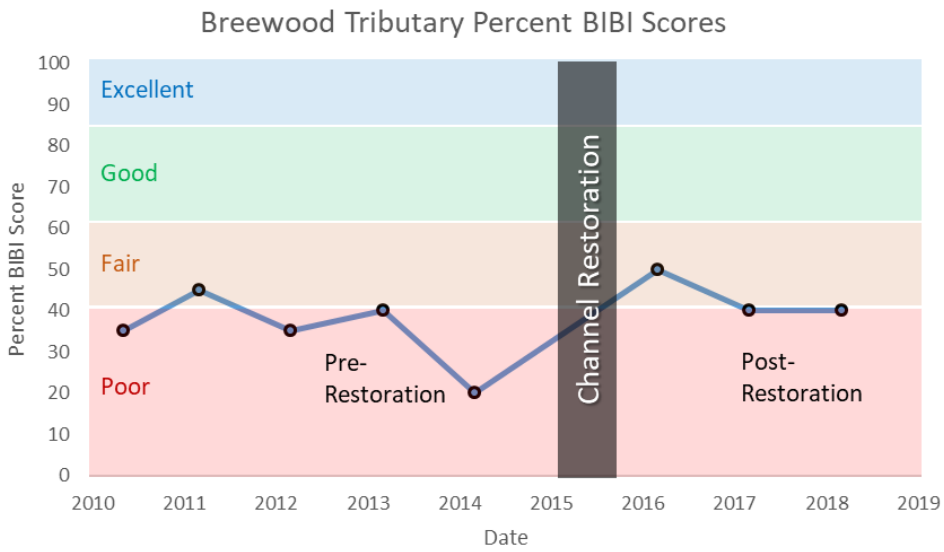


Figure III.H.4 Breewood Tributary (SCBT101) Percent BIBI Scores

Figure III.H.5 shows the average proportion of each FFG at SCBT101 for pre-restoration years 2010 through 2014, compared to a reference stream reach, the Good Hope tributary to Paint Branch (PBGH108). This site was selected as a reference site because it was similar in size and in good condition, providing an accurate comparison before and after the Breewood restoration took place.

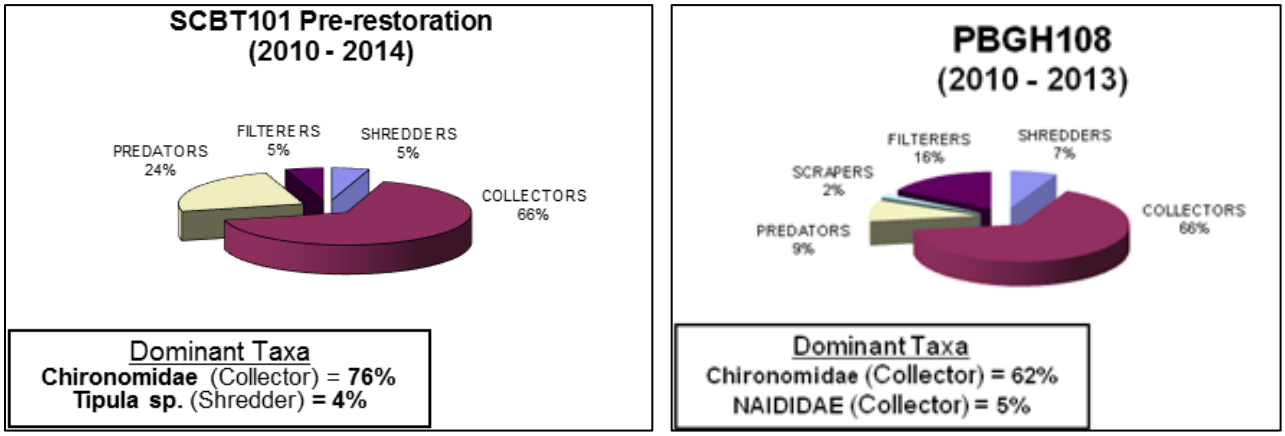


Figure III.H.5 Pre-Restoration Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108)

In the first year of post-restoration, 2016, the stream condition increased to *Fair* (50 percent). There were 13 taxa present, indicating moderate species richness. Shredders accounted for 1 percent (1 *Tipula* species) of the total sample. Scrapers were found for the first time and accounted for 32 percent of the sample, however, all were members of the family *Physidae*, tolerant snails. Collector gatherers accounted for 16 percent, filterers accounted for 27 percent, and predators comprised 24 percent of the sample (Figure III.H.6a). *Chironomidae* accounted for 26 percent of the sample in 2016.

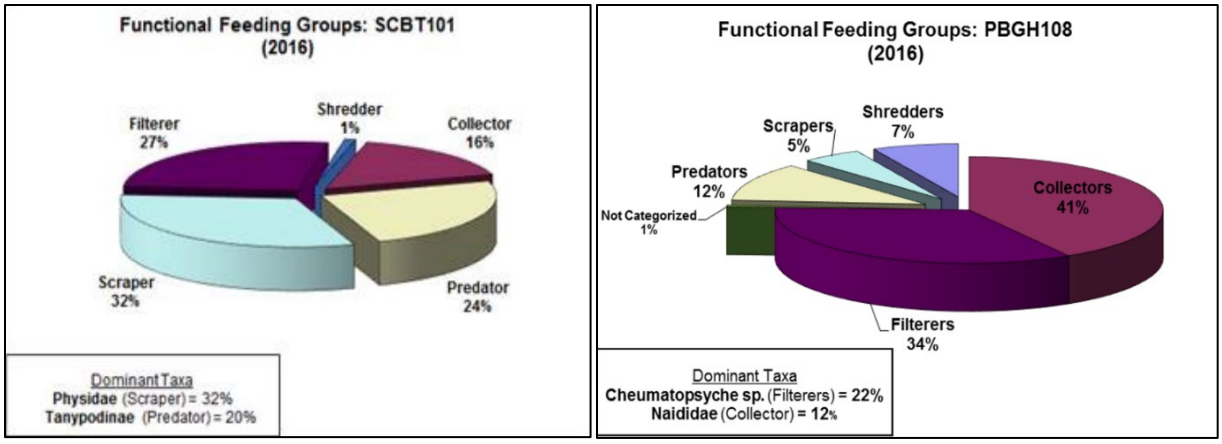


Figure III.H.6a Post-Restoration Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108), 2016

In the second year of post-restoration, 2017, the stream condition declined to Poor (40 percent). There were 10 taxa present, indicating moderate species richness. Shredders still accounted for 1 percent (1 *Tipula* species) of the total sample. Scrapers only accounted for 3 percent of the sample. As in 2016, all were members of the family *Physidae*, tolerant snails. Collector gatherers accounted for 22 percent, filterers accounted for 54 percent, and predators comprised 20 percent of the sample (Figure III.H.6b). *Chironomidae* accounted for 45 percent of the sample in 2017.

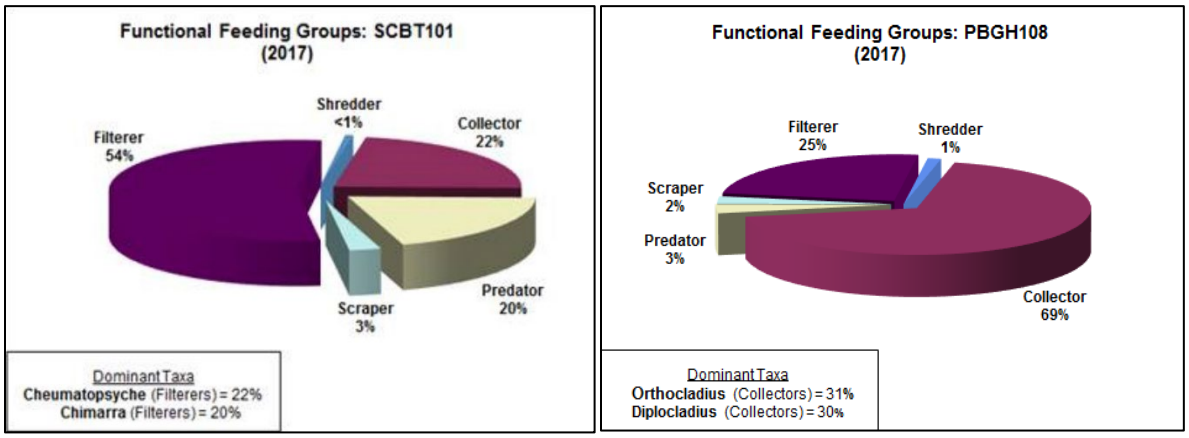


Figure III.H.6b Post-Restoration Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108), 2017

In the third year of post-restoration, 2018, the stream condition remained *Poor* (40 percent). There were 13 taxa present, indicating moderate species richness. Shredders accounted for 19 percent of the total sample (2 species represented- *Tipula* and *Cricotopus* sp). Scrapers still only accounted for 3 percent of the sample, but consisted of three species (family *Physidae*, tolerant snails, *Oulimnius* sp, a tolerant beetle, and *Stagnicola* sp. a tolerant snail), whereas in 2017 only one taxa was represented. Collector gatherers accounted for 14 percent, filterers accounted for 35 percent, and predators comprised 27 percent of the sample (Figure III.H.6c). *Chironomidae* accounted for 50 percent of the sample in 2018.

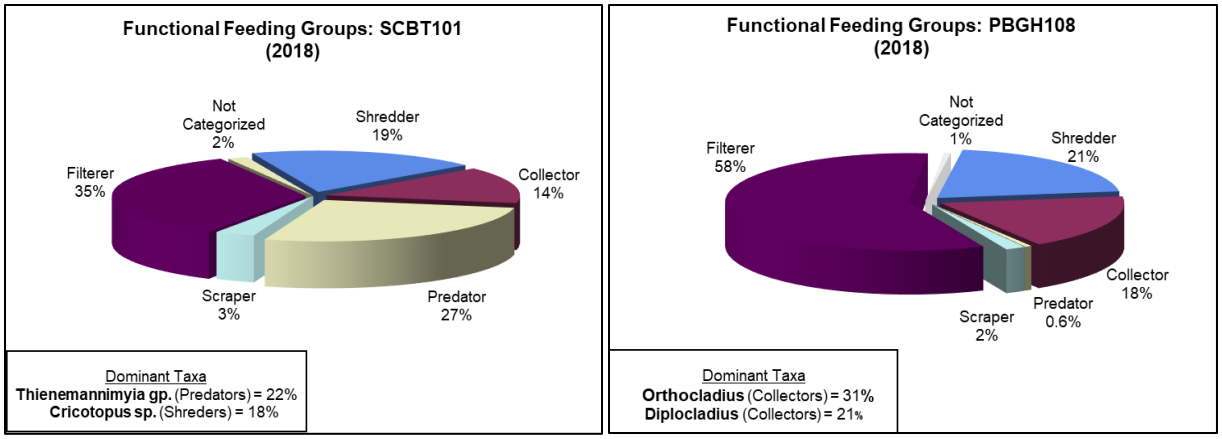


Figure III.H.6c Post-Restoration Functional Feeding Group Comparison in the Breewood Tributary (SCBT101) and in the Good Hope Tributary (PBGH108), 2018

DEP used additional metrics to characterize the benthic macroinvertebrate community of the Breewood tributary. The biotic index, which measures tolerance to organic pollution, remained consistent with prior years (see Figure III.H.7). In 2018, it was 6.2 (out of 10), indicating a moderate tolerance to organic pollution.

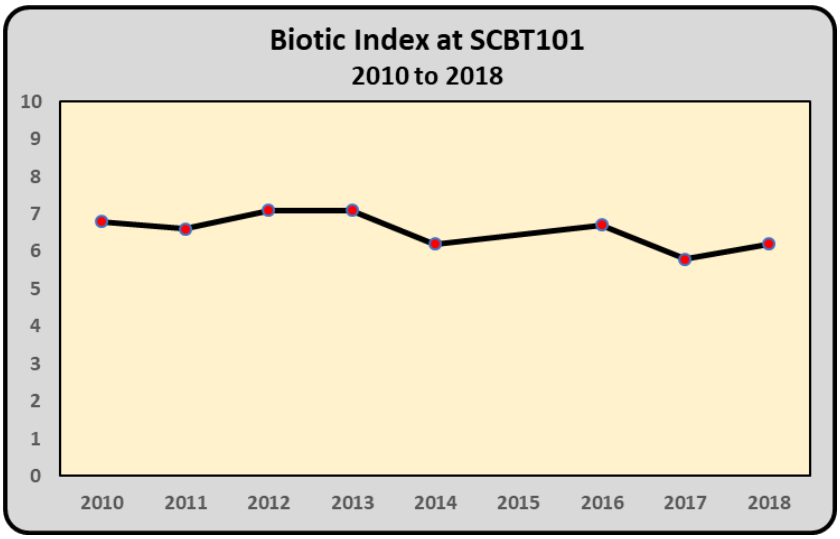


Figure III.H.7 Breewood Tributary (SCBT101) Biotic Index Scores, 2010 to 2018

The BIBI score analysis also includes determining the presence of EPT taxa. EPT comes from *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), and *Trichoptera* (caddisflies), which are sensitive species commonly associated with high quality streams. Prior to restoration in the Breewood tributary, very few EPT taxa were present and consisted primarily of moderately tolerant caddisfly larvae. The proportion of EPT individuals ranged from 1 to 7 percent of the total sample size. Post-construction, although similar numbers of caddisfly genera were observed, the proportion of EPT individuals has increased and now ranges from 26 percent to 46 percent of the total sample size. The number of *Chimarra* species comprised less than 1 percent of the sample in 2014 but accounted for 6 percent of the sample in 2016, 20 percent of the sample in 2017, and 12 percent of the sample in 2018. *Chimarra* are slightly less

tolerant than the other *Trichoptera* genera observed. The post-construction data indicate that that the community structure has shifted in response to the restoration. However, even with substantive improvements in stream habitat, many species of benthic macroinvertebrates have limited recruitment ability, especially given that there is no viable upstream source. It may take several years for recruitment to occur, assuming there are healthier populations in close proximity to the restoration site.

H.2.c. Breewood Tributary Physical Habitat Assessment

i. Pre-Restoration Physical Habitat Analysis

Starting in 2010, DEP performed yearly physical habitat assessments at SCBT101. Pre-restoration monitoring established a baseline for comparison with future habitat assessments. Results indicate that the pre-restoration (2010 through 2014) habitat consistently rated *Fair*, receiving an average score of 41 percent and a range from 36 percent to 49 percent. DEP found that the stream prior to restoration had poor riffle quality, high embeddedness values, bank instability, and a narrow riparian zone, which lowered the overall habitat score. DEP observed an increase in riffle quality in 2011 and 2012, which contributed to the overall increase in habitat score.

Figure III.H.8 shows a comparison of the Breewood tributary BIBI and habitat conditions with those in the Paint Branch reference stream reach from 2010 to 2017. The reference station, PBGH108 was not monitored in 2014. The habitat score for Breewood in 2018 was 47 percent and consistent with pre-construction results. While restoration substantially changed the stream channel, improving instream fish cover, embeddedness, and bank stability, epifaunal substrate was negatively impacted. In 2018, biological conditions are as expected for the observed habitat.

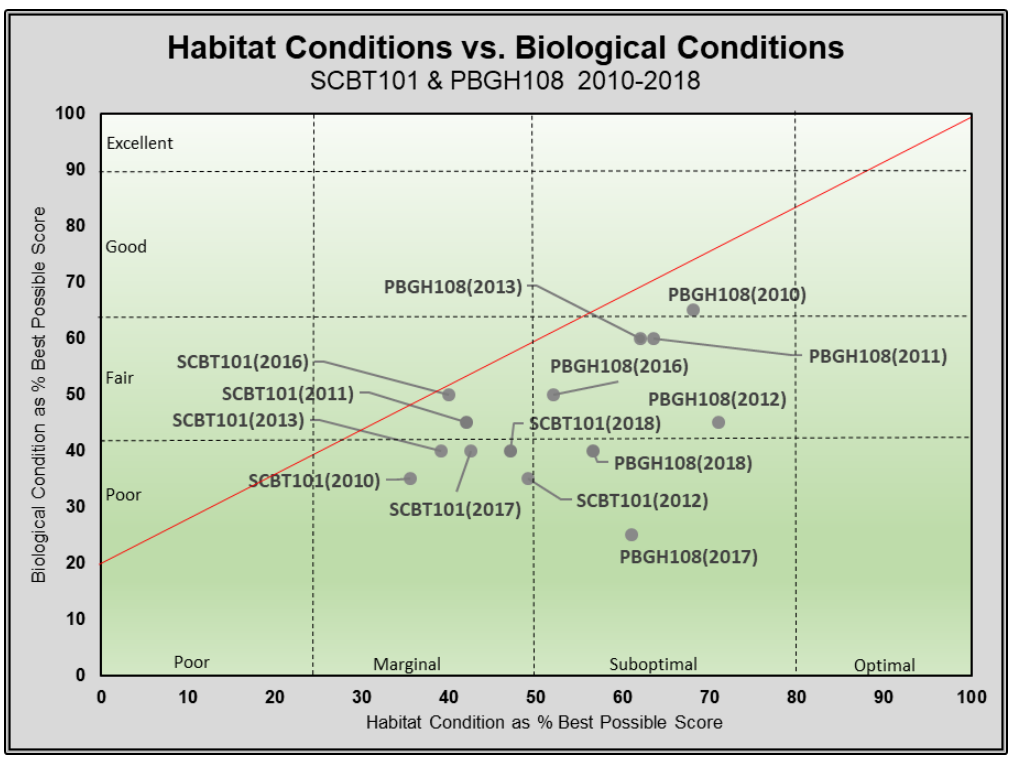


Figure III.H.8 BIBI vs. Habitat Condition at Breewood Tributary and Reference Stream, 2010 through 2018

ii. In-situ Water Chemistry Data

The DEP field team recorded in-situ water chemistry measurements in the Breewood tributary and the reference stream concurrent with the physical habitat assessment. As shown in Table III.H.6, most water quality parameters (dissolved oxygen, pH, and temperature) were within the expected range at SCBT101 and the reference stream.

Conductivity, expressed in micromhos per centimeter (µmho/cm), was the only parameter that consistently differed among the streams, being elevated (maximum 1,282 µmho/cm) at SCBT101 compared to (maximum 336 µmho/cm) at the reference stream. Salt in road runoff from the University Boulevard outfall upstream of the station is the most likely explanation for the unusually high conductivity values recorded. Conductivity values will continue to be tracked to evaluate if this is a consistent pattern and therefore a chronic influence on the benthic community.

Table III.H.6 In Situ Water Chemistry Results at Breewood Tributary (SCBT101) and at the Good Hope Tributary (PBGH108) Reference Stream*

Station	Type	Benthic Community Rating	Date	Dissolved Oxygen (more than 5 mg/L)	Percent Dissolved Oxygen Saturation	pH (more than 6.5 and less than 8.5)	Conductivity (less than or equal to 300 µmho/cm)	Temperature (°C)	
								Air	Water
SCBT101	Benthic	Poor	5/7/2010	8.73	87	7.30	566	21	15.4
	Benthic	Fair	3/9/2011	10.57	87	7.83	727	5	7.8
	Benthic	Poor	3/19/2012	10.35	90	5.9	565	22	14.3
	Benthic	Poor	3/21/2013	11.47	95	7.86	660	2	6.9
	Benthic	Poor	3/20/2014	9.05	83	7.56	966	12	12.0
	Benthic	Fair	3/9/2016	10.06	90	7.78	N/A**	23	11.2
	Benthic	Poor	3/20/2017	9.64	87	7.48	1282	12	10.8
	Benthic	Poor	3/28/2018	12.06	112	6.83	948	10	11.6
PBGH108	Benthic	Good	4/22/2010	10.69	90	6.24	166	12	11.0
	Benthic	Fair	4/18/2011	10.60	104	6.79	143	17	14.4
	Benthic	Fair	4/11/2012	11.27	110	7.36	157	14	10.6
	Benthic	Fair	3/20/2013	12.31	102	6.27	212	9	7.2
	Benthic	Fair	3/17/2016	11.3	108	7.41	239	23	11.2
	Benthic	Poor	3/21/2017	10.54	87	7.73	336	7	7.0
	Benthic	Poor	3/19/2018	13.36	107	6.80	278	19	5.3

** PBGH108 was not monitored in 2014. Neither station was monitored in 2015 when the stream restoration was done.*

*** Conductivity probe failed calibration (recorded value was 1017)*

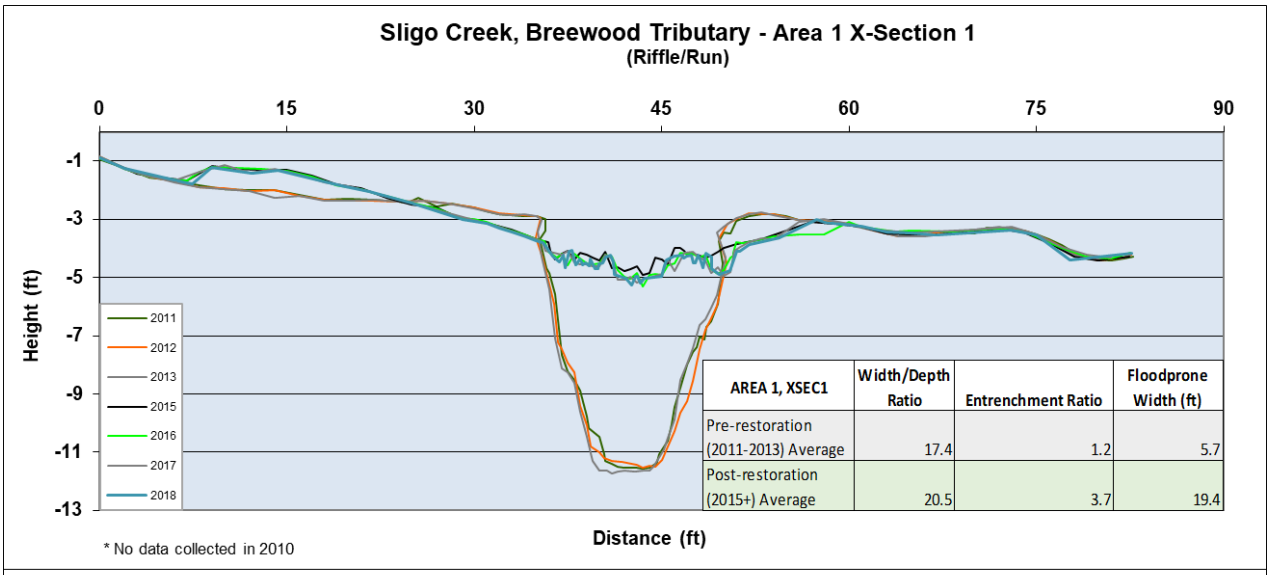
H.2.d Breewood Tributary Physical Geomorphic Assessment

DEP established two study areas (20-bankfull widths) in 2010-2011 to assess the physical geomorphology changes over time in the Breewood tributary. Study area 1 extends from the outfall channel below University Boulevard to the Breewood tributary. Study Area 2 extends downstream from the end of Tenbrook Drive to just upstream from Sligo Creek Parkway and includes the biological monitoring station at SCBT101. (See Figure III.H.2).

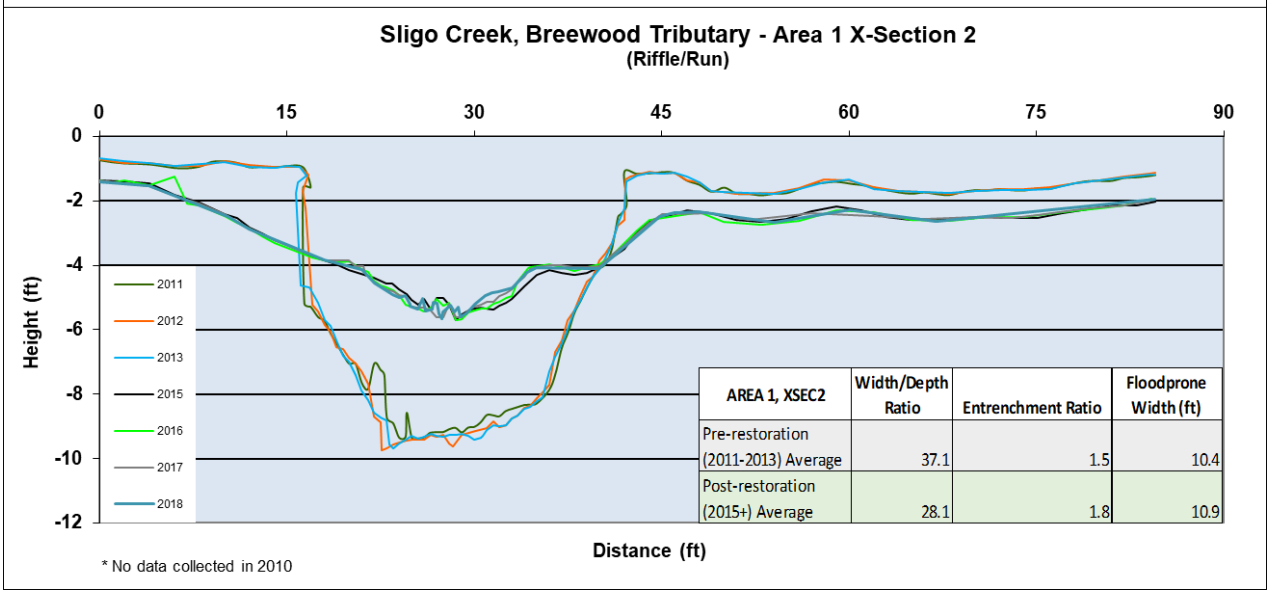
Figures III.H.9 and III.H.10 provide representative cross section views of Study Areas 1 and 2 before (2011-2013) and after (2015-2018) restoration. The pre-restoration surveys indicate degraded, entrenched channels with steep banks, little to no floodplain connection, low sinuosity, and high erosion potential. A geomorphic assessment of the Breewood tributary was not conducted in 2014 due to ongoing stream restoration activities. The Breewood tributary restoration was completed in 2015 and the first post-restoration surveys were conducted in the winter season.

Restoration included the installation of a series of pools and riffle grade controls to mitigate the high erosive flows from the outfall of University Boulevard. After restoration, pools dominate the reach at 68 percent compared to grade control riffles at 32 percent . In 2015, likely due to the post-restoration prevalence of pools, average particle size of the channel substrate also decreased from pre-restoration and was classified as silt/clay in Study Area 1. In 2016, particle size increased to an average size of 39 mm, and then in 2017 returned to silt/clay, and then very course gravel in 2018. At Study Area 2, particle size increased after restoration. In 2013, the last year of preconstruction, the D50 was 8.7 mm. In 2015 and 2016 the D50 was 40 mm. In 2017, the D50 was 55 mm and in 2018, D50 was 50 mm. After restoration the D50 of Area 2 has increased by more than 500 percent. meaning there is substantially less deposition of fine material downstream of the restored reach.

Figures III.H.9 and III.H.10 show how drastically restoration changed the cross sections of Study Areas 1 and 2. The channel bed was raised and banks were graded to open up the cross sections and allow the stream to access the floodplain. Post-restoration (2015-2018) cross section survey results indicate improved width/depth and entrenchment ratios except for Area 2 Cross Section 2. This cross section was not elevated during the restoration though brush bundles were installed to protect the banks. Note that placement of the brush bundles in our cross section makes it impossible to accurately measure the earthen bank. It should also be noted that the brush bundles are unstable which accounts for the variation in area 2 cross section 2 since 2015. Entrenchment ratios of 1-1.4 represent entrenched streams, 1.41-2.2 indicate moderately entrenched streams, and ratios greater than 2.2 represent only slightly entrenched streams with a well-developed floodplain.



AREA 1, XSEC1	Width/Depth Ratio	Entrenchment Ratio	Floodprone Width (ft)
Pre-restoration (2011-2013) Average	17.4	1.2	5.7
Post-restoration (2015+) Average	20.5	3.7	19.4



AREA 1, XSEC2	Width/Depth Ratio	Entrenchment Ratio	Floodprone Width (ft)
Pre-restoration (2011-2013) Average	37.1	1.5	10.4
Post-restoration (2015+) Average	28.1	1.8	10.9

Figure III.H.9 Representative Cross Sections from Breewood Tributary, Study Area 1

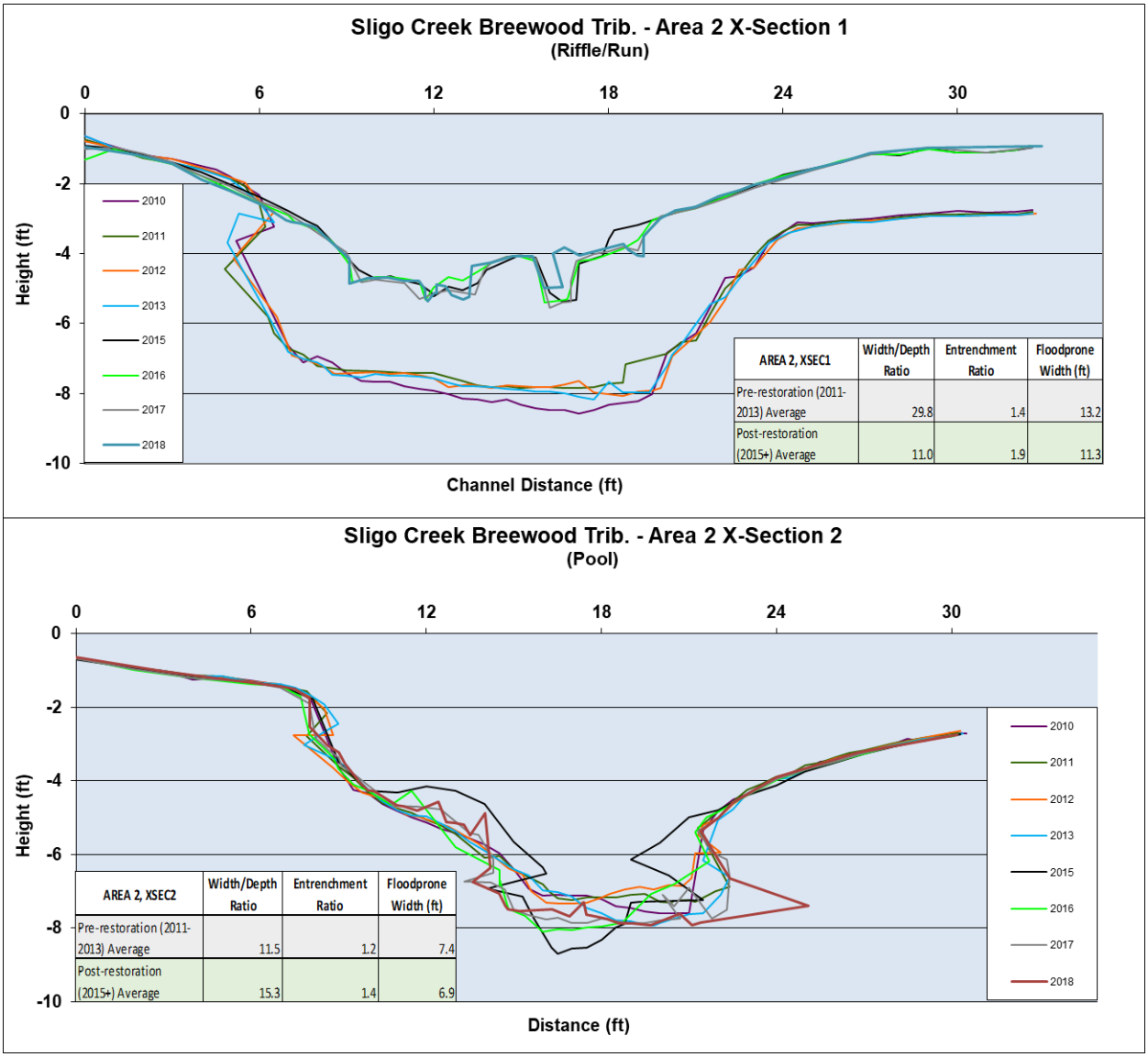


Figure III.H.10 Representative Cross Sections from Breewood Tributary, Study Area 2

Restoration has resulted in a more stable channel with lower erosion potential. Erosive stormflows that were once confined and concentrated in an entrenched channel with erodible soils now have space in the floodplain to spread out and slow down. The design intent is for water to filter through the hyporheic zone to reduce surface flow volumes and improve water quality.

Figure III.H.11 provides a photograph of a representative cross-section within Study Area 1, demonstrating the severe down-cutting that was prevalent pre-restoration in this part of the Breewood tributary. Figure III.H.12 shows the Breewood tributary post restoration.

Figure III.H.11 Upstream View of Sligo Creek - Breewood Tributary, Study area 1, Pre-Restoration (2013)

Figure III.H.12 Upstream View of Sligo Creek, Breewood Tributary, Study Area 1, Post-Restoration (2015)

H.2.e. Summary of Chemical, Biological, and Physical Monitoring of the Breewood Tributary

The monitoring of the Breewood watershed is intended to generate information on the effectiveness of an intensive watershed restoration in improving water quality and stream conditions. The design of the study focuses on comparing conditions before the project with conditions after the completion of restoration efforts. Monitoring of the watershed began in 2009. As outlined in Table III.H.3, various projects were installed from 2014 through 2018. During this period, data collected reflect transitional conditions and construction impacts. While some limited statements may be made on conditions, evaluation of the overall project is impossible from these data. Beginning in 2018, the data provide information on the completed watershed restoration. This data can be compared to data collected between 2009 and 2014 to evaluate the effectiveness of the overall effort. Data will continue to be collected for multiple years to create a robust data set that will permit a conclusive evaluation of the impacts of this project.

The 2010 through 2014 monitoring results document pre-stream restoration conditions and provide evidence that the Breewood tributary was impaired. After the stream restoration was completed in 2015, physical geomorphic surveys indicate many dramatic improvements to the channel morphology. The increased floodplain access, reduced erosion, and hyporheic zone interaction are intended to result in many ecological benefits. The benthic community structure has shifted since channel restoration was completed in 2015, but it has not demonstrated an obvious improvement that may be attributed to channel restoration. Based upon its geographical location in the watershed, there is limited recruitment potential for this headwater stream. The benthic community has not had adequate time to demonstrate improvement from the recently completed upstream projects that address water quality. Monitoring will continue annually to evaluate and substantiate improvements to the biology and habitat that have been documented and that are anticipated as a result of the restoration efforts. For now, the benthic community remains a tolerant community which reflects a degraded stream condition likely attributable to lack of recruitment and historic upstream water quality issues.

H.3 Stormwater Management Assessment

The Permit requires the County to assess effectiveness of stormwater management practices found in the 2000 Maryland Stormwater Design Manual for stream channel protection. During the previous permit cycle, MDE approved DEP's proposal to conduct the required monitoring within a developing area of the Clarksburg Special Protection Area. Specific monitoring requirements include an annual stream profile and survey of permanently mounted cross-sections as well as a comparison to baseline conditions.

The DEP established monitoring stations in two drainage areas. One being "positive control" where the drainage area will remain undeveloped and mostly forested. The other being a "test area" where development occurs in the contributing drainage area. The test area is located in the Newcut Road Neighborhood tributary to Little Seneca Creek (LSLS104). The control area is located in Soper's Branch to the Little Bennett Creek (LBSB101). Methodology is described in the County's 2003 NPDES Report, Part III.D.2, attached to this report as Appendix M. Figure III.H.13 shows the locations of the two areas and their contributing drainage areas. The control area (shown in yellow) is labeled "Soper's Branch", and the Newcut Road Neighborhood test area (shown in red) is labeled "Trib 104".

Both drainage areas include a stream gage at the bottom of each study catchment. The test and control areas are also visited once per year to monitor biological conditions, habitat, and physical-chemical data. Benthic macroinvertebrates are monitored during the spring index period (March 1 through April 30).

Fish were not used as indicators for the small, first order streams since there is often limited fish habitat due to lack of sufficient flow.

Figure III.H.13 also shows the locations of four other areas monitored as part of the Clarksburg Monitoring Partnership (CMP) which is a consortium of local and federal agencies and universities. Two additional test areas were initially selected for the CMP. One area in the Newcut Road Neighborhood labeled as Trib109 and one in the Cabin Branch Neighborhood labeled as Cabin Branch (both shown in red). One additional control area labeled as Crystal Rock (shown in yellow) was set up in an existing developed area in Germantown. More recently, a test area has been established within the Ten Mile Creek watershed (shown in green).

All the test and control areas have United States Geological Survey (USGS) flow gages installed where continuous stream flow data is being collected. Four rain gages monitor area rainfall and document local rainfall intensities to correlate rainfall to stream flow. One gage is located at Little Bennett Regional Park, two gages are located within Black Hill Regional Park, and one gage is located within the headwaters of Ten Mile Creek at the Kingsley School Environmental Center. Figure III.H.13 also depicts the location of a study area (shown in green) in the Ten Mile Creek watershed. This study area contains two USGS flow gages as well as two rain gages.

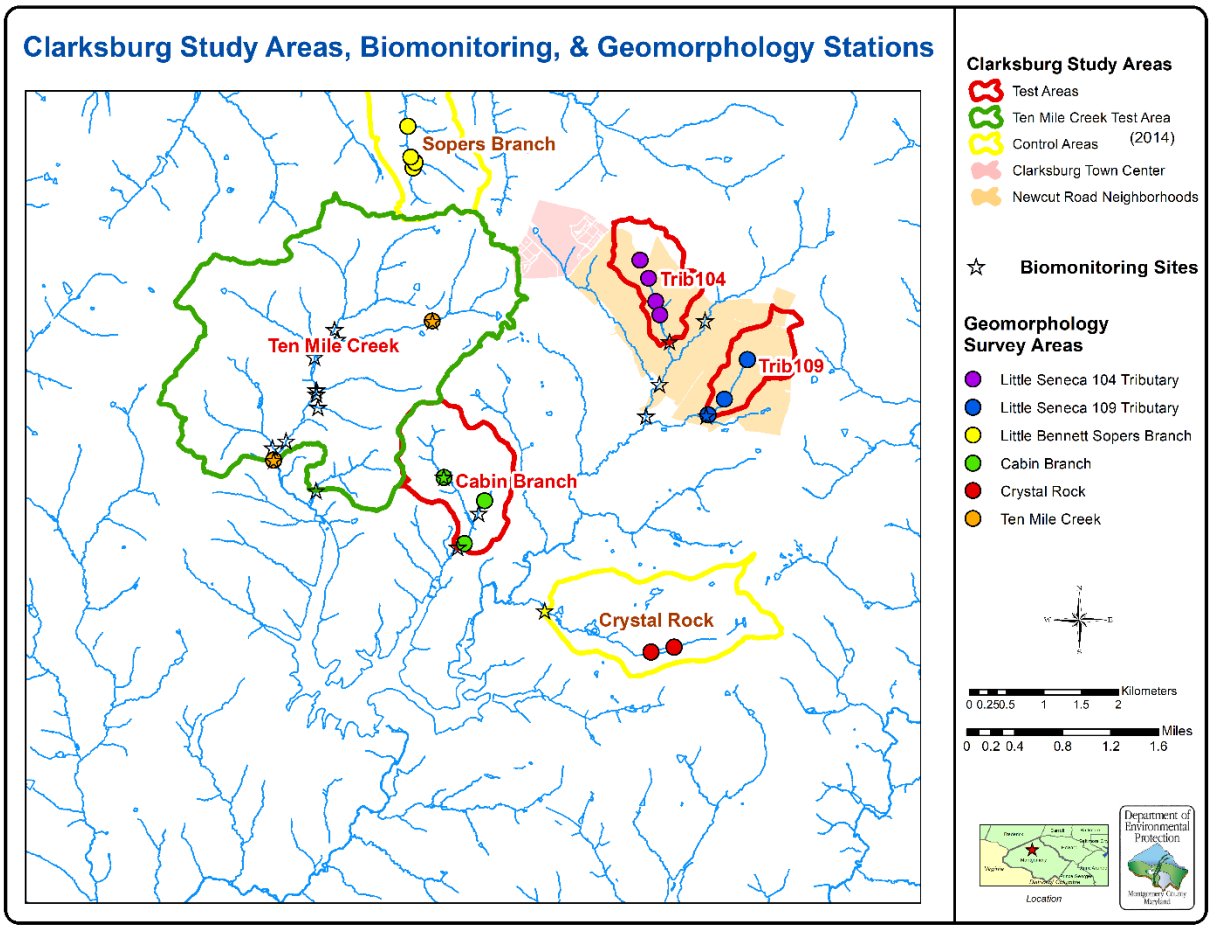


Figure III.H.13 Location of the Clarksburg Monitoring Partnership Four Test Areas and Two Control Areas, including biological and geomorphic survey location.

The CMP is using a Before, After, Control, Impact (BACI) design or paired catchment (watershed) design (Farahmand et al. 2007) approach to assess the land use changes and the impacts to stream conditions. The CMP has been monitoring stream conditions since 2004. The CMP is also using Light Detection and Ranging (LiDAR) elevation data and imagery to provide greater resolution in mapping landscape changes at this smaller drainage area scale than is possible using traditional aerial photography.

H.3.a Status of Development in the Clarksburg Special Protection Area Permit Required Test Area

The drainage catchment to the Newcut Road Neighborhood test area (LSLS104) primarily contains two developments. All phases of Greenway Village are complete and ESC structures have been converted to SWM facilities. Phases I through IV were complete by 2012, while Phase V was completed in Spring 2015. Clarksburg Village Phase I and II are also complete. Clarksburg Village Phase I transitioned from construction to post construction in 2011 and Clarksburg Village Phase II transitioned to post construction in May 2017. The land composition in the Soper's Branch control area drainage catchment remains unchanged.

H.3.b Precipitation, Infiltration, and Annual Flows

Average annual precipitation is about 42 inches in the Baltimore-Washington area (NWS 2008). Average monthly precipitation varies slightly throughout the year but localized spring and summer thunderstorms can cause significant variations in precipitation among nearby locations (Doheny et al. 2006; James 1986). To assure that such localized events were accurately captured, two rain gages were established for the CMP at Black Hill Regional Park in Cabin Branch (2004) and Little Bennett Regional Park in Soper's Branch (2003). Two additional rain gages were installed in 2014 to monitor precipitation events in Ten Mile Creek. The data collected provides statistics on pattern and amount of rainfall, storm durations, storm mean intensity, and storm peak intensity.

H.3.c Hydrologic Data Analysis and Interpretation

Stream flow gages continue to provide data that allows the calculation of instantaneous peak discharge and daily mean discharge as well as stream height response during storm events. Descriptive information on the seven flow gages is presented in Table III.H.7.

Annual runoff from stream gages in the Newcut Road Neighborhood test area (USGS gage 01644371) and the Soper's Branch control area (USGS Gage 01643395) was compared to rainfall data from the Cabin Branch and Soper's Branch rain gages to determine how much average annual precipitation infiltrates into the groundwater or is released into the atmosphere through evapotranspiration within the drainage areas of the gages. Data were obtained from the online Water Year Reports published by the USGS, Baltimore Office (Doheny 2009, personal communication) for water years 2005 through 2018. Water Years cover the period from October 1 to September 30 of each year. The 2018 USGS Water Data Reports for the two stream gages are available at: https://waterdata.usgs.gov/nwis

Table III.H.7 Descriptions of the USGS Stream Gages in the Clarksburg Study Area					
Gage ID Number	**Name**	**Date Started**	**Drainage Area (square miles)**	**Drainage Area (acres)**	**Closest Test or Control Area**
01644371	Newcut Road Neighborhood tributary to Little Seneca Creek Near Clarksburg, MD ("Test Area")	5/2004	0.43	275.2	Test Area (LSLS104)
01643395	Soper's Branch at Hyattstown, MD ("Control Area")	2/2004	1.17	748.8	Control Area (LBSB201)
01644375	Little Seneca Creek Tributary Near Germantown, MD	6/2004	1.35	864.0	Crystal Rock
01644372	Little Seneca Creek Tributary at Brink, MD	6/2004	0.37	236.8	LSLS109
01644380	Cabin Branch Near Boyds, MD	6/2004	0.79	505.6	Cabin Branch
01644388	Ten Mile Creek Near Clarksburg	6/2013	3.37	2156.8	LSTM301A
01644390	Ten Mile Creek Near Boyds	10/2010	4.48	2867.2	LSTM304

H.3.d Time of Concentration

Time of concentration (TOC) is defined as the difference in time between the start of rainfall and when discharge begins to increase at the gaging station (Doheny et al. 2006). This parameter is useful in understanding the stream response to clearing and grading and subsequent land use changes and increasing imperviousness. With less area for precipitation to infiltrate, runoff reaches the stream in a shorter amount of time. The Maryland erosion and sediment control requirements attempt to moderate this during construction by providing storage for one inch of rainfall from the site undergoing construction. However, local site constraints and weather patterns may not allow for storage of one inch of rainfall from the site for every storm. For example, the storms may be back-to-back storms or an unexpected condition discovered such as the BMP being located so that the local groundwater is intercepted.

Flow and rain data collection have not been consistent over the study period due to issues such as equipment malfunction. The number of storms considered for each station is listed in Table III.H.8 and only includes storm events where a response occurred. Storm events were chosen over a variety of durations, intensities and seasons.

Time of Concentration in Soper's Branch has been variable over the course of the study period (Figure III.H.14). Average TOC ranged from 17 minutes in 2008 to 398 minutes in 2018. All averages were over 125 minutes except in 2008. Multiple results were greater than 400 minutes with maximum TOCs ranging from 25 minutes in 2008 to 1190 minutes in 2017.

Table III.H.8 Storm Events Used in TOC Analysis

Station Name	Drainage Area (acres)	Year (2005 - 2018)												
		2005	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
		Number of Storms												
Soper's Branch	749	5	6	4	14	14	8	4	12	10	8	17	37	21
Newcut Road Neighborhood Tributary	275	8	0	4	14	16	8	5	18	15	20	28	57	31

No pre-construction results are available for the Newcut Road Neighborhood Tributary; the USGS flow gage was not installed until after construction was complete. The average TOC at the Newcut Road Neighborhood Tributary ranges from 48 minutes in 2013 to 202 minutes in 2018 (Figure III.H.15). With few exceptions, averages have been consistently less than 90 minutes. Maximum TOC ranges have steadily increased from 200 minutes in 2008 to 1180 minutes in 2017. The maximum value reported in 2018 was 980 minutes. The relatively consistent nature of the results may be attributed to SWM in the watershed. During rain events, runoff reaches the SWM structures relatively quickly. If functioning properly, these structures release flow at predetermined rate. One possible explanation for the increase in maximum TOC may be the design of the SWM structures, which includes 2 feet of dead storage space to promote infiltration. Trends will continue to be monitored over time.

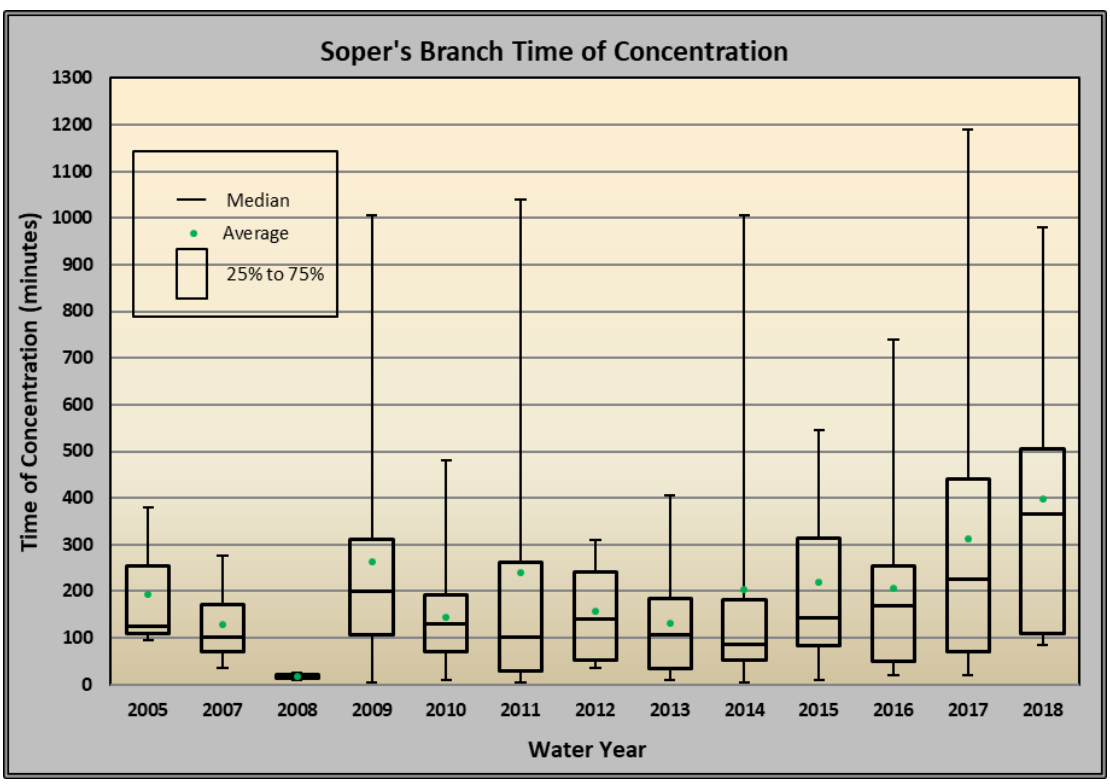


Figure III.H.14 Time of Concentration for Soper's Branch, 2005-2018

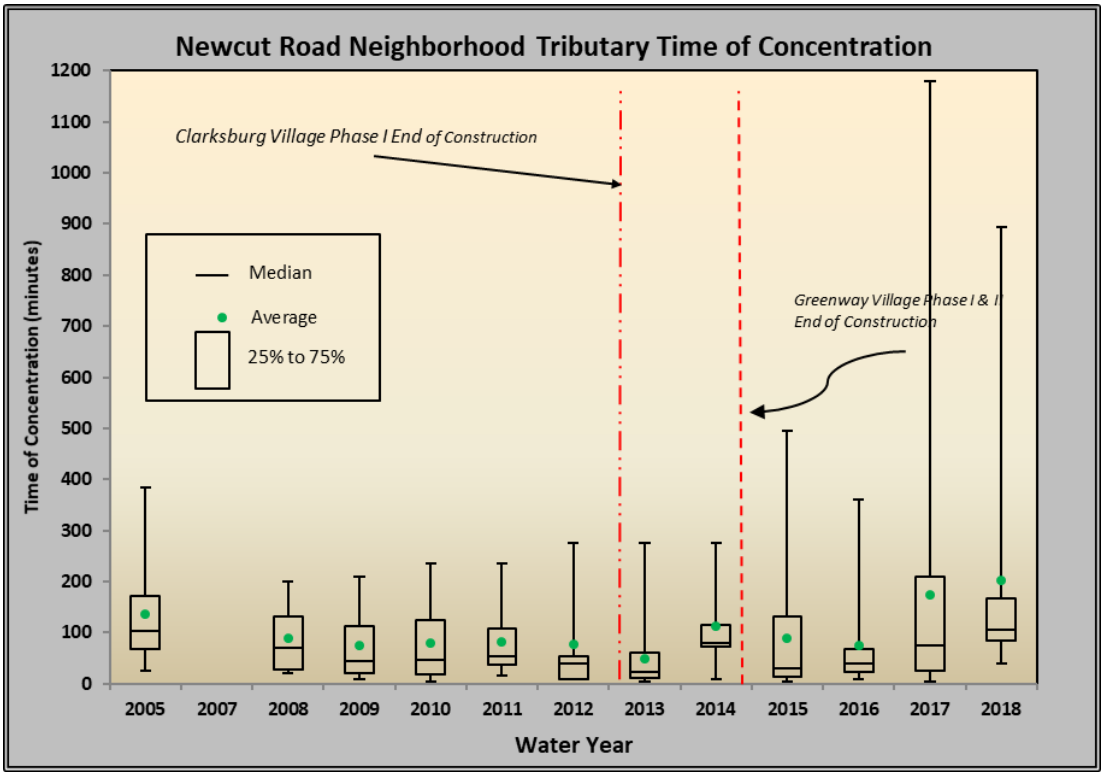


Figure III.H.15 Time of Concentration for Newcut Road Neighborhood Tributary, 2005-2018

H.3.e Stream Geomorphology Monitoring

Figure III.H.16 provides survey locations for the stream geomorphology monitoring in the Little Seneca Creek- Newcut Road Neighborhood Tributary test area and in the Little Bennett Creek- Sopers Branch control area. Multiple surveys were completed in both areas to document the temporal change in stream channel morphology. Survey information includes longitudinal profiles, cross sections, bed composition (pebble counts), and sinuosity.

Surveys were established within similar habitat sections of each study stream. At that time, the upstream habitat sections were steeply-graded, straight channels (low sinuosity index) consisting mostly of riffle habitat. More downstream sections were characterized by decreasing slopes, increasing sinuosity and pools becoming more prevalent. There are four channel cross-section locations in both study areas, labeled from 1-4, with location 4 representing the most downstream cross-section location. All cross sections used in this comparison were measured in riffle/run stream areas. Riffle/run areas serve as grade control for the stream and are areas that resist changes to cross-section features.

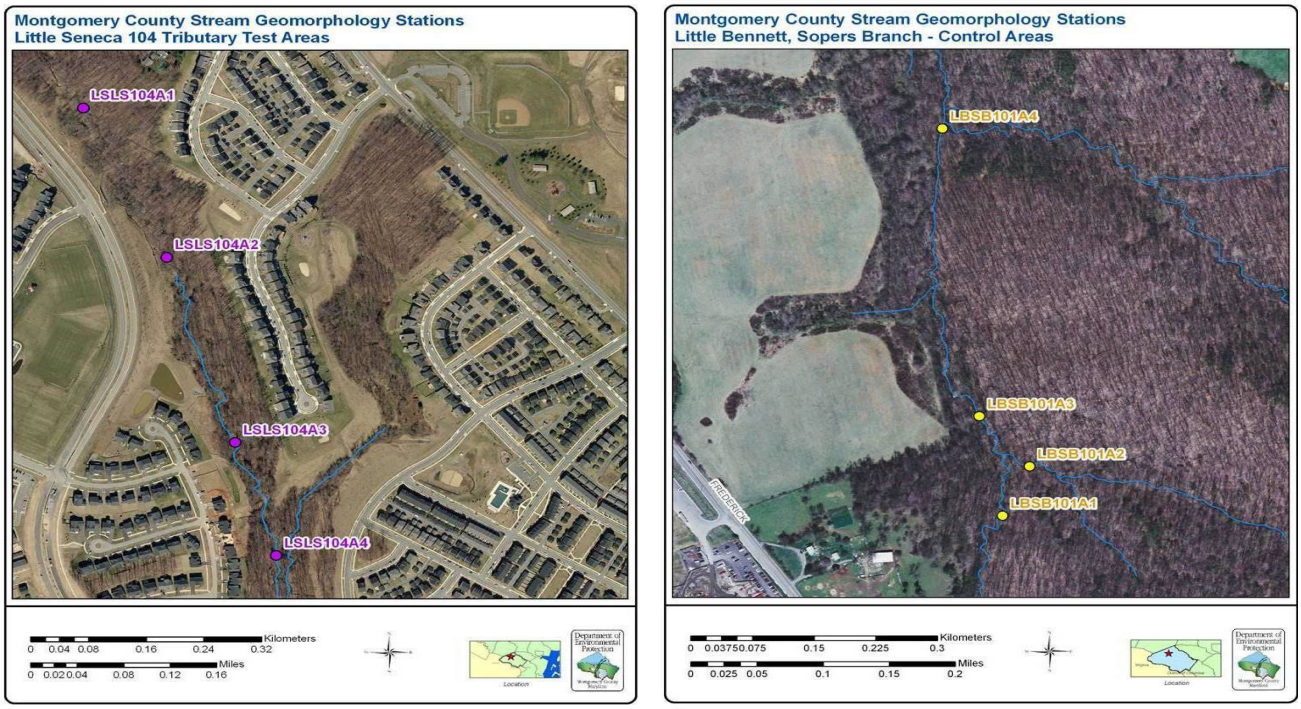


Figure III.H.16 Geomorphology Survey Locations: Little Seneca Creek- Newcut Road Neighborhood Test Area (left), Little Bennett Creek Sopers Branch Control Area (right)

H.3.f Data Analysis and Interpretation

As development alters an area's surface hydrology, rainfall infiltration will decrease and stormwater runoff will increase. This will then cause corresponding higher peak flows and scour in the receiving stream channel. The eroded material is carried away and deposited downstream (aggradation). As the development site stabilizes, less aggradation of the stream from overland sediment occurs (Paul and Meyer 2001). To document stream physical changes during development, DEP conducts annual monitoring of cross-sections, pebble counts for average particle size, stream bed elevation, and measures of sinuosity.

The average particle size (D_{50}) for substrate material in the Newcut Road Neighborhood Tributary exhibited an increase at the most downstream study area (Area 4) through 2010. In 2011 the average particle size decreased at the test area for the first time since 2004. This corresponds with the beginning of the post-construction period at Clarksburg Village Phase I. The average particle size since 2011 has fluctuated between very fine gravel and medium gravel. Increased runoff rates during the construction period may have been flushing the finer particles downstream, while the coarser, parent material aggregates of the stream channel were left in place. Increased impervious may result in more runoff and thus more sediment reaching the stream. To reach equilibrium, sediment is removed from the stream channel in one location and deposited downstream in another area. Little change in particle size over time would be an indication that the system has reached equilibrium.

Representative cross section graphs from the Newcut Road Neighborhood test area illustrate change over time (Figure III.H.17). The cross sections generally show channel aggradation corresponding to the most active years of construction (2004, 2005, and 2006), and then channel degradation and some widening from 2007 to 2011 as the test area neared final elevations and stabilization. In 2012, approximately one

foot of aggradation was observed in cross section 1. In 2013 and 2014, little change was noted. In 2015 however, the channel in cross section 1 scoured out approximately 1 foot. Changes are most evident in the lower portion of the cross-section profiles, at or below frequent storm elevation. Little change was observed in 2016 through 2018 as can be seen in Figure III.H.18.

In contrast, representative sections from the Sopers Branch control area (Figure III.H.19) showed that the channel area at the control station has also increased, but not as rapidly as at the test area. This is consistent with more stable hydrologic pattern and possibly indicative of less sediment moving through the system.

Figure III.H.20 shows longitudinal profile data for the downstream study area at the Newcut Road Neighborhood Tributary Test site (Area 4). Figure III.H.21 shows the longitudinal profile data for the downstream study area at the Soper's Branch Control site (Area 4). The stream bed elevation in the test area tributary has shown considerable instability since construction initiated in 2005 and features frequently change as sediment loads move through the system. Whereas over the same time period, greater consistency was observed in stream bed elevation and feature type at the control station. An examination of the percent of riffle/run to percent pool at the test and the control sites revealed no observable trends.

Results of biological, physical, and hydrologic monitoring indicate the stream channel in the test area may still be in a state of flux as the system responds to the new development. Preliminary results indicate that the change in land use from agricultural to residential has impacted the test area causing instability (erosion) in the stream channel. The streams will remain unstable as they adjust to receiving more runoff at a faster rate from impervious surfaces in the newly developed area.

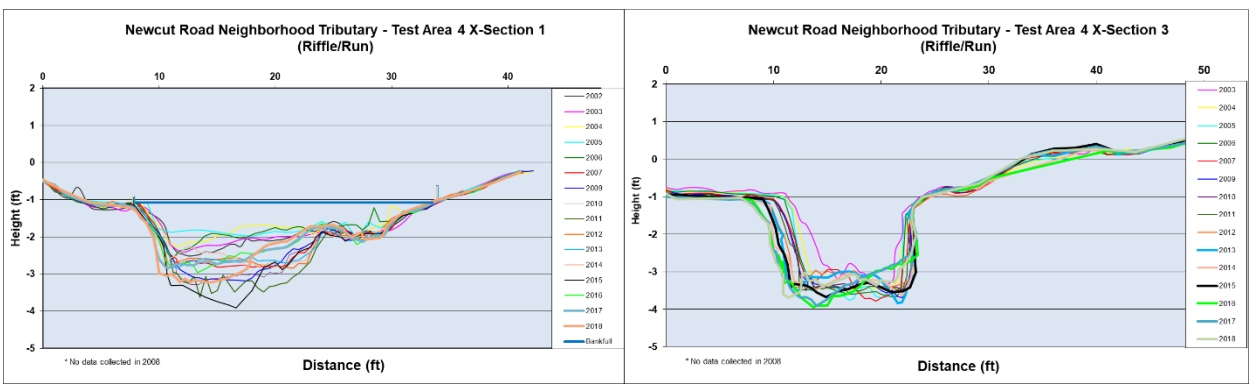


Figure III.H.17 Newcut Rd Neighborhood Tributary Test Area 4 Cross Sections, 2002 to 2018

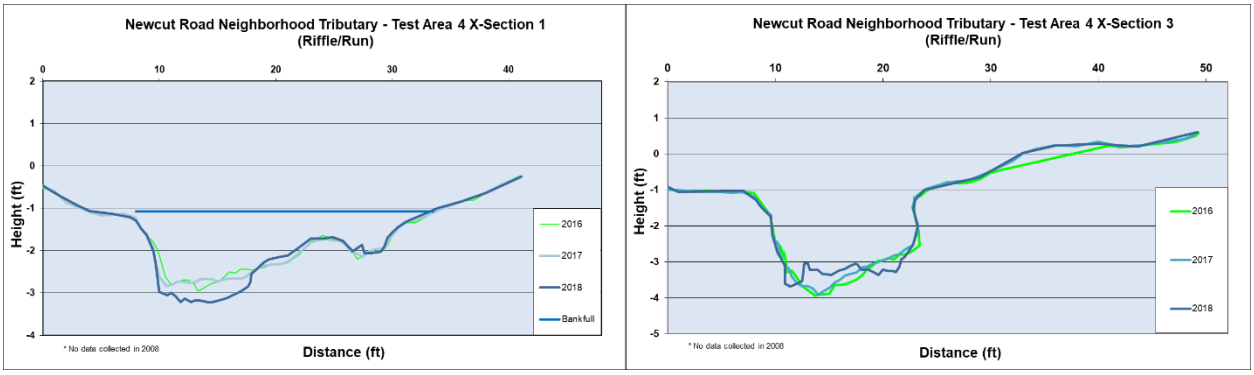


Figure III.H.18 Newcut Rd Neighborhood Tributary Test Area 4 Cross Sections 2016 to 2018

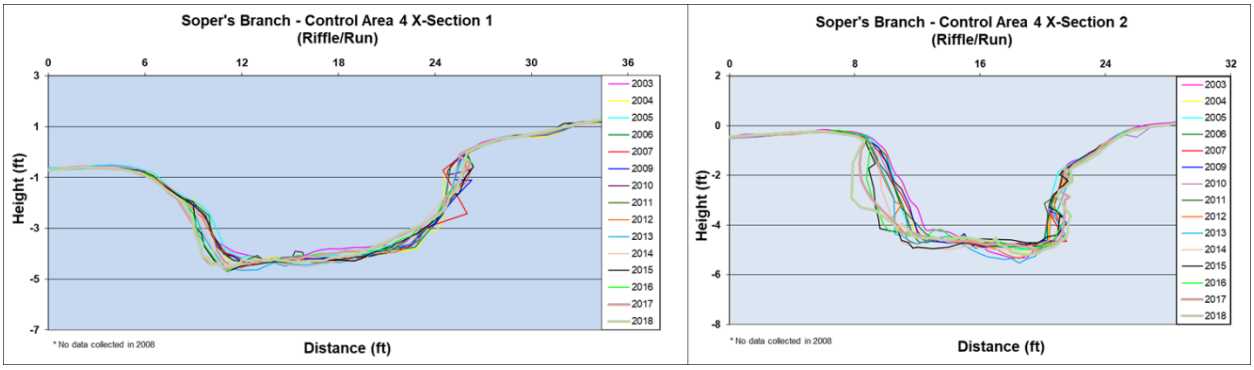


Figure III.H.19 Little Bennett Soper's Branch Control Area 4 Cross Sections, 2003 to 2018

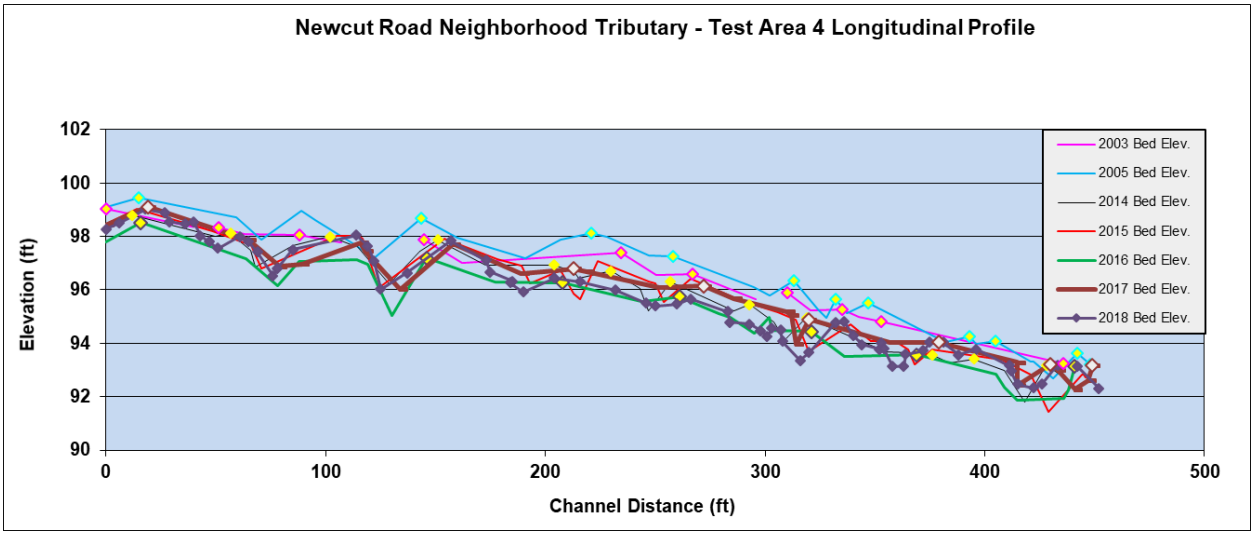


Figure III.H.20 Longitudinal profiles for Newcut Rd Neighborhood Tributary Test Area 4, 2003 to 2018

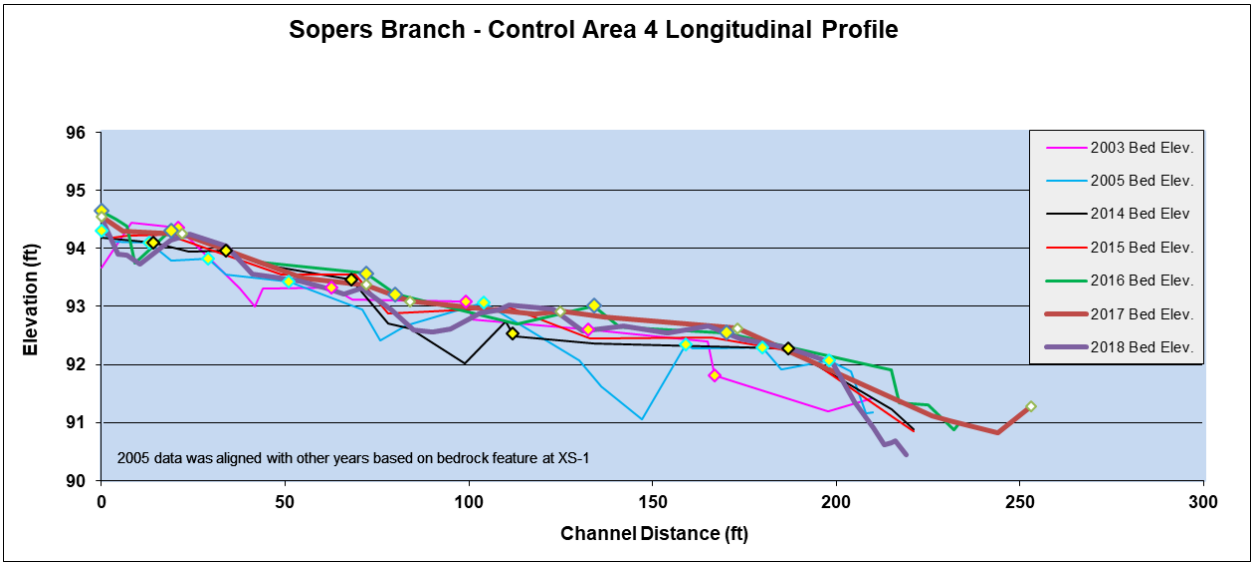


Figure III.H.21 Longitudinal profiles for Soper's Branch Control Area 4, 2003 to 2018

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I. Program Funding

I. 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 below.
2. Adequate program funding to comply with all conditions of this permit shall be maintained.

The Permit requires that the County submit annual funding for the capital, operation, and maintenance expenditures in database format specified in Permit Part IV Attachment A. This section provides a summary of the capital, operation, and maintenance expenditures, as well as the revenue generated by the WQPC.

Beginning with FY13, the expenditures reported include data from multiple departments within the County as well as from MCPS, a co-permittee. The expenditure data do not include operational Department of Transportation and General Services costs associated with pollution prevention on County property since these agencies cannot separate out these specific costs from their other operating costs.

During FY19, the reported total expenditures associated with all Permit requirements was $66,648,765, which is an increase of 1.5 percent over the Permit expenditures in FY18. All fiscal year total expenditures are listed in Table III.I.1 in thousands of dollars.

Table III.I.1 Total Expenditures for County MS4 Related Programs by Fiscal Year (in 000s)

Fiscal Year	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Total Expenditures [1]	$27,415	$30,097	$30,302	$44,773	$51,728	$53,506	$50,536	$64,245	$65,652	$66,648
Change from Prior FY	N/A	9.8%	0.7%	47.8%	15.5%	3.4%	(5.6%)	27.1%	2.2%	1.5%

[1] *Personnel, administrative and debt service costs not reported FY10-FY12. Total budgeted includes all operating expenditures for County MS4 permit including general funded, special enterprise funded (for DEP and DPS), and WQPC funded programs. Also includes debt service payment for capital program, and general funded and WQPC funded capital improvement programs.*

MDE requested a breakdown of the capital costs, operational costs, and, if applicable, the amount of funds raised by the WQPC. Table III.I.2 breaks down the operating and capital expenditures for FY19, and Table III.I.3 summarizes the FY19 actual revenue generated for MS4 Permit requirements. The expenditures provided in Tables III.I.1 and III.I.2 are provided in detail

by program area in Appendix A, MDENPDES19.accdb., Table L, Fiscal Analysis. The FY19 program funding includes revenue generated from the WQPC, BMP Monitoring Fee, Tree Canopy Fee, and Bag Tax.

Table III.I.2 Breakdown of FY19 Operating and Capital Expenditures

Expenditure Type	Expenditure
Operating Expenditures [1]	$42,916,951
Capital Expenditures [2]	$23,731,814
Total Expenditures:	**$66,648,765**

[1] All operating expenditures for County MS4 Permit, including general funded, special enterprise funded (for the DEP and DPS), and WQPC funded programs. Also includes debt service payment for capital program. [2]
[2.] Includes general funded and WQPC funded capital improvement programs.

Table III.I.3 FY19 Revenues

Revenue Source	Amount
WQPC Revenues	$39,285,112
BMP Monitoring Fee Revenue	$222,481
Tree Canopy Fee Revenue	$847,000
Bag Tax Revenue	$2,566,990
Total Revenues:	**$42,921,583**

I.1 FY19 Watershed Restoration Expenditures

The Permit requires the County to submit estimated costs and actual expenditures for implementing the watershed restoration program. Table III.I.4 summarizes FY10 through FY19 CIP costs for both watershed assessments and watershed restoration projects. As noted in the FY16 Annual Report, expenditures decreased from FY15 to FY16 due to the legal challenges against the WQPC. The legal challenges were resolved in FY16 and CIP projects resumed in FY17, as reflected by the increased expenditures in FY17.

The amended FY19-24 CIP budget, approved by the County Council on May 23, 2019, includes program changes intended for the County to use to meet its watershed improvement goals. In FY18, the County made substantial changes to the program to refine the County's implementation costs, including a shift from bond funding to low cost loans and a streamlined contracting approach.

Table III.I.4 FY10-FY19 Capital Improvement Program Expenditures for Watershed Assessment and Restoration

Fiscal Year	Total FY Expenditures from Watershed Assessments	Total FY Expenditures from Watershed Restoration	Total FY CIP Expenditures for Watershed Assessment and Restoration
FY10	$433,800	$2,942,100	$3,375,900
FY11	$749,130	$3,904,222	$4,653,352
FY12	$502,244	$8,168,571	$8,670,815
FY13	$879,435	$9,274,295	$10,153,730
FY14	$1,658,517	$16,490,211	$18,148,728
FY15	$659,634	$16,934,497	$17,594,131
FY16	$432,084	$10,293,457	$10,725,541
FY17	$990,436	$17,933,330	$18,923,766
FY18	$795,655	$18,310,883	$19,106,539
FY19	$858,171	$17,438,101	$18,296,272
Total Expenditures:	**$7,959,106**	**$121,689,667**	**$129,648,774**

During FY19, the County applied for low-cost financing through the Maryland Water Quality Revolving Loan Fund, which will be secured by the WQPC. Through this loan program, the County stands to save an estimated $22 million in financing costs, over the life of the loans, as compared with traditional bond funding. On December 20, 2019, the County closed on two loans to fund restoration projects that will be used for MS4 restoration credit anticipated for the next MS4 permit. The second loan also funds repair and replacement of stormwater facilities and conveyance systems. The total loan amount awarded to the County is $50,667,320. The County also modified its approach of only using separate contracts for impervious surface restoration design and construction of SWM facilities and is pursuing a design-build, contracting vehicle to support restoration requirements anticipated in the next permit. This mechanism has provided significant cost efficiencies in other jurisdictions. As a result of these changes to the capital budget, the WQPC rate in FY19 remained the same as in FY18. Table III.I.5 summarizes the approved-amended FY19-FY24 CIP.

I.2 Financial Assurance Plan

On February 15, 2019, the County submitted its biennial FAP. The law requires Phase I MS4 jurisdictions to project annual and 5-year costs to meet the requirements of their MS4 Permit. On June 25, 2019, MDE determined the County demonstrated that it has sufficient funding in its FAP. Montgomery County is required to submit its next biennial FAP on February 15, 2021.

Table III.I.5 DEP Approved-Amended (May 2019), FY19 through FY24, SWM CIP Budget (in 000 $)

Projects	CIP Cycle Total	FY19	FY20	FY21	FY22	FY23	FY24
SWM Retrofit Countywide	19,040	17,090	1,950	0	0	0	0
SWM Retro-Government Facilities. LID	0	0	0	0	0	0	0
SWM Retrofit- Roads	50	50	0	0	0	0	0
SWM Retrofit Schools	1,000	1,000	0	0	0	0	0
Miscellaneous Stream Valley Improvement	16,770	5,160	9,440	1,630	180	180	180
SWM Facility Planning	4,580	750	730	750	790	780	780
Watershed Restoration Interagency	0	0	0	0	0	0	0
Major Structural Repair	11,720	1,480	2,320	3,330	1,630	1,480	1,480
SWM Design/Build/ Maintain Contract	46,300	1,830	8,720	8,770	9,140	9,640	8,200
Wheaton Reg. Dam Flooding Mitigation	5,530	70	80	330	3,130	1,920	0
Total:	**104,990**	**27,430**	**23,240**	**14,810**	**14,870**	**14,000**	**10,640**

J. Total Maximum Daily Loads

J. **Total Maximum Daily Loads**

1. Section 402(p)(3)(B)(iii) of the Clean Water Action (CWA) states that municipal storm sewer system permits must require stormwater controls to reduce the discharge of pollutants to the MEP. By regulation at 40 CFR§122.44, EPA further requires that BMPs and programs implemented pursuant to this permit must be consistent with applicable WLAs developed under EPA approved TMDLs. The overall goals of Maryland's NPDES municipal stormwater permit program are to control stormwater pollutant discharges by implementing the BMPs and programs required by this permit, show progress toward meeting WLAs developed under EPA approved TMDLs, and contribute to the attainment of water quality standards according to the CWA.

   In order to accomplish these goals, this permit requires in Part III.J.2. below, that the County develop TMDL implementation plans that include estimates of pollutant loading reductions (benchmarks) to be achieved by specific deadlines and describe those actions necessary to meet the storm drain system's share of WLAs in EPA approved TMDLs. These implementation plans may be in addition or complementary to the watershed assessments required in PART III.F. above and include ongoing watershed restoration efforts required in this permit, as appropriate. Implementation plan benchmarks shall be based on data available to and generated by the County and used as interim goals for guiding adaptive management activities. All EPA approved TMDL's that establish WLA's applicable to the County's storm drain system are incorporated by reference into this permit.

2. Within one year of the effective date of this permit or the approval of an applicable TMDL by EPA, whichever is later, the County shall submit to MDE for review and approval a TMDL implementation plan for each EPA approved TMDLs for a watershed or portion of a watershed covered by this permit. The implementation plans shall include:

   a. The actions and deadlines by which those actions must be taken to meet the required pollutant load reduction benchmarks and WLAs within the specified time frame;

   b. A description of how ongoing watershed restoration efforts will be modified to address any applicable WLAs;

   c. A schedule and cost estimate to implement the complete watershed restoration efforts necessary to meet established WLA benchmarks;

   d. A description of a plan that will be used when benchmarks are not met and projected funding is inadequate;

   e. A public participation component that includes:

      i. Notice in a local newspaper and the County's web site outlining how the public may obtain information and provide comments to the County regarding implementation plans;

      ii. Procedures for providing the plan to interested parties upon request;

      iii. A minimum 30-day comment period; and

iv. A summary in the next annual report of how the County addressed or will address any material public comments received.

3. As reflected in PART III.H. above, the assessment to determine whether the conditions of this permit are satisfied, the MEP standard is reached, and whether progress toward meeting applicable WLAs is realized is critical. Therefore, complete and accurate annual reporting, pursuant to PART IV of this permit is required to allow for regulatory review of the permittee's stormwater management program and continued assessment of waters of the state.

4. If EPA approved TMDL WLAs are not being met according to the benchmarks and deadlines contained in the County's TMDL implementation plans, an iterative approach shall be used where additional or alternative stormwater controls are proposed and implemented in order to achieve WLAs. The permittee shall evaluate and document progress toward meeting TMDL requirements within the jurisdiction on an annual basis. This assessment shall describe specific actions undertaken pursuant to the permit and if necessary, how these actions will be modified, and the deadlines by which they will be modified to achieve compliance with EPA approved TMDLs. This assessment shall include complete descriptions of the analytical methodology used to evaluate the effectiveness of restoration efforts; include summaries of monitoring data, descriptions of statistical analysis and/or other modeling approaches used to evaluate the data, and GIS data; and a detailed description of sampling protocols.

5. MDE shall review the annual assessment and any proposed modifications to the TMDL implementation plan and approve the modifications, if they are adequate.

The Permit requires developing implementation plans to meet County MS4 WLAs for any EPA-approved TMDL in County watersheds within 1 year of EPA approval. The County must also report progress towards meeting those WLAs where watershed restoration is occurring.

J.1 Total Maximum Daily Loads Implementation Plans

The County successfully submitted the Montgomery County Coordinated Implementation Strategy (Strategy), as required by the Permit, including meeting the TMDL WLAs, in February 2011, 1 year after issuance of the Permit. The Strategy used the watershed treatment model (WTM) to verify pollutant baseline loads in TMDL watersheds, and estimate pollutant load reductions of a variety of completed and planned structural, non-structural, and programmatic watershed restoration practices. Pollutant load reduction efficiencies were selected based on the best information available during model development. The model estimated pollutant treatment by SWM BMPs and retrofits constructed after TMDL baseline years. Details on the WTM assumptions can be found in the Strategy, Appendix B, Modeling Framework, which can be found in Appendix K. Figure III.J.1 shows those watersheds with MDE identified impairments and EPA-approved TMDLs as of December 2019.

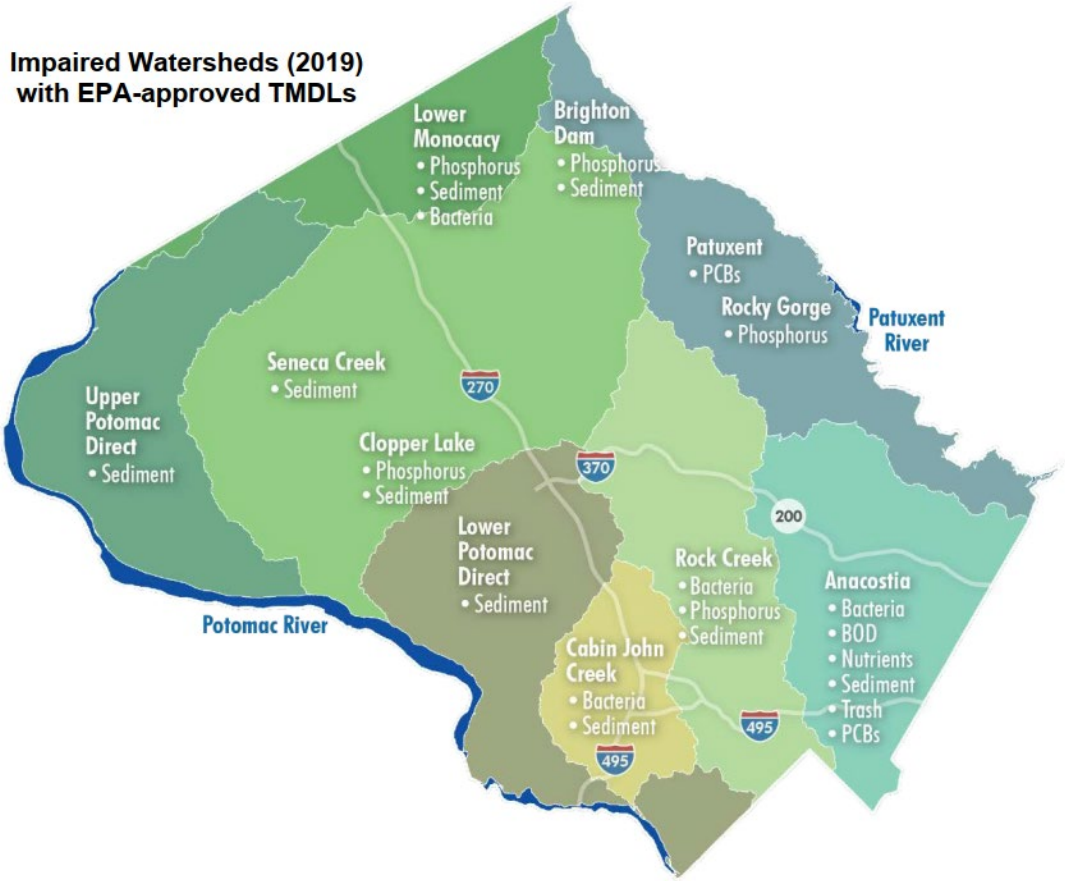

Figure III.J.1 County Watersheds with Impairments and EPA Approved TMDLs

J.2 TMDLs Issued Since June 2009

Table III.J.1 shows the TMDLs approved by EPA for Montgomery County with the status of their implementation plans. The Strategy addressed all existing TMDLs as of September 2009. Individual implementation plans were developed for TMDLs approved after 2009. A TMDL for PCBs in the Patuxent River was approved by EPA in September 2017, and the draft implementation plan was included as Appendix I in the FY18 Annual Report on February 15, 2019.

J.3 Progress Towards Meeting Wasteload Allocations for EPA Approved TMDLs

Table III.J.2 summarizes watershed-specific TMDLs and pollutant reductions achieved by watershed restoration projects constructed after each TMDL's baseline data date. The reductions include nutrients and sediment reductions from stream restoration projects using efficiencies provided in MDE's August 2014 Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated. The FY19 pollutant load reduction information can also be found in this report's electronic (compact disc) attachment in Appendix A, MDENPDES19.mbd, Tables G, and G.1.

Table III.J.1 Status of TMDLs Implementation Plan

Watershed	TMDL	Status of Implementation Plan
Anacostia River	Polychlorinated Biphenyls (PCBs)	Implementation Plan Submitted in 2013
	Nitrogen	Required Reductions Shown in Strategy
	Phosphorus	Required Reductions Shown in Strategy
	Biological Oxygen Demand (BOD)	Required Reductions Shown in Strategy
	Sediment	Required Reductions Shown in Strategy
	Bacteria	Required Reductions Shown in Strategy
	Trash	Required Reductions Shown in Strategy
Cabin John Creek	Sediment	Required Reductions Shown in Strategy
	Bacteria	Required Reductions Shown in Strategy
Lower Monocacy	Bacteria	Implementation Plan Completed in 2014
	Phosphorous	Implementation Plan Completed in 2014
	Sediment	Implementation Plan Completed in 2014
Potomac River Direct	Sediment	Implementation Plan Completed in 2014
Rock Creek	Sediment	Required Reductions Shown in Strategy
	Phosphorous	Required Reductions Shown in Strategy
	Bacteria	Required Reductions Shown in Strategy
Seneca Creek	Sediment	Implementation Plan Completed in 2014
Clopper Lake	Phosphorous	Required Reductions Shown in Strategy
	Sediment	Required Reductions Shown in Strategy
Triadelphia Reservoir	Sediment	Required Reductions Shown in Strategy
	Phosphorous	Required Reductions Shown in Strategy
Rocky Gorge Reservoir	Phosphorous	Required Reductions Shown in Strategy
Patuxent River	PCBs	Draft Implementation Plan Completed in 2018

MDE approved the County's PCB TMDL Implementation Plan for the Anacostia River as written and conditionally approved the County's other TMDL Implementation Plans on September 17, 2018. The plans other than the Anacostia PCB TMDL Implementation Plan must be updated to include the following:

- Baseline load estimates and associated calculations, current progress load assessments, and projected implementation scenario load assessments.
- Enumeration of specific planned implementation actions in an accounting format.
- Schedule of compliance indicating the end dates for achievement of the total required load reductions and regular milestones prior to those end dates.

The County will submit updated TMDL Implementation Plans to MDE by the end of the first year of the forthcoming MS4 Permit.

MDE provided comments on the County's PCB TMDL Implementation Plan for the Patuxent River on June 21, 2019. The TMDL was established in September 2017 and the implementation plan was submitted with the FY18 Annual Report. The County will respond to MDE's comments and submit an updated implementation plan by the end of the first year of the forthcoming MS4 permit.

The Strategy land cover loading rates and BMP reduction efficiencies were developed prior to the issuance of MDE's 2014 Accounting Guidance and therefore do not always match those efficiencies. In 2018, DEP began to evaluate using the Chesapeake Assessment Scenario Tool (CAST) model for local TMDL progress reporting. The complexity of land use categories included in CAST and the fact that it only simulates nitrogen, phosphorus, and sediment loads make it less than ideal for use in tracking progress towards local TMDLs. The County is exploring simpler spreadsheet-tool approaches that would use the land use loading rates and BMP efficiencies found in CAST. MDE also indicated in their September 17, 2018 letter that they will provide an updated load accounting framework that will be based on loading rates and BMP efficiencies found in CAST. The DEP will work with MDE to ensure that the data is accurately captured and explained in future annual reports.

J.4 Chesapeake Bay TMDL

Information on the Chesapeake Bay TMDL is presented in Part V, Special Programmatic Conditions, A. Tributary Strategy.

Table III.J.2 TMDL Summary by Impairment

Impairment	Watershed	Issue Date	Pollutant	County MS4 Baseline Load	Annual Allocation	Units	WLAsw Percent Reduction	Percent Reduction Since Baseline Date*	TMDL Baseline Data Date
Bacteria	Cabin John Creek	2007c	E. coli	44,257	30,670	(billion MPN/yr)	30.7	3.1**	2003
	Rock Creek	2007d	Enterococci	453,669	18,195	(billion MPN/yr)	96.0	4.9	2003
	Anacostia River	2007b	Enterococci	247,809	29,978	(billion MPN/yr)	87.9	7.8	2003
	Lower Monocacy River	2009e	E. coli	67,452	9,848	(billion MPN/yr)	85.4	1.3	2003-2004
Sediment	Anacostia River	2007a	TSS	7,682	1,101	(tons/yr)	85.7	27.6	1997
	Triadelphia Reservoir	2008b	TSS	29	29	(tons/yr)	0.0	0.0	2003
	Clopper Lake	2002	TSS	13	13	(tons/yr)	0.0	0.0	2002
	Lower Monocacy River	2009d	TSS	253	99	(tons/yr)	60.8	1.2	2000
	Seneca Creek	2011	TSS	5,735	3,185	(tons/yr)	44.6	28.4	2005
	Rock Creek	2011	TSS	8,667	5,345	(tons/yr)	38.3	11.6	2005
	Cabin John Creek	2011	TSS	3,143	2,430	(tons/yr)	22.7	5.1	2005
	Potomac River Direct	2011	TSS	4,365	2,783	(tons/yr)	36.2	11.3	2005
Nutrients	Clopper Lake	2002	Phosphorus	101	55	(lbs/yr)	45.4	0.0	2002
	Anacostia River	2008a	Nitrogen	206,312	38,959	(lbs/yr)	81.8	10.2	1997
	Anacostia River	2008a	Phosphorus	20,953	3,947	(lbs/yr)	81.2	37.9	1997
	Triadelphia Reservoir	2008b	Phosphorus	438	373	(lbs/yr)	15.0	0.3	2003
	Rocky Gorge Reservoir	2008b	Phosphorus	4,268	3,628	(lbs/yr)	15.0	6.1	2003

Table III.J.2 TMDL Summary by Impairment

Impairment	Watershed	Issue Date	Pollutant	County MS4 Baseline Load	Annual Allocation	Units	WLAsw Percent Reduction	Percent Reduction Since Baseline Date*	TMDL Baseline Data Date
	Lower Monocacy River	2013	Phosphorus	1,872	1,305	(lbs/yr)	30.0	0.2	2009
	Rock Creek	2013	Phosphorus	12,503	8,089	(lbs/yr)	35.0	8.6	2009
Trash	Anacostia River	2010	Trash	228,683	-	lbs/yr removed	100.0	7.2	2010
PCBs	Anacostia River- Non Tidal – Northwest Branch	2011	PCBs	134.5***	2.56	g/yr	98.1	0.0	2005
	Anacostia River- Non Tidal – Northeast Branch	2011	PCBs	112.57***	1.53	g/yr	98.6	0.0	2005
	Patuxent River	2017	PCBs	32.2	0.00	g/yr	99.9	0.0	2010

Source: (MDE 2013) 2010 Status of Approved Stormwater Wasteload Allocations for NPDES Regulated Stormwater Entities in Montgomery County*, April 27, 2010 by Jeff White, MDE, and additional email 11/13/13*

* *Percent reduction of pollutant by BMPs completed after the TMDL baseline data collection period, as of FY19*

** *The FY18 Annual Report reflected 18.0 percent reduction since baseline in Cabin John Creek Watershed, however, did not account for conversion from* Enterococcus *to E. coli, or fate and transport of bacteria in the environment.*

*** *For all known NPDES stormwater discharges in the County portions of the Northeast and the Northwest Branches, as identified in the TMDL*

billion MPN/yr = billion most probable number per year
g/yr = grams per year
lbs/yr = pounds per year
tons/yr = tons per year
WLAsw = waste load allocation stormwater

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IV. Program Review, Annual Reporting and Reapplication

A. Annual Reporting

Annual progress reports, required under 40 CFR 122.42(c), will facilitate the long-term assessment of Montgomery County's NPDES stormwater program. The County shall submit annual reports on or before the anniversary date of this permit, February 15.

B. Program Review Reapplication for NPDES Stormwater Discharge Permit

MDE will review program implementation, annual reports, and periodic data submittal on an annual basis.

C. Reapplication for NPDES Stormwater Discharge Permit

This permit is intended to continue in effect for no more than 5 years. Continuation or reissuance of this permit beyond this permit term will require the County to reapply for NPDES stormwater discharge permit coverage in its fourth year annual report. Failure to reapply for coverage constitutes a violation of this permit.

As part of this application process, Montgomery County shall submit to MDE an executive summary of its NPDES stormwater management program that specifically describes how the County is meeting the overall goal to ensure that each County watershed has been thoroughly evaluated and its progress in implementing water quality improvements to the MEP. This application shall be used to gauge the effectiveness of the County's NPDES stormwater program and will provide guidance for developing future permit conditions. At a minimum, the application summary shall include:

1. Montgomery County's NPDES stormwater program goals
2. Program summaries for the permit term regarding:
   a. Illicit connection detection and elimination results
   b. Watershed restoration status including County totals for impervious acres, impervious acres controlled by stormwater management, the current status of watershed restoration projects and acres managed, and documentation of progress towards meeting WLA's developed under EPA-approved TMDLs as of the date of issuance of the permit.
   c. Pollutant load reductions as a result of this permit and an evaluation of whether TMDLs are being achieved.
   d. Other relevant data and information for describing County programs.
3. Program Operation and capital improvement costs for the permit term
4. Descriptions of any proposed permit conditions changes based on analyses of the successes and failures of the County's efforts to comply with the conditions of this Permit.

IV.A Annual Reporting

This submission by the County DEP to the MDE fulfills the annual progress report requirement as specified in Part IV of the MS4 Permit Number 06-DP-3320 MD0068349. The County is submitting its tenth report in this current permit cycle (February 16, 2010 through February 15, 2015).

IV.B Program Review Reapplication for NPDES Stormwater Discharge Permit

MDE will review program implementation, annual reports, and periodic data submittals annually. MDE provided the County with a review of its FY18 MS4 Annual Report on July 26, 2019. The County has reviewed the comments and addressed them in this submission.

IV.C Reapplication for NPDES Stormwater Discharge Permit

The County is submitting its tenth report in this current permit cycle (February 16, 2010 through February 15, 2015). The Permit requires the County to reapply for NPDES stormwater discharge permit coverage in its fourth-year annual report for the current permit term. The FY13 MS4 Annual Report, submitted in March 2014, included the reapplication for the Permit in the fourth-year Permit term. The County's fourth-year reapplication can be found in the Permit report Part IV.C of the FY13 Annual Report.

Section II, Corrective Actions, of the CD signed by the County and the MDE on April 13, 2018 required that the County submit its MS4 Annual Report for FY18, including the County's reapplication for NPDES stormwater discharge permit coverage to MDE, by February 15, 2019. The County met this requirement and included the reapplication for permit coverage in Section IV.C of the FY18 MS4 Annual Report, which was submitted on February 15, 2019.

V. Special Programmatic Conditions

A. Tributary Strategies

With the renewal of the Chesapeake Bay Agreement in 2000, Maryland, along with Virginia, Pennsylvania, the District of Columbia, and the Chesapeake Bay Commission, continues to reduce the discharge of nutrients and sediments to Chesapeake Bay. Montgomery County lies predominantly within two of Maryland's ten major Chesapeake Bay tributary basins: The Middle Potomac and Patuxent River tributary basins. This NPDES permit encourages Montgomery County to assist with the implementation of the Tributary Strategy designed to meet the nutrient and sediment reduction goals of these tributaries.

B. Comprehensive Planning

The County shall cooperate with the Maryland National Capital Park and Planning Commission (Commission) during the development and completion of the Water Resources Element (WRE) of the Commission's comprehensive land planning process as required by the Maryland Economic Growth, Resource Protection and Planning Act of 1992 (Article 66B, Annotated Code of Maryland). Such cooperation shall entail all reasonable actions authorized by law and not restricted by the Maryland-Washington Regional District Act (Article 28, Section 7-101 through 7-121.1, Annotated Code of Maryland), including but not limited to reviewing and approving the plans prepared and presented to it by the Commission, appropriating funds, and guiding the work of the Commission by instructing it to include certain tasks within its action plan.

A. Tributary Strategy

During spring 2018, MDE reviewed Maryland's draft planning targets for the State's major river basins. These new planning targets were set based on refinements made to the most recent version of the Bay Watershed Model, which uses the most up-to-date land use, land cover, and monitoring data available. The improved modeling tools are used to estimate where the State is with respect to statewide and basin-level 2025 watershed implementation plan (WIP) goals. These analyses determined that Maryland has already achieved its Phase III WIP planning target for phosphorus, but that more work is needed to achieve further reductions in nitrogen.

MDE and other State partners held five regional Phase III WIP meetings to inform and receive feedback from stakeholders. The agenda featured progress, funding, and lessons learned, along with opportunities to ask questions and give opinions on the proposed Phase III WIP approach. MDE and Maryland Department of Agriculture) MDA worked with stakeholders to build local goals into the State plan and refine, adapt, and adjust local plans. The draft Phase III WIP was available for public comment from April 12, 2019 through June 7, 2019. The Phase III WIP strategies for the urban and septic sectors in Montgomery County were consistent with the County's MS4 FAP for meeting current Phase I MS4 permit requirements and the 2025 Nitrogen Reduction Goals were 581 pounds for urban and 2,390 pounds for septic. MDE submitted the final Phase III WIP to EPA on August 23, 2019. The Phase III WIP strategies for the developed and septic sectors in Montgomery County remained consistent with the County's MS4 FAP for meeting current Phase I MS4 permit requirements, however, the 2025 Nitrogen Reduction Goals increased to 10,312 pounds for developed and 3,909 pounds for septic. Why these sectors' reduction goals increased so much when the strategies remained the same is unclear. The County

will seek to understand these changes and will provide more explanation, if available, in the FY20 Annual Report.

B. Comprehensive Planning

The County agencies are routine participants for review and comment as MNCPPC Sector Plan and Master Plan documents are being developed.